

**FACTORS INFLUENCING INDEPENDENT PRESCRIBING BY
PHYSIOTHERAPISTS AND PHARMACISTS**

by

EMMA MARJORIE GRAHAM-CLARKE

A thesis submitted to the University of Birmingham for the degree of
DOCTOR OF PHILOSOPHY

School of Pharmacy
Institute of Clinical Sciences
College of Medical and Dental Sciences
Medical School Building
University of Birmingham

May 2022

UNIVERSITY OF
BIRMINGHAM

University of Birmingham Research Archive

e-theses repository

This unpublished thesis/dissertation is copyright of the author and/or third parties. The intellectual property rights of the author or third parties in respect of this work are as defined by The Copyright Designs and Patents Act 1988 or as modified by any successor legislation.

Any use made of information contained in this thesis/dissertation must be in accordance with that legislation and must be properly acknowledged. Further distribution or reproduction in any format is prohibited without the permission of the copyright holder.

Abstract

This thesis presents the results of an original research programme that set out to investigate the factors influencing the uptake and utilisation of independent non-medical prescribing by pharmacists and physiotherapists, and to determine if these factors affect both pharmacist and physiotherapist prescribers similarly or if there are differences. For the first time a systematic policy review has been conducted bringing together UK non-medical prescribing (NMP) policy documents. This review identifies the changing role for NMP, from improving access to medicines for patients to streamlining care by reducing duplication and ensuring that patients have access to the most appropriate person. In addition, the systematic policy review highlighted the impact that changes in government, and reorganisation of the NHS, had in delaying legislation and reducing policy document publication.

The policy review was followed by an exploration of the factors influencing the uptake and utilisation of NMP, employing three standalone and sequential research methods; systematic literature review and thematic synthesis, consensus technique and focus groups. The systematic review was the first to investigate and synthesise the literature regarding barriers and facilitators to NMP. The identified papers pertained to research mainly with nurse independent non-medical prescribers (INMP), with limited representation from pharmacist INMPs but none from any other NMP profession. A consensus technique, Delphi, was used to investigate barriers and facilitators experienced by pharmacist and physiotherapist INMPs (the latter a newer, and relatively unexamined, NMP profession) to identify perceived similarities and differences between them. The two professions were chosen because they were similar in size, and range of practice areas, but differed in the length of time since each

profession gained prescribing rights. Focus group methodology then used the lived experiences of pharmacist and physiotherapist prescribers to understand how prescribers perceived the impact of outside influences on their practice.

The importance of this thesis is it defines two important themes influencing the utilisation of NMP. The first links to medical professionals and the wider clinical team, highlighting how support from the team enables successful NMP implementation. The second theme links to the INMP's role, which defined the knowledge they required, and thereby instilled confidence. The research identified the factors influencing NMP, which could be a barrier or a facilitator depending on circumstances, and their frequent interdependence. The Delphi and the focus groups described the experiences of the two professions, identifying differences between them, thus indicating that not all the identified factors affected each profession similarly.

Healthcare in the UK is evolving dramatically in response to workforce shortages, and this research has identified the role NMP now plays in healthcare provision to support continuing patient care. For the first time, not only have the factors that influence the utilisation of NMP been identified, and their frequent interdependence, but that they do not affect pharmacist and physiotherapist INMPs similarly. It cannot therefore be assumed that the factors influencing NMP apply equally to all NMP professions, and this should be recognised as NMP is expanded to other professions, such that mitigating strategies can be adopted. Likewise these factors should be considered when developing new NMP roles.

*"No man is an island, entire of itself; every man is a piece of the continent,
a part of the main."*

'Devotions upon Emergent Occasions'

John Donne 1572-1631

Acknowledgements

This thesis would not have been possible without the support, help and encouragement of many people. Firstly I would like to thank my supervisors; Professor John Marriott and Professor Alison Rushton. I don't think when we had our initial meeting, with my idea for a 'small project', that any of us thought it would develop into the marathon it did. Thank you, John, for your advice on everything from the practicalities of backups to how to improve my scientific writing, and for your reassurance and support when life didn't quite go according to plan. Thank you, Ali, for helping a scientist start to understand qualitative research and how to apply it. Without the faith that you both had in me, this thesis would not have happened. Thank you, and apologies, to Tim Noblet, who started on this journey with me, expecting only a small project, and found himself undertaking a PhD - your support and friendship has been invaluable. Thank you to my husband, Marcus, who despite commenting that PhD's should be undertaken when you're in your twenties, supported me although my twenties are far behind me – you are my rock. I am grateful for John Persaud joining me in a job share, supported by Puneet Sharma and the pharmacy department, thus enabling me to continue my research. I thank all those prescribers who took time to participate in my research and those I work with, who inspired me. I thank my friends and family who have put up with my PhD for so long, but who have often provided wise words, prompting new ideas, including the bridge crew – Brian, Steve and Annie. Sadly, Annie did not live to see the result, but I value her encouragement over the years. There are many others who have helped in many ways over the years; my thanks go to you as well.

Table of Contents

Abstract	i
Acknowledgements	iii
List of Tables	xi
List of illustrations	xii
List of Abbreviations	xiv
Background to thesis	1
Prescribing interest and researcher standpoint	1
Format of thesis	3
CHAPTER 1: Introduction	5
1.1 Non-medical prescribing – from neighbourhood nursing to Nurse Prescribers Formulary	6
1.1.1 Independent prescribing	7
1.1.2 Dependent prescribing	8
1.1.3 Protocol driven prescribing	8
1.2 Political background in the UK and introduction of the Extended Nurse Prescriber's formulary	8
1.3 Introduction of supplementary prescribing	10
1.4 Introduction of independent prescribing	11
1.5 From the early days of independent NMP to 2021	12
1.6 Uptake of prescribing	17
1.7 Factors affecting prescribing uptake and utilisation	18
1.8 Independent non-medical prescribing professions in the UK	19
1.9 Summary rationale for research	21
1.10 Underpinning research paradigm	22
1.11 Research question	23
1.11.1 Research Aims	23
1.11.2 Research Objectives	24
CHAPTER 2: Non-medical prescribing in the United Kingdom National Health Service: A systematic policy review	25

2.1	Introduction.....	27
2.1.1	Research Objective:	27
2.2	Methods	28
2.2.1	Protocol and registration	28
2.2.2	Eligibility criteria	28
2.2.3	Information sources.....	28
2.2.4	Policy document selection	30
2.2.5	Data collection process and data items	30
2.2.6	Risk of bias assessment.....	30
2.2.7	Data syntheses.....	31
2.3	Results	32
2.3.1	Policy document selection and characteristics	32
2.3.2	Synthesis of results	46
2.3.2.1	The Labour Government era 2006–2010.....	46
2.3.2.2	The Coalition and Conservative Governments era 2013–2017.	49
2.3.2.3	Consultation documents.....	51
2.4	Discussion	54
2.4.1	Summary of evidence	54
2.4.2	Chronological aspects	54
2.4.3	Healthcare provision—evolution of policy	57
2.4.4	Strengths and limitations.....	61
2.5	Conclusions.....	62
2.6	Chapter summary	64
2.7	Key points	65
2.8	Introduction to next chapter	65

CHAPTER 3: Facilitators and barriers to non-medical prescribing – A systematic review and thematic synthesis.....66

3.1	Introduction.....	68
3.1.1	Research Objective:	68
3.2	Methods	68
3.2.1	Search strategy and selection criteria.....	68
3.2.2	Quality assessment	71

3.2.2.1 Choice of tool	71
3.2.3 Analysis.....	73
3.3 Results.....	74
3.3.1 Non-medical prescriber themes	88
3.3.2 Human factor themes.....	88
3.3.3 Organisational aspect themes	89
3.4 Discussion.....	91
3.4.1 Strengths and Limitations.....	93
3.5 Conclusions	94
3.6 Chapter summary.....	94
3.7 Key points.....	95
3.8 Introduction to next chapter.....	95

CHAPTER 4: A Delphi study to explore and gain consensus regarding the most important barriers and facilitators affecting physiotherapist and pharmacist non-medical prescribing.....96

4.1 Introduction	98
4.1.1 Research objectives.....	99
4.2 Method	99
4.2.1 Consensus research methods.....	99
4.2.1.1 Nominal group technique.....	99
4.2.1.2 RAND appropriateness method.....	100
4.2.1.3 Consensus development conference	100
4.2.1.4 Delphi technique	100
4.2.1.5 Consensus, agreement and stability.....	101
4.2.1.6 Choice of technique and design	102
4.2.2 Delivery format of questionnaire	103
4.2.3 Participants.....	104
4.2.3.1 Inclusion criteria:	106
4.2.3.2 Exclusion criteria:	106
4.2.4 Overall Design.....	106
4.2.5 Procedure and analysis.....	108
4.2.5.1 Round One.....	108

4.2.5.2 Round Two	111
4.2.5.3 Round Three	112
4.2.6 Research governance and ethical considerations.....	114
4.3 Results	114
4.3.1 Demographic data	114
4.3.2 Response rate	117
4.3.3 Round One results	118
4.3.4 Round Two results	121
4.3.5 Round Three results.....	124
4.4 Discussion	130
4.4.1 Themes	130
4.4.2 Demographics	132
4.4.3 Delphi process.....	134
4.4.4 Strengths and limitations.....	135
4.5 Conclusions.....	135
4.6 Chapter summary	136
4.7 Key points	137
4.8 Introduction to next chapter	137

CHAPTER 5: Exploring the barriers and facilitators to non-medical prescribing experienced by pharmacists and physiotherapists, using focus groups 139

5.1 Introduction.....	141
5.1.1 Covid-19 pandemic	141
5.1.2 Research objective.....	142
5.2 Methods	142
5.2.1 Research team and reflexivity	142
5.2.2 Study Design	143
5.2.3 Choice of setting	145
5.2.4 Participants and recruitment.....	146
5.2.5 Ethical considerations	147
5.2.6 Data analysis	148
5.3 Results	149
5.3.1 Staff.....	161

5.3.2 Self.....	161
5.3.3 Governance	162
5.3.4 Practical aspects	162
5.3.5 Patient care	162
5.3.6 Orphan themes.....	163
5.4 Discussion.....	163
5.4.1 Themes	163
5.4.2 Inter-dependencies	165
5.4.3 Inter-professional differences	166
5.4.4 Data trustworthiness.....	168
5.4.5 Strengths and Limitations.....	169
5.5 Conclusion.....	170
5.6 Chapter summary.....	170
5.7 Key points.....	171
5.8 Introduction to next chapter.....	171
CHAPTER 6: Discussion and conclusions	172
6.1 Policy review	172
6.2 Factors influencing the uptake and utilisation of NMP	174
6.3 Pharmacy	179
6.4 Physiotherapy	180
6.5 Profession comparison and implications for practice	181
6.6 Areas for future research	182
6.7 Strengths and limitations	183
6.8 Conclusions	185
List of references	187
Appendices.....	212
Appendix 8.1 Published paper: Chapter 2.....	213
Appendix 8.2 PLoS ONE, Response to reviewers 5 June 2019: Chapter 2.....	242
Appendix 8.3 PLoS ONE, Response to reviewers 8 July 2019: Chapter 2	248

Appendix 8.4 PROSPERO record: Chapter 2 -Non-medical prescribing in the United Kingdom National Health Service: A systematic policy review and Chapter 3 - Facilitators and barriers to non-medical prescribing – A systematic review and thematic synthesis.....	251
Appendix 8.5 Prisma checklist: Chapter 2 -Non-medical prescribing in the United Kingdom National Health Service: A systematic policy review.....	256
Appendix 8.6 HMIC (Ovid) search strategy: Chapter 2 -Non-medical prescribing in the United Kingdom National Health Service: A systematic policy review.....	259
Appendix 8.7 Published paper: Chapter 3	260
Appendix 8.8 PLoS One Response to reviewers, 3 March 2018: Chapter 3.....	278
Appendix 8.9 Prisma checklist: Chapter 3 - Facilitators and barriers to non-medical prescribing – A systematic review and thematic synthesis.....	280
Appendix 8.10 ENTREQ checklist: Chapter 3 - Facilitators and barriers to non-medical prescribing – A systematic review and thematic synthesis.....	283
Appendix 8.11 Medline (Ovid) search strategy: Chapter 3 - Facilitators and barriers to non-medical prescribing – A systematic review and thematic synthesis	285
Appendix 8.12 QATSDD scores for each paper: Chapter 3 - Facilitators and barriers to non-medical prescribing – A systematic review and thematic synthesis	287
Appendix 8.13 Themes identified in each paper: Chapter 3 - Facilitators and barriers to non-medical prescribing – A systematic review and thematic synthesis	290
Appendix 8.14 Published paper: Chapter 4	293
Appendix 8.15 PLoS ONE, Response to reviewers 9 November 2020: Chapter 4	310
Appendix 8.16 Invitations to participate: Chapter 4.....	311
Appendix 8.17 Participant information sheet: Chapter 4.....	313
Appendix 8.18 Round One questionnaire: Chapter 4.....	316
Appendix 8.19 Round One questionnaire routing structure: Chapter 4.....	327
Appendix 8.20 Round Two questionnaire: Chapter 4.....	328
Appendix 8.21 Round Three questionnaire: Chapter 4	351
Appendix 8.22 Weighted rank sum example - worked example: Chapter 4	365
Appendix 8.23 Reporting criteria for Delphi study: Chapter 4	366
Appendix 8.24 Consensus results for facilitator statements, Round Two–grouped by all participants and for each profession: Chapter 4.....	368
Appendix 8.25 Consensus results for barrier statements, Round Two–grouped by all participants and for each profession: Chapter 4.....	371

Appendix 8.26 Consensus results for facilitator statements, Round Three—grouped by all participants and for each profession. Round Two results included for comparison (see key): Chapter 4	375
Appendix 8.27 Consensus results for barrier statements, Round Three—grouped by all participants and for each profession. Round Two results included for comparison (see key): Chapter 4	377
Appendix 8.28 Published paper: Chapter 5	379
Appendix 8.29 BMCHSR, Response to reviewers: Chapter 5	397
Appendix 8.30 Topic guide: Chapter 5	401
Appendix 8.31 Invitation to participate: Chapter 5	404
Appendix 8.32 Participant information sheet: Chapter 5	405
Appendix 8.33 Screening questionnaire: Chapter 5	409
Appendix 8.34 Consent form: Chapter 5	410
Appendix 8.35 Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist: Chapter 5	411

List of Tables

Table 1-1 Comparison of independent and supplementary prescribing	12
Table 1-2 Summary table highlighting key steps in the evolution of non-medical prescribing in the UK	13
Table 1-3 Brief resume of non-medical professions in the UK: highlighting activities, qualifications and other information that may differ from the international situation.	15
Table 2-1 List of databases and websites searched for policy review	29
Table 2-2 Policy and strategic report documents included in the policy review.	33
Table 2-3 Consultation documents included in the policy review	39
Table 3-1 - Search strategy terms for facilitators and barriers systematic review	70
Table 3-2 Characteristics and details of selected papers included in the systematic review.	77
Table 3-3 The themes and subthemes that influence non-medical prescribing.	83
Table 4-1 Comparison of consensus techniques	101
Table 4-2 Sample matrix for selecting Delphi participants	105
Table 4-3 A priori agreed consensus criteria for Delphi Round Two and Three	112

Table 4-4 Decision tool for selecting ranking, re-rating or removal of the factors, for developing the Delphi Round Three questionnaire.....	113
Table 4-5 Delphi participant demographic data	116
Table 4-6 Delphi response rates for each round	117
Table 4-7 Progress through questionnaire pages for each Delphi round	117
Table 4-8 Identified themes following content analysis of Delphi Round One results.....	119
Table 4-9 Kendall's Coefficient of Concordance (W) results for Delphi Round Two.....	121
Table 4-10 Kendall's Coefficient of Concordance (W) results for Delphi Round Three re-rating of statements.....	124
Table 4-11 Kendall's Coefficient of Concordance (W) for ranked statements from Delphi Round Three	125
Table 4-12 Weighted sums and ranks for statements – presented by all participants and each profession (ordered according to weighted sum for all participants)	127
Table 5-1 Comparison of potential advantages and disadvantages of physical (under Covid-19 restrictions) and virtual meetings for focus groups.....	146
Table 5-2 Target sample matrix for focus group participants	147
Table 5-3 Focus group brief participant demographic data	150
Table 5-4 Code book description of themes and sub themes, with illustrative quotes	154
Table 6-1 Summary of the factors influencing NMP (main and minor) identified in Chapters 3, 4 and 5, grouped by overarching theme.	176

List of illustrations

Figure 1 Outline scheme for thesis chapters	4
Figure 2-1 PRISMA paper selection flow diagram for policy documents.....	32
Figure 2-2 Timeline of documents included in the policy review	45
Figure 2-3 Consultation documents timeline for allied healthcare professions.....	53
Figure 3-1 PRISMA paper selection flow diagram	75
Figure 4-1 Delphi Scheme overview, detailing researcher and participant activities for each round	107
Figure 4-2 Algorithm highlighting the process for exporting and analysing the Delphi Round One responses	110
Figure 4-3 Ranked statements for all participants presented by weighted rank sum.....	128

Figure 4-4 Ranked statements for professional groups presented by weighted rank sum .. 129

Figure 5-1 Sunburst chart depicting the themes and subthemes derived from the focus groups, and their relative importance 152

Figure 5-2 Concept map of hierarchical structure depicting interrelationship between themes and sub themes derived from the focus groups 153

List of Abbreviations

ACMD.....	Advisory Council on the Misuse of Drugs
AHP	Allied Health Professional
ACP	Advanced clinical practitioner
BNF	British National Formulary
BSc	Bachelor of Science
CHAIN	Contact, Help, Advice and Information Network
CMP	Clinical Management Plan
CHM.....	Commission on Human Medicines
CPD	Continuing professional development
DMP	Designated medical practitioner
ENPF	Extended Nurse Prescribers' Formulary
F2F	Face-to-Face
GOC.....	General Optical Council,
GPhC	General Pharmaceutical Council
GP	General Medical Practitioner
GPwSI.....	GP with a special interest
HCPC	Health and Care Professions Council
HEE	Health Education England
HEI	Higher education institute
INMP	Independent non-medical prescriber
IQR	Interquartile range
IPA	Interpretative Phenomenology Analysis
IT	Information technology

MDT..... Multidisciplinary team

MHRA Medicines and Healthcare Products Regulatory Agency

MPharm.... Master of Pharmacy

MSc..... Master of Science

NHS..... National Health Service

NHSFT National Health Service Foundation Trust

NMP Non-medical prescribing

NP..... Nurse prescriber

NPF Nurse Prescribers' Formulary

NMC Nursing and Midwifery Council

PCT Primary care trust

PGD Patient Group Directions

PP Pharmacist prescriber

QATSDD Quality Assessment Tool for Studies of Diverse Designs

RPS Royal Pharmaceutical Society

SHA..... Strategic Health Authority

SSI..... Semi-Structured interviews

TTO 'To take out' – discharge medication

UK..... United Kingdom

USA United States of America

BACKGROUND TO THESIS

Prescribing interest and researcher standpoint

As a consultant pharmacist working in critical care in the National Health Service (NHS), my role is to ensure medicines optimisation for critically ill patients. To support this, I became one of the first cohort of pharmacy supplementary prescribers, qualifying in 2004. The constraints imposed by supplementary prescribing quickly became apparent and I qualified as an independent prescriber in 2006, when the law was changed to enable pharmacists to become independent prescribers.

I also became the non-medical prescribing (NMP) deputy lead for my hospital Trust and, more latterly, lead. This led to an appreciation that the level of support I received during my training, and afterwards, was not always offered to other non-medical prescribers in the Trust. Consequently, several of these non-medical prescribers did not actively prescribe following qualification.

The lead role also led to an awareness of the expansion of NMP to professions other than pharmacy and nursing, as well as the extension from supplementary to independent prescribing for some professions. My Trust now has non-medical prescribers from most of the currently eligible professions (nursing, pharmacy, physiotherapy, podiatry, and optometry), representing a wide range of practice areas from district nursing to specialties such as diabetes and respiratory. Non-medical prescribers in the Trust work both in primary and secondary care and may work in teams or as solo workers.

As an active prescriber and pharmacist, I have been involved in training non-medical prescribers, including course and curriculum development, lecturing and work-based teaching. This has led to an understanding of the extent and limitations of the prescribing course, and the need to support newly qualified prescribers in the Trust. These experiences generated questions concerning the reasons why non-medical prescribers do not use their qualification, and whether the experiences of current prescribers could be used to support new prescribers more effectively.

This research was prompted by the extension of independent prescribing rights to physiotherapists and the desire to understand what factors affected the uptake and utilisation of NMP, so that new physiotherapist independent prescribers could be appropriately supported. The values and beliefs that I bring to this research, as a patient facing pharmacist prescriber in critical care, are balanced by input from my supervisors (JM and AR) and my fellow doctoral student (TN), who are qualified professionals (pharmacy and physiotherapy) but not qualified prescribers.

Format of thesis

Chapter 1 describes the evolution of NMP, and early research findings. The choice of professions studied is explained. The research question to be answered and the aims and objectives are listed.

Chapter 2 reviews Government policy concerning NMP, highlighting changes in political approach.

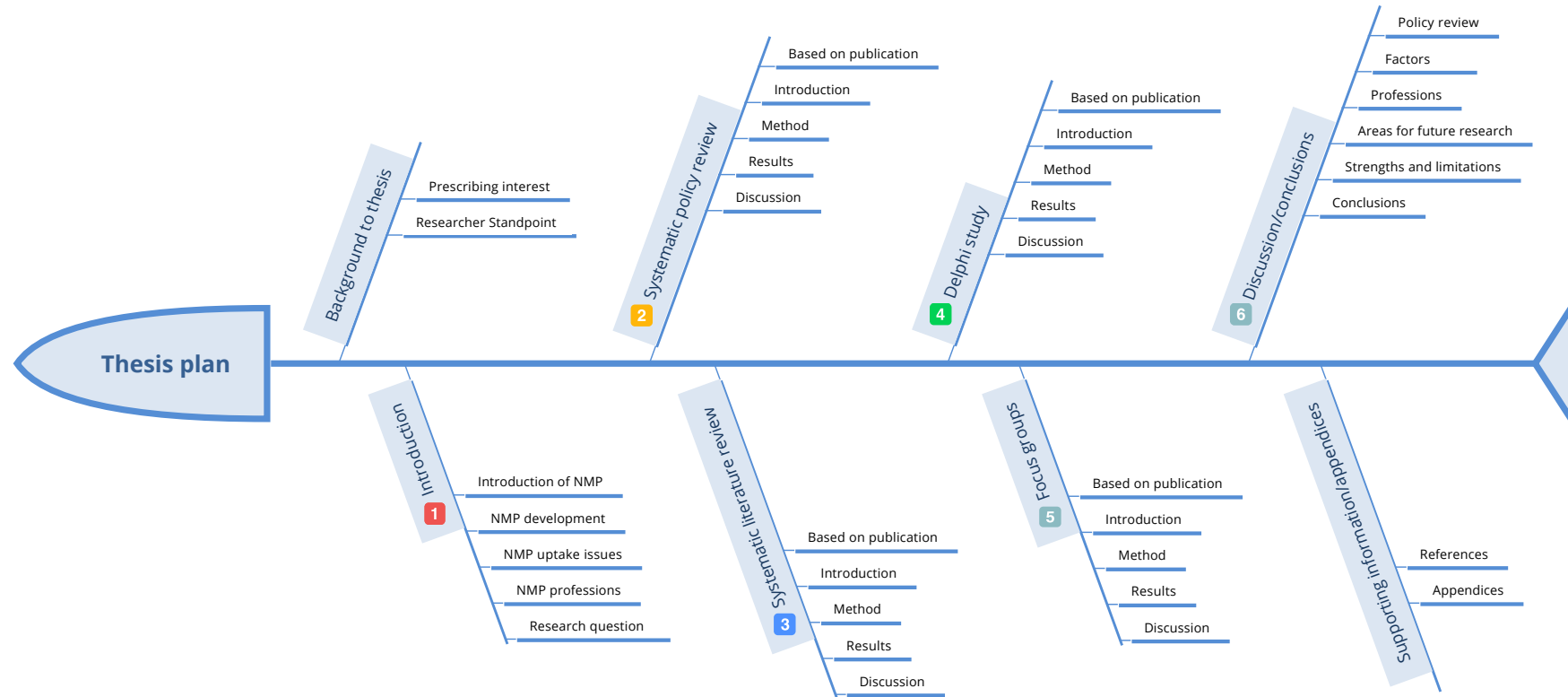
In Chapter 3, the facilitators and barriers to NMP described in the literature are investigated.

Chapter 4 describes the use of a consensus technique to determine the facilitators and barriers experienced by pharmacist and physiotherapist non-medical prescribers.

In Chapter 5 the findings from Chapter 4 are explored in greater depth using focus group methodology.

In Chapter 6 a general discussion of the findings brings together the overall conclusions from the research and identifies areas for future investigation.

Figure 1 Outline scheme for thesis chapters



CHAPTER 1: INTRODUCTION

Chapter overview

In this chapter the evolution of NMP in the United Kingdom (UK) is described. The different prescribing options and professions are discussed, as well as information on uptake of prescribing and factors affecting prescribing. The research question and aims and objectives are listed.

The majority of this chapter is taken verbatim from the introduction and background sections of the following publications in which I am principal author.

Graham-Clarke E, Rushton A, Noblet T, Marriott J. Non-medical prescribing in the United Kingdom National Health Service: A systematic policy review. PLoS ONE [Internet]. 2019; 14(7): e0214630
Available from: <https://doi.org/10.1371/journal.pone.0214630>.

Graham-Clarke E, Rushton A, Noblet T, Marriott J. Facilitators and barriers to non-medical prescribing – A systematic review and thematic synthesis. PLoS ONE [Internet]. 2018; 13(4): e0196471
Available from: <https://doi.org/10.1371/journal.pone.0196471>.

Graham-Clarke E, Rushton A, Marriott J. A Delphi study to explore and gain consensus regarding the most important barriers and facilitators affecting physiotherapist and pharmacist non-medical prescribing. PLoS ONE [Internet]. 2021; 16(2): e0246273.
Available from: <https://doi.org/10.1371/journal.pone.0246273>

Graham-Clarke E, Rushton A, Marriott J. Exploring the barriers and facilitators to non-medical prescribing experienced by pharmacists and physiotherapists, using focus groups. BMC Health Serv Res. 2022;22(1):223.
Available from: <https://doi.org/10.1186/s12913-022-07559-5>

The text has been reordered to provide a coherent and logical overview of the introduction of NMP in the UK. References have been updated and included where appropriate to incorporate current information, in particular from section 1.5 onwards. Minor changes to the narrative text have been made throughout to correct typographical and grammatical errors.

1.1 Non-medical prescribing – from neighbourhood nursing to Nurse Prescribers

Formulary

NMP is an umbrella term used to describe prescribing of human medicines by professions other than the medical and dental professions. Nurse prescribing was introduced in the United States of America (USA) in the 1960s with gradual introduction into other countries since then [1]. In 2011 Kroezen et al [1] reviewed the nurse prescribing literature, identifying seven countries (Australia, Canada, Ireland, New Zealand, Sweden, UK, and USA) that had implemented nurse prescribing, with a further three countries where it was under consideration. They established that nurse prescribing was often subjected to a closed formulary or limited by the medical conditions treated, remaining subordinate to medical jurisdiction, with the UK and Ireland notable exceptions. Kroezen et al (2011) [1] also commented that developments with regard to nurse prescribing were slow overall, apart from in the UK. Since the publication, the UK has pioneered the expansion of prescribing to other non-medical professions, providing a healthcare delivery model that could be utilised by other countries.

Traditionally, prescribing of human medicines had been perceived as a medical role, with only medical professionals and dentists having full prescribing rights in the UK. Two seminal reports

challenged this view; the Cumberlege report [2], which paved the way for limited prescribing by health visitors and district nurses, and the second Crown report [3], which recommended extending prescribing rights for the benefit of patients and to utilise the skills of healthcare professionals. Cumberlege advocated allowing neighbourhood nurses (district nurses and health visitors) to prescribe from a limited list of medications and dressings, with initial legislation to support this development passed in 1992 [4], and associated commencement legislation for England and Wales in 1994 [5] and Scotland in 1996 [6]. Following pilot studies, further legislation was passed in 1997, which defined nurse prescribers as district nurses or health visitors [3, 7]. Furthermore, in Schedule 3 of The Prescription Only Medicines (Human Use) Order 1997, the list of medication they could prescribe was defined, forming the basis of the Nurse Prescribers' Formulary (NPF) [3, 7]. The second Crown report included a review of prescribing approaches utilised across the world, listing three main styles of prescribing: independent, dependent or protocol driven [3].

1.1.1 Independent prescribing

The Crown report described an independent prescriber as someone responsible for the care of the patient, including diagnosing and prescribing medication to treat them [3]. This is exemplified classically by medical practitioners, but the Crown report identified that nurses were also working in a similar manner in some countries (in particular Sweden and the USA) [3]. However, as also described by Kroezen et al, these practitioners were limited in their prescribing practice [1].

1.1.2 Dependent prescribing

Dependent prescribing describes a relationship between a primary practitioner/independent prescriber, who makes the diagnosis, and a secondary practitioner, who prescribes [3]. The primary practitioner retains responsibility for the patient, with the secondary practitioner only responsible for their prescribing practice. The Crown reported various styles of dependent prescribing ranging from simple repeat prescribing to prescribing from a choice of drugs and doses listed in a management plan [3].

1.1.3 Protocol driven prescribing

The third style portrayed was protocol driven prescribing, as utilised in Patient Group Directions (PGD) in the UK, whereby a protocol is drawn up allowing identified staff members to treat a group of patients with an identified drug or drugs [8]. As an example, Emergency Department nurses would be able, under the auspices of a PGD, to prescribe and administer tetanus vaccine to patients who have received an open wound.

1.2 Political background in the UK and introduction of the Extended Nurse Prescriber's formulary

The main UK healthcare provider, within which prescribers practice, is the National Health Service (NHS); established in 1948 to provide comprehensive healthcare to all, free at the point of delivery [9]. The UK also has a parallel smaller privately funded health-care sector. Healthcare policy is directed by the UK government, reflecting the principles of the governing party at the time. Since 1948, this has been one of two main political parties (Labour,

Conservative), apart from 2010–2015 when a Conservative and Liberal Democrat coalition was in power. As a general principle, Conservative governments tend to support free markets and expansion of the private sector, whereas Labour governments support the NHS over the private sector. Rising costs and changes in healthcare practice have led to numerous reforms since the NHS was founded but, irrespective of the political stance, the founding principles have remained [9, 10].

In 2000 the governing Labour Party published a White Paper 'The NHS Plan', which described the government's intention to modernise healthcare services, breaking down the traditional demarcations between professions and introducing new ways of working to increase healthcare capacity, shorten waiting times, and thus improve the patient experience [11]. Nurse prescribing was highlighted as one of the 10 key roles defined by the Chief Nursing Officer and the White paper anticipated that half of all nurses would be able to prescribe by 2004 [11]. The intention was to extend nurse prescribing rights further, through extending the drugs listed in the NPF, and by widening the range of nurses able to prescribe. The White Paper also included broad reference to 'therapists' (a generic term covering the professions allied to health) extending their roles, with prescribing included [11]. To support these sweeping changes to traditional practice the government established the Modernisation Agency, tasked with supporting service redesign at a local level [12], and launched a consultation on extending nurse prescribing [13]. In 2001 the government announced the extension of limited formulary independent prescribing by allowing other groups of nursing staff to train as prescribers [14], with the relevant legislation passed the following year [15]. These nurses were permitted to prescribe drugs included in the Extended Nurse Prescribers'

Formulary (ENPF) for a defined range of conditions such as minor ailments and palliative care. Included in the press release was a statement that consultation would begin on allowing supplementary prescribing for nurses and pharmacists [14], with the consultation launched in 2002 [16] and approval granted later that year [17].

1.3 Introduction of supplementary prescribing

Supplementary prescribing is a form of dependent prescribing and is described as a voluntary partnership between the supplementary prescriber, the doctor looking after the patient, and the patient [18]. The supplementary prescriber is responsible for managing and prescribing for the condition(s) and medication(s) listed in an agreed clinical management plan (CMP) but is unable to prescribe any other medication [18]. Following passing of the necessary legislation [19], the first nurse supplementary prescribers qualified in 2003, with pharmacists following in 2004. In 2005 legislation was passed that allowed supplementary prescribers to prescribe controlled drugs, as well as unlicensed medication (provided these were listed in the CMP) and changes in the NHS regulations allowed podiatrists, physiotherapists and radiographers to also become supplementary prescribers [20, 21]. Additionally, legislation was passed permitting optometrists to become supplementary prescribers [22, 23]. It quickly became apparent that supplementary prescribing, whilst ideal for complex and long-term conditions, had significant limitations regarding acute care (where time constraints did not allow for agreement of a CMP), hampering the government's desire to enhance patient care through expanding nurse and pharmacist roles and hence improving access to medication. This was

articulated clearly in the consultation documents launched in 2005 to investigate expansion into independent prescribing [24, 25].

1.4 Introduction of independent prescribing

The 2005 consultation documents proposed possible models for nurse independent prescribing [25] and the introduction of pharmacist independent prescribing [24]. Legislation to implement independent prescribing by nurses and pharmacists was enacted in 2006 [26] and independent prescribing by nurses and pharmacists was launched under the banner of "improving patients' access to medicines" [27] with restrictions on the prescribing of controlled drugs and unlicensed medication.

Table 1-1 gives an overview comparing supplementary and independent prescribing. In addition, the British National Formulary (BNF) provides an overview of independent NMP, including the restrictions that the various professions must abide by (<https://bnf.nice.org.uk/guidance/>) [28]. All non-medical prescribers must successfully complete an appropriate and accredited prescribing course and be registered as a prescriber with their relevant professional regulatory body. They are expected to only prescribe within their professional expertise and competence [29, 30].

Table 1-1 Comparison of independent and supplementary prescribing

	Prescriber type	
	Independent	Supplementary
Accountable for care	✓	X
Assess the patient	✓	If required as part of the clinical management plan
Diagnose/confirm diagnosis	✓	X
Plan clinical management	✓	X
Prescribe	✓	✓
Range of medication	Any permitted by profession relevant legislation	Any medication or class of medication listed in the agreed clinical management plan and permitted by profession relevant legislation

From: Graham-Clarke E, Rushton A, Noblet T, Marriott J. Non-medical prescribing in the United Kingdom National Health Service: A systematic policy review. PLoS ONE. 2019;14(7):e0214630. [31]

1.5 From the early days of independent NMP to 2021

The restrictions on prescribing controlled drugs and unlicensed medications were lifted, with nurses and pharmacists being granted prescribing rights for unlicensed medication in 2009 [32] and controlled drugs in 2012 [33]. Since then, independent prescribing rights have been gradually extended to a range of healthcare professionals, including paramedics in 2019 [34]. Table 1-2 summarises the evolution of NMP in the UK; listing dates when key legislation was introduced, and the purpose (regarding NMP) that the legislation had.

Table 1-2 Summary table highlighting key steps in the evolution of non-medical prescribing in the UK.

Year	Introduction of:
1997	Nurse Prescribers' formulary
2002	Extended formulary prescribing for nurses
2003	Supplementary prescribing for nurses and pharmacists
2005	Independent prescribing for nurses and pharmacists Supplementary prescribing for physiotherapists, podiatrists, and therapeutic and diagnostic radiographers
2008	Independent prescribing for optometrists
2013	Independent prescribing for physiotherapists and podiatrists
2016	Independent prescribing for therapeutic radiographers Supplementary prescribing for dieticians
2019	Independent prescribing for paramedics

Adapted from Graham-Clarke E, Rushton A, Noblet T, Marriott J. Facilitators and barriers to non-medical prescribing – A systematic review and thematic synthesis. PLoS ONE [Internet]. 2018; 13(4): e0196471 [35]

Further changes in permitted prescribing rights are to be anticipated as qualified prescribers discover the limits imposed by profession specific legislation and as other professions seek prescribing rights. Apart from nurses and pharmacists, the NMP professions are restricted in law regarding the controlled drugs they can prescribe, with individual drugs and forms listed. For example, physiotherapists found their pain management treatment options were curtailed when gabapentin and pregabalin were reclassified as Schedule 3 controlled drugs in 2019 [36] but were not included in the physiotherapy list of permitted controlled drugs. In 2020 NHS England subsequently conducted two consultations to explore widening the choice of controlled drugs that physiotherapists and podiatrists can prescribe, with the outcome awaited [37, 38]. Therapeutic radiographers and paramedics remain unable to prescribe any controlled drugs, as the relevant legislation has yet to be passed [39].

Access to medicines continues to be reviewed, with the aim of improving care to patients, with the latest scoping review falling short of recommending extending full prescribing rights

to other non-medical professions [40]. The Health Foundation had previously identified that physician associates are limited in their practice as they are unable to prescribe [41]; however, until they become a regulated profession this situation will not change as registration with a regulatory body is a prerequisite before prescribing rights can be granted [42].

This thesis refers to the activities and qualifications of non-medical professionals in the UK. As these may vary internationally, a brief resume of the UK position is given in Table 1-3. Prescribing forms part of advanced clinical practice, a loose definition that Health Education England (HEE) describes as involving making complex decisions at a high level of autonomy and encompassing four components: clinical expertise, leadership, education, and research [43].

Table 1-3 Brief resume of non-medical professions in the UK: highlighting activities, qualifications and other information that may differ from the international situation.

Profession	Initial qualification	Regulator	Medically qualified	Core activities	Advanced practice examples	Further details on scope of practice available from:
Diagnostic radiographer	BSc	HCPC	No	Conduct imaging tests on patients using ionising and non-ionising radiation. Use contrast agents or other medication where necessary for investigations	Interpretation and reporting on images Ultrasound guided biopsies	Society of Radiographers: https://www.sor.org
Nurse	BSc	NMC	No	Provide care for patients, assessing needs and delivering treatment plans	Work autonomously to manage a patient case load in a specialist area e.g. pain management Run nurse-led minor injury clinics	Royal College of Nursing: https://www.rcn.org.uk
Optometrist	BSc	GOC	No	Test sight and examine eyes. Prescribe lenses. Detect ocular disease and abnormalities.	Diagnose, assess and manage (including prescribing) ophthalmic conditions – for example glaucoma	The College of Optometrists: https://www.college-optometrists.org
Paramedic	Diploma, foundation degree, BSc, apprenticeship	HCPC	No	Assess, treat, stabilise and transfer patient to appropriate care centre	Diagnose and treat patients. Work in an urgent care centre, or general practice to assess and treat patients	College of Paramedics: https://www.collegeofparamedics.co.uk
Pharmacist	MPharm	GPhC	No	Supply medicines to patients, ensuring that they are appropriate for the patient and of suitable quality. Provide medicines related advice	Work autonomously managing a patient case load in a specialist area e.g. renal failure, chronic pain Work in Emergency departments to independently manage and treat patients.	General Pharmaceutical Council: https://www.pharmacyregulation.org Royal Pharmaceutical Society: https://www.rpharms.com

Physician's associate	Life sciences degree	No regulator Voluntary register held by Faculty of Physician Associates	No	Work alongside medical staff to care and treat patients <i>(The nearest USA equivalent role is physician's assistant.)</i>	Not applicable	Faculty of Physician Associates: https://www.fparcp.co.uk
Physiotherapist	BSc or MSc	HCPC	No	Use various techniques to enable patients to improve movement and function and manage pain.	Work independently to manage a patient caseload in a specialist area e.g. back pain or respiratory failure Utilise techniques such as acupuncture, steroid injections or botulinum toxin injections	Chartered Society of Physiotherapy: https://www.csp.org.uk
Podiatrist	BSc	HCPC	No	Diagnose and treat common foot problems	Conduct podiatric surgery Specialise in areas e.g. diabetes care or sports medicine; utilising techniques such as acupuncture and steroid injections	The College of Podiatry: https://cop.org.uk
Therapeutic radiographer	BSc	HCPC	No	Use radiotherapy to treat cancer patients.	Plan radiotherapy treatment Independently manage and treat patients throughout the course of their radiotherapy	Society of Radiographers: https://www.sor.org

BSc – Bachelor of Science, MPharm – Master of Pharmacy, MSc – Master of Science, GOC – General Optical Council, GPhC – General Pharmaceutical Council, HCPC – Health and Care Professions Council, NMC – Nursing and Midwifery Council

From: Graham-Clarke E, Rushton A, Noblet T, Marriott J. Non-medical prescribing in the United Kingdom National Health Service: A systematic policy review. PLoS ONE. 2019;14(7):e0214630. [31]

1.6 Uptake of prescribing

The initial uptake of NMP was slow, with approximately 240 pharmacists and 4000 nurses having qualified by 2005 [44], the latter contrasting with the government's anticipated 10000 nurses by 2004 [14]. McCann et al found, in their study of pharmacist prescribers in Northern Ireland, that only 46% (n=46) were actively prescribing and 47% (n=47) had never prescribed [45]. In 2015 a report identified that approximately 53000 nurses and over 3800 pharmacists were registered as prescribers [46] , but the authors were unable to identify how many were active. Previous survey evidence indicated 14% of nurse independent prescribers and 29% of pharmacist independent prescribers were not using their prescribing qualification [44], and other estimates indicate under 10% of nurse independent prescribers and nearly 40% of pharmacist and allied health professional (AHP) prescribers are not using their prescribing qualification [47]. Similarly, surveys conducted by the General Pharmaceutical Council (GPhC) indicate varying uptake of prescribing activity. In a 2016 survey of prescribing pharmacists nearly 90% of pharmacist prescribers were reported as active [48], whereas the previous 2014 report had found that only 61% had prescribed in the previous year [49]. The 2016 survey had a poor response rate (<18%) possibly overestimating activity through responder bias. Finally, a survey from 2019 of registered pharmacists identified that 17% had a prescribing qualification, representing over 2000 pharmacists [50]. The survey results state there was a questionnaire response rate of nearly 30% for pharmacist prescribers (overall response rate of 23.1%) [50]. Of those with a prescribing qualification, 20% stated that they had never used it, and of those who had used it, 12% had not prescribed in the last 12 months [50].

Data for the AHPs is more limited, but a freedom of information request published in 2019 on the Health and Care Professions Council (HCPC) website indicates that just over 1,000 physiotherapists were annotated on the register as independent prescribers, and over 1,100 as supplementary prescribers [51]. It is unclear how many have dual annotation, or how many are active. Similar data are available for podiatrists (n=376 and 447 respectively) and paramedics (n=200 and 198) [51]. Data for optometrists is not readily available, and although in 2019 there were approximately 14,000 optometrists in England, it is unknown how many had prescribing rights [52].

1.7 Factors affecting prescribing uptake and utilisation

The full cost of training a non-medical prescriber has been calculated as approximately £10,000 [44] and, with increasing demand on the NHS and limited funding, there is a need to realise the full benefit of training investment. Previous studies have identified reasons for not prescribing, including lack of support from colleagues or within their work environment [47], or a role change [44], but did not explore these issues in depth. A previous thematic literature review of supplementary prescribing did not address the issue of barriers and facilitators specifically but identified a limited number including: medical practitioner support, communication, resource limitations and specific supplementary prescribing aspects [53]. This review also did not address independent prescribing. A study of independent and supplementary pharmacist prescribers in Northern Ireland identified access to medical records, insufficient funding, and lack of awareness of pharmacist prescribers as the three main barriers [45], but was limited in scope. The three surveys conducted on behalf of the

GPhC highlighted various reasons for not prescribing, with common themes concerning lack of support, change of role and funding issues (including lack of commissioned services) [48-50]. Apart from the 2014 survey conducted by NatCen [49], the reports lack detail on the analytical methods used, with the 2016 report in particular referring only to 'thematic analysis' [48].

1.8 Independent NMP professions in the UK

Over 680,000 nurses are registered with the Nursing and Midwifery Council (NMC) in the UK of whom over 50,000 are prescribers and a further 41,000 can prescribe from the NPF [54]. In comparison, the other NMP professions are considerably smaller, with physiotherapy and pharmacy being the largest of these professions, having approximately 56,000 registrants in the UK each [51, 52, 55]. Pharmacy has approximately 8000 prescribers on the register [50], with physiotherapy having just over 1000, and prescriber numbers in the low hundreds for the other AHP NMP professions [51]. Numbers are not available for optometrists, but as the profession is relatively small it could be anticipated that the number of prescribers is similarly modest [52]. Previous research indicates that utilisation of a prescribing qualification is high for nurses, but reduced for AHPs and pharmacists [44, 47-50]. Nurse prescribing has developed over many years, initially with neighbourhood nursing and eventually leading to full independent NMP [2, 32, 33], and has been extensively investigated [44]. Scoping reviews for this research did not reveal a similar level of investigation for the other NMP professions. This research aimed to investigate the factors affecting the utilisation of prescribing, and to determine if profession specific differences existed. Therefore, the decision was made to

study two professions that were comparable in size, but differed in the length of time that each profession had prescribing rights. Pharmacy and physiotherapy are similar sized professions but differ in the length of time each has had independent prescribing rights [26, 56]. Each of these professions has sufficient prescribers to support study recruitment, whilst limiting the potential for one profession to dominate.

Both physiotherapists and pharmacists may work as individuals or as teams and may work in all healthcare sectors. Pharmacy gained independent prescribing rights six years earlier than physiotherapy [26, 56]. Pharmacists are able to prescribe any medication, including controlled drugs and unlicensed medication, except for a small number of drugs for the treatment of addiction [57]. In comparison physiotherapists can prescribe any licensed medication, and a limited range of control drugs, provided they fall within the physiotherapy scope of human movement, physical performance and function [57, 58].

The approach to professional practice differs between the two professions. Physiotherapist interaction with the patient will usually involve an initial diagnosis followed by a multi-modal treatment plan, which may, but may not, include medication. For example, physiotherapists are moving into first point of contact roles for patients with musculoskeletal problems, where the ability to prescribe enables them to provide a complete treatment package without referral to other healthcare professionals [59-62]. Pharmacists in contrast may be involved in the initial diagnosis [63], but more frequently will assume the care of a patient who has received an initial diagnosis, taking responsibility for prescribing, and monitoring, appropriate medication as well as providing lifestyle advice, for example, pharmacists involved in the care of long-term conditions [64].

1.9 Summary rationale for research

The initial focus of government policy regarding NMP was the desire to improve patient access to medicines. However, more recent documents from NHS England have focused on the increased demand for services and the need to drive efficiency so that maximum benefit can be obtained from the limited NHS budget [65, 66]. The role of NMP has been less apparent in these later documents, and it is unclear if this reflects a change in government policy, which warrants further investigation to determine the current place for NMP. These more recent documents suggest that policy emphasis may have changed to a need to streamline care, driven by workforce shortage pressures, and funding shortfalls, [59, 66]. Such plans will be hindered if qualified non-medical prescribers are deterred, for whatever reason, from utilising their skills. At the planning stage for this research, no robust review of the qualitative literature relating to barriers or facilitators of independent NMP was identified, thus indicating a gap in the knowledge base regarding the factors affecting utilisation of NMP.

Where data exists, there is an indication that utilisation of a prescribing qualification is lower for pharmacists and AHPs than it is for the nursing profession [44, 45, 47-50]. However, the paucity of evidence regarding the NMP professions other than nurses, identified during the scoping work for this thesis, gives little indication why this is so. By choosing two comparably sized but distinct professions to investigate, it was postulated that the likelihood of factors influencing NMP being generic, or alternatively specific to a profession, will be highlighted. Establishing factors that facilitate or prevent NMP and investigating if these are generic to

different NMP professions, or are professional, situational or person specific will aid NMP development.

1.10 Underpinning research paradigm

Practical problems, such as identifying factors affecting the utilisation of NMP, can be investigated using a mixed-methods approach, underpinned by the research paradigm of pragmatism [67, 68]. Pragmatism focuses on the research question and outcomes, utilising research methods that enable the question to be answered [67, 68]. Kaushik and Walsh (2019) also highlight that pragmatism epistemology acknowledges that an individual's knowledge derives from their experiences, and hence is unique to that person [68]. Mixed-methods research combines both quantitative and qualitative methods, with the strengths of each method contributing to address weaknesses in the other methods [67, 69]. Utilisation of qualitative research methods will provide a deeper understanding of the factors affecting INMPs, whilst a quantitative component enables the relative importance of these factors to be determined. Hence this research was guided by the principles of pragmatism, utilising research methods that were appropriate to address the aims and objectives.

1.11 Research question

What are the factors influencing uptake and utilisation of independent prescribing by pharmacists and do physiotherapists experience similar influences?

1.11.1 Research Aims

1. To identify key policy documents supporting the use of independent NMP, and determine the current role of independent medical prescribing in the delivery of healthcare in the NHS.
2. To evaluate the literature concerning the use, facilitators, and barriers of independent NMP in primary and secondary care in the UK.
3. To gain consensus regarding the factors that have supported, or discouraged, pharmacist and physiotherapist non-medical prescribers from utilising their prescribing qualification
4. To determine factors that influence prescribing utilisation, and if these were perceived similarly between pharmacists and physiotherapists.
5. To further explore the barriers and facilitators to NMP experienced by pharmacist and physiotherapist prescribers.

1.11.2 Research Objectives

1. To conduct a systematic policy review investigating changes in UK Government policy position to NMP, since the introduction of independent prescribing for nurses and pharmacists to determine the current role of independent NMP in the delivery of healthcare in the NHS, providing a snapshot of a dynamic situation.
2. To conduct an extended systematic literature review to evaluate the use, facilitators, and barriers of independent NMP in primary and secondary care in the UK.
3. To use the Delphi technique to identify common themes affecting the utilisation of NMP by pharmacists and physiotherapists, and to obtain consensus of those themes that have the greatest impact.
4. To use the Delphi technique to determine if the factors influencing uptake and utilisation of prescribing affect both physiotherapist and pharmacist prescribers similarly.
5. To use focus group methodology with pharmacist and physiotherapist independent prescribers to further explore the lived experiences of NMP by pharmacists and physiotherapists.

CHAPTER 2: NON-MEDICAL PRESCRIBING IN THE UNITED KINGDOM NATIONAL HEALTH SERVICE: A SYSTEMATIC POLICY REVIEW

Chapter overview

The previous chapter describes the background to NMP in the UK. In this chapter, policy evolution regarding NMP is reviewed and the drivers behind the expansion of independent prescribing are highlighted.

The majority of this chapter is taken verbatim from the following publication in which I am principal author:

Graham-Clarke E, Rushton A, Noblet T, Marriott J. Non-medical prescribing in the United Kingdom National Health Service: A systematic policy review. PLoS ONE [Internet]. 2019; 14(7): e0214630
Available from: <https://doi.org/10.1371/journal.pone.0214630>.

The introduction has been substantially reduced to avoid duplication, and an introductory sentence added to place the paper in context of the overall thesis. For clarity and to provide more explanation, methods sections 2.2.4 and 2.2.7 have been expanded. In particular, section 2.2.7 relating to data syntheses has been expanded to describe the background to, and process of, narrative synthesis. The discussion has been expanded to clarify and expand on the findings, in particular section 2.4.3. The results and conclusions are taken verbatim from the paper. Other sections such as chapter summary and key points have been included but draw on information included in the paper. Minor changes to the narrative text have been

made throughout to inform the thesis structure, and correct typographical and grammatical errors.

Details of authors' contributions (as acknowledged in the published paper):

E Graham-Clarke (EGC) conceived the protocol, conducted the searches, analysed the data, wrote the first draft, and edited the manuscript. J Marriott (JM) and A Rushton (AR) conceived the protocol, reviewed the data analysis, and edited the manuscript. T Noblet (TN) conceived the protocol, conducted the searches, acted as second reviewer, reviewed the data analysis, and edited the manuscript.

A copy of the published paper is included in appendix 8.1, and the reviewers' comments (and author responses) in appendices 8.2 and 8.3.

2.1 Introduction

Chapter 1 describes the evolution of NMP in the UK. The initial focus of government policy to NMP was the desire to improve patient access to medicines. However, more recent documents from NHS England have focused on the increased demand for services and the need to drive efficiency so that maximum benefit can be obtained from the limited NHS budget [65, 66]. The role of NMP has been less apparent in these later documents, and it is unclear if this reflects a change in government policy.

The aim of this section of work was to identify key policy documents supporting the use of independent NMP and determine the current role of independent medical prescribing in the delivery of healthcare in the NHS.

2.1.1 Research Objective:

To conduct a systematic policy review investigating changes in UK Government policy position to NMP, since the introduction of independent prescribing for nurses and pharmacists and to determine the current role of independent NMP in the delivery of healthcare in the NHS, providing a snapshot of a dynamic situation.

2.2 Methods

2.2.1 Protocol and registration

A systematic policy review was conducted to explore the evolution of government policy concerning independent NMP in the UK. To ensure transparency and enhance rigour a predefined protocol was developed in-line with the PRISMA-P statement [70] and registered with PROSPERO (CRD42015019786) (appendix 8.4) The results are reported following the PRISMA statement (appendix 8.5) [71].

2.2.2 Eligibility criteria

Documents describing policy concerning independent NMP (or independent and supplementary prescribing) in the UK were included. Outputs included White and Green Papers, policy statements, consultation documents and reports. Documents solely concerned with supplementary or dependent prescribing were excluded as were documents concerning the policy outside the UK. Documents published since 2006 were included, as the legislation permitting nurse and pharmacist independent prescribing was enacted in that year [72].

2.2.3 Information sources

Advice was taken from expert University of Birmingham librarians regarding appropriate electronic databases and websites to search (listed in Table 2-1) and to aid development of search strategies. Broad search terms (e.g. prescribing, non-medical) were used to capture as wide a range of documents as possible. Boolean operators and truncation were used if the

database supported them. Iterative and ‘snowball’ search techniques were employed [73], with the primary searches complete to the end of February 2018, and secondary searches conducted as necessary (see appendix 8.6 for sample search strategy). Documents obtained were mapped to identify gaps (for example, documents relating to the consultation process or profession specific policy documents) enabling targeted secondary searches to be conducted. The citation lists in the selected documents were reviewed for additional references, which were also obtained, and personal files were searched [73]. Full texts of the selected documents were screened to remove those that did not meet the eligibility criteria.

Table 2-1 List of databases and websites searched for policy review

Databases and websites	Professional body websites
Google Scholar	Chartered Society of Physiotherapists
HMIC - Ovid	College of Optometrists
Lexis Nexis	College of Paramedics
UK Government Web Archive	General Optical Council
UKOP (UK Official Publications)	General Pharmaceutical Council
UK Parliamentary Papers - ProQuest	Health and Care Professions Council
Web of Science	Institute of Radiology
www.gov.uk	Nursing and Midwifery Council
www.health-ni.gov.uk	Royal College of Nursing
www.publications.scot.nhs.uk	Royal Pharmaceutical Society
www.scot.nhs.uk	The Association of Ambulance Chief Executives
www.wales.nhs.uk	The College of Podiatry
	The Royal College of Radiologists

2.2.4 Policy document selection

Initial screening of titles/abstracts obtained from all searches was conducted to remove duplicates and the number removed recorded [71]. Two reviewers (EGC and TN) conducted each stage independently, resolving differences by discussion, with a third reviewer (AR) available if required for mediation [74]. Numbers excluded were recorded [71, 74].

2.2.5 Data collection process and data items

Selected documents were entered into a Microsoft® Excel for Mac (version 16) spreadsheet. Home nation and professions covered by the reference were noted, and whether the reference related to policy or consultation. The full texts were read, and notes made of any reference to NMP, including the context.

2.2.6 Risk of bias assessment

Unlike research papers, whether qualitative or quantitative in nature, policy and consultation documents are not developed according to well-recognised principles, such as evidence base. Risk of bias assessment is therefore not appropriate for this type of document and was not conducted. Policy documents are liable to be biased towards the ethos of the government in power at the time and documents produced by profession specific bodies towards their profession. The results are reported according to the relevant government era and, where appropriate, the specific professional body involved.

2.2.7 Data syntheses

Information from the selected documents underwent narrative synthesis with visual depictions, described as an appropriate approach for non-research documents [75-77]. Narrative synthesis is described as differing from a narrative review in that the findings are used to generate new ideas and can incorporate visual representations such as spider maps to depict the synthesised findings [75, 76]. Mays et al [76] identified three main stages in narrative synthesis:

- Establishing the preliminary synthesis
- Exploring relationships between the findings
- Reviewing the robustness of the synthesis.

Furthermore Popay et al emphasise that these stages should be iterative, rather than sequential, and that narrative synthesis can be used to build a credible 'story' [75].

Following tabulation and data extraction, the selected documents were grouped depending on whether they concerned policy or consultation. To aid this process and to visualise the time distribution they were also plotted on a timeline, with a further timeline developed for the consultation documents. Using these techniques, a narrative summary was able to be developed by one researcher (EGC), and the findings were then debated and critically assessed by the research group to reach agreement.

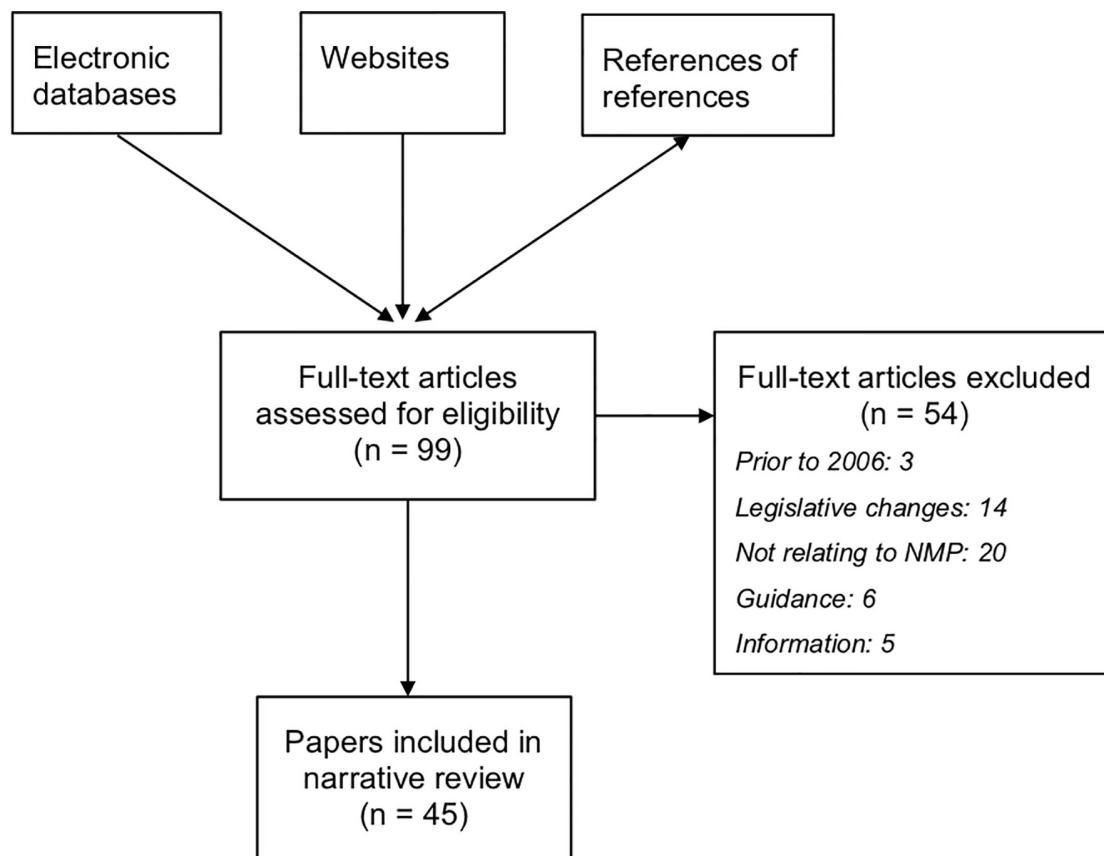
2.3 Results

2.3.1 Policy document selection and characteristics

The search strategy identified 99 full text articles to be assessed for inclusion. Following exclusions, 45 documents were included in the review (see

Figure 2-1).

Figure 2-1 PRISMA paper selection flow diagram for policy documents



Of the included documents, 23 relate to policy or strategic report documents (see Table 2-2), and 22 to the consultation process concerning extension of independent NMP responsibilities to various healthcare professions (see Table 2-3).

Table 2-2 Policy and strategic report documents included in the policy review.

Title	Source	Date	Home Nation	Professional Group									Brief overview of contents
				Nurse	Pharmacist	Physiotherapist	Podiatrist	Paramedic	Radiographer	Optometrist	AHP	INMP	
Improving Patients' Access to Medicines: A Guide to Implementing Nurse and Pharmacist Independent Prescribing within the NHS in England [27]	Department of Health	Apr-06	England	Y	Y								Highlights aims of independent prescribing Describes the scope of everything needed to implement independent prescribing
Medicines Matters. A guide to mechanisms for the prescribing, supply and administration of medicines [78]	Department of Health	Jul-06	United Kingdom	Y	Y					Y			Describes the prescribing, supply and administration of medicines, Including the aims of the non-medical prescribing program
Guidance for Nurse Independent Prescribers and for Community Practitioner Nurse Prescribers in Scotland: A Guide for Implementation [79]	Scottish Executive Health Department	Aug-06	Scotland	Y									Highlights aims of independent prescribing Describes the scope of everything needed to implement independent prescribing

Improving Patients' Access to Medicines: A Guide to Implementing Nurse and Pharmacist Independent Prescribing within the HPSS in Northern Ireland [80]	Department of Health Social Services and Public Safety	Dec-06	Northern Ireland	Y	Y								Highlights aims of independent prescribing Describes the scope of everything needed to implement independent prescribing
The best medicine: the management of medicines in acute and specialist trusts [81]	Commission for Healthcare Audit and Inspection	Jan-07	England	Y	Y								Covers all aspects of medicines management in secondary care Includes a brief mention of non-medical prescribing
Mental Health: New Ways of Working for Everyone. Progress Report [82]	Department of Health, National Institute for Mental Health in England National Workforce Programme	Apr-07	England	Y									Covers progress with developing New Ways of Working, and plans and strategies for further development. Described how non-medical prescribing will support these changes in practice
Non medical prescribing in Wales - A guide for implementation [83]	Welsh Assembly Government	Jul-07	Wales	Y	Y								Highlights aims of independent prescribing Describes the scope of everything needed to implement independent prescribing
New Ways of Working for Everyone: A best practice implementation guide [84]	Department of Health, National Institute for Mental Health in England	Oct-07	England									Y	Provides guidance on implementing New Ways of Working, using theoretical examples to illustrate points

	National Workforce Programme											Examples include the use of non-medical prescribing
Consultation on A Safe Prescription: Developing Nurse, Midwife and Allied Health Profession (NMAHP) Prescribing in NHS Scotland [85]	The Scottish Government, Primary Care Division	Nov-07	Scotland	Y						Y		Consultation strategy paper covering implementation of non-medical prescribing and the role of non-medical prescribing in service development and redesign
Pharmacy in England: Building on strengths – delivering the future (Cm 7341) [86]	Department of Health	Apr-08	England		Y							Government White Paper describing the current role of pharmacy and how pharmacy skills could be better utilised Includes use of prescribing by pharmacists with case studies as examples
Allied health professions prescribing and medicines supply mechanisms scoping project report [87]	Department of Health	Jul-09	England			Y	Y		Y			Describes current position with regard to AHPs and their changing role Highlights that expansion of prescribing rights would improve patient care, with examples Identifies priorities in prescribing expansion
A safe prescription; Developing	The Scottish Government	Sep-09	Scotland	Y						Y		Final version of the consultation strategy paper

nurse, midwife and allied health profession (NMAHP) prescribing in NHS Scotland [88]													Includes key healthcare policy drivers where non-medical prescribing may be beneficial
Pharmacist Prescriber Training Working Group Report for the MPC Programme Board [89]	Medical Education England	Jan-10	England		Y								Describes the background to the pharmacist prescribing, current context and future developments Highlights changes to undergraduate teaching that should occur to optimise pharmacist as prescribers
Prescription for Excellence [90]	The Scottish Government	Sep-13	Scotland		Y								Describes the Scottish vision that all pharmacists will become independent prescribers, working in partnership with medical practitioners
Now or never: shaping pharmacy for the future [91]	The Royal Pharmaceutical Society	Nov-13	England		Y								Covers the current pharmacy activity and potential future developments. Include examples of pharmacist prescribers and mentions how many have qualified. Highlights poor awareness of pharmacy profession by patients and wider healthcare service

Seven Day Services in Hospital Pharmacy: Giving patients the care they deserve [92]	The Royal Pharmaceutical Society	Jun-14	United Kingdom		Y								Describe the challenges in moving to full seven-day services Gives examples of pharmacist prescribers supporting seven-day services
Our Plan for Primary Care in Wales up to March 2018 [93]	Welsh Assembly, NHS Wales	Nov-14	Wales	Y	Y			Y					Highlights general practice doctors' workforce shortfall Highlights how healthcare professionals can support general practitioners, including non-medical prescribing
A Planned Primary Care Workforce for Wales: Approach and development actions to be taken in support of the plan for a primary care service in Wales up to 2018 [59]	Welsh Assembly, NHS Wales	Jun-15	Wales	Y	Y	Y				Y			Covers workforce development, profession by profession, to enable support for general practitioners Highlights the need for expansion in non-medical prescribers
The future of primary care: Creating teams for tomorrow [60]	Health Education England	Jul-15	United Kingdom	Y	Y	Y							Describes the challenges in general practice Highlights development of non-medical professionals to support general practice
Transformation of seven day clinical	NHS England	Sep-16	England		Y								Describes the actions needed to develop seven day working

pharmacy services in acute hospitals [94]													Includes examples of pharmacist prescribing supporting the multi professional team
Improving care for people with Long Term Conditions [64]	The Royal Pharmaceutical Society	Nov-16	England		Y								Describes improving care of patients with long term conditions, utilising pharmacists' skills Recommends prescribing as a key skill
The General Practice Nursing Workforce Development Plan [95]	Health Education England	Mar-17	England	Y									Review of general practice nursing, highlighting practice role and potential workforce issues Identifies challenge of freeing time for prescribing training
Facing the Facts, Shaping the Future: A draft health and care workforce strategy for England to 2027 [96]	Public Health England	Dec-17	England	Y	Y								Describes the current workforce issues including recruitment and retention Reviews this in context of services and of individual staff groups

AHP – Allied Health Professional INMP – Independent non-medical prescriber

Table 2-3 Consultation documents included in the policy review

Title	Source	Date	Home Nation	Professional Group							Brief overview of contents
				Nurse	Pharmacist	Physiotherapist	Podiatrist	Paramedic	Radiographer	Optometrist	
Consultation on proposals to introduce independent prescribing by optometrists (MLX 334) [97]	Medicines & Healthcare Products Regulatory Agency	Aug-06	United Kingdom							Y	Describes scenarios where optometrist prescribing would be beneficial Includes options for immediate referral and management of long-term conditions
Public consultation - independent prescribing of controlled drugs by nurse and pharmacist independent prescribers (MLX338) [98]	Home Office, Drug Strategy Unit	Mar-07	United Kingdom	Y	Y						Includes risk and impact assessments Highlights that controlled drug prescribing would support the aims of improving patient care and choice
Public consultation (MLX 334): Proposals to introduce independent prescribing by optometrists – outcome [99]	Medicines & Healthcare Products Regulatory Agency	Aug-08	United Kingdom							Y	Report of outcome of public consultation, including confirmation that CHM recommend optometrist prescribing
Proposals to introduce prescribing responsibilities for paramedics: stakeholder engagement [100]	Department of Health	Mar-10	United Kingdom					Y			Highlights scenarios where prescribing would be beneficial Discusses which paramedics would be suitable, and planned safeguards

Engagement exercise: To seek views on possibilities for introducing independent prescribing responsibilities for podiatrists [101]	Department of Health	Sep-10	United Kingdom				Y				Described, with examples, podiatry roles and training Describes potential benefits of independent prescribing Uses open questions to gain information from stakeholders
Engagement exercise: To seek views on possibilities for introducing independent prescribing responsibilities for physiotherapists [102]	Department of Health	Sep-10	United Kingdom			Y					Described, with examples, physiotherapy roles and training Describes potential benefits of independent prescribing Uses open questions to gain information from stakeholders
Proposals to introduce independent prescribing by podiatrists: impact assessment [103]	Department of Health	Jul-11	United Kingdom				Y				Describes potential financial and other benefits from streamlined pathways for each option under consideration
Consultation on proposals to introduce independent prescribing by podiatrists [104]	Department of Health	Sep-11	United Kingdom				Y				Public consultation describing current role of podiatrists and scenarios where prescribing would be beneficial Seeks clarification on areas such as education and governance Prescribing unlicensed medication excluded following engagement exercise
Consultation on proposals to introduce independent prescribing by	Department of Health	Sep-11	United Kingdom			Y					Public consultation describing current role of physiotherapists and scenarios where

physiotherapists [105]											prescribing would be beneficial Seeks clarification on areas such as education and governance Prescribing unlicensed medication excluded following engagement exercise
Summary of the Commission on Human Medicines meeting held on Thursday 17th & Friday 18th May 2012 [106]	Commission on Human Medicines	May-12	United Kingdom			Y	Y				Reports that the committee was able to support independent prescribing for podiatrists and physiotherapists in line with results from consultation exercise
Summary of Public Consultation on Proposals to Introduce Independent Prescribing by Physiotherapists [107]	Department of Health	Jul-12	United Kingdom			Y					Majority of respondents supported independent prescribing from a full formulary There was also support for a limited list of controlled drugs and to allow mixing of medicines
Proposals to introduce independent prescribing by physiotherapists: impact assessment [108]	Department of Health	Jul-12	United Kingdom			Y					Describes potential financial and other benefits from streamlined pathways for each option under consideration Includes risk and governance
Summary of Public Consultation on Proposals to Introduce Independent Prescribing by Podiatrists [109]	Department of Health	Jul-12	United Kingdom				Y				Majority of respondents supported independent prescribing from a full formulary There was also support for a limited list of controlled drugs and to allow mixing of medicine
Independent prescribing by radiographers:	NHS England	Jan-15	United Kingdom						Y		Set out a policy background and describes scenarios where

Impact Assessment [110]											prescribing may be beneficial e.g. managing radiotherapy side effects Describes financial costs, governance arrangements and potential risks
Consultation on proposals to introduce independent prescribing by radiographers across the United Kingdom [111]	NHS England	Feb-15	United Kingdom						Y		Public consultation Describes current role and scenarios where prescribing may be beneficial Describes governance proposals
Consultation on proposals to introduce independent prescribing by paramedics across the United Kingdom [112]	NHS England	Feb-15	United Kingdom					Y			Public consultation Describes paramedic roles and changes in practice that result in more patients being treated at home Highlights that this would be for advanced paramedics
Proposal to introduce independent prescribing by paramedics: impact assessment [113]	NHS England	Feb-15	United Kingdom					Y			Highlights current issues and rationale for prescribing Details of the various options and associated costs Identifies potential risks
Summary of The Commission on Human Medicines Meeting held on Thursday 15 October and Friday 16 October 2015 [114]	Commission on Human Medicines	Oct-15	United Kingdom					Y	Y		Describes that committee was unable to support paramedic or diagnostic radiographer independent prescribing The Committee was able to support the therapeutic radiographer independent prescribing
Independent prescribing by	NHS England	Jan-16	United Kingdom						Y		Impact assessment for therapeutic radiographers only

therapeutic radiographers [115]										Set out policy background and describes scenarios where prescribing may be beneficial Describes financial costs, governance arrangements and potential risks
Summary of the responses to the public consultation on proposals to introduce independent prescribing by paramedics across the United Kingdom [116]	NHS England	Feb-16	United Kingdom					Y		Majority of respondents supported independent prescribing by paramedics There was also support for a limited list of controlled drugs and to allow mixing of medicine
Summary of the responses to the public consultation on proposals to introduce independent prescribing by radiographers across the United Kingdom [117]	NHS England	Feb-16	United Kingdom						Y	Majority of respondents supported independent prescribing from a full formulary There was also support for a limited list of controlled drugs and to allow mixing of medicines It was noted that the CHM supported independent prescribing for therapeutic radiographers only
Summary of the Commission on Human Medicines meeting held on Thursday 7th September 2017 [118]	Commission on Human Medicines	Sep-17	United Kingdom					Y		Brief notes that feedback on independent prescribing by paramedics had been considered and discussed, and that they would now endorse the recommendation to support prescribing

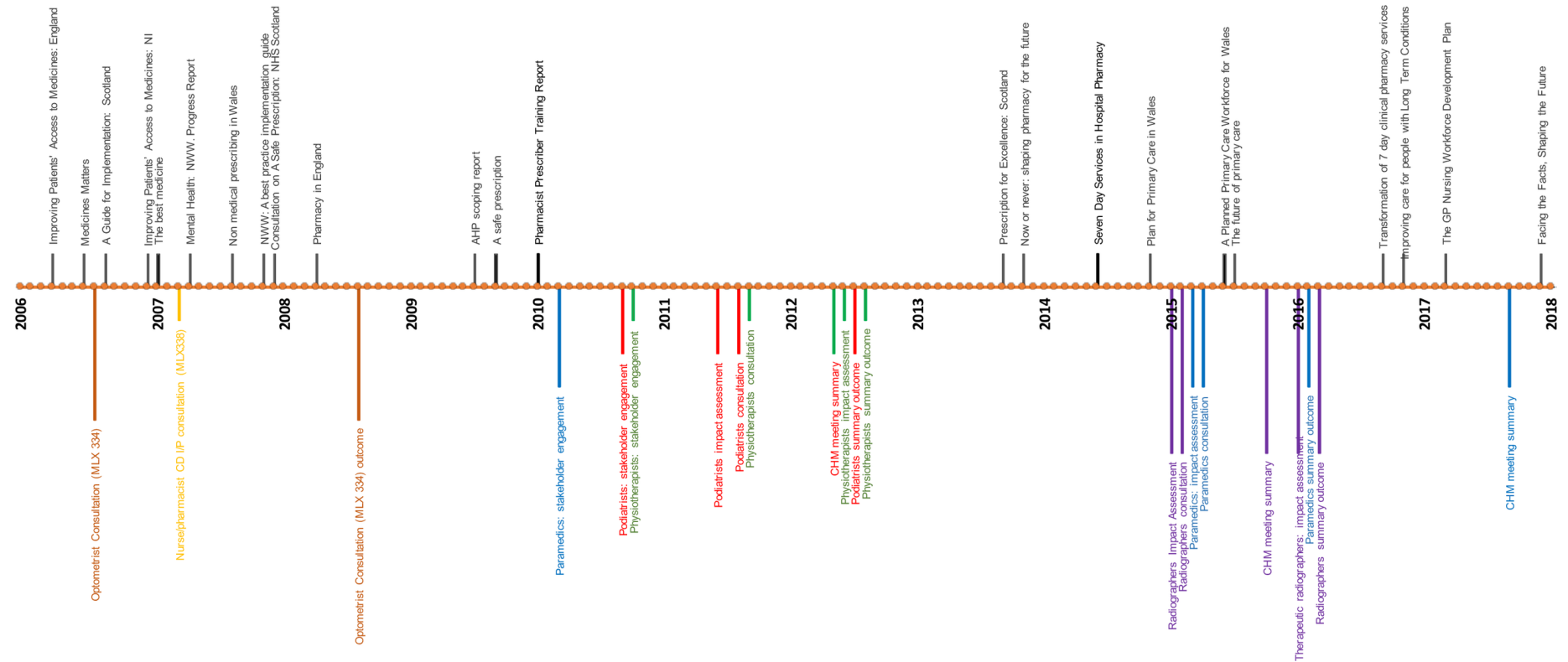
The policy and strategic report documents relate to specific professions (nursing n=3, pharmacy n=7), multiple (n=12), or address a generic NMP approach (n=1). The majority of these documents concern matters in the home nations (England n=12, Scotland n=4, Wales n=3 and Northern Ireland n=1) with only three concerning the UK. They can be divided into two chronological eras, with just over half published between 2006 and 2010, and the remainder published since 2013 (Figure 2-2). The period 2006-2010 corresponds to a Labour (socialist) government. Then during 2010-2015 a Conservative and Liberal Democrat coalition was in power, and this was followed by a Conservative government.

Figure 2-2 Timeline of documents included in the policy review

Policy documents are listed above the timeline and printed in black

Consultation and associated documents are listed below the timeline. The colour depicts the profession as follows:

Optometrist – brown, Radiographer – purple, Nurse/Pharmacist – yellow, Paramedic – blue, Podiatrist – red, Physiotherapist- green



2.3.2 Synthesis of results

2.3.2.1 *The Labour Government era 2006–2010.*

Four of the early documents comprised guidance issued by the home nations to support NMP. These were released as the relevant regulations governing prescribing were amended to permit independent NMP. The first was released by the Department of Health in April 2006, coinciding with the initial changes in legislation and regulations permitting independent prescribing by nurses and pharmacists [26, 27, 72]. This was followed by Scotland's guidance, released in July 2006, Northern Ireland's guidance in December 2006 and the Welsh guidance in 2007 [79, 80, 83]. All four documents are similar in nature, however, Scotland's relates to nurse prescribing only whereas the other three relate to nurse and pharmacist prescribing. This reflects the changes made by the home nations whereby England, Wales, and Northern Ireland each introduced nurse and pharmacist independent prescribing simultaneously, whereas Scotland introduced nurse independent prescribing first [119], followed a year later by pharmacist independent prescribing [120]. Although the bulk of these documents relates to practical implementation guidance, each states the core policy drivers behind NMP which were:

- Improving patient care, without reducing safety
- Making it easier for patients to access the medicines they require
- Increasing patient choice
- Utilising the skills of health professionals
- Supporting team working

The Welsh guidance included the additional benefits of improving healthcare capacity and enhancing patient access for advice and services.

Scotland conducted a prescribing strategy consultation exercise, with the final strategy launched in 2009 [85, 88]. These documents covered independent prescribing by nurses and midwives and supplementary prescribing by AHPs but not pharmacist prescribers. The documents highlighted the variable adoption of NMP across Scotland and had the aim of improving uptake of NMP to support the NHS Boards in delivering patient centred care.

There were two remaining prescribing specific documents in this era: the scoping report on allied health professional (AHP) prescribing and a report on pharmacist prescribing training [87, 89]. The former reviewed the developing role of AHPs and highlighted some of the limitations resulting from their inability to prescribe. Professions that would benefit most from the ability to prescribe, either independently or as a supplementary prescriber were identified, and also which professions should not become prescribers were stated. Additionally, the professions were prioritised regarding the need to prescribe, with physiotherapy and podiatry identified as high priorities for independent prescribing, followed by radiography. The latter document reviewed pharmacist prescribing experiences and recommended several changes to training, both at undergraduate level and regarding the qualifying postgraduate prescribing course.

The remaining documents produced in this era, although generic in nature, include references to NMP. The first was a Department of Health document released in 2006 providing further

guidance on medicines supply and reiterating the drive behind NMP [78]. The document included several proposed next stages for NMP:

- To consult on optometrist independent prescribing
- To promote nurse and pharmacist independent prescribing
- To review the prescribing needs of emerging roles

This was followed by the Healthcare Commission report in 2007 on medicines management, which mentioned the development of nurse and pharmacist prescribing and described the distribution of prescribers at that time [81]. Data collection had been conducted in 2005 and 2006 and therefore the majority of these data would have been collected from supplementary prescribers. The Healthcare Commission recommended that Trusts identify where NMP would provide the maximum benefit clinically and that work should be performed to identify why some non-medical prescribers did not prescribe regularly.

The “New Ways of Working in Mental Health” project released two documents in 2007, a progress report and an implementation guide [82, 84]. The progress report reiterated the five core drivers behind NMP and described how NMP should be incorporated into the changes in working practice such as multidisciplinary team working. The implementation guide provided theoretical examples of changed practice, which incorporated NMP.

The final document in this era was the pharmacy White Paper [86]. This highlighted the roles that pharmacists could play in improving the healthcare of patients, including the example of prescribing in long-term conditions. Although some case studies were described, most of the suggested roles for prescribers were aspirational.

2.3.2.2 The Coalition and Conservative Governments era 2013–2017.

The first two documents in this era were both concerned with the role of pharmacy in providing patient centred health care. The first of these was the Scottish Government's vision for pharmacy, which envisaged integration of pharmacists into all aspects of healthcare [90]. Drivers for this document included NHS Scotland's 2020 vision [121] and a report commissioned by the Scottish Government into pharmaceutical care [122]. Central to this vision was the aim of having all pharmacists qualified as independent prescribers. The second document was a report by the Royal Pharmaceutical Society (RPS) on pharmacy activity and future potential [91]. Various examples of prescribing practice are described (for example, pharmacists running cardiovascular and chronic pain clinics). A significant comment indicated that it is not sufficient to provide prescribing courses, without developing roles that utilise this activity. The report contrasts the English and Scottish governments approach to pharmacy, to the detriment of the former. Although the Scottish government had delayed introducing pharmacist independent prescribing [120], other developments, for example a minor ailment service, had been introduced to support an earlier pharmacy strategy [123].

There are three further pharmacy specific documents in this era, with two of these concerning seven-day hospital clinical pharmacy services. The first was a report by the RPS discussing potential approaches to providing a seven-day service and the associated challenges [92]. Examples where seven-day pharmacy services had been implemented were given, with many of the contributors anticipating the use of pharmacist prescribers to support delivery. The second report, from NHS England, describes the need to deliver clinical pharmacy services seven days a week, highlighting the impact that pharmacy services make and describing the

importance of prescribing to support the multi-professional team [94]. The final pharmacy specific document was the RPS produced policy, concerning care for patients with long-term conditions [64]. This highlights the role that pharmacists can play in supporting these patients and makes several key recommendations, the first of which is that pharmacists should have the opportunity to become prescribers enabling them to manage the treatment of these patients.

The Welsh Assembly produced a plan for primary care in 2014, followed by a primary care workforce development plan in 2015 [59, 93]. The first of these documents highlighted the increasing pressure on general practice from a combination of increasing demand, a shortage of general medical practitioners (GP) and financial constraints. The focus was on health rather than ill-health and to provide person-centred care within the local community, using the most appropriate healthcare professional for the task. Advanced practice such as NMP was perceived to relieve pressure on GPs. The associated workforce plan described the potential role of NMP for various professions and provided examples. One such example was the monitoring of low-risk glaucoma patients by optometrists, and the document comments that there will be an increased need for optometrists to train as prescribers as they develop these advanced roles.

A report commissioned by HEE on primary care, published in 2015, described how primary care could be delivered using a wide range of healthcare professionals [60]. Included in the recommendations was the role of the prescribing pharmacist to support medicines optimisation activities, such as changing the medication of patients at risk of polypharmacy and adverse drug events, and the potential for physiotherapist prescribers to enable them to

provide streamlined care for patients [60]. This was followed in 2017 by the general practice nursing workforce plan [95]. Prescribing is described as complementing the nursing role, but challenges are acknowledged particularly in enabling time for training. Finally, in this era, there was the draft workforce strategy for England, which was released for consultation in December 2017 [96]. This specifically mentioned prescribing in the pharmacy section, describing a project to put advanced pharmacists with prescribing qualifications into emergency departments, and also commented that increased numbers of nurse prescribers would be required in the community and primary-care sectors. No mention was made of prescribing by any other non-medical healthcare professional.

2.3.2.3 Consultation documents.

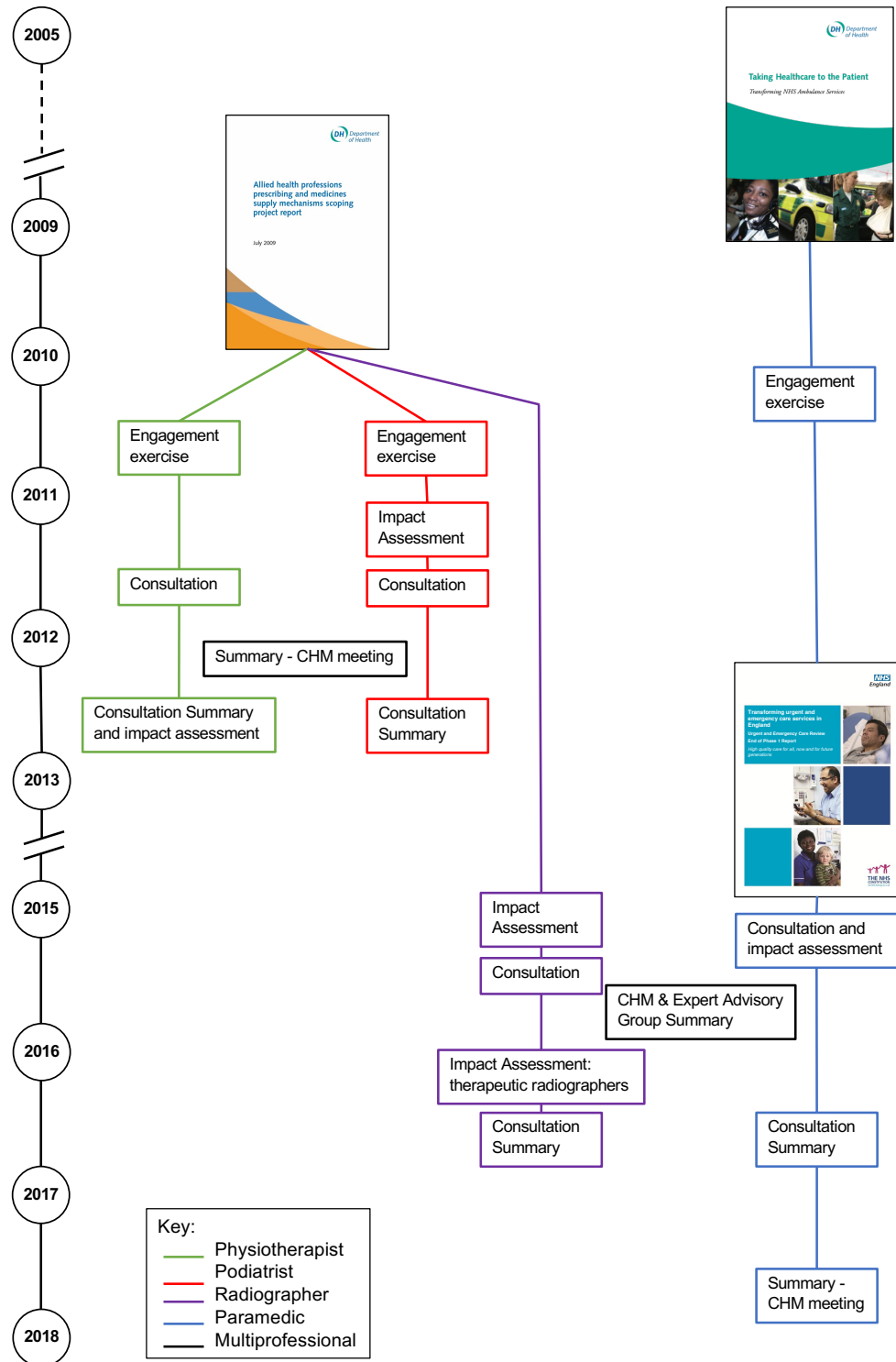
Two public consultations, to gauge opinion, were launched during the period 2006-2008. The first concerned the introduction of independent prescribing for optometrists, and the second regarding controlled drug prescribing by nurse and pharmacist independent prescribers. The consultation process for the introduction of independent prescribing by optometrists was launched in August 2006, with the outcome announced in 2008, and associated legislation passed the same year [97, 99, 124]. This time period contrasts with the second consultation in 2007 on controlled drug prescribing, where agreement that this should be permitted was reached, but changes in legislation were not enacted until 2012 [33, 98, 125].

Following the 2009 AHP scoping report, stakeholder engagement exercises were launched in 2010 to investigate independent prescribing rights for both podiatrists and physiotherapists followed by consultation exercises in 2011 and the outcome and approval in 2012, the whole

process taking a little under two years [101-109]. The consultation for radiographers was launched in 2015 with approval, for therapeutic radiographers only, granted in 2016 (diagnostic radiographers were excluded) [110, 111, 114, 115, 117]. These relatively short consultation exercises contrast strongly with those concerning paramedics. The initial document mentioning paramedic prescribing had been published in 2005 [126], with the stakeholder engagement exercise held in 2010, a year before that of the podiatrists and physiotherapists [100-102]. The potential for paramedic prescribing was reiterated in the 2013 urgent care report, which described the changing role of paramedics, and the potential for further role extension such as treatment at home by a paramedic to reduce demand on emergency care services [127]. Furthermore, when the formal paramedic consultation process began, advanced paramedics had started to work in a range of settings such as emergency care departments as well as the more traditional ambulance service [112]. The paramedic and radiographer consultation exercises ran simultaneously, but final approval for paramedic prescribing was only granted in 2017 [112, 113, 116, 118, 128]. A comment is made in the related paramedic impact assessment that the consultation exercise was delayed because of capacity issues [113]. The relative timescales are shown in Figure 2-3.

Figure 2-3 Consultation documents timeline for allied healthcare professions

The timeline compares the relatively compact timescale taken for podiatrists, physiotherapists, and therapeutic radiographers to attain independent prescribing rights, with the lengthier timescale for paramedics



Adapted from: Graham-Clarke E, Rushton A, Noblet T, Marriott J. Non-medical prescribing in the United Kingdom National Health Service: A systematic policy review. PLoS ONE. 2019;14(7):e0214630. [31]

2.4 Discussion

2.4.1 Summary of evidence

This is the first policy review bringing together the UK policy documents concerning NMP to describe the role of this evolving activity. The document review reveals two main themes, which are expanded below. The first theme highlights issues arising from inspecting the chronological aspects of the selected documents. The second theme covers the evolving approach to healthcare provision and describes how NMP has become embedded into routine practice for many non-medical prescribers. However, differences in practice remain and these are highlighted.

2.4.2 Chronological aspects

Inspection of the timeline of included documents reveals a noticeable gap between 2010 and 2013, when no reports or strategic documents concerning NMP were released by a government body. The beginning of this period coincides with the change in government in 2010 from Labour to the Coalition. Two factors are likely to be responsible for this dearth of publications. Firstly, the Coalition embarked on an overall reorganisation of the NHS in England, initiated in the 2010 White Paper 'Equity and Excellence', and enacted through the Health and Social Care Act in 2012 [129, 130]; focussing on the high-level NHS structure rather than finer details of how, for example, commissioning for healthcare services would be implemented. Secondly, the country had been in economic recession since 2008 and the Coalition's 2010 budget introduced austerity measures designed to reduce the nation's

budget deficit and improve economic growth [131, 132]. The government attempted to protect the NHS from financial cuts implemented more generally across all services, however the funding growth rate for the NHS in England was curtailed to 1.4% a year compared with 6% a year under the previous Labour government [133]. Government priorities were therefore concerned with major reform of the NHS structure and introduction of commissioning groups, rather than the continued development of existing practices.

The change in government also probably explains the delay in extending controlled drug prescribing for nurses and pharmacist independent prescribers. Extending controlled drug prescribing rights requires the agreement of the Department of Health, the Home Office, the Medicines and Healthcare Products Regulatory Agency (MHRA) and the Advisory Council on the Misuse of Drugs (ACMD), and, subsequently, amendments to the Misuse of Drugs Regulations 2001 and medicines legislation [98]. The consultation closed in June 2007, and in November 2007 the ACMD wrote to the Under-Secretary of State at the Home Office, and the Minister of State for Public Health at the Department of Health, to support the proposals and the change in legislation [134]. However, the required change in legislation was only enacted in 2012, and it can be surmised that with the Coalition's priorities focused on reorganisation of the whole NHS, extending controlled drug prescribing to nurse and pharmacist independent prescribers was accorded low priority [33, 125].

The consultation processes for the AHPs (physiotherapists, podiatrists, and radiographers) were all concluded within a reasonable timeframe, despite the change in government occurring between publication of the AHP scoping report and initiation of the physiotherapy and podiatry consultation exercises [87, 101, 102]. The AHP scoping report had demonstrated

a clear role for prescribing for each of these professions in streamlining and improving patient care. In addition, the report prioritised which professions should be considered first, taking into consideration the strength of case for prescribing for each profession and the capacity of the Department of Health and MHRA to conduct the necessary consultations. As an aside, the consultation exercises reflect the NHS reorganisation, with the physiotherapy and podiatry consultation exercises conducted under the auspices of the Department of Health, and subsequent consultation exercises under NHS England.

In comparison, the lack of clarity concerning how prescribing would be utilised by paramedics, and their evolving role, explains the extended time period between the initial recommendation regarding paramedic independent prescribing and final approval. At the time of the initial report, paramedics had recently become registered with the HCPC, and the NHS advanced practice role was developing [126] with a shift in training from resuscitation, to assessing and treating the patient at home. The urgent care report in 2013 highlighted the potential for treatment by paramedics to reduce demand on emergency care services [127]. Following the consultation, the Commission on Human Medicines (CHM) was unable to recommend prescribing by paramedics because of concern that paramedics would need training in a large range of conditions to ensure patient safety [114]. The minutes for the 2017 CHM meeting simply say that they endorse the recommendations for independent prescribing for paramedics, and it is to be presumed that they had been provided with reassurance concerning the training and role of paramedics [118].

2.4.3 Healthcare provision—evolution of policy

The five drivers for prescribing documented in the implementation guidance reiterated the aims of the 2000 NHS White Paper to improve patient care and break down the traditional demarcations between professions [11, 27, 79, 80, 83]. These and other earlier documents such as “Medicines Matters”, and the “Mental Health New Ways of Working” project were published before full independent prescribing was embedded [78, 82, 84]. As such, they address the potential for NMP to improve patient care and, in particular with the mental health documents, develop novel ways of working. “Medicines Matters” explicitly commented that NMP was unsuitable for patients with complex conditions, recommending the use of supplementary prescribing instead [78]. The pharmacy White Paper listed prescribing as one of the activities that pharmacists could undertake, including in the care of long-term conditions, but many of the examples are theoretical [86]. The 2009 AHP scoping report highlights the changing role of, for example physiotherapists or podiatrists, commenting that they may now be responsible for a full package of patient care but were hampered by the inability to prescribe independently [87]. Again, this document describes potential or theoretical benefits.

However, when the Scottish government published their NMP strategy, they were able to draw on a number of published papers providing evidence of the benefits [88], although in reality the only full independent prescribers included were nurses. Likewise, the pharmacist prescriber training report in 2010 was also able to draw on practice examples to illustrate various different ways that independent prescribing had been implemented [89].

The 2010 White Paper “Equity and excellence: liberating the NHS” signalled a change in direction for the health service, putting the patient at the centre of care with ‘*no decision about me without me*’ [129], but without the previous emphasis on workforce development; a point highlighted in a later staffing report [41]. The need for responsive and patient-centred care, within the constraints of limited finances, was further developed in the subsequent “Five-Year Forward View” [66]. This document sets the need to provide more integrated care, giving patients greater control, against the background of increasing demand, rising costs resulting from new technologies, and budgetary constraints. Although prescribing is not specifically mentioned, there is a call to challenge traditional ways of working and to use the most appropriate healthcare professional for the task in hand.

This approach is echoed by the Welsh Assembly primary care plan, which describes a future model of primary care in which the GP acts as the leader over a multi professional team, who between them care for the patient [93]. The Welsh Assembly associated workforce development plan depends on other healthcare professionals taking on roles traditionally associated with GPs or secondary care, with NMP perceived as integral to these developments [59]. The English primary care report [60] describes a number of approaches to reducing the burden on GPs. Included in this are new models of practice such as the work of physicians’ associates, but as The Health Foundation comments, their role in relieving pressure on doctors will be limited if they cannot prescribe [41]. Nurse prescribing is not specifically mentioned, although the report does identify that nurses have many responsibilities, including the care of patients with long-term conditions. More recently, the draft workforce strategy describes advanced practice for a number of professions such as nursing and paramedics but does not

define what this entails [96]. It also describes podiatry and physiotherapy being potential first contact points for patients with musculoskeletal disorders. Prescribing would support all of these activities but is not explicitly mentioned and it could be perceived that NMP is seen to be so routine and embedded in practice for these professions that it warrants no mention. This compares with the pharmacy situation, where the same document put pharmacist independent prescribing as one of the priority areas to address. Other reports also make explicit mention of pharmacy prescribing as one of the tools to enhance medicines optimisation practices [64, 94], suggesting that pharmacist prescribing is still not embedded into routine practice.

A review of the professional distribution of policy documents supports this supposition concerning NMP becoming routine practice, with the majority involving generic NMP or covering multiple NMP professions (see Table 2-2). Of the three nursing specific policy documents, two date from before 2010, and the final one from 2017 [79, 82, 95]. Pharmacy alone of the professions is associated with multiple policy documents since 2013, with three by the RPS and one by each of the Scottish government and NHS England [64, 90-92, 94]. A potential driver for this could be the transformation of the RPS into a professional representative body, following the GPhC assuming the regulatory function in 2010, and consequently the need to re-establish a role. However, this would not explain the governmental documents produced during the same time. Similar policy documents for the same period could not be identified for any other of the NMP professions, despite in-depth searching. This may reflect the need for pharmacists to develop new roles and skills as the traditional dispensing role diminishes because of technological advances such as electronic

prescribing and robotic dispensing. With medicines central to pharmacy practice, it is appropriate that new roles such as prescribing support medicines optimisation; however, these are not existing roles that a pharmacist can move into, rather they are roles that require creation. It is also notable that while community (drugstore/high street) pharmacists comprise the majority of the profession, most prescribers are found in primary care (general practice) and secondary (hospital) care instead, indicating challenges with adopting prescribing in community practice [48, 50, 55]. Historically community pharmacy provided a supply function, enabling separation from prescribing (by general medical practitioners) and therefore acting as a safety mechanism for patients. The current GPhC guidance for prescribers maintains this approach, with a requirement that prescribing and supply functions are separated, potentially limiting the use of prescribing by community pharmacists [135]. The pharmacy orientated policy documents describe to pharmacists and commissioners, as well as other stakeholders, how pharmacist prescribing could work in practice. This compares with other healthcare professions, such as physiotherapy, where medicines form an adjunct to their main practice area, enhancing role expansion. Pharmacy could also be perceived to be an innately cautious profession [136], and the policy documents could thus serve to overcome a reluctance to adopt innovative working practices.

It is notable that there has been a shift regarding the role that NMP plays in the care of patients. The 2006 document, *Medicines Matters*, envisaged independent prescribers utilising a comparatively small personal formulary of drugs, excluding controlled drugs and unlicensed medicines, to treat uncomplicated conditions [78]. This represented an evolution from limited list prescribing for community nurses proposed in the *Cumberlege* and first *Crown* reports [2,

137], to encompass prescribing within a prescriber's area of expertise [3]. However, since independent prescribing for nurses and pharmacists was launched, their prescribing rights have been gradually extended to include unlicensed medicines and controlled drugs [98, 138] and more recent documents describe the role NMP has in the care of long-term conditions and patients with complex conditions, such as palliative care [60, 64]. This is echoed by the changing role of medical staff in patient care. The early implementation guidance described medical staff retaining an overview of patient care, with nurse and pharmacist prescribing intended to improve patients' access to medicines [27, 79, 80, 83]. Subsequent consultation processes (with podiatry, physiotherapy, radiography and paramedics) have changed so that the examples given in these documents describe the provision of a complete package of care without the need to involve other healthcare professionals.

Indeed, the consequent reduction in costs through reducing patient appointments is listed as a benefit in the impact assessments [103, 108, 110, 113]. More recently, the HEE primary care report envisages that GPs will be treating patients with complex conditions, with other healthcare professionals providing routine care [60].

2.4.4 Strengths and limitations

The strengths of the present policy review include the systematic, iterative approach to identifying relevant policy documents, using document mapping techniques to identify missing documents. The dynamic nature of this healthcare area inevitably means that this review provides a snapshot of the situation between 2006 and 2018, which may well be superseded, for example if political changes resulting from unanticipated developments such

as 'snap' general elections or referenda occur. The selected documents relate to the UK and the home nations only and this may limit generalisability to other countries. Additionally, although the legislation permits the use of NMP in UK private healthcare, the policy documents concern the use of NMP in the NHS and this may further limit generalisability for alternative healthcare systems. However, it can also be argued that the development of NMP in the UK could provide a roadmap for other countries wishing to expand their NMP workforce, by providing examples of successful NMP implementation into routine practice.

Despite extensive searches there may well be further policy documents available, such as from the home nations or professional bodies that are not easily identifiable through a systematic search strategy.

2.5 Conclusions

In conclusion, this policy review has revealed that the government approach to NMP has changed over the 12-year period from 2006. NMP was originally intended as a means of improving patient choice and access to medicines, whilst also developing the workforce. A subsequent change in government (and associated political ideology) combined with financial and staffing shortfalls have resulted in the emphasis changing to NMP supporting, or even replacing, medical practitioner input. Patients are expected to be cared for, and treated by, the most appropriate health care professional such as a physiotherapist for a musculoskeletal problem. Medical workload is thus reduced, enabling the more complex cases to still be treated by medical practitioners despite a reduction in their numbers. Costs are reduced by

streamlining care through reducing multiple appointments with different healthcare professionals, and by focussing on the most appropriately qualified professional.

This policy review has also highlighted the role that NMP now plays in patient care, with prescribing perceived as one activity in the advanced practice armamentarium used to treat and support patients, enabling patients to benefit from receiving a complete package of care from a single healthcare professional. As prescribing has become embedded into day-to-day practice for the majority of the NMP professions, so the need to highlight prescribing in policy documents has diminished (as seen in the recent workforce development document), just as it is no longer felt necessary to describe in detail advanced practice in these professions. As new models of practice are developed, such as the use of physician's associates, so has the demand for NMP to expand to other healthcare professional groups continues, with the implication that prescribing is integral to these roles.

However, this policy review has found that while NMP has become embedded into routine practice for many professions, this is not universal. Despite pharmacists having achieved independent prescribing rights in 2006, it would appear from the repeated policy documents describing the need for pharmacist prescribing that it is still not embedded into pharmacists' routine practice. Medicines remain at the core of pharmacy practice through supply and optimisation but, until the new roles become established, prescribing has yet to be perceived as a 'normal' pharmacist activity.

This policy review has also highlighted the practical impact that a change in government can have, as shown by the gap in policy document publication during the Coalition's review and

reorganisation of the NHS, and the delays in legislation concerning controlled drugs. However, these delays are not inevitable, as shown by the physiotherapist and podiatrist consultations which were conducted during this period.

While these findings concern a publicly funded health service in a single country (albeit one comprising four dependent nations and four separate, but linked, health services), and may therefore be considered to have limited generalisability, there are messages that may resonate in other settings. These concern the impact of reorganisation on service development and how uptake of a novel activity is adopted by professions.

2.6 Chapter summary

In this chapter a systematic policy review investigated and described changes in government policy towards NMP since 2006. Documents included in the review comprised 23 policy documents and 22 relating to consultations. Findings could be linked to both chronology and healthcare provision. For the former, it was noticeable that a change in Government, associated with an NHS review, resulted in a dearth of policy documents at that time. Policy changed over the time period to acknowledge the role non-medical prescribers could have in supporting medical staff and reducing healthcare costs. Whilst it appears that NMP is embedded into practice for many professions, this would not appear to be so for all professions, particularly pharmacy. A clear role for prescribing appeared to facilitate the consultation process, although implementation could be affected by changes in Government.

2.7 Key points

- This is the first policy review bringing together UK policy documents concerning NMP.
- Two main themes are identified, relating to chronology and healthcare provision.
- Government policy towards NMP has changed since the original inception in 2006 of independent prescribing, driven partly by financial and staffing shortfalls.
- Prescribing is now embedded into practice for many NMP professions, reflected in reduction of policy documents relating specifically to prescribing.
- Differences remain however, with repeated policy documents highlighting potential roles for pharmacist prescribers, indicating that prescribing is still not fully adopted by pharmacists.

2.8 Introduction to next chapter

Policy documents such as the Welsh Assembly primary care workforce development plan and the draft workforce strategy for England highlight roles for non-medical prescribers [59, 96]. However, few comments are made regarding factors that might support or hinder prescribing development, although the general practice nursing workforce plan acknowledges there may be challenges [95]. In the next chapter, a systematic literature review is conducted to identify the barriers and facilitators affecting the development and implementation of NMP.

CHAPTER 3: FACILITATORS AND BARRIERS TO NON-MEDICAL PRESCRIBING – A

SYSTEMATIC REVIEW AND THEMATIC SYNTHESIS

Chapter overview

The results from Chapter 2 described the evolution of policy relating to NMP in the UK. However, there were few references to the factors that influence the development and implementation of NMP. In this chapter potential barriers and facilitators to NMP are identified.

The majority of this chapter is taken verbatim from the following publication in which I am principal author:

Graham-Clarke E, Rushton A, Noblet T, Marriott J. Facilitators and barriers to non-medical prescribing – A systematic review and thematic synthesis. PLoS ONE [Internet]. 2018; 13(4): e0196471
Available from: <https://doi.org/10.1371/journal.pone.0196471>.

The introduction has been substantially reduced to avoid duplication, and an introductory sentence added to place the paper in context of the overall thesis. For clarity and to provide more explanation the methods section has been expanded. In particular, section 3.2.2 has been expanded to include a discussion of the choice of assessment tool. The results, discussion and conclusions are taken verbatim from the paper. Other sections such as chapter summary and key points have been included but draw on information included in the paper. Minor changes to the narrative text have been made throughout to inform the thesis structure, and correct typographical and grammatical errors.

Details of authors' contributions (as acknowledged in the published paper):

EGC conceived the protocol, conducted the searches, analysed the data, wrote the first draft, and edited the manuscript. JM and AR conceived the protocol, reviewed the data analysis, and edited the manuscript. TN conceived the protocol, conducted the searches, acted as second reviewer, reviewed the data analysis, and edited the manuscript.

A copy of the published paper is included in appendix 8.7, and the reviewers' comments (and author responses) in appendix 8.8.

3.1 Introduction

The previous chapter described NMP policy evolution in the UK; highlighting the change in focus from improving patients' access to medicines to streamlining healthcare delivery, with non-medical prescribers providing complete packages of care. This vision will only be supported if the development of NMP is supported and encouraged. Earlier studies and surveys indicated that variable proportions of non-medical prescribers were not utilising their qualification (range 10-40%) [44, 47-49]. Although some studies had identified some reasons for not prescribing [44, 47, 48], there had been no in-depth exploration of these issues or robust literature review.

The aim of this section of work was to evaluate the literature concerning the use, facilitators and barriers of independent NMP in primary and secondary care in the UK.

3.1.1 Research Objective:

To conduct an extended systematic literature review to evaluate the use, facilitators, and barriers of independent NMP in primary and secondary care in the UK.

3.2 Methods

3.2.1 Search strategy and selection criteria

A systematic review and thematic synthesis was conducted to explore the barriers and facilitators to non-medical independent prescribing in the UK. A protocol for the review was

developed in advance, following the PRISMA-P statement [139], and registered with PROSPERO (CRD42015019786) (see appendix 8.4). The results are reported in accordance with the PRISMA and ENTREQ statements (appendices 8.9 and 8.10) [71, 140].

Qualitative and mixed-methods research studies investigating independent NMP in the UK were included. These included appropriate qualitative designs of empirical research [141] such as focus groups, interviews and questionnaires. Narrative reports describing a service, opinion papers and abstracts were excluded [141]. The legislation permitting independent prescribing by nurses and pharmacists was enacted in 2006 and therefore only studies published since 2006 were included [72]. There was no language restriction.

Table 3-1 - Search strategy terms for facilitators and barriers systematic review

	Inclusion	Exclusion
Participants (P)	Nurses Allied health professionals Physiotherapist Pharmacist Podiatrist Chiropodist Therapist	Doctor Physician Medical practitioner
Intervention (I)	Independent non-medical prescribing	Supplementary prescribing Dependent prescribing Nurse prescribers' formulary prescribing Independent medical prescribing
Comparators (C)	Not applicable	
Outcomes (O)	Themes relating to: Facilitators Barriers Attitudes Utilisation	
Setting (S)	Primary and secondary care	

Specific search strategies were developed, with expert librarian support, for each electronic database, and included broad and narrow, free-text, and thesaurus-based terms as this approach has been shown to capture the greatest number of references when reviewing qualitative literature [142]. Boolean operators and truncation were used. The selected keywords were: nurse, pharmacist, physiotherapist, podiatrist, non-medical, therapist, allied health professional, chiropodist, independent prescribing, utilisation, barriers, facilitators, role, education, support, guidelines, policy, procedures, attitudes and clinic.

The following databases were searched: AMED, ASSIA, BNI, CINAHL, EMBASE, ERIC, MEDLINE, Open Grey, Open access theses and dissertations, and Web of science. Papers that cite, or were cited by, the included papers were screened to identify any further relevant papers.

Personal files were examined to identify further papers [73]. Searches were completed to 26 March 2017 (Appendix 8.11 Medline (Ovid) search strategy).

Titles/abstracts obtained from all searches were screened to remove duplicates and papers that did not meet the eligibility criteria. Full-text copies of the papers remaining were obtained and reviewed. Two independent reviewers (EGC and TN) conducted each stage and resolved differences by discussion, with a third reviewer (AR) available for mediation if required [74]. Numbers excluded at each stage were recorded) [71, 74].

3.2.2 Quality assessment

Critical appraisal and quality assessment of included papers is a key component of a systematic review [143, 144] and can result in exclusion of lower quality papers in quantitative reviews [144]. Including low quality studies in a qualitative systematic review is debated, with some researchers arguing for their inclusion as they may provide valuable insights, whereas others argue they should be excluded [141, 145, 146]. Hannes describes four elements in the critical appraisal of qualitative studies, which are “credibility, transferability, dependability and confirmability”, corresponding to the terms internal and external validity, reliability and objectivity used in quantitative research [141].

3.2.2.1 Choice of tool

A review of published systematic qualitative reviews in 2012 found that over 70% of identified papers used some form of critical appraisal tool, with CASP the most popular [147]. An evaluation in 2010 of three online assessment tools found that the CASP tool was less sensitive

in determining validity (i.e. credibility or transferability) than either the Joanna Briggs Institute tool or the Evaluation tool developed by the Health Care Practice and Research Development Unit at Salford [145]. Hannes and Macaitis [147] identified considerable variability in reported items, such as databases searched and key words used.

To support researchers and publishers a consolidated checklist of 32 items was developed - COREQ (Consolidated Criteria For Reporting Qualitative Research) [148]. This tool, while suitable for quality assessment of studies, was designed specifically for interview and focus group study designs. In the review by Cooper et al [53] most of the studies detected were questionnaire or survey studies, making this tool potentially unsuitable.

More recently a validated quality assessment tool, (Quality Assessment Tool for Studies of Diverse Designs, QATSDD) has been developed, based on the EPPI-Centre tool and with input from the York Centre for Reviews and Dissemination [149]. The tool was developed to support quality analysis where studies use different designs, including qualitative, quantitative, and mixed-methods [149]. The tool comprises 16 elements (listed in appendix 8.12, QATSDD scores for each paper) covering aspects such as theoretical approach, research setting, data collection, and method of analysis. Each element is rated on a scale of 0 – no evidence, to 3 – full details, with clear reasons defined for each score [149]. Twelve elements are common to all studies, with two specific elements each for qualitative and quantitative studies, which permits assessment of a variety of study designs [149]. Validation reported in the paper indicated reasonable correlation with a kappa score of 67.8% with the original researchers, and a score of 71.5% when piloted with researchers naive to the tool [149]. The developers of the tool commented that the tool should be used in an iterative manner, with an initial

assessment, followed by a further review [149]. The framework has subsequently been utilised in several systematic reviews, including a review of patient safety reporting [150, 151]. Fenton and co-researchers expressed concern about clarity of some element descriptions and the equal weighting given to all elements [152], indicating that like many tools QATSDD does have limitations.

Hannes states that the tool selected should be appropriate for both the type of study to be reviewed and the expertise of the researchers [141]. Hannes further comments that assessment tools with closely defined criteria are more suitable for use by novice researchers [141]. The studies included in this review used a variety of research methods, primarily interviews, questionnaires and focus groups, making the QATSDD tool suitable. In addition, the descriptions for each element were considered sufficiently detailed to be appropriate. The tool was piloted before use in the study.

Two reviewers (EGC and TN) independently assessed the studies using the tool, resolving any disagreement in the scores through discussion. The decision was taken to include all studies to inform synthesis and conclusions regardless of quality assessment, but to report on the quality assessment results (see Table 3-2), particularly as from an initial scoping search, limited studies were identified.

3.2.3 Analysis

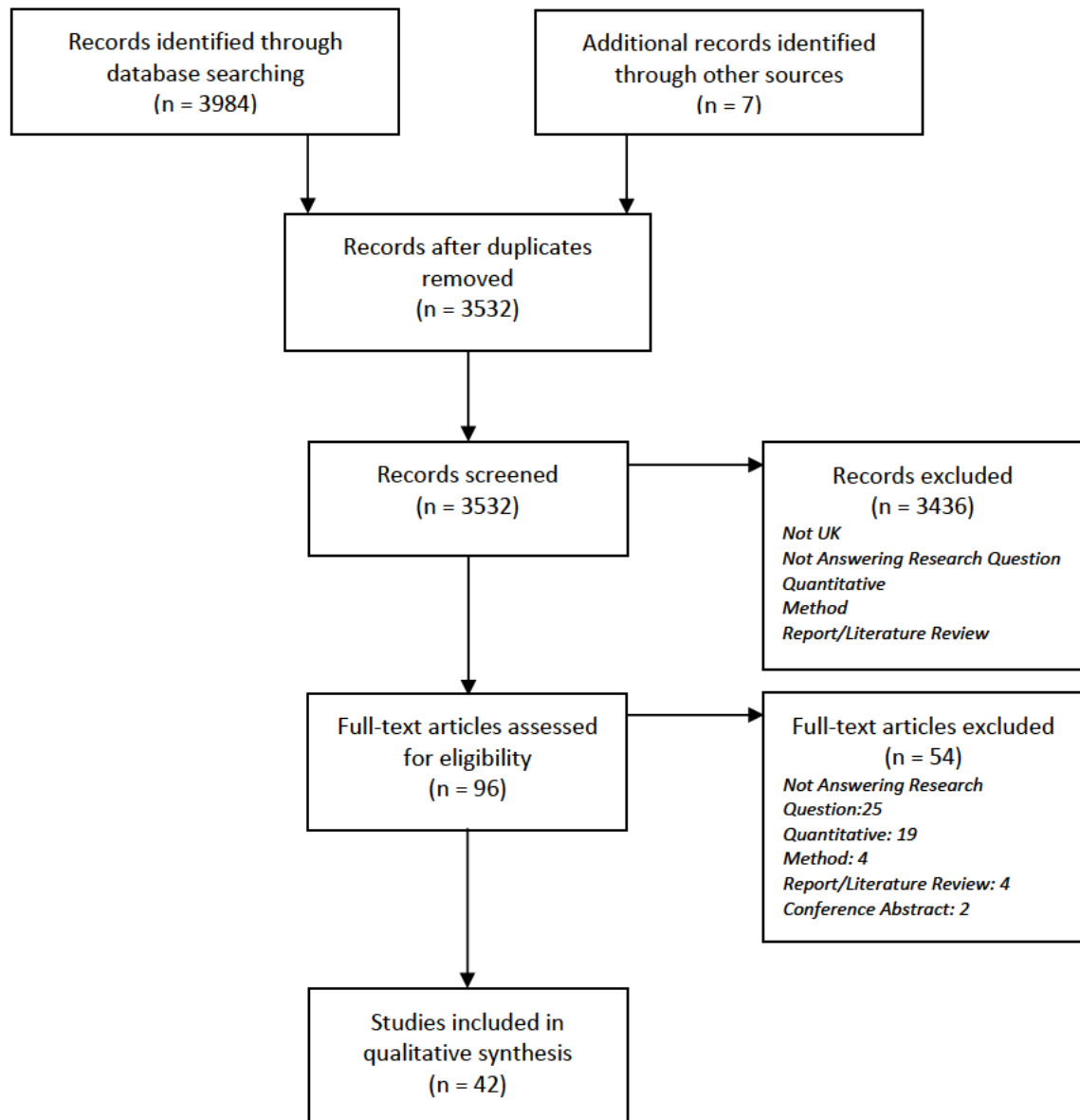
Thematic analysis, to identify recurrent barriers and facilitators to NMP and themes relating to use, was conducted on text from the results and findings sections of the papers together

with any included participant quotations [153, 154]. Thomas and Harden describe this as a three-stage process, coding text, developing descriptive themes, and finally developing analytical themes [154]. The studies were read to identify initial emerging themes, and then underwent line-by-line thematic coding utilising NVivo®11 (QSR International). As further themes emerged, new codes were created. All codes and themes were reviewed iteratively for consistency and appropriateness and amended if necessary. The findings were summarised under descriptive theme headings, permitting development of a hierarchy. The analysis was conducted by one researcher (EGC) and the initial themes and coding discussed and critically debated by the research group. The final version was agreed by the group following further refinement of the theme headings and hierarchy. At the end of data analysis no further themes were identified, indicating that data saturation had been reached [154]. EGC is a practising independent non-medical prescriber (INMP), and an NMP lead with a role in supporting other INMPs. This researcher standpoint was balanced by the other three members of the group, none of whom are prescribers.

3.3 Results

The search strategy identified 3991 potentially relevant studies. Following exclusion of 459 duplicates and 3436 from title and abstract review, 96 studies were reviewed at the full-text stage. Following exclusions, 42 papers were included (Figure 3-1).

Figure 3-1 PRISMA paper selection flow diagram



Overall, the studies included were assessed as moderate quality. There were three low scoring papers [155-157] (score <25%), and four high scoring papers [158-161] (score >75%); the latter being doctoral theses (Appendix 8.12). Key issues highlighted by the scores were the data collection tool choice, analytical method justification, research question and analytical method fit, user involvement and poor reporting of theoretical framework.

Of the 42 papers included, 30 (71%) were published between 2007 and 2012, with the remainder published subsequently. Nurse independent prescribers were studied in 24 papers [155, 157, 159, 162-182], pharmacist prescribers in five papers [45, 156, 160, 183, 184], and a mixture of nurse and pharmacist prescribers in a further six papers [158, 161, 185-188]. The remaining papers investigated the views of patients and staff associated with INMPs [170, 189-194].

Thematic analysis identified 17 subthemes of which 15 described the factors that may impact on INMPs and two described the range of activity. These were grouped into three over-arching themes, which were 1) factors relating to the INMP themselves, 2) human factors and 3) organisational aspects. The themes and subthemes are presented in Table 3-3, together with example factors, and Appendix 8.13 lists the papers from which the themes were identified. The 15 sub-themes impacting on NMP contained factors that could be barriers or facilitators; in many instances, this was dictated by circumstances.

Table 3-2 Characteristics and details of selected papers included in the systematic review.

Author	Population	Setting and/or speciality	Study type	Participant numbers	Results/Findings	QATSDD
Adigwe (2012) [158]	NMPs Patients	Primary & secondary care	SSI-F2F Online survey SSI-F2F	NP (n=9) PP (n=13) NP (n=141) PP (n=27) Other NMP (n=11) Patients (n=12)	Supportive mechanisms & safe prescribing environment required to support prescribers	90%
Armstrong (2015) [162]	Senior nurse Medical consultant NP Nurse Pharmacist Patients	Urgent care setting - one hospital	SSI Questionnaire	Senior nurse (n=1) Doctor (n=1) NP (n=2) Nurse (n=1) Pharmacist (n=1) Patients (n=20)	Benefits of autonomous working identified by staff & patients.	45%
Bennett et al (2008) [163]	Practising NP	HIV clinics - community & secondary care	Postal questionnaire Focus group	NP (n=8) NP (n=7)	Impact of prescribing on NP/doctor and patient relationships discussed. Overall perceived to be beneficial.	45%
Bewley (2007) [155]	Recently qualified nurses Senior paediatric nurses NP HEI	Paediatrics	Facilitated workshop Facilitated workshop Narrative Semi-structured questionnaire Scoping exercise	Recently qualified nurses (n=35) Senior paediatric nurses (n=?) NP (n=1) NP (n=19) HEI (n=4)	Pharmacology knowledge poor during nurse training. Identified as challenging in NMP course.	14%
Bowskill (2009) [159]*	NP	Primary & secondary care	SSI	NP (n=26)	Trust between nurse and doctor identified as necessary for a successful prescribing partnership.	90%
Bowskill et al (2013) [164]*	NP	Primary & secondary care	SSI	NP (n=26)	Trust between nurse and doctor identified as necessary for a successful prescribing partnership. Secondary care practitioners had more restrictions.	60%

Brodie et al (2014) [185]	PP NP	Primary care	SSI-F2F	PP (n=4) NP (n=4)	PP/NP have holistic approach to treatment. Concerns they were underutilised.	38%
Carey et al (2009) [165] [†]	NP	Specialist children's hospital - Intrinsic case study	Interviews	NP (n=7 participants, 18 interviews)	NMP believed to improve care provided to patients.	55%
Carey et al (2009) [166] [†]	NP Doctors DMPs Clinical Leads	Specialist children's hospital - Intrinsic case study	SSI-F2F	NP (n=7 participants, 18 interviews) Doctors (n=4) DMPs (n=7) Clinical Leads (n=3)	Successful NMP implementation but variations in approach and expectations.	48%
Carey et al (2010) [167] [‡]	NP Doctors Administration staff Non-nurse prescribers	Dermatology services - primary & secondary care – 10 site collective case study	SSI-F2F	NP (n=11) Doctors (n=12) Administration staff (n=11) Non-nurse prescribers (n=6)	NMP improved access to treatment, with ability for service reconfiguration. Inconsistent support post-training.	45%
Carey et al (2014) [168]	NP	Respiratory conditions - Primary & secondary care, East of England SHA	SSI - telephone	NP (n=39) Non-prescribing NP (n=1)	Wide variations in practice, but overall improved service to patients. Several challenges to NMP identified.	62%
Courtenay et al (2008) [169]	NP	Primary & secondary care	Questionnaire	NP (n=1377)	Nearly 70% of NP reported problems with implementing NMP.	56%
Courtenay et al (2009) [170] [†]	Doctors DMPs Clinical leads	Specialist children's hospital - Intrinsic case study	F2F interviews	Doctors (n=7) DMPs (n=4) Clinical leads (n=3)	Benefits in improving services to patients identified, but concerns raised regarding roles and NMP selection.	71%
Courtenay et al (2009) [195] [‡]	NP Doctors Administration staff Non-nurse prescribers Patients	Dermatology services - primary & secondary care – 10 site collective case study	1) SSI-F2F 2) Videotaped observations 3) Questionnaire	1) NP (n=10) Doctors (n=12) Administration staff (n=11) Non-nurse prescribers (n=6) 2) NP (n=37) 3) Patients (n=165)	Benefit to care reported by patients.	56%

Courtenay et al (2011) [189]	NMP leads, of whom half had a prescribing qualification	Primary & secondary care - one SHA	SSI	NMP leads (n=28)	Four key aspects of role identified: information, promotion, clinical governance, and training	52%
Cousins et al (2012) [171]	NP	General practice	SSI-F2F	NP (n=6)	NMP enhanced job satisfaction but increased work-related stress.	57%
Dapar (2012) [160]	PP	Community, primary & secondary care	1) Questionnaire 2) Telephone interview	1) PP (n=695/1643) 2) PP (n=34)	Implementation of NMP requires support, and ability to overcome challenges. NMP role clarification required.	98%
Daughtry et al (2010) [172]	NP	One PCT, north England	SSI	NP (n=8)	NMP expands role, but misunderstandings exist with other work colleagues.	38%
Dobel-Ober et al (2010) [190]	Nursing directors	Mental health trusts - England	Postal questionnaire	Directors of nursing (n=39/66)	Majority of trusts had policies and strategies supporting NMP. Only 1 Trust had no NMPs.	46%
Downer et al (2010) [173]	NP	Community - two health boards, Scotland	Conversational F2F interviews	NP (n=8)	Benefits to self and patients identified, but also challenges, including lack of support.	48%
Green et al (2008) [186]	NP (n=12) PP (n=1)	Mental health trust - Humber	Email qualitative survey	INMP (n=10) (profession not indicated)	50% prescribing, others providing advice. NMP qualification of positive benefit.	48%
Herklots et al (2015) [174]	NP	Community - two PCTs	SSI	NP (n=7)	NMP enhanced role, and knowledge from course beneficial to wider practice. Support, inc. CPD, variable.	50%
Hill et al (2014) [183]	Patients PP GPwSI	Addiction services - Lanarkshire	1) SSI based on questionnaire 2) Questionnaire alone	1) Patients (n=86) PP (n=5) 2) GPwSI (n=6)	Overall satisfaction with PP led clinic, with enhanced job satisfaction.	33%
Kelly et al (2010) [175]	Practice nurses, +/- prescribing qualification	Primary care - one southern English county	Postal questionnaire	No prescribing qualification (n=120) NP (n=31)	46% respondents not intending to train as NMP, citing various issues relating	35%

					to the course and age as reasons	
Maclure et al (2013) [191]	General public	Scotland	Postal questionnaire	General public (n=1855/5000)	General support for NMP, but several concerns raised.	43%
Maddox (2011) [161]§	PP NP	Primary & community - predominantly NW England	1) Unstructured interviews 2) Focus group x 3 3) SSI (F2F or telephone) 4) Q-method	1) PP (n=4) NP (n=14) 2) NP (n=10) 3) PP (n=5) NP (n=15) 4) PP (n=22) NP (n=34)	NMPs most confident when prescribing within guidelines. 'Time burden' for DMPs acknowledged as significant.	95%
Maddox et al (2016) [187]§	PP NP	Primary & community - predominantly NW England	1) SSI (F2F or telephone) 2) Focus group x 3	1) PP (n=5) NP (n=15) 2) NP (n=10)	NMPs cautious when prescribing, confidence improved with good support.	69%
McCann et al (2011) [45]¶	PP	Primary & secondary care - Northern Ireland	Postal structured self-administered questionnaire	PP (n=76/100)	Over 50% had or were not prescribing. Issues included lack of funding and lack of GP awareness.	42%
McCann et al (2012) [184]¶	PP DMP Key stakeholders	Primary & secondary care - Northern Ireland	SSI-F2F	PP (n=11) DMP (n=8) Stakeholders (n=13)	Benefits of holistic care for patient and team working identified, together with several challenges.	60%
McCann et al (2015) [192]¶	PP Patients	3 case studies, primary & secondary care - Northern Ireland	Focus Groups x 7	Patients (n=34)	Lack of prior awareness of PP. Patients identified benefits of team approach, but expressed some reservations.	62%
Mulholland (2014) [156]	PP Non-prescribing pharmacists	Neonatal units, United Kingdom	Electronic survey	PP (n=22) Non-prescribing pharmacists (n=23)	NMP identified as a team benefit, with utilisation of pharmacist knowledge.	23%
Mundt-Leach (2012) [157]	NP	NHS addiction services	Telephone survey	NP (n=20)	Benefits of NMP for patients felt to outweigh challenges.	21%
Oldknow et al (2010) [176]	NP Consultant psychiatrists	Older peoples' mental health services - one	1) F2F interviews 2) Postal survey 3) Document review	1) Participants unknown (n=?) 2) Patients (n=16/58) 3) Unknown	Report of a pilot implementation of NMP,	35%

	Patients	mental health trust			which indicated service benefits.	
Oldknow et al (2013) [177]	Non-prescribing NP	One mental health trust	Interviews	Non-prescribing NP (n=6)	Several barriers identified, including lack of remuneration.	71%
Ross (2015) [188]	NP PP Nurse manager Consultant psychiatrists GP Patients	Mental health - Tees, Esk & Wear Valleys NHSFT	1) Focus groups x 9 2) Interviews - F2F & telephone (n=13)	1) & 2) Distribution unknown. 6. NP (n=35) 7. PP (n=3) Nurse manager (n=2) Consultant psychiatrists (n=7) GP (n=1) 8. Patients (n=9)	Patient/NP relationship positive with benefit seen by all participants. De-prescribing highlighted as an important role.	60%
Ross et al (2012) [178]	NP	Mental health - Scotland	3) Email/postal Questionnaire 4) Focus group	1) NP (n=33/60) 2) NP (n=12)	Majority of NMPs yet to prescribe. Numerous barriers identified including lack of support from employer and lack of adequate remuneration.	71%
Shannon et al (2011) [193]	GP Cardiac physician	Heart Failure - one primary care centre & one hospital, West Scotland	1) Focus groups x 4 2) 1-2-1 interviews	1) GP (n=9) Cardiac physician (n=8) 2) GP (n=1) Cardiac physician (n=3)	Participants generally supportive of NMP, but identified communication as a key challenge.	57%
Stenner et al (2007) [180]]	NP	Acute, chronic & palliative pain - community, primary & secondary care	SSI-F2F	NP (n=26)	NMPs more likely to provide advice on treating chronic pain patients than prescribe. Reasons for this include budgetary restrictions.	57%
Stenner et al (2008) [181]]	NP	Acute, chronic & palliative pain - community, primary & secondary care	SSI-F2F	NP (n=26)	Many benefits to NMP identified, resulting from autonomous practice.	52%
Stenner et al (2008) [182]]	NP	Acute, chronic & palliative pain - community,	SSI-F2F	NP (n=26)	Multi-disciplinary team working benefits both NMPs and other team members.	67%

		primary & secondary care			Support from policies and CPD identified as important.	
Stenner et al (2010) [179]	NP Doctors Administration staff Non-prescribing nurse	Diabetes - community, primary & secondary care - 9 site collective case study	SSI	NP (n=10) Doctors (n=9) Administration staff (n=9) Non-prescribing nurse (n=3)	Prescribing incorporated into existing role, with support from other staffs. Some issues initially, but now mainly resolved.	50%
Stenner et al (2011) [194]	Patients	Diabetes - 6 sites, Primary care	SSI	Patients (n=41)	Patients identified a range of benefits from NMP, including improved disease management.	57%

*, § – paper derived from linked theses; †, ‡, ¶, || – linked reports of data from one study

DMP, designated medical practitioner; F2F, Face-to-Face; GP, general practitioner; GPwSI, GP with a special interest; HEI, Higher education institute; NHSFT, National Health Service Foundation Trust; NP, nurse prescriber; INMP, non-medical prescriber; PP, pharmacist prescriber; PCT, primary care trust; QATSDD, Quality Assessment of Studies of Diverse Designs; SHA, strategic health authority; SSI, Semi-Structured interviews

Table 3-3 The themes and subthemes that influence non-medical prescribing.

Theme	Sub, and subsub, themes	Quotations	Interpretation/example factors
1. Non-medical prescriber	1.1. Attitude [158, 159, 161-166, 168, 170-175, 179, 181, 182, 185-188]	<p>"I think it's been a marvelous (sic) thing really and it's been good, it's good for my confidence, it's given me a lot to think about. It's given me a new string to a bow, it, keeps me interested." Nurse [168]</p> <p>"it scares the hell out of me even though I am autonomous in my clinics. I still after doing a prescription have to get a GP to sign to check" Nurse [175]</p>	<p>Job satisfaction and confidence of the practitioners enhanced by non-medical prescribing.</p> <p>Lack of confidence and anxiety can prevent practitioner from using prescribing skills.</p> <p>Attitude towards NMP and role can be affected by views of others.</p>
	1.2. Practice		
	1.2.1. Area of competence [156-161, 164-166, 168, 169, 171, 172, 174, 175, 179, 181-185, 187, 191, 192, 194, 195]	<p>"... with contraception I thought before I start initiating new pills I really want to do an update and I was encouraged to do that quickly. It has given me a lot more confidence to prescribe in that area" Nurse [159]</p> <p>"Some of our patients now would be more difficult to manage you know patients with other conditions like some of our anaemia patients as well as being renal are also oncology patients and that makes them a bit more awkward and those patients I would definitely refer before upping or decreasing a dose" Pharmacist [184]</p>	<p>Confidence gained by defined area of competence.</p> <p>Constraints of co-morbidity acknowledged, need to refer when outside, or perceived to be outside, competence area.</p>
	1.2.2. Role [157-162, 164-168, 171-173, 175, 178, 179, 181, 182, 184-187, 192, 193]	<p>"Hospital trust G and primary care trust A agreed for the nurse specialist to run nurse led clinics in primary care settings. Her prescribing qualification has enabled the successful development of this new service for patients. Without a nurse prescriber in these posts a doctor is required to be present in the community to prescribe for patients accessing healthcare at this point. "I couldn't do my role without nurse prescribing" " Nurse [159]</p> <p>"I have to develop my own role; fighting to find a place in between GPs and prescribing nurses" Pharmacist [160]</p>	<p>Found to enhance existing roles. Success more likely where practitioner's role well-defined or when role specifically designed to include prescribing.</p> <p>Success less likely when lack of role clarity, where role wasn't valued or where organisational issues constrained role development.</p>
2. Human factors	2.1. Patients [158, 160, 162, 163, 176, 179, 183, 186, 188, 191-194]	<p>"I think they (nurse prescribers) look at all the care. They will check that the drugs they have prescribed don't clash with other things. They are interested in my home life. They sit down and take an interest so you don't relapse." Patient [188]</p> <p>"My one (disadvantage) would be crossing the specialisms – crossing the illnesses. My experience here is in relation to diabetic</p>	<p>Patients appreciate receiving holistic care and understandable information from NMPs.</p> <p>Concerns about communication with GP, and that NMP may have limited knowledge/ability to deal with complex issues.</p>

		management, but I would also like one that is appreciative of my overall (health)" Patient [192]	
	2.2. Staff		
	2.2.1. Managers [45, 158-161, 163, 164, 166-168, 173, 175, 177-179, 182, 185, 189, 190]	<p>"...I think the non-medical prescribing lead did a good job in setting it up initially...we are lucky in our Trust because the non-medical prescribing lead has driven it from the onset, he was one of the first supplementary prescribers and he has driven its right from the word go really and he has fought long and hard to get it recognized and that's why we are in the position that we are in now." Nurse [158]</p> <p>"Management appeared threatened, hostile and jealous of my prescribing authority and it is extremely annoying that major decisions regarding nurse prescribing are made by people in management who know nothing about it" Nurse [178]</p>	<p>Development and implementation of NMP, enabled by managerial support, including strong strategic vision.</p> <p>Implementation of NMP hindered through lack of understanding or organisational unpreparedness by managers.</p>
	2.2.2. Medical professionals [156, 158-170, 172-179, 181-186, 188, 193]	<p>"Team working gives you much more information about the patient, and it gives you much more support if you need it; and I have a good working relationship with the GPs ... I have referrals from the practice nurse; I have referrals from the doctor...So I think the close working relationship in the team is the best part" Pharmacist [160]</p> <p>"Again my anxiety is largely for the nurses involved; it doesn't seem at the moment clear, exactly what their responsibility is and if there is a mess up, who carries the can. I am not clear if a nurse prescriber prescribes something at a dreadfully wrong dose and somebody is harmed as a result, who carries the can. Is that my MDU subscription or is it a separate thing? I think those areas are something that to me are not entirely clear." Doctor [170]</p>	<p>Doctors understanding and appreciating benefits of NMP role, including seeking advice.</p> <p>Lack of clarity over role boundaries and concern over loss of control.</p>
	2.2.3. Peers [156-162, 164-167, 169, 172-174, 178, 179, 181-184, 186, 187, 189]	<p>"Long term trusting relationship of mutual respect between medical, nursing and other health care professionals and myself" Pharmacist [160]</p> <p>"I think as soon as they realize you can prescribe they expect you to be able to do exactly what doctors can do. They don't understand your limitations and you can only work within the scope of your knowledge, and they expect you to sign repeat prescriptions, and send everybody through to you. So it can be quite difficult at times explaining to them." Nurse [172]</p>	<p>Peer/NMP relationship providing mutual support and improving team working.</p> <p>Lack of understanding of NMP and/or antagonism hindering NMP.</p>
3. Organisational aspects	3.1. Administration		

	3.1.1. Formulary [158-161, 163, 167, 168, 174, 178, 180, 182, 185, 186, 191]	<p>"You do take each patient on their own merit but within that framework and if there wasn't that framework I think I might be floundering a bit more". Nurse [159]</p> <p>"The clinic is actually limiting the range of non-HIV medications that I can prescribe, even if many of these agents prove very useful in treatment support aims." Nurse [163]</p>	<p>Personal formulary used to define area of competence, and supported by national guidelines.</p> <p>Formulary restrictions derived from organisational policy or cost pressures.</p>
	3.1.2. Policy [158-160, 162, 167, 178, 182, 186]	<p>"I guess the only thing that I would change is by having standards across the country, I think each Trust is allowed to adopt non-medical prescribing within their own guidelines and within their remit and I think it's been good in some areas but it has hindered non-medical prescribing in some others and it has not allowed them to develop their practice, as they would do." Nurse [158]</p> <p>"My Trust has no guidelines and there is no guidance. I don't know anyone in our area who is prescribing" Nurse [178]</p>	<p>Clear policy supporting NMP, and acting as safeguard.</p> <p>Lack of, or restrictive, policy hindering NMP development and implementation.</p>
	3.1.3. Remuneration [45, 158, 160, 168, 173, 175, 177, 178]	<p>"...you know, at the end of the day, I am doing it not for the money and not for the banding, it is for my practice and having a qualification that allows me to develop my practice but also to manage my career plan for the future, if you like..." Nurse [158]</p> <p>"I think that if there was a clear reward in taking up the nurse prescribing mantle, you know, I would be prescribing now" Nurse [177]</p>	<p>Prescribing qualification for role extension or career progression, not for financial reward.</p> <p>Lack of financial reward seen as disincentive to training and unappreciative of role.</p>
	3.2. Development		
	3.2.1. Post course support [156, 158, 160-162, 166-168, 170, 173-175, 178, 179, 181, 182, 184-187, 189, 191, 193]	<p>"I support them to ensure that they have access to further training, development and [continuous professional development]" Pharmacist [162]</p> <p>"Ongoing support has gone very hit and miss. In the first year there were a few evening sessions on general stuff, not specific to dermatology. Now with all the reorganisation it has completely hit the bin and you don't get any CPD from the employer." Nurse [167]</p>	<p>Post training support necessary for continued development of skills and confidence. Enabled by provision of training courses, and managerial support.</p> <p>Time and funding provision limiting access to courses. Peer and professional support absent.</p>
	3.2.2. Training [155, 156, 158, 160-162, 166, 170, 173-175, 178, 179, 185-187, 189, 190, 192, 193]	<p>"All candidates have been required to [. . .] have some clear objectives around the need and use of the skills and ability to prescribe." Nurse [190]</p>	<p>Prior to course, need for NMP should be identified, and appropriate candidates selected. Role of clinical mentor crucial for successful completion.</p>

		<p>"Nurses that have done course say [very] intense and difficult. I have two children and am single parent – so limited commitment to study" Nurse [175]</p>	<p>Time and course commitments off-putting or leading to challenges in completing course.</p>
	3.3. Service delivery		
	<p>3.3.1. Impact on time [156-158, 160-163, 165-168, 170, 172-174, 176, 179, 181, 183-186, 188, 191-195]</p>	<p>"I think it's because of timing issues, you know, because normally if it's someone who has rung in the morning, then they won't get a GP visit till the afternoon, and if they're last on the list, by then they're so far down the line they're in hospital. So timing issues are very important in managing a deteriorating patient ... you get it on board quicker; I mean, it's a 12-hour difference sometimes." Nurse [174]</p> <p>"Oh, it has changed dramatically. Workload had trebled. We see most of the minor ailments. We have taken a lot more on—the more knowledge you get the higher the workload. We do all medication reviews and all hypertension reviews" Nurse [172]</p>	<p>Patients able to receive timelier and streamlined care with NMP. Ability to prescribe saves time for NMP, doctor, and patient.</p> <p>Workload pressure increasing because of prescribing.</p>
	<p>3.3.2. Infrastructure [45, 156, 158-161, 164, 165, 167-169, 173, 174, 178-180, 183, 185, 186, 191, 193]</p>	<p>"What we get on the referral is what we know. I think we've had three more practices now go on to the same system we're on and the GPs are finally coming round to understanding that sharing their notes is a benefit to all of us. So it is improving. I've now got two [GP practices] on my caseload where I can see their notes as well." Nurse [168]</p> <p>"I feel that pharmacy independent prescribing can only take place in a primary care setting, within GP practices. This is because we have no access to patient history and notes otherwise. This makes prescribing from elsewhere more difficult and possibly less effective" Pharmacist [45]</p>	<p>Prescribing supported by good access to patient records, particularly electronic systems.</p> <p>Limited or no access to patient records (including electronic) preventing prescribing and impeding good communication.</p>
	<p>3.3.3. Service [156-158, 160-163, 165-168, 170-172, 174, 176, 181, 183-189, 192-195]</p>	<p>"I can do their prescription there and then, whereas sometimes they'd have to come back for it. For the younger people, who have taken time off work, they don't want to come back again, and sometimes they get angry or frustrated if it puts them out, so yes, it's much, much better for them that it's done there and then." Nurse [168]</p> <p>"At the moment we only have one [nurse prescriber] so it makes it impossible if X is off sick for another nurse to do her clinic without a lot of stress for the other person. And also time consuming for the patients because that nurse might have all the knowledge and skills but they will have to get the doctor to come in because they have not done the prescribing course." Nurse [167]</p>	<p>Service to patient improved and streamlined, with improved patient satisfaction and efficiency.</p> <p>Services dependent on NMPs, with issues arising when NMPs are unavailable.</p>

	3.3.4. Use in practice		
	3.3.4.1. Patients [157, 159-161, 163-168, 170, 175, 177, 179-182, 184-186, 192, 194]	<p>"we started one patient on insulin in the community which is fantastic, saved so much hassle for a demented man not to have to go into hospital" Nurse [159]</p> <p>"The odd time you get people in who are, live on the streets, you know, I'd prescribe for them, and you can get those things over-the-counter because they haven't got the money and they get free prescriptions" Nurse [161]</p>	Long-term conditions such as diabetes. Complex patients such as those with comorbidities. Minor ailments. Patients with social needs for example drug users.
	3.3.4.2. Setting [45, 156, 157, 159-161, 167, 168, 172, 175, 180, 182, 183, 186, 190-194]	<p>"A major benefit of seeing the patient in their home, in a setting where it's to their best convenience" Doctor [193]</p> <p>"My main dealings are treating people with acute respiratory problems. Their medicines' (ran) out, or they're becoming ill with complications. That's mainly an out of hours setting. It is a benefit for them to walk in to the walk-in centre. At least they're getting care somewhere." Nurse [168]</p>	Primary and secondary care, including cross sector working, ranging from home based care to specialist clinic.

3.3.1 Non-medical prescriber themes

Factors affecting the INMP were subdivided into those arising from the attitude of the INMP and those derived from their practice (See Table 3-3). Prescribing enabled the professional to practice autonomously [72, 159, 162, 168, 171, 173, 181], enhancing job satisfaction [159, 168, 171, 173, 181, 183, 186], and supporting professional development [158, 175, 185, 186]. Some practitioners, however, expressed anxiety [163, 168] and cautiousness [158, 161, 174, 181]. Practitioners indicated that their area of competency enabled them to prescribe confidently [161, 172, 174, 179, 181, 182], and to resist pressure to prescribe outside this area [161, 165, 172, 179, 181, 182]. Roles were perceived to be enhanced through including prescribing [157, 158, 166, 168, 171, 172, 179, 185, 193].

3.3.2 Human factor themes

Human factors described the impact that INMPs had on their patients, colleagues, and managers, and the impact that these people had on the INMP themselves. Medical staff that had been involved in the training of INMPs [45, 170, 193] were more supportive than those who were unaware of the training involved [160, 170]. This was regardless of seniority [182, 184]; junior medical staff were less likely to be supportive [170]. Managers were instrumental in developing and supporting the INMP role [158, 160, 167, 189]. Lack of support, flexibility or understanding by managers hindered the implementation and development of NMP [45, 158, 159, 161, 163, 164, 168, 173, 179, 182, 188]. INMPs gained support from colleagues, describing enhanced team working [156, 158, 160, 164-166, 174, 179, 181-184, 186, 189], and

were perceived as supportive experts and leaders [158, 160, 164, 179, 186]. However, INMPs encountered opposition from some colleagues [158-161, 164, 169, 172, 178, 182, 186].

3.3.3 Organisational aspect themes

Organisational aspects encompassed a range of themes covering administration, development and service delivery. Administration comprised three subthemes: formulary, policy, and remuneration. A formulary could be self-imposed [158, 159, 161, 164, 174], or organisation derived [158, 159, 163, 164, 167, 178], and while they could be empowering [159, 161, 167, 182], they could be restrictive [158, 161, 163, 164, 167, 174, 178].

Local policies could be supportive [158, 182, 186], restrictive [158-160, 182], or missing [178]. Remuneration was not considered to be commensurate with skills [45, 158, 160, 173, 175, 177, 178]. Development covered both training, including selection for the independent prescribing course, as well as post course support. Course facilitators included appropriate selection of candidates [166, 170, 175, 186, 189, 190], awareness of course commitments and requirements [174], and support from medical mentors [160, 193], and managers [170, 189, 190]. Post course support included the provision or facilitation of professional development courses [158, 167, 174, 179, 186, 189], mentoring [158, 174, 175, 189], and clinical supervision [158, 167, 182]. Absence of such support hindered INMP development [158, 160, 161, 166-168, 173, 174, 178, 179, 182, 185, 193]. Infrastructure covered several issues, each with the potential to support or hinder the prescribing role, including access to: patient records [45, 158, 160, 161, 168, 173, 180, 183, 191, 193], information technology [158-160, 167, 169, 174], prescriptions [158-160, 164, 168, 169, 178, 179], and facilities [160, 183]. INMPs spent more

time with patients [161, 166, 168, 170, 183, 184, 186, 192-194], and were considered to provide a responsive, efficient, and convenient service [158, 163, 166-168, 170, 172, 174, 176, 181, 183, 185, 186, 194]. Doctors' time was released by INMPs activity [160, 163, 167, 179, 191, 193], but time constraints and workload could hinder the INMP service [161, 163, 165, 166, 172, 173, 183, 193]. Some services were now reliant on INMPs [167, 168] and had issues when cover was absent [167]. The settings and patient groups where NMP was utilised were diverse. Examples were given of utilising NMP to treat patients who may find accessing healthcare difficult such as frail and housebound patients [161, 168, 193], the homeless [161], and drug users [157, 160]. NMP was also utilised in more conventional healthcare settings such as specialist clinics (for example, dermatology [160, 167], anti-coagulation [192], and cardiovascular [160]), minor illness clinics [159, 167, 168, 172, 175], and out-of-hours services [161, 167, 168].

During analysis, it became apparent that many factors were not present in isolation but were interdependent. Frequently, the interdependence was between a member of staff, the INMP, an organisational aspect such as policy, and how this impacted on the INMP's confidence and ability to prescribe. Examples include a situation whereby a supportive GP had given an INMP confidence to develop their competence area and expand their personal prescribing formulary [158], and identification by NMP leads that an INMP role was more likely to flourish when linked to a strategic vision and a well-defined area of practice [189]. Other interdependencies were within organisational aspects, such as the increased time required when the INMP was unable to easily access the patient's notes [168], or when the NMP policy specifically supported access to continuing training [162].

3.4 Discussion

This is the first systematic review to investigate and synthesise the qualitative and mixed-methods literature regarding barriers and facilitators to, and use of, independent NMP. Three overarching themes, each comprising subthemes: were identified; the INMP, human factors and organisational aspects. The themes and subthemes could all impact on successful implementation of NMP and could be interdependent.

The INMP theme describes three aspects: one is intrinsic to the person (attitude), one derives from their role (role), and the final one may be personally or externally derived (area of competence). The later subtheme 'Area of competence' was one of the four most highly mentioned aspects found during analysis, highlighting its importance. This is supported by the "Competency framework for all prescribers" [30] and the NMC "Standards of proficiency for nurse and midwife prescribers" [29], which state that practitioners should only prescribe within their scope of practice. In contrast, in the traditional medical model, doctors would expect not only to initiate new treatment, but to continue existing medication, often started by another speciality. The EQUIP study found that junior doctors felt unsupported with their prescribing, implying that they were being asked to prescribe outside their competency area [196]. There are implications if an INMP changes role as further training and support in these new areas would be required. Closely defined areas of competence could also hamper full utilisation of NMP, particularly in patients with co-morbidities, not by restricting the range of medication as with supplementary prescribing, but through limitations on the conditions to be treated.

The second theme 'human factors' describes the complex interrelation between the INMP, their managers, peers, the medical professionals they work with, and their patients. This theme included the most frequently mentioned subtheme 'Medical professionals', identified in 32 papers. It is notable that, in contrast with the review by Cooper et al, medical professionals generally accepted the INMP role [53]. Reasons for acceptance may be because NMP has become established practice but also because INMPs have made deliberate efforts to gain trust. There was an appreciation that the INMP role permitted medical professionals to concentrate on patients where their expertise was necessary. Changes in managerial personnel could adversely impact on NMP, particularly where systems and processes were not embedded into practice. This review found that patients' views of NMP were mixed, with many patients appreciating the time taken and holistic approach of the INMP, whereas others expressed concerns. A lack of public understanding of NMP remains, even with patients treated by INMPs. Cooper et al noted that very little research was identified investigating the views of patients about NMP [53]. The present review identified one paper investigating public perception of NMP [191] and eight papers that included the views of patients [158, 162, 176, 183, 188, 192, 194, 195]. However, one of these only included quantitative 'rating' data from patients [195]. Research into patients' opinions of NMP warrants further investigation.

The final theme covers the organisational aspects that support and enable an INMP to practice. It contains two of the four most frequently mentioned subthemes, 'impact on time' and 'service'. In comparison to other subthemes, these two were frequently interdependent on each other, with both highlighting the perceived improvement to patient care by providing a streamlined, holistic, and convenient service. Funding pressures may make this aspect of the

service, appreciated by patients, difficult to sustain. The current review identified that contingency and succession planning should be considered during service development.

3.4.1 Strengths and Limitations

This review's strength lies in its rigorous methodology and breadth of search strategy. This compares with the previous investigations, which were limited in scope and rigour [48, 53]. The predetermined stringent protocol, registered with PROSPERO, and the use of two independent reviewers are recognised strategies to reduce potential bias associated with paper selection [141, 143]. Limitations included the inconsistent definitions used to describe INMPs, which became apparent during the literature search. The terminology would have been appropriate when those studies were conducted, but the meaning changed as prescribing rights evolved (see Table 1-2). Every effort was made to limit the included studies to those investigating full independent NMP. The nursing profession dominated the included studies, with limited representation from pharmacist prescribers (mentioned in 11 of the 42 papers [45, 156, 158, 160, 161, 183-188]) and none from other NMP professions. This reflects the relative numbers of the different professions, with nursing the largest profession, followed by pharmacy [49, 197] and the numbers of qualified prescribers in each profession [46]. However, the numbers of AHPs are likely to have increased recently following legislation changes and that could be considered a limitation. Research into independent NMP by the permitted other professions (currently optometry, physiotherapy, podiatry, paramedicine, and radiography) is needed to identify if they experience the same barriers and facilitators.

3.5 Conclusions

The themes and subthemes identified in this review influence the implementation and development of NMP; each could act as a barrier or facilitator depending on circumstances. Where there was a lack of understanding of the NMP role, or lack of trust in the INMP, then the factors were more inclined to be barriers. For example, medical professionals were less likely to support NMP where there was a lack of clarity about who took responsibility for the prescribing practice [166, 170, 175]. Facilitation of NMP occurred when medical professionals trusted the INMP, for example enabling access to patient records [168]. As a consequence of budgetary constraints, factors may become barriers, such as the use of restrictive formularies as a cost saving measure [161, 168, 180]. Additionally, this review has identified that these themes and subthemes do not stand in isolation but are interdependent on each other. Each of these aspects should be considered when developing a NMP service and could be utilised as a model for developing a NMP strategy framework. It could be postulated that addressing all these aspects will enable the full benefit of an NMP service to be realised.

3.6 Chapter summary

In this chapter a systematic literature review investigated the barriers and facilitators to NMP. From thematic analysis of the 42 included papers, three major themes were identified that influenced the utilisation of NMP: the INMP, human factors and organisational aspects. The most frequently mentioned factors related to medical professionals, area of competence, and impact on time and service. Factors could be barriers or facilitators, depending on circumstances, and were often interlinked. Most papers concerned nurse prescribing with a

smaller number relating to pharmacists. No papers were identified that studied other NMP professions.

3.7 Key points

- This is the first systematic review investigating the literature regarding barriers and facilitators to, and use of, independent NMP.
- Three main themes were identified: relating to the INMP, human factors and organisational aspects.
- The most frequently mentioned factor concerned the impact of medical professionals.
- Each factor could be a barrier or facilitator depending on circumstances.
- Most papers concerned nurse prescribing, with a smaller number pharmacist prescribing, but none related to the other NMP professions.

3.8 Introduction to next chapter

The identified factors influencing NMP were derived from studies investigating nurse and pharmacist prescribing only. It remains unclear if these factors similarly affect other NMP professions. In the next chapter, a Delphi study is conducted comparing the views of prescribers from an established prescribing profession (pharmacists) and a relatively new prescribing profession (physiotherapists) regarding barriers and facilitators to prescribing.

CHAPTER 4: A DELPHI STUDY TO EXPLORE AND GAIN CONSENSUS REGARDING THE MOST IMPORTANT BARRIERS AND FACILITATORS AFFECTING PHYSIOTHERAPIST AND PHARMACIST NON-MEDICAL PRESCRIBING

Chapter overview

The results from CHAPTER 3: highlighted barriers and facilitators to NMP that were derived from nursing and pharmacy literature only. In this chapter, the experiences of pharmacists are compared with a newer, and relatively unexamined, NMP profession (physiotherapy). A consensus technique, Delphi, is used to investigate barriers and facilitators experienced by these two professional groups to identify similarities and differences between them.

The majority of this chapter is taken verbatim from the following publication in which I am principal author:

Graham-Clarke E, Rushton A, Marriott J. A Delphi study to explore and gain consensus regarding the most important barriers and facilitators affecting physiotherapist and pharmacist non-medical prescribing. PLoS ONE [Internet]. 2021; 16(2): e0246273.

Available from: <https://doi.org/10.1371/journal.pone.0246273>

The introduction has been substantially reduced to avoid duplication, and an introductory sentence added to place the paper in context of the overall thesis. For clarity and to provide more explanation the methods section has been expanded. In particular section 4.2.1 which discusses the choice of consensus technique, section 4.2.2 which concerns the questionnaire delivery method, section 4.2.3 concerning participant selection and section 4.2.5 which

describes the procedure for each round and choice of statistical tests. The results (sections 4.3.1, 4.3.2, 4.3.3, 4.3.4 and 4.3.5) have been expanded to include more information on the results from each round. The discussion and conclusions are taken verbatim from the paper. Other sections such as chapter summary and key points have been included but draw on information included in the paper. Minor changes to the narrative text have been made throughout to inform the thesis structure, and correct typographical and grammatical errors.

Details of authors' contributions (as acknowledged in the published paper):

EGC conceived the protocol, conducted the study, analysed the data, wrote the first draft, and edited the manuscript. JM and AR conceived the protocol, reviewed the data analysis, and edited the manuscript.

A copy of the published paper is included in Appendix 8.14, and the reviewers' comments (and author responses) in Appendix 8.15.

4.1 Introduction

In the previous chapter, 15 themes relating to the utilisation of NMP were identified in the systematic literature review. The included studies concerned nursing primarily with a smaller number of studies reporting research involving pharmacists. No studies were identified that investigated the barriers and facilitators to prescribing in other NMP professions. It is therefore unclear if other NMP professions experience similar barriers and facilitators, potentially affecting how transferable the review findings are to other NMP professions, and if they can provide insight for future NMP professions. This section of work presents the results of further investigation into the facilitators and barriers encountered by an established NMP profession, pharmacy, compared with a newer NMP profession, physiotherapy, which is relatively unexamined. These professions were chosen as they are similar sizes in the UK (approximately 56,000), may work individually or as teams, and may work in all healthcare sectors [51, 55]. They differ in the length of time that each profession has had prescribing rights, with pharmacy gaining independent prescribing rights six years earlier than physiotherapy [56, 72].

The primary aim was to gain consensus regarding the factors that have supported, or discouraged, pharmacist and physiotherapist non-medical prescribers from utilising their prescribing qualification. Furthermore, to determine which factors that appear to be associated with the greatest influence on prescribing utilisation, and if these factors were perceived similarly between pharmacists and physiotherapists.

4.1.1 Research objectives

1. To use the Delphi technique to identify common themes affecting the utilisation of NMP by pharmacists and physiotherapists, and to obtain consensus of those themes that have the greatest impact.
2. To use the Delphi technique to determine if the factors influencing uptake and utilisation of prescribing affect both physiotherapist and pharmacist prescribers similarly.

4.2 Method

4.2.1 Consensus research methods

Research methods, such as consensus techniques, that systematically obtain and prioritise expert opinion can be utilised when published information is scanty or non-existent [198, 199]. Consensus research methods were developed as a means of enabling expert opinions to be gathered, collated and prioritised [198]. Four main consensus methods have been described in the literature; nominal group technique, RAND appropriateness method, consensus development conference and Delphi technique [198, 199].

4.2.1.1 *Nominal group technique*

The nominal group technique is a structured group meeting where ideas are generated individually, debated as a group and then voted on [200]. Group size varies, although a

maximum of seven participants has been recommended [200]. There are practical considerations to be considered such as arranging a suitable date, providing appropriate facilities and consideration of travel costs [199, 200].

4.2.1.2 *RAND appropriateness method*

In the RAND method, nine participants are asked to rate a list of statements that have been determined from the literature. The participants then meet for a panel discussion, following which they re-rate statements [199, 201]. As with the nominal group technique, there are practical issues concerning organisation of the panel meeting.

4.2.1.3 *Consensus development conference*

A small group of experts is convened to listen to public evidence on the topic under consideration. They then meet in private to discuss the evidence, with the intention of reaching consensus [198]. This technique is resource intense, and usually run by large organisations such as the Kings Fund or the United States National Institutes of Health [198, 202].

4.2.1.4 *Delphi technique*

The Delphi technique was developed by the RAND Corporation in the 1950s as a forecast method, originally for predicting sites for nuclear attack, and since then it has been increasingly used in healthcare research [203]. It is an iterative technique using sequential questionnaires and controlled group feedback, with anonymity of participants to each other

as a key feature [204, 205]. The classic Delphi design has an information seeking first-round followed by prioritisation rounds, stopping when consensus is achieved. The literature describes variations, such as using literature reviews to generate the first round questionnaire [203].

Some aspects of these techniques are summarised in Table 4-1.

Table 4-1 Comparison of consensus techniques

	Nominal group technique	RAND appropriateness method	Consensus development conference	Delphi technique
Face to face meeting	✓	✓	✓	X (✓ if a focus group is used)
Questionnaire	X	✓	X	✓
Prior literature review	X	✓	✓	✓ /X
Anonymity	X	X	X	✓ (X if a focus group is used)
Limited number of participants	✓	✓	✓	X
Resources	Meeting room Travel costs Facilitator	Questionnaire – postal or online Meeting room Travel costs Facilitator	Meeting room Travel costs Facilitator	Questionnaires – postal or online
Participant time commitment	1-2 hours, potentially longer	1-2 days, plus completion of prior questionnaire	Several days	½-1 hour per questionnaire, repeated at intervals

4.2.1.5 Consensus, agreement and stability

Three aspects need to be considered when determining whether the group has reached consensus or not. There is debate about the definitions of the following terms, but the following interpretations were used in this research [202, 205]. Tests selected for each aspect are described in section 4.2.5.

- Consensus is described as the level to which participants agree with each other [202].

- Agreement is described as participants having a similar majority viewpoint on a statement [202, 205]. Agreement includes the potential to achieve consensus regarding the statement, but with significant outliers as well.
- Stability is described as group consistency of response between rounds. Individual stability between rounds has been measured in some studies, however von der Gracht [205] argued that consensus is a group decision and hence group stability is more important than individual stability.

4.2.1.6 *Choice of technique and design*

Delphi can be described as a mixed-methods research technique as analysis comprises both quantitative and qualitative elements. Statistical techniques are used to assess agreement and consensus, and qualitative methods used to assess stability in responses between rounds.

In the present study, the Delphi technique was chosen for several reasons. This technique can include many participants ('experts'), enabling a range of pharmacist and physiotherapist prescribers to be included. Participants do not need to attend a meeting and are able to complete the questionnaire at their own pace. As participants remain unknown to each other, they are less likely to be biased by opinions of other participants [205-207]. The technique does not require resources such as meeting rooms and travel expenses, making it suitable for minimally funded researchers. The preceding systematic literature review, showing an absence of physiotherapist literature, indicated the appropriateness of the classic Delphi information gathering first round to seek physiotherapy opinions [205].

The technique is not without limitations which can include participant fatigue with sequential rounds and, consequently, increasing dropout rates [204]. The technique requires high levels of organisation by the researcher and can be time consuming and complex [204].

4.2.2 Delivery format of questionnaire

Questionnaires are traditionally distributed using the postal service, but they can also be administered via online web survey software or e-mail, a design which Hasson and Keeney describe as 'e-Delphi' [203].

Boulkedid et al [208] in their systematic review of Delphi reporting recommended using both electronic and postal options to optimise response rates. This was based on a study by Leece et al [209] comparing response rates for postal versus online questionnaires and finding a higher response rate with the postal version. More recent studies comparing electronic and postal versions have found negligible differences in response rates between the two delivery systems [210, 211]. Use of online questionnaires is more common recently, ranging from simple feedback on online purchases to consultations on healthcare services (NHS England: <https://www.engage.england.nhs.uk>). It could be postulated that as online surveys have become more commonplace, so response rates will improve.

Postal questionnaires require paperwork preparation, including stamped addressed envelopes for return of questionnaire, and obtaining postal addresses. Costs are incurred with printing and postal charges, not only for each round but also each reminder. Careful

administration is needed to track responses at each stage. Participants are able to complete the questionnaires in stages before returning them.

Electronic questionnaires can be delivered via email as a direct electronic equivalent of the postal system, by using online survey software or specific web-based software. The former two require similar preparation to the postal system, such as questionnaire design; the later can incur significant development costs [209]. The latter two methods can support study administration including response tracking and automatic reminders [212]. Current, valid email addresses are required.

Questionnaires were administered using online survey software (<https://www.onlinesurveys.ac.uk/>) supporting participant anonymity whilst providing response tracking and automatic reminder facilities. Online Surveys is the University preferred electronic survey software and stores data securely in accordance with UK data protection laws.

4.2.3 Participants

Delphi participants are described as ‘experts’ and require knowledge of the research topic. A criterion based purposive technique was adopted to recruit pharmacist and physiotherapist independent prescribers, qualified since 2013 when the law was amended to permit physiotherapist independent prescribing, using a sample matrix (Table 4-2) [56, 213, 214].

- Newly or recently qualified prescribers might be perceived to benefit from “Pathfinder” prescribers but, as the inclusion timeframe was short, differentiation was

only required between those that have qualified within the previous 12 months and those qualified longer.

- Representation was weighted towards the two main practice areas (primary and secondary care), whilst allowing representation from other practice areas
- More experienced professionals might be perceived to benefit from enhanced working relations with medical and other colleagues compared to younger professionals.

However, as the prescribing course can be completed at any stage in the professional career, the sample matrix was designed to allow representation across the experience range.

Table 4-2 Sample matrix for selecting Delphi participants

Criteria	Pharmacist	Physiotherapist	Years of professional practice	
Profession	30	30		
Length of time qualified as a prescriber:			≥5	0-10
≥12 months	5-20	5-20	6-10	0-10
<12 months	5-20	5-20	11-15	0-10
Main practice area:			16-20	0-10
Primary Care	5-20	5-20	>21	0-10
Secondary care	5-20	5-20		
Community	0-5	0-5		
Other (please describe)	0-5	0-5		
Other requested information (but no control required for sampling): Home nation – England, Scotland, Wales, Northern Ireland				

Readily accessible lists of such prescribers are unavailable, and recruitment was conducted indirectly. Invitation emails were sent to West Midlands NMP Leads, CHAIN (a healthcare orientated online mutual support network: www.chain-network.org.uk) and Health Education England (a national body overseeing education: <https://www.hee.nhs.uk>) Pharmacy Deans, requesting they forward the email invitation to physiotherapist and pharmacist prescribers.

Invitations to participate contained a brief study outline, participant information sheet and contact details (see appendices 8.16 and 8.17). Potential participants were invited to contact the lead researcher with questions and to express their interest in participation. Sample sizes for Delphi exercises vary, ranging from fewer than 10 to several hundred, with smaller numbers suitable for homogenous samples [204]. The current research sample was heterogenous since recruitment covered all healthcare sectors and levels of experience. As the number of qualified physiotherapist independent prescribers was unknown, a pragmatic target sample size of 30 for each profession was chosen. Recruitment was closed in October 2018.

4.2.3.1 Inclusion criteria:

Independent prescribing pharmacists or physiotherapists, who gained their prescribing qualification during or after 2013

4.2.3.2 Exclusion criteria:

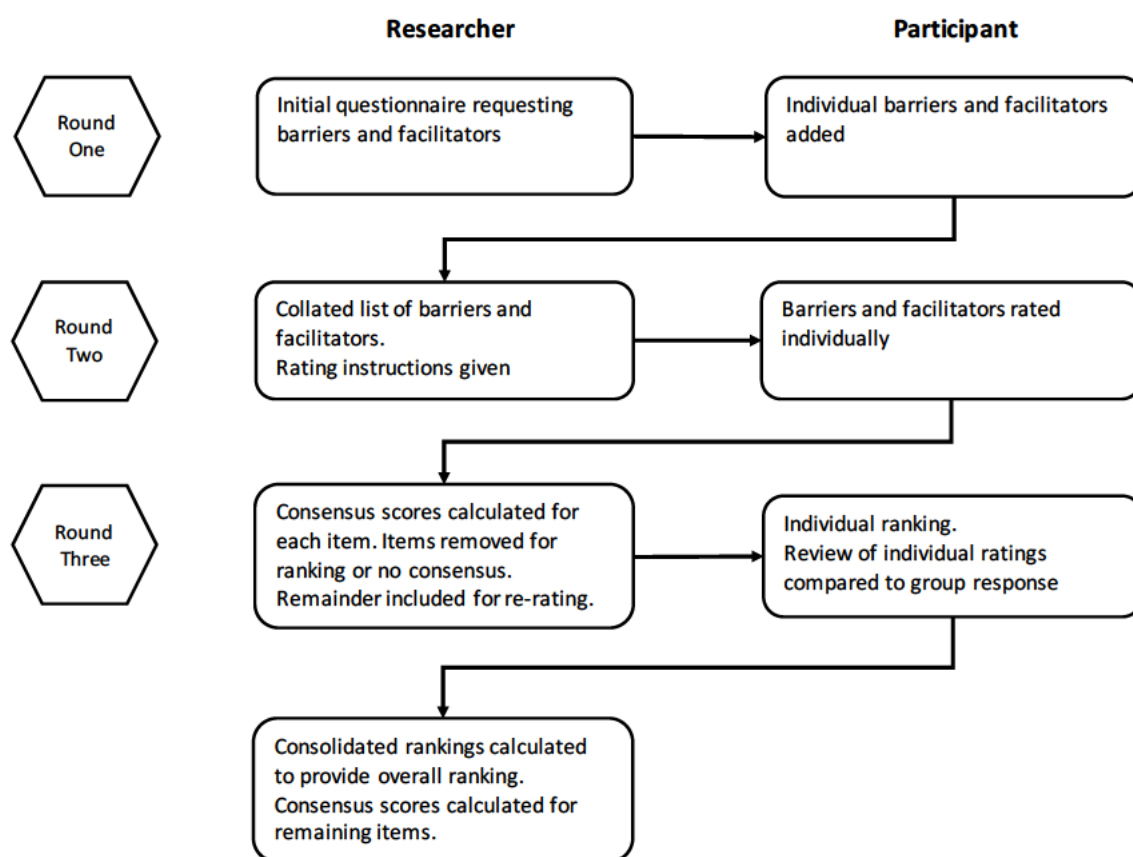
Supplementary prescribing pharmacists or physiotherapists

4.2.4 Overall Design

A three round Delphi was conducted, following the scheme in Figure 4-1. People responding positively to the invitation email were sent an email link to the first questionnaire. Subsequent questionnaires were sent to participants who responded to the previous questionnaire. Each round was open for one month, with non-respondents sent reminder emails at two and three

weeks to maximise the response rate [200, 206, 212, 215]. Regular emails regarding the progress of the exercise were sent to all participants to minimise response dropout; an acknowledged limitation of Delphi studies [212, 215]. The Round One questionnaire was piloted with nurse independent prescribers and the questionnaires for Rounds Two and Three were reviewed by the research group.

Figure 4-1 Delphi Scheme overview, detailing researcher and participant activities for each round



4.2.5 Procedure and analysis

4.2.5.1 Round One

The Round One questionnaire comprised three sections (Appendix 8.18). The first section included study information and a consent statement; participants could only proceed further if consent was agreed. The second section requested brief demographic data. The third section, using open ended questions, asked participants to provide at least three facilitators and/or barriers to prescribing that they had encountered.

Participants were provided with the following definitions to aid them:

'A facilitator is something that has helped, or made it easier, for you to practice as a prescriber.'

'A barrier is something that has prevented, or made it difficult, for you to practice as a prescriber.'

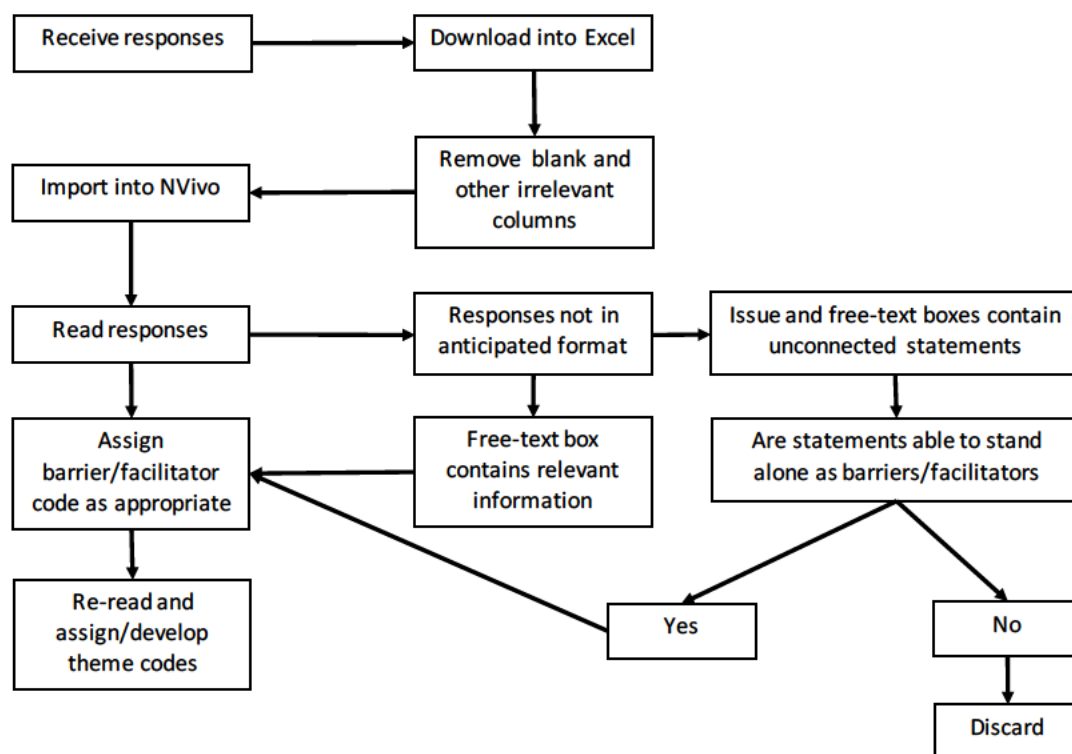
Participants were asked to state whether they considered the given issue to be a facilitator or a barrier, in case of ambiguity, and were able to add free-text if they wished to elaborate. Routing was used to expand the questionnaire if the participant wished to add more than four facilitators/barriers (Appendix 8.18, and Appendix 8.19- routing structure).

Proctor and Hunt [216] described the potential for the first round to generate a large quantity of information, which can be difficult to manage. However, to prevent a paucity of responses, some authors recommend requesting a minimum or set number of responses from each

participant [204, 217]. The decision was made to request a minimum of three responses, allowing participants to add further responses if they wished, with the aim of achieving a balance between highlighting all relevant issues and deterring participants by specifying a higher number of mandatory responses. Participants were able to comment on questionnaire design and content.

Demographic data were imported into SPSS (IBM® SPSS® Statistics 25) for descriptive statistics. The open responses, detailing barriers and facilitators, were exported into NVivo® 12 (QSR International) for content analysis [218-220]. The responses were reviewed and coded to identify recurrent themes and used to develop the Round Two questionnaire [204, 206, 221]. An algorithm was developed to describe the process of exporting responses, assigning codes and how to resolve responses that were not in the anticipated format, see Figure 4-2.

Figure 4-2 Algorithm highlighting the process for exporting and analysing the Delphi Round One responses



The final list of statements, following content analysis, was reviewed by JM, AR and EGC, and used to formulate the Round Two questionnaire. The original wording was used wherever possible, with only minor editing to clarify statements or to render them generic [206]. Where additions were made to clarify a statement, then the addition was enclosed in square brackets, for example:

'[Lack of] Funding for time spent prescribing'

(in this example the participant had described the statement as a barrier).

4.2.5.2 Round Two

The Round Two questionnaire comprising the tabulated statements was sent to all participants who had responded to Round One (Appendix 8.20). Participants were asked to rate the importance of the factors in each statement to their practice through a 5-point Likert scale [212, 222-224] and were able to add free-text comments throughout to explain their ratings. Anonymous rating data were exported from the online survey software into an Excel spreadsheet (Microsoft® Excel for Mac 16) and thence into SPSS (IBM® SPSS® Statistics 25).

Approaches to measuring consensus vary widely in the literature as demonstrated by the reviews by Diamond et al, and von der Gracht, which list numerous methods ranging from qualitative analysis to descriptive and inferential statistics [205, 225]. In general, studies use two or more tests to determine if consensus has been achieved; often a combination of percent agreement and a measure of central tendency with or without additional inferential statistics [204, 224, 226].

Percentage agreement, median and interquartile range (IQR) were calculated for each statement [204, 205, 212, 223]. The median and IQR were chosen as they are appropriate for ordinal scales such as Likert [198, 204, 205, 212]. Kendall's Coefficient of Concordance (W) was calculated as a measure of group response agreement and was chosen as a suitable non-parametric statistic [205, 217, 227]. Kendall's Coefficient of Concordance (W) results range from 0 (no agreement) to 1 (full agreement). The null hypothesis that there is no agreement is thus tested statistically. Diamond et al [225] argue that consensus definitions, both criteria and cut-off values, should be defined *a priori*. Values set for the *a priori* definitions (Table 4-3)

were arbitrary but similar to other Delphi studies [212, 223, 224, 226]. As with the choice of tests for consensus, there is no agreement on appropriate values, however Murphy et al comment that the more stringent the criteria, the blander the conclusions will be [198]. Keeney et al argue that the values should be appropriate for the issues under discussion [215]. The calculations were performed for the physiotherapist and pharmacist groups separately, as well as the combined group. Results of the descriptive statistics were compared with the *a priori* consensus criteria to determine which statements reached consensus, which statements met some but not all criteria and which statements met no criteria.

Table 4-3 A priori agreed consensus criteria for Delphi Round Two and Three

Test	Round Two	Round Three	Purpose of test
Percentage agreement	60	70	<i>Level of agreement</i>
Median	3.5	4	<i>Measure of central tendency</i>
Interquartile range	≤ 2	≤ 1	<i>Measure of dispersion</i>
Kendall's Coefficient of Concordance (W)	$P < 0.05$	$P < 0.05$	<i>Consensus</i>

4.2.5.3 Round Three

The Round Three questionnaire was derived following analysis of Round Two, using the decision criteria listed in Table 4-4. and was sent to all participants who had completed Round Two (Appendix 8.21). Participants received group median feedback on statements included for re-rating and were invited to review and amend their rating, using the same 0–5 Likert scale. Statements achieving consensus in Round Two were included separately, with participants asked to rank the ten most important to them, from one to ten.

Table 4-4 Decision tool for selecting ranking, re-rating or removal of the factors, for developing the Delphi Round Three questionnaire

Decision	Criteria
Included for ranking	Met all consensus criteria, for all participants and for individual professional groups
Included for re-rating	Met two consensus criteria and/or disagreement between groups (all participants, individual professional groups)
Removed from study	Met one or no consensus criteria, for all participants and for individual professional groups

Factors removed from the questionnaire were omitted from subsequent analysis. Whether or not statements should be removed or amended between rounds is debatable; Hasson states that removing statements may introduce bias in subsequent rounds but that this may be balanced by making questionnaires more manageable [206].

Consensus criteria analyses were calculated as described in Round Two. The number of comments received in Round Two and Round Three were compared, with a decrease in numbers supporting stability in participant responses [228]. The ranking data were exported into an Excel spreadsheet (Microsoft® Excel for Mac 16) and weighted sum ranks calculated, allowing ordering of statements (See Appendix 8.22 for worked example of the method used). Statements were ordered according to weighted rank, both for all participants and for each individual professional group. Kendall's Coefficient of Concordance (W) was calculated for the ranking results using SPSS as before. Results were reported for the whole participant group and for each professional group [205, 227].

4.2.6 Research governance and ethical considerations

The study was approved by the University of Birmingham's Science, Technology, Engineering and Mathematics Ethical Review Committee (application number: ERN_18-0602A) and all data were held securely in accordance with university guidance. The study is reported in accordance with the criteria proposed by Junger et al, in the absence of an agreed reporting structure for Delphi studies (Appendix 8.23) [229].

4.3 Results

4.3.1 Demographic data

Forty-nine participants expressed an interest in participating and received the Round One questionnaire. The Round One questionnaire was completed by 42 participants (n = 24 pharmacists, n = 18 physiotherapists). Participant demographic data is presented in The demographic data compared favourably with the proposed sample matrix except for primary care pharmacists. The intention had been to recruit between five and 20 participants, but only three were recruited.

Table 4-5. The majority of physiotherapists (11/18) had been qualified in their profession for ≥ 21 years, compared to pharmacists (6/24). Secondary care was the predominant practice area for recruited pharmacists (21/24), with physiotherapist practice areas distributed across all sectors. Physiotherapists were also more likely to have a secondary practice area (7/18) than pharmacists (1/24). More pharmacists were active prescribers (20/24) compared to physiotherapists (11/18). The demographic data compared favourably with the proposed

sample matrix except for primary care pharmacists. The intention had been to recruit between five and 20 participants, but only three were recruited.

Table 4-5 Delphi participant demographic data

Demographics		Pharmacists (n=24)		Physiotherapists (n=18)		Total (n=42)	
		n	%	n	%	n	%
Years qualified in profession	≤5	2	8.3	0	0	2	4.8
	6-10	7	29.2	1	5.5	8	19.0
	11-15	4	16.7	3	16.7	7	16.7
	16-20	5	20.8	3	16.7	8	19.0
	>21	6	25	11	61.1	17	40.5
Time qualified as independent prescriber	≤12 months	7	29.2	5	27.8	12	28.6
	>12 months	17	70.8	13	72.2	30	71.4
Home nation in which they qualified	England	23	95.8	18	100	41	97.6
	Scotland	1	4.2	0	0	1	2.4
	Wales	0	0	0	0	0	0
	Northern Ireland	0	0	0	0	0	0
Main practice area	Primary Care	3	12.5	5	27.8	8	19.0
	Secondary care	21	87.5	6	33.3	27	64.3
	Community	0	0	5	27.8	5	11.9
	Other	0	0	Private practice 1 Mental health services for older people 1	11.1	2	4.8
Secondary practice areas	Primary Care	0	0	1	5.5	1	2.4
	Secondary care	0	0	0	0	0	0
	Community	1	4.2	4	22.2	5	11.9
	Other	0	0	Private practice 1 Out-patients 1	11.1	2	4.8
Active prescriber	Yes	20	83.3	11	61.1	31	73.8
	No	4	16.7	7	38.9	11	26.2
Average number of prescriptions written per week*	<5	5	20.8	7	38.9	12	28.6
	6-15	7	29.2	3	16.7	10	23.8
	16-25	2	8.3	1	5.5	3	7.1
	26-35	3	12.5	0	0	3	7.1
	36-45	1	4.2	0	0	1	2.4
	>46	2	8.3	0	0	2	4.8
Type of practice§	Generalist	10	41.7	7	38.9	17	40.5
	Specialist	13	54.2	11	61.1	24	57.1
Specialities listed		Anticoagulation Antimicrobials Clinical research/cardiology Critical care Diabetes and Hypertension Heart Failure Infections Mental Health Nephrology Neuro-developmental disorders Osteoporosis Palliative care Respiratory Medicine		Critical care and respiratory MSK and pain Pain Management (n=2) Pain management and community acquired infections Persistent pain Respiratory Rheumatology Spinal orthopaedic services Stroke Stroke/Neurology			

* Percentage response calculated using total n for group, not just active prescribers

§ Not all participants responded to this question, therefore percentages do not add up to 100%

4.3.2 Response rate

The response rates at each stage, including after each reminder, are given in Table 4-6. The response rate decreased from an initial 85% response to the final overall response rate of 41%.

Table 4-6 Delphi response rates for each round

Stage	Invitations	Responses	Percentage response rate (n = 49)
Delphi Round One	49		
First reminder		26	53
Second reminder		39	79
End of Round One		42	85
Delphi Round Two	42		
First reminder		15	31
Second reminder		20	41
End of Round Two		31	63
Delphi Round Three	31		
First reminder		9	18
Second reminder		17	35
End of Round Three		20	41

The survey software enabled a breakdown to be made of progress through each page of the questionnaire, indicating where participants stopped completing the questionnaire. The breakdown for each questionnaire round is shown in Table 4-7.

Table 4-7 Progress through questionnaire pages for each Delphi round

Round	Pg. 1	Pg. 2	Pg. 3	Pg. 4	Pg. 5	Pg. 6	Pg. 7	Pg. 8	Pg. 9	Pg. 10	Pg. 11	Pg. 12	No. of Pg.'s in survey
One	0	0	0	2	0	0	0	0	0	0	1	42	12 (N.B. pg.'s 4-10 optional)
Two	0	3	4	0	31								5
Three	1	1	0	1	3	0	20						7

Consequently, three participants started, but didn't complete, the first questionnaire, seven participants the second questionnaire and six the third questionnaire. The dropouts for the second questionnaire occurred at page 2 and page 3 which asked participants to rate the facilitator and barrier statements. For the Round Three questionnaire, page 5, which asked participants to rank statements, incurred the most dropouts.

4.3.3 Round One results

The number of statements received from each participant ranged between three and seven, with 172 in total. Content analysis resulted in 24 major themes, (see Table 4-8).

Table 4-8 Identified themes following content analysis of Delphi Round One results

Theme	Description	Facilitator (n)	Barrier (n)
Alternative prescriber	As alternative to a doctor, or replaced by an alternative, possibly 'cheaper' model	2	3
Clinical skills	Clinical examination skills – acquisition or lack of.	1	2
Confidence	Personal confidence in skills	2	2
Employer	Support from Trust, department, manager etc	12	5
Funding	Funding to practice	0	5
Information sources	Access to information sources, use of information sources. Keeping up to date with new information.	3	2
Infrastructure	Access to clinic room, prescription pads etc.	2	2
Knowledge	Experience in prescribing area (or lack of). Specialist knowledge.	6	1
Legal Aspects	Prescribing legislation, indemnity, registration	4	9
Medical Records	Access to medical records - paper or electronic	3	5
Medical support	Medical support - GP/Consultant etc. Includes acceptance of role etc..	19	6
Nursing support	Relationship with nursing staff. Could be supportive or indicate lack of understanding of the role.	2	2
Patients	Patient experience and knowledge of NMP.	5	0
Peer support	Other colleagues and clinicians.	12	5
Post Course Support	Post course development including appraisals	3	2
Prescribing budget	Access to prescribing budget	1	1
Prescribing Course	Usefulness/appropriateness of course. Aspects relating to communication from the university during and following course completion.	0	3
Prescription review	Pharmacy review of prescriptions. Includes need for second pharmacist.	1	5
Role	Personal job role. Includes effect of change in role.	2	7
Role model	Acting as a role model. Being inspired by other role models.	2	0
Time	Time to prescribe, time free from other duties etc.	0	10
Ward round	Role and attendance on ward rounds. Attendance at MDT meeting.	1	2
Working environment	Totality of working environment, including protocols and policies guiding activity.	2	3
Minor themes	Competency, formulary, practice area, external drivers and working patterns	1	4

Following removal of duplicates, 127 statements were included in Round Two across the 24 themes (59 facilitators, 68 barriers). In many cases, participants elaborated on the statement

using a free-text facility. For example, participant Pharm17 listed 'effective personal development reviews' as a facilitator and expanded on it as follows:

'effective PDR enable (sic) to identify areas of development and opportunities for expansion of areas of practice' [Pharm17]

Likewise, Physio05 gave 'the Law' as a barrier, elaborating with:

'as a physio I am restricted to my prescribing. In most terms this is appropriate but it does cause me to have to go to a GP for a prescription that I may have been able to do myself' [Physio05]

Finally, participants were asked for any further general comments that they had; 24 had no further comments to make and 13 commented that the questionnaire was easy to complete.

Physio09 stated:

'very easy to complete and made me stop and reflect on the facilitators/barriers to my practice (which was good!)' [Physio09]

Two participants had expected more questions about their role, but one accepted that this was probably outside the research remit. Physio13 gave a lengthy response, highlighting their concern at the lack of understanding about physiotherapist prescribing:

'I think as a Physiotherapist we need more staff promotion about our extended roles. Other professions are often very good at promoting themselves with extended roles, perhaps that's the problem with AHPs with procuring funding for courses as a NMP or other MSc modules. Perhaps we should start in the universities with talks on injection, NMP ordering and reporting of x-rays and bloods. Consultant roles and leadership on rehabilitation ...ect (sic)' [Physio13]

4.3.4 Round Two results

Of participants completing Round One, n = 31 responded in Round Two. Kendall's W was calculated with the significance results indicating agreement between participants as a whole and for pharmacists and physiotherapists separately (Table 4-9).

Table 4-9 Kendall's Coefficient of Concordance (W) results for Delphi Round Two

Group	Population	N	Kendall's W	Chi-Square	df	Significance
All statements	Total group	31	.284	1110.893	126	<0.01
	Pharmacists	14	.393	692.609	126	<0.01
	Physiotherapists	17	.294	629.334	126	<0.01
Facilitator statements	Total group,	31	.234	420.712	58	<0.01
	Pharmacists,	14	.333	270.610	58	<0.01
	Physiotherapists	17	.230	226.642	58	<0.01
Barrier statements	Total group	31	.090	187.220	67	<0.01
	Pharmacists	14	.223	209.178	67	<0.01
	Physiotherapists	17	.151	171.609	67	<0.01

Twenty-nine statements reached consensus and included 28 facilitator and one barrier statement. Of the 40 statements not reaching the consensus criteria, 10 were facilitators and 30 barriers and were removed from further rounds as described in Table 4-4. The remaining statements were included for re-rating in Round Three. Full results are presented in Appendices 8.24 and 8.25.

Comments were received for most statements, with 300 received for facilitators (range 0–16 per statement), and 134 received for barriers (range 0–6 per statement). Comments included requests for more explanation (5% of all comments) or indicated that the statement was irrelevant to themselves or their practice (facilitator statements—30%, barrier statements—43%). No overriding or common themes were highlighted by the comments.

For example, the statement:

'My employer has provided the support for me to be able to go on the NMP course and then supported me once qualified'

received ten comments including:

"I was given time to spend in clinics and assisted with legalities when needed" [Pharm24]

"No support since qualification, my supervisor has left and I am on my own entirely, I have had to seek my own support from peers" [Physio20]

"Define the support measures provided." [Pharm17]

"without my manager support I would not have been able to have been given the time to show the specialties the role a prescribing pharmacist could play within the team." [Pharm08]

"I am very well supported but the ongoing review of my prescribing has been led by me and my colleagues as prescribers not the trust at all." [Physio05]

A general free-text question **"would you change the wording of any questions?"** was asked after each block of statements, and this generated 21 comments (19 from the facilitator statements and 2 from the barrier statements). Some were comments on the wording of the statements such as:

"Quite a few boxes are worded strangely" [Physio11]

Other comments stated that the statements were unclear, or the participant requested more explanation, for example:

"It is not clear whether the 'training time' means university time or it includes mandatory supervision sessions as well" [Physio19]

A few were more general remarks, rather than comments on statements, for example:

"I agree with statement re specialty, but I relate it to specialty in general. I don't see prescribing as a specialty but as a skill" [Physio04]

And some participants stated that statements are not relevant to their practice, for example,

"steroid questions very specific, didn't understand the point of these?" [Pharm07]

In reply to the question ***"are there any barriers/facilitators that are missing"*** four responses were received (relating to governance, funding, NMP leads and change in role), but without a common theme, indicating that all main themes had been captured.

The final question concerning completion of the questionnaire generated ten comments (of which two responses were *"no"*). The main foci were the length of the survey, the lack of relevance of some statements to the participant, the vagueness of some statements and the lack of a 'not applicable' option. Four participants stated they were unsure how to rate statements that were inapplicable to their practice, with some rating them as *"neutral"* and some as *"strongly disagree"*. The Round Three information was amended following these comments, with instructions to rate 'not applicable' statements as *"neutral"*.

4.3.5 Round Three results

Of the 31 participants receiving the Round Three questionnaire, 20 responded. No further statements reached consensus following re-rating (Appendices 8.26 and 8.27). Round Three Kendall's W is reported in Table 4-10, indicating agreement except for the facilitator statements from physiotherapists. Whilst the lack of agreement for facilitator statements from the physiotherapists influenced the total group result regarding facilitator statements, the total group result remained significant. Fewer comments were received, compared with Round Two, indicating stability within responses (30 for facilitators [range 0–4 per statement], 11 for barriers [range 0–1 per statement]). However, a small number of comments indicated a failure to understand the limitations imposed on selected professions. For example, a pharmacist responded to the statement: "Lack of medical cover at times means I cannot prescribe opioids" with:

"Why would this be an issue?" [Pharm12]

Table 4-10 Kendall's Coefficient of Concordance (W) results for Delphi Round Three re-rating of statements

Group	Population	N	Kendall's W	Chi-Square	df	Significance
All statements	Total group	20	.207	236.360	57	<0.01
	Pharmacists	10	.302	172.251	57	<0.01
	Physiotherapists	10	.306	174.689	57	<0.01
Facilitator statements	Total group,	20	.071	28.235	20	0.104
	Pharmacists,	10	.191	38.165	20	0.008
	Physiotherapists	10	.122	24.444	20	0.224
Barrier statements	Total group	20	.128	92.162	36	<0.01
	Pharmacists	10	.287	103.400	36	<0.01
	Physiotherapists	10	.231	83.039	36	<0.01

Table 4-11 reports Kendall's W for the ranking exercise and indicates agreement within groups ($p>0.05$). Table 4-12 lists the weighted rank sums, for all participants and each profession. The ranks for all participants are presented graphically in Figure 4-3 and for each profession in Figure 4-4. The highest ranked statement was common to all participants and to each profession:

*"Being able to prescribe to patients is more effective and really useful
working [in my area]"*

Table 4-11 Kendall's Coefficient of Concordance (W) for ranked statements from Delphi Round Three

Population	N	Kendall's W	Chi-Square	df	Significance
Total group	20	.132	73.812	28	<0.01
Pharmacists	10	.185	51.761	28	0.004
Physiotherapists	10	.168	47.014	28	0.014

Differences are noted when the top ten ranked statements from all participants are compared with either the pharmacist or physiotherapist groups. Statements made by the pharmacist group concur with the top ten statements from all participants, albeit in a different rank order. When the top ten statements for physiotherapists and all participants are compared, three statements differ. In the pharmacist top ten, all weighted sums for statements were ≥ 30 , however only the top five for physiotherapists were ≥ 30 . The weighted sums for remaining statements for physiotherapists were low, with tied ranks affecting 17 statements.

Five comments were received that indicated participants found the ranking section difficult to complete because of the way it was displayed on the computer screen, and 17 participants requested a copy of the results, which were provided.

Table 4-12 Weighted sums and ranks for statements – presented by all participants and each profession (ordered according to weighted sum for all participants)

Statements	All participants (n=20)		Pharmacists (n=10)		Physiotherapists (n=10)	
	Weighted sum	Rank	Weighted sum	Rank	Weighted sum	Rank
Being able to prescribe to patients is more effective and really useful working [in my area]	917	1	201	1	280	1
Having a speciality allows development of skills and knowledge	164	2	38	8	94	2
Direct contact with medical team caring for patient	160	3	95	2	17	14
Motivation to help the patients who will benefit with prescribing and cut care delay / duplication	157	4	90	3	13	16
Patient requirements. A need for patients to have streamlined care by being able to prescribe at the point of contact	139	5	36	9	39	4
Good relationship with consultants	128	6	46	5	30	5
Working as part of an MDT [multidisciplinary team] / interdisciplinary group	90	7	40	7	24	6
Personal confidence in specialism	88	8	45	6	21	9
Well supported by team and they allow me to prescribe for their patients	69	9	60	4	9	20
My knowledge of medication	62	10	34	10	24	6
Supportive nursing colleagues	54	11	5	24	43	3
Easy access to medication info	49	12	19	12	18	12
Clinical supervision with a [doctor] has massively helped me increase my confidence prescribing	44	13	14	17	16	15
My employer has provided the support for me to be able to go on the NMP course and then supported me once qualified	44	13	16	14	24	6
Forward thinking DMP [designated medical practitioner] who is keen to integrate different MDG [multidisciplinary group] professionals into the team	38	15	14	17	18	12
Lack of time to develop further prescribing skills	35	16	15	15	20	11
Supportive medical colleagues	32	17	3	25	21	9
Great antibiotic guidelines in this trust/area	27	18	20	11	7	23
Support from the employer/department for the role of non-medical prescribers	26	19	15	15	11	18
Doctors have been working [with] this [NMP] model	19	20	9	21	10	19
Management support enables funding and training time to qualify as a prescriber	19	20	10	20	9	20
Supportive working environment [with NMP] policies in place	18	22	12	19	6	24
Support from my line manager	17	23	17	13	0	28
The nature of the role facilitates prescribing practice as part of the overall review of patients	16	24	7	22	9	20
Supportive medical supervision / mentorship	13	25	0	28	13	16
Wide variety of options that you can offer patients to improve their experience	13	25	7	22	6	24
The law enables me to practice as an NMP	9	27	1	27	6	24
Support from other NMPs	4	28	0	28	4	27
Mentor already NMP - creates a positive environment for NMP	3	29	3	25	0	28

Figure 4-3 Ranked statements for all participants presented by weighted rank sum

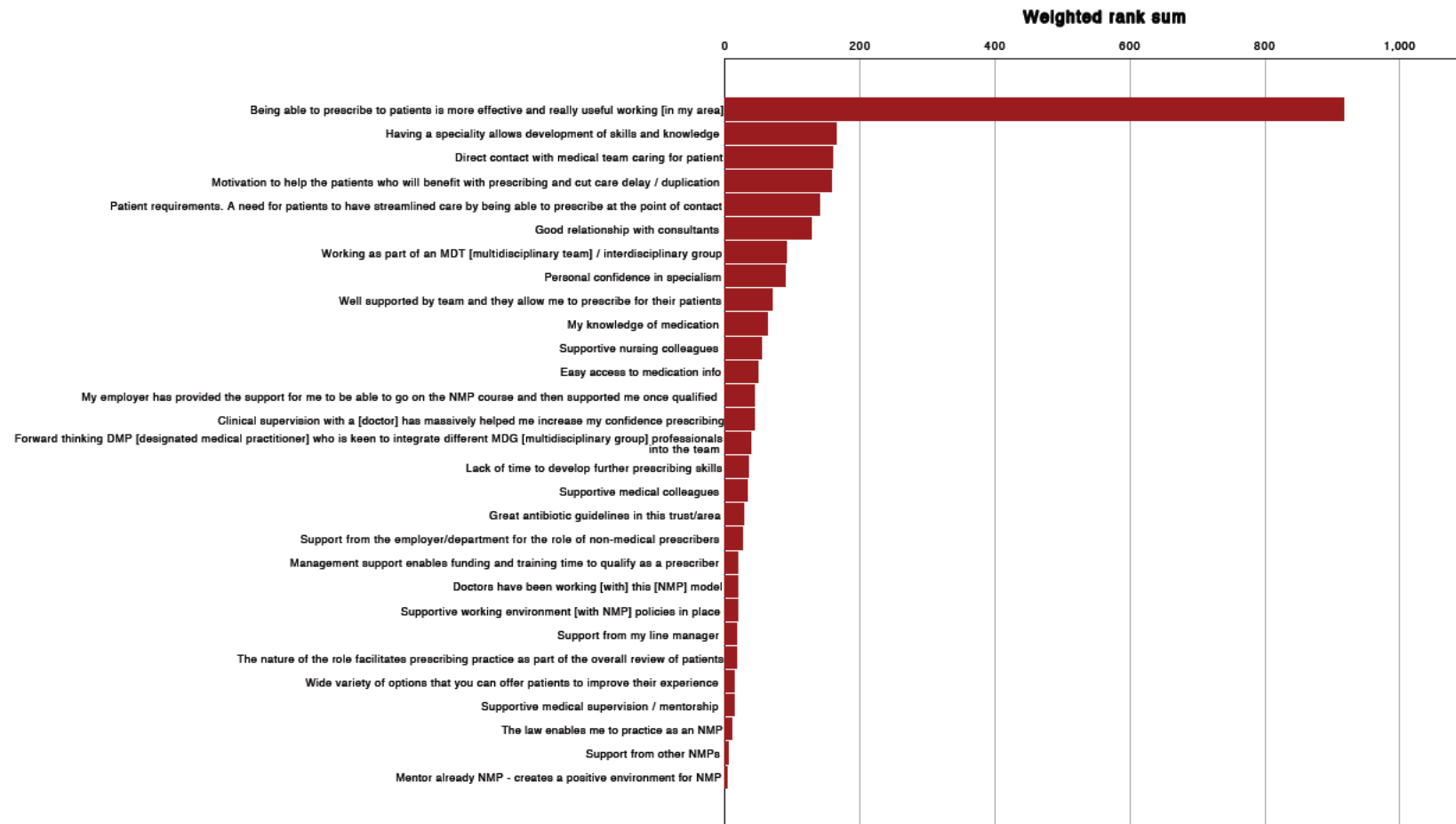
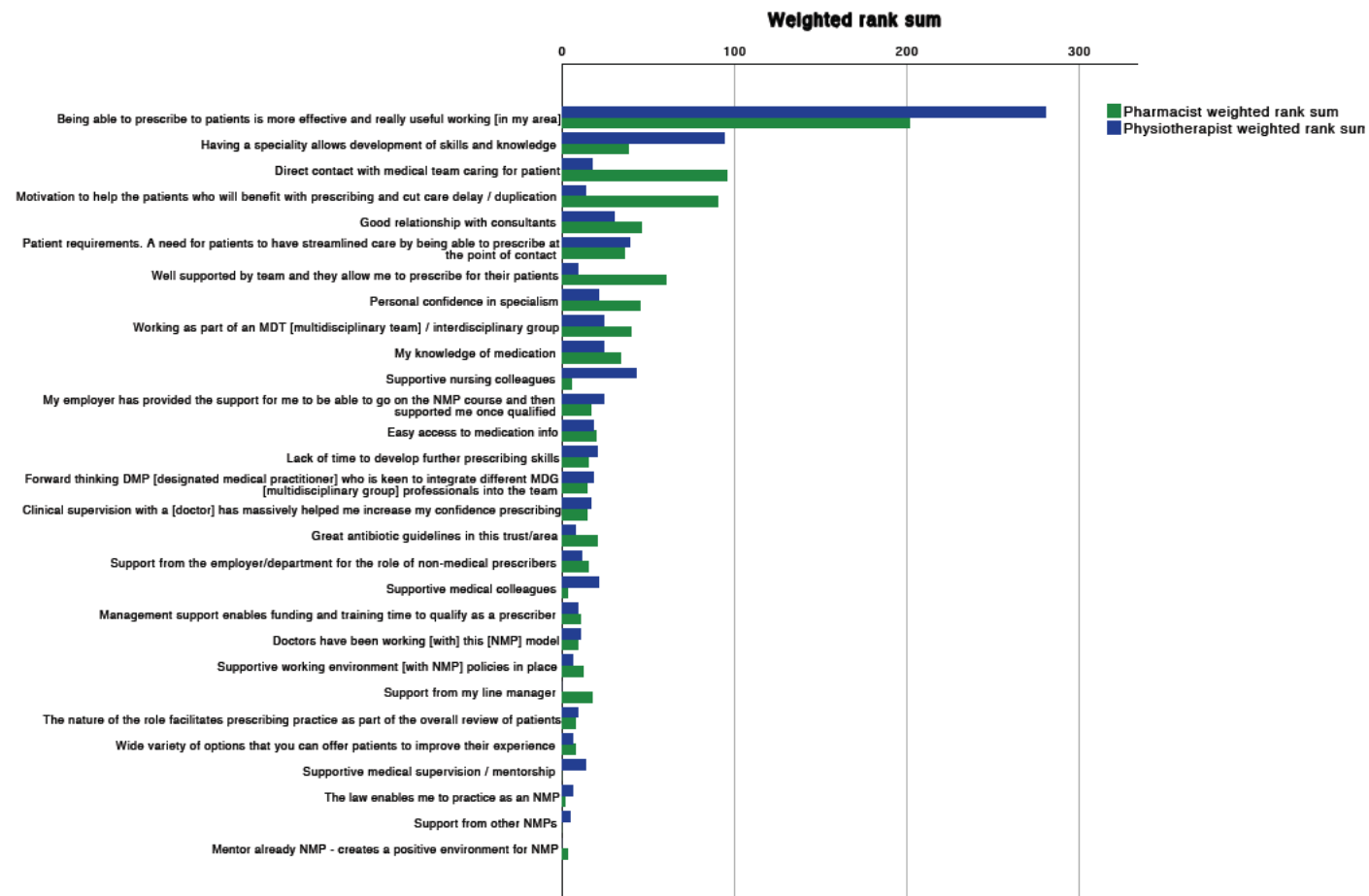


Figure 4-4 Ranked statements for professional groups presented by weighted rank sum



4.4 Discussion

This is the first study to identify the factors influencing the uptake and utilisation of prescribing by physiotherapists and pharmacists and to investigate if each profession perceived them similarly. A similar number of barriers and facilitators were identified in Round One. Following Round Two, consensus was obtained for 28/59 facilitator statements, but only 1/68 barrier statements, with no further consensus achieved after Round Three. It is striking that despite the greater initial number of barrier statements, only one achieved consensus. This suggests that most NMP barriers are specific to the post and person, whereas facilitators are generic.

4.4.1 Themes

Of the themes identified from content analysis, 13 had statements achieving consensus. “Medical professionals” was the most highly cited theme, reinforcing the importance of their support for NMP identified in the preceding literature review. A higher number of medical professional statements reached consensus (7/29) in Round Two compared with other themes. The numbers of statements relating to patient care (4/29) and employer (4/29) themes that achieved consensus were similar. Themes such as medical records and infrastructure highlighted in the preceding literature review were not associated with statements reaching consensus.

The ranking results emphasised the importance of prescribing to patient care, with the foremost statement overall concerning the effectiveness of prescribing for patients. Both professions highlighted the benefit of streamlining care for patients. Additionally, pharmacists

ranked highly the statement regarding motivation to help patients benefit from reduced delay and duplication, possibly driven by perceived secondary care hinderances in prescribing medication. Pharmacists and physiotherapists ranked practice related statements in their top ten statement ranking, highlighting the importance to their role. In particular, those related to the benefit of a specialist area in allowing the development of skills and knowledge and building confidence. Both professions ranked good working relationships with consultants in their top ten. Subtle differences in the manner in which pharmacists and physiotherapists practice were highlighted by the distribution of statements in the top ten. Pharmacists ranked the three statements mentioning teams in their top ten (direct contact with medical team, working as part of a multidisciplinary team and support from team) showing the importance of team working in their practice. In comparison the physiotherapist top ten highlighted the benefits of multidisciplinary teams but also supportive nursing and medical colleagues, suggesting a more independent mode of working. Only physiotherapists ranked an employer support statement in their top ten statement ranking, which may be driven by the newness of prescribing to physiotherapists and the need for employer support. In comparison, several pharmacists commented that they had changed employer since qualifying as an independent prescriber. Outside the top ten, the weighted rank sums for the remaining statements for both groups were low; rendering them inappropriate as discriminators. The only barrier reaching consensus concerned the lack of time to develop skills and was ranked 16th overall and outside the top ten for both pharmacists and physiotherapists, implying that while this was a concern, it was not a major deterrent to prescribing.

The difference in the number of barriers and facilitators gaining consensus is striking, but closer inspection of the Round One content analysis results, when considered in conjunction with the demographic data, may help to explain them.

Table 4-8 indicates that the distribution of the facilitator and barrier statements are very different, with facilitators clustered around three themes: 'Employer', 'Medical support', and 'Peer support', whereas the barrier statements are more evenly distributed. All prescribers will work with medical professionals and other colleagues, so these working relationships will be important, as will the relationship with their employer. In comparison a barrier such as legal limitations on controlled drug prescribing would be relevant for physiotherapists but the impact would also depend on their speciality. Hence the change in legal status of gabapentin and pregabalin affected pain physiotherapists, who are limited in their choice of controlled drugs they can prescribe [36], whereas this did not impact on pharmacists (regardless of speciality) and may have had less impact on physiotherapists working in specialities such as respiratory. Likewise, access to medical records may be limited in community practice, however most participants worked in primary and secondary care, where records are generally more accessible. Thus the barrier statements were less likely to reach consensus as they are dictated by profession and area of practice, as well as any other circumstances unique to the person and/or post.

4.4.2 Demographics

Equal numbers of pharmacists and physiotherapists completed Round Three, with potentially the same weighted rank sum, so it is surprising that the physiotherapist weighted rank sums

were relatively low compared with pharmacy results. This may be explained by the variety of physiotherapy practice areas and associated factors indicated by the participants. This compares to pharmacists who were primarily recruited from secondary care.

Initially more pharmacist than physiotherapist prescribers were recruited, reflecting both difficulty in accessing physiotherapist prescribers and differences in prescribing legislation dates [26, 56]. Physiotherapists were more likely to have been registered in their profession longer than pharmacists. This reflects previous early prescribing studies which suggested that more experienced professionals adopted prescribing initially after its introduction to their profession [48, 169, 230-232]. Recruited physiotherapists worked in several healthcare settings, whereas pharmacists were mainly from secondary care. Pharmacists were more inclined to be active prescribers, which may reflect how embedded pharmacist prescribing has become, although several comments indicated that pharmacists were now in roles that did not support prescribing.

The two professions were initially selected because of the difference in independent prescribing implementation stage, with pharmacists having a six-year potential advantage over physiotherapists. This time difference is most apparent when the participant demographics are reviewed, with physiotherapists tending to be both more experienced practitioners and less likely to be actively prescribing compared to pharmacists. However, when the ranked statements are reviewed the differences between the groups would appear to be more related to practice areas and mode of practice, than to prescribing implementation stage. The exception is the support from employers that the physiotherapist group ranked in their top ten, whereas for pharmacists this was not perceived to be as important an issue.

4.4.3 Delphi process

The relevance of the topic was indicated by the Round One response rate (85%), and the number of barriers and facilitators initially identified. Comments received for each round supported the high engagement level of the participants. Despite steps taken to minimise drop-out, the response rate decreased over the three rounds, with a final response rate representing 41% of the initial 49 participants. The survey software enabled the overall progress through each questionnaire to be reviewed, indicating the potential for questionnaire design and survey software constraints to contribute to the attrition. For Round Two, a balance was required between returning all the statements back to participants, risking disengagement if apparent repetition, and grouping similar statements as a single statement, risking introducing researcher bias [206, 227]. Consequently, the decision was made to only omit those where there was evident duplication. Supported by participant comments in Round Two, statements were removed from Round Three (as described earlier) rendering the questionnaire more manageable, whilst accepting the potential introduction of bias [206, 227]. The survey software constraints resulted in sub-optimal display for the ranking question, with participants commenting that selecting their top ten was challenging.

A small number of comments were received from pharmacist participants indicating they were unaware of prescribing constraints for some professions, or they had forgotten there were physiotherapy participants. Failure to understand these constraints is concerning as it indicates that pharmacists, responsible for dispensing prescriptions, are unfamiliar with prescribing regulations [233].

4.4.4 Strengths and limitations

This is the first study investigating and comparing prescribing barriers and facilitators in pharmacy and physiotherapy professions. The participants' level of engagement, emphasised by the Round One responses and free-text comments, highlight the relevance of the topic.

The recruitment strategy relied on self-identifying participants, potentially introducing bias as participants with strong views are more inclined to volunteer [206]. Accessing physiotherapist prescribers also proved difficult, with an initial imbalance in participant numbers. Participant fatigue and attrition are recognised Delphi limitations [212, 215] and this was evident, despite approaches to minimise attrition. Software limitations influenced questionnaire design, deterring participants from completing Round Two and Three, and affecting response rate.

4.5 Conclusions

This study set out to explore the factors (both facilitators and barriers) that affected pharmacist and physiotherapist prescribing, and to determine if there were differences between the two professional groups. Greater understanding of factors influencing NMP utilisation will aid successful implementation, and identifying if inter-professional differences exist would indicate that profession specific research into potential barriers and facilitators should be undertaken when considering granting prescribing rights to a profession. Initially similar numbers of facilitator and barrier statements were identified by participants, but only one barrier statement reached consensus, compared to 28 facilitator statements. Improving patient care and medical professionals' support appear to be the most important factors in

enabling NMP. In contrast the lack of time to develop prescribing skills was the only barrier to reach consensus. These results indicate that prescribing barriers are post and person specific, whereas facilitators are more likely to be generic. Differences in the ranking of facilitator statements were detected between pharmacy and physiotherapy, appearing to reflect the manner in which the two professions practice. In particular pharmacists favoured factors relating to team support whereas these were less important for physiotherapists who may work more independently. This intimates that factors identified in the preceding literature review may not be universally applicable to all NMP professions. Participants' opinions shape Delphi results and further research is required to determine the transferability of these results [203, 234].

4.6 Chapter summary

In this chapter a Delphi consensus technique was used to investigate barriers and facilitators experienced by two professional groups, pharmacists and physiotherapists. A representative sample of physiotherapists and pharmacists was recruited; with 20 participants completing the Delphi (10 pharmacists, 10 physiotherapists). Consensus was reached regarding 29 statements (28 facilitators, one barrier). Ranking of these statements by the participants revealed that the most important statement concerned the effectiveness of prescribing for patients. Review of the rankings by profession revealed apparent differences between the professions. This may reflect newness of prescribing to physiotherapists, or the wide range of practice areas that the recruited physiotherapists practised in, in comparison to the recruited pharmacist group.

4.7 Key points

- This is the first study to explore and compare barriers and facilitators to prescribing in the pharmacy and physiotherapy professions.
- Initial response rate was high, indicating the topic's relevance, with a final response rate of 41%, despite difficulties reported by participants in completing the final round.
- Consensus was reached for 29 statements, of which only one was a barrier.
- Participants ranked the statement relating to the effectiveness of prescribing for patients as the most important.
- Facilitators appeared generic, regardless of practice area, whereas barriers appear to be specific to post and person
- Differences were apparent between the two professions.

4.8 Introduction to next chapter

The Delphi Oracle was notorious for ambiguous prophecies, illustrated by the story of Croesus of Lydia who received the reply, when he consulted the Oracle, that if he went to war against Persia then a great empire would fall [235, 236]. The Lydians were duly beaten by the Persians and the Lydian Empire fell. Likewise, the Delphi technique could be deemed to produce ambiguous findings. The Delphi technique provides a representation of expert opinion, based on the participants knowledge and experiences at the time of the study [203]. The findings

from a Delphi technique should be interpreted in the light of other evidence and can be used to inform further research [234]. In the next chapter, focus group methodology is used to explore the Delphi findings in greater depth.

CHAPTER 5: EXPLORING THE BARRIERS AND FACILITATORS TO NON-MEDICAL PRESCRIBING EXPERIENCED BY PHARMACISTS AND PHYSIOTHERAPISTS, USING FOCUS GROUPS

Chapter overview

The results from Chapter 4 indicate that prescribing facilitators are mainly generic, compared with barriers which appeared specific to person and post. Differences between the physiotherapy and pharmacy professions were also apparent. In the present chapter, focus group methodology is used to explore these findings, using the lived experiences of pharmacist and physiotherapist prescribers, to understand how prescribers perceived the impact of outside influences on their practice.

The majority of this chapter is taken verbatim from the following publication in which I am principal author:

Graham-Clarke E, Rushton A, Marriott J. Exploring the barriers and facilitators to non-medical prescribing experienced by pharmacists and physiotherapists, using focus groups. BMC Health Serv Res. 2022;22(1):223.
Available from: <https://doi.org/10.1186/s12913-022-07559-5>

The introduction has been substantially reduced to avoid duplication, and an introductory sentence added to place the paper in context of the overall thesis. The introduction includes a short section (5.1.1) on the Covid-19 pandemic, which occurred whilst this portion of the research was being undertaken. For clarity and to provide more explanation the methods

section has been expanded, in particular section 5.2.2. The results, discussion and conclusions are taken verbatim from the paper. Other sections such as chapter summary and key points have been included but draw on information included in the paper. Minor changes to the narrative text have been made throughout to inform the thesis structure, and correct typographical and grammatical errors.

Details of authors' contributions (as acknowledged in the published paper):

EGC conceived the protocol, conducted the study, analysed the data, wrote the first draft, and edited the manuscript. JM and AR conceived the protocol, reviewed the data analysis, and edited the manuscript.

A copy of the published paper is included in Appendix 8.28, and the reviewers' comments (and author responses) in Appendix 8.29.

5.1 Introduction

The previous chapter described a three round Delphi study investigating facilitators and barriers to independent NMP, conducted with qualified independent prescribers from the physiotherapy and pharmacy professions [237]. Consensus was gained for one barrier and 28 facilitators, however, item ranking orders differed for the pharmacist and physiotherapist groups. This suggested that the facilitators and barriers to NMP differ depending on profession. However, it was possible that the differences arose from chance and did not accurately reflect experiences.

In this chapter, focus groups are used to further investigate the findings of the Delphi study: to further explore the barriers and facilitators to NMP experienced by pharmacist and physiotherapist prescribers. This would indicate how generalisable the Delphi study findings are to the wider pharmacist and physiotherapist prescribing populations. This research stage coincided with the Covid-19 pandemic (January 2020 onwards [238]), affecting study design, and impacting on recruitment of potential participants.

5.1.1 Covid-19 pandemic

At the end of December 2019, cases of viral pneumonia of unknown origin were reported in Wuhan, China [239]. By January 2020 the cause was identified as a novel coronavirus, later named SARS-CoV-2, and the resultant disease Covid-19 [239]. By March 2020 Covid-19 had spread sufficiently for the World Health Organisation (WHO) to declare a pandemic [239]. On March 23 2020, the UK went into the first lockdown as hospital and critical care cases started

to rise [238, 240]. Vulnerable people were advised to shield by staying at home and only essential work permitted [238]. The full lockdown was eased in England from June 2020, with a further four-week lockdown occurring in November 2020 [238]. This was followed by another national lockdown in January 2021 [238, 240].

Many healthcare workers were redeployed to assist in areas such as critical care, Nightingale hospitals (large scale, dedicated, rapidly built healthcare facilities) and vaccination centres [241, 242]. Some healthcare workers were amongst those advised to shield and worked from home or were furloughed [238]. Most healthcare workers, and the wider UK population, had to adapt to new modes of working, for example remote working and online meetings.

5.1.2 Research objective

To use focus group methodology with pharmacist and physiotherapist independent prescribers to further explore the lived experiences of NMP by pharmacists and physiotherapists.

5.2 Methods

5.2.1 Research team and reflexivity

EGC, JM and AR developed the study protocol and topic guide and EGC conducted the focus groups. EGC is a doctoral student, researching influences affecting NMP utilisation and inter-professional differences. The research question was prompted by her activity as an independent pharmacist prescriber, and her role as NMP lead for an acute NHS Trust in the

Midlands. Her researcher standpoint is balanced by the other two researchers, neither of whom is a prescriber, but who have extensive research experience and represent the pharmacy and physiotherapy professions.

EGC acted as the contact point for participants during recruitment. Participants were made aware of the background to the research via the participant information sheet, issued at the time of recruitment, and this information was reinforced at the start of each focus group.

5.2.2 Study Design

The study design and analytical approach were guided by the principles of Interpretative Phenomenology Analysis (IPA) [243]. IPA acknowledges that the lived experience of each participant reflects their world view, and that interpretation is affected by the researcher's own experiences. This study sought to understand how non-medical prescribers perceived their practice was affected by outside influences, whether procedural or people. Each participant will have had different formative experiences, shaping their view of NMP, and IPA will aid in interpretation of this, whilst recognising the potential influence of the lead researcher.

Focus groups enable discussion between participants on selected specific topics. The discussion and interaction between the participants allow ideas and views to be developed and refined, and thus provide a deeper understanding of the issues being considered [244, 245]. There is also the potential for unanticipated ideas to be expressed, supporting further understanding of the research topic [245]. Research indicates that 80% of ideas are generated

within the first two or three focus groups, and these comprise the most frequently mentioned themes [246, 247]. Furthermore, Hennink describes focussed research questions requiring fewer focus groups to generate ideas than research questions where the issues are unknown [248]. A pragmatic approach to the groups was adopted, balancing available resources and the level of information anticipated from the closely defined topic guide [248]. Two focus groups were planned, using the 'Zoom' virtual platform (Zoom.us), hosted by the University of Birmingham. Each group was led by a moderator (EGC) and the conversation was audio recorded digitally, using the virtual platform record feature, and handwritten fieldnotes were taken. Each focus group followed a similar format of introduction, main discussion and closing stage, and followed an *a priori* developed topic guide [244, 249-251].

The topic guide was drafted by EGC, using the previous Delphi results as a guide, and debated within the research group to ensure that the guide was clear, followed a logical progression and was appropriate for the aim of the study (appendix 8.30). To allow sufficient time for the group to fully discuss each topic, the number of topics for discussion was limited [252]. An initial, broad, topic was used to open the discussion [251, 252]. This was followed by further, more specific, topics to probe the research area in greater depth. Each topic was introduced using neutral and nondirective language, with follow-up questions and prompts for probing included in the discussion guide [251, 252]. Topics were selected where there was apparent disagreement, shown by the Delphi results, between the professions. A final general 'wind down' topic asked participants what advice they would give to new non-medical prescribers to enable them to utilise their new qualification [251]. The discussion was summarised after

each topic and at the end of each focus group, enabling participants to comment and correct any misinterpretation.

5.2.3 Choice of setting

Focus groups are conventionally run face-to-face, using a location suitable for researchers and participants. However, to reduce transmission of Covid-19, people were advised to physically distance themselves, to meet outdoors rather than inside and to wear face masks [253], making physical meetings difficult to conduct. Virtual focus groups have been previously reported, with researchers using a variety of techniques such as message boards and video conferencing, with cost of equipment (e.g., webcams) and programmes listed as potential disadvantages [254, 255]. The restrictions imposed to limit the spread of Covid-19 accelerated the widespread adoption of virtual meeting platforms such Zoom® for both work and social uses. Indeed, many participants in this study described the benefits of online meetings, indicating that many of the earlier challenges with virtual platforms, such as equipment availability, had been overcome. Table 5-1 lists potential advantages and disadvantages of physical (under Covid-19 restrictions) and virtual meetings. The assessment was made that, with the ongoing pandemic associated restrictions, the virtual platform was the most appropriate technique to enable the focus groups to be conducted.

Table 5-1 Comparison of potential advantages and disadvantages of physical (under Covid-19 restrictions) and virtual meetings for focus groups

	Physical meeting, under Covid-19 restrictions	Virtual meeting
Advantages	<ul style="list-style-type: none"> • No special equipment required e.g., cameras • Conversation and discussion can flow easily • No specialist knowledge (e.g., computer literacy) required 	<ul style="list-style-type: none"> • No travel required; participants may be able to join who would otherwise be time restricted. • Virtual platform includes record function • Face masks may not be required, dependent on participant's location • Participants can join from any suitable location
Disadvantages	<ul style="list-style-type: none"> • Large room required to enable social distancing • Face masks need to be worn, hiding facial expressions • Recording equipment required • Travel, and travel time, required to attend meeting location 	<ul style="list-style-type: none"> • Only one person can speak at once, potentially stiling conversation • Depends on internet connectivity • Requires computer or smartphone or similar, with audio and camera • Participants required to have basic computer literacy

5.2.4 Participants and recruitment

Participants for the focus groups included independent prescribing pharmacists or physiotherapists working in primary or secondary care in the West Midlands region. No easily accessible list for pharmacist and physiotherapist independent prescribers was available and therefore participants were recruited indirectly using groups such as the United Kingdom Clinical Pharmacy Association and West Midlands NMP leads. An email, including study details, participant information sheet, screening questionnaire and contact email address, was sent to these groups and recipients were requested to forward the email to potential participants (see appendices 8.31, 8.32 and 8.33).

The number of qualified independent pharmacist and physiotherapist prescribers in the West Midlands region is unknown, as this information is recorded by individual healthcare providers, and not centrally. Therefore, the intention was to recruit ten prescribing pharmacists and ten prescribing physiotherapists, allowing for non-attendees, but providing sufficient participants for a meaningful discussion [244, 248, 256]. The literature on focus groups recommends a group size of 6-8 participants, with recommendations to over recruit by approximately 20% in case of non-attendance [244, 248, 256]. Participants were required to have obtained their prescribing qualification since the beginning of 2013 (when physiotherapists gained independent prescribing rights [56]), and the final selection was guided by the sample matrix in Table 5-2.

Table 5-2 Target sample matrix for focus group participants

Criteria	Pharmacist	Physiotherapist	Years of professional practice	
Profession	10	10		
Length of time qualified as a prescriber:			≤5	0-5
≥12 months	1-6	1-6	6-10	0-5
<12 months	1-6	1-6	11-15	0-5
Main practice area:			16-20	0-5
Primary Care	1-6	1-6	>21	0-5
Secondary care	1-6	1-6		

Participants were asked to sign and return a consent form, including consent to record the focus group, prior to the focus group being conducted (appendix 8.34). Recruitment was closed in October 2020.

5.2.5 Ethical considerations

Ethical approval for the study was obtained from the University of Birmingham's Science, Technology, Engineering and Mathematics Ethical Review Committee (ERN_19-1900) and all

data were held securely in accordance with university policy. Participation was voluntary and participants were free to withdraw at any time, however they were made aware that if they had already participated in the discussion, then it would not be possible to remove their contribution. All participants gave written consent, including for digital audio recording, prior to the focus group. All recordings were transcribed verbatim and anonymised to ensure that participants, locations, or other identifiable information were removed, and participants were assigned an identification code.

5.2.6 Data analysis

Digital transcripts of each conversation were produced by the virtual platform, and these were checked for accuracy, corrected, and verified by EGC. This process required repeated listening to the recording, hence ensuring all information was captured accurately, and permitting immersion in the data. Following transcription, data were imported into NVivo® 12 (QSR International) for thematic analysis [220, 244, 257]. The transcript for Focus Group One was read and reread to identify emergent themes and patterns, and coded line by line, with new codes created as themes emerged. The process was repeated for Focus Group Two, with further themes added as they emerged. Coding was an iterative process, with repeat reviewing of the coded data to ensure consistency and initial thoughts on the findings recorded using the NVivo memo function. Finally, the themes were reviewed and consolidated where appropriate. A codebook was produced to support the coding process. Data was visualised using a concept map of the major and minor themes and interdependencies, and a sunburst graph which depicted the frequency that themes were mentioned. Quotations

illustrating each theme were presented as a table (Table 5-4). The initial coding was performed by EGC, and the themes and hierarchy were discussed critically by the research team.

The study is reported in accordance with the COREQ statement (appendix 8.35) [148].

5.3 Results

Eighteen participants initially expressed an interest in participating in the focus groups. The recruitment window was extended, and further invitation emails sent to encourage further interest in participation, but the response remained low. The decision was taken to conduct the focus groups with the existing pool of potential participants, rather than risk a high dropout rate as participants were called to care for Covid-19 patients. Even with this approach, five potential participants who had previously expressed an interest failed to respond to the focus groups emails. A further three participants were excluded: two were ineligible, and dates were unsuitable for one, leaving ten participants. Three participants participated in Focus Group One and seven participated in Focus Group Two. Brief demographic data are included in Table 5-3. Focus Group One was held on 23 November 2020 in the evening and Focus Group Two on 3 December 2020 during the day, each lasting just over one hour.

Table 5-3 Focus group brief participant demographic data

Participant ID	Profession	Practice area	Years qualified in profession	Active prescriber	Focus Group
FG1-P1	Pharmacist	Ward, secondary care	16-20	Yes	One
FG1-P2	Pharmacist	Clinic, secondary care	16-20	Yes	One
FG1-P3	Pharmacist	Ward, secondary care	6-10	Yes	One
FG2-P1	Physiotherapist	Clinic, primary care	16-20	Yes	Two
FG2-P2	Pharmacist	Clinic, secondary care	6-10	Yes	Two
FG2-P3	Physiotherapist	Ward, secondary care	16-20	No, temporarily stopped	Two
FG2-P4	Pharmacist	Ward, secondary care	16-20	Yes	Two
FG2-P5	Physiotherapist	Clinic, primary care	>21	Yes	Two
FG2-P6	Pharmacist	Clinic, secondary care	11-15	Yes	Two
FG2-P7	Pharmacist	Ward, secondary care	11-15	No, never prescribed	Two

Initial coding was reviewed by EGC by reading the results for each node coded and the matrix tool in NVivo utilised to check that coding was appropriate. A concept map of themes was derived by EGC following coding of the transcripts, and the map and derived themes were debated by EGC, AR and JM to ensure they reflected participants views. After further discussion, the hierarchy and concept map were re-drawn to reflect the lived experiences of the participants more accurately. For example the original hierarchy did not contain a 'self' theme and hence 'personal competence' was grouped under 'governance' instead. However, as this quote highlights, 'personal competence' is derived from the participant's views and feelings, not externally driven:

'...as long as it's, it's, something that, you know, you feel comfortable within your competence, because I think that's where sometimes, some of my colleagues have got more experience in sexual health, whereas I haven't so it might be something that I'll say 'I'm not comfortable. I would refer you to this service'...' [FG1-P2]

Obsolete or duplicate codes were also removed, for example the original codebook included an 'advisory role' code, but on review the 'team role' code was deemed to be more appropriate.

Thematic analysis identified five themes each comprising several subthemes. Figure 5-1 depicts the themes as a sunburst chart and Figure 5-2 is a concept map depicting the hierarchy and interrelationships between themes and subthemes. Table 5-4 lists the themes and sub themes, their code book descriptions, and illustrative quotes from the participants.

Figure 5-1 Sunburst chart depicting the themes and subthemes derived from the focus groups, and their relative importance (The size of each segment reflects the number of references to the item, and hence the relative importance of the topic to the participants. The inner ring contains the themes, with subthemes radiating out.)

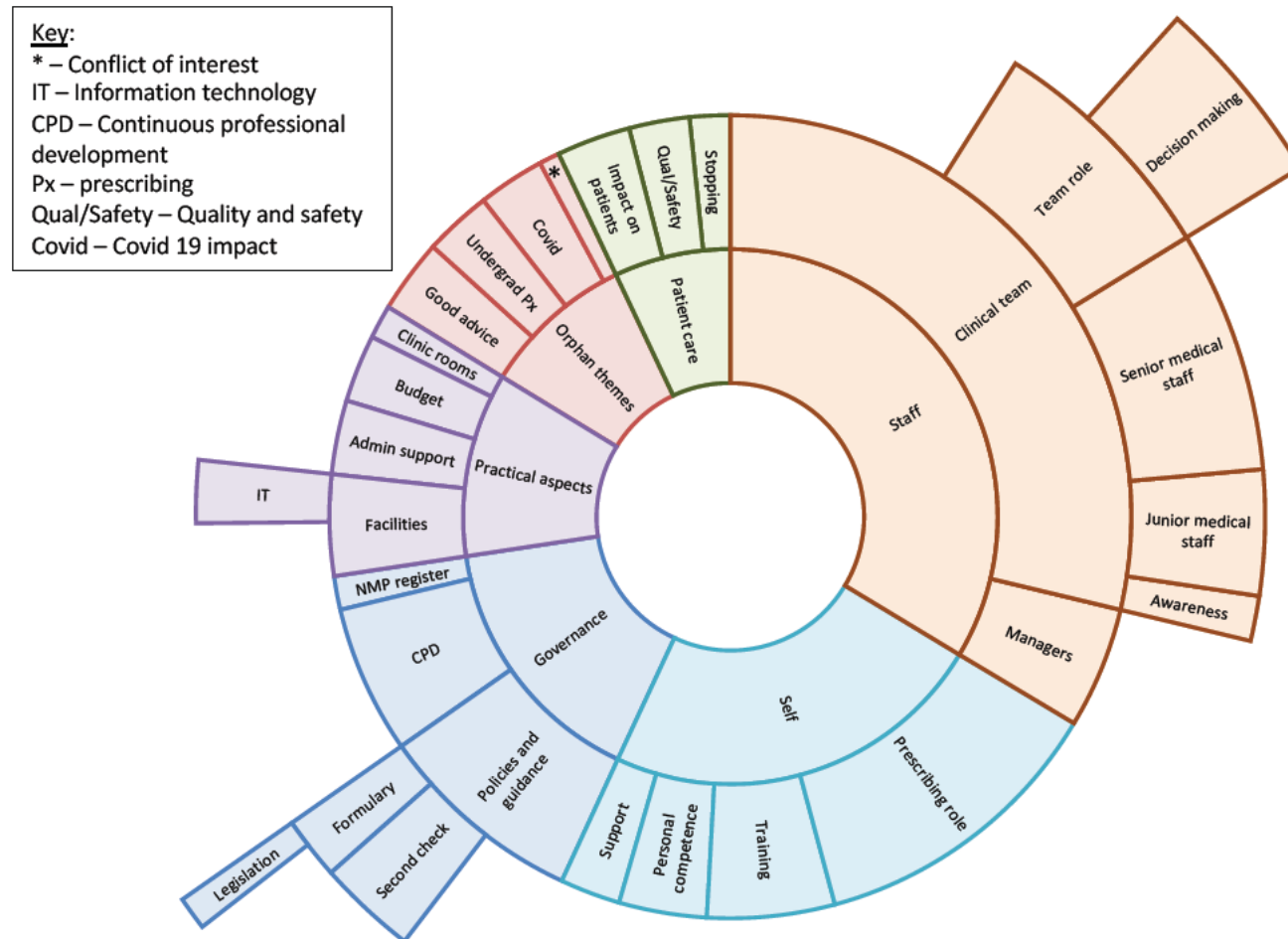


Figure 5-2 Concept map of hierarchical structure depicting interrelationship between themes and sub themes derived from the focus groups

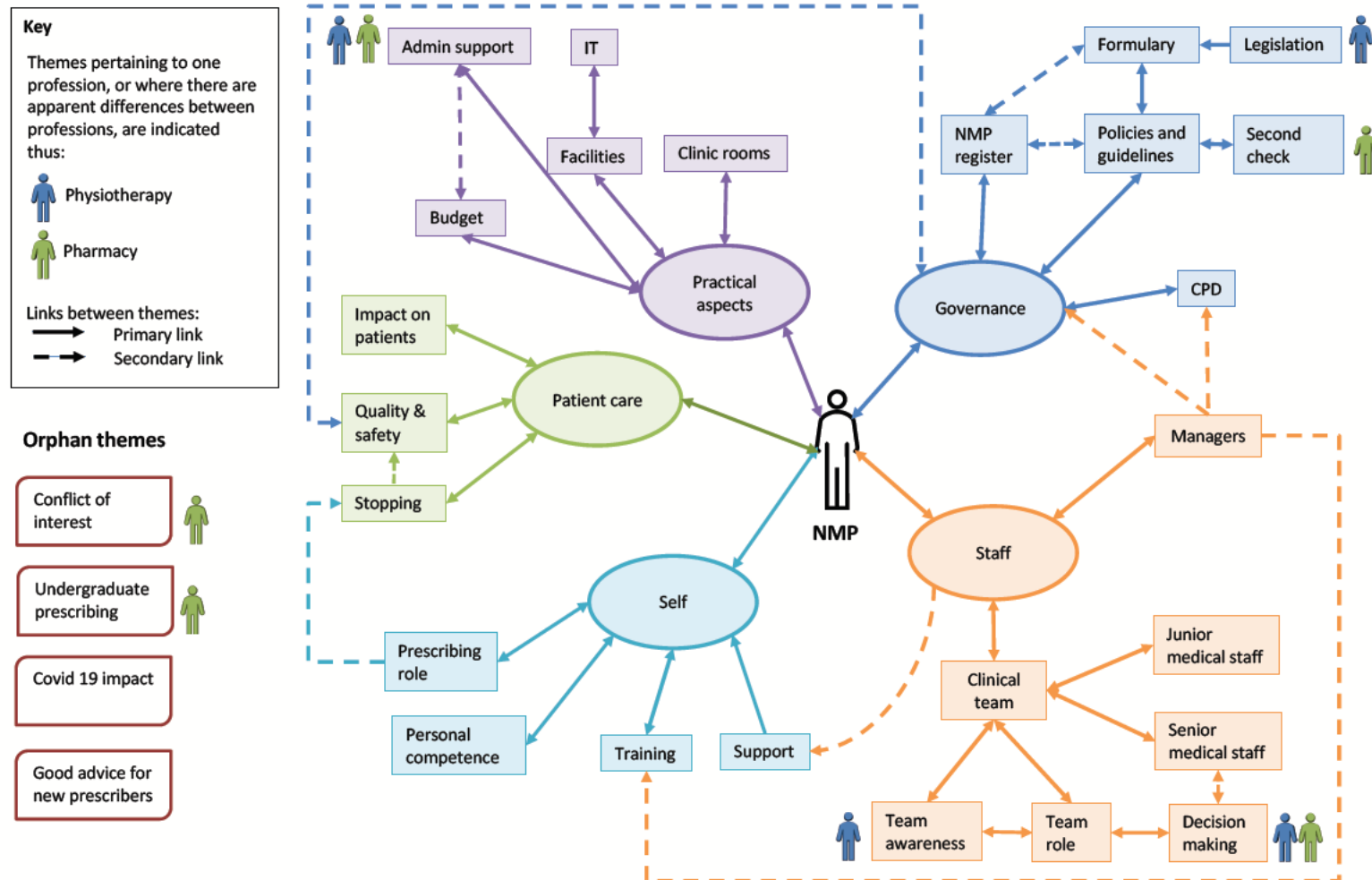


Table 5-4 Code book description of themes and sub themes, with illustrative quotes

Name	Description/Code book entry	Illustrative quotes
Staff	Overarching theme bringing all staff related themes together	
Clinical team	Prescribing within, or supported by, multidisciplinary team. Degree of integration into the team. Team or autonomous working.	<p>"I say that because I work in a really small MDT and I, and I work with consultants that because we're such a small team It's all first name terms, we can easily kind of have a dialogue and get hold of each other..." [FG1-P2]</p> <p>"I think, for us being able to prescribe has kind of made me more part of the medical team. Yeah, because they kind of see me as more similar to them. So, they've sort of accepted me a little bit more, if that makes sense?" [FG2-P3]</p> <p>"I sometimes feel like I'm not fully part of any one team because I sort of dip in and out of different teams." [FG2-P4]</p> <p>"Um, for me, because we mostly work on our own and autonomously, a lot of the decisions fall with just myself with prescribing unless there is an issue, and then I would refer, would ask for advice from our specialist that we have meetings with every week." [FG2-P1]</p>
Junior medical staff	Working relationships with junior medical staff. Impact on junior medical staff workload. Potential for deskilling junior medical staff by prescribing. INMP teaching junior medical staff.	<p>"...so it is actually taking a lot of workload out of that system for the junior staff particularly so they can focus on things I can't do like bloods..." [FG1-P3]</p> <p>"I think the junior medics appreciate having a specific point of call. I, like, during the day I get often get bleeps and queries from all over the hospital about 'oh I've got this patient on this and we want to switch them to this for discharge.'" [FG2-P2]</p> <p>"...the junior doctors accept that it's normal to have an ACP, and they prescribe, and it's normal that they're from a variety of backgrounds, because that's what they've been exposed to." [FG2-P3]</p>
Senior medical staff	Working relationships with senior medical staff. Building trust between INMP and consultants. Constructive discussions with senior medical staff. Consultant concern regarding accountability.	<p>"The only thing I was gonna say is some of the consultants, particularly those when they're sort of new to having an ACP around still feel that they are responsible and accountable for what you do." [FG2-P3]</p> <p>"I think there is a shift now of um understanding as sort of more junior consultants have come through. Um, it's fine now, but I think this is, I mean, this has been happening over several years now. Now it's, it's much more accepted that physios don't just do exercises or patting on the back. (laughs)" [FG2-P1]</p> <p>"And I think the consultants probably work with me in a slightly different way. They tend to ask if they've got more complex queries or areas where there's less evidence for kind of my interpretation of it, and that tends to be more of a discussion" [FG2-P2]</p>

Team awareness	Team awareness of prescribing role, or lack of awareness.	<p>"But as for junior doctors, I'm not even sure if they know that I'm a prescriber because I suppose I don't go around saying 'I'm a prescriber'." [FG2-P4]</p> <p>"...my, my colleagues, that I've been working with for many years, have gone through that process with me because obviously they've been my supervisors and stuff, so, um yeah, it's kind of more the not, not the inexperienced but the ones that haven't been part of the team that are unaware of that." [FG2-P5]</p>
Team role	INMP role within the team. Includes team interest in prescribing or lack of, and the effect on the INMP workload and role. Also, is the team in a better position to prescribe than INMP or are INMP's non-prescribing skills utilised more than prescribing.	<p>"I feel like I'm very much part of the team and they recognize my area of expertise and things like that (nods from FG2-P6). So, I think I feel like we work like well together. And it's, it's a really good job. I wouldn't want to give it to someone else!" [FG2-P2]</p> <p>"So, I work with consultants, with clinical specialist nurses as well and psychologists. ... So, you know, I don't think it's imperative for my role that I needed to, I need to prescribe. I need to have an understanding, though, of the, of the drugs because I work with, you know, other members that can prescribe. I suppose my skills are elsewhere." [FG2-P5]</p> <p>"I sometimes feel amongst, that certainly some of the doctor teams, I work with, it's, it feels the opposite, and they very much want to palm off work. ... So, I haven't left on time for a long time ... a large part of that is because I'm constantly being stopped by nurses that now know I'm a prescriber and want me to write things up." [FG1-P3]</p>
Decision making	Who makes the initial prescribing decision - INMP or medical team? Does the INMP make full use of their taught skills or not? Outcome dependant on role within the team, and medical staff attitude.	<p>"So, I think they're finding it useful to have like an extra prescriber who's physically there, who can, if he says, 'I want to increase this dose', I can physically do the writing of that on the chart. Yes, I think, I mean in psychiatry it's usually the consultant who makes a decision about which medication to use, but they're quite open to discussion about that and tweaking things." [FG2-P4]</p> <p>"The thought I want to throw in is do you, do you sometimes feel though as if you are... do you feel sometimes you just seen as the person just doing the writing of the prescription rather than doing the decision making of the prescription or, or is that ... is that accepted now so that we can make the full decision process?" [FG1-P1]</p> <p>"No, I'd say, I don't really find that find that I feel like I'm just kind of writing out somebody else instructions, either. so, any new antiretroviral it's always a very sort of team led decision." [FG1-P2]</p>
Managers	Impact on INMP. Support for INMP and INMP role and understanding of INMP role. Differences highlighted between prescribing and non-prescribing managers. Links with 'CPD', 'Training' and 'Governance' themes.	<p>"...my line manager is, had completed the prescribing course before me. So was very well versed in what it involved and what it could, how it could enhance my role and then has put me in a, in a position to use it in a really effective way." [FG1-P3]</p> <p>"Yeah, I was gonna say so my line manager is nonclinical. They are from management background, so they have no real understanding of the role when they started. So, it was an explanation of the role and what it meant. Um, so they have quite limited understanding about the issues that might be involved." [FG2-P3]</p> <p>"...because often like quite a few people have said your actual line manager doesn't have an understanding of what you might be doing clinically or the risks you might be taking." [FG2-P2]</p> <p>"So, the new one, I think she's just happy that she's got a prescriber, because I was a first pharmacist prescriber in the team. ... she's always kind of offering me out to people, and 'oh, FG2-P4 can come and do some clinics.' But I think it's, I don't know if she understands the logistics and sort of how it'd be." [FG2-P4]</p>

Self	Overarching theme containing themes relating to the NMP themselves, their views and practice.	
Personal competence	Personal competence around prescribing. When they refer on to someone else and which areas the INMP is comfortable to prescribe in.	<p>"Okay, yeah, I would just say I suppose know what your specialist area is. it's not that you can't ever prescribe off your, your limited formulary. But know what your limits are because I think I know people go, oh I've got to get a doctor to need to sign this, can you just sign this and you think well no, that's not what I'm here to do." [FG2-P4]</p> <p>"I just want to say I don't always necessarily agree with the prescribing of the consultants So, I tend to, I wouldn't prescribe that myself and I wouldn't rewrite that because then it's got my signature on it. I'll certainly prescribe what I'm happy with prescribing." [FG2-P4]</p> <p>"...some of my colleagues have got more experience in sexual health, whereas I haven't so it might be something that I'll say 'I'm not comfortable. I would refer you to this service'" [FG1-P2]</p>
Prescribing Role	Role that prescribing plays within the job. Whether or not prescribing is an essential part of role. For existing jobs, who covers aspects of the existing role. Blurring, or clarity, between INMP and professional role aspects. Links with 'Stopping' theme.	<p>"...but I've never thought as a prescriber that I've ever been given that allocation of time to make sure that, you know, you can function in the role when you're doing clinics." [FG2-P6]</p> <p>"I think it's probably easier, like my role was a new role and the expectation from the medical side was that this person would prescribe, whereas I think it's maybe slightly harder if you've got an existing role and then do it, because then you need to create the time to do it and some other part of your job has to go somewhere or to someone else, ..." [FG2-P2]</p> <p>"So, you know, I don't think it's imperative for my role that I needed to, I need to prescribe." [FG2-P5]</p> <p>"you know, we've taken on that role and, er, and, and, particularly sort of with more some more clinical competencies coming along we're properly taking on newer roles' um, but we need to make sure that, then the sort of traditional roles are either filled or taken up" [FG1-P1]</p>
Support	Who, or when, to ask for help. Support from different areas and people. Use of networks for support. Links with 'Staff' theme.	<p>"...so I asked to have a professional kind of supervisor in a way, that I could go to if there were any issues and to make sure that I sort of safety netted myself..." [FG2-P3]</p> <p>"...so if I see a patient that's more complex or slightly unusual, that doesn't fit the usual pattern, then I can just catch him between patients or if it's less urgent I'll discuss that patient with him at the end of the clinic." [FG2-P2]</p>

Training	Ease of access to training course, or challenges. Personal development during the training course. Medical supervisor support and change in working relationship resulting from the course. Benefit of an area of expertise when undergoing the course.	<p>"And it comes with a whole host of other skills, isn't it, that you're learning as well. It's about, you know, your history taking, examination skills and a whole host of other skills as well" [FG1-P2]</p> <p>"...my line manager has supported me in terms of the prescribing, are quite happy for me to go on the course..." [FG2-P7]</p> <p>"The, the course itself really enhanced my practice because although it was an absolutely mission, getting the hours in around full time work ... I really do think it helped me hugely because the um so spending time one on one with consultants in their clinics, for example. ... I think they then saw me as more of an integrated member of the team." [FG1-P3]</p> <p>So, so that, yeah, that took a little while to actually get the agreement for the, for the for the funding to, to do that, because they couldn't just quite understand what the purpose of it is, yeah." [FG1-P1]</p>
Governance	Overarching theme which incorporates aspects such as policies and guidance, formulary, legislation etc. Certain aspects have cross links with other themes, for example 'CPD' links with 'Managers'.	
CPD	Support to attend CPD, including provision of time and funding. Availability of CPD within work environment and outside. Self-directed or directed by manager/organisation. Benefits of web-based meetings and conferences.	<p>"If it's something that costs money, then it can be a bit more difficult to arrange" [FG2-P2]</p> <p>"I book my own diary. Um so I if I need to do CPD, I can just build it in but also, I can attend the monthly non-medical prescribing meetings that we have at our trust, which also has an element of CPD as part of the meetings..." [FG2-P1]</p> <p>"In fact, this, this Covid's been a wonder, because I can actually get to all these webinars, instead of having to go to stuff." [FG1-P3]</p> <p>"...we have a monthly pharmacists clinical supervision meeting and also the monthly NMP supervision meeting so there's various things that built in that you can do CPD but obviously you can go off and do more reading and things in your own time as well." [FG2-P4]</p>
NMP register	Ease of registering as an INMP with organisation. Maintenance of registration. Amending register entry.	<p>"I think I've signed a form but I'm really not quite sure what actually happened with it." [FG1-P1]</p> <p>"Um, yeah, I think it's just that attitude in Trusts that NMPs have to jump through many hoops, don't they, and they have to, once you're qualified, you can't just start prescribing, you have to then go to a committee to be stamped, and they have to prove evidence of things." [FG2-P4]</p>
Policies and guidance	Policies and guidelines relating to INMP: the clarity and value of them, or absence of them. The support given by them.	<p>"We've got a non-medical prescribing policy, haven't we, but it seems quite a vague in its limitations." [FG1-P3]</p> <p>"So, I think our, our, I guess, policy and things are quite clear that you, you have like an allocated clinical supervisor, as such, and you should be meeting them like once or twice a year to kind of check in..." [FG2-P2]</p>
Formulary	Personal or organisation formulary affecting INMP role.	<p>"And I had to give a list of a maximum of 10 drugs I could prescribe..." [FG2-P3]</p> <p>"Have your small, very small personal formulary and build up so that you're prescribing really well, just a small handful of drugs to begin with and then slowly expand it." [FG2-P1]</p>

Legislation	Effect of legislation on prescribing, particularly affecting physiotherapists.	"...the main sort of medications you would have used, we weren't able to as physio's, um so, your gabapentin, obviously, and pregabalin's changed, codeine we weren't, we weren't able to, so co-codamol we weren't able to prescribe." [FG2-P5]
Second check	Value of second check by a pharmacist when prescribing. Mentioned by pharmacist prescribers within the context of safety.	<p>"I think, I think, I think it's probably both true, isn't it, because FG1-P2 you've got a very, very specialist role and, and so have, I and we can both, our prescriptions will go and be checked by somebody else..." [FG1-P1]</p> <p>"...in reality, a lot of TTOs don't come through pharmacy, a lot of them are nurse lead TTOs. so I am, I then become the technician, pharmacist and pharmacist prescriber for that patient. I'm the only pharmacist contact, pharmacy contact, that that patient sees or gets and I'm prescribing as part of that role, which probably opens me up to some risk of error in terms of not getting a second check." [FG1-P3]</p>
Practical aspects	Overarching theme which incorporates aspects such as access to clinic rooms, budget, admin support etc.	
Admin support	Availability of administrative support. Allocated time to complete INMP associated administration.	<p>"...like some weeks I might do three clinic sessions, which then generates a significant amount of after clinic work but there's no, there's not the recognition that you also need time to do that work." [FG2-P2]</p> <p>"I do a mixture of home visits and clinics and we have as much admin time as we need really." [FG2-P1]</p>
Budget	For post and equipment. Source of budget – single or multiple departments.	<p>"Because I think, particularly I think in pharmacy, they look to get that financial support from the directorates that they're prescribing for rather than just coming out of the pharmacy budget." [FG2-P6]</p> <p>"...I've had to sort of justify why I need a laptop, why I need a mobile phone, why I need headset and camera..... my role is jointly funded by pharmacy and the ID directorate as well so it's the barrier I find sometimes is, is well which budget is it going to come from." [FG1-P2]</p>
Clinic rooms	Access to, and availability of, clinic rooms.	"In our trust, clinic rooms are at a premium. They are really struggling for space and that has been one of, one of the barriers..." [FG2-P7]
Facilities	Access to facilities needed for prescribing. Includes drug charts, notes etc.	<p>"Still on paper. So sometimes it's just physically getting hold of the flaming drug chart." [FG1-P3]</p> <p>"we have a very clear process in the trust, I get my pads from a... ..lockable drawer from a named person, everything's secure where I work, so I've got no problems." [FG2-P1]</p>
IT	Access to IT. Integration, or lack of, across areas. Issues using IT.	<p>"...the IT infrastructure in our place is just, it's just woeful..." [FG1-P3]</p> <p>"we also share in, in our trust, it's community and acute services, and I have access to the electronic patient record that's used in the hospital, which I can also add records on, if I'm managing a patient that's also managed by the respiratory consultant, so we've got a really seamless um patient record..." F[G2-P1]</p>

Patient care	Overarching theme exploring the use of NMP in patient care	
Impact on patients	Direct or indirect impact on patients and patient care.	<p>"...make sure it's happening in a time efficient manner, so patients are, you know, getting the prescriptions when they need because, particularly with the home care prescriptions as you have to work a month ahead." [FG1-P2]</p> <p>"For me, it's definitely reduced the time to treat, so before we'd have to write, request from GPs to prescribe inhalers or, urgent medications, whereas now writing a script in the patient's home, it's just so much quicker." [FG2-P1]</p>
Quality & Safety	INMP improving quality and safety of prescribed medicines for the patient. Links to 'Governance' theme.	<p>"I guess for the inpatient side, um, when I do more of that, I guess more of patients are more likely to be started on the appropriate anticoagulation, at the right dose, etc." [FG2-P2]</p> <p>"I suppose, and I probably said this, I think the probably the influence I have on the consultants is their, is their..., you know, assessing the use of their pain meds now, and is that appropriate. whereas consultants, if that's been their practice for years and years and years, it, you know, it wouldn't, er wouldn't change unless it was challenged and I think we've got a good environment now that we can, we can have those discussions. And I think we bring a more balanced view possibly (nods from FG2-P4)." [FG2-P5]</p>
Stopping	Function as INMP to stop medication/refer back to main prescriber/GP.	<p>"And also, that they get the medication they need stopping, stopped a lot quicker (nods from FG2-P4, FG2-P5 and FG2-P6)." [FG2-P3]</p> <p>"... we do more deprescribing now so I'm using it a lot less and when I do use it, it's more to give advice to GPs on how to maybe rationalize medication more than anything." [FG2-P5]</p>
Orphan themes	These themes do not fall easily under one overarching theme. They may cross link to several other themes or stand alone.	
Conflict of interest	Theme highlighting conflicts of interest identified by participants.	<p>"...they don't want to push the case too hard, because they also want additional consultants, and they feel if they're saying I can do it than that weakens their case. So, it's almost like a conflict of interest there at the moment." [FG2-P7]</p> <p>"But I suppose, even, even with herself, there is a conflict of interest because if I'm off prescribing that's time taken away from delivering our service which she needs to manage." [FG2-P7]</p>
Covid	Impact that Covid-19 pandemic has had on INMP and /or their prescribing practice	<p>"...particularly with Covid that aspect of the service has become more and more NMP led. I think at one point I was actually the only prescriber prescribing for that group of patients." [FG1-P2]</p> <p>"my most recent experience was during Covid and being redeployed to wards for a couple of, well it was eight weeks, and you know generally junior medical staff did receive the prescribing well" [FG1-P2]</p>

Good advice	What advice would the participants give new or prospective non-medical prescribers	<p>"I would say you need to have decided with your organization where you're going to use it before you do the course, because otherwise you end up kind of stuck in limbo maybe without either the time or a role to use it." [FG2-P2]</p> <p>"I think it's really important that it's not just an additional duty that you take on as part of your role, have a dedicated area, have that time, time carved out so you can actually carry out that role." [FG2-P6]</p> <p>"Don't be afraid to ask for help. You're independent, but you're not alone." [FG1-P3]</p>
Undergrad Px	Prescribing taught at undergraduate level. Preparedness of new prescribers to take on role. Impact on rest of service.	<p>"...I share both your concerns, that I think at the moment the undergrads coming out too green to be independently prescribing and what we've already discussed about being not just the prescriber in, on paper, but actually it changes your role and becoming far more embedded into your team." [FG1-P3]</p> <p>"...having undergrads coming out as prescribers, from a trust point of view, they're just going to be really expensive junior doctors, aren't they?" [FG1-P3]</p> <p>"...I think that when you've got a lot of junior people applying for jobs and you always say 'Where do you see yourself in five years', and they always say they want to do the prescribing course and you think, well, who's going to be left just to do the day job, if everybody sees themselves as a prescriber..." [FG2-P4]</p> <p>"...they're not really taught an awful lot about medications, never mind prescribing at undergraduate level so I think that's got a long way to come." [FG2-P1]</p>

Abbreviations:

ACP – advanced clinical practitioner
IT – information technology
prescriber
TTO – 'to take out' – discharge medication

CPD – continuing professional development
MDT – multidisciplinary team

GP – general practitioner
INMP – non-medical

The five themes identified were 'Staff', 'Self', 'Governance', 'Practical aspects' and 'Patient care'. Some subthemes did not fall easily under any of these themes, rather they linked disparate themes or subthemes, and are described as orphan themes. These were 'Conflict of interest', 'Covid', 'Undergraduate prescribing', and 'Good advice'.

5.3.1 Staff

This was the most frequently mentioned theme, particularly in relation to the clinical team but also to managers. The theme described the relationship between participants and senior and junior medical staff as well as other team members. Differences were highlighted in interactions between participants and senior or junior medical staff. The role within the clinical team was described and who leads on decision making. A lack of awareness of NMP was identified by some, mainly physiotherapist, participants. Managers who prescribed were more supportive compared with non-prescribing managers, who may be unaware of prescribing governance issues. The 'Managers' subtheme linked to 'Training' and 'CPD' through the provision of funding and time.

5.3.2 Self

This was the second most important theme, describing the participants' practice. It encompassed the role prescribing took within their job and, for some, the challenges associated with incorporating this into their existing role, as well as prescribing within their personal competence, and support they gained from others, such as the clinical team. The

theme highlighted training aspects including access to, and skills gained on, the course. The 'Prescribing role' subtheme linked to the 'Stopping' subtheme as part of 'Patient care'.

5.3.3 Governance

This theme incorporates aspects such as policies and guidelines supporting NMP, organisation NMP registers, formulary and continuing professional development (CPD). Participants highlighted other policies affecting their practice, including accountability for patient care, which may influence the senior medical approach to NMP. Two minor subthemes were identified, which were profession specific: 'Legislation' affecting physiotherapists and 'Second check' affecting pharmacists.

5.3.4 Practical aspects

This theme incorporates those resources required to undertake prescribing, such as access to clinic rooms, information technology, appropriate budget and administrative support. Administration time was built into the roles for physiotherapist participants, whereas pharmacist participants described a lack of provision for administration time.

5.3.5 Patient care

This theme incorporates aspects of patient care including the impact on patients by ensuring prescriptions were appropriate and completed in a timely manner. Other benefits included improvements in quality and safety for example by stopping inappropriate medication and having sufficient clinic time to check adherence. 'Quality and safety' linked with 'Governance'.

5.3.6 Orphan themes

Two of these themes were only mentioned by pharmacist participants and they were 'Conflict of interest' and 'Undergraduate prescribing'. Several participants highlighted the impact the Covid-19 pandemic had on their practice and the final theme collated the advice the participants would give to new prescribers.

5.4 Discussion

This study enabled an in-depth investigation of issues affecting pharmacist and physiotherapist non-medical prescribers. Participants' lived experiences supported further exploration of the findings from the previous Delphi study (see Chapter 4). Five themes, describing the experiences of the participants were identified.

5.4.1 Themes

The theme of "Staff" reflected the previous Delphi findings whereby the clinical team (medical, nursing and peer support) accounted for approximately 40% of factors affecting NMP achieving consensus [237], and further confirming the role of medical professionals and colleagues in supporting NMP, identified in the preceding review [35]. This is unsurprising as all participants described working collaboratively to share the patient caseload, within a multidisciplinary team usually led by a medical professional. Traditionally senior medical staff were accountable for the patient's care, and team members had closely defined roles. More latterly the move has been towards advanced practice in the non-medical professions, to develop a flexible workforce that is able to adopt innovative ways of working. This was

described in the 2017 draft workforce strategy, which highlighted the increasing demand on the NHS, and the limited number of clinicians to provide care [96], and which built on earlier work such as developing primary care services [60, 93]. In addition, NMP courses require the trainee to complete a period of practice-based training supervised by an experienced prescriber. Until recently (2019) all regulatory bodies required this trainer to be a member of the medical profession, fostering closer links between trainer and trainee, which many participants commented on.

The “Self” theme, accounting for approximately a quarter of all references, focused on the “Prescribing role”, the role that prescribing within the participant’s job and whether prescribing was integral to that role. All prescribers are required to prescribe within their scope of practice and the prescriber’s role implicitly defines that scope, together with guidance from regulatory and professional bodies [30, 58, 135]. Some pharmacist prescribers described challenges when prescribing had been added into their existing role, implying that for this group, the potential impact of prescribing had not been fully considered.

The “Practical aspects” and Governance” themes together highlighted the importance of ensuring adequate facilities for the prescriber, and a strong governance framework to support their prescribing practice. Covid-19 was found to affect some prescribers, either by altering how they practice, or by temporary changes to their role, as found by the “Covid-19” theme. However, changes brought about by the Covid-19 pandemic also appeared in the “CPD” theme, with many participants describing online conferences and meetings becoming routine practice; enabling participation by a wider audience.

The relatively limited number of references to patient care may be considered surprising when compared with the Delphi study (Chapter 4), where the top ranked statement concerned the effectiveness and benefits of prescribing for patients [237]. However, this finding partially reflects the different research methods, with Delphi seeking consensus whereas focus groups enable deeper exploration of lived experiences of the participants. It also reflects the topics chosen for discussion, which were those where there were areas of potential disagreement between the two prescribing professions, and hence patient care was a subsidiary aspect of the discussion.

5.4.2 Inter-dependencies

The previous review (see Chapter 3) exploring barriers and facilitators to NMP identified that many of the factors involved were inter-dependent [35]. The experiences of the participants in the present study supported this finding, with the important secondary co-dependencies depicted in Figure 5-2. The “Quality and safety” theme was interdependent with all aspects of the “Governance” theme, perceived to result in improved care for patients. For example, participant FG2-P5 described constructive discussions with senior medical staff, informed by policies and guidance, resulting in team-wide changes in prescribing practice and improved patient care. For pharmacy managers, there was an implicit conflict between service delivery and governance, inferred by the “Second check” theme. Pharmacists are experts in medicines [258]; clinically screening prescriptions, the so called ‘second check’, to ensure appropriateness for the patient. Pharmacy managers are required to maintain the governance structure surrounding medicines supply, within a limited staffing establishment, and this can result not only in limiting time for pharmacist prescribing, but also difficulty in providing the

second check. Evidence indicates that pharmacist prescribers make fewer errors than medical staff [259], but pharmacist participants perceived that they had been left without an important safety net. Further co-dependencies described by participants included the impact on senior medical staff of policies regarding patient accountability, with concern by some senior medical staff that they were accountable for the non-medical prescriber's actions. This lack of clarity regarding accountability was identified in the previous systematic review (see Chapter 3). Prescribers are accountable for their prescribing decisions, as stated in the prescribing competency framework for all prescribers [30], and would be subject to prosecution under relevant legislation if the occasion arose, regardless of any perceptions to the contrary. However, if a policy regarding patient accountability states that the senior doctor is responsible for the actions of their entire team, then this could result in confusion.

5.4.3 Inter-professional differences

Differences were highlighted between professions, many of which could be anticipated from the way in which each profession traditionally works. For physiotherapists, prescribing forms another treatment option when caring for patients, fitting in to existing roles such as in musculoskeletal clinics [260], whilst also supporting the development of new roles based on existing skills [61]. For the secondary care pharmacist participants, prescribing in many instances was in addition to their existing role, without due consideration to restructuring job plans to allow sufficient time. Consequently, physiotherapist participants felt well-supported for administration time, whereas for the pharmacist participants, unless expressly included in their job plan, administration time was a source of stress. Similarly, pharmacist participants, used to working in a team, described a team approach to decision-making, compared with

physiotherapists, used to planning treatment courses for patients, who were more inclined to make their own decisions.

For the physiotherapist participants, the choice of medicines that they can prescribe is limited by their professional scope of practice and legislation [58, 261], compared with pharmacists who can prescribe any medication, except certain drugs for the treatment of dependence [33, 262]. For the physiotherapists, probable changes in controlled drug legislation have the potential to influence how advanced practice roles develop, particularly if physiotherapists continue to have restricted access to controlled drugs [37]. One physiotherapist participant described the constraints imposed by controlled drug legislation in chronic pain management, but commented that current guidance was moving away from drug treatment and hence expanding the choice of controlled drugs physiotherapists could prescribe may have limited impact in their case [37, 263].

Physiotherapist participants were more likely to describe lack of awareness of physiotherapist prescribing by the clinical team, than pharmacist participants. This reflects both the relatively short time span in which physiotherapists have had prescribing rights (independent prescribing rights granted in 2013) and the small numbers registered as prescribers (1017 independent prescribers in 2019) [51, 56]. In comparison, pharmacists gained independent prescribing rights in 2006, with 8077 independent prescribers on the register in 2019 [26, 50].

Planned changes in pharmacist pre-registration training, including at undergraduate level, will result in newly registered pharmacists registering as independent prescribers [264]. Pharmacist participants expressed concerns about this development, including detraction

from training aspects and potential exacerbation of prescribing errors, as previously identified with junior medical staff [196]. The participants placed their views in the context of their own prescribing training, highlighting the struggle that less experienced pharmacists had with the course, and commenting that routine pharmacy work still needed addressing. However, the development is in-line with the Carter report and draft workforce strategy, which both envisaged a clinical pharmacy workforce, with pharmacy technicians adopting some of the traditional pharmacist roles [96, 265]. The concerns expressed by pharmacist participants regarding time pressures to complete their tasks suggest that advanced pharmacy technician roles, which would release pharmacist time for prescribing, have still to be adopted.

5.4.4 Data trustworthiness

Trustworthiness of the data is supported by the approach to analysis. Full, in-depth discussion of the findings by all authors, with challenge of the derived themes to ensure that they reflected the participants experiences was undertaken. The differences in background and experiences of the research team composition ensured that EGC's longstanding prescribing experience in critical care, and possible preconceptions, were counterbalanced by the other team members, who were non-prescribers but clinicians in both physiotherapy and pharmaceutical fields. Data saturation was achieved, with the themes and main subthemes identified by each focus group and profession. This is supported by the answers to the final question regarding advice to new prescribers, added as a positive end note to each session. No new ideas were articulated but participants emphasised the need for a prescribing role, ensuring facilities were in place beforehand, asking for advice and not being pressurised to prescribe medication that they deemed outside their personal competence.

5.4.5 Strengths and Limitations

The present study allowed in-depth discussion of issues affecting pharmacist and physiotherapist prescribers, with ideas developed by the participants throughout the discussion. Participants drew on their experiences to describe issues affecting them, allowing a greater understanding of the background and contributory factors. As the themes were derived directly from these lived experiences, they acquired content and face validity.

The virtual platform, with choice of dates and times, allowed participants to join who may otherwise have been unable to because of constraints such as work commitments.

The Covid-19 pandemic limited recruitment: in particular fewer physiotherapist participants were recruited than planned. However, findings appeared unaffected with no new themes emerging from the second focus group. This supports the assertion that data saturation was achieved for the major themes identified.

It is acknowledged that recruitment may have been enhanced by widening the geographical catchment area. However, it was possible that some of the variation seen in the previous Delphi results [237] may have arisen from the wide range of practice and geographic areas in which participants were employed. Therefore a deliberate decision was made to limit recruitment to pharmacist and physiotherapist prescribers working in the NHS West Midlands area (either primary or secondary care), to reduce the risk of introducing variability into the findings.

5.5 Conclusion

The key finding from this study related to the theme of collaborative working with the clinical team; emphasising the impact this has on successful implementation of NMP. When their role was specifically designed to include prescribing, this was a benefit for pharmacist participants. Multiple factors contribute to the themes of governance, practical aspects and patients, and each factor is important for successful implementation of NMP. Crucially, the identified themes and subthemes cannot be considered in isolation but are inter-dependent on each other.

Differences between the professions were illustrated from the analysis, most reflecting the way each profession practises and, for pharmacists, the way that prescribing has been introduced into their role. For the pharmacists, healthcare managers need to address the skill mix within pharmacy to enable pharmacist prescribers to practise with support.

To ensure NMP is fully enabled, all aspects must be fully scoped before recruiting or training a non-medical prescriber. Failure to do so may limit full utilisation of prescribing skills and result in a poorly motivated workforce.

5.6 Chapter summary

In this chapter focus group methodology was used to further investigate the findings from Chapter 4 by exploring the lived experiences of pharmacist and physiotherapist prescribers. A sample of physiotherapists and pharmacists, working in the West Midlands, was recruited (7 pharmacists, 3 physiotherapists); who participated in one of two online focus groups.

Thematic analysis identified five themes, each comprising several subthemes, and various inter-dependencies between these themes. The key finding was the impact that collaborative working between the INMP and the clinical team had on successful implementation of NMP. Professional differences were highlighted, relating to the way each profession practises, and for pharmacists, how the prescribing role had been introduced.

5.7 Key points

- This study explored the lived experiences of pharmacist and physiotherapist prescribers.
- Study design and recruitment were affected by the ongoing Covid-19 pandemic
- Five themes, and subthemes were identified: staff, self, governance, practical aspects, and patient care.
- Many interdependences were identified between the themes and subthemes.
- The key finding was the collaborative working between the INMP and the clinical team.
- Differences were identified between the two professions.

5.8 Introduction to next chapter

In the next and final chapter, the findings of the preceding research chapters (Chapters 2-5) are critically discussed, and overall conclusions derived. Areas for future research are also identified.

CHAPTER 6: DISCUSSION AND CONCLUSIONS

Chapter overview

In this chapter the findings from the preceding research chapters are synthesised and critically discussed to address the overall thesis research question. Recommendations for future research are highlighted and final conclusions drawn.

This research programme set out to investigate the factors influencing the uptake and utilisation of independent NMP by pharmacists and physiotherapists, and to determine if these factors affect both pharmacist and physiotherapist prescribers similarly or if there are differences. In the first stage of the research the background policy regarding NMP was reviewed to identify the current role of NMP in delivering healthcare in the UK. This was followed by a systematic review to identify the factors influencing the uptake and utilisation of NMP. In the third and final stages, the experiences of two prescribing professions (pharmacy and physiotherapy) were investigated, using first a consensus technique and then focus groups, to gain an in depth understanding of the factors influencing their utilisation of NMP.

6.1 Policy review

Issues identified in the policy review impact on the factors affecting INMPs. The policy review identified that legislation permitting INMPs to prescribe controlled drugs required the involvement of many agencies and government departments, consequently resulting in delays

in passing legislation to enable nurses and pharmacists to prescribe controlled drugs [33, 98]. Similar delays are now being experienced by therapeutic radiographers and paramedics, whereby initial legislation granting prescribing rights listed the controlled drugs they would ultimately be able to prescribe [266-268], but the relevant amendments to the Misuse of Drugs Regulations have not yet been passed [39]. Recent consultations on expanding the range of controlled drugs able to be prescribed by physiotherapists and podiatrists closed in December 2020 [37, 38] but, as of May 2022, the conclusions have yet to be reported. Delays in implementing any decisions could be anticipated to occur, not only resulting from impact of the Covid-19 pandemic [238], but also the ongoing health service reorganisation [269]. The previous reorganisation, described in the 2010 White paper [129] and enacted in 2012 [130] coincided with a reduction in policy document production and delays in the passing of legislation, as depicted in Figure 2-2 (Page 45).

The policy review emphasised the changing role for NMP, from improving access to medicines for patients to streamlining care by reducing duplication and ensuring that patients have access to the most appropriate person, for example physiotherapy first contact practitioners [61]. As identified, the consultation documents stressed the benefit of a reduction in costs through reducing appointments, particularly with medical staff [103, 108, 110, 113], a key consideration when healthcare costs are growing. A recent report highlighted that demand for healthcare continues to expand with an UK population ageing, and living with increasing morbidity [133]. Additional cost pressures arise from the introduction of new technologies and treatments, as well as staff costs [133]. Since 2018, funding for the NHS had been sequentially increased by the UK government, including top-up funding to support increased

expenditure resulting from the Covid-19 pandemic [270-273]. A further challenge to NMP may be the overall shortage of staff, with The King's Fund reporting a shortfall of around 84,000 full-time equivalent staff [274], with approximately 10% of nurse and GP posts vacant [62]. However, this may also act as an opportunity to expand roles such as physiotherapy first contact practitioners and primary care pharmacists. Beech and et al highlighted these two specific roles as having the potential to significantly reduce GP workload by, pharmacists taking on routine prescribing and medication review activities, and physiotherapists treating musculoskeletal problems (including prescribing appropriate medication): these roles have been described as accounting for 20-30% of the GP workload [62]. NMP would now appear to be an accepted component of UK healthcare provision, and the roles are likely to continue to develop as the NHS endeavours to match demand with the available workforce. Indeed, the Covid-19 pandemic accelerated changes in the way care is delivered [275] and this, combined with the workforces shortages exacerbated further by the pandemic [274], has created an opportunity for NMP to become fully embedded into healthcare delivery.

6.2 Factors influencing the uptake and utilisation of NMP

Chapters 3, 4 and 5 explored the factors influencing the uptake and utilisation of NMP sequentially, with the latter two chapters focusing on the experiences of pharmacist and physiotherapist prescribers. Consequently, it is possible to bring together the results from each study to determine the overall common factors, a process described as methodologic triangulation [276]. Methodological triangulation describes the use of different research methods to answer a research question, therefore enhancing understanding of the study area

[276-278]. In addition, Creswell and Plano Clark describe triangulation as a method of testing the validity of research findings [67]. Hence the use of triangulation can be seen to enhance study rigour by comparing and contrasting the results obtained from the different research methods [276-278]. Where convergence of the results occurs, then this supports the validity of the findings, whereas complementary or divergent results enable a greater understanding of the research area [277].

Although each research study in this thesis followed on sequentially from the previous one, they were analysed independently, and hence the thematic groupings of the factors derived from each study varied in description. However, it is possible to ascertain the presence of common themes/factors by triangulating and tabulating the results from these sequential studies. Table 6-1 tabulates and summarises the factors identified from the literature review (Chapter 3), Delphi study (Chapter 4) and focus groups (Chapter 5) using three main headings - Self/INMP, People and Organisational Aspects, with footnote symbols (†, ‡) used to highlight common factors. The terms 'barrier' and 'facilitator' were frequently used in the studies included in the systematic review and by participants in the Delphi and focus groups to describe the impact of a factor on them. However, the results showed that something could be both a barrier and facilitator, depending on depending on circumstances and hence the term factor is used to encompass both positive and negative connotations.

Table 6-1 Summary of the factors influencing NMP (main and minor) identified in Chapters 3, 4 and 5, grouped by overarching theme.

Research chapter		Self/INMP	People	Organisational aspects
Chapter 3, Systematic review	Main themes	Non-medical prescriber	Human Factors	Organisational aspects
	Minor themes	Attitude Area of competence† Role†	Patients Managers Medical professionals‡ Peers	Formulary Policy Remuneration Post course support Training Impact on time Infrastructure Service
Chapter 4, Delphi*	Themes	Alternative prescriber Lack of clinical skills Confidence† Knowledge† Role‡	Employer Medical support‡ Nursing support Patients Peer support Role model	Funding Information sources Legal aspects Medical records Post course support Prescribing budget Prescribing course Prescription review Time Ward round Working environment
Chapter 5, Focus Groups	Main themes	Self	Staff Patient Care	Practical aspects Governance
	Minor themes	Personal competence† Prescribing role† Support Training	Clinical team‡ Junior medical staff‡ Senior medical staff‡ Team awareness Team role Decision making Managers Impact on patients Quality and safety Stopping	CPD NMP register Policies and guidance Formulary Legislation Second check Admin support Budget Clinic rooms Facilities IT

*Themes derived from content analysis results

† linked themes – prescribing role

‡ linked themes – medical professionals

The most prevalent theme overall was found to be that relating to medical professionals, and by wider implication, the clinical team. It was the most frequently mentioned theme in the systematic review and the Delphi (both the results from Round One and the statements reaching consensus). “Clinical team” was also the most frequently mentioned theme in the focus groups, partly influenced by the topic guide, but with a wider scope. This underscores

the importance, if NMP is to succeed, of good working relationships between medical staff and the INMP. Hostility towards and lack of acceptance of INMPs were identified in several papers included in the systematic review [158-161, 166, 170, 172, 175, 179, 182, 184, 193]. However, lack of acceptance was only mentioned once in the Delphi Round One and not in the focus groups, neither was hostility raised as an issue, suggesting increasing acceptance of INMPs by the medical profession. Concern regarding accountability for care of the patient was highlighted both in the systematic review [45, 166, 170, 193] and the focus group, with the medical staff indicating to the INMP that they were unclear who would take ultimate responsibility for the prescribing decisions made by the INMP. With developments such as first contact practitioners [61], which require the medical practitioner to 'surrender' the management of their patients to another practitioner, it would be prudent to ensure that all staff, and the policies governing these developments, are clear regarding accountability. Without this, medical professionals may feel that they need to retain some control over the patients, limiting the intended benefits of NMP.

The other main recurring theme through the three research studies linked to the INMP's role and, by association, their area of competence and knowledge. The role defined the knowledge they required, in turn becoming their area of competence and instilling confidence. All prescribers are expected to only prescribe within their scope of practice, which encompasses area of competence and associated knowledge, together with other requirements, for example professional such as pharmacists who must include some documentation relating to prescribing when submitting revalidation documents [30, 135]. INMPs described seeking further training to enable them to expand their existing role, or if they moved to a new role,

indicating that an area of competence was not fixed but changeable. Where a role lacked clarity, or prescribing was added into an existing role in addition to usual duties, then NMP proved more challenging. Thus, when developing a strategy to expand NMP, managers and clinicians should ensure that NMP roles are clearly defined and, if necessary, some duties should be reallocated to other staff.

It is clear from both the systematic review and the focus groups that identified themes do not stand in isolation but are frequently interdependent upon each other. This adds complexity to developing NMP roles, and expansion and implementation strategies, but consideration of all factors will support the successful introduction of INMP. Although there is a tendency to regard the identified themes as barriers or facilitators, this is too simplistic a view. It is clear from the present results that each theme, or factor, had the potential to be both a barrier and a facilitator, sometimes simultaneously. For example, Stenner et al found that some doctors, whilst confident of INMPs they worked with, were less confident with INMPs that they did not know, expressing concern regarding their potential prescribing decisions [279]. It would be appropriate for managers, when devising NMP roles and strategies, to use the overarching themes as headings to aid identification of the factors that need to be considered. This may reveal that different approaches are required for each post, and, in addition, aid prioritisation when implementing the strategy by initially concentrating on posts supported by more favourable factors whilst working to resolve less favourable factors.

6.3 Pharmacy

The systematic policy review identified that pharmacy, alone of the NMP professions, continued to produce policy documents during the review search period (2006 to February 2018), highlighting the benefits that pharmacist INMPs could bring [64, 90-92, 94]. More recently the Royal Pharmaceutical Society launched a policy document to support pharmacist INMPs in 2018 [280], followed in 2021 by new recommendations designed to increase the numbers of pharmacist INMPs [281], suggesting that there is still a perceived need to promote the uptake of pharmacist prescribing. This may arise from the planned changes in pharmacy education, with the GPhC new pharmacist education standards enabling registration as a pharmacist and prescriber simultaneously [264]. To benefit fully from these changes, roles for these new prescribers will need designing, or existing services adapted to incorporate prescribing [282], and challenges such as lack of funding for community prescribing pharmacists will need addressing [50]. Additionally there will be a large pool of legacy pharmacists, currently without a prescribing qualification, who will require support [281]. The focus group results highlighted that where roles were developed, due thought needed to be given to aspects such as provision of administration time and delegation of some duties to other staff such as pharmacy technicians, and this is a further consideration for managers.

It was clear that pharmacists appreciated being able to prescribe for patients, finding that it motivated them to care for the patient and made their care more effective and timelier. The lack of a second check of their prescribing by another pharmacist (as would routinely happen to other prescriptions) was raised in the both the Delphi and the focus groups, with

pharmacists stating this left them feeling vulnerable. The GPhC standards for prescribing state that where possible the prescribing and supply functions should be separated to safeguard the patient [135]. If this is difficult to achieve in a hospital setting, as described by the participants, where several pharmacists are usually employed, then it will be challenging to achieve in community where pharmacists are often sole practitioners, potentially limiting further the uptake of pharmacist prescribing.

6.4 Physiotherapy

A recurrent theme for the physiotherapists in both the Delphi and the focus groups concerned the impact of legislation limiting which controlled drugs they could prescribe [261]. For physiotherapists working in pain management, this was compounded by the change in legal status resulting in gabapentin and pregabalin becoming Schedule 3 controlled drugs, and rendering them unable to be prescribed by physiotherapists [36]. The Delphi highlighted that these restrictions did not impact equally on all physiotherapists, with another group benefitting from the ability to prescribe steroid and opioid joint injections, and a further group finding their activities as ACPs hampered. For the latter group, there was the potential for them to work in similar roles to nurse ACPs, but with very different prescribing rights [33, 283]. ACPs are key in delivering care in a wide variety of healthcare settings, as endorsed by the NHS Long Term Plan [284], but the full benefit of physiotherapist ACPs may not be realised if their role is constrained by their prescribing limitations, and this should be considered when developing these roles.

Compared to the pharmacist prescribers, physiotherapists appeared to place less emphasis on team working. This is unsurprising as physiotherapists are used to delivering a package of care which includes identifying the problem and providing appropriate treatment options. Prescribing has simply added an extra treatment choice and removed in most instances the need to refer the patient to a medical professional for a prescription. Consequently, physiotherapists did not appear to encounter the same problems as pharmacists in ensuring sufficient time for prescribing.

6.5 Profession comparison and implications for practice

Both professions studied identified the benefit that prescribing brought to patient care, with the top ranked statement in the Delphi by both pharmacists and physiotherapists supporting this, as well as patient care mentioned in the focus group discussions, despite not being listed in the topic guide. Factors relating to themselves as INMPs, such as prescribing role, were also highlighted by both professions. Identified differences included those relating to controlled drug legislation and physiotherapists, 'second checks' for pharmacists, and provision of administration support. Many of the perceived differences seem to relate to the prescriber's role as much as their profession, for example, the limits imposed by controlled drug legislation only concerns physiotherapists, but does not impact on all physiotherapists, as many were able to practice within the current constraints.

The identified factors frequently spanned both professions, and reflected many of the factors highlighted by the systematic review. However, the relative importance of each factor appears to vary depending on the profession and the role. For example, team working was more

important for pharmacists than physiotherapists, but was still relevant for physiotherapists. Factors identified by the systematic review were reflected in the results of the Delphi and focus group studies. The main area of difference between the studies related to organisational aspects, where the Delphi and focus group studies described a range of issues in greater depth, except for the issue of remuneration, which had been highlighted by the systematic review, but was not mentioned by participants in either of the two following studies.

To ensure success when developing NMP roles the two most important factors for managers to consider are ensuring the support of the medical team and the prescribing role design. For the latter, a broader review of workforce may be required than initially anticipated so that prescribing can be successfully implemented: this was clearly articulated by some of the pharmacist participants who described competing demands from their traditional pharmacy and prescribing roles, which could be alleviated if some duties were delegated to other staff, for example pharmacy technicians. Some factors, for example the impact of legislation on physiotherapist prescribing, are outside the control of managers and prescribers, and prescribing roles should be developed accordingly.

6.6 Areas for future research

- This research programme has revealed that there are common factors influencing the utilisation of NMP. However, it has not addressed the impact of these factors on INMPs over time; for example, is the INMP able to overcome factors that are seen as barriers to practice, and if so, what strategies did they adopt. This could be investigated by following a group of INMPs from starting their prescribing practice, either as newly

qualified prescribers or in a new prescribing role, through to working as established prescribers. By conducting semi-structured interviews, designed to explore the factors that affect prescribing practice, at regular intervals it should be possible to identify the strategies they had adopted to resolve any issues, as well as to determine if prior experience as a prescriber was beneficial in addressing such issues.

- Changes in pharmacy training will result in all new pharmacists also qualifying as prescribers [264]. What is unclear at the present time is how they will be able to implement their prescribing practice and what constraints, if any, are applied to them by their employers. This requires investigation to ensure that the intended consequences of this development are met, firstly by surveying newly qualified pharmacist prescribers, who have been through this revised training programme, and a cross-section of employers, to determine whether the prescribing qualification is utilised, and if so, what constraints if any are imposed. Secondly, more in-depth investigations, such as focus groups or interviews, could be conducted to explore successful, or otherwise, utilisation of the prescribing qualification and the reasoning behind any imposed constraints.

6.7 Strengths and limitations

The strengths and limitations of each individual research study are documented in the relevant chapter, with each study reported using the relevant reporting statement (for example PRISMA and COREQ). The overall strength of this research lies in mixed-methods used to generate data, with each method providing different, but complementary, perspectives on the factors affecting the utilisation of NMP. Each study was conducted as a

standalone but sequential piece of research. For each method a full protocol was developed prior to conducting the study, and fully debated by EGC, JM, and AR, and for the first two studies, also TN. The analysis for each method was conducted in isolation from the preceding method to reduce preconceptions when interpreting the results, and the results debated and challenged within the research team. The discussion of the results enabled findings from the preceding research studies to be triangulated, and the final discussion described the common themes. Attention is also drawn to apparent differences in the findings from each method. The Delphi and focus group study findings provided greater understanding of the factors affecting NMP utilisation by pharmacist and physiotherapist prescribers; two professions that had limited representation in the systematic review papers.

The main limitation related to the challenge of identifying and recruiting participants for the Delphi and focus groups. Although the regulators will have details of those registered as prescribers, it is not possible for a doctoral student to easily access them. Instead, recruitment relied on other approaches such as professional message boards and regional NMP leads. In addition, for the focus groups, the Covid-19 pandemic affected workload for both contacts, such as regional NMP leads, and potential participants. Consequently, although sufficient participants were recruited, the spread of workplaces represented was not as diverse as originally planned, limiting the transferability of the results.

6.8 Conclusions

This research set out to investigate the factors influencing the uptake and utilisation of NMP by pharmacists and physiotherapists, and to determine if the professions experience these factors similarly.

The systematic policy review identified changes in UK Government policy position regarding NMP and the current role of independent NMP in the delivery of healthcare in the NHS, with INMPs now an integral part of the healthcare system, and often providing a complete package of care to patients. Three main themes were identified in the systematic literature review, those relating to the INMP themselves, those relating to the people and patients the INMP works with and the organisational aspects, with the most frequently mentioned factor concerning the impact of medical professionals. In addition it was identified that each factor could be a barrier or facilitator depending on circumstances.

Participants in the Delphi study reached consensus on 29 statements, of which only one was a barrier and the rest described as facilitators. The effectiveness of prescribing for patients in their working practice was ranked as the most important statement overall. The importance of factors influencing uptake and utilisation of prescribing appeared different between physiotherapist and pharmacist prescribers, with the two professions ranking the statements differently.

From the focus groups, five themes, and subthemes, were identified: staff, self, governance, practical aspects, and patient care, with participants highlighting the collaborative working

between the INMP and the clinical team as key. In addition, participants described, through their lived experiences, the many interdependences between the different factors.

This research has identified that the two most cited factors influencing the use of NMP related to team working and the INMP themselves. Whilst most factors influencing the utilisation of NMP are generic, there are some profession specific differences for pharmacy and physiotherapy. It is therefore likely that other NMP professions will also have profession specific differences. It would be advisable when considering the expansion of NMP to other professions that attempts are made to identify these in advance, so that mitigating strategies can be put in place.

LIST OF REFERENCES

1. Kroezen M, van Dijk L, Groenewegen PP, Francke AL. Nurse prescribing of medicines in Western European and Anglo-Saxon countries: a systematic review of the literature. BMC Health Serv Res [Internet]. 2011 May 27 [cited 2011 Jul 13]; 11:[127 p.]. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/21619565>.
2. Department of Health and Social Security. Neighbourhood nursing: a focus for care. (The Cumberlege Report). London: HMSO; 1986.
3. Department of Health. Review of prescribing, supply and administration of medicines. Final report (Crown II Report). [Internet]. London: The Stationery Office; 1999. [Accessed 2013 Feb 09]. Available from: http://webarchive.nationalarchives.gov.uk/20130105143320/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4077153.pdf
4. Medicinal Products: Prescription by Nurses etc. Act 1992., c28. London: HMSO; 1992.
5. Medicinal Products: Prescription by Nurses etc. Act 1992 (Commencement No. 1) Order 1994, 2408 (C.48). London: HMSO; 1994.
6. Medicinal Products: Prescription by Nurses etc. Act 1992 (Commencement No.2) Order 1996., 1505 (C.28) (S.133). London: The Stationery Office; 1996.
7. The Prescription Only Medicines (Human Use) Order 1997, 1830. London: The Stationery Office; 1997.
8. National Institute for Health and Care Excellence. Patient Group Directions (MPG2). [Internet]. 2017 [updated 27 March 2017; cited 2021 7 July]. Available from: <https://www.nice.org.uk/guidance/mpg2>
9. Greengross P, Grant K, Collini E. The History and Development of The UK National Health Service 1948 - 1999. [Internet]. London: DFID Health Systems Resource Centre; 1999. [Accessed 2019 Jan 4]. Available from: <https://assets.publishing.service.gov.uk/media/57a08d91e5274a31e000192c/The-history-and-development-of-the-UK-NHS.pdf>
10. Nuffield Trust. The history of NHS reform. [Internet]. (no date) [cited 2018 Jul 4]. Available from: <http://nhstimeline.nuffieldtrust.org.uk/>
11. The NHS Plan - a plan for investment, a plan for reform [Internet]. Cm 4818-I. London: The Stationery Office Limited: 2000. [cited 2013 Feb 09]. Available from: https://webarchive.nationalarchives.gov.uk/ukgwa/20130107105354/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/@ps/documents/digitalasset/dh_118522.pdf
12. Department of Health. NHS Modernisation Agency and Affiliated Programmes. [Internet]. (no date) [cited 2018 Aug 20]. Available from: <https://webarchive.nationalarchives.gov.uk/ukgwa/20051115214352/http://www.dh.gov.uk>

/PublicationsAndStatistics/Publications/PublicationsPolicyAndGuidance/PublicationsPAmpG
BrowsableDocument/fs/en?CONTENT_ID=4098680&MULTIPAGE_ID=4991386&chk=5izwHn

13. Consultation on proposals to extend nurse prescribing [Internet]. London: Department of Health: 2000. [cited 2018 Oct 30]. Available from: <http://webarchive.nationalarchives.gov.uk/20040803061541/http://www.dh.gov.uk/assetRoot/04/06/82/27/04068227.pdf>
14. Department of Health. Patients to get quicker access to medicines [Press release]. [Internet]. 2001 May 4 [cited 2014 August 11]. Available from: http://webarchive.nationalarchives.gov.uk/+www.dh.gov.uk/en/Publicationsandstatistics/Pressreleases/DH_4010748
15. The Prescription Only Medicines (Human Use) Amendment Order 2002, 549. London: The Stationery Office; 2002.
16. Department of Health. Groundbreaking new consultation aims to extend prescribing powers for pharmacists and nurses [Press release]. [Internet]. 2002 [updated 2002 Apr 16; cited 2019 Sep 30]. Available from: http://webarchive.nationalarchives.gov.uk/20051012062254/http://www.dh.gov.uk/PublicationsAndStatistics/PressReleases/PressReleasesNotices/fs/en?CONTENT_ID=4013114&chk=JkpptS
17. Department of Health. Pharmacists to prescribe for the first time nurses will prescribe for chronic illness [Press release]. [Internet]. 2002 [updated 21 November 2002; cited 2019 Sep 30]. Available from: http://webarchive.nationalarchives.gov.uk/20051012062249/http://www.dh.gov.uk/PublicationsAndStatistics/PressReleases/PressReleasesNotices/fs/en?CONTENT_ID=4025974&chk=BOhuz1
18. Department of Health. Supplementary Prescribing by Nurses, Pharmacists, Chiropodists/Podiatrists, Physiotherapists and Radiographers within the NHS in England: A guide for implementation. [Internet]. London: The Stationery Office; 2005. Report No.: 4941. [Accessed 2014 Aug 11]. Available from: http://webarchive.nationalarchives.gov.uk/20130124065910/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4110033.pdf
19. The Prescription Only Medicines (Human Use) Amendment Order 2003, SI 2003/696. London: The Stationery Office; 2003.
20. The Misuse of Drugs (Amendment) Regulations 2005, 271. London: The Stationery Office; 2005.
21. The National Health Service (Primary Medical Services) (Miscellaneous Amendments) Regulations 2005, 893. London: The Stationery Office; 2005.
22. The National Health Service (Primary Medical Services) (Miscellaneous Amendments) (No. 2) Regulations 2005, 3315. London: The Stationery Office; 2005.
23. The National Health Service (Pharmaceutical Services) (Amendment No. 2) Regulations 2005, 1501. London: The Stationery Office; 2005.

24. Department of Health. Consultation on proposals to introduce independent prescribing by pharmacists [Internet]. MLX 321. London: Department of Health; 2005. [cited 2013 Oct 7]. Available from: <http://webarchive.nationalarchives.gov.uk/20141008042455/http://www.mhra.gov.uk/home/groups/comms-ic/documents/websiteresources/con007684.pdf>
25. Department of Health. Consultation on options for the future of independent prescribing by extended formulary nurse prescribers [Internet]. MLX 320. London: Department of Health; 2005. [cited 2018 Oct 30]. Available from: http://webarchive.nationalarchives.gov.uk/20050425224658/http://www.dh.gov.uk/Consultations/LiveConsultations/LiveConsultationsArticle/fs/en?CONTENT_ID=4104057&chk=xNuvDV
26. The Medicines for Human Use (Prescribing) (Miscellaneous Amendments) Order 2006, 915. London: The Stationery Office; 2006.
27. Improving Patients' Access to Medicines: A Guide to Implementing Nurse and Pharmacist Independent Prescribing within the NHS in England [Internet]. Gateway ref: 6429. Leeds: Department of Health; 2006. [cited 2013 Dec 5]. Available from: http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4133747.pdf
28. National Institute for Health and Care Excellence. Non-medical prescribing. (no date) [cited 2019 Apr 30]. Available from: <https://bnf.nice.org.uk/guidance/non-medical-prescribing.html>
29. Nursing and Midwifery Council. Standards of proficiency for nurse and midwife prescribers. [Internet]. London: Nursing and Midwifery Council; 2006. [Accessed 2017 Apr 22]. Available from: <https://www.nmc.org.uk/standards/additional-standards/standards-of-proficiency-for-nurse-and-midwife-prescribers/>
30. Royal Pharmaceutical Society. A competency framework for all prescribers. [Internet]. London: Royal Pharmaceutical Society; 2021. [Accessed 2021 Sep 22]. Available from: <https://www.rpharms.com/resources/frameworks/prescribing-competency-framework/competency-framework>
31. Graham-Clarke E, Rushton A, Noblet T, Marriott J. Non-medical prescribing in the United Kingdom National Health Service: A systematic policy review. PLoS ONE. 2019;14(7):e0214630.
32. Medicines for Human Use (Miscellaneous Amendments) (No.2) Regulations 2009, 3063. London: The Stationery Office; 2009.
33. The Misuse of Drugs (Amendment No. 2) (England, Wales and Scotland) Regulations 2012, 973. London: The Stationery Office; 2012.
34. NHS England. Better treatment for patients as advanced paramedics prescribe medicines [News]. [Internet]. 2018 [updated 2018 Mar 31; cited 2018 Apr 26]. Available from: <https://www.england.nhs.uk/2018/03/paramedic-prescribing/>

35. Graham-Clarke E, Rushton A, Noblet T, Marriott J. Facilitators and barriers to non-medical prescribing – A systematic review and thematic synthesis. PLoS ONE. 2018;13(4):e0196471.
36. The Misuse of Drugs and Misuse of Drugs (Safe Custody) (Amendment) (England and Wales and Scotland) Regulations 2018, 1383. London: The Stationery Office; 2018.
37. Consultation on proposed amendments to the list of controlled drugs that physiotherapists can independently prescribe across the United Kingdom [Internet]. PAR145. Leeds: NHS England; 2020. [cited 2021 Mar 10]. Available from: <https://www.engage.england.nhs.uk/consultation/physiotherapists/>
38. Consultation on proposed amendments to the list of controlled drugs that podiatrists can independently prescribe across the United Kingdom [Internet]. 2020. Available from: <https://www.engage.england.nhs.uk/consultation/podiatrists/>
39. Gallagher CT. UK non-medical CD prescribing law: permissive or restrictive? Prescriber. 2021;32(3):15-9.
40. NHS England. Chief Professions Officers' medicines mechanisms programme. [Internet]. 2020 [cited 2021 Jul 16]. Available from: <https://www.england.nhs.uk/medicines-2/chief-professions-officers-medicines-mechanisms-programme/>
41. The Health Foundation. Staffing matters; funding counts. [Internet]. London The Health Foundation; 2016. [Accessed 2017 Feb 12]. Available from: <http://www.health.org.uk/publications/staffing-matters-funding-counts>
42. Royal College of Physicians. The Faculty of Physician Associates - at the Royal College of Physicians. [Internet]. 2021 [cited 2021 Jul 16]. Available from: <https://www.fparcp.co.uk>
43. Health Education England. Advanced clinical practice. [Intranet]. (no date) [cited 2019 Apr 29]. Available from: <https://www.hee.nhs.uk/our-work/advanced-clinical-practice>
44. Latter S, Blenkinsopp A, Smith A, Chapman S, Tinelli M, Gerard K, et al. Evaluation of nurse and pharmacist independent prescribing. [Internet]. University of Southampton; Keele University; 2010. [Accessed 2013 May 6]. Available from: <https://eprints.soton.ac.uk/184777/3/ENPIPfullreport.pdf>.
45. McCann L, Haughey S, Parsons C, Lloyd F, Crealey G, Gormley GJ, et al. Pharmacist prescribing in Northern Ireland: a quantitative assessment. Int J Clin Pharm. 2011;33(5):824-31.
46. i5 Health. Non-Medical Prescribing (NMP); An Economic Evaluation. [Internet]. NHS Health Education North West; 2015. [Accessed 2015 Dec 26]. Available from: <http://www.i5health.com/NMP/NMPEconomicEvaluation.pdf>
47. Courtenay M, Carey N, Stenner K. An overview of non medical prescribing across one strategic health authority: a questionnaire survey. BMC Health Serv Res. 2012;12:138.
48. General Pharmaceutical Council. Prescribers Survey Report. [Internet]. London: General Pharmaceutical Council; 2016. [Accessed 2017 Feb 13]. Available from:

https://www.pharmacyregulation.org/sites/default/files/gphc_prescribers_survey_report.pdf

49. Phelps A, Agur M, Nass L, Blake M. GPhC Registrant Survey 2013 Findings. [Internet]. London: NatCen Social Research; 2014. [Accessed 2017 Feb 12]. Available from: https://www.pharmacyregulation.org/sites/default/files/gphc_registrant_survey_2013_main_report_by_natcen.pdf
50. Enventure Research. Survey of registered pharmacy professionals 2019. [Internet]. London: General Pharmaceutical Council; 2019. [Accessed 2021 Apr 30]. Available from: <https://www.pharmacyregulation.org/about-us/research/gphc-survey-registered-pharmacy-professionals-2019>
51. HCPC. Number of registrants with prescribing rights - August 2019. [Internet]. 2019 [cited 2021 May 11]. Available from: <https://www.hcpc-uk.org/resources/freedom-of-information-requests/2019/number-of-registrants-with-prescribing-rights---august-2019/>
52. NHS Digital. General Ophthalmic services workforce statistics - 31 December 2019. [Internet]. 2020 Mar 5 [cited 2021 Jul 29]. Available from: <https://digital.nhs.uk/data-and-information/publications/statistical/general-ophthalmic-services-workforce-statistics/31-december-2019>
53. Cooper RJ, Anderson C, Avery T, Bissell P, Guillaume L, Hutchinson A, et al. Nurse and pharmacist supplementary prescribing in the UK-a thematic review of the literature. Health Policy. 2008;85(3):277-92.
54. Nursing and Midwifery Council. The NMC register: 1 April 2020 – 31 March 2021. [Internet]. London: Nursing and Midwifery Council; 2021. [Accessed 2021 Jul 29]. Available from: <https://www.nmc.org.uk/globalassets/sitedocuments/data-reports/annual-2021/0005b-nmc-register-2021-web.pdf>
55. General Pharmaceutical Council. Council Meeting. [Internet]. London: General Pharmaceutical Council; 2019. [Accessed 2019 May 18]. Available from: <https://www.pharmacyregulation.org/sites/default/files/document/gphc-council-meeting-papers-01-02-2019.pdf>
56. The Human Medicines (Amendment) Regulations 2013, 1855. London: The Stationery Office; 2013.
57. Pharmaceutical Services Negotiating Committee. Who can prescribe what? : Pharmaceutical Services Negotiating Committee,; 2021 [Available from: <https://psnc.org.uk/dispensing-supply/receiving-a-prescription/who-can-prescribe-what/>
58. Chartered Society of Physiotherapists. Practice Guidance for Physiotherapist Supplementary and/or Independent Prescribers (4th Edition) [Information paper]. [Internet]. 2018 [cited 2021 Aug 27]. Available from: https://www.csp.org.uk/system/files/publication_files/PD026_PracticeGuidancePrescribing_4thEd_2018.pdf
59. A Planned Primary Care Workforce for Wales: Approach and development actions to be taken in support of the plan for a primary care service in Wales up to 2018 [Internet]. WG25991. Cardiff: Welsh Assembly; 2015. [cited 2018 Feb 6]. Available from:

<https://primarycareone.nhs.wales/files/primary-care-roles-resources/planned-primary-care-workforce-2015-pdf/>

60. Health Education England. The future of primary care: Creating teams for tomorrow. [Internet]. London: Health Education England; 2015. [Accessed 2018 Jun 26]. Available from: https://napc.co.uk/wp-content/uploads/2017/09/Future_of_primary_care.pdf
61. Health Education England, NHS England, Skills for Health. Musculoskeletal core capabilities framework for first point of contact practitioners. [Internet]. London: Health Education England; 2018. [Accessed 2020 Jun 14]. Available from: https://www.csp.org.uk/system/files/musculoskeletal_framework2.pdf
62. Beech J, Bottery S, Charlesworth A, Evans H, Gershlick B, Hemmings N, et al. Closing the gap. [Internet]. London; 2019. [Accessed 2021 Sep 13]. Available from: <https://www.kingsfund.org.uk/sites/default/files/2019-06/closing-the-gap-full-report-2019.pdf>
63. Pharmacy faces up to the urgent care challenge. Pharm J [Internet]. 2015 [cited 2019 Sep 30]. Available from: <https://pharmaceutical-journal.com/article/news/pharmacy-faces-up-to-the-urgent-care-challenge>.
64. Royal Pharmaceutical Society. Improving care for people with Long Term Conditions. [Internet]. London: Royal Pharmaceutical Society; 2016. [Accessed 2018 Mar 20]. Available from: <https://www.rpharms.com/Portals/0/RPS%20document%20library/Open%20access/Policy/LTC%20-%20England.pdf>
65. England N. The NHS belongs to the people: A call to action [Internet]. London: NHS England; 2013. [cited 2013 Jul 12]. Available from: <https://www.england.nhs.uk/wp-content/uploads/2013/07/nhs-belongs.pdf>
66. NHS England. Five Year Forward View. [Internet]. London: The Stationery Office; 2014. [Accessed 2017 Feb 12]. Available from: <https://www.england.nhs.uk/wp-content/uploads/2014/10/5yfv-web.pdf>
67. Creswell JW, Plano Clark VL. Designing and conducting mixed methods research. 2 ed. London: Sage; 2011.
68. Kaushik V, Walsh CA. Pragmatism as a Research Paradigm and Its Implications for Social Work Research. Social Sciences. 2019;8(9):255.
69. Regnault A, Willgoss T, Barbic S, On behalf of the International Society for Quality of Life Research Mixed Methods Special Interest Group. Towards the use of mixed methods inquiry as best practice in health outcomes research. Journal of Patient-Reported Outcomes. 2018;2(1):19.
70. Moher D, Shamseer L, Clarke M, Ghersi D, Liberati A, Petticrew M, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. Systematic Reviews. 2015;4(1):1-9.

71. Moher D, Liberati A, Tetzlaff J, Altman DG, Group TP. Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLOS Med. 2009;6(7):e1000097.
72. The National Health Service (Miscellaneous Amendments Relating to Independent Prescribing) Regulations 2006, 913. London: The Stationery Office; 2006.
73. Greenhalgh T, Peacock R. Effectiveness and efficiency of search methods in systematic reviews of complex evidence: audit of primary sources. BMJ. 2005;331(7524):1064-5.
74. Liberati A, Altman DG, Tetzlaff J, Mulrow C, Gotzsche PC, Ioannidis JP, et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. PLOS Med. 2009;6(7):e1000100.
75. Popay J, Roberts H, Sowden A, Petticrew M, Arai L, Rodgers M, et al. Guidance on the Conduct of Narrative Synthesis in Systematic Reviews. ESRC Methods Programme; 2006. [Accessed 2015 Jul 27]. Available from: DOI: 10.13140/2.1.1018.4643.
76. Mays N, Pope C, Popay J. Systematically reviewing qualitative and quantitative evidence to inform management and policy-making in the health field. J Health Serv Res Policy. 2005;10(Suppl 1):6-20.
77. Booth A, Noyes J, Flemming K, Gerhardus A, Wahlster P, van der Wilt GJ, et al. Guidance on choosing qualitative evidence synthesis methods for use in health technology assessments of complex interventions. [Internet]. INTEGRATE-HTA; 2016. Report No.: 7. [Accessed 2018 Apr 14]. Available from: https://www.researchgate.net/publication/298743768_Guidance_on_choosing_qualitative_evidence_synthesis_methods_for_use_in_health_technology_assessments_of_complex_interventions
78. Medicines Matters. A guide to mechanisms for the prescribing, supply and administration of medicines [Internet]. Gateway ref: 6773. London: Department of Health; 2006. [cited 2016 Mar 28]. Available from: https://webarchive.nationalarchives.gov.uk/20091106163742/http://www.dh.gov.uk/dr_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_064326.pdf
79. Guidance for Nurse Independent Prescribers and for Community Practitioner Nurse Prescribers in Scotland [Internet]. ISBN: 0-7559-5137-9. Edinburgh: Scottish Executive; 2006. [cited 2018 Feb 28]. Available from: <https://www.gov.scot/Publications/2006/08/23133351/0>
80. Department of Health, Social Services and Public Safety. Improving Patients' Access to Medicines: A Guide to Implementing Nurse and Pharmacist Independent Prescribing within the HPSS in Northern Ireland. [Internet]. Belfast: Department of Health, Social Services and Public Safety; 2006. Report No.: 104/06. [Accessed 2018 May 29]. Available from: <https://www.publichealth.hscni.net/sites/default/files/directorates/files/Guide%20to%20im>

plementing%20nurse%20and%20pharmacist%20independent%20prescribing%20in%20NI 0.pdf

81. Healthcare Commission. The best medicine: the management of medicines in acute and specialist trusts. [Internet]. London: Commission for Healthcare Audit and Inspection; 2007. [Accessed 2016 Apr 4]. Available from: https://webarchive.nationalarchives.gov.uk/20081203024742/http://www.healthcarecommission.org.uk/db/documents/The_Best_Medicine_acute_trust_tagged.pdf

82. Mental Health: New Ways of Working for Everyone. Progress Report [Internet]. Gateway ref: 7938. London: Department of Health; 2007. [cited 2018 Feb 28]. Available from: http://webarchive.nationalarchives.gov.uk/+www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_074495.pdf

83. Pharmaceutical Division. Non medical prescribing in Wales - A guide for implementation. [Internet]. Cardiff: Welsh Assembly Government; 2007. [Accessed 2018 May 29]. Available from: <https://webarchive.nationalarchives.gov.uk/20081112234902/http://www.wales.nhs.uk/sites3/page.cfm?orgid=371&pid=21001>

84. New Ways of Working for Everyone: A best practice implementation guide [Internet]. Gateway ref: 8699. London: Department of Health; 2007. [cited 2018 Feb 28]. Available from: http://webarchive.nationalarchives.gov.uk/20130105064321/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_079106.pdf

85. Consultation on A Safe Prescription: Developing Nurse, Midwife and Allied Health Profession (NMAHP) Prescribing in NHS Scotland [Internet]. Edinburgh: The Scottish Government; 2007. [cited 2018 Feb 28]. Available from: <https://www.webarchive.org.uk/wayback/archive/20150219074447/http://www.gov.scot/Publications/2007/11/08120246/0>

86. Pharmacy in England: Building on strengths – delivering the future [Internet]. Cm 7341. Norwich: The Stationery Office; 2008. [cited 2008 Apr 28]. Available from: <https://www.gov.uk/government/publications/pharmacy-in-england-building-on-strengths-delivering-the-future>

87. Marks D. Allied health professions prescribing and medicines supply mechanisms scoping project report. [Internet]. Leeds: The Stationery Office; 2009. Report No.: Gateway ref: 12185. [Accessed 2015 Jul 27]. Available from: http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_103949.pdf

88. A safe prescription; Developing nurse, midwife and allied health profession (NMAHP) prescribing in NHS Scotland [Internet]. ISBN: 978-0-7559-5685-2. Edinburgh: The Scottish Government; 2009. [cited 2018 Feb 6]. Available from: https://test1.nes.digital/media/555944/a_safe_prescription_2009.pdf

89. Medical Education England. Pharmacist Prescriber Training Working Group Report for the MPC Programme Board. [Internet]. Medical Education England; 2010. [Accessed 2016 Nov 21]. Available from: <https://webarchive.nationalarchives.gov.uk/20160509163634/https://www.hee.nhs.uk/sites/default/files/documents/Modernising%20Pharmacy%20Careers%20Programme%20Report%202010.pdf>.
90. The Scottish Government. Prescription for Excellence [Internet]. ISBN: 978-1-78256-876-6. Edinburgh: The Scottish Government; 2013. [cited 2018 Feb 28]. Available from: <https://www.webarchive.org.uk/wayback/archive/3000/https://www.gov.scot/resource/0043/00434053.pdf>
91. Smith J, Picton C, Dayan M. Now or never: shaping pharmacy for the future. [Internet]. London: Royal Pharmaceutical Society; 2013. [Accessed 2018 Mar 4]. Available from: <https://www.rpharms.com/Portals/0/RPS%20document%20library/Open%20access/Publications/Now%20or%20Never%20-%20Report.pdf>
92. Royal Pharmaceutical Society. Seven Day Services in Hospital Pharmacy: Giving patients the care they deserve. [Internet]. London: Royal Pharmaceutical Society; 2014. [Accessed 2016 Nov 21]. Available from: <https://www.rpharms.com/Portals/0/RPS%20document%20library/Open%20access/Professional%20standards/Professional%20standards%20for%20Hospital%20pharmacy/rps-seven-day-report.pdf>
93. Our Plan for Primary Care in Wales up to March 2018 [Internet]. WG23564. Cardiff: Welsh Assembly; 2014. [cited 2018 Feb 14]. Available from: <http://www.wales.nhs.uk/sitesplus/documents/986/our%20plan%20for%20primary%20care%20in%20wales%20up%20to%20march%202018.pdf>
94. NHS England. Transformation of seven day clinical pharmacy services in acute hospitals. [Internet]. London: The Stationery Office; 2016. Report No.: Gateway ref: 5764. [Accessed 2017 Apr 1]. Available from: <https://www.england.nhs.uk/wp-content/uploads/2016/09/7ds-clinical-pharmacy-acute-hosp.pdf>
95. Health Education England. The General Practice Nursing Workforce Development Plan. [Internet]. London: Health Education England; 2017. [Accessed 2018 Jun 26]. Available from: <https://hee.nhs.uk/sites/default/files/documents/The%20general%20practice%20nursing%20workforce%20development%20plan.pdf>
96. Facing the Facts, Shaping the Future: A draft health and care workforce strategy for England to 2027 [Internet]. London: Public Health England; 2017. [cited 2018 Mar 12]. Available from: <https://www.hee.nhs.uk/sites/default/files/documents/Facing%20the%20Facts%2C%20Shaping%20the%20Future%20-%20a%20draft%20health%20and%20care%20workforce%20strategy%20for%20England%20to%202027.pdf>

97. Consultation on proposals to introduce independent prescribing by optometrists [Internet]. MLX 334. London: Department of Health: 2006. [cited 2018 Feb 19]. Available from:
https://webarchive.nationalarchives.gov.uk/20061016154410/http://www.mhra.gov.uk/home/idcplg?IdcService=SS_GET_PAGE&useSecondary=true&ssDocName=CON2024332&ssTargetNodeId=373
98. Public consultation - independent prescribing of controlled drugs by nurse and pharmacist independent prescribers [Internet]. MLX338. London: Home Office: 2007. [cited 2018 Feb 28]. Available from:
<http://webarchive.nationalarchives.gov.uk/20070905223650/http://www.homeoffice.gov.uk/documents/cons-2007-indpres?view=Binary>
99. Medicines & Healthcare Products Regulatory Agency. Public consultation (MLX 334): Proposals to introduce independent prescribing by optometrists - outcome. [Internet]. 2008 [updated 2007 Aug 28; cited 2019 Sep 30]. Available from:
<http://webarchive.nationalarchives.gov.uk/20130515160823/http://www.mhra.gov.uk/Publications/Consultations/Medicinesconsultations/MLXs/CON2024332?ssSourceNodeId=387>
100. Department of Health. Proposals to introduce prescribing responsibilities for paramedics: stakeholder engagement [Internet]. 13665. London: Department of Health: 2010. [cited 2018 Apr 3]. Available from:
http://webarchive.nationalarchives.gov.uk/20130105055008/http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_114355
101. Engagement exercise: To seek views on possibilities for introducing independent prescribing responsibilities for podiatrists [Internet]. Gateway ref: 14691. Leeds: Department of Health: 2010. [cited 2018 Jun 25]. Available from:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/216033/dh_119374.pdf
102. Engagement exercise: To seek views on possibilities for introducing independent prescribing responsibilities for physiotherapists [Internet]. Gateway ref: 14685. Leeds: Department of Health: 2010. [cited 2018 May 25]. Available from:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/216032/dh_119375.pdf
103. Proposals to introduce independent prescribing by podiatrists: impact assessment [Internet]. IA No: 1019. Leeds: Department of Health: 2011. [cited 2018 Apr 28]. Available from:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/213480/DH-1019-Proposals-to-introduce-independent-prescribing-by-podiatrists.pdf
104. Consultation on proposals to introduce independent prescribing by podiatrists [Internet]. Gateway ref: 16576. Leeds: Department of Health: 2011. [cited 29 April 2018]. Available from:
<https://webarchive.nationalarchives.gov.uk/ukgwa/20191028121102/https://consultations.>

[dh.gov.uk/cno-ahp/podiatrists-prescribing/user_uploads/onlineconsultation_podiatrists_nov11_acc2.pdf](https://www.dh.gov.uk/cno-ahp/podiatrists-prescribing/user_uploads/onlineconsultation_podiatrists_nov11_acc2.pdf)

105. Consultation on proposals to introduce independent prescribing by physiotherapists [Internet]. Gateway ref: 16305. Leeds: Department of Health: 2011. [cited 2018 Jan 5]. Available from:

https://webarchive.nationalarchives.gov.uk/ukgwa/20131112223651/http://consultations.dh.gov.uk/cno-ahp/prescribingmedicines/user_uploads/onlineconsultation_physiotherapists_nov11_acc2.pdf

106. Department of Health. Summary of the Commission on Human Medicines meeting held on Thursday 17th & Friday 18th May 2012 [Internet]. London: Department of Health: 2012. [cited 2012 Jul 11]. Available from:

<https://webarchive.nationalarchives.gov.uk/20121105181741/http://www.mhra.gov.uk/home/groups/l-cs-el/documents/committeedocument/con172304.pdf>

107. Summary of Public Consultation on Proposals to Introduce Independent Prescribing by Physiotherapists [Internet]. Gateway ref: 17948. Leeds: Department of Health: 2012. [cited 2013 Jul 28]. Available from:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/216881/Physiotherapist-Consultation-Summary.pdf

108. Proposals to introduce independent prescribing by physiotherapists: impact assessment [Internet]. IA No: 1018. Leeds: Department of Health: 2012. [cited 2018 Mar 1]. Available from:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/213478/DH-1018-Proposals-to-introduce-independent-prescribing-by-physiotherapists1.pdf

109. Summary of Public Consultation on Proposals to Introduce Independent Prescribing by Podiatrists [Internet]. Gateway ref: 17900. Leeds: Department of Health: 2012 [cited 2013 Jul 10]. Available from: <https://consultations.dh.gov.uk/cno-ahp/podiatrists-prescribing/results/2900265---podiatrist-consultation-summary-v1-1-200712.pdf>

110. Independent prescribing by radiographers: Impact Assessment [Internet]. IA No: 5196. Leeds: NHS England: 2015. [cited 2018 May 25]. Available from:

https://www.engage.england.nhs.uk/consultation/independent-prescribing-radiographers/user_uploads/consult-stag-impct-assmnt-radiographer.pdf

111. Consultation on proposals to introduce independent prescribing by radiographers across the United Kingdom [Internet]. Gateway Ref: 03047. London: NHS England: 2015. [cited 2015 Feb 26]. Available from:

https://www.engage.england.nhs.uk/consultation/independent-prescribing-radiographers/user_uploads/consult-indepndnt-prescrib-radiographers.pdf

112. Consultation on proposals to introduce independent prescribing by paramedics across the United Kingdom [Internet]. Gateway Ref: 03046. Leeds: NHS England: 2015. [cited 2015 Feb 26]. Available from:

https://www.engage.england.nhs.uk/consultation/independent-prescribing-paramedics/user_uploads/consult-indpndnt-prescrbng-paramedics.pdf

113. Proposal to introduce independent prescribing by paramedics: impact assessment [Internet]. IA No: 5193. Leeds: NHS England: 2015. [cited 2018 May 25]. Available from: https://www.engage.england.nhs.uk/consultation/independent-prescribing-paramedics/user_uploads/consult-stag-impct-assmnt-paramedics.pdf

114. Department of Health. Summary of The Commission on Human Medicines Meeting held on Thursday 15 October and Friday 16 October 2015 [Internet]. London: Department of Health: 2015. [cited 2018 Feb 28]. Available from: <https://app.box.com/s/jv487awvqzsrqql0o34h9gg350ceyd4/1/3477158784/47424519277/1>

115. Independent prescribing by therapeutic radiographers [Internet]. IA No: 5196. Leeds: NHS England: 2016. [cited 2018 Jun 20]. Available from: https://www.legislation.gov.uk/ukia/2016/38/pdfs/ukia_20160038_en.pdf

116. Summary of the responses to the public consultation on proposals to introduce independent prescribing by paramedics across the United Kingdom [Internet]. Gateway Ref: 04805. Leeds: NHS England: 2016. [cited 2016 Mar 7]. Available from: <https://www.england.nhs.uk/wp-content/uploads/2016/02/Paramedics-summary-consult-responses.pdf>

117. NHS England. Summary of the responses to the public consultation on proposals to introduce independent prescribing by radiographers across the United Kingdom [Internet]. Gateway Ref: 04804. Leeds: NHS England: 2016. [cited 2016 Mar 7]. Available from: <https://www.england.nhs.uk/wp-content/uploads/2016/02/radiographers-summary-consult-responses.pdf>

118. Department of Health. Summary of the Commission on Human Medicines meeting held on Thursday 7th September 2017 [Internet]. London: Department of Health: 2017. [cited 2018 Feb 28]. Available from: <https://app.box.com/s/jv487awvqzsrqql0o34h9gg350ceyd4/file/255151586515>

119. The National Health Service (Primary Medical Services Section 17C Agreements) (Scotland) Amendment Regulations 2006, 248. London: The Stationery Office; 2006.

120. The National Health Service (Primary Medical Services Section 17C Agreements) (Scotland) Amendment (No. 3) Regulations 2007, 502. London: The Stationery Office; 2007.

121. NHS Scotland. A Route Map to the 2020 Vision for Health and Social Care [Internet]. Edinburgh: The Scottish Government 2013. [cited 2021 Nov 22]. Available from: http://www.sspc.ac.uk/media/Media_473395_smxx.pdf

122. Dr H Wilson & Prof N Barber. Review of NHS Pharmaceutical Care of Patients in the Community in Scotland [Internet]. Edinburgh: The Scottish Government: 2013. [cited 2021 Nov 22]. Available from: <https://www.gov.scot/binaries/content/documents/govscot/publications/independent-report/2013/08/review-nhs-pharmaceutical-care-patients-community-scotland/documents/review-nhs-pharmaceutical-care-patients-community-scotland/review->

[nhs-pharmaceutical-care-patients-community-scotland/govscot%3Adocument/00430209.pdf](https://www.gov.scot/document/00430209.pdf)

123. Scottish Executive. The Right Medicine: a strategy for pharmaceutical care for Scotland [Internet]. Edinburgh: Scottish Executive: 2002. [cited 2021 Nov 23]. Available from: https://www.webarchive.org.uk/wayback/en/archive/20160108082204mp_/http://www.gov.scot/Resource/Doc/158742/0043086.pdf

124. The Medicines for Human Use (Prescribing) (Miscellaneous Amendments) Order 2008, 1161. London: The Stationery Office; 2008.

125. The Misuse of Drugs (Amendment) Regulations (Northern Ireland) 2012, 168. London: The Stationery Office; 2012.

126. Taking Healthcare to the Patient: Transforming NHS Ambulance Services [Internet]. Gateway ref: 5133. London: Department of Health: 2005. [cited 2018 Apr 30]. Available from:

<http://aace.org.uk/wp-content/uploads/2011/11/Taking-Healthcare-to-the-Patient-Transforming-NHS-Ambulance-Services.pdf>

127. High quality care for all, now and for future generations: Transforming urgent and emergency care services in England - Urgent and Emergency Care Review End of Phase 1 Report [Internet]. Gateway ref: 00691. Leeds: NHS England: 2013. [cited 2018 Aug 21]. Available from: <https://www.nhs.uk/NHSEngland/keogh-review/Documents/UECR.Ph1Report.FV.pdf>

128. HCPC. Independent and supplementary prescribing for paramedics [News]. [Internet]. 2018 Apr 3 [cited 2021 Aug 27]. Available from: <https://www.hcpc-uk.org/news-and-events/news/2018/independent-and-supplementary-prescribing-for-paramedics/>

129. Equity and Excellence: Liberating the NHS [Internet]. Cm 7881. London: HMSO: 2010. [cited 2015 Jul 27]. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/213823/dh_117794.pdf

130. Health and Social Care Act 2012, c7. London: The Stationery Office; 2012.

131. Budget 2010 [Internet]. HC 61. London: The Stationery Office: 2010. [cited 2018 Oct 12]. Available from: http://webarchive.nationalarchives.gov.uk/20121003045351/http://www.direct.gov.uk/prod_consum_dg/groups/dg_digitalassets/@dg/@en/documents/digitalasset/dg_188581.pdf

132. Office for National Statistics. The 2008 recession 10 years on. [Internet]. 2018 Apr 30 [cited 2019 Sep 30]. Available from: <https://www.ons.gov.uk/economy/grossdomesticproductgdp/articles/the2008recession10years/2018-04-30>

133. Stoye G. Does the NHS need more money and how could we pay for it? [Internet]. London: The Health Foundation, The Institute for Fiscal Studies, The King's Fund and the Nuffield Trust; 2018. [Accessed 2018 Oct 15]. Available from:

https://www.kingsfund.org.uk/sites/default/files/2018-06/NHS_at_70_does_the_NHS_need_more_money.pdf

134. Advisory Council on the Misuse of Drugs. Annual Report: Accounting Year 2007 - 2008. [Internet]. London: The Stationery Office; 2008. [Accessed 2018 Oct 15]. Available from:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/119127/annualreport.pdf.

135. General Pharmaceutical Council. In practice: Guidance for pharmacist prescribers. London: General Pharmaceutical Council; 2019. [Accessed 2021 Apr 23]. Available from: <https://www.pharmacyregulation.org/sites/default/files/document/in-practice-guidance-for-pharmacist-prescribers-february-2020.pdf>

136. Cordina M, Lauri M-A, Buttigieg R, Lauri J. Personality traits of pharmacy and medical students throughout their course of studies. *Pharmacy practice*. 2015;13(4):640-.

137. Department of Health. Report of the advisory group on nurse prescribing (Crown Report). London: HMSO; 1989.

138. Department of Health. Outcome of the consultation exercise on proposals for regularising the position of those mixing and administering medicines in palliative care [Internet]. London: Department of Health; 2008. [cited 2018 Oct 29]. Available from: <http://webarchive.nationalarchives.gov.uk/20141206164734/http://www.mhra.gov.uk/home/groups/es-policy/documents/publication/con051813.pdf>

139. Moher D, Shamseer L, Clarke M, Ghersi D, Liberati A, Petticrew M, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Systematic Reviews*. 2015;4(1):1-9.

140. Tong A, Flemming K, McInnes E, Oliver S, Craig J. Enhancing transparency in reporting the synthesis of qualitative research: ENTREQ. *BMC Med Res Methodol*. 2012;12(1):181.

141. Hannes K. Chapter 4: Critical appraisal of qualitative research. 2011. In: *Supplementary Guidance for Inclusion of Qualitative Research in Cochrane Systematic Reviews of Interventions* [Internet]. Cochrane Collaboration Qualitative Methods Group,. Version 1. [cited 2018 Feb 6]. Available from: <http://cqrmg.cochrane.org/supplemental-handbook-guidance>

142. Shaw RL, Booth A, Sutton AJ, Miller T, Smith JA, Young B, et al. Finding qualitative research: an evaluation of search strategies. *BMC Med Res Methodol*. 2004;4(5):5.

143. EPPI-Centre. EPPI-Centre Methods for Conducting Systematic Reviews. [Internet]. London: Evidence for Policy and Practice Information and Co-ordinating Centre; Updated 2010. [Accessed 2015 Jul 27]. Available from: <http://eppi.ioe.ac.uk/cms/LinkClick.aspx?fileticket=hQBu8y4uVwl=&tabid=1919&mid=6163>

144. Boutron I, Page MJ, Higgins JPT, Altman DG, Lundh A, Hróbjartsson A. Chapter 7: Considering bias and conflicts of interest among the included studies. 2019. In: *Cochrane Handbook for Systematic Reviews of Interventions* version 60 (updated July 2019) [Internet]. Cochrane, [cited 2019 Sep 15]. Available from: <http://www.training.cochrane.org/handbook>

145. Hannes K, Lockwood C, Pearson A. A comparative analysis of three online appraisal instruments' ability to assess validity in qualitative research. *Qual Health Res.* 2010;20(12):1736-43.
146. Sandelowski M, Voils CI, Barroso J. Defining and designing mixed research synthesis studies. *Res Sch.* 2006;13(1):29.
147. Hannes K, Macaitis K. A move to more systematic and transparent approaches in qualitative evidence synthesis: update on a review of published papers. *Qual Res.* 2012;12(4):402-42.
148. Tong A, Sainsbury P, Craig JC. Consolidated criteria for reporting qualitative research (COREQ) A 32-item checklist for interviews and focus groups. *Int J Qual Health Care.* 2007;19(6):349-57.
149. Sirriyeh R, Lawton R, Gardner P, Armitage G. Reviewing studies with diverse designs: the development and evaluation of a new tool. *J Eval Clin Pract.* 2012;18(4):746-52.
150. Ward JK, Armitage G. Can patients report patient safety incidents in a hospital setting? A systematic review. *BMJ Qual Saf.* 2012;21(8):685-99.
151. Wolfenden C, Wittkowski A, Hare DJ. Symptoms of Autism Spectrum Disorder (ASD) in Individuals with Mucopolysaccharide Disease Type III (Sanfilippo Syndrome): A Systematic Review. *J Autism Dev Disord.* 2017;47(11):3620-33.
152. Fenton L, Lauckner H, Gilbert R. The QATSDD critical appraisal tool: comments and critiques. *J Eval Clin Pract.* 2015;21(6):1125-8.
153. Noyes J, Lewin S. Supplemental Guidance on Selecting a Method of Qualitative Evidence Synthesis, and Integrating Qualitative Evidence with Cochrane Intervention Reviews. 2011. In: *Supplementary Guidance for Inclusion of Qualitative Research in Cochrane Systematic Reviews of Interventions* [Internet]. Cochrane Collaboration Qualitative Methods Group. Version 1 (updated August 2011). [cited 2015 Jul 27]. Available from: <http://cgrmg.cochrane.org/supplemental-handbook-guidance>
154. Thomas J, Harden A. Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Med Res Methodol.* 2008;8:45.
155. Bewley T. Preparation for non medical prescribing: a review. *Paediatr Nurs.* 2007;19(5):23-6.
156. Mulholland PJ. Pharmacists as non-medical prescribers: what role can they play? The experience in a neonatal intensive care unit. *Eur J Hosp Pharm-Sci Pract.* 2014;21(6):335-8.
157. Mundt-Leach R. Non-medical prescribing by specialist addictions nurses. *Mental Health Practice.* 2012;16(3):28-31.
158. Adigwe OP. Non-medical prescribing in chronic non-malignant pain [PhD thesis]. Leeds: University of Leeds; 2012.
159. Bowskill D. The integration of nurse prescribing: case studies in primary and secondary care [DHSci thesis]. Nottingham: University of Nottingham; 2009.

160. Dapar MP. An investigation of the structures and processes of pharmacist prescribing in Great Britain: a mixed methods approach [PhD thesis]. Aberdeen: Robert Gordon University; 2012.
161. Maddox C. Influences on non-medical prescribing: nurse and pharmacist prescribers in primary and community care [PhD thesis]. Manchester: University of Manchester; 2011.
162. Armstrong A. Staff and patient views on nurse prescribing in the urgent-care setting. *Nurse Prescribing*. 2015;13(12):614-9.
163. Bennett J, Jones M. Nurse prescribing in HIV: opportunities and threats. *HIV Nursing*. 2008;8(4):12-6.
164. Bowskill D, Timmons S, James V. How do nurse prescribers integrate prescribing in practice: case studies in primary and secondary care. *J Clin Nurs*. 2013;22(13-14):2077-86.
165. Carey N, Stenner K, Courtenay M. Adopting the prescribing role in practice: exploring nurses' views in a specialist children's hospital. *Paediatr Nurs*. 2009;21(9):25-9.
166. Carey N, Stenner K, Courtenay M. Views on implementing nurse prescribing in a specialist children's hospital. *Nurse Prescribing*. 2009;7(5):205-10.
167. Carey N, Stenner K, Courtenay M. Stakeholder views on the impact of nurse prescribing on dermatology services. *J Clin Nurs*. 2010;19(3-4):498-506.
168. Carey N, Stenner K, Courtenay M. An exploration of how nurse prescribing is being used for patients with respiratory conditions across the east of England. *BMC Health Serv Res*. 2014;14:13.
169. Courtenay M, Carey N. Nurse independent prescribing and nurse supplementary prescribing practice: national survey. *J Adv Nurs*. 2008;61(3):291-9.
170. Courtenay M, Carey N. Nurse prescribing by children's nurses: views of doctors and clinical leads in one specialist children's hospital. *J Clin Nurs*. 2009;18(18):2668-75.
171. Cousins R, Donnell C. Nurse prescribing in general practice: a qualitative study of job satisfaction and work-related stress. *Family Practice*. 2012;29(2):223-7.
172. Daughtry J, Hayter M. A qualitative study of practice nurses' prescribing experiences. *Practice Nursing*. 2010;21(6):310-4.
173. Downer F, Shepherd CK. District nurses prescribing as nurse independent prescribers. *Br J Community Nurs*. 2010;15(7):348-52.
174. Herklots A, Baileff A, Latter S. Community matrons' experience as independent prescribers. *Br J Community Nurs*. 2015;20(5):217-23.
175. Kelly A, Neale J, Rollings R. Barriers to extended nurse prescribing among practice nurses. *Community Pract*. 2010;83(1):21-4.
176. Oldknow H, Bottomley J, Lawton M. Independent nurse prescribing for older people's mental health. *Nurse Prescribing*. 2010;8(2):66-9.

177. Oldknow H, Gillibrand W. Non-prescribing, non-medical prescribers: a qualitative exploratory enquiry - preliminary findings. *Mental Health Nursing*. 2013;33(4):10-3.
178. Ross JD, Kettles AM. Mental health nurse independent prescribing: what are nurse prescribers' views of the barriers to implementation? *J Psychiatr Ment Health Nurs*. 2012;19(10):916-32.
179. Stenner K, Carey N, Courtenay M. Implementing nurse prescribing: a case study in diabetes. *J Adv Nurs*. 2010;66(3):522-31.
180. Stenner K, Courtenay M. A qualitative study on the impact of legislation on prescribing of controlled drugs by nurses. *Nurse Prescribing*. 2007;5(6):257-61.
181. Stenner K, Courtenay M. Benefits of nurse prescribing for patients in pain: nurses' views. *J Adv Nurs*. 2008;63(1):27-35.
182. Stenner K, Courtenay M. The role of inter-professional relationships and support for nurse prescribing in acute and chronic pain. *J Adv Nurs*. 2008;63(3):276-83.
183. Hill DR, Conroy S, Brown RC, Burt GA, Campbell D. Stakeholder views on pharmacist prescribing in addiction services in NHS Lanarkshire. *J Subst Use*. 2014;19(1-2):56-67.
184. McCann L, Lloyd F, Parsons C, Gormley G, Haughey S, Crealey G, et al. "They come with multiple morbidities": A qualitative assessment of pharmacist prescribing. *J Interprof Care*. 2012;26(2):127-33.
185. Brodie L, Donaldson J, Watt S. Non-medical prescribers and benzodiazepines: a qualitative study. *Nurse Prescribing*. 2014;12(7):353-9.
186. Green B, Courtney H. Evaluating the investment: a survey of non-medical prescribing. *Mental Health Practice*. 2008;12(1):28-32.
187. Maddox C, Halsall D, Hall J, Tully MP. Factors influencing nurse and pharmacist willingness to take or not take responsibility for non-medical prescribing. *Res Social Adm Pharm*. 2016;12(1):41-55.
188. Ross JD. Mental health nurse prescribing: the emerging impact. *J Psychiatr Ment Health Nurs*. 2015;22(7):529-42.
189. Courtenay M, Carey N, Stenner K. Non medical prescribing leads views on their role and the implementation of non medical prescribing from a multi-organisational perspective. *BMC Health Serv Res*. 2011;11:142.
190. Dobel-Ober D, Brimblecombe N, Bradley E. Nurse prescribing in mental health: national survey. *J Psychiatr Ment Health Nurs*. 2010;17(6):487-93.
191. Maclure K, George J, Diack L, Bond C, Cunningham S, Stewart D. Views of the Scottish general public on non-medical prescribing. *Int J Clin Pharm*. 2013;35(5):704-10.
192. McCann LM, Haughey SL, Parsons C, Lloyd F, Crealey G, Gormley GJ, et al. A patient perspective of pharmacist prescribing: 'crossing the specialisms-crossing the illnesses'. *Health Expect*. 2015;18(1):58-68.

193. Shannon E, Spence W. The attitudes and views of GPs and physicians to prescribing by heart failure nurse specialists. *British Journal of Cardiac Nursing*. 2011;6(9):450-5.
194. Stenner KL, Courtenay M, Carey N. Consultations between nurse prescribers and patients with diabetes in primary care: A qualitative study of patient views. *Int J Nurs Stud*. 2011;48(1):37-46.
195. Courtenay M, Carey N, Stenner K. Nurse prescriber-patient consultations: a case study in dermatology. *J Adv Nurs*. 2009;65(6):1207-17.
196. Dornan T, Ashcroft D, Heathfield H, Lewis P, Miles J, Taylor D, et al. An in depth investigation into causes of prescribing errors by foundation trainees in relation to their medical education. EQUIP study - final report. [Internet]. London: General Medical Council; 2009. [Accessed 2015 Jul 27]. Available from: https://www.gmc-uk.org/-/media/documents/final-report-prevalence-and-causes-of-prescribing-errors_pdf-28935150.pdf
197. Nursing and Midwifery Council. Annual Report and Accounts 2016–2017 and Strategic Plan 2017–2018. [Internet]. London: Nursing and Midwifery Council; 2017. Report No.: HC 154. [Accessed 2018 Feb 20]. Available from: https://www.nmc.org.uk/globalassets/sitedocuments/annual_reports_and_accounts/annual-report-and-accounts-2016-2017.pdf
198. Murphy MK, Black NA, Lamping DL, McKee CM, Sanderson CF, Askham J, et al. Consensus development methods, and their use in clinical guideline development. *Health Technol Assess*. 1998;2(3):i-iv, 1-88.
199. Campbell SM, Cantrill JA. Consensus methods in prescribing research. *J Clin Pharm Ther*. 2001;26(1):5-14.
200. McMillan SS, King M, Tully MP. How to use the nominal group and Delphi techniques. *Int J Clin Pharm*. 2016;38(3):655-62.
201. Fitch K, Bernstein SJ, Aguilar MaD, Burnand B, LaCalle JRn, Lázaro P, et al. The RAND/UCLA Appropriateness Method User's Manual. Santa Monica,: RAND; 2001.
202. Jones J, Hunter D. Consensus methods for medical and health services research. *BMJ*. 1995;311(7001):376-80.
203. Hasson F, Keeney S. Enhancing rigour in the Delphi technique research. *Technol Forecast Soc Change*. 2011;78(9):1695-704.
204. Keeney S, Hasson F, McKenna H. The Delphi technique in nursing and health research. 1 ed. Chichester: Wiley-Blackwell; 2011.
205. von der Gracht HA. Consensus measurement in Delphi studies: Review and implications for future quality assurance. *Technol Forecast Soc Change*. 2012;79(8):1525-36.
206. Hasson F, Keeney S, McKenna H. Research guidelines for the Delphi survey technique. *J Adv Nurs*. 2000;32(4):1008-15.

207. Hsu C-C, Sandford BA. The Delphi Technique: Making Sense Of Consensus. *Pract Assess Res.* 2007;12(10).
208. Boulkedid R, Abdoul H, Loustau M, Sibony O, Alberti C. Using and reporting the Delphi method for selecting healthcare quality indicators: a systematic review. *PLoS ONE.* 2011;6(6):e20476.
209. Leece P, Bhandari M, Sprague S, Swiontkowski MF, Schemitsch EH, Tornetta P, et al. Internet Versus Mailed Questionnaires: A Controlled Comparison (2). *J Med Internet Res.* 2004;6(4):e39.
210. McMaster HS, LeardMann CA, Speigle S, Dillman DA, Stander V, Pflieger J, et al. An experimental comparison of web-push vs. paper-only survey procedures for conducting an in-depth health survey of military spouses. *BMC Med Res Methodol.* 2017;17(1):73.
211. Loomis DK, Paterson S. A comparison of data collection methods: Mail versus online surveys. *J Leis Res.* 2018;49(2):133-49.
212. Hung HL, Altschuld JW, Lee YF. Methodological and conceptual issues confronting a cross-country Delphi study of educational program evaluation. *Evaluation and Program Planning.* 2008;31(2):191-8.
213. Ritchie J, Lewis J, Elam G, Tennant R, Rahim N. Designing and selecting samples. In: Ritchie J, Lewis J, Nicholls CM, Ormston R, editors. *Qualitative Research Practice.* 2 ed. London: Sage Publications Ltd; 2014. p. 111-45.
214. Palinkas LA, Horwitz SM, Green CA, Wisdom JP, Duan N, Hoagwood K. Purposeful Sampling for Qualitative Data Collection and Analysis in Mixed Method Implementation Research. *Adm Policy Ment Health.* 2015;42(5):533-44.
215. Keeney S, Hasson F, McKenna H. Consulting the oracle: ten lessons from using the Delphi technique in nursing research. *J Adv Nurs.* 2006;53(2):205-12.
216. Proctor S, Hunt M. Using the Delphi survey technique to develop a professional definition of nursing for analysing nursing workload. *J Adv Nurs.* 1994;19:1003-14.
217. Schmidt RC. Managing Delphi Surveys Using Nonparametric Statistical Techniques. *Decis Sci.* 1997;28(3):763-74.
218. Hsieh H-F, Shannon SE. Three Approaches to Qualitative Content Analysis. *Qual Health Res.* 2005;15(9):1277-88.
219. Elo S, Kääriäinen M, Kanste O, Pölkki T, Utriainen K, Kyngäs H. Qualitative Content Analysis: A Focus on Trustworthiness. *SAGE Open.* 2014;4(1):2158244014522633.
220. Vaismoradi M, Turunen H, Bondas T. Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. *Nurs Health Sci.* 2013;15(3):1442-2018.
221. Pope C, Mays N, Popay J. Synthesizing qualitative and quantitative health evidence: a guide to methods. Maidenhead, England: Open University Press, McGraw Hill Education; 2007.

222. McColl E, Jacoby A, Thomas L, Soutter J, Bamford C, Steen N, et al. Design and use of questionnaires: a review of best practice applicable to surveys of Health Service staff and patients. *Health Technol Assess*. 2001;5(31):1-256.
223. Rushton AB, Fawkes CA, Carnes D, Moore AP. A modified Delphi consensus study to identify UK osteopathic profession research priorities. *Manual Ther*. 2014;19(5):445-52.
224. Wiangkham T, Duda J, Haque MS, Rushton A. Development of an active behavioural physiotherapy intervention (ABPI) for acute whiplash-associated disorder (WAD) II management: A modified Delphi study. *BMJ Open*. 2016;6 (9) (no pagination)(e011764):e011764.
225. Diamond IR, Grant RC, Feldman BM, Pencharz PB, Ling SC, Moore AM, et al. Defining consensus: A systematic review recommends methodologic criteria for reporting of Delphi studies. *J Clin Epidemiol*. 2014;67(4):401-9.
226. Zambaldi M, Beasley I, Rushton A. Return to play criteria after hamstring muscle injury in professional football: a Delphi consensus study. *BJSM online*. 2017;51(16):1221-6.
227. Hicks CM. *Research Methods for Clinical Therapists: Applied project design and analysis*. 5 ed. London: Churchill Livingstone; 2009.
228. Holey EA, Feeley JL, Dixon J, Whittaker VJ. An exploration of the use of simple statistics to measure consensus and stability in Delphi studies. *BMC Med Res Methodol*. 2007;7(1):52.
229. Jünger S, Payne SA, Brine J, Radbruch L, Brearley SG. Guidance on Conducting and REporting DElphi Studies (CREDES) in palliative care: Recommendations based on a methodological systematic review. *Palliat Med*. 2017;31(8):684-706.
230. Weiss MC, Sutton J, Adams C. Exploring innovation in pharmacy practice: A qualitative evaluation of supplementary prescribing by pharmacists. London: The Royal Pharmaceutical Society of Great Britain; 2006. [Accessed 2015 Jul 27]. Available from: [https://pharmacyresearchuk.org/wp-content/uploads/2012/11/Exploring innovation in pharmacy practice supplementary pre scribing.pdf](https://pharmacyresearchuk.org/wp-content/uploads/2012/11/Exploring_innovation_in_pharmacy_practice_supplementary_prescribing.pdf)
231. Courtenay M, Carey N, Burke J. Independent extended and supplementary nurse prescribing practice in the UK: a national questionnaire survey. *Int J Nurs Stud*. 2007;44(7):1093-101.
232. Hacking S, Taylor J. An evaluation of the scope and practice of Non Medical Prescribing in the North West: For NHS North West. [Internet]. NHS North West; 2010. [Accessed 2017 Mar 28]. Available from: https://www.researchgate.net/publication/228406352_An_evaluation_of_the_scope_and_practice_of_Non_Medical_Prescribing_in_the_North_West_For_NHS_North_West
233. Part XVIIIB(ii) - Non-Medical Independent Prescribing (Nurses, Pharmacists, Optometrists, Physiotherapists and Chiropodists/Podiatrists). 2020. In: *Electronic Drug Tariff* [Internet]. NHS Business Services Authority, NHS Prescription Services, [cited 2020 Apr 27]. Available from: [http://www.drugtariff.nhsbsa.nhs.uk/#/00782291-DD/DD00781684/Part%20XVIIIB\(ii\)%20-%20Non-](http://www.drugtariff.nhsbsa.nhs.uk/#/00782291-DD/DD00781684/Part%20XVIIIB(ii)%20-%20Non-)

Medical%20Independent%20Prescribing%20(Nurses,%20Pharmacists,%20Optometrists,%20Physiotherapists%20and%20Chiropodists%20Podiatrists).

234. Malterud K. Qualitative research: standards, challenges, and guidelines. *The Lancet*. 2001;358(9280):483-8.
235. Herodotus. *The Histories*. de Sélincourt A, Translator. London: Penguin Classics; 1972.
236. Holland T. *Persian Fire*. London: Abacus; 2006.
237. Graham-Clarke E, Rushton A, Marriott J. A Delphi study to explore and gain consensus regarding the most important barriers and facilitators affecting physiotherapist and pharmacist non-medical prescribing. *PLoS ONE*. 2021;16(2):e0246273.
238. British Foreign Policy Group. COVID-19 Timeline. [Internet]. 2021 [updated 24 August 2021; cited 2021 Aug 26]. Available from: <https://bfpgrp.co.uk/2020/04/covid-19-timeline/>
239. World Health Organization G. Timeline: WHO's COVID-19 response. World Health Organization, Geneva; [updated 16 April 2021. Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/interactive-timeline#!>
240. Institute for Government. Timeline of UK government coronavirus lockdowns. [Internet]. 2021 [updated 2021 Jun; cited 2021 Aug 3]. Available from: <https://www.instituteforgovernment.org.uk/charts/uk-government-coronavirus-lockdowns>
241. NHS England, NHS Improvement, Health Education England. Advice on acute sector workforce models during COVID-19. [Internet]. London: NHS England; 2020. Contract No.: 001559. [Accessed 2021 Aug 26]. Available from: https://www.england.nhs.uk/coronavirus/wp-content/uploads/sites/52/2020/12/C0833_advice-on-acute-sector-workforce-models-during-COVID-with-apps_10dec.pdf
242. NHS England. New NHS nightingale hospital to fight coronavirus [News]. [Internet]. 2020 [updated 24 March 2020; cited 2021 Aug 26]. Available from: <https://www.england.nhs.uk/2020/03/new-nhs-nightingale-hospital-to-fight-coronavirus/>
243. Peat G, Rodriguez A, Smith J. Interpretive phenomenological analysis applied to healthcare research. *Evid Based Nurs*. 2019;22(1):7-9.
244. Finch H, Lewis J, Turley C. Focus Groups. In: Ritchie J, Lewis J, Nicholls CM, Ormston R, editors. *Qualitative Research Practice*. 2 ed. London: Sage Publications Ltd; 2014. p. 211-42.
245. Hennink MM. Introduction to focus group research. 2007. In: *International Focus Group Research: A Handbook for the Health and Social Sciences* [Internet]. Cambridge: Cambridge University Press, [cited 2019 May 18]; [1-17]. Available from: <https://www.cambridge.org/core/books/international-focus-group-research/introduction-to-focus-group-research/CE2C6D772805302A6A522DB57EB3CF6F>
246. Hennink MM, Kaiser BN, Weber MB. What Influences Saturation? Estimating Sample Sizes in Focus Group Research. *Qual Health Res*. 2019;29(10):1483-96.

247. Guest G, Namey E, McKenna K. How Many Focus Groups Are Enough? Building an Evidence Base for Nonprobability Sample Sizes. *Field Methods*. 2017;29(1):3-22.
248. Hennink MM. Number of groups and group size. 2007. In: *International Focus Group Research: A Handbook for the Health and Social Sciences* [Internet]. Cambridge: Cambridge University Press, [cited 2019 May 18]; [135-51]. Available from: <https://www.cambridge.org/core/books/international-focus-group-research/number-of-groups-and-group-size/B1AF4CD1C4FFC1E76ED55B1240AD82C4>
249. Hennink MM. Conducting the group discussion. 2007. In: *International Focus Group Research: A Handbook for the Health and Social Sciences* [Internet]. Cambridge: Cambridge University Press, [cited 2019 May 18]; [165-92]. Available from: <https://www.cambridge.org/core/books/international-focus-group-research/conducting-the-group-discussion/626BE4ACD9373F43DAE93180A015488D>
250. Ritchie J, Spencer L. Qualitative data analysis for applied policy research. In: Bryman A, Burgess RG, editors. *Analyzing Qualitative Data*: Taylor & Francis Books Ltd; 1994. p. 173-94.
251. Arthur S, Mitchell M, Lewis J, Nicholls CM. Designing fieldwork. In: Ritchie J, Lewis J, Nicholls CM, Ormston R, editors. *Qualitative Research Practice*. 2 ed. London: Sage Publications Ltd; 2014. p. 147-76.
252. Hennink MM. Preparing the discussion guide. 2007. In: *International Focus Group Research: A Handbook for the Health and Social Sciences* [Internet]. Cambridge: Cambridge University Press, [cited 2019 May 18]; [44-74]. Available from: <https://www.cambridge.org/core/books/international-focus-group-research/preparing-the-discussion-guide/272C7D90652E176981BE617EE682DF8A>
253. World Health Organisation. Coronavirus disease (COVID-19) advice for the public. [Internet]. 2021 [updated 2021 May 12; cited 2021 May 17]. Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public>
254. Rupert DJ, Poehlman JA, Hayes JJ, Ray SE, Moultrie RR. Virtual Versus In-Person Focus Groups: Comparison of Costs, Recruitment, and Participant Logistics. *J Med Internet Res*. 2017;19(3):e80-e.
255. Hill JC, Patterson C. Assessment from a Distance: A Case Study Implementing Focus Groups at an Online Library. *College & Undergraduate Libraries*. 2013;20(3-4):399-413.
256. Onwuegbuzie AJ, Dickinson WB, Leech NL, Zoran AG. A Qualitative Framework for Collecting and Analyzing Data in Focus Group Research. *Int J Qual Methods*. 2009;8(3):1-21.
257. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol*. 2006;3(2):77-101.
258. General Pharmaceutical Council. What does a pharmacist do? [Internet]. (no date) [cited 2021 May 10]. Available from: <https://www.pharmacyregulation.org/raising-concerns/raising-concerns-about-pharmacy-professional/what-expect-your-pharmacy/what-does-0>

259. Baqir W, Crehan O, Murray R, Campbell D, Copeland R. Pharmacist prescribing within a UK NHS hospital trust: nature and extent of prescribing, and prevalence of errors. *Eur J Hosp Pharm-Sci Pract.* 2015;22(2):79-82.
260. Department of Health. The Musculoskeletal Services Framework - A joint responsibility: doing it differently. [Internet]. London: The Stationery Office; 2006. [Accessed 2015 Apr 04]. Available from: http://webarchive.nationalarchives.gov.uk/20130124073659/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4138412.pdf
261. The Misuse of Drugs (Amendment) (No. 2) (England, Wales and Scotland) Regulations 2015, 891. London: The Stationery Office; 2015.
262. The Human Medicines Regulations 2012, 1916. London: The Stationery Office; 2012.
263. National Institute for Health and Care Excellence. Chronic pain (primary and secondary) in over 16s: assessment of all chronic pain and management of chronic primary pain. [Internet]. 2021 [updated 7 April 2021; cited 2021 May 10]. Available from: <https://www.nice.org.uk/guidance/ng193>
264. General Pharmaceutical Council. Standards for the initial education and training of pharmacists. [Internet]. London: General Pharmaceutical Council; 2021. [Accessed 2021 Apr 13]. Available from: <https://www.pharmacyregulation.org/sites/default/files/document/standards-for-the-initial-education-and-training-of-pharmacists-january-2021.pdf>
265. Lord Carter of Coles. Operational productivity and performance in English NHS acute hospitals: Unwarranted variations. [Internet]. London: The Stationery Office; 2016. [Accessed 2016 Feb 5]. Available from: <https://www.gov.uk/government/publications/productivity-in-nhs-hospitals>
266. The Human Medicines (Amendment) Regulations 2016, 186. The Stationery Office; 2016.
267. The Human Medicines (Amendment) Regulations 2018, 64. London: The Stationery Office; 2018.
268. The National Health Service (Paramedic Independent Prescriber and Paramedic Supplementary Prescriber) (Wales) (Miscellaneous Amendments) Regulations 2019, No. 149 (W. 34). London: The Stationery Office; 2019.
269. Department of Health and Social Care. Intergration and Innovation: working together to improve health and social care for all [Internet]. CP 381. London: The Stationery Office; 2021. [cited 2021 Sep 10]. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/960548/integration-and-innovation-working-together-to-improve-health-and-social-care-for-all-web-version.pdf
270. PM speech on the NHS: 18 June 2018 [Internet]. London: Prime Minister's Office, 10 Downing Street; 2018 [cited 2021 Sep 10]. Available from: <https://www.gov.uk/government/speeches/pm-speech-on-the-nhs-18-june-2018>

271. Spending Round 2019: what you need to know [Internet]. London: HM Treasury; 2019 [cited 2021 Sep 10]. Available from: <https://www.gov.uk/government/news/spending-round-2019-what-you-need-to-know>
272. PM statement to the House of Commons on health and social care: 7 September 2021 [Internet]. London: Prime Minister's Office, 10 Downing Street; 2021 [cited 2021 Sep 10]. Available from: <https://www.gov.uk/government/speeches/pm-statement-to-the-house-of-commons-on-health-and-social-care-7-september-2021>
273. The NHS budget and how it has changed [Internet]. London: The King's Fund; 2021 [updated 2021 Mar 24; cited 2021 Sep 10]. Available from: <https://www.kingsfund.org.uk/projects/nhs-in-a-nutshell/nhs-budget>
274. The King's Fund. NHS workforce: our position [Internet]. London: The King's Fund; 2021 [updated 2021 Feb 26; cited 2021 Sep 13]. Available from: <https://www.kingsfund.org.uk/projects/positions>
275. NHS England. We are the NHS: People Plan 2020/21 - action for us all. [Internet]. London; 2020. Report No.: 0067. [Accessed 2021 Sep 13]. Available from: <https://www.england.nhs.uk/wp-content/uploads/2020/07/We-Are-The-NHS-Action-For-All-Of-Us-FINAL-March-21.pdf>.
276. Thurmond VA. The Point of Triangulation. J Nurs Scholarsh. 2001;33(3):253-8.
277. Heale R, Forbes D. Understanding triangulation in research. Evid Based Med [Internet]. 2013 [cited 2021 Sep 10]; 16(4). Available from: <https://ebn.bmj.com/content/ebnurs/16/4/98.full.pdf>
278. Noble H, Heale R. Triangulation in research, with examples. Evid Based Nurs. 2019;22(3):67-8.
279. Stenner K, Carey N, Courtenay M. Nurse prescribing in dermatology: doctors' and non-prescribing nurses' views. J Adv Nurs. 2009;65(4):851-9.
280. Pharmacist Independent Prescribers. [Internet]. London: The Royal Pharmaceutical Society; 2018. [Accessed 2021 Sep 22]. Available from: <https://www.rpharms.com/Portals/0/RPS%20document%20library/Open%20access/Policy/GB%20Prescriber%20Policy%20-FINAL.pdf?ver=2018-08-07-152908-900>
281. Pharmacist Independent Prescribing [Internet]. London: Royal Pharmaceutical Society;; 2021 [updated 2021 Apr 21; cited 2021 Sep 22]. Available from: <https://www.rpharms.com/recognition/all-our-campaigns/pharmacist-prescribing>
282. Revising the education and training requirements for pharmacist independent prescribers [Internet]. London: General Pharmaceutical Council; 2021 [updated 2021 Sep 27; cited 2021 Sep 28]. Available from: <https://www.pharmacyregulation.org/sites/default/files/document/gphc-revising-education-training-requirements-pharmacist-independent-prescribers-sept-2021.pdf>
283. NHS England. Multi-professional framework for advanced clinical practice in England. [Internet]. London: NHS England; 2017. [Accessed 2021 Sep 23]. Available from:

<https://www.hee.nhs.uk/sites/default/files/documents/multi-professionalframeworkforadvancedclinicalpracticeinengland.pdf>

284. NHS England. The NHS Long Term Plan. [Internet]. London: NHS England; 2019. [Accessed 2021 Sep 23]. Available from: <https://www.longtermplan.nhs.uk/wp-content/uploads/2019/08/nhs-long-term-plan-version-1.2.pdf>

APPENDICES

Appendix 8.1 Published paper: Chapter 2

Graham-Clarke E, Rushton A, Noblet T, Marriott J. Non-medical prescribing in the United Kingdom National Health Service: A systematic policy review. PLoS ONE [Internet]. 2019; 14(7): e0214630

Available from: <https://doi.org/10.1371/journal.pone.0214630>.



RESEARCH ARTICLE

Non-medical prescribing in the United Kingdom National Health Service: A systematic policy review

Emma Graham-Clarke^{1*}, Alison Rushton², Timothy Noblet^{2,3}, John Marriott¹

1 School of Pharmacy, Institute of Clinical Sciences, College of Medical and Dental Sciences, University of Birmingham, Birmingham, United Kingdom, **2** Centre of Precision Rehabilitation for Spinal Pain, School of Sport, Exercise and Rehabilitation Sciences, College of Life and Environmental Sciences, University of Birmingham, Birmingham, United Kingdom, **3** Physiotherapy Department, St George's University Hospitals NHS Foundation Trust, London, United Kingdom



Abstract

Introduction

Non medical prescribing was introduced into the United Kingdom (UK) to improve patient care, through extending healthcare professionals' roles. More recent government health service policy focuses on the increased demand and the need for efficiency. This systematic policy review aimed to describe any changes in government policy position and the role that non medical prescribing plays in healthcare provision.

Method

The systematic policy review included policy and consultation documents that describe independent non medical prescribing. A pre defined protocol was registered with PROSPERO (CRD42015019786). Professional body websites, other relevant websites and the following databases were searched to identify relevant documents: HMIC, Lexis Nexis, UK Government Web Archive, UKOP, UK Parliamentary Papers and Web of Science. Documents published between 2006 and February 2018 were included.

Results and discussion

Following exclusions, 45 documents were selected for review; 23 relating to policy or strategy and 22 to consultations. Of the former, 13/23 were published 2006–2010 and the remainder since 2013. Two main themes were identified: chronological aspects and health care provision. In the former, a publication gap for policy documents resulted from a change in government and associated major healthcare service reorganisation. In the latter, the role of non medical prescribing was found to have evolved to support efficient service delivery, and cost reduction. For many professions, prescribing appears embedded into practice; however, the pharmacy profession continues to produce policy documents, suggesting that prescribing is not yet perceived as normal practice.

OPEN ACCESS

Citation: Graham-Clarke E, Rushton A, Noblet T, Marriott J (2019) Non medical prescribing in the United Kingdom National Health Service: A systematic policy review. PLoS ONE 14(7): e0214630. <https://doi.org/10.1371/journal.pone.0214630>

Editor: Sandra C. Buttigieg, University of Malta Faculty of Health Sciences, MALTA

Received: March 15, 2019

Accepted: July 9, 2019

Published: July 29, 2019

Copyright: © 2019 Graham-Clarke et al. This is an open access article distributed under the terms of the [Creative Commons Attribution License](https://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Data Availability Statement: All relevant data are within the paper and its Supporting Information files.

Funding: The author(s) received no specific funding for this work.

Competing interests: The authors have declared that no competing interests exist.

Conclusion

Prescribing appears to be more easily adopted into practice where it can form part of the overall care of the patient. Where new roles are required to be established, then prescribing takes longer to be universally adopted. While this review concerns policy and practice in the UK, the aspect of role adoption has wider potential implications.

Introduction

Nurse prescribing was introduced in the United States of America in the 1960's with gradual introduction into other countries since then [1]. In 2011 Kroezen et al [1] reviewed the nurse prescribing literature, identifying seven countries (Australia, Canada, Ireland, New Zealand, Sweden, United Kingdom, and United States of America) that had implemented nurse prescribing, with a further three countries where it was under consideration. They established that nurse prescribing was often subjected to a closed formulary or limited by the medical conditions treated, remaining subordinate to medical jurisdiction, with the United Kingdom (UK) and Ireland notable exceptions. Kroezen et al also commented that developments with regard to nurse prescribing were slow overall, apart from in the UK. Since that paper, the UK has pioneered the expansion of prescribing to other non-medical professions, providing a healthcare delivery model that could be utilised by other countries.

Traditionally, prescribing of human medicines had been perceived as a medical role, with only medical professionals and dentists having full prescribing rights in the UK. Two seminal reports challenged this view; the Cumberlege report [2] which paved the way for limited prescribing by health visitors and district nurses, and the Crown report [3], which recommended extending prescribing rights for the benefit of patients and to utilise the skills of healthcare professionals. The main UK healthcare provider, within which prescribers practice, is the National Health Service (NHS); established in 1948 to provide comprehensive healthcare to all, free at the point of delivery [4]. The UK also has a parallel smaller privately funded healthcare sector. Healthcare policy is directed by the UK government, reflecting the principles of the governing party at the time. Since 1948, this has been one of two main political parties (Labour, Conservative), apart from 2010–2015 when a Conservative and Liberal Democrat coalition was in power. As a general principle, Conservative governments tend to support free markets and expansion of the private sector, whereas Labour governments support the NHS over the private sector. Rising costs and changes in healthcare practice have led to numerous reforms since the NHS was founded but, irrespective of the political stance, the founding principles remain [4, 5].

In 2000 the governing Labour Party published a White Paper 'The NHS Plan', which described the government's intention to modernise healthcare services, breaking down the traditional demarcations between professions and introducing new ways of working to increase healthcare capacity, shorten waiting times, and thus improve the patient experience [6]. Nurse prescribing was highlighted as one of the 10 key roles defined by the Chief Nursing Officer and the White Paper also included broad reference to 'therapists' (a generic term covering the professions allied to health) extending their roles, with prescribing included within this [6]. To support these sweeping changes to traditional practice the government established the Modernisation Agency, tasked with supporting service redesign at a local level [7], and launched a consultation on extending nurse prescribing [8]. This was followed in 2002 by a consultation on the introduction of supplementary prescribing for nurses and pharmacists [9], with approval granted later that year [10].

Table 1. Comparison of independent and supplementary prescribing.

	Prescriber type	
	Independent	Supplementary
Accountable for care	✓	X
Assess the patient	✓	If required as part of the clinical management plan
Diagnose/confirm diagnosis	✓	X
Plan clinical management	✓	X
Prescribe	✓	✓
Range of medication	Any permitted by profession relevant legislation	Any medication or class of medication listed in the agreed clinical management plan and permitted by profession relevant legislation

<https://doi.org/10.1371/journal.pone.0214630.t001>

Supplementary prescribing is described as a voluntary partnership between the supplementary prescriber, the doctor looking after the patient, and the patient. The supplementary prescriber is then responsible for managing and prescribing the condition(s) and medication(s) listed in an agreed clinical management plan [11] but is unable to prescribe any other medication. The first supplementary nurse prescribers qualified in 2003, with pharmacists following in 2004. It quickly became apparent that supplementary prescribing, whilst ideal for complex and long-term conditions, had significant limitations with regard to acute care, hampering the government's desire to enhance patient care through expanding nurse and pharmacist roles and hence improving access to medication. This was articulated clearly in the consultation documents launched in 2005 to investigate expansion into independent prescribing [12, 13]. Unlike supplementary prescribers, independent prescribers are accountable for the care of the patient, including examination and prescribing; Table 1 gives an overview comparing supplementary and independent prescribing. In addition, the British National Formulary provides an overview of independent non-medical prescribing, including the restrictions that the various professions must abide by (<https://bnf.nice.org.uk/guidance/>) [14]. All non-medical prescribers are required to complete a certified training course, be registered with their professional regulator, and to only prescribe within their professional expertise and competence.

Legislation to implement independent prescribing by nurses and pharmacists was enacted in 2006 [15], and since that time independent prescribing rights have been gradually extended to a range of healthcare professionals, most recently paramedics [16]. Although non-medical prescribing (NMP) is the umbrella term used to cover all prescribing by professions other than doctors, in this paper it refers to independent non-medical prescribing only.

This paper refers to the activities and qualifications of non-medical professionals in the UK. As these may vary internationally, a brief resume of the UK position is given in Table 2. Prescribing forms part of advanced clinical practice, a loose definition that Health Education England describes as involving making complex decisions at a high level of autonomy and encompassing four components: clinical expertise, leadership, education, and research [17].

The initial focus of government policy with regard to NMP was the desire to improve patient access to medicines. However, more recent documents from NHS England have focused on the increased demand for services and the need to drive efficiency so that maximum benefit can be obtained from the limited NHS budget [18, 19]. The role of NMP has been less apparent in these later documents, and it is unclear if this reflects a change in government policy.

The aim was to conduct a systematic policy review investigating changes in UK Government policy position with regard to NMP, since the introduction of independent prescribing

Table 2. Brief resume of non medical professions.

Profession	Initial qualification	Regulator	Medically qualified	Core activities	Advanced practice examples	Further details on scope of practice available from:
Diagnostic radiographer	BSc	HCPC	No	Conduct imaging tests on patients using ionising and non ionising radiation. Use contrast agents or other medication where necessary for investigations	Interpretation and reporting on images Ultrasound guided biopsies	Society of Radiographers: https://www.sor.org
Nurse	BSc	NMC	No	Provide care for patients, assessing needs and delivering treatment plans	Work autonomously to manage a patient case load in a specialist area e.g. pain management Run nurse led minor injury clinics	Royal College of Nursing: https://www.rcn.org.uk
Optometrist	BSc	GOC	No	Test sight and examine eyes. Prescribe lenses. Detect ocular disease and abnormalities.	Diagnose, assess and manage (including prescribing) ophthalmic conditions for example glaucoma	The College of Optometrists: https://www.college-optometrists.org
Paramedic	Diploma, foundation degree, BSc, apprenticeship	HCPC	No	Assess, treat, stabilise and transfer patient to appropriate care centre	Diagnose and treat patients. Work in an urgent care centre, or GP practice to assess and treat patients	College of Paramedics: https://www.collegeofparamedics.co.uk
Pharmacist	MPharm	GPhC	No	Supply medicines to patients, ensuring that they are appropriate for the patient and of suitable quality. Provide medicines related advice	Work autonomously managing a patient case load in a specialist area e.g. renal failure, chronic pain Work in Emergency Departments to independently manage and treat patients.	General Pharmaceutical Council: https://www.pharmacyregulation.org Royal Pharmaceutical Society: https://www.rpharms.com
Physicians associate	Life sciences degree	No regulator Voluntary register held by Faculty of Physician Associates	No	Work alongside medical staff to care and treat patients (the nearest USA equivalent role is physician's assistant.)	Not applicable	Faculty of Physician Associates: https://www.fparcp.co.uk
Physiotherapist	BSc or MSc	HCPC	No	Use various techniques to enable patients to improve movement and function and manage pain.	Work independently to manage a patient caseload in a specialist area e.g. back pain or respiratory failure Utilise techniques such as acupuncture, steroid injections or botulinum toxin injections	Chartered Society of Physiotherapy: https://www.csp.org.uk
Podiatrist	BSc	HCPC	No	Diagnose and treat common foot problems	Conduct podiatric surgery Specialise in areas e.g. diabetes care or sports medicine; utilising techniques such as acupuncture and steroid injections	The College of Podiatry: https://cop.org.uk
Therapeutic radiographer	BSc	HCPC	No	Use radiotherapy to treat cancer patients.	Plan radiotherapy treatment Independently manage and treat patients throughout the course of their radiotherapy	Society of Radiographers: https://www.sor.org

BSc Bachelor of Science, MPharm Master of Pharmacy, MSc Master of Science, GOC General Optical Council, GPhC General Pharmaceutical Council, HCPC Health and Care Professions Council, NMC Nursing and Midwifery Council

<https://doi.org/10.1371/journal.pone.0214630.t002>

for nurses and pharmacists. The review also aimed to determine the current role of independent NMP in the delivery of healthcare in the NHS, providing a snapshot of a dynamic situation.

Method

Protocol and registration

A systematic policy review was conducted to explore the evolution of government policy concerning independent NMP in the UK. To ensure transparency and enhance rigour a pre-defined protocol was developed in line with the PRISMA-P statement [20] and registered with PROSPERO (CRD42015019786) (S1 Protocol). The results are reported following the PRISMA statement (S1 Appendix) [21].

Eligibility criteria

Documents describing policy concerning independent NMP in the UK were included. These included White and Green Papers, policy statements, consultation documents and reports. Documents published since 2006 were included, as the legislation permitting nurse and pharmacist independent prescribing was enacted in that year [15].

Information sources

Advice was taken regarding appropriate electronic databases and websites to search (listed in Table 3) and to aid development of search strategies. Broad search terms (e.g. prescribing, non-medical) were used to capture as wide a range of documents as possible. Boolean operators and truncation were used if the database supported them. Iterative and 'snowball' search techniques were employed [22], with the primary searches complete to the end of February 2018, and secondary searches conducted as necessary (S2 Appendix). Documents obtained were mapped to identify gaps (for example, documents relating to the consultation process or profession specific policy documents) enabling targeted secondary searches to be conducted. Relevant citations in the reviewed documents were also obtained and personal files searched [22]. Full texts of the selected documents were screened to remove those that did not meet the eligibility criteria.

Policy document selection

Two reviewers (EGC and TN) independently conducted each stage, resolving differences by discussion, with a third reviewer (AR) available if required for mediation [23]. Numbers excluded were recorded [21, 23].

Table 3. Databases and websites searched.

Databases and websites	Professional body websites
Google Scholar	Chartered Society of Physiotherapists
HMIC Ovid	College of Optometrists
Lexis Nexis	College of Paramedics
UK Government Web Archive	General Optical Council
UKOP (UK Official Publications)	General Pharmaceutical Council
UK Parliamentary Papers ProQuest	Health and Care Professions Council
Web of Science	Institute of Radiology
www.gov.uk	Nursing and Midwifery Council
www.health.ni.gov.uk	Royal College of Nursing
www.publications.scot.nhs.uk	Royal Pharmaceutical Society
www.scot.nhs.uk	The Association of Ambulance Chief Executives
www.wales.nhs.uk	The College of Podiatry
	The Royal College of Radiologists

<https://doi.org/10.1371/journal.pone.0214630.t003>

Data collection process and data items

Selected documents were entered into a Microsoft® Excel for Mac (version 16) spreadsheet. Home nation and professions covered by the reference were noted, and whether the reference related to policy or consultation. The full texts were read, and notes made of any reference to NMP, including the context.

Risk of bias assessment

Unlike research papers, whether qualitative or quantitative in nature, policy and consultation documents are not developed according to well-recognised principles. Risk of bias assessment is therefore not appropriate for this type of document and was not conducted. Policy documents are liable to be biased towards the ethos of the government in power at the time and documents produced by profession specific bodies towards their profession. The results are reported according to the relevant government era and, where appropriate, the specific professional body.

Data syntheses

Information from the selected documents underwent narrative synthesis with visual depictions, described as an appropriate approach for non-research documents [24–26]. Following tabulation and data extraction, the selected documents were grouped depending on whether they concerned policy or consultation. To aid this process and to visualise the time distribution they were also plotted on a timeline, with a further timeline developed for the consultation documents. Using these techniques, a narrative summary was able to be developed by one researcher (EGC), and the findings were then debated and critically assessed by all authors to reach agreement.

One of the authors (EGC) is a practising pharmacist independent prescriber and NMP lead for an acute trust. In this role they support other non-medical prescribers and have an interest in NMP developments. This researcher standpoint is balanced by the other authors, who do not have prescribing qualifications.

Results

Policy document selection and characteristics

The search strategy identified 99 full text articles to be assessed for inclusion. Following exclusions, 45 documents were included in the review (Fig 1).

Of the included documents, 23 relate to policy or strategic report documents (see Table 4), and 22 to the consultation process concerning extension of independent NMP responsibilities to various healthcare professions (see Table 5).

The policy and strategic report documents relate to a single profession (nursing 3, pharmacy 7), multiple professions (12), or generic NMP (one). The majority concern matters in the home nations (England 12, Scotland 4, Wales 3 and Northern Ireland 1) with only 3 concerning the United Kingdom. They can be divided into two chronological eras, with just over half published between 2006 and 2010, and the remainder published since 2013 (Fig 2).

Synthesis of results

The Labour Government era 2006–2010. Four of the early documents comprised guidance issued by the home nations to support NMP. These were released as the relevant regulations governing prescribing were amended to permit independent NMP. The first was released by the Department of Health in April 2006, coinciding with the initial changes in

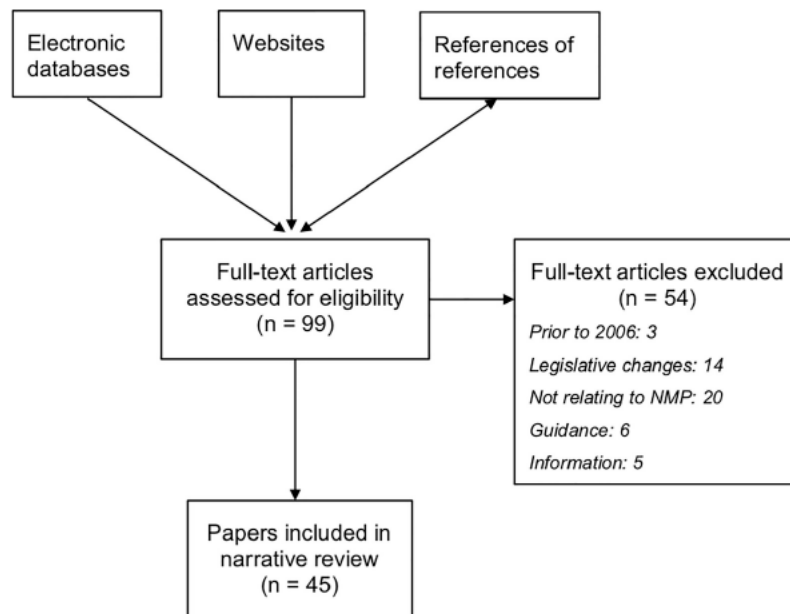


Fig 1. PRISMA paper selection flow diagram.

<https://doi.org/10.1371/journal.pone.0214630.g001>

legislation and regulations permitting independent prescribing by nurses and pharmacists [15, 27, 28]. This was followed by Scotland's guidance, released in July 2006, Northern Ireland's guidance in December 2006 and the Welsh guidance in 2007 [29–31]. All four documents are similar in nature; however, Scotland's relates to nurse prescribing only whereas the other three relate to nurse and pharmacist prescribing. This reflects the changes made by the home nations whereby England, Wales and Northern Ireland each introduced nurse and pharmacist independent prescribing simultaneously, whereas Scotland introduced nurse independent prescribing first, followed a year later by pharmacist independent prescribing. Although the bulk of these documents relates to practical implementation guidance, each states the core policy drivers behind NMP which were:

- improving patient care, without reducing safety
- making it easier to patients to access the medicines they require
- increasing patient choice
- utilising the skills of health professionals
- supporting team working

The Welsh guidance included the additional benefits of improving healthcare capacity and enhancing patient access for advice and services.

Table 4. Policy and strategic report documents.

Title	Source	Date	Home Nation	Professional Group								Brief overview of contents
				Nurse	Pharmacist	Physiotherapist	Podiatrist	Paramedic	Radiographer	Optometrist	AHP	
Improving Patients' Access to Medicines: A Guide to Implementing Nurse and Pharmacist Independent Prescribing within the NHS in England	Department of Health	Apr 06	England	Y	Y							Highlights aims of independent prescribing. Describes the scope of everything needed to implement independent prescribing.
Medicines Matters. A guide to mechanisms for the prescribing, supply and administration of medicines	Department of Health	Jul 06	United Kingdom	Y	Y					Y		Describes the prescribing, supply and administration of medicines, including the aims of the non medical prescribing program.
Guidance for Nurse Independent Prescribers and for Community Practitioner Nurse Prescribers in Scotland: A Guide for Implementation	Scottish Executive Health Department	Aug 06	Scotland	Y								Highlights aims of independent prescribing. Describes the scope of everything needed to implement independent prescribing.
Improving Patients' Access to Medicines: A Guide to Implementing Nurse and Pharmacist Independent Prescribing within the HPSS in Northern Ireland	Department of Health Social Services and Public Safety	Dec 06	Northern Ireland	Y	Y							Highlights aims of independent prescribing. Describes the scope of everything needed to implement independent prescribing.
The best medicine: the management of medicines in acute and specialist trusts	Commission for Healthcare Audit and Inspection	Jan 07	England	Y	Y							Covers all aspects of medicines management in secondary care. Includes a brief mention of non medical prescribing.
Mental Health: New Ways of Working for Everyone. Progress Report	Department of Health, National Institute for Mental Health in England National Workforce Programme	Apr 07	England	Y								Covers progress with developing New Ways of Working, and plans and strategies for further development. Describes how non medical prescribing will support these changes in practice.

(Continued)

Table 4. (Continued)

Title	Source	Date	Home Nation	Professional Group									Brief overview of contents
				Nurse	Pharmacist	Physiotherapist	Podiatrist	Paramedic	Radiographer	Optometrist	AHP	NMP	
Non medical prescribing in Wales A guide for implementation	Welsh Assembly Government	Jul 07	Wales	Y	Y								Highlights aims of independent prescribing Describes the scope of everything needed to implement independent prescribing
New Ways of Working for Everyone: A best practice implementation guide	Department of Health, National Institute for Mental Health in England National Workforce Programme	Oct 07	England									Y	Provides guidance on implementing New Ways of Working, using theoretical examples to illustrate points Examples include the use of non medical prescribing
Consultation on A Safe Prescription: Developing Nurse, Midwife and Allied Health Profession (NMAHP) Prescribing in NHS Scotland	The Scottish Government, Primary Care Division	Nov 07	Scotland	Y								Y	Consultation strategy paper covering implementation of non medical prescribing and the role of non medical prescribing in service development and redesign
Pharmacy in England: Building on strengths delivering the future (Cm 7341)	Department of Health	Apr 08	England		Y								Government White Paper describing the current role of pharmacy and how pharmacy skills could be better utilised Includes use of prescribing by pharmacists with case studies as examples
Allied health professions prescribing and medicines supply mechanisms scoping project report	Department of Health	Jul 09	England			Y	Y		Y				Describes current position with regard to AHPs and their changing role Highlights that expansion of prescribing rights would improve patient care, with examples Identifies priorities in prescribing expansion

(Continued)

Table 4. (Continued)

Title	Source	Date	Home Nation	Professional Group									Brief overview of contents
				Nurse	Pharmacist	Physiotherapist	Podiatrist	Paramedic	Radiographer	Optometrist	AHP	NMP	
A safe prescription; Developing nurse, midwife and allied health profession (NMAHP) prescribing in NHS Scotland	The Scottish Government	Sep 09	Scotland	Y							Y		Final version of the consultation strategy paper. Includes key healthcare policy drivers where non medical prescribing may be beneficial.
Pharmacist Prescriber Training Working Group Report for the MPC Programme Board	Medical Education England	Jan 10	England		Y								Describes the background to the pharmacist prescribing, current context and future developments. Highlights changes to undergraduate teaching that should occur to optimise pharmacist as prescribers.
Prescription for Excellence	The Scottish Government	Sep 13	Scotland		Y								Describes the Scottish vision that all pharmacists will become independent prescribers, working in partnership with medical practitioners.
Now or never: shaping pharmacy for the future	The Royal Pharmaceutical Society	Nov 13	England		Y								Covers the current pharmacy activity and potential future developments. Include examples of pharmacist prescribers and mentions how many have qualified. Highlights poor awareness of pharmacy profession by patients and wider healthcare service.
Seven Day Services in Hospital Pharmacy: Giving patients the care they deserve	The Royal Pharmaceutical Society	Jun 14	United Kingdom		Y								Describe the challenges in moving to full seven day services. Gives examples of pharmacist prescribers supporting seven day services.

(Continued)

Table 4. (Continued)

Title	Source	Date	Home Nation	Professional Group									Brief overview of contents
				Nurse	Pharmacist	Physiotherapist	Podiatrist	Paramedic	Radiographer	Optometrist	AHP	NMP	
Our Plan for Primary Care in Wales up to March 2018	Welsh Assembly, NHS Wales	Nov 14	Wales	Y	Y			Y					Highlights general practice doctors' workforce shortfall Highlights how healthcare professionals can support general practitioners, including non medical prescribing
A Planned Primary Care Workforce for Wales Approach and development actions to be taken in support of the plan for a primary care service in Wales up to 2018	Welsh Assembly, NHS Wales	Jun 15	Wales	Y	Y	Y				Y			Covers workforce development, profession by profession, to enable support for general practitioners Highlights the need for expansion in non medical prescribers
The future of primary care: Creating teams for tomorrow	Health Education England	Jul 15	United Kingdom	Y	Y	Y							Describes the challenges in general practice Highlights development of non medical professionals to support general practice
Transformation of seven day clinical pharmacy services in acute hospitals	NHS England	Sep 16	England		Y								Describes the actions needed to develop seven day working Includes examples of pharmacist prescribing supporting the multi professional team
Improving care for people with Long Term Conditions	The Royal Pharmaceutical Society	Nov 16	England		Y								Describes improving care of patients with long term conditions, utilising pharmacists' skills Recommends prescribing as a key skill

(Continued)

Table 4. (Continued)

Title	Source	Date	Home Nation	Professional Group									Brief overview of contents
				Nurse	Pharmacist	Physiotherapist	Podiatrist	Paramedic	Radiographer	Optometrist	AHP	NMP	
The General Practice Nursing Workforce Development Plan	Health Education England	Mar 17	England	Y									Review of general practice nursing, highlighting practice role and potential workforce issues. Identifies challenge of freeing time for prescribing training.
Facing the Facts, Shaping the Future: A draft health and care workforce strategy for England to 2027	Public Health England	Dec 17	England	Y	Y								Describes the current workforce issues including recruitment and retention. Reviews this in context of services and of individual staff groups.

AHP allied health professional, NMP Non medical prescriber

<https://doi.org/10.1371/journal.pone.0214630.t004>

Scotland conducted a prescribing strategy consultation exercise, with the final strategy launched in 2009 [32, 33]. These documents covered independent prescribing by nurses and midwives and supplementary prescribing by allied health professionals but not pharmacist prescribers. They highlighted the variable adoption of NMP across Scotland and had the aim of improving uptake of NMP to support the NHS boards in delivering patient centred care.

There were two remaining prescribing specific documents in this era; the scoping report on Allied Health Professional (AHP) prescribing and a report on pharmacist prescribing training [34, 35]. The former reviewed the developing role of AHPs (see Table 2) and highlighted some of the limitations resulting from their inability to prescribe; identifying which professions would benefit most from the ability to prescribe, either independently or as a supplementary prescriber, and also which professions should not become prescribers. Additionally, the professions were prioritised, with physiotherapy and podiatry identified as high priorities for independent prescribing, followed by radiography. The latter document reviewed pharmacist prescribing experiences and recommended several changes to training, both at undergraduate level and regarding the prescribing course.

The remaining documents produced in this era, although generic in nature, include references to NMP. The first was a Department of Health document released in 2006 providing further guidance on medicine supply and reiterating the drive behind NMP [36]. The document included several proposed next stages for NMP:

- To consult on optometrist independent prescribing
- To promote nurse and pharmacist independent prescribing
- To review the prescribing needs of emerging roles

Table 5. Consultation documents.

Title	Source	Date	Home Nation	Professional Group							Brief overview of contents
				Nurse	Pharmacist	Physiotherapist	Podiatrist	Paramedic	Radiographer	Optometrist	
Consultation on proposals to introduce independent prescribing by optometrists (MLX 334)	Medicines & Healthcare Products Regulatory Agency	Aug 06	United Kingdom							Y	Describes scenarios where optometrist prescribing would be beneficial Includes options for immediate referral and management of long term conditions
Public consultation independent prescribing of controlled drugs by nurse and pharmacist independent prescribers (MLX338)	Home Office, Drug Strategy Unit	Mar 07	United Kingdom	Y	Y						Includes risk and impact assessments Highlights that controlled drug prescribing would support the aims of improving patient care and choice
Public consultation (MLX 334): Proposals to introduce independent prescribing by optometrists outcome	Medicines & Healthcare Products Regulatory Agency	Aug 08	United Kingdom							Y	Report of outcome of public consultation, including confirmation that CHM recommend optometrist prescribing
Proposals to introduce prescribing responsibilities for paramedics: stakeholder engagement	Department of Health	Mar 10	United Kingdom					Y			Highlights scenarios where prescribing would be beneficial Discusses which paramedics would be suitable, and planned safeguards
Engagement exercise: To seek views on possibilities for introducing independent prescribing responsibilities for podiatrists	Department of Health	Sep 10	United Kingdom				Y				Described, with examples, podiatry roles and training Describes potential benefits of independent prescribing Uses open questions to gain information from stakeholders
Engagement exercise: To seek views on possibilities for introducing independent prescribing responsibilities for physiotherapists	Department of Health	Sep 10	United Kingdom			Y					Described, with examples, physiotherapy roles and training Describes potential benefits of independent prescribing Uses open questions to gain information from stakeholders
Proposals to introduce independent prescribing by podiatrists: impact assessment	Department of Health	Jul 11	United Kingdom				Y				Describes potential financial and other benefits from streamlined pathways for each option under consideration
Consultation on proposals to introduce independent prescribing by podiatrists	Department of Health	Sep 11	United Kingdom				Y				Public consultation describing current role of podiatrists and scenarios where prescribing would be beneficial Seeks clarification on areas such as education and governance Prescribing unlicensed medication excluded following engagement exercise

(Continued)

Table 5. (Continued)

Title	Source	Date	Home Nation	Professional Group						Brief overview of contents
				Nurse	Pharmacist	Physiotherapist	Podiatrist	Paramedic	Radiographer	
Consultation on proposals to introduce independent prescribing by physiotherapists	Department of Health	Sep 11	United Kingdom			Y				Public consultation describing current role of physiotherapists and scenarios where prescribing would be beneficial Seeks clarification on areas such as education and governance Prescribing unlicensed medication excluded following engagement exercise
Summary of the Commission on Human Medicines meeting held on Thursday 17th & Friday 18th May 2012	Commission on Human Medicines	May 12	United Kingdom			Y	Y			Reports that the committee was able to support independent prescribing for podiatrists and physiotherapists in line with results from consultation exercise
Summary of Public Consultation on Proposals to Introduce Independent Prescribing by Physiotherapists	Department of Health	Jul 12	United Kingdom			Y				Majority of respondents supported independent prescribing from a full formulary There was also support for a limited list of controlled drugs and to allow mixing of medicines
Proposals to introduce independent prescribing by physiotherapists: impact assessment	Department of Health	Jul 12	United Kingdom			Y				Describes potential financial and other benefits from streamlined pathways for each option under consideration Includes risk and governance
Summary of Public Consultation on Proposals to Introduce Independent Prescribing by Podiatrists	Department of Health	Jul 12	United Kingdom				Y			Majority of respondents supported independent prescribing from a full formulary There was also support for a limited list of controlled drugs and to allow mixing of medicine
Independent prescribing by radiographers: Impact Assessment	NHS England	Jan 15	United Kingdom					Y		Set out a policy background and describes scenarios where prescribing may be beneficial e.g. managing radiotherapy side effects Describes financial costs, governance arrangements and potential risks
Consultation on proposals to introduce independent prescribing by radiographers across the United Kingdom	NHS England	Feb 15	United Kingdom					Y		Public consultation Describes current role and scenarios where prescribing may be beneficial Describes governance proposals

(Continued)

Table 5. (Continued)

Title	Source	Date	Home Nation	Professional Group							Brief overview of contents
				Nurse	Pharmacist	Physiotherapist	Podiatrist	Paramedic	Radiographer	Optometrist	
Consultation on proposals to introduce independent prescribing by paramedics across the United Kingdom	NHS England	Feb 15	United Kingdom					Y			Public consultation Describes paramedic roles and changes in practice that result in more patients being treated at home Highlights that this would be for advanced paramedics
Proposal to introduce independent prescribing by paramedics: impact assessment	NHS England	Feb 15	United Kingdom					Y			Highlights current issues and rationale for prescribing Details of the various options and associated costs Identifies potential risks
Commission on Human Medicines and Expert Advisory Group Final Summary Minutes	Commission on Human Medicines	Oct 15	United Kingdom					Y	Y		Describes that committee was unable to support paramedic or diagnostic radiographer independent prescribing The Committee was able to support the therapeutic radiographer independent prescribing
Independent prescribing by therapeutic radiographers	NHS England	Jan 16	United Kingdom						Y		Impact assessment for therapeutic radiographers only Set out policy background and describes scenarios where prescribing may be beneficial Describes financial costs, governance arrangements and potential risks
Summary of the responses to the public consultation on proposals to introduce independent prescribing by paramedics across the United Kingdom	NHS England	Feb 16	United Kingdom					Y			Majority of respondents supported independent prescribing by paramedics There was also support for a limited list of controlled drugs and to allow mixing of medicines
Summary of the responses to the public consultation on proposals to introduce independent prescribing by radiographers across the United Kingdom	NHS England	Feb 16	United Kingdom						Y		Majority of respondents supported independent prescribing from a full formulary There was also support for a limited list of controlled drugs and to allow mixing of medicines It was noted that the CHM supported independent prescribing for therapeutic radiographers only

(Continued)

Table 5. (Continued)

Title	Source	Date	Home Nation	Professional Group						Brief overview of contents
				Nurse	Pharmacist	Physiotherapist	Podiatrist	Paramedic	Radiographer	
Summary of the Commission on Human Medicines meeting held on Thursday 7th September 2017	Commission on Human Medicines	Sep 17	United Kingdom					Y		Brief notes that feedback on independent prescribing by paramedics had been considered and discussed, and that they would now endorse the recommendation to support prescribing

CHM Commission on Human Medicines

<https://doi.org/10.1371/journal.pone.0214630.t005>

This was followed by the Audit Commission report in 2007 on medicines management, which mentioned the development of nurse and pharmacist prescribing and described the distribution of prescribers at that time [37]. Data collection had been in 2005 and 2006 and therefore the majority of these data would have been collected from supplementary prescribers. They recommended that trusts identify where NMP would provide the maximum benefit clinically and that work should be performed to identify why some non-medical prescribers did not prescribe regularly.

The "New Ways of Working in Mental Health" project released two documents in 2007, a progress report and an implementation guide [38, 39]. The progress report reiterated the five core drivers behind NMP and described how NMP should be incorporated into the changes in working practice such as multidisciplinary team working. The implementation guide provided theoretical examples of changed practice which incorporated NMP.

The final document in this era was the pharmacy White Paper [40]. This highlighted the roles that pharmacists could play in improving the healthcare of patients, including the example of prescribing in long-term conditions. Although some case studies were described, most of the suggested roles for prescribers were aspirational.

The Coalition and Conservative Governments era 2013–2017. The first two documents in this era both concerned the role of pharmacy in providing patient centred health care. The first of these was the Scottish Government's vision for pharmacy which envisaged integration of pharmacists into all aspects of healthcare [41]. Central to this vision was the aim of having all pharmacists qualified as independent prescribers. The second document was a report by the Royal Pharmaceutical Society on pharmacy activity and future potential [42]. Various examples of prescribing practice are described (for example, pharmacists running cardiovascular and chronic pain clinics) but the comment is made that it is not sufficient simply to provide prescribing courses, that roles must also be developed that utilise this activity. The report contrasts the English and Scottish governments approach to pharmacy, to the detriment of the English government's approach.

There are three further pharmacy specific documents in this era, with two of these concerning seven-day hospital clinical pharmacy services. The first was a report by the Royal Pharmaceutical Society discussing potential approaches to providing a seven-day service and the associated challenges [43]. Examples where seven-day pharmacy services had been implemented were given, with many of the contributors anticipating the use of pharmacist prescribers to support delivery. The second report, from NHS England, describes the need to deliver clinical pharmacy services seven days a week, highlighting the impact that pharmacy services make and describing the importance of prescribing to support the multi-professional team

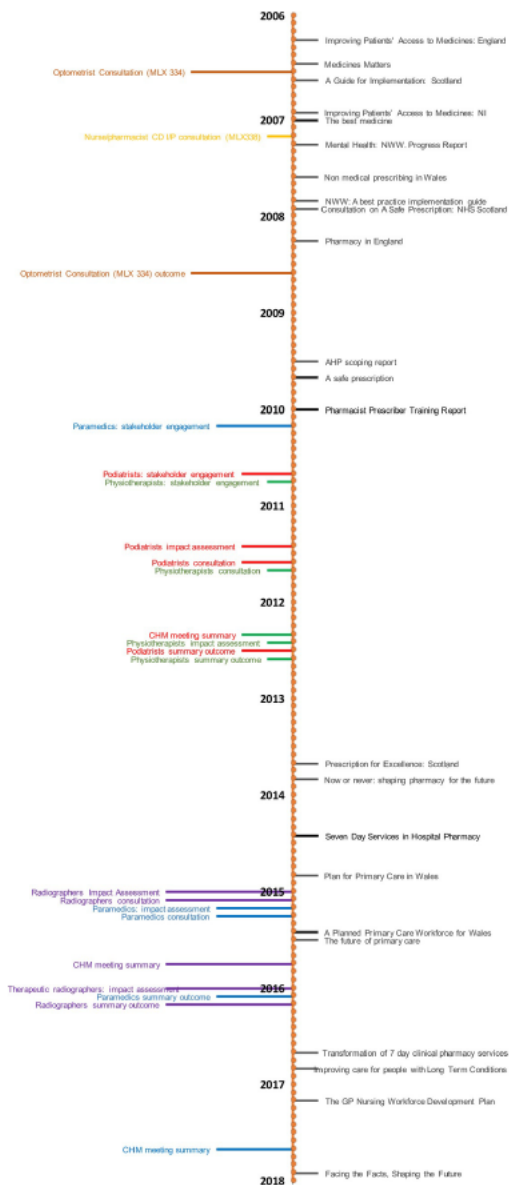


Fig 2. Timeline of selected documents. Policy black, Optometrist brown, Radiographer purple, Nurse/Pharmacist yellow, Paramedic blue, Podiatrist red, Physiotherapist green.

<https://doi.org/10.1371/journal.pone.0214630.g002>

[44]. The final pharmacy specific document was the Royal Pharmaceutical Society produced policy, concerning care for patients with long-term conditions [45]. This highlights the role that pharmacists can play in supporting these patients, and makes a number of key recommendations, the first of which is that pharmacists should have the opportunity to become prescribers enabling them to manage treatment of these patients.

The Welsh Assembly produced a plan for primary care in 2014, followed by a primary care workforce development plan in 2015 [46, 47]. The first of these documents highlighted the increasing pressure on general practice from a combination of increasing demand, a shortage of general practitioners and financial constraints. The focus was on health rather than ill-health and to provide person centred care within the local community, using the most appropriate healthcare professional for the task. Advanced practice such as NMP was seen to relieve pressure on general practitioners. The associated workforce plan described the potential role of NMP for various professions and provided examples. One such example is the monitoring of low risk glaucoma patients by optometrists, and the document comments that there will be an increased need for optometrists to train as prescribers as they develop these advanced roles.

A report commissioned by Health Education England on primary care, published in 2015, described how primary care could be delivered using a wide range of healthcare professionals [48]. Included in the recommendations was the role of the prescribing pharmacist to support medicines optimisation activities, such as changing the medication of patients at risk of polypharmacy and adverse drug events, and the potential for physiotherapist prescribers to enable them to provide streamlined care for patients [48]. This was followed in 2017 by the general practice nursing workforce plan [49]. Prescribing is described as complementing the nursing role, but challenges are acknowledged particularly in enabling time for training. Finally in this era, there was the draft workforce strategy for England which was released for consultation in December 2017 [50]. This specifically mentioned prescribing in the pharmacy section, describing a project to put advanced pharmacists with prescribing qualifications into emergency departments, and also commented that increased numbers of nurse prescribers would be required in the community and primary-care sectors. No mention was made of prescribing by any other non-medical healthcare professional.

Consultation documents. Two public consultations, to gauge opinion, were launched during the period 2006–2008; the first concerned the introduction of independent prescribing for optometrists, and the second regarding controlled drug prescribing by nurse and pharmacist independent prescribers. The consultation process for the introduction of independent prescribing by optometrists was launched in August 2006, with the outcome announced in 2008, and associated legislation passed the same year [51–53]. This time period contrasts with the second consultation in 2007 on controlled drug prescribing, where agreement that this should be permitted was reached, but changes in legislation were not enacted until 2012 [54–56].

Following the 2009 AHP scoping report, stakeholder engagement exercises were launched in 2010 to investigate independent prescribing rights for both podiatry and physiotherapy, followed by consultation exercises in 2011 and the outcome and approval in 2012, the whole process taking a little under two years [57–65]. The consultation for radiographers was launched in 2015 with approval for therapeutic radiographers only granted in 2016 (diagnostic radiographers were excluded) [66–70]. These relatively short consultation exercises contrast strongly with that of the paramedics. The initial document mentioning paramedic prescribing had

been published in 2005 [71], with the stakeholder engagement exercise held in 2010, a year before that of the podiatrists and physiotherapists [57, 61, 72]. The potential for paramedic prescribing was reiterated in the 2013 urgent care report, which described the changing role of paramedics, and the potential for further role extension such as treatment at home by a paramedic to reduce demand on emergency care services [73]. Furthermore, when the formal paramedic consultation process began, advanced paramedics had started to work in a range of settings such as emergency care departments as well as the more traditional ambulance service (see Table 2) [74]. The paramedic and radiographer consultation exercises ran simultaneously, but final approval for paramedics was only granted in 2017 [74–78]. A comment is made in the related paramedic impact assessment that the consultation exercise was delayed because of capacity issues [75]. The relative timescales are visually depicted in Fig 3.

Discussion

Summary of evidence

This is the first such policy review bringing together the UK policy documents concerning NMP to describe the role of this evolving activity. The document review reveals two main themes, which are expanded on below. The first theme highlights issues arising from inspecting the chronological aspects of the selected documents. The second theme covers the evolving approach to healthcare provision and describes how NMP has become embedded into routine practice for many non-medical prescribers. However, differences in practice remain and these are highlighted.

Chronological aspects. Inspection of the timeline of included documents reveals a noticeable gap between 2010 and 2013, when no reports or strategic documents concerning NMP were released by a government body. The beginning of this period coincides with the change in government in 2010 from Labour to the Coalition. Two factors are likely to be responsible for this dearth of publications. Firstly, the Coalition embarked on an overall reorganisation of the NHS in England, initiated in the 2010 White Paper 'Equity and Excellence', and enacted through the Health and Social Care Act in 2012 [79, 80]; focussing on the high level structure rather than finer detail. Secondly, the country had been in economic recession since 2008 and the Coalition's 2010 budget introduced austerity measures designed to reduce the nation's budget deficit and improve economic growth [81, 82]. The government attempted to protect the NHS from financial cuts implemented more generally across all services, however the funding growth rate for the NHS in England was curtailed to 1.4% a year compared with 6% a year under the previous Labour government [83]. Government priorities were therefore concerned with major reform of the NHS structure and introduction of commissioning groups, rather than the continued development of existing practices.

The change in government also probably explains the delay in extending controlled drug prescribing for nurses and pharmacist independent prescribers. Extending controlled drug prescribing rights requires the agreement of the Department of Health, the Home Office, the Medicines and Healthcare Products Regulatory Agency and the Advisory Council on the Misuse of Drugs (ACMD), and, subsequently, amendments to the Misuse of Drugs Regulations 2001 and medicines legislation [54]. The consultation closed in June 2007, and in November 2007 the ACMD wrote to the Under-Secretary of State at the Home Office, and the Minister of State for Public Health at the Department of Health, to support the proposals and the change in legislation [84]. However, the required change in legislation was only enacted in 2012, and it can be surmised that with the Coalition's priorities focused on reorganisation of the whole NHS, extending controlled drug prescribing to nurse and pharmacist independent prescribers was accorded low priority [55, 56].

The consultation processes for the AHPs (physiotherapists, podiatrists and radiographers) were all concluded within a reasonable timeframe, despite the change in government occurring between publication of the AHP scoping report and initiation of the physiotherapy and podiatry consultation exercises [34, 57, 61]. The AHP scoping report had demonstrated a clear role for prescribing for each of these professions in streamlining and improving patient care. In addition, the report prioritised which professions should be considered first, taking into consideration the strength of case for prescribing for each profession and the capacity of the Department of Health, and Medicines and Healthcare Products Regulatory Agency to conduct the necessary consultations. As an aside, the consultation exercises reflect the NHS reorganisation, with the physiotherapy and podiatry consultation exercises conducted under the auspices of the Department of Health, and subsequent consultation exercises under NHS England.

In comparison, the lack of clarity concerning how prescribing would be utilised by paramedics, and their evolving role, explains the extended time period between the initial recommendation regarding paramedic independent prescribing and final approval. At the time of the initial report paramedics had recently become registered with the Health Care Professions Council, and the NHS advanced practice role was developing [71] with a shift in training from resuscitation, to assessing and treating the patient at home. The urgent care report in 2013 highlighted the potential for treatment by paramedics to reduce demand on emergency care services [73]. Following the consultation, the Commission on Human Medicines (CHM) was unable to recommend prescribing by paramedics because of concern that paramedics would need training in a large range of conditions to ensure patient safety [66]. The minutes for the 2017 CHM meeting simply say that they endorse the recommendations for independent prescribing for paramedics, and it is to be presumed that they had been provided with reassurance concerning the training and role of paramedics [78].

Healthcare provision—evolution of policy. The five drivers for prescribing documented in the implementation guidance reiterated the aims of the 2000 NHS White Paper to improve patient care and break down the traditional demarcations between professions [6, 27, 29–31]. These and other early documents such as Medicines Matters, and the “Mental Health New Ways of Working” project were published before full independent prescribing was embedded [36, 38, 39]. As such, they discuss the potential for NMP to improve patient care and, in particular with the mental health documents, develop novel ways of working. Medicines Matters explicitly commented that NMP was unsuitable for patients with complex conditions, recommending the use of supplementary prescribing instead [36]. The pharmacy White Paper listed prescribing as one of the activities that pharmacists could undertake, including in the care of long-term conditions, but many of the examples are theoretical [40]. The 2009 AHP scoping report highlights the changing role of, for example physiotherapists or podiatrists, commenting that they may now be responsible for a full package of patient care but were hampered by the inability to prescribe independently [34]. Again, this document describes potential or theoretical benefits.

However, when the Scottish government published their NMP strategy, they were able to draw on a number of published papers providing evidence of the benefits [33], although in reality the only full independent prescribers included were nurses. Likewise the pharmacist prescriber training report in 2010 was also able to draw on practice examples to illustrate various different ways that independent prescribing had been implemented [35].

The 2010 White Paper ‘Equity and excellence: liberating the NHS’ signalled a change in direction for the health service, putting the patient at the centre of care with ‘no decision about me without me’ [79] but without the previous emphasis on workforce development; a point highlighted in a later staffing report [85]. The need for responsive and patient centred care, within the constraints of limited finances, was further developed in the subsequent Five-Year

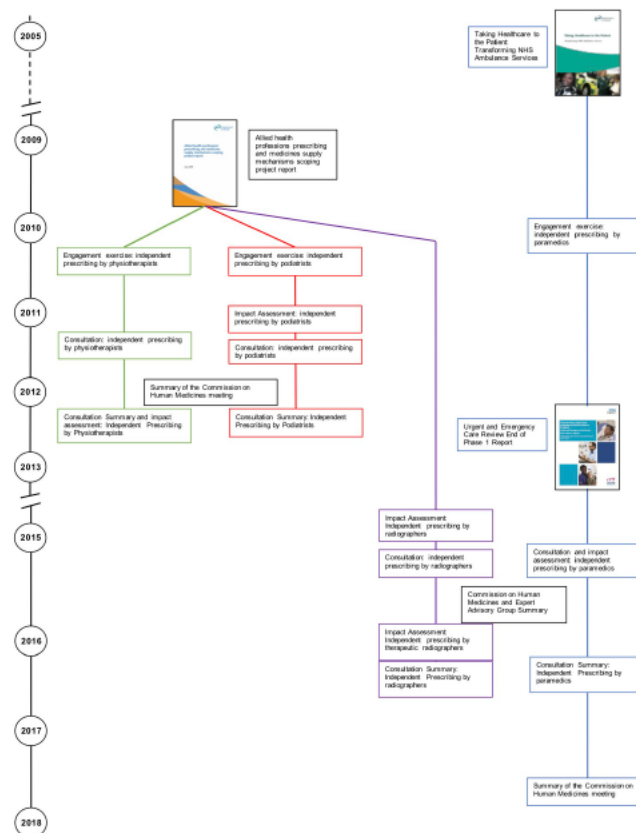


Fig 3. Consultation timeline.

<https://doi.org/10.1371/journal.pone.0214630.g003>

Forward View [19]. This document sets the need to provide more integrated care, giving patients greater control, against the background of increasing demand, rising costs resulting from new technologies, and budgetary constraints. Although prescribing is not specifically mentioned, there is a call to challenge traditional ways of working and to use the most appropriate healthcare professional for the task in hand.

This approach is echoed by the Welsh Assembly primary care plan, which describes a future model of primary-care in which the general practitioner acts as the leader over a multi professional team, who between them care for the patient [46]. The Welsh Assembly associated workforce development plan depends on other healthcare professionals taking on roles traditionally associated with general practitioners or secondary care, with NMP perceived as integral to these developments [47]. The English primary care report [48] describes a number of

approaches to reducing the burden on general practitioners. Included in this are new models of practice such as the work of physicians' associates (see Table 2), but as The Health Foundation comments, their role in relieving pressure on doctors will be limited if they cannot prescribe [85]. Nurse prescribing is not specifically mentioned, although the report does identify that nurses have many responsibilities, including the care of patients with long-term conditions. More recently, the draft workforce strategy describes advanced practice for a number of professions such as nursing and paramedics but does not define what this entails [50]. It also describes podiatry and physiotherapy being potential first contact points for patients with musculoskeletal disorders. Prescribing would support all of these activities but is not explicitly mentioned and it could be perceived that NMP is seen to be so routine and embedded in practice for these professions that it warrants no mention. This compares with the pharmacy situation, where the same document put pharmacist independent prescribing as one of the priority areas to address. Other reports also make explicit mention of pharmacy prescribing as one of the tools to enhance medicines optimisation practices [44, 45] suggesting that pharmacist prescribing is still not embedded into routine practice.

A review of the professional distribution of policy documents supports this supposition concerning NMP becoming routine practice, with the majority involving generic NMP or covering multiple NMP professions (see Table 4). Of the three nursing specific policy documents, two date from before 2010, and the final one from 2017 [29, 38, 49]. Pharmacy alone of the professions is associated with multiple policy documents since 2013; with three by the Royal Pharmaceutical Society and one by each of the Scottish government and NHS England [41–45]. Similar recent policy documents were unable to be identified for any other of the NMP professions, despite in-depth searching. This may reflect the need for pharmacists to develop new roles and skills as the traditional dispensing role diminishes as a consequence of technological advances such as electronic prescribing and robotic dispensing. With medicines central to pharmacy practice, it is appropriate that these roles support medicines optimisation; however, these are not existing roles that a pharmacist can move into, rather they are roles that require creating. It is also notable that while community (drugstore) pharmacists comprise the majority of the profession, most prescribers are found in primary and secondary care instead, indicating challenges with adopting prescribing in community practice [86, 87]. The pharmacy orientated policy documents describe to both pharmacists and commissioners how pharmacist prescribing could work in practice. This compares with other healthcare professions, such as physiotherapy, where medicines form an adjunct to their main practice area, enhancing role expansion. Pharmacy could also be perceived to be an innately cautious profession [88], and the policy documents could thus serve to overcome a reluctance to adopt innovative working practices.

It is notable that there has been a shift regarding the role that NMP plays in the care of patients. The 2006 document, *Medicines Matters*, envisaged independent prescribers utilising a comparatively small personal formulary of drugs, excluding controlled drugs and unlicensed medicines, to treat uncomplicated conditions [36]. Since independent prescribing for nurses and pharmacists was launched, their prescribing rights have been gradually extended to include unlicensed medicines and controlled drugs [54, 89] and more recent documents describe the role NMP has in the care of long-term conditions and complex patients, such as palliative care [45, 48]. This is echoed by the changing role of medical staff in patient care. The early implementation guidance described medical staff retaining an overview of patient care, with nurse and pharmacist prescribing intended to improve patients' access to medicines [27, 29–31]. Subsequent consultation processes (podiatry, physiotherapy, radiography and paramedics) have seen a change so that the examples given in these documents describe the provision of a complete package of care without the need to involve other healthcare professionals.

Indeed, the consequent reduction in costs through reducing appointments is listed as a benefit in the impact assessments [60, 62, 68, 75]. More recently, the Health Education England primary care report envisages that general practitioners will be treating patients with complex conditions, with other healthcare professionals providing routine care [48].

Strengths and limitations

The strengths of the present policy review include the systematic, iterative approach to identifying relevant policy documents, using document mapping techniques to identify missing documents. The dynamic nature of this healthcare area inevitably means that this review provides a snapshot of the situation between 2006 and 2018, which may well be superseded, for example if political changes resulting from unanticipated developments such as 'snap' general elections and referenda occur. The selected documents relate to the UK and the home nations only and this may limit generalisability to other countries. Additionally, although the legislation permits the use of NMP in UK private healthcare, the policy documents concern the use of NMP in the NHS and this may further limit generalisability for alternative healthcare systems. However, it can also be argued that the development in the UK could provide a roadmap for other countries wishing to expand their non-medical prescribing workforce, by providing examples of successful NMP implementation into routine practice.

Despite extensive searches there may well be further policy documents available, such as from the home nations or professional bodies that are not identifiable through a search strategy.

Conclusions

In conclusion it can be seen that this policy review has revealed that the government approach to NMP has changed over the 12-year period from 2006. NMP was originally intended as a means of improving patient choice and access to medicines, whilst also developing the workforce. A subsequent change in government (and associated political ideology) combined with financial and staffing shortfalls have resulted in the emphasis subtly changing to NMP supporting, or even replacing, medical practitioners. Patients are expected to be cared for, and treated by, the most appropriate health care professional such as a physiotherapist for a musculoskeletal problem. Medical workload is thus reduced, enabling the more complex cases to still be treated by medical practitioners despite a reduction in their numbers. Costs are reduced by streamlining care through reducing multiple appointments with different healthcare professionals, and by using the most appropriately qualified professional.

This policy review has also highlighted the role that NMP now plays in patient care, with prescribing perceived as one activity in the advanced practice armamentarium used to treat and support patients, enabling patients to benefit from receiving a complete package of care from a single healthcare professional. As prescribing has become embedded into day to day practice for the majority of the NMP professions, so the need to highlight prescribing in policy documents has diminished (as seen in the recent workforce development document), just as it is no longer felt necessary to describe in detail advanced practice in these professions. As new models of practice are developed, such as use of physician's associates, so the demand for NMP to expand to other healthcare professional groups continues, with the implication that prescribing is integral to these roles.

However, this policy review has found that while NMP has become embedded into routine practice for many professions, this is not universal. Despite pharmacists having achieved independent prescribing rights in 2006, it would appear from the repeated policy documents describing the need for pharmacist prescribers that it is still not embedded into pharmacists'

routine practice. Medicines remain at the core of pharmacy practice through supply and optimisation but, until the new roles become established, prescribing has yet to be perceived as a 'normal' pharmacist activity.

This policy review has also highlighted the practical impact that a change in government can have, as shown by the gap in policy document publication during the Coalition's review and reorganisation of the NHS, and the delays in legislation concerning controlled drugs. However, these delays are not inevitable, as shown by the physiotherapist and podiatrist consultations which were conducted during this period.

While these findings concern a publicly funded health service in a single country, and may therefore be considered to have limited generalisability, there are messages that may resonate in other settings. These concern the impact of reorganisation on service development and how uptake of a novel activity is adopted by professions.

Supporting information

S1 Appendix. PRISMA checklist.
(DOC)

S2 Appendix. HMIC (Ovid) search strategy.
(DOCX)

S1 Protocol PROSPERO record.
(PDF)

Author Contributions

Conceptualization: Emma Graham-Clarke, Alison Rushton, Timothy Noblet, John Marriott.

Data curation: Emma Graham-Clarke.

Formal analysis: Emma Graham-Clarke, Timothy Noblet.

Investigation: Emma Graham-Clarke, Timothy Noblet.

Methodology: Emma Graham-Clarke, Alison Rushton, Timothy Noblet, John Marriott.

Project administration: Emma Graham-Clarke.

Supervision: Alison Rushton, John Marriott.

Validation: Alison Rushton, John Marriott.

Writing – original draft: Emma Graham-Clarke.

Writing – review & editing: Emma Graham-Clarke, Alison Rushton, Timothy Noblet, John Marriott.

References

1. Kroezen M, van Dijk L, Groenewegen PP, Francke AL. Nurse prescribing of medicines in Western European and Anglo-Saxon countries: a systematic review of the literature. *BMC Health Serv Res.* 2011; 11:127. Epub 2011/05/31. <https://doi.org/10.1186/1472-6963-11-127> PMID: 21619565
2. Department of Health and Social Security. Neighbourhood nursing: a focus for care. (The Cumberlege Report). London: HMSO1986.
3. Crown J. Review of prescribing, supply and administration of medicines. Final report. London: Department of Health1999. Available from: http://webarchive.nationalarchives.gov.uk/20130105143320/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4077153.pdf.

4. Greengross P, Grant K, Collini E. The History and Development of The UK National Health Service 1948–1999. London: DFID Health Systems Resource Centre 1999. Available from: <https://assets.publishing.service.gov.uk/media/57a08d91e5274a31e000192c/The-history-and-development-of-the-UK-NHS.pdf>.
5. The history of NHS reform: Nuffield Trust; (no date) [cited 4 July 2018]. Available from: <http://nhstimeline.nuffieldtrust.org.uk/>.
6. Department of Health. The NHS Plan—a plan for investment, a plan for reform. London: The Stationery Office Limited; 2000. Available from: www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/@ps/documents/digitalasset/dh_118522.pdf.
7. NHS Modernisation Agency and Affiliated Programmes (no date) [cited 20 August 2018]. Available from: http://webarchive.nationalarchives.gov.uk/+/http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/Browsable/DH_4991386.
8. Department of Health. Consultation on proposals to extend nurse prescribing. 2000. Available from: <http://webarchive.nationalarchives.gov.uk/20040803061541/http://www.dh.gov.uk/assetRoot/04/06/82/27/04068227.pdf>.
9. Groundbreaking new consultation aims to extend prescribing powers for pharmacists and nurses [Internet]. London; 2002; 16 April 2002 [cited 30 October 2018]. Available from: http://webarchive.nationalarchives.gov.uk/20051012062254/http://www.dh.gov.uk/PublicationsAndStatistics/PressReleases/PressReleasesNotices/fs/en?CONTENT_ID_4013114&chk_JkprtS.
10. Pharmacists to prescribe for the first time nurses will prescribe for chronic illness [Internet]. London; 2002; 21 November 2002 [cited 30 October 2018]. Available from: http://webarchive.nationalarchives.gov.uk/20051012062249/http://www.dh.gov.uk/PublicationsAndStatistics/PressReleases/PressReleasesNotices/fs/en?CONTENT_ID_4025974&chk_BOhuz1.
11. Department of Health. Supplementary Prescribing by Nurses, Pharmacists, Chiropodists/Podiatrists, Physiotherapists and Radiographers within the NHS in England: A guide for implementation. London 2005. Report No.: 4941. Available from: http://webarchive.nationalarchives.gov.uk/20130124065910/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4110033.pdf.
12. Medicines & Healthcare Products Regulatory Agency. Consultation on options for the future of independent prescribing by extended formulary nurse prescribers. 2005. Available from: http://webarchive.nationalarchives.gov.uk/20050425224658/http://www.dh.gov.uk/Consultations/LiveConsultations/LiveConsultationsArticle/fs/en?CONTENT_ID_4104057&chk_xNuvDV.
13. Medicines & Healthcare Products Regulatory Agency. Consultation on proposals to introduce independent prescribing by pharmacists. 2005. Available from: <http://webarchive.nationalarchives.gov.uk/20141008042455/http://www.mhra.gov.uk/home/groups/comms-ic/documents/webstateresources/con007684.pdf>.
14. Non-medical prescribing: NICE; (no date) [cited 30 April 2019]. Available from: <https://bnf.nice.org.uk/guidance/non-medical-prescribing.html>.
15. The National Health Service (Miscellaneous Amendments Relating to Independent Prescribing) Regulations 2006, Stat. 913 (1 May 2006).
16. NHS England. Better treatment for patients as advanced paramedics prescribe medicines 2018 [cited 26 April 2018]. Available from: <https://www.england.nhs.uk/2018/03/paramedic-prescribing/>.
17. Advanced clinical practice: Health Education England; (no date). Available from: <https://www.hee.nhs.uk/our-work/advanced-clinical-practice>.
18. NHS England. The NHS belongs to the people: A call to action. London 2013. Available from: <https://www.england.nhs.uk/wp-content/uploads/2013/07/nhs-belongs.pdf>.
19. NHS England. Five Year Forward View 2014 24 October 2014. Available from: <https://www.england.nhs.uk/wp-content/uploads/2014/10/5yfv-web.pdf>.
20. Moher D, Shamseer L, Clarke M, Ghersi D, Liberati A, Petticrew M, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. Systematic Reviews. 2015; 4(1):1–9. Epub 2015/01/03. <https://doi.org/10.1186/2046-4053-4-1> PMID: 25554246
21. Moher D, Liberati A, Tetzlaff J, Altman DG, Group TP. Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLOS Med. 2009; 6(7):e1000097. Epub 2009/07/22. <https://doi.org/10.1371/journal.pmed.1000097> PMID: 19621072
22. Greenhalgh T, Peacock R. Effectiveness and efficiency of search methods in systematic reviews of complex evidence: audit of primary sources. BMJ. 2005; 331(7524):1064–5. Epub 2005/10/19. <https://doi.org/10.1136/bmj.38636.593461.68> PMID: 16230312
23. Liberati A, Altman DG, Tetzlaff J, Mulrow C, Gotzsche PC, Ioannidis JP, et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions:

- explanation and elaboration. *PLOS Med.* 2009; 6(7):e1000100. Epub 2009/07/22. <https://doi.org/10.1371/journal.pmed.1000100> PMID: 19621070
24. Popay J, Roberts H, Sowden A, Petticrew M, Arai L, Rodgers M, et al. Guidance on the Conduct of Narrative Synthesis in Systematic Reviews. ESRC Methods Programme 2006.
 25. Booth A, Noyes J, Flemming K, Gerhardus A, Wahlster P, van der Wilt GJ, et al. Guidance on choosing qualitative evidence synthesis methods for use in health technology assessments of complex interventions [online]. 2016. Available from: <http://www.integrate-hta.eu/downloads/>.
 26. Mays N, Pope C, Popay J. Systematically reviewing qualitative and quantitative evidence to inform management and policy-making in the health field. *Journal of Health Services Research & Policy.* 2005; 10(Suppl 1):6–20. Epub 2005/08/02. <https://doi.org/10.1258/1355819054308576> PMID: 16053580
 27. Department of Health. Improving Patients' Access to Medicines: A Guide to Implementing Nurse and Pharmacist Independent Prescribing within the NHS in England. Leeds 2006. Available from: http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4133747.pdf.
 28. The Medicines for Human Use (Prescribing) (Miscellaneous Amendments) Order 2006, Stat. 915 (1 May 2006).
 29. NHS Scotland. Guidance for Nurse Independent Prescribers and for Community Practitioner Nurse Prescribers in Scotland. Edinburgh 2006. Available from: <https://www.gov.scot/Publications/2006/08/23133351/0>.
 30. Department of Health, Social Services and Public Safety. Improving Patients' Access to Medicines: A Guide to Implementing Nurse and Pharmacist Independent Prescribing within the HPSS in Northern Ireland. Belfast 2006. Report No.: 104/06. Available from: https://www.publhealth.hscni.net/sites/default/files/directories/files/Guide%20to%20implementing%20nurse%20and%20pharmacist%20independent%20prescribing%20in%20NI_0.pdf.
 31. Pharmaceutical Division. Non medical prescribing in Wales—A guide for implementation. Cardiff 2007. Available from: https://webarchive.nationalarchives.gov.uk/20081112234902/http://www.wales.nhs.uk/sites3/page.cfm?orgid_371&pid_21001.
 32. Primary Care Division. Consultation on A Safe Prescription: Developing Nurse, Midwife and Allied Health Profession (NMAHP) Prescribing in NHS Scotland. Edinburgh 2007. Available from: <https://www.gov.scot/Publications/2007/11/08120246/0>.
 33. NHS Scotland. A safe prescription; Developing nurse, midwife and allied health profession (NMAHP) prescribing in NHS Scotland. Edinburgh 2009. Available from: <https://www2.gov.scot/Resource/Doc/286359/0087194.pdf>.
 34. Marks D. Allied health professions prescribing and medicines supply mechanisms scoping project report. Leeds: Department of Health 2009. Report No.: Gateway ref: 12185. Available from: http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_103949.pdf.
 35. Medical Education England. Pharmacist Prescriber Training Working Group Report for the MPC Programme Board. 2010. Available from: <https://webarchive.nationalarchives.gov.uk/20160509163634/https://www.hee.nhs.uk/sites/default/files/documents/Modernising%20Pharmacy%20Careers%20Programme%20Report%202010.pdf>.
 36. Department of Health. Medicines Matters. A guide to mechanisms for the prescribing, supply and administration of medicines. London 2006. Available from: https://webarchive.nationalarchives.gov.uk/20091106163742/http://www.dh.gov.uk/dr_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_064326.pdf.
 37. Commission for Healthcare Audit and Inspection. The best medicine: the management of medicines in acute and specialist trusts. London; January 2007 2007. Available from: https://webarchive.nationalarchives.gov.uk/20081203024742/http://www.healthcarecommission.org.uk/db_documents/The_Best_Medicine_acute_trust_tagged.pdf.
 38. National Institute for Mental Health in England National Workforce Programme. Mental Health: New Ways of Working for Everyone. Progress Report. London 2007. Available from: http://webarchive.nationalarchives.gov.uk/+http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_074495.pdf.
 39. National Institute for Mental Health in England National Workforce Programme. New Ways of Working for Everyone: A best practice implementation guide. London 2007. Available from: http://webarchive.nationalarchives.gov.uk/20130105064321/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_079106.pdf.
 40. Department of Health. Pharmacy in England: Building on strengths—delivering the future. Norwich: The Stationery Office; 2008. Available from: <https://www.gov.uk/government/publications/pharmacy-in-england-building-on-strengths-delivering-the-future>.

41. The Scottish Government. Prescription for Excellence. Edinburgh 2013. Available from: <https://www.gov.scot/resource/0043/00434063.pdf>.
42. Smith J, Picton C, Dayan M. Now or never: shaping pharmacy for the future. London: The Royal Pharmaceutical Society; November 2013. Available from: <https://www.rpharms.com/Portals/0/RPS%20document%20library/Open%20access/Publications/Now%20or%20Never%20-%20Report.pdf>.
43. Royal Pharmaceutical Society. Seven Day Services in Hospital Pharmacy: Giving patients the care they deserve. London 2014. Available from: <https://www.rpharms.com/Portals/0/RPS%20document%20library/Open%20access/Professional%20standards/Professional%20standards%20for%20Hospital%20pharmacy/rps-seven-day-report.pdf>.
44. NHS England. Transformation of seven day clinical pharmacy services in acute hospitals. 5 September 2016. Report No.: Gateway ref: 5764. Available from: <https://www.england.nhs.uk/wp-content/uploads/2016/09/7ds-clinical-pharmacy-acute-hosp.pdf>.
45. Royal Pharmaceutical Society. Improving care for people with Long Term Conditions. London; November 2016. Available from: <https://www.rpharms.com/Portals/0/RPS%20document%20library/Open%20access/Policy/LTC%20-%20England.pdf>.
46. NHS Wales. Our Plan for Primary Care in Wales up to March 2018. 2014. Available from: <http://www.wales.nhs.uk/sitesplus/documents/986/our%20plan%20for%20primary%20care%20in%20wales%20up%20to%20march%202018.pdf>.
47. NHS Wales. A Planned Primary Care Workforce for Wales: Approach and development actions to be taken in support of the plan for a primary care service in Wales up to 2018. 2015. Available from: <https://gov.wales/docs/dhss/publications/151106plannedprimarycareen.pdf>.
48. Health Education England. The future of primary care: Creating teams for tomorrow. July 2015. Available from: <https://www.hee.nhs.uk/sites/default/files/documents/The%20Future%20of%20Primary%20Care%20report.pdf>.
49. Health Education England. The General Practice Nursing Workforce Development Plan. March 2017. Available from: <https://hee.nhs.uk/sites/default/files/documents/The%20general%20practice%20nursing%20workforce%20development%20plan.pdf>.
50. Public Health England. Facing the Facts, Shaping the Future: A draft health and care workforce strategy for England to 2027. 2017. Available from: <https://www.hee.nhs.uk/sites/default/files/documents/Facing%20the%20Facts%20-%20Shaping%20the%20Future%20-%20a%20draft%20health%20and%20care%20workforce%20strategy%20for%20England%20to%202027.pdf>.
51. Medicines & Healthcare Products Regulatory Agency. Consultation on proposals to introduce independent prescribing by optometrists. London 2006. Available from: https://webarchive.nationalarchives.gov.uk/20061016154410/http://www.mhra.gov.uk/home/ldoplg?ldcService=SS_GET_PAGE&useSecondary=true&ssDocName=CON2024332&ssTargetNodeId=373.
52. Medicines & Healthcare Products Regulatory Agency. Public consultation (MLX 334): Proposals to introduce independent prescribing by optometrists—outcome London 2008 [cited 28 February 2018]. Available from: <http://webarchive.nationalarchives.gov.uk/20130515160823/http://www.mhra.gov.uk/Publications/Consultations/Medicinesconsultations/MLXs/CON2024332?ssSourceNodeid=387>.
53. The Medicines for Human Use (Prescribing) (Miscellaneous Amendments) Order 2008, Stat. 1161 (4 June 2008).
54. Drug Strategy Unit. Public consultation—Independent prescribing of controlled drugs by nurse and pharmacist independent prescribers. London 2007. Available from: <http://webarchive.nationalarchives.gov.uk/20070905223650/http://www.homeoffice.gov.uk/documents/cons-2007-indpres?view=Binary>.
55. The Misuse of Drugs (Amendment No. 2) (England, Wales and Scotland) Regulations 2012, Stat. 973 (23 April 2012).
56. The Misuse of Drugs (Amendment) Regulations (Northern Ireland) 2012, (10 May 2012).
57. Department of Health. Engagement exercise: To seek views on possibilities for introducing independent prescribing responsibilities for physiotherapists. Leeds 2010. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/216032/dh_119375.pdf.
58. Department of Health. Consultation on proposals to introduce independent prescribing by physiotherapists. Leeds 2011. Available from: <https://consultations.dh.gov.uk/cno-ahp/prescribingmedicines/user/uploads/ip-consultation-doc-physios.pdf>.
59. Department of Health. Summary of Public Consultation on Proposals to Introduce Independent Prescribing by Physiotherapists. Leeds 2012. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/216881/Physiotherapist-Consultation-Summary.pdf.
60. Department of Health. Proposals to introduce independent prescribing by physiotherapists: impact assessment. 2012. Available from: <https://assets.publishing.service.gov.uk/government/uploads/>

- [system/uploads/attachment_data/file/213478/DH-1018-Proposals-to-introduce-independent-prescribing-by-physiotherapists1.pdf](#).
61. Department of Health. Engagement exercise: To seek views on possibilities for introducing independent prescribing responsibilities for podiatrists. Leeds 2010. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/216033/dh_119374.pdf.
 62. Department of Health. Proposals to introduce independent prescribing by podiatrists: impact assessment. 2011. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/213480/DH-1019-Proposals-to-introduce-independent-prescribing-by-podiatrists.pdf.
 63. Department of Health. Consultation on proposals to introduce independent prescribing by podiatrists. Leeds 2011. Available from: http://webarchive.nationalarchives.gov.uk/20130104224853/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_131019.pdf.
 64. Department of Health. Summary of Public Consultation on Proposals to Introduce Independent Prescribing by Podiatrists. Leeds 2012 Available from: <https://consultations.dh.gov.uk/cno-ahp/podiatrists-prescribing/results/2900265—podiatrist-consultation-summary-v1-1-200712.pdf>.
 65. Commission on Human Medicines. Summary of the Commission on Human Medicines meeting held on Thursday 17th & Friday 18th May 2012. 2012. Available from: <https://webarchive.nationalarchives.gov.uk/20121105181741/http://www.mhra.gov.uk/home/groups/csl-cs-el/documents/committeedocument/con172304.pdf>.
 66. Commission on Human Medicines. Summary of The Commission on Human Medicines Meeting held on Thursday 15 October and Friday 16 October 2015. 2015. Available from: <https://app.box.com/s/jv487awvqzszrdq0o34h9gg350ceyd4/1/3477158784/47424519277/1>.
 67. Allied Health Professions Medicines Project Team. Consultation on proposals to introduce independent prescribing by radiographers across the United Kingdom. 2015. Available from: https://www.engage.england.nhs.uk/consultation/independent-prescribing-radiographers/user_uploads/consult-independent-prescrib-radiographers.pdf.
 68. NHS England. Independent prescribing by radiographers: Impact Assessment. 2015. Available from: https://www.engage.england.nhs.uk/consultation/independent-prescribing-radiographers/user_uploads/consult-stag-impct-assmnt-radiographer.pdf.
 69. Allied Health Professions Medicines Project Team. Summary of the responses to the public consultation on proposals to introduce independent prescribing by radiographers across the United Kingdom. Leeds 2016. Available from: <https://www.england.nhs.uk/wp-content/uploads/2016/02/radiographers-summary-consult-responses.pdf>.
 70. NHS England. Independent prescribing by therapeutic radiographers. 2016. Available from: https://www.legislation.gov.uk/ukia/2016/38/pdfs/ukia_20160038_en.pdf.
 71. Department of Health. Taking Healthcare to the Patient: Transforming NHS Ambulance Services. London 2005. Available from: https://www.nwas.nhs.uk/media/79142/taking_healthcare_to_the_patient_1.pdf.
 72. Crowther N. Proposals to introduce prescribing responsibilities for paramedics: stakeholder engagement. London 2010. Available from: http://webarchive.nationalarchives.gov.uk/20130105055008/http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_114355.
 73. NHS England. High quality care for all, now and for future generations: Transforming urgent and emergency care services in England—Urgent and Emergency Care Review End of Phase 1 Report. Leeds 2013. Available from: https://www.nhs.uk/NHSEngland/keogh-review/Documents/UECR_Ph1Report_FV.pdf.
 74. Allied Health Professions Medicines Project Team. Consultation on proposals to introduce independent prescribing by paramedics across the United Kingdom. Leeds 2015. Available from: https://www.engage.england.nhs.uk/consultation/independent-prescribing-paramedics/user_uploads/consult-independent-prescribing-paramedics.pdf.
 75. NHS England. Proposal to introduce independent prescribing by paramedics: impact assessment. 2015. Available from: https://www.engage.england.nhs.uk/consultation/independent-prescribing-paramedics/user_uploads/consult-stag-impct-assmnt-paramedics.pdf.
 76. Allied Health Professions Medicines Project Team. Summary of the responses to the public consultation on proposals to introduce independent prescribing by paramedics across the United Kingdom. Leeds 2016. Available from: <https://www.england.nhs.uk/wp-content/uploads/2016/02/Paramedics-summary-consult-responses.pdf>.
 77. Independent Prescribing by Paramedics to be Recommended for Implementation 2017 [cited 28 February 2018]. Available from: <https://www.collegeofparamedics.co.uk/news/independent-prescribing-by-paramedics-to-be-recommended-for-implementation>.

78. Commission on Human Medicines. Summary of the Commission on Human Medicines meeting held on Thursday 7th September 2017. 2017. Available from: https://www.collegeofparamedics.co.uk/downloads/CHM_7_Sept_2017_-_Final_Summary_Minutes.pdf.
79. Department of Health. Equity and Excellence: Liberating the NHS. London: HMSO; 2010. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/213823/dh_117794.pdf.
80. Health and Social Care Act 2012 (c 7).
81. HM Treasury. Budget 2010. London: The Stationery Office; 2010. Available from: http://webarchive.nationalarchives.gov.uk/20121003045351/http://www.direct.gov.uk/prod_consum_dg/groups/dg_digitalassets/@dg/@en/documents/digitalasset/dg_188581.pdf.
82. The 2008 recession 10 years on: Office for National Statistics; 2018 [cited 12 October 2018]. A decade after the beginning of the recession, how has the UK economy recovered?. Available from: <https://www.ons.gov.uk/economy/grossdomesticproductgdp/articles/the2008recession10years-on/2018-04-30>.
83. Stoye G. Does the NHS need more money and how could we pay for it?: The Health Foundation, the Institute for Fiscal Studies, The King's Fund and the Nuffield Trust 2018. Available from: https://www.kingsfund.org.uk/sites/default/files/2018-06/NHS_at_70_does_the_NHS_need_more_money.pdf.
84. Advisory Council on the Misuse of Drugs. Annual Report: Accounting Year 2007–2008. London, Home Office 2008. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/119127/annualreport.pdf.
85. The Health Foundation. Staffing matters; funding counts. London 2016. Available from: <http://www.health.org.uk/sites/default/files/StaffingMattersFundingCounts.pdf>.
86. Prescribers Survey Report. London: General Pharmaceutical Council; 2016. p. 54. Available from: https://www.pharmacyregulation.org/sites/default/files/gphc_prescribers_survey_report.pdf.
87. Council Meeting. General Pharmaceutical Council; 2019. Available from: <https://www.pharmacyregulation.org/sites/default/files/document/gphc-council-meeting-papers-01-02-2019.pdf>.
88. Cordina M, Lauri M-A, Buttigieg R, Lauri J. Personality traits of pharmacy and medical students throughout their course of studies. *Pharmacy practice*. 2015; 13(4):640–. Epub 2015/12/15. <https://doi.org/10.18549/PharmPract.2015.04.640> PMID: 26759618
89. Commission on Human Medicines. Outcome of the consultation exercise on proposals for regularising the position of those mixing and administering medicines in palliative care. 2008. Available from: <http://webarchive.nationalarchives.gov.uk/20141206164734/http://www.mhra.gov.uk/home/groups/es-policy/documents/publication/con051813.pdf>.

Appendix 8.2 PLoS ONE, Response to reviewers 5 June 2019: Chapter 2

Reviewer's Comments	Line numbers in original manuscript	Authors Response
We note you have included a table to which you do not refer in the text of your manuscript. Please ensure that you refer to Tables 1-3 in your text; if accepted, production will need this reference to link the reader to the Table.		Thank you for highlighting this. For some reason the cross-references seem to have been disabled. We have removed the cross-reference links and rewritten to ensure that each table is mentioned in the text.
"Therapists" is a very broad term. Does this refer to psychotherapists, physical therapists, or what? And how else could their role be extended beyond prescribing?	Line 72:	Therapists is a catch all phrase which was used in the referenced White Paper to cover professions allied to health such as speech and language therapists, occupational therapists and physiotherapists. At the time of the White Paper this group worked very much along traditional lines for each profession, and extending roles related to not only prescribing but also other activities such as ordering investigations and diagnostic tests. We have added a short definition in brackets to line 84: <i>"(a generic term covering the professions allied to health)"</i>
Please provide more information about "an agreed clinical management plan." I assume this is between the physician and the supplementary prescriber. If the physician has already decided what medications are appropriate for the patient, what is the additional role of the supplementary prescriber?	Line 81:	An agreed clinical management plan may be very specific in terms of the medication that can be prescribed or give broad categories. The supplementary prescriber is then responsible for the ongoing prescribing of the medication until the next review date by the independent prescriber. In the UK, prescriptions are issued on a monthly basis. We have added a short explanation to line 92 et seq. <i>"The supplementary prescriber is then responsible for managing and prescribing the condition(s) and medication(s) listed in an agreed clinical management plan [11] but is unable to prescribe any other medication."</i> We have also added Table 1 which gives an overview of independent and supplementary prescribing responsibilities.
Surely there must be limitations on the authority of pharmacists to prescribe. They do not examine patients or make diagnoses. Under what circumstances can pharmacists	Line 88 et seq:	All independent prescribers regardless of profession are expected to be able to examine patients and diagnose or confirm the diagnosis. The examination skills for pharmacists would be those that are relevant to the area that they are prescribing in. This could include measuring BP, examining the eye

<p>prescribe, and what sorts of medications? Also you should say more about the role of paramedics in prescribing. Obviously in emergency situations they can administer certain medications, but I believe you are talking about community paramedic programs in which paramedics make home visits and serve as physician extenders. You should explain more about this</p>		<p>using an ophthalmoscope and ordering appropriate investigations for a pharmacist running a BP clinic.</p> <p>More experienced paramedics can take on extended roles such as an advanced paramedic or working in urgent care centres, enabling patients to be treated at, or near, home and with the aim of reducing emergency admission to hospital. In these roles they are able to work autonomously.</p> <p>We have added Table 2 to the introduction detailing qualifications and core activities of the various non-medical professions mentioned in the text to clarify the UK situation.</p>
<p>Here and in several other places there has been an error with your bibliographical software</p>	<p>Line 119:</p>	<p>Thank you for highlighting this. For some reason the cross-references seem to have been disabled. We have removed the cross-reference links and rewritten to ensure that each table is mentioned in the text.</p>
<p>Again, you should explain the policies regarding nurse and pharmacist prescribing in more detail. In the United States professionals called Nurse Practitioners and Physician Assistants can prescribe in some states, with varying policies regarding physician supervision and the types of medications they can prescribe. Are you talking about nurses in general or is this limited to some category of advanced practice nurses? Under what circumstances can they prescribe? And again, I am puzzled by the idea of pharmacists as independent prescribers. This requires more explanation.</p>	<p>Line 181 et seq:</p>	<p>We have added Table 2 to the introduction detailing qualifications and core activities of the various non-medical professions mentioned in the text to clarify the UK situation.</p>
<p>In the United States, podiatrists have doctoral degrees and have prescribing authority within their scope of practice, i.e. conditions of the foot and ankle. For the benefit of the international audience, please explain the qualifications of podiatrists in the UK and their scope of practice.</p>	<p>Line 217:</p>	<p>Podiatrists in the UK complete a BSc, and while they have authority to administer limited medications, prescribing forms part of their advanced level of practice. We have added Table 2 to the introduction detailing qualifications and core activities of the various non-medical professions mentioned in the text to clarify the UK situation.</p>

In the United States, radiologists are medical doctors who by virtue of their license have the same prescribing authority as any M.D. However, they seldom if ever have any occasion to prescribe. Again, please explain the qualifications and scope of practice of radiologists in the UK, and under what circumstances it might make sense for them to prescribe.	Line 218:	In the UK we have both radiographers and radiologists. As in the United States, radiologists are medical doctors. This paper is referring to radiographers. Diagnostic radiographers use contrast media and other medication used in imaging tests, which require prescribing in the UK. Whilst this can be done by radiologists, there are limited numbers of these available to support the imaging departments. Therapeutic radiographers conduct treatment courses for cancer patients and in the course of this will treat the side effects of radiation and other associated issues. We have added Table 2 to the introduction detailing qualifications and core activities of the various non-medical professions mentioned in the text to clarify the UK situation. We have amended line 249 to read " radiography " rather than radiology.
It is difficult for me to imagine any role for optometrists in prescribing, other than lenses. Surely eye diseases for which medications are indicated should be managed by an ophthalmologist. Optometrists are not qualified to do this.	Line 225:	Optometrists in the UK are responsible for testing eyesight and prescribing lenses, but they are also trained to detect ocular diseases and abnormalities. Optometrists can specialise in various areas such as glaucoma treatment and are responsible for the treatment and care of these patients. We have added Table 2 to the introduction detailing qualifications and core activities of the various non-medical professions mentioned in the text to clarify the UK situation.
I am still quite puzzled by the idea of pharmacists as independent prescribers. You refer to "various examples of prescribing practice" but do not present any	Line 248 et seq:	Please see above explanation. We have expanded this sentence to include a couple of examples (line 285 et seq): <i>"Various examples of prescribing practice are described (for example, pharmacists running cardiovascular and chronic pain clinics) but the comment..."</i>
I am baffled by the idea that there might be British hospitals that do not have 7 day pharmacy service. What happens if people need medications on Sunday?	Line 259:	We have clarified this sentence. Hospitals will have some form of service to provide urgent drugs but may not provide the full range of service available during the working week. These reports aim to expand the scope of these services (line 292 et seq): <i>"...with two of these concerning seven-day hospital clinical pharmacy services..."</i>
This should read "A report commissioned by Health Education England," using "Health Education England" as a modifier is extremely awkward.	Line 282:	Thank you for this suggested improvement. We have amended line 318.
What is mean by the term "consultation" in this context? And again, the idea of optometrists as prescribers is very puzzling to me and requires more explanation.	Line 295:	We have amended line 334 to clarify this: <i>'Two public consultations, to gauge opinion, were...'</i> Table 2 describes the core activities of optometrists (along with other non-medical professionals mentioned in this review) and we have added line 314 et seq as an example:

		<i>“One such example is the monitoring of low risk glaucoma patients by optometrists, and the document comments that there will be an increased need for optometrists to train as prescribers as they develop these advanced roles.”</i>
I can understand the idea of giving therapeutic (what we call interventional) radiologists limited prescribing rights, but again in the U.S. they are medical doctors and already have the authority. Please explain the qualifications and role of these professionals.	Line 306:	In the UK we have both radiographers and radiologists. Radiologists are medical doctors, but radiographers are a profession in their own right, and are not medically qualified. We have added Table 2 to the introduction detailing qualifications and core activities of the various non-medical prescribing professions mentioned in the text to clarify the UK situation.
Please explain more about the changing role of paramedics.	Line 313:	We have moved some information from the discussion section to the results sections to clarify this (lines 355 et seq). We have added Table 2 to the introduction detailing qualifications and core activities of the various non-medical prescribing professions mentioned in the text to clarify the UK situation.
Much of what is in the "discussion" section probably belongs in the findings. You present a good deal of new information in the discussion.		We have moved appropriate information into the results section. This includes lines 355 et seq, 321 et seq and 329 et seq
Please explain the distinction between NMP and "supplementary" prescribing.	Line 402:	We have added a definition of independent prescribing to the introduction to clarify this situation, line 102 et seq., and added Table 1 to clarify the differences between the two approaches. We have also amended line 114 et seq to clarify that this paper refers to independent prescribing <i>“Although non-medical prescribing (NMP) is the umbrella term used to cover all prescribing by professions other than doctors, in this paper it refers to independent non-medical prescribing only.”</i>
What is a physician's associate? Is this what we call a Physician Assistant? Or is this just intended as a general term for allied health professions?	Line 439:	They are similar to physician’s assistants in the USA. They complete a 2-year diploma, but this does not entitle them to practice in the USA. We have added Table 2 to the introduction detailing qualifications and core activities of the various non-medical prescribing professions mentioned in the text to clarify the UK situation.
Pharmacists do indeed perform the medication optimization activities you describe, but this is not prescribing.	Line 443:	In the UK prescribing allows them to amend or change the medication, not just advise on changes.
I am very surprised to learn that pharmacists are allowed to prescribe unlicensed medicines and controlled drugs. Under what circumstances is this allowed? What is the	Line 486:	A recent General Pharmaceutical Council Survey [48] quotes this breakdown of prescribers: <ul style="list-style-type: none"> • Hospital 46% • GP practice 29% • Primary care org 8%

<p>rationale for it? I can well imagine that this might result in reduced appointments with physicians but again, pharmacists do not examine patients, and are not trained to diagnose disease. Without some further explanation of how this works the idea seems preposterous. Indeed, I would use the word appalling. Can people in the UK really walk into a drugstore and be dispensed opioids without a physician's prescription? Surely that is not what you mean.</p>		<ul style="list-style-type: none"> • Community 8% <p>As prescribers they would be expected to prescribe within their professional competency, having first assessed and examined the patients. Pharmacists may prescribe opioids in a variety of areas such as palliative care, oncology or intensive care. Community (drugstore) pharmacists would only be prescribing opioids if they were managing an appropriate patient caseload.</p> <p>This reflects the differences in practice in different countries, and we have added Table 2 to the introduction detailing qualifications and core activities of the various non-medical prescribing professions mentioned in the text to clarify the UK situation.</p>
<p>The manuscript is quite interesting and informative, however I do not think it qualifies as a systematic review. It does not summarize or synthesize research but rather reviews policy statements. This is more akin to a literature review. Since the manuscript does not address research, it does not meet other criteria for a systematic review, such as using a recognized, referenced method for data analysis, evaluating the strength of evidence, or using a precise answerable research question. Nevertheless, the evolution of policy on prescribing by non-medical practitioners is an important topic to which a review of policy documents could contribute. I suggest the authors re-frame their work as a qualitative analysis of policy statements and relate their findings to a thesis about policy development in this area. This could include a more structured content analysis of the documents. If the authors proceed along</p>		<p>Thank you for your comment. However, we disagree with the contention that this article does not meet the criteria to be considered as a systematic review.</p> <p>Specifically, NICE define a systematic review as:</p> <p>‘A review that summarises the evidence on a clearly formulated review question according to a predefined protocol, using systematic and explicit methods to identify, select and appraise relevant studies, and to extract, analyse, collate and report their findings. It may or may not use statistical techniques, such as meta-analysis.’[285]</p> <p>In this review there is a predefined protocol (and approved to be, registered with PROSPERO) and the methods used to identify relevant documents were systematic and explicit. These methods included the use of two independent reviewers to complete the searches and paper selection.</p> <p>A recognised narrative method, suitable for non-research findings, was used for data analysis, which included visual techniques (timelines), as described by Mays et al, and Popay et al [75, 76]. The findings were debated amongst the research team to ensure the final synthesis was appropriate.</p> <p>Evaluation of strength of evidence would be problematical for the type of evidence sought and obtained.</p> <p>There is a clearly formulated answerable review question (lines 132-6).</p> <p>Other methods of data synthesis such as content analysis or thematic analysis were considered but the literature supports the use of a narrative method (as described above) for these data.</p> <p>We appreciate that it would be useful to expand the tables of documents selected (Tables 3 and 4) to include brief details about the contents. We have therefore amended the tables accordingly.</p>

these lines, I also suggest that they include consideration of the positions of opponents of non-medical prescribing. Without this context, it is difficult to understand fully the factors driving the evolution of policy.		
--	--	--

1. Systematic review definition: National Institute for Health and Care Excellence; 2019 [cited 29 April 2019]. Available from: <https://www.nice.org.uk/Glossary?letter=S#Systematic%20review>.
2. Mays N, Pope C, Popay J. Systematically reviewing qualitative and quantitative evidence to inform management and policy-making in the health field. *Journal of Health Services Research & Policy*. 2005;10(Suppl 1):6-20. Epub 2005/08/02. doi: 10.1258/1355819054308576.
3. Popay J, Roberts H, Sowden A, Petticrew M, Arai L, Rodgers M, et al. Guidance on the Conduct of Narrative Synthesis in Systematic Reviews. ESRC Methods Programme 2006.
4. Prescribers Survey Report. London: General Pharmaceutical Council; 2016. p. 54. Available from: https://www.pharmacyregulation.org/sites/default/files/gphc_prescribers_survey_report.pdf.

Appendix 8.3 PLoS ONE, Response to reviewers 8 July 2019: Chapter 2

Reviewer's Comments	Line numbers in original manuscript	Authors Response
<p>I do agree with the comments provided by reviewer 2 both in the comments for the original submission, namely "The manuscript is quite interesting and informative, however I do not think it qualifies as a systematic review. It does not summarize or synthesize research but rather reviews policy statements. This is more akin to a literature review. Since the manuscript does not address research, it does not meet other criteria for a systematic review, such as using a recognized, referenced method for data analysis, evaluating the strength of evidence, or using a precise answerable research question." and more elaborately in the comments to the revised version: "I continue to have concerns about framing the manuscript as a systematic review. Systematic reviews analyze findings of research studies. The policy statements that were reviewed in the manuscript are not research studies, and they did not produce research findings. The Cochrane Consumer Network's definition of systematic reviews states that they summarize "the results of available carefully designed healthcare studies (controlled trials)" (https://consumers.cochrane.org/what-systematic-review). A paper published in 2011 explaining the methodology of systematic reviews describes them as having "the goal of reducing bias by identifying, appraising, and synthesizing all relevant studies on a particular topic" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3024725/). The definition from NICE that the authors cite refers to a method "to identify, select and appraise relevant studies..." The manuscript uses government documents as a primary data source, not as a source of research study results for synthesis. It is best characterized as qualitative research." It is not clear how web of science was utilised and whether any results from this source were included. I do advise the authors to revise the manuscript accordingly.</p>		<p>We have reworked the manuscript as a policy review, following further discussion with Dr Buttigieg.</p>

First, you need to carefully proofread. There is still an error with the bibliographical software, a few typographical errors and infelicities. (E.g., on line 498 "could not" would be better than "were unable to").	493	Thank you for highlighting this. The cross-reference link appears to have been disabled and we have therefore rewritten it to ensure that the table is mentioned in the text. (Line 544) We have also corrected typographical errors and rephrased some sentences throughout the document.
The information in the tables now addresses the context and limitations of NMP which I queried you about in my first review. However, I think it would be helpful to the reader if you would briefly describe these in the text or at least draw attention to them. Also, in your response to my review you discussed the context of prescribing of controlled substances by pharmacists but you do not explain this in the paper		Re Table 2, we have cross referenced this in the text where appropriate. Reference is made to pharmacists running chronic pain clinics and we have also added an example to line 593 – ‘... such as palliative care. ’ We have added a sentence concerning the sector distribution of pharmacists to the discussion. Line 574 et seq
I continue to have concerns about framing the manuscript as a systematic review. Systematic reviews analyze findings of research studies. The policy statements that were reviewed in the manuscript are not research studies, and they did not produce research findings. The Cochrane Consumer Network’s definition of systematic reviews states that they summarize “the results of available carefully designed healthcare studies (controlled trials)” (https://consumers.cochrane.org/what-systematic-review). A paper published in 2011 explaining the methodology of systematic reviews describes them as having “the goal of reducing bias by identifying, appraising, and synthesizing all relevant studies on a particular topic” (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3024725/). The definition from NICE that the authors cite refers to a method “to identify, select and appraise relevant studies...” The manuscript uses government documents as a primary data source, not as a source of research study results for synthesis. It is best characterized as qualitative research.		We have reworked the manuscript as a policy review, following further discussion with Dr Buttigieg.
In the United States, the term “Anglo-Saxon” countries is unusual. Does it include just the British Isles or other northern European countries, as well?	Line 50	The referenced paper uses the term Anglo-Saxon but doesn’t define what they identify by the term. However, they include papers from the USA, Canada, Australia and New Zealand, so the assumption is that they have used the term to mean English speaking. We have rephrased the sentence to list the identified countries which we believe makes this aspect clearer. (line 66 et seq)

The reference to “expert librarians” is not appropriate. It should be assumed that the authors received expert assistance.	Line 152	We have removed this reference. (Line 184)
The manuscript here explicitly acknowledges that it does not involve a review of research studies.	Line 175	The paper has been rewritten to become a policy review
Non-medical prescribing is not a skill. It is a professional activity.	Line 367	We have changed to ‘activity’ throughout the document, where appropriate
A citation or other support is needed for the statement that pharmacy is a “conservative” profession.	Line 509	A citation has been added, and the wording changed to cautious. (Line 584)
Since the manuscript does not consider research findings, the phrase “gaps in the evidence” is inappropriate.	Line 534	The paper has been rewritten to become a policy review. The phrase has now been changed to ‘missing documents’ Line 616
The phrase “unanticipated developments” should be explained. Since the manuscript does not address research studies, what might they be?	Line 536	In the UK we have recently had a significant referendum (Brexit), a snap general election resulting in a minority government and now a change in prime minister mid-government. All of these have or will impact on policy decisions etc... We have tried to clarify this sentence by adding the section in bold: <i>‘The dynamic nature of this healthcare area inevitably means that this review provides a snapshot of the situation between 2006 and 2018, which may well be superseded by political changes resulting from unanticipated developments such as ‘snap’ general elections and referenda.’</i> Line 618 et seq
The conclusion that the government approach to non-medical prescribing has changed over the study period should be obvious, given the extensive changes in health care that occurred during this time.	Line 549	Many of the healthcare changes in the UK were driven by the financial shortfalls, and the shortage of doctors, combined with an aging population. Although the later was a known factor, the other two were unanticipated when NMP was launched in 2006. We have changed the sentence to clarify it. Line 633 et seq
The term “physician’s associates” is uncommon in the United States. Does it mean “physician’s assistant”?	Line 566	They are similar to physician’s assistants in the USA. They complete a 2-year diploma, but this does not entitle them to practice in the USA. We have added a line to Table 2 to clarify this: <i>“(the nearest equivalent USA role is physician’s assistant.)”</i> We have also referenced the table in the body of the text. Line 544
The importance of a relationship between changes in government and production of policy documents is not clear. The important question is the effect of changes in government on actual policy. Do the authors have observations on this point?	Lines 576 et seq	We have clarified the sentence Line 618 et seq and expanded the discussion line 639 et seq

Appendix 8.4 PROSPERO record: Chapter 2 -Non-medical prescribing in the United Kingdom National Health Service: A systematic policy review and Chapter 3 - Facilitators and barriers to non-medical prescribing – A systematic review and thematic synthesis

Policy evolution and role of independent non-medical prescribing in the United Kingdom: a mixed methods systematic review

Emma Graham-Clarke, Timothy Noblet, John Marriott, Alison Rushton

Citation

Emma Graham-Clarke, Timothy Noblet, John Marriott, Alison Rushton. Policy evolution and role of independent non-medical prescribing in the United Kingdom: a mixed methods systematic review. PROSPERO 2015 CRD42015019786 Available from:

https://www.crd.york.ac.uk/prospERO/display_record.php?ID=CRD42015019786

Review question

1) What descriptors are there of the role of independent non-medical prescribing in the provision of healthcare? Research Aim: 1) To evaluate the literature concerning the use, facilitators and barriers of independent non-medical prescribing in primary and secondary care in the United Kingdom. Objective: 1) To conduct an extended systematic literature review to determine the position of independent non-medical prescribing, including review of facilitators and barriers that influence non-medical prescribers. 2) How does government policy view independent prescribing by non-medical practitioners, and has this changed since the initial introduction of independent prescribing by nurses and pharmacists? Research Aim: 2) To identify key policy documents supporting the use of independent non-medical prescribing and determine the current role of independent medical prescribing in the delivery of healthcare in the National Health Service. Objective: 2) To conduct a chronological review of government policy regarding the roles of independent non-medical prescribing in the provision of healthcare.

Searches

Objective 1

MEDLINE, CINAHL, EMBASE, AMED, BNI, ERIC, ASSIA, Web of Science, Open access theses and dissertations, Open grey, and SIGLE, will be searched for papers relating to the practice of independent non-medical prescribing. Papers that cite or are cited by the included papers will also be screened to identify any further relevant papers. All relevant papers will be included. Papers written in a language other than English will have their abstracts translated by an appropriate member of the university (staff or student). If the abstract indicates that the paper should be included in the analysis, then the full paper will be obtained and translated.

Objective 2

Database searches: Lexis Nexis, NHS evidence, UKOP, House of Commons Parliamentary Papers, HMIC, Web of Science, as well as the www.gov.uk (and national archives) website. A further search using Advanced Google search will also be conducted, using the key words, to capture any remaining relevant papers. The databases will be searched from the beginning of 2006 onwards. Additional search strategy information can be found in the attached PDF document (link provided below).

Search strategy

https://www.crd.york.ac.uk/PROSPEROFILES/19786_STRATEGY_20170101.pdf

Types of study to be included

Objective 1 Inclusion criteria :Qualitative and mixed-method research trials and studies relating to independent non-medical prescribing Exclusion criteria:Narrative reports describing a service, opinion papers and case studies Objective 2 Inclusion criteria:Both white and green papers will be included as well other relevant policy statements, consultation documents and reports that relate to the United Kingdom. Exclusion criteria:Policy and reports that relate to countries outside the United Kingdom

Condition or domain being studied

Independent non-medical prescribing

Objective 1 - utilisation and uptake

Objective 2 - policy relating to the use of non-medical prescribing

Participants/population

objective 1

Inclusion criteria:

Nurses, Allied health professionals, Physiotherapist, Pharmacist, Podiatrist, Chiropodist, Therapist

Exclusion criteria:

Doctor, Physician, Medical practitioner

Objective 2

Inclusion criteria:

policy relating to independent non-medical prescribing

Exclusion criteria:

policy relating to supplementary/dependent non-medical prescribing

Intervention(s), exposure(s)

Objective 1

Inclusion criteria:

Independent non-medical prescribing

Exclusion criteria:

Supplementary prescribing, Dependent prescribing, Independent medical prescribing

Objective 2

as above, except papers that include both independent and supplementary prescribing will be included.

Comparator(s)/control

Not applicable.

Main outcome(s)

Objective 1

Facilitators, Barriers, Attitudes, Utilisation

Objective 2

the use of independent non-medical prescribing to improve healthcare provision.

* Measures of effect

Not applicable.

Additional outcome(s)

Objective 1

Secondary themes relating to more specific aspects may be able to be identified during the data extraction phase such as effect of training

Objective 2

N/a

* Measures of effect

Not applicable.

Data extraction (selection and coding)

Both Objectives:

Initial screening of titles/abstracts obtained from all searches will be conducted to remove duplicates and the number removed will be recorded. The remaining abstracts and titles will be reviewed by two independent reviewers and any obviously unsuitable papers will be excluded at this stage and the numbers recorded. When studies appear to meet the eligibility criteria or when a decision cannot be made based solely on the title or abstract, full-text copies will be obtained, and two independent reviewers will assess the papers for eligibility for inclusion. If there is any disagreement between the two reviewers, then a third reviewer will be asked to mediate. Full details of the number of papers included and excluded at each stage will be recorded. Inter-rater reliability will be assessed using Cohen's kappa statistic. Data extraction for the policy documents will use a standardised pre-formatted and pre-piloted form, with two reviewers extracting the data independently. Each reviewer will extract the data independently. The data extraction forms will be compared and any discrepancies identified. If it is not possible to resolve the discrepancies through discussion, then a third reviewer will be asked to mediate.

Objective 1

Data items to be extracted: Aims/Research Question, Ethics, Study design/Theoretical approach, Source of funding, Participant numbers and demographics, Study setting, Study methodology, Data Collection, Data Analysis, Key outcomes, Key themes, Key findings, Recommendations

Objective 2

Data items to be extracted: Date, Advisory, consultative or implementation, Context eg DH, advisory body, charity, Key messages, Potential sources of bias

Risk of bias (quality) assessment

Objective 1

Two independent reviewers will assess risk of bias using the QATSDD tool and the results will be compared. If there is disagreement between the reviewers, which is unable to be resolved through discussion, then a third reviewer will be asked to mediate. Lower quality studies will be included in the synthesis, but reference will be made in the synthesis to the lower quality (with specific indications, such as lack of clarity over study design details). The risk of bias tool will be piloted beforehand to ensure familiarity with it.

Objective 2

Risk of Bias assessment is not applicable, however, potential sources of bias, such as documents produced by a single professional body, which may be inclined towards that profession, will be identified at the data extraction stage.

Strategy for data synthesis

Objective 1

The intention is to conduct a thematic synthesis of the data. The papers will undergo thematic coding and analysis to identify recurrent themes, which then permits summarisation of the findings under descriptive theme headings. The findings will be presented in a tabular form, grouped according to the major themes identified. The absence of any supporting literature for any of the themes identified will be highlighted in the discussion of the final review.

In addition, a simple time line representation of the selected studies will be completed, to include date of publication and major findings.

Objective 2

A narrative synthesis of the data will be undertaken. The papers (and main findings) will be presented visually in the form of a timeline.

Analysis of subgroups or subsets

None planned

Contact details for further information

Miss Graham-Clarke

Organisational affiliation of the review

School of Clinical and Experimental Medicine, University of Birmingham
www.birmingham.ac.uk

Review team members and their organisational affiliations

Miss Emma Graham-Clarke. School of Clinical and Experimental Medicine, University of Birmingham
Mr Timothy Noblet. School of Sport, Exercise and Rehabilitation Sciences, University of Birmingham
Professor John Marriott. School of Clinical and Experimental Medicine, University of Birmingham
Dr Alison Rushton. School of Clinical and Experimental Medicine, University of Birmingham

Type and method of review

Systematic review

Anticipated or actual start date

01 May 2015

Anticipated completion date

31 January 2018

Funding sources/sponsors

Self-funded PhD

Conflicts of interest

None known

Language

English

Country

England

Stage of review

Review Completed published

Details of final report/publication(s) or preprints if available

Graham-Clarke E, Rushton A, Noblet T, Marriott J (2018) Facilitators and barriers to non-medical prescribing – A systematic review and thematic synthesis. PLoS ONE 13(4): e0196471.
<https://doi.org/10.1371/journal.pone.0196471>

Graham-Clarke E, Rushton A, Noblet T, Marriott J (2019) Non-medical prescribing in the United Kingdom National Health Service: A systematic policy review. PLoS ONE 14(7): e0214630.
<https://doi.org/10.1371/journal.pone.0214630>

<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0196471>

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0214630>

Subject index terms status

Subject indexing assigned by CRD

Subject index terms

Drug Prescriptions; Great Britain; Humans; Policy

Date of registration in PROSPERO

30 April 2015

Date of first submission

11 December 2017

Stage of review at time of this submission

Stage	Started	Completed
Preliminary searches	Yes	Yes
Piloting of the study selection process	Yes	Yes
Formal screening of search results against eligibility criteria	Yes	Yes
Data extraction	Yes	Yes
Risk of bias (quality) assessment	Yes	Yes
Data analysis	Yes	Yes

Revision note

details added of second publication and status of review updated

The record owner confirms that the information they have supplied for this submission is accurate and complete and they understand that deliberate provision of inaccurate information or omission of data may be construed as scientific misconduct.

The record owner confirms that they will update the status of the review when it is completed and will add publication details in due course.

Versions

30 April 2015
17 February 2016
01 February 2017
21 December 2017
13 June 2018
21 August 2019

PROSPERO

This information has been provided by the named contact for this review. CRD has accepted this information in good faith and registered the review in PROSPERO. The registrant confirms that the information supplied for this submission is accurate and complete. CRD bears no responsibility or liability for the content of this registration record, any associated files or external websites.

Appendix 8.5 Prisma checklist: Chapter 2 -Non-medical prescribing in the United Kingdom National Health Service: A systematic policy review

Page numbers relate to published paper (Appendix 8.1)

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	1
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	2
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	3/4
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	1 & 5 Appendix 8.4
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	5
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	5
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	Appendix 8.6
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	5
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	6

Section/topic	#	Checklist item	Reported on page #
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	5
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	6
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	6
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	6
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	6
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	n/a
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	7
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	8-12
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	6
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	n/a
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	6-19 & 21
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	6

Section/topic	#	Checklist item	Reported on page #
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	n/a
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	19-23
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	23
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	23
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	No funding.

Adapted from: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement.

PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

For more information, visit: www.prisma-statement.org.

Appendix 8.6 HMIC (Ovid) search strategy: Chapter 2 -Non-medical prescribing in the United Kingdom National Health Service: A systematic policy review

1. allied health professionals/ or physiotherapists/ or podiatrists/ or radiographers/ or allied health professions/
2. exp Prescribing/
3. exp Nurses/
4. exp Pharmacists/
5. exp Optometrists/
6. exp Paramedics/
7. 1 or 3 or 4 or 5 or 6
8. 7 and 2
9. 8
10. limit 9 to yr="2006 - 2018"
11. (policy or consultation).mp. [mp=title, other title, abstract, heading words]
12. 11 and 10

Appendix 8.7 Published paper: Chapter 3

Graham-Clarke E, Rushton A, Noblet T, Marriott J. Facilitators and barriers to non-medical prescribing – A systematic review and thematic synthesis. PLoS ONE [Internet]. 2018; 13(4): e0196471

Available from: <https://doi.org/10.1371/journal.pone.0196471>



RESEARCH ARTICLE

Facilitators and barriers to non-medical prescribing – A systematic review and thematic synthesis

Emma Graham-Clarke^{1*}, Alison Rushton², Timothy Noble², John Marriott¹

1 School of Pharmacy, Institute of Clinical Sciences, College of Medical and Dental Sciences, University of Birmingham, Birmingham, United Kingdom, **2** Centre of Precision Rehabilitation for Spinal Pain, School of Sport, Exercise and Rehabilitation Sciences, College of Life and Environmental Sciences, University of Birmingham, Birmingham, United Kingdom



Abstract

Introduction

Non medical prescribing has the potential to deliver innovative healthcare within limited finances. However, uptake has been slow, and a proportion of non medical prescribers do not use the qualification. This systematic review aimed to describe the facilitators and barriers to non medical prescribing in the United Kingdom.

Methods

The systematic review and thematic analysis included qualitative and mixed methods papers reporting facilitators and barriers to independent non medical prescribing in the United Kingdom. The following databases were searched to identify relevant papers: AMED, ASSIA, BNI, CINAHL, EMBASE, ERIC, MEDLINE, Open Grey, Open access theses and dissertations, and Web of Science. Papers published between 2006 and March 2017 were included. Studies were quality assessed using a validated tool (QATSDD), then underwent thematic analysis. The protocol was registered with PROSPERO (CRD42015019786).

Results

Of 3991 potentially relevant identified studies, 42 were eligible for inclusion. The studies were generally of moderate quality (83%), and most (71%) were published 2007–2012. The nursing profession dominated the studies (30/42). Thematic analysis identified three overarching themes: non medical prescriber, human factors, and organisational aspects. Each theme consisted of several sub themes; the four most highly mentioned were 'medical professionals', 'area of competence', 'impact on time' and 'service'. Sub themes were frequently interdependent on each other, having the potential to act as a barrier or facilitator depending on circumstances.

Discussion

Addressing the identified themes and subthemes enables strategies to be developed to support and optimise non medical prescribing. Further research is required to identify if similar

OPEN ACCESS

Citation: Graham Clarke E, Rushton A, Noblet T, Marriott J (2018) Facilitators and barriers to non medical prescribing – A systematic review and thematic synthesis. PLoS ONE 13(4): e0196471. <https://doi.org/10.1371/journal.pone.0196471>

Editor: Baltica Cabezas, Universidad del Desarrollo, CHILE

Received: December 21, 2017

Accepted: April 13, 2018

Published: April 30, 2018

Copyright: © 2018 Graham Clarke et al. This is an open access article distributed under the terms of the [Creative Commons Attribution License](https://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Data Availability Statement: All relevant data are within the paper and its Supporting Information files.

Funding: The authors received no specific funding for this work.

Competing interests: The authors have declared that no competing interests exist.

themes are encountered by other non medical prescribing groups than nurses and pharmacists.

Introduction

The drive behind non medical prescribing in the United Kingdom (UK) is the need to deliver high quality healthcare to patients where and when they require it, within a limited financial resource [1–3]. Innovative patient centred care pathways are being developed, using the most appropriate healthcare professionals, such as clinical pharmacists in general practice [4], or prescribing physiotherapists streamlining musculoskeletal pathways [5]. The extension of non medical prescribing to other professional groups continues; with pressure for physician associates to become prescribers [6] and paramedics; who were unsuccessful at the last consultation [7].

Non medical prescribing evolved from limited list prescribing for a few nurses in the early 1990s to the current range of eligible healthcare professionals (Table 1). Each healthcare professional must successfully complete an appropriate and approved prescribing course, and be registered as a prescriber with their relevant regulatory body. Professionally, they are expected to prescribe within their competency area [8, 9].

The initial uptake of non medical prescribing was slow, with approximately 240 pharmacists and 4000 nurses having qualified by 2005 [10], the later contrasting with the government's anticipated 10000 nurses [11]. A recent report identified that approximately 53000 nurses and over 3800 pharmacists were registered as prescribers in 2015 [12], but was unable to identify how many were active. Previous survey evidence indicated 14% of nurse independent prescribers and 29% of pharmacist independent prescribers were not using their prescribing qualification [10], and other estimates [13] indicate under 10% of nurse independent prescribers and nearly 40% of pharmacist and allied health professional prescribers are not using their prescribing qualification. Similarly, surveys conducted by the General Pharmaceutical Council indicate varying uptake of prescribing activity. In a 2016 survey of prescribing pharmacists nearly 90% of pharmacist prescribers were reported as active [14], whereas the previous 2014 report had found that only 61% had prescribed in the previous year [15]. The 2016 survey had a poor response rate (<18%) possibly overestimating activity through responder bias.

The full cost of training a non medical prescriber (NMP) has been calculated as approximately £10000 [10] and, with increasing demand on the NHS and limited funding, there is a

Table 1. Evolution of non-medical prescribing in the UK.

2002	Extended formulary prescribing for nurses
2003	Supplementary prescribing for nurses and pharmacists
2005	Independent prescribing for nurses and pharmacists Supplementary prescribing for physiotherapists, podiatrists, and therapeutic and diagnostic radiographers
2008	Independent prescribing for optometrists
2012	Independent prescribing for physiotherapists and podiatrists
2016	Independent prescribing for therapeutic radiographers Supplementary prescribing for dieticians

An independent prescriber is responsible for the care of the patient, including prescribing.

A supplementary prescriber works in collaboration with an independent prescriber and the patient to prescribe according to a pre-determined treatment scheme.

<https://doi.org/10.1371/journal.pone.0196471.t001>

need to realise the full benefit of training investment. Previous studies have identified reasons for not prescribing including lack of support from colleagues or within their work environment [13, 14], or a role change [10]; but did not explore these issues in depth. A previous thematic literature review of supplementary prescribing did not address the issue of barriers and facilitators specifically, but identified a limited number including: medical practitioner support, communication, resource limitations and specific supplementary prescribing aspects [16]. It also did not address independent prescribing. There has been no robust review of the qualitative literature relating to barriers or facilitators of independent non medical prescribing. Identifying facilitators and barriers to independent non medical prescribing has the potential for strategy development to optimise its implementation.

The aim of this review was to evaluate the use, facilitators, and barriers of independent non medical prescribing in primary and secondary care in the UK.

Methods

Search strategy and selection criteria

A systematic review and thematic synthesis was conducted to explore the barriers and facilitators to non medical independent prescribing in the UK. A protocol for the review was developed in advance, following the PRISMA P statement [17], and registered with PROSPERO (CRD42015019786). The results are reported in accordance with the PRISMA and ENTREQ statements (S1 and S2 Appendices) [18, 19].

Qualitative and mixed methods research studies investigating independent non medical prescribing in the UK were included. Narrative reports describing a service, opinion papers and abstracts were excluded [20]. The legislation permitting independent prescribing by nurses and pharmacists was enacted in 2006 and therefore only studies published since 2006 were included [21]. There was no language restriction.

Specific search strategies were developed with expert librarian support, for each electronic database, and included broad and narrow, free text, and thesaurus based terms [22]. Boolean operators and truncation were used. The selected keywords were: nurse, pharmacist, physio therapist, podiatrist, non medical, therapist, allied health professional, chiropodist, independent prescribing, utilisation, barriers, facilitators, role, education, support, guidelines, policy, procedures, attitudes and clinic. The following databases were searched: AMED, ASSIA, BNI, CINAHL, EMBASE, ERIC, MEDLINE, Open Grey, Open access theses and dissertations, and Web of science. Papers that cite, or were cited by, the included papers were screened to identify any further relevant papers. Searches were completed to 26 March 2017 (S3 Appendix. Med line (Ovid) search strategy).

Titles/abstracts obtained from all searches were screened to remove duplicates and papers that did not meet the eligibility criteria. Full text copies of the papers remaining were obtained and reviewed. Two independent reviewers (EGC and TN) conducted each stage and resolved differences by discussion, with a third reviewer (AR) available for mediation if required [23]. Numbers excluded at each stage were recorded [18, 23].

Quality assessment

A validated quality assessment tool, (Quality Assessment Tool for Studies of Diverse Designs, QATSDD), was used to assess the studies [24]. The tool was developed to support quality analysis where studies use different designs, including qualitative, quantitative, and mixed methods. The tool comprises 16 elements (listed in S1 Table. QATSDD scores for each paper) covering aspects such as theoretical approach, research setting, data collection, and method of analysis. Each element is rated on a scale of 0 no evidence, to 3 full details, with clear reasons

defined for each score. Twelve elements are common to all studies, with two specific elements each for qualitative and quantitative studies. The studies included in this review used a variety of research methods, primarily interviews, questionnaires and focus groups, making this tool suitable. Two reviewers (EGC and TN) independently assessed the studies using the tool; resolving any disagreement in the scores through discussion. Including low quality studies in a qualitative systematic review is debated, with some researchers arguing for their inclusion as they may provide valuable insights, whereas others argue they should be excluded [20, 25, 26]. The decision was taken to include all studies to inform synthesis and conclusions regardless of quality assessment, but to report on the quality assessment results (see Table 2), particularly as from an initial scoping search, limited studies were identified.

Analysis

Thematic analysis, to identify recurrent barriers and facilitators to non medical prescribing and themes relating to use, was conducted on text from the results and findings sections of the papers together with any included participant quotations [69, 70]. The studies were read to identify initial emerging themes, and then underwent line by line thematic coding utilising NVivo®11 (QSR International). As further themes emerged, new codes were created. All codes and themes were reviewed iteratively for consistency and appropriateness and amended if necessary. The findings were summarised under descriptive theme headings, permitting development of a hierarchy. The analysis was conducted by one researcher (EGC) and the initial themes and coding discussed and critically debated by all authors. The final version was agreed by all authors following further refinement of the theme headings and hierarchy. At the end of data analysis no further themes were identified, indicating that data saturation had been reached [70]. EGC is a practising NMP, and an NMP lead with a role in supporting other NMPs. This researcher standpoint was balanced by the other three authors, none of whom are prescribers.

Results

The search strategy identified 3991 potentially relevant studies. Following exclusion of 459 duplicates and 3436 from title and abstract review, 96 studies were reviewed at the full text stage. Following exclusions, 42 papers were included (Fig 1, PRISMA flow diagram).

Overall, the studies were assessed as moderate quality. There were three low scoring papers [30, 57, 58] (score <25%), and four high scoring papers [27, 31, 43, 52] (score >75%); the latter being doctoral theses (S1 Table, QATSDD scores for each paper). Key issues highlighted by the scores were poor reporting of theoretical framework, data collection tool choice, analytical method justification, research question and analytical method fit, and user involvement.

Of the 42 papers, 30 (71%) were published between 2007 and 2012, with the remainder published subsequently. Nurse independent prescribers were studied in 24 papers [28, 32, 34, 38, 40, 42, 44, 46, 48, 50, 58, 60, 62, 64, 67], pharmacist prescribers in five papers [43, 49, 54, 55, 57], and a mixture of nurse and pharmacist prescribers in a further six papers [27, 33, 47, 52, 53, 61]. The remaining papers investigated the views of patients and staff associated with NMPs [39, 41, 45, 51, 56, 63, 68].

Thematic analysis identified 17 subthemes of which 15 described the factors that may impact on NMPs and two described the range of activity. These were grouped into three overarching themes, which were 1) factors relating to the NMP themselves, 2) human factors and 3) organisational aspects. The themes and subthemes are presented in Table 3, together with example factors, and S2 Table lists the papers that the themes were identified in. The 15 sub themes impacting on non medical prescribing contained factors which could be barriers or facilitators; in many instances, this was dictated by circumstances.

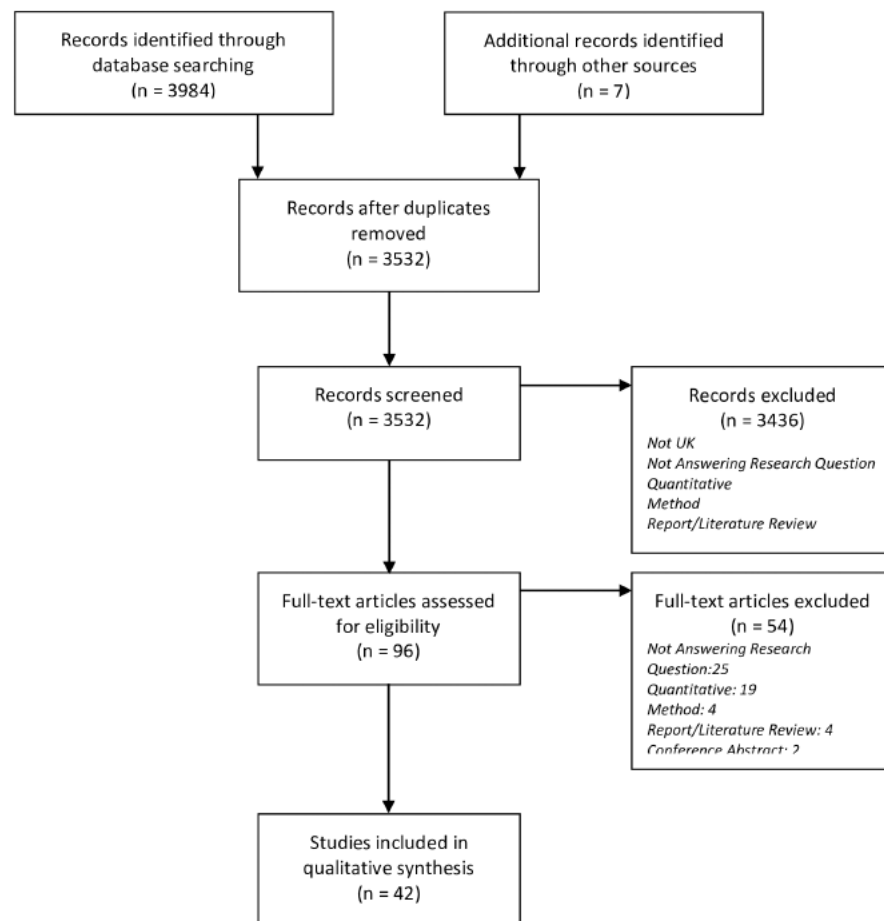


Fig 1. PRISMA flow diagram.

<https://doi.org/10.1371/journal.pone.0196471.g001>

Non medical prescriber themes

Factors affecting the NMP were subdivided into those arising from the attitude of the NMP and those derived from their practice (See [Table 3](#)). Prescribing enabled the professional to practice autonomously [21, 28, 31, 37, 42, 46, 65], enhancing job satisfaction [31, 37, 42, 46, 47, 49, 65], and supporting professional development [27, 33, 47, 50]. Some practitioners, however, expressed anxiety [29, 37] and cautiousness [27, 48, 52, 65]. Practitioners indicated that their area of competency enabled them to prescribe confidently [44, 48, 52, 65, 67], and to resist pressure to prescribe outside this area [34, 44, 52, 65, 67]. Roles were enhanced through including prescribing [27, 33, 35, 37, 42, 44, 58, 63, 67].

Table 2. Characteristics and details of selected papers.

Author	Population	Setting and/or speciality	Study type	Participant numbers	Results/Findings	QATSDD
Adigwe (2012) [27]	NMPs Patients	Primary & secondary care	1) SSI-F2F 2) Online survey 3) SSI-F2F	1) NP (n 9) PP (n 13) 2) NP (n 141) PP (n 27) Other NMP (n 11) 3) Patients (n 12)	Supportive mechanisms & safe prescribing environment required to support prescribers	90%
Armstrong (2015) [28]	Senior nurse Medical consultant NP Nurse Pharmacist Patients	Urgent care setting—one hospital	1) SSI 2) Questionnaire	1) Senior nurse (n 1) Doctor (n 1) NP (n 2) Nurse (n 1) Pharmacist (n 1) 2) Patients (n 20)	Benefits of autonomous working identified by staff & patients.	45%
Bennett et al (2008) [29]	Practising NP	HIV clinics—community & secondary care	1) postal questionnaire 2) Focus group	1) NP (n 8) 2) NP (n 7)	Impact of prescribing on NP/doctor and patient relationships discussed. Overall perceived to be beneficial.	45%
Bewley (2007) [30]	Recently qualified nurses Senior paediatric nurses NP HEI	Paediatrics	1) Facilitated workshop 2) Facilitated workshop 3) Narrative 4) Semi-structured questionnaire 5) Scoping exercise	1) Recently qualified nurses (n 35) 2) Senior paediatric nurses (n ?) 3) NP (n 1) 5) NP (n 19) 5) HEI (n 4)	Pharmacology knowledge poor during nurse training. Identified as challenging in NMP course.	14%
Bowskill (2009) [31]*	NP	Primary & secondary care	SSI	NP (n 26)	Trust between nurse and doctor identified as necessary for a successful prescribing partnership.	90%
Bowskill et al (2013) [32]*	NP	Primary & secondary care	SSI	NP (n 26)	Trust between nurse and doctor identified as necessary for a successful prescribing partnership. Secondary care practitioners had more restrictions.	60%
Brodie et al (2014) [33]	PP NP	Primary care	SSI-F2F	PP (n 4) NP (n 4)	PP/NP have holistic approach to treatment. Concerns they were underutilised.	38%
Carey et al (2009) [34]†	NP	Specialist children's hospital—Intrinsic case study	Interviews	NP (n 7 participants, 18 interviews)	NMP believed to improve care provided to patients.	55%
Carey et al (2009) [35]†	NP Doctors DMPs Clinical Leads	Specialist children's hospital—Intrinsic case study	SSI-F2F	NP (n 7 participants, 18 interviews) Doctors (n 4) DMPs (n 7) Clinical Leads (n 3)	Successful NMP implementation but variations in approach and expectations.	48%
Carey et al (2010) [36]‡	NP Doctors Administration staff Non-nurse prescribers	Dermatology services—primary & secondary care—10 site collective case study	SSI-F2F	NP (n 11) Doctors (n 12) Administration staff (n 11) Non-nurse prescribers (n 6)	NMP improved access to treatment, with ability for service reconfiguration. Inconsistent support post-training.	45%
Carey et al (2014) [37]	NP	Respiratory conditions - Primary & secondary care, East of England SHA	SSI—telephone	NP (n 39) Non-prescribing NP (n 1)	Wide variations in practice, but overall improved service to patients. Several challenges to NMP identified.	62%

(Continued)

Table 2. (Continued)

Author	Population	Setting and/or speciality	Study type	Participant numbers	Results/Findings	QATSDD
Courtenay et al (2008) [38]	NP	Primary & secondary care	Questionnaire	NP (n 1377)	Nearly 70% of NP reported problems with implementing NMP.	56%
Courtenay et al (2009) [39]†	Doctors DMPs Clinical leads	Specialist children's hospital—Intrinsic case study	F2F interviews	Doctors (n 7) DMPs (n 4) Clinical leads (n 3)	Benefits in improving services to patients identified, but concerns raised regarding roles and NMP selection.	71%
Courtenay et al (2009) [40]‡	NP Doctors Administration staff Non-nurse prescribers Patients	Dermatology services—primary & secondary care—10 site collective case study	1) SSI-F2F 2) Videotaped observations 3) Questionnaire	1) NP (n 10) Doctors (n 12) Administration staff (n 11) Non-nurse prescribers (n 6) 2) NP (n 37) 3) Patients (n 165)	Benefit to care reported by patients.	56%
Courtenay et al (2011) [41]	NMP leads, of whom half had a prescribing qualification	Primary & secondary care—one SHA	SSI	NMP leads (n 28)	Four key aspects of role identified: information, promotion, clinical governance, and training	52%
Cousins et al (2012) [42]	NP	General practice	SSI-F2F	NP (n 6)	NMP enhanced job satisfaction, but increased work-related stress.	57%
Dapar (2012) [43]	PP	Community, primary & secondary care	1) Questionnaire 2) Telephone interview	1) PP (n 695/1643) 2) PP (n 34)	Implementation of NMP requires support, and ability to overcome challenges. NMP role clarification required.	98%
Daughtry et al (2010) [44]	NP	One PCT, north England	SSI	NP (n 8)	NMP expands role, but misunderstandings exist with other work colleagues.	38%
Dobel-Ober et al (2010) [45]	Nursing directors	Mental health trusts—England	Postal questionnaire	Directors of nursing (n 39/66)	Majority of trusts had policies and strategies supporting NMP. Only 1 Trust had no NMPs.	46%
Downer et al (2010) [46]	NP	Community—two health boards, Scotland	Conversational F2F interviews	NP (n 8)	Benefits to self and patients identified, but also challenges, including lack of support.	48%
Green et al (2008) [47]	NP (n 12) PP (n 1)	Mental health trust—Humber	Email qualitative survey	NMP (n 10) (profession not indicated)	50% prescribing, others providing advice. NMP qualification of positive benefit.	48%
Herklots et al (2015) [48]	NP	Community—two PCTs	SSI	NP (n 7)	NMP enhanced role, and knowledge from course beneficial to wider practice. Support, inc. CPD, variable.	50%
Hill et al (2014) [49]	Patients PP GPwSI	Addiction services—Lanarkshire	1) SSI based on questionnaire 2) Questionnaire alone	1) Patients (n 86) PP (n 5) 2) GPwSI (n 6)	Overall satisfaction with PP led clinic, with enhanced job satisfaction.	33%
Kelly et al (2010) [50]	Practice nurses, +/- prescribing qualification	Primary care—one southern English county	Postal questionnaire	No prescribing qualification (n 120) NP (n 31)	46% respondents not intending to train as NMP, citing various issues relating to the course and age as reasons	35%
Maclure et al (2013) [51]	General public	Scotland	Postal questionnaire	General public (n 1855/5000)	General support for NMP, but several concerns raised.	43%

(Continued)

Table 2. (Continued)

Author	Population	Setting and/or speciality	Study type	Participant numbers	Results/Findings	QATSDD
Maddox et al (2011) [52]§	PP NP	Primary & community—predominantly NW England	1) Unstructured interviews 2) Focus group x 3 3) SSI (F2F or telephone) 4) Q-method	1) PP (n 4) NP (n 14) 2) NP (n 10) 3) PP (n 5) NP (n 15) 4) PP (n 22) NP (n 34)	NMPs most confident when prescribing within guidelines. 'Time burden' for DMPs acknowledged as significant.	95%
Maddox et al (2016) [53]§	PP NP	Primary & community—predominantly NW England	1) SSI (F2F or telephone) 2) Focus group x 3	1) PP (n 5) NP (n 15) 2) NP (n 10)	NMPs cautious when prescribing, confidence improved with good support.	69%
McCann et al (2011) [54]¶	PP	Primary & secondary care—Northern Ireland	Postal structured self-administered questionnaire	PP (n 76/100)	Over 50% had or were not prescribing. Issues included lack of funding and lack of GP awareness.	42%
McCann et al (2012) [55]¶	PP DMP Key stakeholders	Primary & secondary care—Northern Ireland	SSI-F2F	PP (n 11) DMP (n 8) Stakeholders (n 13)	Benefits of holistic care for patient and team working identified, together with several challenges.	60%
McCann et al (2015) [56]¶	PP Patients	3 case studies, primary & secondary care—Northern Ireland	Focus Groups x 7	Patients (n 34)	Lack of prior awareness of PP. Patients identified benefits of team approach, but expressed some reservations.	62%
Mulholland (2014) [57]	PP Non-prescribing pharmacists	Neonatal units, United Kingdom	Electronic survey	PP (n 22) Non-prescribing pharmacists (n 23)	NMP identified as a team benefit, with utilisation of pharmacist knowledge.	23%
Mundt-Leach (2012) [58]	NP	NHS addiction services	Telephone survey	NP (n 20)	Benefits of NMP for patients felt to outweigh challenges.	21%
Oldknow et al (2010) [59]	NP Consultant psychiatrists Patients	Older peoples' mental health services—one mental health trust	1) F2F interviews 2) Postal survey 3) Document review	1) Participants unknown (n ?) 2) Patients (n 16/58) 3) Unknown	Report of a pilot implementation of NMP, which indicated service benefits.	35%
Oldknow et al (2013) [60]	Non-prescribing NP	One mental health trust	Interviews	Non-prescribing NP (n 6)	Several barriers identified, including lack of remuneration.	71%
Ross (2015) [61]	NP PP Nurse manager Consultant psychiatrists GP Patients	Mental health—Tees, Esk & Wear Valleys NHSFT	1) Focus groups x 9 2) Interviews—F2F & telephone (n 13)	1) & 2) Distribution unknown. NP (n 35) PP (n 3) Nurse manager (n 2) Consultant psychiatrists (n 7) GP (n 1) Patients (n 9)	Patient/NP relationship positive with benefit seen by all participants. De-prescribing highlighted as an important role.	60%
Ross et al (2012) [62]	NP	Mental health—Scotland	3) Email/postal Questionnaire 4) Focus group	1) NP (n 33/60) 2) NP (n 12)	Majority of NMPs yet to prescribe. Numerous barriers identified including lack of support from employer and lack of adequate remuneration.	71%
Shannon et al (2011) [63]	GP Cardiac physician	Heart Failure—one primary care centre & one hospital, West Scotland	1) Focus groups x 4 2) 1-2-1 interviews	1) GP (n 9) Cardiac physician (n 8) 2) GP (n 1) Cardiac physician (n 3)	Participants generally supportive of NMP, but identified communication as a key challenge.	57%

(Continued)

Table 2. (Continued)

Author	Population	Setting and/or speciality	Study type	Participant numbers	Results/Findings	QATSDD
Stenner et al (2007) [64]	NP	Acute, chronic & palliative pain—community, primary & secondary care	SSI-F2F	NP (n 26)	NMPs more likely to provide advice on treating chronic pain patients than prescribe. Reasons for this include budgetary restrictions.	57%
Stenner et al (2008) [65]	NP	Acute, chronic & palliative pain—community, primary & secondary care	SSI-F2F	NP (n 26)	Many benefits to NMP identified, resulting from autonomous practice.	52%
Stenner et al (2008) [66]	NP	Acute, chronic & palliative pain—community, primary & secondary care	SSI-F2F	NP (n 26)	Multi-disciplinary team working benefits both NMPs and other team members. Support from policies and CPD identified as important.	67%
Stenner et al (2010) [67]	NP Doctors Administration staff Non-prescribing nurse	Diabetes—community, primary & secondary care —9 site collective case study	SSI	NP (n 10) Doctors (n 9) Administration staff (n 9) Non-prescribing nurse (n 3)	Prescribing incorporated into existing role, with support from other staffs. Some issues initially, but now mainly resolved.	50%
Stenner et al (2011) [68]	Patients	Diabetes—6 sites, Primary care	SSI	Patients (n 41)	Patients identified a range of benefits from NMP, including improved disease management.	57%

* paper derived from linked theses.

§ paper derived from linked theses.

† linked reports of data from one study.

‡ linked reports of data from one study.

¶ linked reports of data from one study.

|| linked reports of data from one study.

DMP, designated medical practitioner; F2F, Face-to-Face; GP, general practitioner; GPwSI, GP with a special interest; HEI, Higher education institute; NHSFT, National Health Service Foundation Trust; NP, nurse prescriber; NMP, non-medical prescriber; PP, pharmacist prescriber; PCT, primary care trust; QATSDD, Quality Assessment of Studies of Diverse Designs; SHA, strategic health authority; SSI, Semi-Structured interviews

<https://doi.org/10.1371/journal.pone.0196471.t002>

Human factor themes

Human factors described the impact that NMPs had on their patients, colleagues, and managers, and the impact that these people had on the NMP themselves. Medical staff that had been involved in the training of NMPs [39, 54, 63] were more supportive than those who were unaware of the training involved [39, 43]. This was regardless of seniority [55, 66]; junior medical staff were less likely to be supportive [39]. Managers were instrumental in developing and supporting the NMP role [27, 36, 41, 43]. Lack of support, flexibility or understanding by managers hindered the implementation and development of non medical prescribing [27, 29, 31, 32, 37, 46, 52, 54, 61, 66, 67]. NMPs gained support from colleagues, describing enhanced team working [27, 32, 34, 35, 41, 43, 47, 49, 55, 57, 65, 67], and were perceived as supportive experts and leaders [27, 32, 43, 47, 67]. However, NMPs encountered opposition from some colleagues [21, 27, 31, 32, 38, 43, 44, 47, 52, 62, 66].

Organisational aspect themes

Organisational aspects encompassed a range of themes covering administration, development and service delivery. Administration comprised three subthemes: formulary, policy, and

Table 3. The themes and subthemes that influence non-medical prescribing.

Theme	Sub- and subsub- themes	Questions	Interpretation/example factors
1. Non-medical prescriber	1.1. Attitude 27–29 , 31–35 , 40 , 42 , 46 , 46–50 , 52 , 53 , 61 , 65–67	"I think it's been a marvelous (sic) thing really and it's been good, it's good for my confidence, it's given me a lot to think about. It's given me a new string to a bow, it keeps me interested." 37 "It scares the hell out of me even though I am autonomous in my clinics. I still after doing a prescription have to get a GP to sign to check." 50	Job satisfaction and confidence of the practitioners enhanced by non-medical prescribing. Lack of confidence and anxiety can prevent practitioner from using prescribing skills. Attitude towards NMP and role can be affected by views of others.
	1.2. Practice		
	1.2.1. Area of competence 27 , 31–35 , 37 , 38 , 45 , 52–54 , 56–58 , 59–60	"... with contraception I thought before I start initiating new pills I really want to do an update and I was engaged to do that quickly. It has given me a lot more confidence, prescribe in that." 27 "Some of our patients now would be more difficult to manage you know patients with other conditions like some of our asthma patients as well as being renal are also osteoporosis patients and that makes them a bit more awkward and those patients I would definitely refer before upping or decreasing a dose." 53	Confidence gained by defined area of competence. Continuation of competence acknowledged, need to refer when outside, or perceived to be outside, competence area.
	1.2.2. Role 27 , 28 , 31–37 , 40 , 46 , 47 , 53 , 52 , 53 , 56 , 58 , 62 , 63 , 65–67	"Hospital trust G and primary care trust A agreed for the nurse specialist to run nurse led clinics in primary care settings. Her prescribing qualification has enabled the successful development of this new service for patients. Without a nurse prescriber in these points a doctor is required to be present in the community to prescribe for patients accessing healthcare at this point. "I couldn't do my role without nurse prescribing" 31 "I have to develop my own role fighting to find a place in between GPs and prescribing nurses." 53 "I think they (nurse prescribers) look at all the care. They will check that the drug they have prescribed don't clash with other things. They are interested in my home life. They sit down and take an interest so you don't relapse." 63 "My one (disadvantage) would be crossing the specialist—crossing the illnesses. My experience here is in relation to diabetic management, but I would also like one that is appreciative of my overall (health)" 59	Found to enhance existing roles. Success more likely where practitioner's role well-defined or when role specifically designed to include prescribing. Success less likely when lack of role clarity, where role wasn't valued or where organisational issues constrained role development. Patients appreciate receiving holistic care and understandable information from NMPs. Concerns about communication with GP, and that NMP may have limited knowledge/ability to deal with complex issues.
2. Human factors	2.1. Patients 27–29 , 43 , 47 , 49 , 51 , 56 , 59 , 63 , 65 , 67 , 68		
	2.2. Staff		
	2.2.1. Managers 27 , 28 , 31–33 , 35–37 , 41 , 45 , 46 , 50 , 52 , 54 , 60 , 62 , 66 , 67	"... I think the non-medical prescribing lead did a good job in setting it up initially... we are lucky in our Trust because the non-medical prescribing lead has driven it from the onset, he was one of the first supplementary prescribers and he has driven it right from the word go really and he has fought long and hard to get it recognised and that's why we are in the position that we are in now." 27 "Management appeared threatened, hostile and jealous of my prescribing authority and it is extremely annoying that major decisions regarding nurse prescribing are made by people in management who know nothing about it." 67	Development and implementation of NMP, enabled by managerial support, including strong strategic vision. Implementation of NMP hindered through lack of understanding or organisational unpreparedness by managers.
	2.2.2. Medical professional 27–29 , 31–35 , 43 , 46 , 49 , 52 , 53 , 57 , 58 , 62 , 65–67	"Team working gives you much more information about the patient, and it gives you much more support if you need it, and I have a good working relationship with the GPs... I have referrals from the practice nurse; I have referrals from the doctor... So I think the close working relationship in the team is the best part." 43 "Again my anxiety is largely for the nurses involved, it doesn't seem at the moment clear, exactly what their responsibility is and if there is a mess up, who carries the can. I am not clear if a nurse prescriber prescribes something at a dreadfully wrong dose and somebody is harmed as a result, who carries the can. Is that my MDU subscription or is it a separate thing? I think those areas are something that to me are not entirely clear." 59 "Long term trusting relationship of mutual respect between medical, nursing and other health care professionals and myself" 43 "I think as soon as they realize you can prescribe they expect you to be able to do exactly what doctors can do. They don't understand your limitations and you can only work within the scope of your knowledge, and they expect you to sign repeat prescriptions, and send everybody through to you. So it can be quite difficult at times explaining to them." 44	Doctors understanding and appreciating benefits of NMP role, including seeking advice. Lack of clarity over role boundaries and concerns over loss of control.
	2.2.3. Peers 27 , 28 , 31 , 32 , 34–36 , 38 , 41 , 43 , 44 , 46–49 , 52 , 53 , 55 , 57 , 58 , 62 , 65–67		Peer/NMP relationship providing mutual support and improving team working. Lack of understanding of NMP and/or antagonism hindering NMP.

(Continued)

Table 3. (Continued)

Theme	Sub, and subth, themes	Quotations	Interpretation/example factors
3. Organisational aspects	3.1. Administration 3.1.1. Formulary 27, 29, 31–33, 36, 37, 43, 47, 48, 51, 52, 62, 64, 66	"You take each patient on their own merit but within that framework and if there wasn't that framework I think I might be floundering a bit more" 33 "The clinic is actually limiting the range of non-HIV medications that I can prescribe, even if many of those agents prove very useful in treatment support unit." 29	Personal formulary used to define area of competence, and supported by national guidelines. Formulary restrictions derived from organisational policy or cost pressures.
	3.1.2. Policy 27, 28, 31, 35, 43, 47, 62, 66	"I guess the only thing that I would change is by having standards across the country. I think each Trust is allowed to adopt non-medical prescribing within their own guidelines and within their remit and I think it's been good in some areas but it has hindered non-medical prescribing in some others and it has not allowed them to develop their practice, as they would do." 27 "My Trust has no guidelines and there is no guidance. I don't know anyone in our area who is prescribing" 62 "... you know at the end of the day, I am doing it not for the money and not for the banding it is for my practice and having a qualification that allows me to develop my practice but also to manage my career plan for the future, if you like." 27 "I think that if there was a clear reward in taking up the nurse prescribing mantle, you know, I would be prescribing now" 66	Clear policy supporting NMP, and acting as safeguard. Lack of or restrictive, policy hindering NMP development and implementation.
	3.1.3. Remuneration 27, 37, 43, 45, 50, 54, 60, 63	"... you know at the end of the day, I am doing it not for the money and not for the banding it is for my practice and having a qualification that allows me to develop my practice but also to manage my career plan for the future, if you like." 27 "I think that if there was a clear reward in taking up the nurse prescribing mantle, you know, I would be prescribing now" 66	Prescribing qualification for role extension or career progression, not for financial reward. Lack of financial reward seen as disincentive to training and unappreciative of role.
	3.2. Development 3.2.1. Post course support 27, 28, 33, 35–37, 39, 43, 45, 46–48, 50–53, 55–57, 63, 65, 67	"I support them to ensure that they have access to further training, development and continuous professional development" 28 "Ongoing support has gone very hit and miss. In the first year there were a few evening sessions on general stuff, not specific to dermatology. Now with all the reorganisation it has completely hit the bin and you don't get any CPD from the employer." 39 "All candidates have been required to ... have some clear objectives around the need and use of the skills and ability to prescribe" 43 "Nurses that have done course say very intense and difficult. I have two children and am single parent—so limited commitment to study" 50	Post training support necessary for continued development of skills and confidence. Enabled by provision of training courses, and managerial support. Time and funding provision limiting access to courses. Peer and professional support absent. Prior to course, need for NMP should be identified, and appropriate candidates selected. Role of clinical mentor crucial for successful completion. Time and course commitments off-putting or leading to challenges in completing course.
	3.2.2. Training 27, 28, 30, 33, 35, 39, 41, 43, 45–48, 50, 52, 53, 56, 57, 63, 67	"All candidates have been required to ... have some clear objectives around the need and use of the skills and ability to prescribe" 43 "Nurses that have done course say very intense and difficult. I have two children and am single parent—so limited commitment to study" 50	Post training support necessary for continued development of skills and confidence. Enabled by provision of training courses, and managerial support. Time and funding provision limiting access to courses. Peer and professional support absent. Prior to course, need for NMP should be identified, and appropriate candidates selected. Role of clinical mentor crucial for successful completion. Time and course commitments off-putting or leading to challenges in completing course.
3.3. Service delivery	3.3.1. Impact on time 27–29, 33–37, 39, 40, 43, 45, 46–49, 51, 52, 55–59, 61, 63, 65, 67, 69	"I think it's because of timing issues, you know, because normally if it's someone who has rung in the morning, then they won't get a GP visit till the afternoon, and if they're last on the list, by then they're so far down the line they're in hospital. So timing issues are very important in managing a deteriorating patient ... you get it on board quicker. I mean, it's a 12-hour difference sometimes." 49 "Oh, it has changed dramatically. Workload had trebled. We see most of the minor ailments. We have taken a lot more on—the more knowledge you get the higher the workload. We do all medication reviews and all hypertension reviews" 49 "What we get on the referral is what we know. I think we've had three more practices now go on to the same system we're on and the GPs are finally coming round to understanding that sharing their notes is a benefit to all of us. So it is improving. I've now got two GP practices on our caseload where I can see their notes as well." 37 "I feel that pharmacy independent prescribing can only take place in a primary care setting, within GP practices. This is because we have no access to patient history and notes otherwise. This makes prescribing from elsewhere more difficult and possibly less effective" 59 "I can do their prescription there and then, whereas sometimes they'd have to come back for it. For the younger people, who have taken time off work, they don't want to come back again, and sometimes they get angry or frustrated if it puts them out, so yes, it's much, much better for them that if it's there and they can get it." 37 "At the moment we only have one GP practice that I've been able to get a referral to. It's a bit of an issue to do her clinic without it, for the other persons. And also time consuming for the patients because that time might have all the knowledge and skills but they will have to get the doctor to come in because they have not done the prescribing course." 51	Patients able to receive timelier and streamlined care with NMP. Ability to prescribe saves time for NMP, doctor, and patient. Workload pressure increasing because of prescribing. Prescribing supported by good access to patient records, particularly electronic systems. Limited or no access to patient records (including electronic) preventing prescribing and impeding good communication.
	3.3.2. Infrastructure 27, 31–34, 36–38, 43, 46–49, 51, 52, 54, 57, 62–64, 67	"I feel that pharmacy independent prescribing can only take place in a primary care setting, within GP practices. This is because we have no access to patient history and notes otherwise. This makes prescribing from elsewhere more difficult and possibly less effective" 59 "I can do their prescription there and then, whereas sometimes they'd have to come back for it. For the younger people, who have taken time off work, they don't want to come back again, and sometimes they get angry or frustrated if it puts them out, so yes, it's much, much better for them that if it's there and they can get it." 37 "At the moment we only have one GP practice that I've been able to get a referral to. It's a bit of an issue to do her clinic without it, for the other persons. And also time consuming for the patients because that time might have all the knowledge and skills but they will have to get the doctor to come in because they have not done the prescribing course." 51	Service to patients improved and streamlined, with improved patient satisfaction and efficiency. Services dependent on NMPs, with issues arising when NMPs are unavailable.
	3.3.3. Service 27–29, 33–37, 39–46, 47–49, 52, 53–55, 61, 63, 65, 69	"I can do their prescription there and then, whereas sometimes they'd have to come back for it. For the younger people, who have taken time off work, they don't want to come back again, and sometimes they get angry or frustrated if it puts them out, so yes, it's much, much better for them that if it's there and they can get it." 37 "At the moment we only have one GP practice that I've been able to get a referral to. It's a bit of an issue to do her clinic without it, for the other persons. And also time consuming for the patients because that time might have all the knowledge and skills but they will have to get the doctor to come in because they have not done the prescribing course." 51	Service to patients improved and streamlined, with improved patient satisfaction and efficiency. Services dependent on NMPs, with issues arising when NMPs are unavailable.
	3.3.4. Use in practice 3.3.4.1. Patients 29, 31–37, 39, 43, 47, 50, 52, 55, 56, 60, 64–66	"We started one patient on insulin in the community which is fantastic, saved so much hassle for a demented man not to have to go into hospital" 31 "The odd time you get people in who are, live on the streets, you know, I'd prescribe for them, and you can get those things over the counter because they haven't got the money and they get free prescriptions" 53 "A major benefit of seeing the patient in their home, in a setting where it's to their best convenience" 63 "My main design are treating people with acute respiratory problems. Their medicines (can) out, or they're having asthma attacks. That's mainly an out of the hour setting. It is a benefit for them to walk in to the walk-in centre. At least they're getting care somewhere." 37	Long-term conditions such as diabetes. Complex patients such as those with comorbidities. Minor ailments. Patients with social needs for example drug users. Primary and secondary care, including cross sector working, ranging from home based care to specialist clinic.

<https://doi.org/10.1371/journal.pone.0196471.t003>

remuneration. A formulary could be self imposed [27, 31, 32, 48, 52], or organisation derived [27, 29, 31, 32, 36, 62], and while they could be empowering [31, 36, 52, 66], they could be restrictive [27, 29, 32, 36, 48, 52, 62]. Local policies could be supportive [27, 47, 66], restrictive [27, 31, 43, 66], or missing [62]. Remuneration was considered to be non commensurate with skills [27, 43, 46, 50, 54, 60, 62]. Development covered both training, including selection for course, as well as post course support. Course facilitators included appropriate selection of candidates [35, 39, 41, 45, 47, 50], awareness of course commitments and requirements [48], and support from medical mentors [43, 63], and managers [39, 41, 45]. Post course support included the provision or facilitation of professional development courses [27, 36, 41, 47, 48, 67], mentoring [27, 41, 48, 50], and clinical supervision [27, 36, 66]. Absence of such support hindered NMP development [27, 33, 35, 37, 43, 46, 48, 52, 62, 63, 66, 67]. Infrastructure covered several issues, each with the potential to support or hinder, including access to: patient records [27, 37, 43, 46, 49, 51, 52, 54, 63, 64], information technology [27, 31, 36, 38, 43, 48], prescriptions [27, 31, 32, 37, 38, 43, 62, 67], and facilities [43, 49]. NMPs spent more time with patients [35, 37, 39, 47, 49, 52, 55, 56, 63, 68], and were considered to provide a responsive, efficient, and convenient service [27, 29, 33, 35, 37, 40, 44, 47, 49, 59, 65, 68]. Doctors' time was released by NMPs activity [29, 36, 43, 51, 63, 67], but time constraints and workload could hinder the NMP service [29, 34, 35, 44, 46, 49, 52, 63]. Some services were now reliant on NMPs [36, 37] and had issues when cover was absent [36]. The settings and patient groups where non medical prescribing is utilised were diverse. Examples were given of utilising non medical prescribing to treat patients who may find accessing healthcare difficult such as frail and housebound patients [37, 52, 63], the homeless [52], and drug users [43, 58]. Non medical prescribing was also utilised in more conventional healthcare settings such as specialist clinics (for example, dermatology [36, 43], anti coagulation [56], and cardiovascular [43]), minor illness clinics [31, 36, 37, 44, 50], and out of hours services [36, 37, 52].

During analysis, it became apparent that many factors were not present in isolation but were interdependent. Frequently, the interdependence was between a member of staff, the NMP, an organisational aspect such as policy, and how this impacted on the NMP's confidence and ability to prescribe. Examples include a situation whereby a supportive GP had given an NMP confidence to develop her competence area and expand her personal prescribing formulary [27], and identification by NMP leads that an NMP role was more likely to flourish when linked to a strategic vision and a well defined area of practice [41]. Other interdependencies were within organisational aspects, such as the increased time required when the NMP was unable to easily access the patient's notes [37], or when the non medical prescribing policy specifically supported access to continuing training [28].

Discussion

This is the first systematic review to investigate and synthesise the qualitative and mixed methods literature regarding barriers and facilitators to, and use of, independent non medical prescribing. Three overarching themes, each containing subthemes, were identified; the NMP, human factors and organisational aspects. The themes and subthemes could all impact on successful implementation of non medical prescribing, and could be interdependent.

The NMP theme describes three aspects; one is intrinsic to the person (attitude), one derives from their role, and the final one may be personally or externally derived. The later subtheme 'Area of competence' was one of the four most highly mentioned aspects found during analysis, highlighting its importance. This is supported by the 'Competency framework for all prescribers' [8] and the NMC 'Standards of proficiency for nurse and midwife prescribers'

[9], which state that practitioners should only prescribe within their scope of practice (in contrast with the traditional medical model). There are implications if the NMP changes role, or in planned service expansion, as further training and support in these new areas would be required. Closely defined areas of competence could hamper full utilisation of non medical prescribing, particularly in patients with co morbidities.

The second theme 'human factors' describes the complex interrelation between the NMP, their managers, peers, the medical professions they work with, and their patients. This theme included the most frequently mentioned subtheme 'Medical professionals', identified in 32 papers. It is notable that, in contrast with the review by Cooper et al, medical professionals generally accepted the NMP role [16]. Reasons for acceptance may be because non medical prescribing has become established practice but also because NMPs have made deliberate efforts to gain trust. There was an appreciation that the NMP role permitted medical professionals to concentrate on patients where their expertise was necessary. Changes in managerial personnel could adversely impact on non medical prescribing, particularly where systems and processes were not embedded into practice. This review found that patients' views of non medical prescribing were mixed, with many patients appreciating the time taken and holistic approach of the NMP, whereas others expressed concerns. A lack of public understanding of non medical prescribing remains, even with patients treated by NMPs. Cooper et al noted that very little research was identified investigating the views of patients about non medical prescribing [16]. This review identified one paper investigating public perception of non medical prescribing [51] and eight papers that included the views of patients [27, 28, 40, 49, 56, 59, 61, 68]; however, one of these only included quantitative 'rating' data from patients [40]. Research into patients' opinions of non medical prescribing warrants further investigation.

The final theme covers the organisational aspects that support and enable an NMP to practice. It contains two of the four most frequently mentioned subthemes, 'impact on time' and 'service'. In comparison to other subthemes, these two were frequently interdependent on each other, with both highlighting the perceived improvement to patient care by providing a streamlined, holistic, and convenient service. Funding pressures may make this aspect of the service, appreciated by patients, difficult to sustain. This review identified that contingency and succession planning should be considered during service development.

This review's strength lies in its rigorous methodology and breadth of search strategy. This compares with the previous investigations, which were limited in scope and rigour [14, 16]. The predetermined stringent protocol, registered with PROSPERO, and the use of two independent reviewers are recognised strategies to reduce potential bias associated with paper selection [20, 71]. Limitations included the inconsistent definitions used to describe NMPs, which became apparent during the literature search. The terminology would have been appropriate when those studies were conducted, but the meaning changed as prescribing rights evolved (see Table 1). Every effort was made to limit the included studies to those investigating full independent non medical prescribing. The nursing profession dominated the included studies, with limited representation from pharmacist prescribers (mentioned in 11 papers [27, 33, 43, 47, 49, 52, 55, 57, 61]) and none from other non medical prescribing professions. This reflects the relative numbers of the different professions [15, 72] and the numbers of qualified prescribers [12]. However, the numbers of AHPS are likely to have increased recently following legislation changes and that could be considered a limitation. Research into non medical prescribing by the other professions is needed to identify if they experience the same barriers and facilitators.

The themes and subthemes identified in this review influence the implementation and development of non medical prescribing; each could act as a barrier or facilitator depending on circumstances. Where there was a lack of understanding of the non medical prescribing

role, or lack of trust in the non medical prescriber, then the factors were more inclined to be barriers. For example, medical professionals were less likely to support non medical prescribing where there was a lack of clarity about who took responsibility for the prescribing practice [35, 39, 50]. Facilitation of NMP occurred when medical professionals trusted the NMP, for example enabling access to patient records [37]. As a consequence of budgetary constraints, factors may become barriers, such as the use of restrictive formularies as a cost saving measure [37, 52, 64]. Additionally, this review has identified that these themes and subthemes do not stand in isolation but are interdependent on each other. Each of these aspects should be considered when developing a non medical prescribing service, and could be utilised as a model for developing a non medical prescribing strategy framework. This review will also inform those currently managing or running a service, enabling service optimisation. Failure to address all these aspects may mean that the full benefit of an NMP service will not be realised.

Supporting information

S1 Appendix. PRISMA checklist.
(DOC)

S2 Appendix. ENTREQ checklist.
(DOCX)

S3 Appendix. Medline (Ovid) search strategy.
(DOCX)

S1 Protocol. PROSPERO record.
(PDF)

S1 Table. QATSDD scores for each paper.
(DOCX)

S2 Table. Themes identified in each paper.
(DOCX)

Author Contributions

Conceptualization: Emma Graham Clarke, Alison Rushton, Timothy Noblet, John Marriott.

Data curation: Emma Graham Clarke.

Formal analysis: Emma Graham Clarke, Timothy Noblet.

Investigation: Emma Graham Clarke, Timothy Noblet.

Methodology: Emma Graham Clarke, Alison Rushton, Timothy Noblet, John Marriott.

Project administration: Emma Graham Clarke.

Supervision: Alison Rushton, John Marriott.

Validation: Alison Rushton.

Writing original draft: Emma Graham Clarke.

Writing review & editing: Alison Rushton, Timothy Noblet, John Marriott.

References

1. NHS England. Five Year Forward View 2014 October 2014. Available from: <https://www.england.nhs.uk/wp-content/uploads/2014/10/5yfv-web.pdf>.

2. NHS England. NHS England sets out proposals for more efficient and responsive access to medicines for patients 2015 [updated 26/02/15; cited 2015 12/13]. Available from: <https://www.england.nhs.uk/2015/02/26/access-to-medicines/>.
3. Next steps on the NHS five-year forward view. NHS England; 2017. Available from: <https://www.england.nhs.uk/2017/03/next-steps-on-the-five-year-forward-view/>.
4. General Practice Forward View. NHS England; 2016. Available from: <https://www.england.nhs.uk/wp-content/uploads/2016/04/gpfv.pdf>.
5. Loughran I, Rae G. Physiotherapist prescribing in lower back pain: a case study. *Nurse Prescribing*. 2015; 13(2):94–7. <https://doi.org/10.12968/npre.2015.13.2.94>
6. The Health Foundation. Staffing matters; funding counts. London: The Health Foundation; 2016. Available from: <http://www.health.org.uk/sites/default/files/StaffingMattersFundingCounts.pdf>.
7. Allied Health Professions Medicines Project Team. Summary of the responses to the public consultation on proposals to introduce independent prescribing by paramedics across the United Kingdom. NHS England; 2016. Available from: <https://www.england.nhs.uk/wp-content/uploads/2016/02/Paramedics-summary-consult-responses.pdf>.
8. A competency framework for all prescribers. London: Royal Pharmaceutical Society; 2016. Available from: <https://www.rpharms.com/resources/frameworks/prescribers-competency-framework>.
9. Standards of proficiency for nurse and midwife prescribers. Updated 2015 ed. London: Nursing and Midwifery Council; 2006. Available from: <https://www.nmc.org.uk/standards/additional-standards/standards-of-proficiency-for-nurse-and-midwife-prescribers/>.
10. Latter S, Blenkinsopp A, Smith A, Chapman S, Tinelli M, Gerard K, et al. Evaluation of nurse and pharmacist independent prescribing: University of Southampton; Keele University; 2010 October 2010. 374 p.
11. Department of Health. Patients to get quicker access to medicines. Richmond House, 79 Whitehall, London SW1A 2NJ, UK: Department of Health; 2001 [11/08/2014]. Press Release. Available from: http://webarchive.nationalarchives.gov.uk/+/www.dh.gov.uk/en/Publicationsandstatistics/Pressreleases/DH_4010748.
12. NHS Health. Non-Medical Prescribing (NMP): An Economic Evaluation. NHS Health Education North West, 2015. Available from: <https://www.hee.nhs.uk/sites/default/files/documents/Agenda%20Item%207%20-%2015%20Health%20-%20NMP%20Economic%20Evaluation.pdf>.
13. Courtenay M, Carey N, Stenner K. An overview of non medical prescribing across one strategic health authority: a questionnaire survey. *BMC Health Serv Res*. 2012; 12:138. <https://doi.org/10.1186/1472-6963-12-138> PMID: 22657272
14. Prescribers Survey Report. London: General Pharmaceutical Council; 2016. p. 54. Available from: https://www.pharmacyregulation.org/sites/default/files/gphc_prescribers_survey_report.pdf.
15. Phelps A, Agur M, Nass L, Blake M. GPhC Registrant Survey 2013 Findings. London: NatCen, 2014 March 2014. Report No. Available from: https://www.pharmacyregulation.org/sites/default/files/gphc_registrant_survey_2013_main_report_by_natcen.pdf.
16. Cooper RJ, Anderson C, Avery T, Bissell P, Guillaume L, Hutchinson A, et al. Nurse and pharmacist supplementary prescribing in the UK—a thematic review of the literature. *Health Policy*. 2008; 85(3):277–92. <https://doi.org/10.1016/j.healthpol.2007.07.016> PMID: 17900744
17. Moher D, Shamseer L, Clarke M, Ghersi D, Liberati A, Petticrew M, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Systematic Reviews*. 2015; 4(1):1–9. <https://doi.org/10.1186/2046-4053-4-1> PMID: 25554246
18. Moher D, Liberati A, Tetzlaff J, Altman DG, Group TP. Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLOS Med*. 2009; 6(7):e1000097. <https://doi.org/10.1371/journal.pmed.1000097> PMID: 19621072
19. Tong A, Flemming K, McInnes E, Oliver S, Craig J. Enhancing transparency in reporting the synthesis of qualitative research: ENTREQ. *BMC Med Res Methodol*. 2012; 12(1):181. <https://doi.org/10.1186/1471-2288-12-181> PMID: 23185978
20. Hannes K. Chapter 4: Critical appraisal of qualitative research. In: Noyes J, Booth A, Hannes K, Harden A, Harris J, Lewin S, et al., editors. *Supplementary Guidance for Inclusion of Qualitative Research in Cochrane Systematic Reviews of Interventions*. Version 1 ed 2011.
21. The National Health Service (Miscellaneous Amendments Relating to Independent Prescribing) Regulations 2006, Stat. 913 (1st May 2006).
22. Shaw RL, Booth A, Sutton AJ, Miller T, Smith JA, Young B, et al. Finding qualitative research: an evaluation of search strategies. *BMC Med Res Methodol*. 2004; 4(5). <https://doi.org/10.1186/1471-2288-4-5> PMID: 15070427

23. Liberati A, Altman DG, Tetzlaff J, Mulrow C, Gotzsche PC, Ioannidis JP, et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. *PLOS Med*. 2009; 6(7):e1000100. <https://doi.org/10.1371/journal.pmed.1000100> PMID: 19621070
24. Sirriyeh R, Lawton R, Gardner P, Armitage G. Reviewing studies with diverse designs: the development and evaluation of a new tool. *J Eval Clin Pract*. 2012; 18(4):746–52. <https://doi.org/10.1111/j.1365-2753.2011.01662.x> PMID: 21410846
25. Hannes K, Lockwood C, Pearson A. A comparative analysis of three online appraisal instruments' ability to assess validity in qualitative research. *Qual Health Res*. 2010; 20(12):1736–43. <https://doi.org/10.1177/1049732310378656> PMID: 20671302
26. Sandelowski M, Voils CI, Barroso J. Defining and designing mixed research synthesis studies. *Res Sch*. 2006; 13(1):29. Epub 2006/04/01. PMID: 20098638
27. Adigwe OP. Non-medical prescribing in chronic non-malignant pain [PhD]. Leeds: University of Leeds; 2012.
28. Armstrong A. Staff and patient views on nurse prescribing in the urgent-care setting. *Nurse Prescribing*. 2015; 13(12):614–9. <https://doi.org/10.12968/npre.2015.13.12.614>
29. Bennett J, Jones M. Nurse prescribing in HIV: opportunities and threats. *HIV Nursing*. 2008; 8(4):12–6.
30. Bewley T. Preparation for non medical prescribing: a review. *Paediatr Nurs*. 2007; 19(5):23–6. PMID: 17621779
31. Bowskill D. The integration of nurse prescribing: case studies in primary and secondary care [DHS]. Nottingham: University of Nottingham; 2009.
32. Bowskill D, Timmons S, James V. How do nurse prescribers integrate prescribing in practice: case studies in primary and secondary care. *J Clin Nurs*. 2013; 22(13–14):2077–86. <https://doi.org/10.1111/j.1365-2702.2012.04338.x> PMID: 23186080
33. Brodie L, Donaldson J, Watt S. Non-medical prescribers and benzodiazepines: a qualitative study. *Nurse Prescribing*. 2014; 12(7):353–9. <https://doi.org/10.12968/npre.2014.12.7.353>
34. Carey N, Stenner K, Courtenay M. Adopting the prescribing role in practice: exploring nurses' views in a specialist children's hospital. *Paediatr Nurs*. 2009; 21(9):25–9. <https://doi.org/10.7748/paed2009.11.21.9.25.c7357> PMID: 19947105
35. Carey N, Stenner K, Courtenay M. Views on implementing nurse prescribing in a specialist children's hospital. *Nurse Prescribing*. 2009; 7(5):205–10. <https://doi.org/10.12968/npre.2009.7.5.42356>
36. Carey N, Stenner K, Courtenay M. Stakeholder views on the impact of nurse prescribing on dermatology services. *J Clin Nurs*. 2010; 19(3–4):498–506. <https://doi.org/10.1111/j.1365-2702.2009.02874.x> PMID: 19747199
37. Carey N, Stenner K, Courtenay M. An exploration of how nurse prescribing is being used for patients with respiratory conditions across the east of England. *BMC Health Serv Res*. 2014; 14:13. <https://doi.org/10.1186/1472-6963-14-13> PMID: 24410733
38. Courtenay M, Carey N. Nurse independent prescribing and nurse supplementary prescribing practice: national survey. *J Adv Nurs*. 2008; 61(3):291–9. <https://doi.org/10.1111/j.1365-2648.2007.04512.x> PMID: 18197863
39. Courtenay M, Carey N. Nurse prescribing by children's nurses: views of doctors and clinical leads in one specialist children's hospital. *J Clin Nurs*. 2009; 18(18):2668–75. <https://doi.org/10.1111/j.1365-2702.2009.02799.x> PMID: 19619207
40. Courtenay M, Carey N, Stenner K. Nurse prescriber-patient consultations: a case study in dermatology. *J Adv Nurs*. 2009; 65(6):1207–17. <https://doi.org/10.1111/j.1365-2648.2009.04974.x> PMID: 19374682
41. Courtenay M, Carey N, Stenner K. Non medical prescribing leads views on their role and the implementation of non medical prescribing from a multi-organisational perspective. *BMC Health Serv Res*. 2011; 11:142. <https://doi.org/10.1186/1472-6963-11-142> PMID: 21635744
42. Cousins R, Donnell C. Nurse prescribing in general practice: a qualitative study of job satisfaction and work-related stress. *Fam Pract*. 2012; 29(2):223–7. <https://doi.org/10.1093/fampra/cmr077> PMID: 21965550
43. Dapar MP. An investigation of the structures and processes of pharmacist prescribing in Great Britain: a mixed methods approach [PhD]. Aberdeen: Robert Gordon University; 2012.
44. Daughtry J, Hayter M. A qualitative study of practice nurses' prescribing experiences. *Practice Nursing*. 2010; 21(6):310–4. <https://doi.org/10.12968/pnur.2010.21.6.48329>
45. Dohel-Ober D, Brimblecombe N, Bradley E. Nurse prescribing in mental health: national survey. *J Psychiatr Ment Health Nurs*. 2010; 17(6):487–93. <https://doi.org/10.1111/j.1365-2850.2009.01541.x> PMID: 20633075

46. Downer F, Shepherd CK. District nurses prescribing as nurse independent prescribers. *Br J Community Nurs.* 2010; 15(7):348–52. <https://doi.org/10.12968/bjcn.2010.15.7.48774> PMID: 20733541
47. Green B, Courtney H. Evaluating the investment: a survey of non-medical prescribing. *Mental Health Practice.* 2008; 12(1):28–32.
48. Herklots A, Baileff A, Latter S. Community matrons' experience as independent prescribers. *Br J Community Nurs.* 2015; 20(5):217–23. <https://doi.org/10.12968/bjcn.2015.20.5.217> PMID: 25993369
49. Hill DR, Conroy S, Brown RC, Burt GA, Campbell D. Stakeholder views on pharmacist prescribing in addiction services in NHS Lanarkshire. *J Subst Use.* 2014; 19(1–2):56–67. <https://doi.org/10.3109/14659891.2012.734540>
50. Kelly A, Neale J, Rollings R. Barriers to extended nurse prescribing among practice nurses. *Community Pract.* 2010; 83(1):21–4. PMID: 20196305
51. Maclure K, George J, Diack L, Bond C, Cunningham S, Stewart D. Views of the Scottish general public on non-medical prescribing. *Int J Clin Pharm.* 2013; 35(5):704–10. <https://doi.org/10.1007/s11096-013-9792-x> PMID: 23690252
52. Maddox C. Influences on non-medical prescribing: nurse and pharmacist prescribers in primary and community care [PhD]. Manchester: University of Manchester; 2011.
53. Maddox C, Halsall D, Hall J, Tully MP. Factors influencing nurse and pharmacist willingness to take or not take responsibility for non-medical prescribing. *Res Social Adm Pharm.* 2016; 12(1):41–55. <https://doi.org/10.1016/j.sapharm.2015.04.001> PMID: 26048711
54. McCann L, Haughey S, Parsons C, Lloyd F, Crealey G, Gormley GJ, et al. Pharmacist prescribing in Northern Ireland: a quantitative assessment. *Int J Clin Pharm.* 2011; 33(5):824–31. <https://doi.org/10.1007/s11096-011-9545-7> PMID: 21830075
55. McCann L, Lloyd F, Parsons C, Gormley G, Haughey S, Crealey G, et al. "They come with multiple morbidities": A qualitative assessment of pharmacist prescribing. *J Interprof Care.* 2012; 26(2):127–33. <https://doi.org/10.3109/13561820.2011.642425> PMID: 22360391
56. McCann LM, Haughey SL, Parsons C, Lloyd F, Crealey G, Gormley GJ, et al. A patient perspective of pharmacist prescribing: 'crossing the specialisms-crossing the illnesses'. *Health Expect.* 2015; 18(1):58–68. <https://doi.org/10.1111/hex.12008> PMID: 23067131
57. Mulholland PJ. Pharmacists as non-medical prescribers: what role can they play? The experience in a neonatal intensive care unit. *Eur J Hosp Pharm-Sci Pract.* 2014; 21(6):335–8. <https://doi.org/10.1136/epharm-2013-000401>
58. Mundt-Leach R. Non-medical prescribing by specialist additions nurses. *Mental Health Practice.* 2012; 16(3):28–31.
59. Oldknow H, Bottomley J, Lawton M. Independent nurse prescribing for older people's mental health. *Nurse Prescribing.* 2010; 8(2):66–9. <https://doi.org/10.12968/npre.2010.8.2.46527>
60. Oldknow H, Gillibrand W. Non-prescribing, non-medical prescribers: a qualitative exploratory enquiry—preliminary findings. *Mental Health Nursing.* 2013; 33(4):10–3.
61. Ross JD. Mental health nurse prescribing: the emerging impact. *J Psychiatr Ment Health Nurs.* 2015; 22(7):529–42. <https://doi.org/10.1111/jpm.12207> PMID: 26031457
62. Ross JD, Kettles AM. Mental health nurse independent prescribing: what are nurse prescribers' views of the barriers to implementation? *J Psychiatr Ment Health Nurs.* 2012; 19(10):916–32. <https://doi.org/10.1111/j.1365-2850.2011.01872.x> PMID: 22295995
63. Shannon E, Spence W. The attitudes and views of GPs and physicians to prescribing by heart failure nurse specialists. *British Journal of Cardiac Nursing.* 2011; 6(9):450–5. <https://doi.org/10.12968/bjcn.2011.6.9.450>
64. Stenner K, Courtenay M. A qualitative study on the impact of legislation on prescribing of controlled drugs by nurses. *Nurse Prescribing.* 2007; 5(6):257–61. <https://doi.org/10.12968/npre.2007.5.6.24292>
65. Stenner K, Courtenay M. Benefits of nurse prescribing for patients in pain: nurses' views. *J Adv Nurs.* 2008; 63(1):27–35. <https://doi.org/10.1111/j.1365-2648.2008.04644.x> PMID: 18503536
66. Stenner K, Courtenay M. The role of inter-professional relationships and support for nurse prescribing in acute and chronic pain. *J Adv Nurs.* 2008; 63(3):276–83. <https://doi.org/10.1111/j.1365-2648.2008.04707.x> PMID: 18702774
67. Stenner K, Carey N, Courtenay M. Implementing nurse prescribing: a case study in diabetes. *J Adv Nurs.* 2010; 66(3):522–31. <https://doi.org/10.1111/j.1365-2648.2009.05212.x> PMID: 20423387
68. Stenner KL, Courtenay M, Carey N. Consultations between nurse prescribers and patients with diabetes in primary care: A qualitative study of patient views. *Int J Nurs Stud.* 2011; 48(1):37–46. <https://doi.org/10.1016/j.ijnurstu.2010.06.006> PMID: 20627198

69. Noyes J, Lewin S. Supplemental Guidance on Selecting a Method of Qualitative Evidence Synthesis, and Integrating Qualitative Evidence with Cochrane Intervention Reviews. In: Noyes J, Booth A, Hannes K, Harden A, Harris J, Lewin S, et al., editors. *Supplementary Guidance for Inclusion of Qualitative Research in Cochrane Systematic Reviews of Interventions*. Version 1 (updated August 2011) ed: Cochrane Collaboration Qualitative Methods Group; 2011.
70. Thomas J, Harden A. Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Med Res Methodol*. 2008; 8:45. <https://doi.org/10.1186/1471-2288-8-45> PMID: [18616818](https://pubmed.ncbi.nlm.nih.gov/18616818/)
71. EPPI. EPPI-Centre Methods for Conducting Systematic Reviews. London: Evidence for Policy and Practice Information and Co-ordinating Centre, 2010 March 2007. Report No. Available from: http://eppi.ioe.ac.uk/cms/LinkClick.aspx?fileticket=hQB8y4uVwI_&tabid=1919&mid=6163.
72. Nursing and Midwifery Council. Annual Report and Accounts 2016–2017 and Strategic Plan 2017–2018. 2017 17 July 2017. Report No.: HC 154. Available from: <https://www.nmc.org.uk/globalassets/sitedocuments/annual-reports-and-accounts/annual-report-and-accounts-2016-2017.pdf>.

Appendix 8.8 PLoS One Response to reviewers, 3 March 2018: Chapter 3

Reviewer's Comments	Line numbers affected in original manuscript	Authors Response
I have read your manuscript on the factors limiting (or facilitating) non-medical prescription. I really enjoyed reading this manuscript. I only have minor comments, which you can read in the attached file.	n/a	<i>Thank you for your comments and feedback.</i>
Why appendices S2 and S3 are cited before S1?	95, 114, 547-9	<i>Thank you for bringing this oversight to our attention. The numbers have now been corrected and the appendices appropriately relabelled.</i>
Is this a kind of bias? Did you do any evaluation on potential biases (e.g. publication bias)?	311	<p><i>Thank you for these interesting and insightful comments.</i></p> <p><i>Owing to the qualitative nature of the study, a formal evaluation of risk of bias is problematic as inconsistent with the methodological framework. Developing a pre-determined protocol (registered with PROSPERO) which utilises a stringent search strategy reduces the risk of publication bias, an approach recommended by Hannes for the Cochrane Group. Further steps to reduce bias included the use of two independent reviewers to complete the searches and paper selection, as well as the quality assessment. In addition, we hand searched the reference list of each paper to identify any missing studies.</i></p> <p><i>We have added the following sentence to the discussion to clarify this point:</i></p> <p><i>'The predetermined stringent protocol, registered with PROSPERO, and the use of two independent reviewers are recognised strategies to reduce potential bias associated with paper selection [20, 71].'</i></p>
Given that most of the NMP are nurses and pharmacist, can this fact bias the NMP in the UK?	311	<p><i>The distribution of professional background of the included studies reflects both the overall numbers of nursing and pharmacy professionals, and the numbers of qualified NMPs. This balance therefore ensures that no bias has been introduced.</i></p> <p><i>We have added the following sentences to the discussion to clarify the point:</i></p> <p><i>'This reflects the relative numbers of the different professions [15, 72] and the numbers of qualified prescribers [12]. However, the numbers of AHPS are likely to have increased recently following legislation changes and that could be considered a limitation.'</i></p>

Would it be possible to have an example on what circumstances cause a factor to be a barrier or a facilitator?	316-8	<p><i>Thank you for this comment, and the opportunity to expand this aspect. We have added the following sentences which we believe illustrates some of the circumstances where a factor may become a barrier or facilitator.</i></p> <p>'Where there was a lack of understanding of the non-medical prescribing role, or lack of trust in the non-medical prescriber, then the factors were more inclined to be barriers. For example, medical professionals were less likely to support non-medical prescribing where there was a lack of clarity about who took responsibility for the prescribing practice [35, 39, 50]. Facilitation of NMP occurred when medical professionals trusted the NMP, for example enabling access to patient records [37]. As a consequence of budgetary constraints, factors may become barriers, such as the use of restrictive formularies as a cost saving measure [37, 52, 64].'</p>
--	-------	---

Appendix 8.9 Prisma checklist: Chapter 3 - Facilitators and barriers to non-medical prescribing – A systematic review and thematic synthesis

Page numbers relate to published paper (Appendix 8.7)

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	1
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	2 & 3
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	3
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	1 & 3 Appendix 8.4
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	3
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	3
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	Appendix 8.11
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	3
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	3 & 4

Section/topic	#	Checklist item	Reported on page #
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	4
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	3 & 4
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	4
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	4
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	3 & 4
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	n/a
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	4 & 5
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	6 - 11
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	6 - 9 Appendix 8.12
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	8 - 11
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	8 - 11
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	6 - 7 Appendix 8.12

Section/topic	#	Checklist item	Reported on page #
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	n/a
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	4 - 12
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	13
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	12 - 14
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	No funding.

Adapted from: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement.

PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

For more information, visit: www.prisma-statement.org.

Appendix 8.10 ENTREQ checklist: Chapter 3 - Facilitators and barriers to non-medical prescribing – A systematic review and thematic synthesis

Page numbers relate to published paper (Appendix 8.7)

No	Item	Guide and description	Page no.
1	Aim	State the research question the synthesis addresses.	3
2	Synthesis methodology	Identify the synthesis methodology or theoretical framework which underpins the synthesis, and describe the rationale for choice of methodology (<i>e.g. meta-ethnography, thematic synthesis, critical interpretive synthesis, grounded theory synthesis, realist synthesis, meta-aggregation, meta-study, framework synthesis</i>).	4
3	Approach to searching	Indicate whether the search was pre-planned (<i>comprehensive search strategies to seek all available studies</i>) or iterative (<i>to seek all available concepts until they theoretical saturation is achieved</i>).	3
4	Inclusion criteria	Specify the inclusion/exclusion criteria (<i>e.g. in terms of population, language, year limits, type of publication, study type</i>).	3
5	Data sources	Describe the information sources used (<i>e.g. electronic databases (MEDLINE, EMBASE, CINAHL, psycINFO, Econlit), grey literature databases (digital thesis, policy reports), relevant organisational websites, experts, information specialists, generic web searches (Google Scholar) hand searching, reference lists</i>) and when the searches conducted; provide the rationale for using the data sources.	3
6	Electronic Search strategy	Describe the literature search (<i>e.g. provide electronic search strategies with population terms, clinical or health topic terms, experiential or social phenomena related terms, filters for qualitative research, and search limits</i>).	Appendix 8.11
7	Study screening methods	Describe the process of study screening and sifting (<i>e.g. title, abstract and full text review, number of independent reviewers who screened studies</i>).	3
8	Study characteristics	Present the characteristics of the included studies (<i>e.g. year of publication, country, population, number of participants, data collection, methodology, analysis, research questions</i>).	6 - 8
9	Study selection	Identify the number of studies screened and provide reasons for study exclusion (<i>e.g. for comprehensive searching, provide numbers of studies screened and reasons for exclusion indicated in a figure/flowchart; for iterative searching describe reasons for study exclusion and inclusion based on modifications to the research question and/or contribution to theory development</i>).	5
10	Rationale for appraisal	Describe the rationale and approach used to appraise the included studies or selected findings (<i>e.g. assessment of conduct (validity and robustness), assessment of reporting (transparency), assessment of content and utility of the findings</i>).	3 & 4
11	Appraisal items	State the tools, frameworks and criteria used to appraise the studies or selected findings (<i>e.g. Existing tools: CASP, QARI, COREQ, Mays and Pope [25]; reviewer developed tools; describe the domains assessed: research team, study design, data analysis and interpretations, reporting</i>).	3 & 4 Appendix 8.11
12	Appraisal process	Indicate whether the appraisal was conducted independently by more than one reviewer and if consensus was required.	4

13	Appraisal results	Present results of the quality assessment and indicate which articles, if any, were weighted/excluded based on the assessment and give the rationale.	5 6-8 Appendix 8.11
14	Data extraction	Indicate which sections of the primary studies were analysed and how were the data extracted from the primary studies? (<i>e.g. all text under the headings "results /conclusions" were extracted electronically and entered into a computer software</i>)..	4
15	Software	State the computer software used, if any.	4
16	Number of reviewers	Identify who was involved in coding and analysis	4
17	Coding	Describe the process for coding of data (<i>e.g. line by line coding to search for concepts</i>).	4
18	Study comparison	Describe how were comparisons made within and across studies (<i>e.g. subsequent studies were coded into pre-existing concepts, and new concepts were created when deemed necessary</i>).	4
19	Derivation of themes	Explain whether the process of deriving the themes or constructs was inductive or deductive.	4
20	Quotations	Provide quotations from the primary studies to illustrate themes/constructs, and identify whether the quotations were participant quotations of the author's interpretation.	9 - 11
21	Synthesis output	Present rich, compelling and useful results that go beyond a summary of the primary studies (<i>e.g. new interpretation, models of evidence, conceptual models, analytical framework, development of a new theory or construct</i>).	4 - 12

1. Tong A, Flemming K, McInnes E, Oliver S, Craig J. Enhancing transparency in reporting the synthesis of qualitative research: ENTREQ. BMC Med Res Methodol. 2012;12(1):181. doi: 10.1186/1471-2288-12-181.

Appendix 8.11 Medline (Ovid) search strategy: Chapter 3 - Facilitators and barriers to non-medical prescribing – A systematic review and thematic synthesis

1. Independent prescrib*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
2. exp prescription/
3. Drug prescription.mp.
4. Drug kardex.mp.
5. 1 or 2 or 3 or 4
6. Non-medical.mp.
7. Nurs*.mp.
8. Allied health professional*.mp.
9. AHP.mp.
10. Physio*.mp.
11. Pharm*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
12. Podiat*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
13. Chiropod*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
14. Therapist*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
15. 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14
16. utilisation.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
17. utilization.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
18. Practice.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
19. Clinic.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
20. Clinical area.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
21. Function.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
22. Role.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
23. 16 or 17 or 18 or 19 or 20 or 21 or 22
24. Barriers.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
25. facilitators.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
26. Deterrent.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
27. Encouragement.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
28. Education.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
29. Support.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
30. Guidelines.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
31. Policy.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]

32. Procedures.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
33. Attitudes.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
34. Feedback.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
35. 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34
36. 5 and 15 and 23 and 35
37. limit 36 to (human and yr="2006 -Current")
38. non-medical prescrib*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
39. 37 and 38
40. dependent prescrib*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
41. supplementary prescrib*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
42. 40 or 41
43. 37 not 42
44. doctor.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
45. physician.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
46. medical practitioner.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
47. 44 or 45 or 46
48. 43 not 47

Appendix 8.12 QATSDD scores for each paper: Chapter 3 - Facilitators and barriers to non-medical prescribing – A systematic review and thematic synthesis

	Paper Reference Number																																										
Assessment Criteria [1]	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	
Explicit theoretical framework	3	2	0	0	3	0	1	1	1	1	1	1	2	1	1	1	3	0	1	3	0	1	0	0	1	3	0	0	2	0	0	0	1	3	3	1	2	1	0	2	1	1	
Statement of aims/objectives in main body of report	1	3	3	2	3	3	2	3	3	3	3	3	3	3	2	2	3	3	2	3	1	3	0	3	3	3	2	3	2	2	2	2	3	3	1	3	3	3	3	3	3	3	
Clear description of research setting	3	2	2	2	3	3	3	3	2	1	3	3	3	3	3	3	3	3	3	1	3	2	1	2	3	3	2	2	2	2	2	2	1	3	2	3	2	2	2	2	2	3	
Evidence of sample size considered in terms of analysis	2	1	1	0	3	3	0	1	2	1	0	3	1	3	1	3	3	0	1	0	2	0	0	1	0	3	3	2	2	1	2	1	1	1	2	1	0	2	2	3	1	0	
Representative sample of target group of a reasonable size	3	1	3	1	3	3	2	2	2	2	3	3	3	3	3	3	3	1	3	0	3	2	2	3	2	3	3	3	3	2	2	1	2	2	2	2	2	3	3	2	2	3	
Description of procedure for data collection	3	1	3	1	3	3	2	2	2	2	2	3	3	3	3	2	3	2	3	2	2	2	3	1	1	3	3	2	3	3	1	1	2	3	1	3	3	2	2	2	2	3	
Rationale for choice of data collection tool(s)	3	1	3	0	3	0	0	0	0	0	0	2	3	2	2	1	3	0	2	3	3	1	0	0	0	3	2	0	0	3	0	0	2	2	0	3	0	0	0	3	0	0	
Detailed recruitment data	3	2	3	0	3	2	1	3	2	1	3	3	3	3	3	2	3	2	3	1	3	3	2	2	0	3	3	3	3	3	2	2	3	3	2	3	2	1	1	2	2	3	
Statistical assessment of reliability & validity of measurement tool(s) (Quantitative only)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	n/a	0	0	0	n/a	3	n/a	0	n/a	n/a	n/a	n/a	0	n/a	n/a	n/a	1	n/a	n/a	0	n/a	0	n/a	n/a	1	n/a	n/a	n/a	n/a	n/a		
Fit between stated research question & method of data collection (Quantitative)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	n/a	0	0	0	n/a	3	n/a	0	n/a	n/a	n/a	n/a	0	n/a	n/a	n/a	0	n/a	n/a	0	n/a	0	n/a	n/a	0	n/a	n/a	n/a	n/a	n/a	n/a	
Fit between stated research question & format & content of data collection tool (Qualitative)	3	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Fit between research question & method of analysis	3	3	0	0	3	3	2	3	0	0	3	3	3	3	3	3	3	3	2	3	0	3	2	3	3	3	3	0	3	3	0	0	0	3	3	3	3	3	3	3	3	3	
Good justification for analytical method selected	3	0	1	0	3	1	0	0	1	3	1	0	1	0	0	0	3	0	0	3	0	2	0	0	2	3	1	1	1	2	0	0	0	3	1	3	2	2	1	1	0	0	
Assessment of reliability of analytical process (Qualitative only)	3	0	0	0	2	0	0	3	3	3	3	0	3	3	2	3	2	0	0	0	0	1	0	0	3	3	0	3	2	0	0	0	3	2	3	2	3	3	3	3	3	3	
Evidence of user involvement in design	2	1	0	0	3	1	0	0	0	0	1	1	0	0	1	0	3	0	0	0	2	0	1	2	2	1	1	2	0	0	0	0	0	1	1	3	2	0	0	0	0		
Strengths & limitations critically discussed	3	2	0	0	0	0	3	2	2	2	3	2	2	1	1	1	3	2	2	1	1	2	0	1	3	3	1	1	3	0	0	0	3	2	3	1	2	2	2	2	2	2	
Total	38	19	19	6	38	25	16	23	20	19	26	27	30	28	25	24	47	16	22	20	20	21	14	17	18	40	29	20	25	26	11	9	17	30	25	34	24	24	22	28	21	24	
Maximum score possible	42	42	42	42	42	42	42	42	42	42	42	48	42	48	42	48	42	48	42	42	42	42	48	42	42	42	42	42	42	48	42	48	42	42	48	42	42	42	42	42	42	42	
Score as Percentage (%)	90	45	45	14	90	60	38	55	48	45	62	56	71	58	52	57	98	38	46	48	48	50	33	35	43	95	69	42	60	62	23	21	35	71	60	71	57	52	67	50	57		

n/a = not applicable

References

1. Sirriyeh R, Lawton R, Gardner P, Armitage G. Reviewing studies with diverse designs: the development and evaluation of a new tool. *J Eval Clin Pract*. 2012;18(4):746-52. doi: 10.1111/j.1365-2753.2011.01662.x.
2. Adigwe OP. Non-medical prescribing in chronic non-malignant pain [PhD]. Leeds: University of Leeds; 2012.
3. Armstrong A. Staff and patient views on nurse prescribing in the urgent-care setting. *Nurse Prescribing*. 2015;13(12):614-9. doi: 10.12968/npre.2015.13.12.614.
4. Bennett J, Jones M. Nurse prescribing in HIV: opportunities and threats. *HIV Nursing*. 2008;8(4):12-6.
5. Bewley T. Preparation for non medical prescribing: a review. *Paediatr Nurs*. 2007;19(5):23-6.
6. Bowskill D. The integration of nurse prescribing: case studies in primary and secondary care [DHSci]. Nottingham: University of Nottingham; 2009.
7. Bowskill D, Timmons S, James V. How do nurse prescribers integrate prescribing in practice: case studies in primary and secondary care. *J Clin Nurs*. 2013;22(13-14):2077-86. doi: 10.1111/j.1365-2702.2012.04338.x.
8. Brodie L, Donaldson J, Watt S. Non-medical prescribers and benzodiazepines: a qualitative study. *Nurse Prescribing*. 2014;12(7):353-9. doi: 10.12968/npre.2014.12.7.353.
9. Carey N, Stenner K, Courtenay M. Adopting the prescribing role in practice: exploring nurses' views in a specialist children's hospital. *Paediatr Nurs*. 2009;21(9):25-9. doi: 10.7748/paed2009.11.21.9.25.c7357.
10. Carey N, Stenner K, Courtenay M. Views on implementing nurse prescribing in a specialist children's hospital. *Nurse Prescribing*. 2009;7(5):205-10. doi: 10.12968/npre.2009.7.5.42356.
11. Carey N, Stenner K, Courtenay M. Stakeholder views on the impact of nurse prescribing on dermatology services. *J Clin Nurs*. 2010;19(3-4):498-506. doi: 10.1111/j.1365-2702.2009.02874.x.
12. Carey N, Stenner K, Courtenay M. An exploration of how nurse prescribing is being used for patients with respiratory conditions across the east of England. *BMC Health Serv Res*. 2014;14:13. doi: 10.1186/1472-6963-14-27.
13. Courtenay M, Carey N. Nurse independent prescribing and nurse supplementary prescribing practice: national survey. *J Adv Nurs*. 2008;61(3):291-9. doi: 10.1111/j.1365-2648.2007.04512.x.
14. Courtenay M, Carey N. Nurse prescribing by children's nurses: views of doctors and clinical leads in one specialist children's hospital. *J Clin Nurs*. 2009;18(18):2668-75. doi: 10.1111/j.1365-2702.2009.02799.x.
15. Courtenay M, Carey N, Stenner K. Nurse prescriber-patient consultations: a case study in dermatology. *J Adv Nurs*. 2009;65(6):1207-17. doi: 10.1111/j.1365-2648.2009.04974.x.
16. Courtenay M, Carey N, Stenner K. Non medical prescribing leads views on their role and the implementation of non medical prescribing from a multi-organisational perspective. *BMC Health Serv Res*. 2011;11:142. doi: 10.1186/1472-6963-11-142.
17. Cousins R, Donnell C. Nurse prescribing in general practice: a qualitative study of job satisfaction and work-related stress. *Fam Pract*. 2012;29(2):223-7. doi: 10.1093/fampra/cmr077.
18. Dapar MP. An investigation of the structures and processes of pharmacist prescribing in Great Britain: a mixed methods approach [PhD]. Aberdeen: Robert Gordon University; 2012.
19. Daughtry J, Hayter M. A qualitative study of practice nurses' prescribing experiences. *Practice Nursing*. 2010;21(6):310-4. doi: 10.12968/pnur.2010.21.6.48329.
20. Dobel-Ober D, Brimblecombe N, Bradley E. Nurse prescribing in mental health: national survey. *J Psychiatr Ment Health Nurs*. 2010;17(6):487-93. doi: 10.1111/j.1365-2850.2009.01541.x.
21. Downer F, Shepherd CK. District nurses prescribing as nurse independent prescribers. *Br J Community Nurs*. 2010;15(7):348-52. doi: 10.12968/bjcn.2010.15.7.48774.
22. Green B, Courtney H. Evaluating the investment: a survey of non-medical prescribing. *Mental Health Practice*. 2008;12(1):28-32.
23. Herklots A, Baileff A, Latter S. Community matrons' experience as independent prescribers. *Br J Community Nurs*. 2015;20(5):217-23. doi: 10.12968/bjcn.2015.20.5.217.
24. Hill DR, Conroy S, Brown RC, Burt GA, Campbell D. Stakeholder views on pharmacist prescribing in addiction services in NHS Lanarkshire. *J Subst Use*. 2014;19(1-2):56-67. doi: 10.3109/14659891.2012.734540.

25. Kelly A, Neale J, Rollings R. Barriers to extended nurse prescribing among practice nurses. *Community Pract.* 2010;83(1):21-4.
26. Maclure K, George J, Diack L, Bond C, Cunningham S, Stewart D. Views of the Scottish general public on non-medical prescribing. *Int J Clin Pharm.* 2013;35(5):704-10. doi: 10.1007/s11096-013-9792-x.
27. Maddox C. Influences on non-medical prescribing: nurse and pharmacist prescribers in primary and community care [PhD]. Manchester: University of Manchester; 2011.
28. Maddox C, Halsall D, Hall J, Tully MP. Factors influencing nurse and pharmacist willingness to take or not take responsibility for non-medical prescribing. *Res Social Adm Pharm.* 2016;12(1):41-55. doi: <http://dx.doi.org/10.1016/j.sapharm.2015.04.001>.
29. McCann L, Haughey S, Parsons C, Lloyd F, Crealey G, Gormley GJ, et al. Pharmacist prescribing in Northern Ireland: a quantitative assessment. *Int J Clin Pharm.* 2011;33(5):824-31. doi: <http://dx.doi.org/10.1007/s11096-011-9545-7>.
30. McCann L, Lloyd F, Parsons C, Gormley G, Haughey S, Crealey G, et al. "They come with multiple morbidities": A qualitative assessment of pharmacist prescribing. *J Interprof Care.* 2012;26(2):127-33. doi: 10.3109/13561820.2011.642425.
31. McCann LM, Haughey SL, Parsons C, Lloyd F, Crealey G, Gormley GJ, et al. A patient perspective of pharmacist prescribing: 'crossing the specialisms-crossing the illnesses'. *Health Expect.* 2015;18(1):58-68. doi: 10.1111/hex.12008.
32. Mulholland PJ. Pharmacists as non-medical prescribers: what role can they play? The experience in a neonatal intensive care unit. *Eur J Hosp Pharm-Sci Pract.* 2014;21(6):335-8. doi: 10.1136/ejpharm-2013-000401.
33. Mundt-Leach R. Non-medical prescribing by specialist addictions nurses. *Mental Health Practice.* 2012;16(3):28-31.
34. Oldknow H, Bottomley J, Lawton M. Independent nurse prescribing for older people's mental health. *Nurse Prescribing.* 2010;8(2):66-9. doi: 10.12968/npre.2010.8.2.46527.
35. Oldknow H, Gillibrand W. Non-prescribing, non-medical prescribers: a qualitative exploratory enquiry - preliminary findings. *Mental Health Nursing.* 2013;33(4):10-3.
36. Ross JD. Mental health nurse prescribing: the emerging impact. *J Psychiatr Ment Health Nurs.* 2015;22(7):529-42. doi: 10.1111/jpm.12207.
37. Ross JD, Kettles AM. Mental health nurse independent prescribing: what are nurse prescribers' views of the barriers to implementation? *J Psychiatr Ment Health Nurs.* 2012;19(10):916-32. doi: 10.1111/j.1365-2850.2011.01872.x.
38. Shannon E, Spence W. The attitudes and views of GPs and physicians to prescribing by heart failure nurse specialists. *British Journal of Cardiac Nursing.* 2011;6(9):450-5. doi: 10.12968/bjca.2011.6.9.450.
39. Stenner K, Courtenay M. A qualitative study on the impact of legislation on prescribing of controlled drugs by nurses. *Nurse Prescribing.* 2007;5(6):257-61. doi: 10.12968/npre.2007.5.6.24292.
40. Stenner K, Courtenay M. Benefits of nurse prescribing for patients in pain: nurses' views. *J Adv Nurs.* 2008;63(1):27-35. doi: 10.1111/j.1365-2648.2008.04644.x.
41. Stenner K, Courtenay M. The role of inter-professional relationships and support for nurse prescribing in acute and chronic pain. *J Adv Nurs.* 2008;63(3):276-83. doi: 10.1111/j.1365-2648.2008.04707.x.
42. Stenner K, Carey N, Courtenay M. Implementing nurse prescribing: a case study in diabetes. *J Adv Nurs.* 2010;66(3):522-31. doi: 10.1111/j.1365-2648.2009.05212.x.
43. Stenner KL, Courtenay M, Carey N. Consultations between nurse prescribers and patients with diabetes in primary care: A qualitative study of patient views. *Int J Nurs Stud.* 2011;48(1):37-46. doi: 10.1016/j.ijnurstu.2010.06.006.

Appendix 8.13 Themes identified in each paper: Chapter 3 - Facilitators and barriers to non-medical prescribing – A systematic review and thematic synthesis

Theme	Paper Reference Number
1. Non-medical prescriber	
1.1. Attitude	1,2,3,5,6,7,8,9,11,14,16,18,20,21,22,23,24,26,27,35,39,40,41,
1.2. Practice	
1.2.1. Area of competence	1,5,6,7,8,9,11,12,14,16,17,18,22,23,24,25,26,27,29,30,31,32,39,40,41,42,
1.2.2. Role	1,2,5,6,7,8,9,10,11,16,17,18,20,21,24,26,27,29,30,32,36,37,39,40,41,
2. Human factors	
2.1. Patients	1,2,3,17,21,23,25,30,33,35,37,41,42,
2.2. Staff	
2.2.1. Managers	1,3,5,6,7,9,10,11,15,17,19,20,24,26,28,34,36,40,41,
2.2.2. Medical Professionals	1,2,3,5,6,7,8,9,10,11,12,13,17,18,20,21,22,23,24,26,27,28,29,31,33,34,35,36,37,39,40,41,
2.2.3. Peers	1,2,5,6,8,9,10,12,15,17,18,20,21,22,23,26,27,29,31,32,36,39,40,41,
3. Organisational aspects	
3.1. Administration	
3.1.1. Formulary	1,3,5,6,7,10,11,17,21,22,25,26,36,38,40,
3.1.2. Policy	1,2,5,10,17,21,36,40,
3.1.3. Remuneration	1,11,17,20,24,28,34,36,
3.2. Development	
3.2.1. Post Course support	1,2,7,9,10,11,13,15,17,20,21,22,24,25,26,27,29,31,36,37,39,40,41,
3.2.2. Training	1,2,4,7,9,13,15,17,19,20,21,22,24,26,27,30,31,36,37,41,
3.3. Service delivery	
3.3.1. Impact on time	1,2,3,7,8,9,10,11,13,14,17,18,20,21,22,23,25,26,29,30,31,32,33,35,37,39,41,42,
3.3.2. Infrastructure	1,5,6,7,8,10,11,12,17,20,21,22,23,25,26,28,31,36,37,38,41,
3.3.3. Service	1,2,3,7,8,9,10,11,13,14,15,16,17,18,21,22,23,26,27,29,30,31,32,33,35,37,39,42,
3.3.4. Use in practice	
3.3.4.1. Patients	3,5,6,7,8,9,10,11,13,17,21,24,26,29,30,32,34,38,39,40,41,42,
3.3.4.2. Setting	5,10,11,17,18,19,21,23,24,25,26,28,30,31,32,37,38,40,42,

References

1. Adigwe OP. Non-medical prescribing in chronic non-malignant pain [PhD]. Leeds: University of Leeds; 2012.
2. Armstrong A. Staff and patient views on nurse prescribing in the urgent-care setting. Nurse Prescribing. 2015;13(12):614-9. doi: 10.12968/npre.2015.13.12.614.
3. Bennett J, Jones M. Nurse prescribing in HIV: opportunities and threats. HIV Nursing. 2008;8(4):12-6.
4. Bewley T. Preparation for non medical prescribing: a review. Paediatr Nurs. 2007;19(5):23-6.

5. Bowskill D. The integration of nurse prescribing: case studies in primary and secondary care [DHSci]. Nottingham: University of Nottingham; 2009.
6. Bowskill D, Timmons S, James V. How do nurse prescribers integrate prescribing in practice: case studies in primary and secondary care. *J Clin Nurs*. 2013;22(13-14):2077-86. doi: 10.1111/j.1365-2702.2012.04338.x.
7. Brodie L, Donaldson J, Watt S. Non-medical prescribers and benzodiazepines: a qualitative study. *Nurse Prescribing*. 2014;12(7):353-9. doi: 10.12968/npre.2014.12.7.353.
8. Carey N, Stenner K, Courtenay M. Adopting the prescribing role in practice: exploring nurses' views in a specialist children's hospital. *Paediatr Nurs*. 2009;21(9):25-9. doi: 10.7748/paed2009.11.21.9.25.c7357.
9. Carey N, Stenner K, Courtenay M. Views on implementing nurse prescribing in a specialist children's hospital. *Nurse Prescribing*. 2009;7(5):205-10. doi: 10.12968/npre.2009.7.5.42356.
10. Carey N, Stenner K, Courtenay M. Stakeholder views on the impact of nurse prescribing on dermatology services. *J Clin Nurs*. 2010;19(3-4):498-506. doi: 10.1111/j.1365-2702.2009.02874.x.
11. Carey N, Stenner K, Courtenay M. An exploration of how nurse prescribing is being used for patients with respiratory conditions across the east of England. *BMC Health Serv Res*. 2014;14:13. doi: 10.1186/1472-6963-14-27.
12. Courtenay M, Carey N. Nurse independent prescribing and nurse supplementary prescribing practice: national survey. *J Adv Nurs*. 2008;61(3):291-9. doi: 10.1111/j.1365-2648.2007.04512.x.
13. Courtenay M, Carey N. Nurse prescribing by children's nurses: views of doctors and clinical leads in one specialist children's hospital. *J Clin Nurs*. 2009;18(18):2668-75. doi: 10.1111/j.1365-2702.2009.02799.x.
14. Courtenay M, Carey N, Stenner K. Nurse prescriber-patient consultations: a case study in dermatology. *J Adv Nurs*. 2009;65(6):1207-17. doi: 10.1111/j.1365-2648.2009.04974.x.
15. Courtenay M, Carey N, Stenner K. Non medical prescribing leads views on their role and the implementation of non medical prescribing from a multi-organisational perspective. *BMC Health Serv Res*. 2011;11:142. doi: 10.1186/1472-6963-11-142.
16. Cousins R, Donnell C. Nurse prescribing in general practice: a qualitative study of job satisfaction and work-related stress. *Fam Pract*. 2012;29(2):223-7. doi: 10.1093/fampra/cmz077.
17. Dapar MP. An investigation of the structures and processes of pharmacist prescribing in Great Britain: a mixed methods approach [PhD]. Aberdeen: Robert Gordon University; 2012.
18. Daughtry J, Hayter M. A qualitative study of practice nurses' prescribing experiences. *Practice Nursing*. 2010;21(6):310-4. doi: 10.12968/pnur.2010.21.6.48329.
19. Dobel-Ober D, Brimblecombe N, Bradley E. Nurse prescribing in mental health: national survey. *J Psychiatr Ment Health Nurs*. 2010;17(6):487-93. doi: 10.1111/j.1365-2850.2009.01541.x.
20. Downer F, Shepherd CK. District nurses prescribing as nurse independent prescribers. *Br J Community Nurs*. 2010;15(7):348-52. doi: 10.12968/bjcn.2010.15.7.48774.
21. Green B, Courtney H. Evaluating the investment: a survey of non-medical prescribing. *Mental Health Practice*. 2008;12(1):28-32.
22. Herklots A, Baileff A, Latter S. Community matrons' experience as independent prescribers. *Br J Community Nurs*. 2015;20(5):217-23. doi: 10.12968/bjcn.2015.20.5.217.
23. Hill DR, Conroy S, Brown RC, Burt GA, Campbell D. Stakeholder views on pharmacist prescribing in addiction services in NHS Lanarkshire. *J Subst Use*. 2014;19(1-2):56-67. doi: 10.3109/14659891.2012.734540.
24. Kelly A, Neale J, Rollings R. Barriers to extended nurse prescribing among practice nurses. *Community Pract*. 2010;83(1):21-4.
25. Maclure K, George J, Diack L, Bond C, Cunningham S, Stewart D. Views of the Scottish general public on non-medical prescribing. *Int J Clin Pharm*. 2013;35(5):704-10. doi: 10.1007/s11096-013-9792-x.
26. Maddox C. Influences on non-medical prescribing: nurse and pharmacist prescribers in primary and community care [PhD]. Manchester: University of Manchester; 2011.
27. Maddox C, Halsall D, Hall J, Tully MP. Factors influencing nurse and pharmacist willingness to take or not take responsibility for non-medical prescribing. *Res Social Adm Pharm*. 2016;12(1):41-55. doi: <http://dx.doi.org/10.1016/j.sapharm.2015.04.001>.

28. McCann L, Haughey S, Parsons C, Lloyd F, Crealey G, Gormley GJ, et al. Pharmacist prescribing in Northern Ireland: a quantitative assessment. *Int J Clin Pharm*. 2011;33(5):824-31. doi: <http://dx.doi.org/10.1007/s11096-011-9545-7>.
29. McCann L, Lloyd F, Parsons C, Gormley G, Haughey S, Crealey G, et al. "They come with multiple morbidities": A qualitative assessment of pharmacist prescribing. *J Interprof Care*. 2012;26(2):127-33. doi: 10.3109/13561820.2011.642425.
30. McCann LM, Haughey SL, Parsons C, Lloyd F, Crealey G, Gormley GJ, et al. A patient perspective of pharmacist prescribing: 'crossing the specialisms-crossing the illnesses'. *Health Expect*. 2015;18(1):58-68. doi: 10.1111/hex.12008.
31. Mulholland PJ. Pharmacists as non-medical prescribers: what role can they play? The experience in a neonatal intensive care unit. *Eur J Hosp Pharm-Sci Pract*. 2014;21(6):335-8. doi: 10.1136/ejhp-2013-000401.
32. Mundt-Leach R. Non-medical prescribing by specialist addictions nurses. *Mental Health Practice*. 2012;16(3):28-31.
33. Oldknow H, Bottomley J, Lawton M. Independent nurse prescribing for older people's mental health. *Nurse Prescribing*. 2010;8(2):66-9. doi: 10.12968/npre.2010.8.2.46527.
34. Oldknow H, Gillibrand W. Non-prescribing, non-medical prescribers: a qualitative exploratory enquiry - preliminary findings. *Mental Health Nursing*. 2013;33(4):10-3.
35. Ross JD. Mental health nurse prescribing: the emerging impact. *J Psychiatr Ment Health Nurs*. 2015;22(7):529-42. doi: 10.1111/jpm.12207.
36. Ross JD, Kettles AM. Mental health nurse independent prescribing: what are nurse prescribers' views of the barriers to implementation? *J Psychiatr Ment Health Nurs*. 2012;19(10):916-32. doi: 10.1111/j.1365-2850.2011.01872.x.
37. Shannon E, Spence W. The attitudes and views of GPs and physicians to prescribing by heart failure nurse specialists. *British Journal of Cardiac Nursing*. 2011;6(9):450-5. doi: 10.12968/bjca.2011.6.9.450.
38. Stenner K, Courtenay M. A qualitative study on the impact of legislation on prescribing of controlled drugs by nurses. *Nurse Prescribing*. 2007;5(6):257-61. doi: 10.12968/npre.2007.5.6.24292.
39. Stenner K, Courtenay M. Benefits of nurse prescribing for patients in pain: nurses' views. *J Adv Nurs*. 2008;63(1):27-35. doi: 10.1111/j.1365-2648.2008.04644.x.
40. Stenner K, Courtenay M. The role of inter-professional relationships and support for nurse prescribing in acute and chronic pain. *J Adv Nurs*. 2008;63(3):276-83. doi: 10.1111/j.1365-2648.2008.04707.x.
41. Stenner K, Carey N, Courtenay M. Implementing nurse prescribing: a case study in diabetes. *J Adv Nurs*. 2010;66(3):522-31. doi: 10.1111/j.1365-2648.2009.05212.x.
42. Stenner KL, Courtenay M, Carey N. Consultations between nurse prescribers and patients with diabetes in primary care: A qualitative study of patient views. *Int J Nurs Stud*. 2011;48(1):37-46. doi: 10.1016/j.ijnurstu.2010.06.006.

Appendix 8.14 Published paper: Chapter 4

Graham-Clarke E, Rushton A, Marriott J. A Delphi study to explore and gain consensus regarding the most important barriers and facilitators affecting physiotherapist and pharmacist non-medical prescribing. PLoS ONE [Internet]. 2021; 16(2): e0246273.

Available from: <https://doi.org/10.1371/journal.pone.0246273>

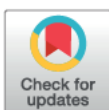
PLOS ONE

RESEARCH ARTICLE

A Delphi study to explore and gain consensus regarding the most important barriers and facilitators affecting physiotherapist and pharmacist non-medical prescribing

Emma Graham-Clarke¹, Alison Rushton^{2,3}, John Marriott¹

1 School of Pharmacy, Institute of Clinical Sciences, College of Medical and Dental Sciences, University of Birmingham, Birmingham, United Kingdom, **2** School of Physical Therapy, Western University, London, Canada, **3** Centre of Precision Rehabilitation for Spinal Pain, School of Sport, Exercise and Rehabilitation Sciences, College of Life and Environmental Sciences, University of Birmingham, Birmingham, United Kingdom



Abstract

Non medical prescribing was introduced into the United Kingdom to improve patient care, but early research indicated a third of Allied Health Professionals may not use their prescribing qualification. A previous literature review, highlighting factors influencing prescribing, identified only papers with nursing and pharmacy participants. This investigation explored consensus on factors affecting physiotherapist and pharmacist non medical prescribers. A three round Delphi study was conducted with pharmacist and physiotherapist prescribers. Round One comprised information gathering on facilitators and barriers to prescribing participants had experienced, and underwent content analysis. This was followed by two sequential consensus seeking rounds with participants asked to rate the importance of statements to themselves. Consensus criteria were determined a priori, including median, interquartile range, percentage agreement and Kendall's Coefficient of Concordance (W). Statements reaching consensus were ranked for importance in Round Three and analysed to produce top ten ranks for all participants and for each professional group. Participants, recruited October 2018, comprised 24 pharmacists and 18 physiotherapists. In Round One, content analysis of 172 statements regarding prescribing influences revealed 24 themes. 127 statements were included in Round Two for importance rating (barriers = 68, facilitators = 59). After Round Two, 29 statements reached consensus (barriers = 1, facilitators = 28), with no further statements reaching consensus following Round Three. The highest ranked statement in Round Three overall was: "Being able to prescribe to patients is more effective and really useful working [in my area]". Medical support and improved patient care factors appeared the most important. Differences were noted between physiotherapist and pharmacist prescribers regarding the top ten ranked statements, for example team working which pharmacists ranked higher than physiotherapists. Differences may be explained by the variety of practice areas and relative newness of physiotherapy prescribing. Barriers appear to be post or person specific, whereas facilitators appear universal.

OPEN ACCESS

Citation: Graham Clarke E, Rushton A, Marriott J (2021) A Delphi study to explore and gain consensus regarding the most important barriers and facilitators affecting physiotherapist and pharmacist non medical prescribing. PLoS ONE 16(2): e0246273. <https://doi.org/10.1371/journal.pone.0246273>

Editor: Vijayaprakash Supplah, University of South Australia, AUSTRALIA

Received: August 28, 2020

Accepted: January 17, 2021

Published: February 2, 2021

Peer Review History: PLOS recognizes the benefits of transparency in the peer review process; therefore, we enable the publication of all of the content of peer review and author responses alongside final, published articles. The editorial history of this article is available here: <https://doi.org/10.1371/journal.pone.0246273>

Copyright: © 2021 Graham Clarke et al. This is an open access article distributed under the terms of the [Creative Commons Attribution License](https://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Data Availability Statement: All relevant data are within the paper and its [Supporting Information](#) files.

Funding: The author(s) received no specific funding for this work.

Competing interests: The authors have declared that no competing interests exist.

Introduction

Non medical prescribing (NMP) (prescribing by professions other than the medical profession) was introduced in the United Kingdom (UK) to improve patient care and access to medicines, following the second Crown report [1]. The UK recognises two main approaches to NMP; supplementary and independent. Supplementary prescribers can only prescribe from a clinical management plan agreed by the doctor treating the patient, supplementary prescriber and patient [2]. Independent prescribers are responsible for patient care, including assessment and prescribing [3] and may prescribe any drugs detailed by profession specific legislation and regulations [4]. Initially only nurses and pharmacists could become non medical prescribers, gaining independent prescribing rights in 2006. Subsequently there has been a gradual expansion to other professions [5, 6].

Since NMP introduction, with the UK National Health Service (NHS) experiencing increased patient demand, workforce shortage pressures and funding shortfalls, the policy emphasis has changed to streamlining care [5, 7, 8]. For example, physiotherapists are moving into first point of contact roles for patients with musculoskeletal problems, where the ability to prescribe enables them to provide a complete treatment package without referral to other healthcare professionals [8–10]. These plans will be hindered if non medical prescribers are deterred from utilising their skills. Additionally, the approximate cost of training non medical prescribers was calculated as £10,000; failure to utilise this skill therefore represents poor use of limited NHS funds [11].

Previous research evaluating the use of NMP indicated that approximately a third of qualified Allied Health Professional prescribers may not prescribe compared to approximately 10% of nurses [11, 12]. A systematic literature review described 15 factors or themes (for example, medical support or facilities availability) potentially influencing prescribing utilisation by non medical professions [13]. The majority of included studies concerned nurse prescribing and the remainder pharmacists. No papers reviewed the experiences of other non medical prescribers; hence it is unclear if other NMP professions experience similar factors affecting prescribing utilisation. Establishing factors that facilitate or prevent NMP and investigating if these are generic to the different NMP professions, or are professional, situational or person specific will aid NMP development.

This paper presents the results of an investigation into facilitators and barriers encountered by two NMP professions, pharmacy and physiotherapy. These professions were chosen as they are similar sizes in the UK (approximately 50,000), may work individually or as teams, and may work in all healthcare sectors [14, 15]. They differ in the length of time that each profession had prescribing rights, with pharmacy gaining independent prescribing rights six years earlier than physiotherapy [16, 17].

The primary objective was to gain consensus regarding the factors that have supported, or discouraged, pharmacist and physiotherapist non medical prescribers from utilising their prescribing qualification. Furthermore, to determine which factors had greatest influence on prescribing utilisation, and if these factors were perceived similarly between pharmacists and physiotherapists.

Method

Design

Research methods, such as consensus techniques, that systematically obtain and prioritise expert opinion can be utilised when published information is scanty or non existent [18, 19]. The Delphi technique was developed in the 1950s as a forecast method and has been

increasingly used in healthcare research [20]. It is an iterative technique using sequential questionnaires and controlled group feedback, with anonymity of participants to each other as a key feature [21, 22]. The classic Delphi design has an information seeking first round followed by prioritisation rounds, stopping when consensus is achieved. The literature describes variations, such as using literature reviews to generate the first round [20]. A previous systematic literature review [13], showing an absence of physiotherapist literature, indicated the appropriateness of the classic Delphi information gathering first round to seek physiotherapy opinions [22].

Questionnaires were administered using online survey software (<https://www.onlinesurveys.ac.uk/>) supporting participant anonymity whilst providing response tracking and automatic reminder facilities. The study was approved by the University of Birmingham's Science, Technology, Engineering and Mathematics Ethical Review Committee and all data were held securely in accordance with university guidance. The study is reported in accordance with the criteria proposed by Jünger and colleagues, in the absence of an agreed reporting structure for Delphi studies (S1 Appendix) [23].

Participants

Delphi participants are described as 'experts' and require knowledge of the research topic. A criterion based purposive technique was adopted to recruit pharmacist and physiotherapist independent prescribers, qualified since 2013 when the law was amended to permit physiotherapist independent prescribing, using a sample matrix (S1 Table) [17, 24, 25]. Readily accessible lists of such prescribers are unavailable, and recruitment was conducted indirectly. Invitation emails were sent to West Midlands NMP Leads, CHAIN (a healthcare orientated online mutual support network: www.chain-network.org.uk) and Health Education England (a national body overseeing education: <https://www.hee.nhs.uk>) Pharmacy Deans, requesting they forward the email invitation to physiotherapist and pharmacist prescribers. Invitations to participate contained a brief study outline, participant information sheet and contact details. Potential participants were invited to contact the lead researcher with questions and to express their interest in participation. Sample sizes for Delphi exercises are variable, ranging from fewer than 10 to several hundred, with smaller numbers suitable for homogenous samples [21]. The current research sample was heterogenous since recruitment covered all healthcare sectors and levels of experience. As the number of qualified physiotherapist independent prescribers was unknown, a pragmatic target sample size of 30 for each profession was chosen. Recruitment was closed in October 2018.

Procedure and analysis

A three round Delphi was conducted, following the scheme in Fig 1. People responding positively to the invitation email were sent an email link to the first questionnaire. Subsequent questionnaires were sent to participants who responded to the previous questionnaire. Each round was open for one month, with non respondents sent reminder emails at two and three weeks to maximise response rate [26–29]. Regular emails regarding the progress of the exercise were sent to all participants to minimise response dropout; an acknowledged limitation of Delphi studies [27, 28]. The Round One questionnaire was piloted with nurse independent prescribers and the questionnaires for Rounds Two and Three were reviewed by the research group.

Round One. The Round One questionnaire comprised three sections (see S2 Appendix). The first section included study information and a consent statement; participants could only proceed further if consent was agreed. The second section requested brief demographic data.

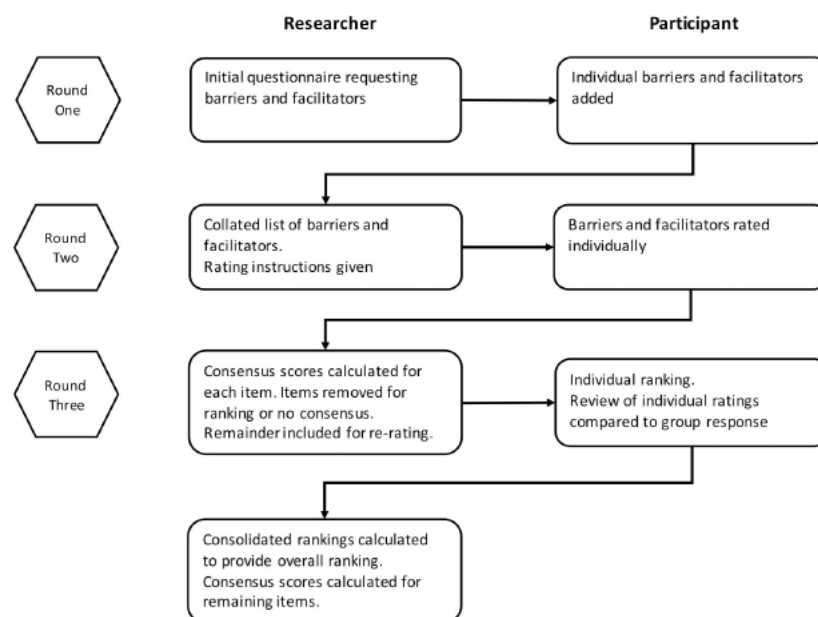


Fig 1. Diagram describing the three Delphi rounds and the researcher and participant actions at each round.

<https://doi.org/10.1371/journal.pone.0246273.g001>

The third section, using open ended questions, asked participants to provide at least three facilitators and/or barriers to prescribing that they had encountered. Participants were able to comment on questionnaire design and content.

Demographic data were imported into SPSS (IBM® SPSS® Statistics 25) for descriptive statistics. The open responses, detailing barriers and facilitators, were exported into NVivo® 12 (QSR International) for content analysis [30–32]. The responses were reviewed and coded to identify recurrent themes and used to develop the Round Two questionnaire [21, 26, 33].

Round Two. The Round Two questionnaire comprising the tabulated statements was sent to all participants who had responded to Round One (see S3 Appendix). Participants were asked to rate the importance of the factors in each statement to their practice through a 5 point Likert scale. [28, 34–36] and were able to add free text comments throughout to explain their ratings.

Anonymous rating data were exported from the online survey software into an Excel spreadsheet (Microsoft® Excel for Mac 16) and thence into SPSS (IBM® SPSS® Statistics 25). Percentage agreement, median and interquartile range (IQR) were calculated for each statement [21, 22, 28, 35]. The median and IQR were chosen as they are appropriate for ordinal scales such as Likert [18, 21, 22, 28]. Kendall's Coefficient of Concordance (W) was calculated as a measure of group response agreement [22, 37, 38]. Kendall's Coefficient of Concordance (W) results range from 0 (no agreement) to 1 (full agreement). Consensus criteria, based on previous studies, were determined a priori (Table 1) [28, 35, 36, 39].

Round Three. The Round Three questionnaire was derived following analysis of Round Two, using the decision criteria listed in Table 2, and was sent to all participants who had completed Round Two (see S4 Appendix). Participants received group median feedback on

Table 1. Consensus criteria for Rounds Two and Three.

Test	Round Two	Round Three
Percentage agreement	60	70
Median	3.5	4
Interquartile range	≤2	≤1
Kendall's Coefficient of Concordance (W)	P<0.05	P<0.05

<https://doi.org/10.1371/journal.pone.0246273.t001>

statements included for re-rating and were invited to review and amend their rating, using the same 0–5 Likert scale. Statements achieving consensus in Round Two were included separately, with participants asked to rank the ten most important to them, from one to ten.

Consensus criteria analyses were calculated as described in Round Two. The number of comments received in Round Two and Round Three were compared, with a decrease in numbers supporting stability in participant responses [40]. The ranking data were exported into an Excel spreadsheet (Microsoft® Excel for Mac 16) and weighted sum ranks calculated, allowing ordering of statements (See [S5 Appendix](#)).

Results

Demographic data

Forty-nine participants expressed an interest in participating and received the Round One questionnaire. The Round One questionnaire was completed by 42 participants (n = 24 pharmacists, n = 18 physiotherapists). Participant demographic data is presented in [Table 3](#). The majority of physiotherapists (11/18) had been qualified in their profession for ≥ 21 years, compared to pharmacists (6/24). Secondary care was the predominant practice area for recruited pharmacists (21/24), with physiotherapist practice areas distributed across all sectors. Physiotherapists were also more likely to have a secondary practice area (7/18) than pharmacists (1/24). More pharmacists were active prescribers (20/24) compared to physiotherapists (11/18).

Round One results

The number of statements received from each participant ranged between three and seven, with 172 in total. Content analysis resulted in 24 major themes (see [Table 4](#)). Following removal of duplicates, 127 statements were included in Round Two across the 24 themes (59 facilitators, 68 barriers). In many cases, participants elaborated on the statement using a free text facility. For example, participant Pharm17 listed ‘*effective personal development reviews*’ as a facilitator and expanded on it as follows:

‘effective PDR enable (sic) to identify areas of development and opportunities for expansion of areas of practice’ Pharm17

Table 2. Decision criteria regarding statement inclusion in Round Three.

Decision	Criteria
Included for ranking	Met all consensus criteria, for all participants and for individual professional groups
Included for re-rating	Met two consensus criteria and/or disagreement between groups (all participants, individual professional groups)
Removed from study	Met one or no consensus criteria, for all participants and for individual professional groups

<https://doi.org/10.1371/journal.pone.0246273.t002>

Table 3. Participant demographic data.

Demographics		Pharmacists (n = 24)		Physiotherapists (n = 18)		Total (n = 42)	
		n	%	n	%	n	%
Years qualified in profession	≤5	2	8.3	0	0	2	4.8
	6–10	7	29.2	1	5.5	8	19.0
	11–15	4	16.7	3	16.7	7	16.7
	16–20	5	20.8	3	16.7	8	19.0
	>21	6	25	11	61.1	17	40.5
Time qualified as independent prescriber	≤12 months	7	29.2	5	27.8	12	28.6
	>12 months	17	70.8	13	72.2	30	71.4
Home nation in which they qualified	England	23	95.8	18	100	41	97.6
	Scotland	1	4.2	0	0	1	2.4
	Wales	0	0	0	0	0	0
	Northern Ireland	0	0	0	0	0	0
Main practice area	Primary Care	3	12.5	5	27.8	8	19.0
	Secondary care	21	87.5	6	33.3	27	64.3
	Community	0	0	5	27.8	5	11.9
	Other	0	0	Private practice 1 Mental health services for older people 1	11.1	2	4.8
Secondary practice areas	Primary Care	0	0	1	5.5	1	2.4
	Secondary care	0	0	0	0	0	0
	Community	1	4.2	4	22.2	5	11.9
	Other	0	0	Private practice 1 Out-patients 1	11.1	2	4.8
Active prescriber	Yes	20	83.3	11	61.1	31	73.8
	No	4	16.7	7	38.9	11	26.2
Average number of prescriptions written per week*	<5	5	20.8	7	38.9	12	28.6
	6–15	7	29.2	3	16.7	10	23.8
	16–25	2	8.3	1	5.5	3	7.1
	26–35	3	12.5	0	0	3	7.1
	36–45	1	4.2	0	0	1	2.4
	>46	2	8.3	0	0	2	4.8
Type of practice§	Generalist	10	41.7	7	38.9	17	40.5
	Specialist	13	54.2	11	61.1	24	57.1
Specialities listed		Anticoagulation	Critical care and respiratory				
		Antimicrobials	MSK and pain				
		Clinical research/ cardiology	Pain Management (n = 2)				
		Critical care	Pain management and community acquired infections				
		Diabetes and Hypertension	Persistent pain				
		Heart Failure	Respiratory				
		Infections	Rheumatology				
		Mental Health	Spinal orthopaedic services				
		Nephrology					
		Neuro-developmental disorders	Stroke				
		Osteoporosis	Stroke/Neurology				
		Palliative care					
		Respiratory Medicine					

<https://doi.org/10.1371/journal.pone.0246273.t003>

Table 4. Identified themes following content analysis of Round One results.

Theme	Description	Facilitator (n)	Barrier (n)
Alternative prescriber	As alternative to a doctor, or replaced by an alternative, possibly 'cheaper' model	2	3
Clinical skills	Clinical examination skills—acquisition or lack of.	1	2
Confidence	Personal confidence in skills	2	2
Employer	Support from Trust, department, manager etc	12	5
Funding	Funding to practice	0	5
Information sources	Access to information sources, use of information sources. Keeping up to date with new information.	3	2
Infrastructure	Access to clinic room, prescription pads etc.	2	2
Knowledge	Experience in prescribing area (or lack of). Specialist knowledge.	6	1
Legal Aspects	Prescribing legislation, indemnity, registration	4	9
Medical Records	Access to medical records—paper or electronic	3	5
Medical support	Medical support—GP/Consultant etc. Includes acceptance of role etc..	19	6
Nursing support	Relationship with nursing staff. Could be supportive or indicate lack of understanding of the role.	2	2
Patients	Patient experience and knowledge of NMP.	5	0
Peer support	Other colleagues and clinicians.	12	5
Post Course Support	Post course development including appraisals	3	2
Prescribing budget	Access to prescribing budget	1	1
Prescribing Course	Usefulness/appropriateness of course. Aspects relating to communication from the university during and following course completion.	0	3
Prescription review	Pharmacy review of prescriptions. Includes need for second pharmacist.	1	5
Role	Personal job role. Includes effect of change in role.	2	7
Role model	Acting as a role model. Being inspired by other role models.	2	0
Time	Time to prescribe, time free from other duties etc.	0	10
Ward round	Role and attendance on ward rounds. Attendance at MDT meeting.	1	2
Working environment	Totality of working environment, including protocols and policies guiding activity.	2	3
Minor themes	Competency, formulary, practice area, external drivers and working patterns	1	4

<https://doi.org/10.1371/journal.pone.0246273.t004>

Likewise, Physio05 gave 'the Law' as a barrier, elaborating with:

'as a physio I am restricted to my prescribing. In most terms this is appropriate but it does cause me to have to go to a GP for a prescription that I may have been able to do myself'
Physio05

Round Two results

Of participants completing Round One, $n = 31$ responded in Round Two. Kendall's W was calculated with the significance results indicating agreement between participants as a whole and for pharmacists and physiotherapists separately (Table 5).

Twenty nine statements reached consensus and included 28 facilitator and one barrier statement. Of the 40 statements not reaching the consensus criteria, 10 were facilitators and 30 barriers and were removed from further rounds as described in Table 2. The remaining statements were included for re-rating in Round Three. Full results are presented in supporting information S2 and S3 Tables. Comments were received for most statements, with 300 received for facilitators (range 0–16 per statement), and 134 received for barriers (range 0–6 per statement). Comments included requests for more explanation (5% of all comments) or indicated that the statement was irrelevant to themselves or their practice (facilitator statements 30%, barrier statements 43%).

Table 5. Kendall's Coefficient of Concordance (W) results for Round Two.

Group	Population	n	Kendall's W	Chi-Square	df	Significance
All statements	Total group	31	.284	1110.893	126	<0.01
	Pharmacists	14	.393	692.609	126	<0.01
	Physiotherapists	17	.294	629.334	126	<0.01
Facilitator statements	Total group,	31	.234	420.712	58	<0.01
	Pharmacists,	14	.333	270.610	58	<0.01
	Physiotherapists	17	.230	226.642	58	<0.01
Barrier statements	Total group	31	.090	187.220	67	<0.01
	Pharmacists	14	.223	209.178	67	<0.01
	Physiotherapists	17	.151	171.609	67	<0.01

<https://doi.org/10.1371/journal.pone.0246273.t005>

Round Three results

Of the 31 participants receiving the Round Three questionnaire, 20 responded. No further statements reached consensus following re-rating (see S4 and S5 Tables). Round Three Kendall's W is reported in Table 6, indicating agreement except for the facilitator statements from physiotherapists. Fewer comments were received, compared with Round Two, indicating stability within responses (30 for facilitators [range 0–4 per statement], 11 for barriers [range 0–1 per statement]). However, a small number of comments indicated a failure to understand the limitations imposed on selected professions. For example, a pharmacist responded to the statement: "Lack of medical cover at times means I cannot prescribe opioids" with:

"Why would this be an issue?" Pharm12

Table 7 reports Kendall's W for the ranking exercise and indicates agreement within groups ($p > 0.05$). Table 8 lists the weighted rank sums, for all participants and each profession. The ranks for all participants are presented graphically in Fig 2 and for each profession in Fig 3. The highest ranked statement was common to all participants and to each profession:

"Being able to prescribe to patients is more effective and really useful working [in my area]"

Differences are noted when the top ten ranked statements from all participants are compared with either the pharmacist or physiotherapist groups. Statements made by the

Table 6. Kendall's Coefficient of Concordance (W) results for Round Three re-rating of statements.

Group	Population	n	Kendall's W	Chi-Square	df	Significance
All statements	Total group	20	.207	236.360	57	<0.01
	Pharmacists	10	.302	172.251	57	<0.01
	Physiotherapists	10	.306	174.689	57	<0.01
Facilitator statements	Total group,	20	.071	28.235	20	.104
	Pharmacists,	10	.191	38.165	20	.008
	Physiotherapists	10	.122	24.444	20	.224
Barrier statements	Total group	20	.128	92.162	36	<0.01
	Pharmacists	10	.287	103.400	36	<0.01
	Physiotherapists	10	.231	83.039	36	<0.01

<https://doi.org/10.1371/journal.pone.0246273.t006>

Table 7. Kendall's Coefficient of Concordance (W) for ranked statements.

Population	n	Kendall's W	Chi-Square	df	Significance
Total group	20	.132	73.812	28	<0.01
Pharmacists	10	.185	51.761	28	.004
Physiotherapists	10	.168	47.014	28	.014

<https://doi.org/10.1371/journal.pone.0246273.t007>

pharmacist group concur with the top ten statements from all participants, albeit in a different rank order. When the top ten statements for physiotherapists and all participants are compared, three statements differ. In the pharmacist top ten, all weighted sums for statements were ≥ 30 , however only the top five for physiotherapists were ≥ 30 . The weighted sums for remaining statements for physiotherapists were low, with tied ranks affecting 17 statements.

Discussion

This is the first study to identify the factors influencing the uptake and utilisation of prescribing by physiotherapists and pharmacists and to investigate if each profession perceived them similarly. A similar number of barriers and facilitators were identified in Round One. Following Round Two, consensus was obtained for 28/59 facilitator statements, but only 1/68 barrier statements, with no further consensus achieved after Round Three. It is striking that despite the greater initial number of barrier statements, only one achieved consensus. This suggests that most NMP barriers are specific to the post and person, whereas facilitators are generic.

Of the themes identified from content analysis, 13 had statements achieving consensus. "Medical professionals" was the most highly cited theme, reinforcing the importance of their support for NMP identified in a previous literature review [13]. A disproportionately high number of medical professional statements reached consensus (7/29) in Round Two compared with other themes. Similar numbers of statements relating to patient care (4/29) and employer (4/29) themes achieved consensus. Themes such as medical records and infrastructure highlighted in a previous literature review [13] did not have statements reaching consensus.

The ranking results emphasised the importance of prescribing to patient care, with the foremost statement overall concerning the effectiveness of prescribing for patients. Both professions highlighted the benefit of streamlining care for patients. Additionally, pharmacists ranked highly the statement regarding motivation to help patients benefit from reduced delay and duplication, possibly driven by perceived secondary care hinderances in prescribing medication. Pharmacists and physiotherapists ranked practice related statements in their top ten statement ranking, highlighting the importance to their role. In particular these related to the benefit of a specialist area in allowing the development of skills and knowledge and building confidence. Both professions ranked good working relationships with consultants in their top ten. Subtle differences in the manner in which pharmacists and physiotherapists practice were highlighted by the distribution of statements in the top ten. Pharmacists ranked the three statements mentioning teams in their top ten (direct contact with medical team, working as part of a multidisciplinary team and support from team) showing the importance of team working in their practice. In comparison the physiotherapist top ten highlighted the benefits of multidisciplinary teams but also supportive nursing and medical colleagues, suggesting a more independent mode of working. Only physiotherapists ranked an employer support statement in their top ten statement ranking, which may be driven by the newness of prescribing to physiotherapists and the need for employer support. In comparison, several pharmacists commented that they had changed employer since qualifying as an independent prescriber. Outside the top ten, the weighted rank sums for the remaining statements for both groups were small; rendering

Table 8. Weighted sums and statements ranks for all participants and each profession.

Statements	All participants (n = 20)		Pharmacists (n = 10)		Physiotherapists (n = 10)	
	Weighted sum	Rank	Weighted sum	Rank	Weighted sum	Rank
Being able to prescribe to patients is more effective and really useful working [in my area]	917	1	201	1	280	1
Having a speciality allows development of skills and knowledge	164	2	38	8	94	2
Direct contact with medical team caring for patient	160	3	95	2	17	14
Motivation to help the patients who will benefit with prescribing and cut care delay / duplication	157	4	90	3	13	16
Patient requirements. A need for patients to have streamlined care by being able to prescribe at the point of contact	139	5	36	9	39	4
Good relationship with consultants	128	6	46	5	30	5
Working as part of an MDT [multidisciplinary team] / interdisciplinary group	90	7	40	7	24	6
Personal confidence in specialism	88	8	45	6	21	9
Well supported by team and they allow me to prescribe for their patients	69	9	60	4	9	20
My knowledge of medication	62	10	34	10	24	6
Supportive nursing colleagues	54	11	5	24	43	3
Easy access to medication info	49	12	19	12	18	12
Clinical supervision with a [doctor] has massively helped me increase my confidence prescribing	44	13	14	17	16	15
My employer has provided the support for me to be able to go on the NMP course and then supported me once qualified	44	13	16	14	24	6
Forward thinking DMP [designated medical practitioner] who is keen to integrate different MDG [multidisciplinary group] professionals into the team	38	15	14	17	18	12
Lack of time to develop further prescribing skills	35	16	15	15	20	11
Supportive medical colleagues	32	17	3	25	21	9
Great antibiotic guidelines in this trust/area	27	18	20	11	7	23
Support from the employer/department for the role of non-medical prescribers	26	19	15	15	11	18
Doctors have been working [with] this [NMP] model	19	20	9	21	10	19
Management support enables funding and training time to qualify as a prescriber	19	20	10	20	9	20
Supportive working environment [with NMP] policies in place	18	22	12	19	6	24
Support from my line manager	17	23	17	13	0	28
The nature of the role facilitates prescribing practice as part of the overall review of patients	16	24	7	22	9	20
Supportive medical supervision / mentorship	13	25	0	28	13	16
Wide variety of options that you can offer patients to improve their experience	13	25	7	22	6	24
The law enables me to practice as an NMP	9	27	1	27	6	24
Support from other NMPs	4	28	0	28	4	27
Mentor already NMP—creates a positive environment for NMP	3	29	3	25	0	28

<https://doi.org/10.1371/journal.pone.0246273.t008>

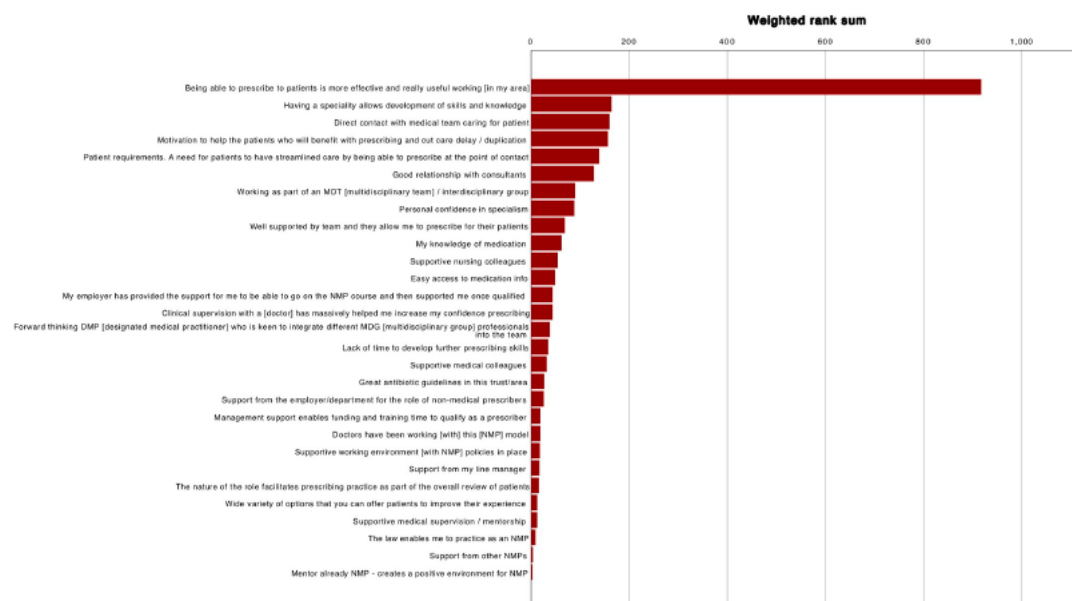


Fig 2. Ranked statements for all participants by weighted rank sum.

<https://doi.org/10.1371/journal.pone.0246273.g002>

them inappropriate as discriminators. The only barrier reaching consensus concerned the lack of time to develop skills and was ranked 16th overall and outside the top ten for both pharmacists and physiotherapists, implying that while this was a concern, it was not a major deterrent to prescribing.

Equal numbers of pharmacists and physiotherapists completed Round Three, with potentially the same weighted rank sum, so it is surprising that the physiotherapist weighted rank sums were relatively low compared with pharmacy results. This may be explained by the variety of physiotherapy practice areas and associated factors indicated by the participants. This compares to pharmacists who were primarily recruited from secondary care.

Initially more pharmacist than physiotherapist prescribers were recruited, reflecting both difficulty in accessing physiotherapist prescribers and differences in prescribing legislation dates [17, 41]. Physiotherapists were more likely to have been registered in their profession longer than pharmacists. This reflects previous early prescribing studies which suggested that more experienced professionals adopted prescribing initially after its introduction to their profession [42–46]. Recruited physiotherapists worked in several healthcare settings, whereas pharmacists were mainly from secondary care. Pharmacists were more inclined to be active prescribers, which may reflect how embedded pharmacist prescribing has become, although several comments indicated that pharmacists were now in roles that did not support prescribing.

The relevance of the topic was indicated by the Round One response rate (85%), and the number of barriers and facilitators initially identified. Comments received for each round supported the high engagement level of the participants. Despite steps taken to minimise drop out, the response rate decreased over the three rounds, with a final response rate representing

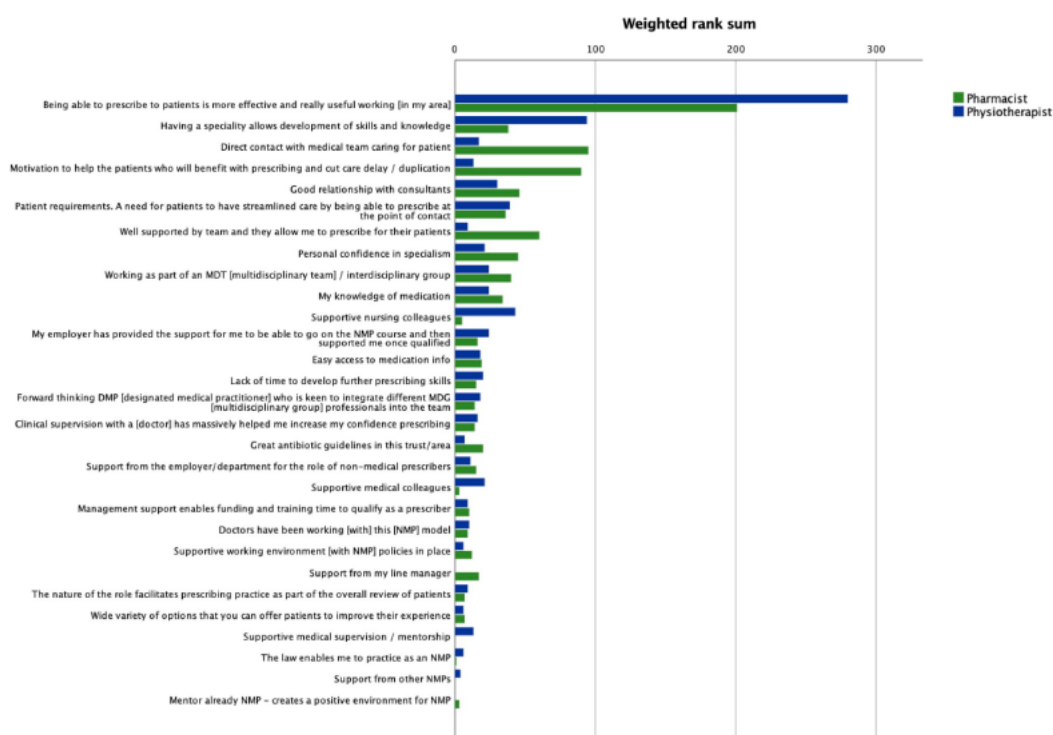


Fig 3. Ranked statements for professional groups by weighted rank sum.

<https://doi.org/10.1371/journal.pone.0246273.g003>

41% of the initial 49 participants. The survey software enabled the overall progress through each questionnaire to be reviewed, indicating the potential for questionnaire design and survey software constraints to contribute to the attrition. For Round Two, a balance was required between returning all the statements back to participants, risking disengagement if apparent repetition, and grouping similar statements as a single statement, risking introducing researcher bias [26, 38]. Consequently, the decision was made to only omit those where there was evident duplication. Supported by participant comments in Round Two, statements were removed from Round Three (as described earlier) rendering the questionnaire more manageable, whilst accepting the potential introduction of bias [26, 38]. The survey software constraints resulted in sub optimal display for the ranking question, with participants commenting that selecting their top ten was challenging.

A small number of comments were received from pharmacist participants indicating they were unaware of prescribing constraints for some professions, or they had forgotten there were physiotherapy participants. Failure to understand these constraints is concerning as it indicates that pharmacists, responsible for dispensing prescriptions, are unfamiliar with prescribing regulations [4].

The two professions were initially selected because of the difference in independent prescribing implementation stage, with pharmacists having a six year potential advantage over

physiotherapists. This time difference is most apparent when the participant demographics are reviewed, with physiotherapists tending to be both more experienced practitioners and less likely to be actively prescribing compared to pharmacists. However, when the ranked statements are reviewed the differences between the groups would appear to be more related to practice areas and mode of practice, than to prescribing implementation stage. The exception is the support from employers that the physiotherapist group ranked in their top ten, whereas for pharmacists this was not perceived to be as important an issue.

Strengths and limitations

This is the first study investigating and comparing prescribing barriers and facilitators in pharmacy and physiotherapy professions. The participants' level of engagement, emphasised by the Round One responses and free text comments, highlight the relevance of the topic.

The recruitment strategy relied on self-identifying participants, potentially introducing bias as participants with strong views are more inclined to volunteer [26]. Accessing physiotherapist prescribers also proved difficult, with an initial imbalance in participant numbers. Participant fatigue and attrition are recognised Delphi limitations [27, 28] and this was evident, despite approaches to minimise attrition. Software limitations influenced questionnaire design, deterring participants from completing Round Two and Three, and affecting response rate.

Conclusion

This study set out to explore the factors (both facilitators and barriers) that affected pharmacist and physiotherapist prescribing, and to determine if there were differences between the two professional groups. Initially similar numbers of facilitator and barrier statements were identified by participants, but only one barrier statement reached consensus, compared to 28 facilitator statements. Improving patient care and medical professionals' support appear to be the most important factors in enabling non-medical prescribing. In contrast the lack of time to develop prescribing skills was the only barrier to reach consensus. These results indicate that prescribing barriers are post and person specific, whereas facilitators are more likely to be generic. Differences in the ranking of facilitator statements were detected between pharmacy and physiotherapy, appearing to reflect the manner in which the two professions practice. In particular pharmacists favoured factors relating to team support whereas these were less important for physiotherapists who may work more independently. This intimates that factors identified in a previous literature review [13] may not be universally applicable to all NMP professions. Participants' opinions shape Delphi results and further research is required to determine the transferability of these results [20, 47].

Supporting information

S1 Appendix. Reporting criteria.
(DOCX)

S2 Appendix. Round One questionnaire.
(PDF)

S3 Appendix. Round Two questionnaire.
(PDF)

S4 Appendix. Round Three questionnaire.
(PDF)

S5 Appendix. Weighted rank sum example.

(DOCX)

S1 Table. Sample matrix for selecting Delphi participants.

(DOCX)

S2 Table. Consensus results for facilitator statements, Round Two grouped by all participants and for each profession.

(DOCX)

S3 Table. Consensus results for barrier statements, Round Two grouped by all participants and for each profession.

(DOCX)

S4 Table. Consensus results for facilitator statements, Round Three grouped by all participants and for each profession.

(DOCX)

S5 Table. Consensus results for barrier statements, Round Three grouped by all participants and for each profession.

(DOCX)

Author Contributions**Conceptualization:** Emma Graham Clarke, Alison Rushton, John Marriott.**Data curation:** Emma Graham Clarke.**Formal analysis:** Emma Graham Clarke.**Investigation:** Emma Graham Clarke.**Methodology:** Emma Graham Clarke, Alison Rushton, John Marriott.**Project administration:** Emma Graham Clarke.**Supervision:** Alison Rushton, John Marriott.**Validation:** Alison Rushton, John Marriott.**Visualization:** Emma Graham Clarke.**Writing original draft:** Emma Graham Clarke.**Writing review & editing:** Emma Graham Clarke, Alison Rushton, John Marriott.**References**

1. Department of Health. Review of prescribing, supply and administration of medicines. Final report (Crown II Report). London: HMSO1999. Available from: http://webarchive.nationalarchives.gov.uk/20130105143320/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4077153.pdf.
2. Department of Health. Supplementary Prescribing by Nurses, Pharmacists, Chiropodists/Podiatrists, Physiotherapists and Radiographers within the NHS in England: A guide for implementation. London2005. Report No.: 4941. Available from: http://webarchive.nationalarchives.gov.uk/20130124065910/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4110033.pdf.
3. Department of Health. Improving Patients' Access to Medicines: A Guide to Implementing Nurse and Pharmacist Independent Prescribing within the NHS in England. Leeds 2006. Available from: http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4133747.pdf.

4. Part XVIIIB(ii) Non-Medical Independent Prescribing (Nurses, Pharmacists, Optometrists, Physiotherapists and Chiropodists/Podiatrists). 2020 [cited 27 April 2020]. In: Electronic Drug Tariff [Internet]. NHS Business Services Authority, NHS Prescription Services, [cited 27 April 2020]. Available from: [http://www.drugtariff.nhs.uk/#/00782291-DD/DD00781684/Part%20XVIIIB\(ii\)%20-%20Non-Medical%20Independent%20Prescribing%20\(Nurses,%20Pharmacists,%20Optometrists,%20Physiotherapists%20and%20Chiropodists%20Podiatrists\)](http://www.drugtariff.nhs.uk/#/00782291-DD/DD00781684/Part%20XVIIIB(ii)%20-%20Non-Medical%20Independent%20Prescribing%20(Nurses,%20Pharmacists,%20Optometrists,%20Physiotherapists%20and%20Chiropodists%20Podiatrists)).
5. Graham-Clarke E, Rushton A, Noblet T, Marriott J. Non-medical prescribing in the United Kingdom National Health Service: A systematic policy review. PLoS ONE [Internet]. 2019; 14(7):[e0214630 p.]. Available from: <https://doi.org/10.1371/journal.pone.0214630> PMID: 31356615
6. Non-medical prescribing: NICE; (no date) [cited 30 April 2019]. Available from: <https://bnf.nice.org.uk/guidance/non-medical-prescribing.html>.
7. NHS England. Five Year Forward View 2014 24 October 2014. Available from: <https://www.england.nhs.uk/wp-content/uploads/2014/10/5yfv-web.pdf>.
8. NHS Wales. A Planned Primary Care Workforce for Wales: Approach and development actions to be taken in support of the plan for a primary care service in Wales up to 2018. 2015. Available from: <https://gov.wales/docs/dhss/publications/151106plannedprimarycareen.pdf>.
9. Health Education England. The future of primary care: Creating teams for tomorrow. July 2015. Available from: <https://www.hee.nhs.uk/sites/default/files/documents/The%20Future%20of%20Primary%20Care%20report.pdf>.
10. Health Education England, NHS England, Skills for Health. Musculoskeletal core capabilities framework for first point of contact practitioners. London 2018. Available from: <https://www.skillsforhealth.org.uk/news/latest-news/item/689-new-musculoskeletal-core-capabilities-framework>.
11. Latter S, Blenkinsopp A, Smith A, Chapman S, Tinelli M, Gerard K, et al. Evaluation of nurse and pharmacist independent prescribing: University of Southampton; Keele University; 2010 October 2010. 374 p.
12. Courtenay M, Carey N, Stenner K. An overview of non medical prescribing across one strategic health authority: a questionnaire survey. BMC Health Serv Res. 2012; 12:138. Epub 2012/06/05. <https://doi.org/10.1186/1472-6963-12-138> PMID: 22657272
13. Graham-Clarke E, Rushton A, Noblet T, Marriott J. Facilitators and barriers to non-medical prescribing A systematic review and thematic synthesis. PLoS ONE [Internet]. 2018; 13(4):[e0196471 p.]. Available from: <https://doi.org/10.1371/journal.pone.0196471>.
14. Health & Care Professions Council. Physiotherapists 2015 [cited 3/1/16 2016]. Available from: http://www.hcpc-uk.co.uk/aboutregistration/professions/index.asp?id_11.
15. Council Meeting. General Pharmaceutical Council; 2019. Available from: <https://www.pharmacyregulation.org/sites/default/files/document/gphc-council-meeting-papers-01-02-2019.pdf>.
16. The National Health Service (Miscellaneous Amendments Relating to Independent Prescribing) Regulations 2006, Stat. 913 (1 May 2006).
17. The Human Medicines (Amendment) Regulations 2013, Stat. 1855 (20th August 2013).
18. Murphy MK, Black NA, Lamping DL, McKee CM, Sanderson CF, Askham J, et al. Consensus development methods, and their use in clinical guideline development. Health Technol Assess. 1998; 2(3):i-iv, 1–88. Epub 1998/04/30.
19. Campbell SM, Cantrill JA. Consensus methods in prescribing research. Journal of Clinical Pharmacy and Therapeutics. 2001; 26(1):5–14. Epub 2001/04/05. <https://doi.org/10.1046/j.1365-2710.2001.00331.x> PMID: 11286603
20. Hasson F, Keeney S. Enhancing rigour in the Delphi technique research. Technol Forecast Soc Change. 2011; 78(9):1695–704. <https://doi.org/10.1016/j.techfore.2011.04.005>.
21. Keeney S, Hasson F, McKenna H. The Delphi technique in nursing and health research. 1 ed: Wiley-Blackwell; 2011. 198 p.
22. von der Gracht HA. Consensus measurement in Delphi studies: Review and implications for future quality assurance. Technol Forecast Soc Change. 2012; 79(8):1525–36. <https://doi.org/10.1016/j.techfore.2012.04.013>.
23. Junger S, Payne SA, Brine J, Radbruch L, Brearley SG. Guidance on Conducting and REporting DELphi Studies (CREDES) in palliative care: Recommendations based on a methodological systematic review. Palliative Medicine. 2017; 31(8):684–706. Epub 2017/02/14. <https://doi.org/10.1177/0269216317690685> PMID: 28190381
24. Ritchie J, Lewis J, Elam G, Tennant R, Rahim N. Designing and selecting samples. In: Ritchie J, Lewis J, Nicholls CM, Ormston R, editors. Qualitative Research Practice. 2 ed. London: Sage Publications Ltd; 2014. p. 111–45.

25. Palinkas LA, Horwitz SM, Green CA, Wisdom JP, Duan N, Hoagwood K. Purposeful Sampling for Qualitative Data Collection and Analysis in Mixed Method Implementation Research. *Administration and Policy in Mental Health and Mental Health Services Research*. 2015; 42(5):533–44. Epub 2013/11/07. <https://doi.org/10.1007/s10488-013-0528-y> PMID: 24193818
26. Hasson F, Keeney S, McKenna H. Research guidelines for the Delphi survey technique. *J Adv Nurs*. 2000; 32(4):1008–15. Epub 2000/11/30. <https://doi.org/10.1046/j.1365-2648.2000.101-1-01567.x> PMID: 11095242
27. Keeney S, Hasson F, McKenna H. Consulting the oracle: ten lessons from using the Delphi technique in nursing research. *J Adv Nurs*. 2006; 53(2):205–12. Epub 2006/01/21. <https://doi.org/10.1111/j.1365-2648.2006.03716.x> PMID: 16422719
28. Hung HL, Altschuld JW, Lee YF. Methodological and conceptual issues confronting a cross-country Delphi study of educational program evaluation. *Evaluation and program planning*. 2008; 31(2):191–8. Epub 2008/04/12. <https://doi.org/10.1016/j.evalprogplan.2008.02.005> PMID: 18403018
29. McMillan SS, King M, Tully MP. How to use the nominal group and Delphi techniques. *Int J Clin Pharm*. 2016; 38(3):655–62. Epub 5 February 2016. <https://doi.org/10.1007/s11096-016-0257-x> PMID: 26846316
30. Hsieh H-F, Shannon SE. Three Approaches to Qualitative Content Analysis. *Qualitative Health Research*. 2005; 15(9):1277–88. Epub 2005/10/06. <https://doi.org/10.1177/1049732305276687> PMID: 16204405
31. Elo S, Kyngas H. The qualitative content analysis process. *J Adv Nurs*. 2008; 62(1):107–15. Epub 2008/03/21. <https://doi.org/10.1111/j.1365-2648.2007.04569.x> PMID: 18352969
32. Vaismoradi M, Turunen H, Bondas T. Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. *Nurs Health Sci*. 2013; 15(3):1442–1448. Epub 2013/03/14. <https://doi.org/10.1111/nhs.12048> PMID: 23480423
33. Pope C, Mays N, Popay J. Synthesizing qualitative and quantitative health evidence: a guide to methods. Maidenhead, England: Open University Press, McGraw Hill Education; 2007.
34. McColl E, Jacoby A, Thomas L, Soutter J, Bamford C, Steen N, et al. Design and use of questionnaires: a review of best practice applicable to surveys of Health Service staff and patients. *Health Technology Assessment*. 2001; 5(31):1–256. Epub 2002/01/26. <https://doi.org/10.3310/hta5310> PMID: 11809125
35. Rushton AB, Fawkes CA, Carnes D, Moore AP. A modified Delphi consensus study to identify UK osteopathic profession research priorities. *Manual Ther*. 2014; 19(5):445–52. Epub 07 May 2014. <https://doi.org/10.1016/j.math.2014.04.013> PMID: 24855956
36. Wiangkham T, Duda J, Haque MS, Rushton A. Development of an active behavioural physiotherapy intervention (ABPI) for acute whiplash-associated disorder (WAD) II management: A modified Delphi study. *BMJ Open*. 2016; 6(9) (no pagination):e011764. Epub 2016/09/16. <https://doi.org/10.1136/bmjopen-2016-011764> PMID: 27630069
37. Schmidt RC. Managing Delphi Surveys Using Nonparametric Statistical Techniques. *Decision Sciences*. 1997; 28(3):763–74. <https://doi.org/10.1111/j.1540-5915.1997.tb01330.x>
38. Hicks CM. *Research Methods for Clinical Therapists: Applied project design and analysis*. 5 ed: Churchill Livingstone; 2009.
39. Zambaldi M, Beasley I, Rushton A. Return to play criteria after hamstring muscle injury in professional football: a Delphi consensus study. *BJSM online*. 2017; 51(16):1221–6. Epub 2017/03/02. <https://doi.org/10.1136/bjsports-2016-097131> PMID: 28246078
40. Holey EA, Feeley JL, Dixon J, Whittaker VJ. An exploration of the use of simple statistics to measure consensus and stability in Delphi studies. *BMC Med Res Methodol*. 2007; 7(1):52. Epub 2007/11/30. <https://doi.org/10.1186/1471-2288-7-52> PMID: 18045508
41. The Medicines for Human Use (Prescribing) (Miscellaneous Amendments) Order 2006, Stat. 915 (1 May 2006).
42. Weiss MC, Sutton J, Adams C. *Exploring innovation in pharmacy practice: A qualitative evaluation of supplementary prescribing by pharmacists*. London: Royal Pharmaceutical Society of Great Britain; March 2006 2006.
43. Courtenay M, Carey N, Burke J. Independent extended and supplementary nurse prescribing practice in the UK: a national questionnaire survey. *Int J Nurs Stud*. 2007; 44(7):1093–101. Epub 2006/06/06. <https://doi.org/10.1016/j.ijnurstu.2006.04.005> PMID: 16750832
44. Courtenay M, Carey N. Nurse independent prescribing and nurse supplementary prescribing practice: national survey. *J Adv Nurs*. 2008; 61(3):291–9. Epub 2008/01/17. <https://doi.org/10.1111/j.1365-2648.2007.04512.x> PMID: 18197863

45. Hacking S, Taylor J. An evaluation of the scope and practice of Non Medical Prescribing in the North West: For NHS North West. School of Nursing & Caring Sciences, University of Central Lancashire; June 2010 2010.
46. Prescribers Survey Report. London: General Pharmaceutical Council; 2016. p. 54. Available from: https://www.pharmacyregulation.org/sites/default/files/gphc_prescribers_survey_report.pdf.
47. Malterud K. Qualitative research: standards, challenges, and guidelines. *The Lancet*. 2001; 358 (9280):483–8. Epub 2001/08/22. [https://doi.org/10.1016/S0140-6736\(01\)05627-6](https://doi.org/10.1016/S0140-6736(01)05627-6).

Appendix 8.15 PLoS ONE, Response to reviewers 9 November 2020: Chapter 4

Editor's Comments	Line numbers affected in original manuscript	Authors Response
Please ensure that your manuscript meets PLOS ONE's style requirements, including those for file naming.		<i>We have checked the manuscript and amended it where necessary. Additional supporting information files have been appropriately named</i>
Please include additional information regarding the questionnaires used in the study and ensure that you have provided sufficient details that others could replicate the analyses. For instance, if you developed a questionnaire as part of this study and it is not under a copyright more restrictive than CC-BY, please include a copy, in both the original language and English, as Supporting Information.		<i>We have included copies of all the questionnaires as supporting information (S2, S3 and S4 Appendices). The consensus results for Round Three have been added as supporting information to enable comparison with the Round Two results (S4 and S5 Tables) A worked example of the weighting for ranked results in Round Three has been added as supporting information (S5 Appendix) to clarify the process.</i>
Reviewer's Comments	Line numbers affected in original manuscript	Authors Response
Thank you for the opportunity to review this manuscript exploring NMP in allied health. The manuscript is a useful addition to the literature. The Introduction and Methods are well described and easy to follow.		<i>Thank you for your kind comments and feedback.</i>
Please describe how Kendall's w was interpreted.	167	<i>The criteria for interpreting Kendall's Coefficient of Concordance (W) are included in Table 1, and we have added an additional sentence to clarify the potential range of results for Kendall's Coefficient of Concordance (W).</i>
Table 5 - please amend the p-values to <0.01 or similar. p-values can't be 0.	232, 265, 280	<i>Thank you for highlighting this. We have amended Tables 5, 6 and 7 accordingly and also amended the column heading to further clarify the tables.</i>
It may be helpful to focus the initial aspects of the Discussion on the results that were obtained. Currently, the whole Discussion reads as the 'strengths and limitations' although I appreciate the thoroughness with which the authors have considered these issues.	297 et seq	<i>We have reordered the Discussion as you suggest, highlighting the initial findings.</i>

Appendix 8.16 Invitations to participate: Chapter 4

Invitation email to NMP leads, heads of prescribing programmes, CHAIN

Re: A Delphi study to explore and gain consensus regarding the most important barriers and facilitators affecting physiotherapist and pharmacist non-medical prescribing

My name is Emma Graham-Clarke and as part of my doctoral research I am investigating the barriers and facilitators to non-medical prescribing experienced by pharmacists and physiotherapists. I have contacted you to ask your help in bringing the next stage of my research to the attention of potential participants. I am seeking to recruit pharmacists and physiotherapists who have qualified as prescribers since 2013.

Background

Earlier research suggests that a quarter of Allied Health Professionals (AHP) who qualified as prescribers may not use this skill, compared to approximately 10% of nurses. I have already completed a literature review investigating the barriers and facilitators to non-medical prescribing, which identified 15 factors that may affect the utilisation of prescribing. Most of the research was conducted in nursing, with only a few papers reporting research in pharmacists. No papers were identified that involved AHPs, and therefore it is unknown if the same factors apply to all non-medical prescribers or whether some may affect some professions more than others.

Research study

The research aim of this study is to investigate whether the pharmacy and physiotherapy professions report similar non-medical prescribing barriers and facilitators to each other, or if there are differences. Identification of barriers and facilitators, including profession specific barriers and facilitators, will enable strategies to be developed to support future non-medical prescribers.

I will be utilising a Delphi technique, used to gain consensus on topics where there is little published information. I will be asking pharmacists and physiotherapists what barriers and facilitators to non-medical prescribing they have encountered, and then ask them to rank these for importance.

The participant information sheet enclosed with this email contains further details on the study, including the study design and anticipated time commitment.

I would be grateful if you could kindly forward this email to pharmacist or physiotherapist prescribers in your networks.

If there are any questions, then please do not hesitate to contact me:

This study has been approved by the University Ethics Committee.

Invitation email to Pharmacy Deans

Re: A Delphi study to explore and gain consensus regarding the most important barriers and facilitators affecting physiotherapist and pharmacist non-medical prescribing

My name is Emma Graham-Clarke and as part of my doctoral research I am investigating the barriers and facilitators to non-medical prescribing experienced by pharmacists and physiotherapists. I have contacted you to ask your help in bringing the next stage of my research to the attention of potential participants. I am seeking to recruit pharmacists and physiotherapists who have qualified as prescribers since 2013.

Background

Earlier research suggests that a quarter of Allied Health Professionals (AHP) who qualified as prescribers may not use this skill, compared to approximately 10% of nurses. I have already completed a literature review investigating the barriers and facilitators to non-medical prescribing, which identified 15 factors that may affect the utilisation of prescribing. Most of the research was conducted in nursing, with only a few papers reporting research in pharmacists. No papers were identified that involved AHPs, and therefore it is unknown if the same factors apply to all non-medical prescribers or whether some may affect some professions more than others.


Research study

The research aim of this study is to investigate whether the pharmacy and physiotherapy professions report similar non-medical prescribing barriers and facilitators to each other, or if there are differences. Identification of barriers and facilitators, including profession specific barriers and facilitators, will enable strategies to be developed to support future non-medical prescribers.

I will be utilising a Delphi technique, used to gain consensus on topics where there is little published information. I will be asking pharmacists and physiotherapists what barriers and facilitators to non-medical prescribing they have encountered, and then ask them to rank these for importance.

The participant information sheet enclosed with this email contains further details on the study, including the study design and anticipated time commitment.

I would be grateful if you could kindly forward this email to non-medical prescribing leads or university heads of prescribing programmes in your region.

If there are any questions, then please do not hesitate to contact me: 

This study has been approved by the University Ethics Committee.

Appendix 8.17 Participant information sheet: Chapter 4

Participant Information Leaflet

Title of the proposed study

A Delphi study to explore and gain consensus regarding the most important barriers and facilitators affecting physiotherapist and pharmacist non-medical prescribing.

Description of the proposed study

The main aim of this study is to obtain consensus concerning which of the barriers and facilitators to non-medical prescribing experienced by pharmacists and physiotherapists are most important.

The study forms the second part of doctoral research into non-medical prescribing, at the University of Birmingham. The first part of this research identified several barriers and facilitators from the literature, but these mainly concerned nurse prescribers. It is unknown if similar barriers and facilitators are experienced by other professions. Earlier research suggests that a quarter of Allied Health Professionals who qualified as prescribers may not use this skill, compared to approximately 10% of nurses.

The Delphi technique is used to investigate expert opinion and gain consensus where there is little or no published information. The participants give their expert opinion on the research subject and then through an iterative process of controlled feedback, consensus is gained. The participants remain anonymous to each other throughout the process. All personal data will remain confidential to the lead researcher, and a unique ID will be used when analysing data. This study will use sequential electronic questionnaires firstly to collect information on the barriers and facilitators experienced, and then secondly to develop consensus on the most important of these.

The results will be analysed to establish if physiotherapist and pharmacist prescribers experience similar barriers and facilitators or if there are differences. These results have the potential to support future physiotherapist and pharmacist prescribers.

Invitation to participate and explanation of what participation entails

You are invited to participate in this research study. Please read this information sheet carefully before deciding if you would like to participate.

Do I have to take part?

Your participation is entirely voluntary, and you do not have to choose to take part. If you do decide to participate, then you are free to withdraw from the study, without giving a reason, during any of the questionnaire rounds. Because the data from the preceding questionnaire round is used to inform the next questionnaire round, it will not be possible to withdraw your data from an individual round once that data has been analysed.

Why have I been contacted?

You have been contacted because you are either pharmacist or a physiotherapist independent prescriber. If you have qualified as a prescriber since the beginning of 2013 then you are eligible to be involved in this research.

The study aims to include 30 pharmacist and 30 physiotherapist prescribers.

What do I have to do?

If you agree to take part, you will need to contact the lead researcher by email (Emma Graham-Clarke: [REDACTED] indicating you would like to be involved.

You will then be emailed a link to the first online questionnaire.

You will be asked to complete the online questionnaires, at approximately six-week intervals. The first questionnaire will ask you to list any barriers and facilitators to prescribing that you have encountered (in other words, anything that has helped or prevented you from using your prescribing skills). In the second questionnaire, you will be given a list of these barriers and facilitators and be asked to rate how important they are to you. In the third questionnaire, you will have an opportunity to review your score based on the overall scores. You will also be asked to rank the barriers and facilitators in order of importance to you.

The amount of time it will take to complete each questionnaire will vary; the first questionnaire may take up to 45 minutes, but the subsequent questionnaires should be quicker.

Each questionnaire will include detailed instructions on how to complete it. It is important to note that there are no right or wrong answers, but it is your expert opinion that is being sought.

How may the study affect me and are there any risks and benefits to taking part?

The study is unlikely to affect you and no direct risks are anticipated. You will have no personal immediate benefit from taking part in the study. The results from this study could help future pharmacist and physiotherapist prescribers to use their skills

Further information

If there is anything that you are unclear about then please do not hesitate to contact the lead researcher for further information and clarification. Full contact details are given at the end of this sheet.

Fair Processing Statement

This information is being collected as part of a doctoral research project concerned with non-medical prescribing by the School of Pharmacy in the University of Birmingham. The information which you supply and that which may be collected as part of the research project will be entered into a filing system or database and will only be accessed by authorised personnel involved in the project. The information will be retained by the University of Birmingham and will only be used for the purpose of research, and statistical and audit purposes. By supplying this information, you are consenting to the University storing your information for the purposes stated above. The information will be processed by the University of Birmingham in accordance with the provisions of the Data Protection Act 1998. No identifiable personal data will be published.

Confidentiality/anonymity and data security

Your personal data will be confidential, and you will be assigned a unique ID code for use when analysing the questionnaires.

All in electronic information held securely on central University servers will be encrypted and password controlled. The password will be held by the lead researcher. The anonymised results will only be shared by the research team during the analysis. The data will be kept securely for 10 years following completion of the research and will then be destroyed in accordance with University research guidance.

Results of the study

The results from this study will form part of a doctoral research thesis. The results may be presented at scientific conferences and published in peer reviewed scientific journals. The results may be shared with relevant people or institutions to improve practice. No individual participant details would be included in any report or publication.

You will be offered the opportunity to have feedback on the study and this will be provided as tabulated results.

Who is funding the study

The researcher will not receive any funding for undertaking this study

Contact details

Emma Graham-Clarke
University of Birmingham
Email: [REDACTED]

Prof John Marriott
University of Birmingham
Email: [REDACTED]

Dr Alison Rushton
University of Birmingham
Email: [REDACTED]

Delphi Round 1 - NMP

Introduction

Thank you for agreeing to participate in this study, which is investigating barriers and facilitators to prescribing experienced by pharmacist and physiotherapist independent prescribers.

In this questionnaire, you will first be asked a few general questions about yourself. You will then be asked to list barriers and facilitators to prescribing that you have experienced.

- You will see a progress bar at the top of the page and this will indicate how far through the questionnaire you are.
- The questionnaire will take on average 30 minutes to complete but this may vary depending on how much you wish to write.
- You will be able to go back and forwards through the questionnaire if you need to.
- You will also be able to save the questionnaire and come back and finish it at a later time. To do this you will need to carefully follow the instructions that will be given at the time.

If you have any questions or comments please do not hesitate to contact me:

Emma Graham-Clarke, email address:

I consent to participate in this study * *Required*

☐ Yes

☐ No

Demographic data

About you

Which profession do you belong to? * *Required*

- ☐ Pharmacist
- ☐ Physiotherapist

Which is the main area that you practice in? * *Required*

- ☐ Primary Care
- ☐ Secondary care
- ☐ Community
- ☐ Other

If you selected Other, please specify:

Do you practice in any other areas? *Optional*

- ☐ Primary Care
- ☐ Secondary care
- ☐ Community
- ☐ Other

If you selected Other, please specify:

How many years have you been qualified in your profession? * *Required*

- ☐ ≥5
- ☐ 6-10
- ☐ 11-15
- ☐ 16-20
- ☐ >21

About your prescribing

Which home nation did you qualify as a prescriber in? * *Required*

- ☐ England
- ☐ Scotland
- ☐ Wales
- ☐ Northern Ireland

How long have you been qualified as an independent prescriber? * *Required*

- ☐ ≤ 12 months
- ☐ > 12 months

Are you actively prescribing? * *Required*

- ☐ Yes ☐ No

If yes, how many prescriptions on average do you write a week?

- ☐ <5
☐ 6-15
☐ 16-25
☐ 26-35
☐ 36-45
☐ >46

How would you describe your area of prescribing? *Optional*

- ☐ I would describe myself as a specialist
☐ I would describe myself as a generalist

If you describe yourself as a specialist, then please describe your specialty

Facilitators and barriers

You will now be asked to list any barriers or facilitators to non-medical prescribing that you have encountered.

- A **facilitator** is something that has helped, or made it easier, for you to practice as a prescriber.
- A **barrier** is something that has prevented, or made it difficult, for you to practice as a prescriber.

Please list at least three barriers and/or facilitators. You can list as many as you wish. Please use the free text box to add any information concerning the facilitator and/or barrier. For example, why you think it is important or how it has affected your practice.

Facilitator/Barrier * *Required*

 [More info](#)

Would you describe this as a facilitator or barrier? * *Required*

☐ Facilitator

☐ Barrier

Free text box for comments

Facilitator/Barrier * *Required*

 [More info](#)

Would you describe this as a facilitator or barrier? * *Required*

☐ Facilitator ☐ Barrier

Free text box for comments

Facilitator/Barrier * *Required*

[+ More info](#)

Would you describe this as a facilitator or barrier? * *Required*

☐ Facilitator ☐ Barrier

Free text box for comments

Facilitator/Barrier *Optional*

[+ More info](#)

Would you describe this as a facilitator or barrier?

☐ Facilitator

☐ Barrier

Free text box for comments

Do you wish to add more facilitators and/or barriers? * *Required*

☐ Yes

☐ No

Extra Facilitators and Barriers

Facilitator/Barrier *Optional*

[+ More info](#)

Would you describe this as a facilitator or barrier?

☐ Facilitator

☐ Barrier

Free text box for comments

Facilitator/Barrier *Optional*

[+ More info](#)

Would you describe this as a facilitator or barrier?

☐ Facilitator

☐ Barrier

Free text box for comments

Do you wish to add more facilitators and/or barriers? * *Required*

☐ Yes

☐ No

Pages 8 and 9 are repeated a further 6 times, but have been omitted for clarity

Additional comments

Do you have any comments about completing this questionnaire, such as ease of completion?



The next steps:

All the responses will be reviewed to identify common themes and used to produce a list of the facilitators and barriers that have affected the participants.

You will then be sent a link to a new questionnaire. In the next questionnaire, you will be asked to review the list of barriers and facilitators and decide which of these you consider to be important.

The next questionnaire will be sent out in approximately six weeks from: 15 October 2018

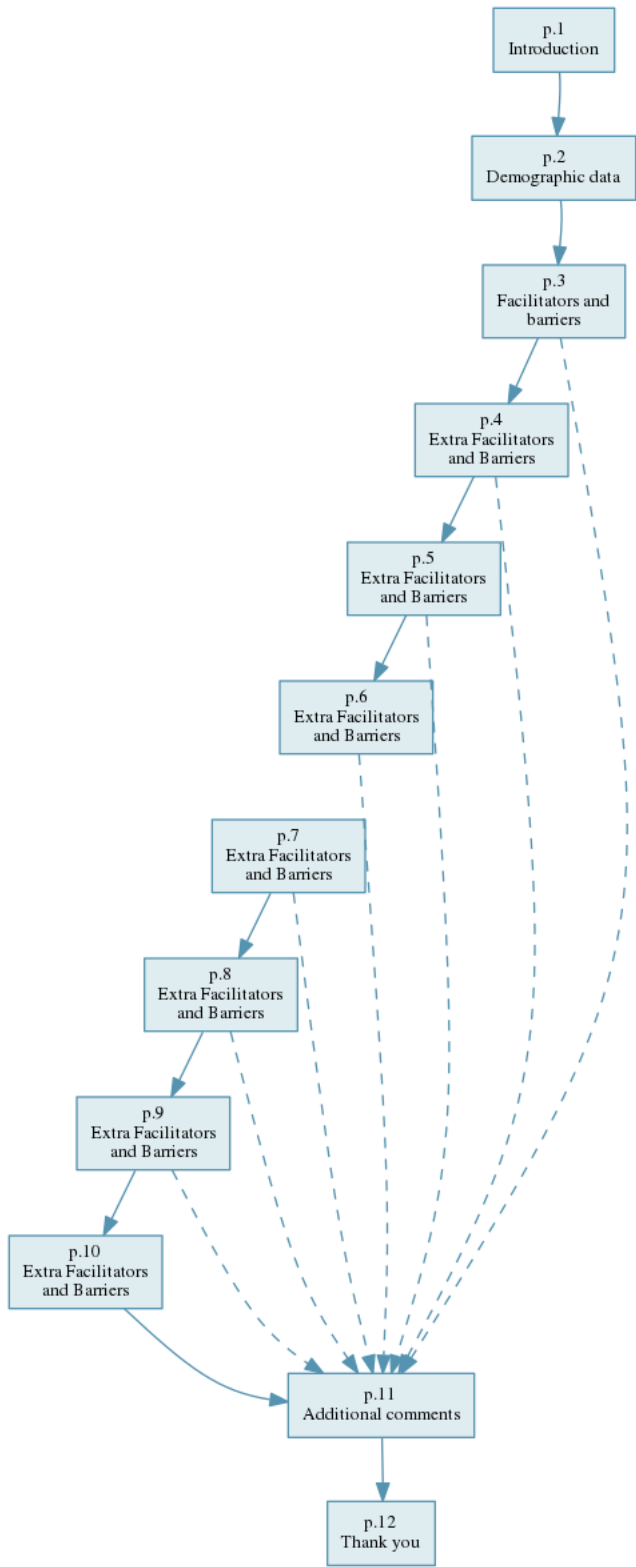
Thank you

Thank you for completing this questionnaire.

If you have any questions or comments please do not hesitate to contact the lead researcher:

Emma Graham-Clarke, email address:

Appendix 8.19 Round One questionnaire routing structure: Chapter 4



Appendix 8.20 Round Two questionnaire: Chapter 4

Delphi Round 2 - NMP

Page 1: Introduction

Thank you for agreeing to participate in this study which is to investigate barriers and facilitators to prescribing experienced by pharmacist and physiotherapist independent prescribers

In this questionnaire you will be presented with various statements developed from the responses to the last questionnaire that you participated in. You will be asked to agree or disagree with a statement, or make it applicable to a specific area of work and professions.

The statements have been divided into two sections: the first lists the various facilitators to non-medical prescribing that you have described, and the second lists the various barriers that you have also described. Each section comprises six tables of statements, grouped approximately by theme.

You will be asked to rate, using a simple scale, whether or not you agree that these are important factors. You will be able to add any comments you wish regarding each statement, such as elaborating on why you have chosen the rating you have given. You will also have the opportunity to add any further comments you may have.

- You will see a progress bar at the top of the page and this will indicate how far through the questionnaire you are.
- The questionnaire will take on average 30 minutes to complete but this may vary depending on how much you wish to write.
- You will be able to go back and forwards through the questionnaire if you need to.
- You will also be able to save the questionnaire and come back and finish it at a later time. To do this you will need to carefully follow the instructions that will be given at the time.

If you have any questions or comments please do not hesitate to contact me. Emma Graham Clarke, email address

[Redacted email address]

Page 2: Rating of facilitators

1. Please rate the following facilitator statements for their importance to you and your prescribing practice. Please use the free text box to add any comments elaborating on your choice of rating for that statement. A **facilitator** is defined as something that has helped or made it easier for you to practice as a prescriber.

	Rating * Required					Free text comments
	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	
Management support enables funding and training time to qualify as a prescriber	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Manager prompting [me] to do the course and plan how to introduce it in the department	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
My employer has provided the support for me to be able to go on the NMP course and then supported me once qualified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
My manager is keen to develop non medical prescribers within the trust so is supportive of my role and helping me to negotiate a contract	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Support from my line manager	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Support from the employer/department for the role of non medical prescribers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
The department created a role that allows me to utilise my skill set and supports me in the role	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

A patient rated the NMP experience as high and highly value the NMP prescribing as part of the care	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Patient requirements A need for patient's to have streamlined care by being able to prescribe at the point of contact	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Being able to prescribe to patients more effectively and really useful working [in my area]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Wide variety of options that you can offer patients to improve the experience	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Motivation to help the patients who benefit with prescribing and cut care delay / duplication	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

1.a. Would you change the wording of any of the above statements? If you would, please describe what you would change in the following free text box

2. Please rate the following facilitator statements for their importance to you and your prescribing practice. Please use the free text box to add any comments elaborating on your choice of rating for that statement. A **facilitator** is defined as something that has helped or made it easier for you to practice as a prescriber

Rating * Required					Free text comments
Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	

3 / 24

Medica colleagues informed by my frequent prescribing habits and have begun prescribing common drugs often start a patient on	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Current supervision with a [doctor] has massively helped me increase my confidence prescribing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Direct contact with medical team caring for patient	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Doctors have been working [with] this [NMP] mode	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Forward thinking DMP [designated medical practitioner] who is keen to integrate different MDG [multidisciplinary group] professions into the team	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Good relationship with consultants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Joint working / shadowing opportunities with the specialist prescribers or GPs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>

4 / 24

Supportive medical supervision / mentorship	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Supportive medical colleagues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Supportive nursing colleagues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

2.a. Would you change the wording of any of the above statements? If you would, please describe what you would change in the following free text box

3. Please rate the following facilitator statements for their importance to you and your prescribing practice. Please use the free text box to add any comments elaborating on your choice of rating for that statement. A **facilitator** is defined as something that has helped or made it easier for you to practice as a prescriber

	Rating * Required					Free text comments
	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	
The nature of the role facilitates prescribing practice as part of the overall review of patients	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Mentor a ready NMP creates a positive environment for NMP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Being a role model for others [of my profession] as the only non-patient NMP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

My know edge of med cat on	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
As an NMP have much better knowledge of OTC [over the counter] med cat on and can adv se pat ents accord ng y	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
My exper ence work ng as a ongs de a consu tan /[GP] for many years	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Hav ng a spec a ty a ows deve opment of sk s and knowledge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Ev dence base from nvest gat ons	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Prescr b ng regu ary n pr mary care, a most advantageous sk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
30 years exper ence [g v ng conf dence]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Persona conf dence n spec a sm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>

3.a. Would you change the word ng of any of the above statements? f you wou d, p ease descr be say what you wou d change n the fo ow ng free text box

6 / 24

4. Please rate the following facilitator statements for their importance to you and your prescribing practice. Please use the free text box to add any comments elaborating on your choice of rating for that statement. A **facilitator** is defined as something that has helped or made it easier for you to practice as a prescriber.

	Rating * Required					
	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	Free text comments
Community Lead pushing the project forwards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Good NMP support group with regular meetings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Working as part of an MDT [multidisciplinary team] / interdisciplinary group	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Nursing and medical staff very open to pharmacist NMP role	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Support from other NMPs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
When you see others doing, thinking gives you the confidence to do it yourself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
We supported by team and they allow me to prescribe for the patients	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>

4.a. Would you change the wording of any of the above statements? If you would, please describe what you would change in the following free text box

5. Please rate the following facilitator statements for their importance to you and your prescribing practice. Please use the free text box to add any comments elaborating on your choice of rating for that statement. A **facilitator** is defined as something that has helped or made it easier for you to practice as a prescriber

	Rating * Required					Free text comments
	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	
Process for registering, getting prescriptions pads etc in place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div style="border: 1px solid black; height: 40px; width: 100%;"></div>
Room space available for clinics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div style="border: 1px solid black; height: 40px; width: 100%;"></div>
The law enables me to practice as an NMP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div style="border: 1px solid black; height: 40px; width: 100%;"></div>
As an IP [Independent prescriber] it has made doing steroid injections much easier as less paperwork is necessary	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div style="border: 1px solid black; height: 40px; width: 100%;"></div>

As an P [ndependent prescr ber] t has made the process of stero d nject ons eas er as am ab e to m x med cat on	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
E ectron c prescr b ng system a ows an aud t tra of my prescr b ng and pharmac sts can eas y access the prescr pt ons and ver fy them	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Hav ng an e ectron c pat ent record mean that can use a pat ent data ava ble to base my prescr b ng upon	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
have a [prescr b ng] budget where work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Lack of med ca cover proves the need have an extra prescr ber on the ward	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Nurses are not yet prescr bers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>

5.a. Would you change the word ng of any of the above statements? f you wou d, p ease descr be say what you wou d change n the fo ow ng free text box

9 / 24

6. Please rate the following facilitator statements for their importance to you and your prescribing practice. Please use the free text box to add any comments elaborating on your choice of rating for that statement. A **facilitator** is defined as something that has helped or made it easier for you to practice as a prescriber.

	Rating * Required					Free text comments
	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	
Supportive pharmacy leadership allowing prescribing without needing on a second check by pharmacist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
[Benefit of] NICE Guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Great antibiotic guidelines in this trust/area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Easy access to medication info	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Supportive working environment [with NMP] processes in place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
We are well supported with NMP training opportunities, including 2 full in-house training days a year	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>

Effect ve persona deve opment rev ews	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Ongo ng mentorsh p [supports] CPD [cont nu ng profess ona deve opment] and keep ng up to date w th current med cat on reg mes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Attendance of MDT [mut d sc p nary team] meet ng [as] pat ents are d scussed a ow ng the prescr pt on to be d scussed w th the team	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>

6.a. Wou d you change the word ng of any of the above statements? f you wou d, p ease descr be say what you wou d change n the fo ow ng free text box

7. Do you fee that there are any fac tators that are m ss ng? f there are, p ease add them to the fo ow ng free text box

Page 3: Rating of barriers

8. Please rate the following barrier statements for their importance to you and your prescribing practice. Please use the free text box to add any comments elaborating on your choice of rating for that statement. A **barrier** is defined as something that has prevented or made it difficult for you to practice as a prescriber.

	Rating * Required					Free text comments
	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	
I am starting a new service, without much peer/manager support to set it up	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Managers not supporting prescribing role	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
The department is not very supportive within the context of expanding my role and utilising the practical aspects of my prescribing such as patient examination	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Trust application process lengthy and waiting to be allowed to prescribe. Director of nursing does not know me and has been reluctant to sign paperwork	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
[Lack of] acceptance as NMP by nurses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Pressure from ward to prescribe beyond my scope	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
A lack of clinicians wanting to share the risks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Colleagues may feel prescribing should only occur after a the usual duties have been completed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
I have no other P [ndependent prescriber] to chat things through with quickly & easily	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Lack of staffing, so often conducting medical reconciliations, which I am reluctant to prescribe from, and may not have time to go on the ward round	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Sometimes junior clinicians feel an NMP is prescribing because the own prescriber is inadequate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>

8.a. Would you change the wording of any of the above statements? If you would, please describe what you would change in the following free text box

13 / 24

9. Please rate the following barrier statements for their importance to you and your prescribing practice. Please use the free text box to add any comments elaborating on your choice of rating for that statement. A **barrier** is defined as something that has prevented or made it difficult for you to practice as a prescriber.

	Rating * Required					Free text comments
	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	
[Med c] Instead of increasing the dose may change the drug instead of discussing with me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of acceptance by [med cs]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of immediate medical advice/support	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of suitable mentor/mentorship	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Non attendance on clinical ward rounds as documentation of patient progress or clinical plan notes not always clear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Community/one working [as] we only ever see patients on our own, so I'm unable to gain advice from other sources immediately	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Poor integration between the community team and the hospital team	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Secondary care
outpatient
specialists should
suggest course of
action to the GP
regarding
medicines
(Clinical Pathways
and Hospital
Processes)



New ways of
working from
joining new team



I am unable to
access any
shared medical
records making
prescribing very
difficult



9.a. Would you change the wording of any of the above statements? If you would, please describe what you would change in the following free text box

10. Please rate the following barrier statements for their importance to you and your prescribing practice. Please use the free text box to add any comments elaborating on your choice of rating for that statement. A barrier is defined as something that has prevented or made it difficult for you to practice as a prescriber

	Rating * Required					Free text comments
	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	
Lack of confidence as it is a new skill and not enough exposure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>

My confidence do sometimes doubt my abilities and worry a great deal about the legal/professional implications of making an incorrect decision	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Change in job role, [to one that] did not end itself to prescribing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Changed roles [and] don't feel confident to prescribe in the area that work in now	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Due to change employment shortly where new post doesn't currently have prescribing for [my profession] in place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
NMP role not well established for [my profession]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
No defined prescribing role in current work area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
There's no time to actively prescribe [in my current role]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
[Lack of] a defined reason to prescribe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Lack of clear requirements to what's competent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>

16 / 24

Formulary differences between Trust and APC/CCG [area prescribing committee/clinical commissioning group] make it difficult to know what can prescribe

☐
☐
☐
☐
☐

10.a. Would you change the wording of any of the above statements? If you would, please describe what you would change in the following free text box

11. Please rate the following barrier statements for their importance to you and your prescribing practice. Please use the free text box to add any comments elaborating on your choice of rating for that statement. A barrier is defined as something that has prevented or made it difficult for you to practice as a prescriber

	Rating * Required					Free text comments
	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	
Keeping up with new research difficult	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
You've had to stop a particular drug, even though licensed for reasons being prescribed, as CCG [clinical commissioning group] is following guidance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Starting a new specialty with new medicines to learn about	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Lack of diagnostic skills makes primary prescribing more difficult	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>

C n ca exam nat on sk s On y bas cs taught on the course BP and p use Th s makes me apprehens ve to prescr be	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of access to ongo ng deve opment out of Trust	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of tra n g structure w th n the department[/workp ace]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of commun cat on from un vers ty fo ow ng course comp et on	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of pharmaco gy exposure dur ng undergraduate tra n g	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
NMP course very pr mary care and nurs ng focussed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of c n c rooms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Re y on externa company to reg ster NMPs, pr nt pads etc somet mes de ays someone be ng ab e to prescr be	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

11.a. Wou d you change the word ng of any of the above statements? f you wou d, p ease descr be say what you wou d change n the fo ow ng free text box

12. Please rate the following barrier statements for their importance to you and your prescribing practice Please use the free text box to add any comments elaborating on your choice of rating for that statement A **barrier** is defined as something that has prevented or made it difficult for you to practice as a prescriber

	Rating * Required					Free text comments
	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	
The availability of a pharmacist to clinically screen the prescriptions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
[My] prescribing not reviewed by pharmacists in the same way as medical or other NMPs prescribing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Variable access to patient records would not be happy to prescribe when did not have access to patient record with up to date medication/allergies etc	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Unable to access patient's full SCR [summary care records] / GP records	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
[Unable to prescribe certain drugs and have to use] supplementary prescribing, [which] requires a slight change to the pathway of the team and doctors need to be educated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cost of professional indemnity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of medical cover at times means cannot prescribe opioids	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

19 / 24

L m tat ons of [ega] prescr b ng gu de nes [wth a d spar ty between pract t oner ro es]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Profess ona ndemn ty s a cha enge to acqu re need updated JD [job descr pt on] and emp oyer s ow to produce	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Sk s earnt dur ng NMP course cannot be put nto pract ce unt [profess ona] reg strat on wh ch took 2 months	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Unab e to prescr be [certa n drugs] and have to ask a [doctor] to do th s	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>

12.a. Wou d you change the word ng of any of the above statements? f you wou d, p ease descr be say what you wou d change n the fo ow ng free text box

13. Please rate the following barrier statements for their importance to you and your prescribing practice Please use the free text box to add any comments elaborating on your choice of rating for that statement A barrier is defined as something that has prevented or made it difficult for you to practice as a prescriber

	Rat ng * Required					Free text comments
	Strong y d sagree (1)	D sagree (2)	Neutra (3)	Agree (4)	Strong y agree (5)	
NMP nc nc s not recogn sed as not comm ss oned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>

[Lack of] Fund ng for t me spent prescr b ng	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Ga n ng perm ss on for p ot and n t a fund ng for c n cs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Lack of organ sat ona fund ng	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
No money to pay for staff go ng on any courses. However there seems to be a d spar ty as nurses n acute care appear to be ab e to access MSc modu es	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Nurses are cheaper	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Nurse ed c n c ntroduc ng nurse prescr bers so no need for other prescr bers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
There s no current budget for prescr b ng	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>

21 / 24

[Lack of time] time available for prescribing activities Facilitating attendance on ward round to allow further patient history and inpatient episode history	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
[Lack of] time to specialise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Lack of allocated time resulting from new management role	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Lack of time to develop further prescribing skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Lack of time to prescribe as core/candidate duties take priority	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>

13.a. Would you change the wording of any of the above statements? If you would, please describe what you would change in the following free text box

14. Do you feel that there are any barriers that are missing? If there are, please add them to the following free text box

22 / 24

Page 4: Next Steps

15. Do you have any comments about completing this questionnaire such as ease of completion?

--	--

The next steps

All the responses from the questionnaire will be analysed, and some simple statistics calculated

You will then be sent a link to a new questionnaire, which will enable you to compare your rating with the average panel result. If you wish to amend your response you will be able to do this. You will also be asked to rank the factors and barriers in order of importance.

The next questionnaire will be sent out in approximately six weeks from 07/18

Page 5: Thank you

Thank you for completing this questionnaire

If you have any questions or comments please do not hesitate to contact the lead researcher Emma Graham-Clarke email address

Appendix 8.21 Round Three questionnaire: Chapter 4

Delphi Round 3 - NMP

Page 1: Introduction

Thank you for continuing to participate in this study which is to investigate barriers and facilitators to prescribing experienced by pharmacist and physiotherapist independent prescribers

In this questionnaire you will have the opportunity to review ratings given to statements in the previous round and to rank statements in order of their importance to you. Information in [] clarifies a statement or makes it applicable to all areas of work and professions

In the **first section** of the questionnaire you will be re-presented with statements from the last questionnaire that did not reach agreement on their importance

By each statement you will see the median response that you and your fellow participants gave. For example: "Manager prompting [me] to do the course and plan how to introduce it in the department (Median 4)"

Please reconsider your initial rating compared to the feedback you receive. If you wish to change the rating you gave to the statement then you can do this using the rating scale. If you do not wish to amend your previous response then leave the rating blank.

If the statement is not applicable to your practice or you are unable to give an opinion on it then please rate the statement as 'neutral'

You can add any further comments you wish regarding each statement such as elaborating on why you have chosen the rating you have given but you do not need to repeat any comments that you gave in the previous round

Please remember that there are no right or wrong answers. I am seeking your opinions

In the **second section** of the questionnaire you will have the opportunity to rank in order of importance to you those statements where consensus has already been achieved

- You will see a progress bar at the top of the page and this will indicate how far through the questionnaire you are
- The questionnaire will take on average 30 minutes to complete but this may vary depending on how much you wish to write
- You will be able to go back and forwards through the questionnaire if you need to
- You will also be able to save the questionnaire and come back and finish it at a later time. To do this you will need to carefully follow the instructions that will be given at the time

If you have any questions or comments please do not hesitate to contact me

Emma Graham Clarke email address

Page 2: Review of facilitators

Please review the median rating assigned to each facilitator statement with regard to the importance to you and your prescribing practice and reconsider your initial rating. If you wish to change the rating you originally gave, then use the rating scale to do so. If you are happy with your original rating, then you need do nothing. If the statement is not applicable to you, or you have no opinion about it, then please rate it as neutral. Please use the free text box to add any comments elaborating on your rating for that statement.

[More info](#)

	Rating					Free text comments
	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	
All patients rated the NMP experience as high and highly value their NMP prescribing as part of their care (Median 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Clinical Lead pushing the project forwards (Median 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Good NMP support group with regular meetings (Median 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Joint working / shadowing opportunities with the specialist prescribers or GPs (Median 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Manager prompting [me] to do the course and plan how to introduce it in the department (Median 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Medical colleagues informed by my frequent prescribing habits and have begun prescribing common drugs often start a patient on (Median 3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
My experience working as alongside a consultant/[GP] for many years (Median 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
My manager is keen to develop non medical prescribers within the trust so is supportive of my role and helping me to negotiate a clinic slot again (Median 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Nursing and medical staff very open to pharmacist NMP role (Median 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Supportive pharmacy leadership allowing prescribing without insisting on a second check by pharmacist (Median 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Please review the median rating assigned to each facilitator statement with regard to the importance to you and your prescribing practice and reconsider your initial rating. If you wish to change the rating you originally gave, then use the rating scale to do so. If you are happy with your original rating, then you need do nothing. If the statement is not applicable to you, or you have no opinion about it, then please rate it as neutral. Please use the free text box to add any comments elaborating on your rating for that statement.

[+ More info](#)

	Rating					Free text comments
	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	
As an NMP, have much better knowledge of OTC [over the counter] medication and can advise patients accordingly (Median 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Attendance of MDT [multidisciplinary team] meeting [as] patients are discussed allowing the prescription to be discussed with the team (Median 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
[Benefit of] NCE Guidelines (Median 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Effective personal development reviews (Median 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Evidence base from investigations (Median 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Having an electronic patient record mean that can use all patient data available to base my prescribing upon (Median 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

3 / 15

Ongoing mentorship [supports] CPD [continuing professional development] and keeping up to date with current medication regimes (Median 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Prescribing regularly in primary care a most advantageous skill (Median 3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Process for registering getting prescription pads etc in place (Median 3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
We are well supported with NMP training opportunities including 2 full in house training days a year (Median 3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
When you see others doing think it gives you the confidence to do it yourself (Median 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>

Page 3: Review of barriers

Please review the median rating assigned to each barrier statement with regard to the importance to you and your prescribing practice and reconsider your initial rating. If you wish to change the rating you originally gave, then use the rating scale to do so. If you are happy with your original rating, then you need do nothing. If the statement is not applicable to you, or you have no opinion about it, then please rate it as neutral. Please use the free text box to add any comments elaborating on your rating for that statement.

[More info](#)

	Rating					Free text comments
	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	
A lack of clinicians wanting to share their skills (Median 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Colleagues may feel prescribing should only occur after all the usual duties have been completed (Median 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
I am starting a new service without much peer/managerial support to set it up (Median 3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
I have no other P [independent prescriber] to chat things through with quickly & easily (Median 1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of immediate medical advice/support (Median 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
New ways of working from joining new team (Median 3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Poor integration between the community team and the hospital team (Median 3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Sometimes junior clinicians feel an NMP is prescribing because their own prescribing is inadequate (Median 3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

The department is not very supportive within the context of expanding my role and utilising the practical aspects of my prescribing such as patient examination (Median 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>

Please review the median rating assigned to each barrier statement with regard to the importance to you and your prescribing practice and reconsider your initial rating. If you wish to change the rating you originally gave, then use the rating scale to do so. If you are happy with your original rating, then you need do nothing. If the statement is not applicable to you, or you have no opinion about it, then please rate it as neutral. Please use the free text box to add any comments elaborating on your rating for that statement.

[More info](#)

	Rating					Free text comments
	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	
[Lack of] a defined reason to prescribe (Median 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Lack of access to ongoing development out of Trust (Median 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Lack of communication from university following course completion (Median 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Lacking confidence as it is a new skill and not enough exposure (Median 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Lack of diagnostic skills makes primary prescribing more difficult (Median 3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Lack of pharmacology exposure during undergraduate training (Median 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Lack of training structure within the department[workplace] (Median 3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>

My confidence do sometimes doubt my abilities and worry a great deal about the legal/professional implications of making an incorrect decision (Median 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
NMP role not well established for [my profession] (Median 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>
Starting a new speciality with new medicines to learn about (Median 3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div></div>

7 / 15

Page 4: Review of barriers (part 2)

Please review the median rating assigned to each barrier statement with regard to the importance to you and your prescribing practice and reconsider your initial rating. If you wish to change the rating you originally gave, then use the rating scale to do so. If you are happy with your original rating, then you need do nothing. If the statement is not applicable to you, or you have no opinion about it, then please rate it as neutral. Please use the free text box to add any comments elaborating on your rating for that statement.

[+ More info](#)

	Rating					Free text comments
	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	
Cost of professional indemnity (Median 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of clinic rooms (Median 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of medical cover at times means cannot prescribe opioids (Median 3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Limitations of [legal] prescribing guidelines [with a disparity between practitioner roles] (Median 3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
[My] prescribing not reviewed by pharmacists in the same way as medical or other NMPs prescribing (Median 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
The availability of a pharmacist to clinically screen the prescriptions (Median 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
[Unable to prescribe certain drugs and have to use] supplementary prescribing [which] requires a slight change to the pathway of the team and doctors need to be educated (Median 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Variable access to patient records would not be happy to prescribe when did not have access to patient record with up to date medication/allergies etc (Median 3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Please review the median rating assigned to each barrier statement with regard to the importance to you and your prescribing practice and reconsider your initial rating. If you wish to change the rating you originally gave, then use the rating scale to do so. If you are happy with your original rating, then you need do nothing. If the statement is not applicable to you, or you have no opinion about it, then please rate it as neutral. Please use the free text box to add any comments elaborating on your rating for that statement.

[+ More info](#)

	Rating					Free text comments
	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	
Lack of allotted time resulting from new management role (Median 3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of organisational funding (Median 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
[Lack of] time available for prescribing activities Facilitating attendance on ward round to allow full patient history and inpatient episode history (Median 3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of time to prescribe as core/clinical duties take priority (Median 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
[Lack of] time to specialise (Median 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Nurses are cheaper (Median 3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Nurse led clinic introducing nurse prescribers so no need for other prescribers (Median 3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Professional indemnity is a challenge to acquire need updated JD [job description] and employer slow to produce (Median 3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Skills learnt during NMP course cannot be put into practice until [professional] registration which took 2 months (Median 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Unable to prescribe
[certain drugs] and have
to ask a [doctor] to do this
(Median 3)



Page 5: Ranking the statements

Below are a number of statements that you were asked to rate in the previous questionnaire and which achieved consensus at that stage. Please select the 10 most important statements that affect your practice and rank them from 1 to 10 (where 1 is most important and 10 least important) * Required

Please don't select more than 10 answer(s) per row

Please select between 5 and 10 answers

Please don't select more than 10 answer(s) in any single column

	1	2	3	4	5	6	7	8	9	10
Being able to prescribe to patients is more effective and really useful working [in my area]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clinical supervision with a [doctor] has massively helped me increase my confidence prescribing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Doctors have been working [with] this [NMP] model	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Direct contact with medical team caring for patient	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Easy access to medication info	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Forward thinking DMP [designated medical practitioner] who is keen to integrate different MDG [multidisciplinary group] professionals into the team	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Great antibiotic guidelines in this trust/area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Good relationship with consultants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Having a speciality allows development of skills and knowledge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of time to develop further prescribing skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Management support enables funding and training time to qualify as a prescriber	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My knowledge of medication	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My employer has provided the support for me to be able to go on the NMP course and then supported me once qualified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mentor already NMP creates a positive environment for NMP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Motivation to help the patients who will benefit with prescribing and cut care delay / duplication	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Personal confidence in specialism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Patient requirements A need for patients to have streamlined care by being able to prescribe at the point of contact	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Supportive medical colleagues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Supportive medical supervision / mentorship	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Supportive nursing colleagues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Supportive working environment [with NMP] policies in place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Support from my line manager	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Support from the employer/department for the role of non medical prescribers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12 / 15										

Support from other NMPs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The law enables me to practice as an NMP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The nature of the role facilitates prescribing practice as part of the overall review of patients	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wide variety of options that you can offer patients to improve their experience	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Well supported by team and they allow me to prescribe for their patients	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Working as part of an MDT [multidisciplinary team] / interdisciplinary group	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13 / 15

Page 6: Next Steps

Do you have any comments about completing this questionnaire such as ease of completion?

Thank you for your participation in this doctoral research study. If you would like to be informed of the research results and receive a copy of the final results, then please give your email address below.

Please enter a valid email address

Page 7: Thank you

Thank you for completing this questionnaire.

If you have any questions or comments, please do not hesitate to contact the lead researcher, Emma Graham Clarke, email address

Appendix 8.22 Weighted rank sum example - worked example: Chapter 4

Weighted rank sum – worked example for statement: “Being able to prescribe to patients is more effective and really useful working [in my area]”

Step 1 – reverse the rank. For example, rank 1 becomes 10

Step 2 – count the number at each rank – this is the weighting. In this example 9 participants have ranked the statement at 10, 3 at 9, etc.

Step 3 – multiply the reversed rank by the weighting

Original rank	Reverse rank	Weighting	Weighted rank
3	8	1	8
1	10	9	90
10	1	1	1
2	9	3	27
2	9	3	27
1	10	9	90
6	5	1	5
1	10	9	90
1	10	9	90
8	3	2	6
1	10	9	90
2	9	3	27
1	10	9	90
1	10	9	90
1	10	9	90
8	3	2	6
1	10	9	90

Appendix 8.23 Reporting criteria for Delphi study: Chapter 4

Proposed key methodologic criteria to report in publications of Delphi studies – adapted from Jünger et al 2017

Page numbers relate to published paper (Appendix 8.14)

No.	Item	Guide and description	Page no.
Rationale for the choice of the Delphi technique			
1	Justification.	The choice of the Delphi technique as a method of systematically collating expert consultation and building consensus needs to be well justified. When selecting the method to answer a particular research question, it is important to keep in mind its constructivist nature	2 – 3
Planning and design			
2	Planning and process.	The Delphi technique is a flexible method and can be adjusted to the respective research aims and purposes. Any modifications should be justified by a rationale and be applied systematically and rigorously	3
3	Definition of consensus.	Unless not reasonable due to the explorative nature of the study, an a priori criterion for consensus should be defined. This includes a clear and transparent guide for action on (a) how to proceed with certain items or topics in the next survey round, (b) the required threshold to terminate the Delphi process and (c) procedures to be followed when consensus is (not) reached after one or more iterations	4 – 5
Study conduct			
4	Informational input.	All material provided to the expert panel at the outset of the project and throughout the Delphi process should be carefully reviewed and piloted in advance in order to examine the effect on experts' judgements and to prevent bias	4 – 5
5	Prevention of bias.	Researchers need to take measures to avoid directly or indirectly influencing the experts' judgements. If one or more members of the research team have a conflict of interest, entrusting an independent researcher with the main coordination of the Delphi study is advisable	3
6	Interpretation and processing of results.	Consensus does not necessarily imply the 'correct' answer or judgement; (non)consensus and stable disagreement provide informative insights and highlight differences in perspectives concerning the topic in question	13
7	External validation.	It is recommended to have the final draft of the resulting guidance on best practice in palliative care reviewed and approved by an external board or authority before publication and dissemination	N/A
Reporting			
8	Purpose and rationale.	The purpose of the study should be clearly defined and demonstrate the appropriateness of the use of the Delphi technique as a method to achieve the research aim. A rationale for the choice of the Delphi technique as the most suitable method needs to be provided	2 - 3

9	Expert panel.	Criteria for the selection of experts and transparent information on recruitment of the expert panel, socio- demographic details including information on expertise regarding the topic in question, (non)response and response rates over the ongoing iterations should be reported	3 Appendix 8.18
10	Description of the methods.	The methods employed need to be comprehensible; this includes information on preparatory steps (How was available evidence on the topic in question synthesised?), piloting of material and survey instruments, design of the survey instrument(s), the number and design of survey rounds, methods of data analysis, processing and synthesis of experts' responses to inform the subsequent survey round and methodological decisions taken by the research team throughout the process	2 – 5
11	Procedure.	Flow chart to illustrate the stages of the Delphi process, including a preparatory phase, the actual 'Delphi rounds', interim steps of data processing and analysis, and concluding steps	4
12	Definition and attainment of consensus.	It needs to be comprehensible to the reader how consensus was achieved throughout the process, including strategies to deal with non-consensus	3 - 5
13	Results.	Reporting of results for each round separately is highly advisable in order to make the evolving of consensus over the rounds transparent. This includes figures showing the average group response, changes between rounds, as well as any modifications of the survey instrument such as deletion, addition or modification of survey items based on previous rounds	5 - 12
14	Discussion of limitations.	Reporting should include a critical reflection of potential limitations and their impact of the resulting guidance	13
15	Adequacy of conclusions.	The conclusions should adequately reflect the outcomes of the Delphi study with a view to the scope and applicability of the resulting practice guidance	9 - 13
16	Publication and dissemination.	The resulting guidance on good practice in palliative care should be clearly identifiable from the publication, including recommendations for transfer into practice and implementation. If the publication does not allow for a detailed presentation of either the resulting practice guidance or the methodological features of the applied Delphi technique, or both, reference to a more detailed presentation elsewhere should be made (e.g. availability of the full guideline from the authors or online; publication of a separate paper reporting on methodological details and particularities of the process (e.g. persistent disagreement and controversy on certain issues)). A dissemination plan should include endorsement of the guidance by professional associations and health care authorities to facilitate implementation	N/A

Jünger S, Payne SA, Brine J, Radbruch L, Brearley SG. Guidance on Conducting and REporting DELphi Studies (CREDES) in palliative care: Recommendations based on a methodological systematic review. *Palliative Medicine*. 2017;31(8):684-706. Epub 2017/02/14. doi: 10.1177/0269216317690685.

Appendix 8.24 Consensus results for facilitator statements, Round Two—grouped by all participants and for each profession:

Chapter 4

Key to Table

Decision	Criteria
Included for ranking	Met all consensus criteria, for all participants and for individual professional groups
Included for re-rating	Met two consensus criteria and/or disagreement between groups (all participants, individual professional groups)
Removed From study	Met one or no consensus criteria, for all participants and for individual professional groups

Statement	All participants (n=31)			Pharmacist (n=14)			Physiotherapist (n=17)		
	Median	IQ range	% agreement	Median	IQ range	% agreement	Median	IQ range	% agreement
My knowledge of medication	4	1	100	4	1	100	4	1	100
Having a speciality allows development of skills and knowledge	4	1	93.6	4	1	92.8	4	1	94.1
Management support enables funding and training time to qualify as a prescriber	5	1	90.3	5	1	85.7	5	1	94.1
Patient requirements. A need for patient's to have streamlined care by being able to prescribe at the point of contact	5	1	90.3	4	1	85.8	5	1	94.1
Supportive medical colleagues	4	1	90.3	4	1	92.8	4	1	88.3
Being able to prescribe to patients is more effective and really useful working [in my area]	5	1	87.1	5	1	92.9	5	1	82.4
Easy access to medication info	5	1	87.1	4.5	1	85.7	5	1	88.2
Personal confidence in specialism	4	0	87.1	4	1.25	78.6	4	0	94.1
Supportive medical supervision / mentorship	4	1	87.1	4	1.25	78.6	5	1	94.1
The nature of the role facilitates prescribing practice as part of the overall review of patients	4	1	87.1	4	1	92.9	5	1	82.3
The law enables me to practice as an NMP	4	1	87.1	4.5	1	92.9	4	1	82.4
Motivation to help the patients who will benefit with prescribing and cut care delay / duplication	4	1	87.1	4	1	85.8	5	1	88.2
Working as part of an MDT [multidisciplinary team] / interdisciplinary group	5	1	83.9	5	1.25	78.6	4	1	88.3
Support from the employer/department for the role of non-medical prescribers	4	1	83.9	4	1	85.7	5	1	82.3

Supportive working environment [with NMP] policies in place	4	1	83.9	4	2	71.4	4	1	94.1
My employer has provided the support for me to be able to go on the NMP course and then supported me once qualified	5	1	83.8	4	1	85.8	5	1	82.3
Good relationship with consultants	4	1	80.7	4.5	1	92.9	4	2	70.6
Forward thinking DMP [designated medical practitioner] who is keen to integrate different MDG [multidisciplinary group] professionals into the team	4	1	80.6	4	2	71.4	4	1	88.3
Supportive nursing colleagues	4	1	80.6	4	1	87.5	4	1.5	76.5
Wide variety of options that you can offer patients to improve their experience	4	1	80.6	4	1.25	71.4	5	1	88.2
Well supported by team and they allow me to prescribe for their patients	4	1	77.5	4.5	1	92.9	4	2	64.7
Support from other NMPs	4	1	77.4	4	1.25	78.6	4	1.5	76.5
Clinical supervision with a [doctor] has massively helped me increase my confidence prescribing	4	2	74.2	4	1.25	64.3	4	1	82.4
Support from my line manager	5	2	74.2	4.5	1	85.7	5	2.5	64.7
Direct contact with medical team caring for patient	4	2	74	4	1	85.7	4	1.5	82.4
Doctors have been working [with] this [NMP] model	4	1	71	4	1.5	71.4	4	1.5	70.5
My manager is keen to develop non-medical prescribers within the trust so is supportive of my role and helping me to negotiate a clinic slot again.	4	2	71	4	1.25	78.6	4	3	64.7
Great antibiotic guidelines in this trust/area	4	2	70.9	4	2	64.3	4	1.5	76.5
[Benefit of] NICE Guidelines	4	1	67.8	3.5	1	50	4	1	82.4
Nursing and medical staff very open to pharmacist NMP role	4	2	67.7	5	0.25	92.9	3	1	47.1
When you see others doing, I think it gives you the confidence to do it yourself	4	2	67.7	4	0.25	85.7	4	3	52.9
Joint working / shadowing opportunities with the specialist prescribers or GPs	4	2	67.7	4	2.25	71.5	4	2	64.7
As an NMP I have much better knowledge of OTC [over the counter] medication and can advise patients accordingly	4	2	67.7	3	2.25	42.8	4	1	88.2
Mentor already NMP - creates a positive environment for NMP	4	1	64.6	4	1.25	64.3	4	1	64.7
Effective personal development reviews	4	1	64.6	3	1.25	42.9	4	0	82.3
Ongoing mentorship [supports] CPD [continuing professional development] and keeping up to date with current medication regimes	4	2	64.5	3	1	42.9	4	1	82.4
All patients rated the NMP experience as high and highly value their NMP prescribing as part of their care	4	1	61.3	4	1	57.1	4	1.5	64.7
My experience working as alongside a consultant/[GP] for many years	4	1	61.3	4	1.5	78.5	3	1.5	47

Evidence base from investigations	4	1	61.3	4	1	57.1	4	1.5	64.7
Attendance of MDT [multidisciplinary team] meeting [as] patients are discussed allowing the prescription to be discussed with the team	4	2	61.3	4	1.25	64.3	4	2	58.8
Clinical Lead pushing the project forwards	4	1	58.1	4	1.25	78.6	3	1	70.6
Supportive pharmacy leadership allowing prescribing without insisting on a second check by pharmacist	4	2	58.1	4	2	57.2	4	2	58.8
The department created a role that allows me to utilise my skillset and supports me in the role	4	3	54.9	4	2.25	57.1	4	3	52.9
Good NMP support group with regular meetings	4	1	51.7	3	2	28.5	4	2	70.6
Manager prompting [me] to do the course and plan how to introduce it in the department.	4	2	51.7	4	2	71.2	3	2	35.3
Having an electronic patient record mean that I can use all patient data available to base my prescribing upon	4	2	51.6	3	2	42.9	4	2	58.9
We are well supported with NMP training opportunities, including 2 full in-house training days a year	3	2	48.4	3	2	35.7	4	1.5	58.8
Process for registering, getting prescription pads etc... in place	3	1	45.2	3	2.25	28.5	4	1	58.8
Room space available for clinics	3	2	38.7	3.5	1.5	50	3	2	29.4
Prescribing regularly in primary care, a most advantageous skill	3	2	35.5	3	1.25	14.2	4	1.5	52.9
Being a role model for others [of my profession] as the only in-patient NMP	3	2	35.5	3	1.5	21.4	3	1.5	47
Electronic prescribing system allows an audit trail of my prescribing and pharmacists can easily access the prescriptions and verify them	3	1	32.2	3	1.25	28.5	3	1	35.3
Lack of medical cover proves the need have an extra prescriber on the ward	3	1	29	3	1.5	42.9	3	0.5	17.7
Medical colleagues informed by my frequent prescribing habits and have begun prescribing common drugs I often start a patient on	3	2	29	3	2	28.6	3	2.5	29.4
30 years experience [giving confidence]	3	1	19.4	3	2	14.2	3	1.5	23.5
I have a [prescribing] budget where I work	2	1	16.2	2	1	14.3	2	2	17.7
As an IP [independent prescriber] it has made doing steroid injections much easier as less paperwork is necessary	3	0	9.7	3	1.5	0	3	0.5	17.6
As an IP [independent prescriber] it has made the process of steroid injections easier as I am able to mix medication	3	0	9.7	3	0.5	0	3	0	17.6
Nurses are not yet prescribers	2	1	6.5	1.5	1.25	7.1	3	2	5.9

Appendix 8.25 Consensus results for barrier statements, Round Two—grouped by all participants and for each profession:

Chapter 4

Key to Table

Decision	Criteria
Included for ranking	Met all consensus criteria, for all participants and for individual professional groups
Included for re-rating	Met two consensus criteria and/or disagreement between groups (all participants, individual professional groups)
Removed From study	Met one or no consensus criteria, for all participants and for individual professional groups

Statement	All participants (n=31)			Pharmacist (n=14)			Physiotherapist (n=17)		
	Median	IQ range	% agreement	Median	IQ range	% agreement	Median	IQ range	% agreement
Lack of time to develop further prescribing skills	4	1	67.7	4	1.25	71.4	4	1	64.7
My confidence. I do sometimes doubt my abilities and worry a great deal about the legal/professional implications of making an incorrect decision	4	2	67.8	4	2	57.1	4	0.5	76.4
Lack of time to prescribe as core/clinical duties take priority	4	3	54.8	4	3	64.3	3	2	47
Lacking confidence as it is a new skill and not enough exposure	4	2	51.6	2	3	42.8	4	2	76.4
Skills learnt during NMP course cannot be put into practice until [professional] registration which took 2 months	4	3	51.6	2.5	2.25	42.9	4	3	58.8
Unable to prescribe [certain drugs] and have to ask a [doctor] to do this	3	3	45.2	2	1.25	7.1	4	1.5	76.5
Variable access to patient records. I would not be happy to prescribe when I did not have access to patient record with up to date medication/allergies etc.	3	4	45.1	2	3.25	35.7	4	3	52.9
Lack of training structure within the department[/workplace]	3	2	42	3	1.25	21.4	4	2	58.8
Keeping up with new research difficult	3	2	41.9	3	2	42.8	3	2	41.2
New ways of working from joining new team	3	2	38.7	3	2	42.9	3	3	35.3
Lack of diagnostic skills makes primary prescribing more difficult	3	3	38.7	4	2	57.2	2	2.5	23.5
Nurses are cheaper	3	3	38.7	4	2.25	57.1	2	2.5	23.5
NMP course very primary care and nursing focused	3	3	35.5	1.5	2.25	21.4	3	3.5	47
No identified prescribing role in current work area	2	3	35.5	2	3	28.5	2	3.5	41.1
Lack of suitable mentor/mentorship	2	3	35.5	2	3	28.5	3	2.5	41.2

Unable to access patient's full SCR [summary care records] / GP records	2	3	35.5	2	2.25	21.4	3	3.5	47
No money to pay for staff going on any courses. However there seems to be a disparity as nurses in acute care appear to be able to access MSc modules	2	3	35.5	2	2.25	21.4	3	2.5	47
I am starting a new service, without much peer/managerial support to set it up	3	2	32.3	2	2.25	28.5	3	2.5	35.3
Starting a new speciality with new medicines to learn about	3	3	32.3	3	2	35.7	3	3	29.4
Lack of medical cover at times means I cannot prescribe opioids	3	3	32.3	1	2	7.1	4	3	52.9
[Lack of time] time available for prescribing activities. Facilitating attendance on ward round to allow full patient history and inpatient episode history	3	3	32.3	4	2	57.1	2	2	11.8
Nurse led clinic introducing nurse prescribers so no need for other prescribers	3	3	32.3	3.5	2	50	2	2	17.7
Lack of allotted time resulting from new management role	3	3	32.3	3.5	2	50	3	2	17.6
[Lack of] time to specialise	2	2	32.3	2	2	28.6	3	2.5	35.3
Clinical examination skills. Only basics taught on the course - BP and pulse. This makes me apprehensive to prescribe	2	2	32.3	3.5	2.25	50	2	2	17.6
I am unable to access any shared medical records making prescribing very difficult	2	3	32.3	1	3	28.6	3	3.5	35.3
NMP role not well established for [my profession]	2	3	32.3	2	2	14.3	3	2.5	47
Lack of communication from university following course completion	2	3	32.3	2	1.5	21.4	3	3	41.2
Lack of clinic rooms	2	3	32.3	3.5	3.25	50	2	2	17.6
Poor integration between the community team and the hospital team	3	2	32.2	3	3	28.6	3	1.5	35.2
Secondary care outpatient specialities should suggest course of action to the GP regarding medicines. (Clinical Pathways and Hospital Policies)	3	2	29.1	3	1.25	21.4	3	1.5	35.3
[Unable to prescribe certain drugs and have to use] supplementary prescribing, [which] requires a slight change to the pathway of the team and doctors need to be educated	2	3	29.1	1	1.25	7.1	3	3	47.1
Limitations of [legal] prescribing guidelines [with a disparity between practitioner roles]	3	3	29	1.5	1	7.1	3	2	47
Lack of access to ongoing development out of Trust	2	2	29	3	1.25	21.4	2	2.5	35.3
The availability of a pharmacist to clinically screen the prescriptions	2	3	25.9	2	2.25	42.9	2	1.5	11.8
Cost of professional indemnity	2	3	25.9	2.5	2.25	35.7	2	1.5	17.79
Professional indemnity is a challenge to acquire - need updated JD [job description] and employer slow to produce	3	2	22.6	2	2.25	21.4	3	1.5	23.6
There is no time to actively prescribe [in my current role]	2	3	25.9	2	3	28.6	2	2.5	23.5
Changed roles [and] I don't feel confident to prescribe in the area that I work in now	2	3	25.9	2	2.25	21.4	3	2.5	29.4

There is no current budget for prescribing	3	2	25.8	3	2	14.3	3	2	35.2
Pressure from ward to prescribe beyond my scope	3	3	25.8	3	2.25	28.5	3	2.5	23.6
Due to change employment shortly where new post doesn't currently have prescribing for [my profession] in place	3	3	25.8	2	2.25	21.4	3	2.5	29.4
Non-attendance on clinical ward rounds as documentation of patient progress or clinical plan in notes not always clear	3	1	22.6	3	2	35.7	3	2	11.8
Change in job role, [to one that] did not lend itself to prescribing	3	1	22.6	2	1.5	21.4	3	2	23.6
Gaining permission for pilot and initial funding for clinics	3	1	22.6	3	2	28.5	3	2	17.7
Formulary differences between Trust and APC/CCG [area prescribing committee/clinical commissioning group] make it difficult to know what I can prescribe	3	2	22.6	2	2	14.3	3	2	29.4
The department is not very supportive within the context of expanding my role and utilising the practical aspects of my prescribing such as patient examination	2	1	22.6	2	1.25	21.4	2	2.5	23.6
A lack of clinicians wanting to share their skills	2	2	22.6	2	2.25	21.4	2	2.5	23.5
Lack of organisational funding	2	2	22.6	2	1.25	14.2	3	3	29.4
Managers not supporting prescribing role	2	2	22.6	2	1	14.2	2	2.5	29.4
Lack of staffing, so often conducting medicines reconciliation, which I am reluctant to prescribe from, and may not have time to go on the ward round	3	1	19.4	3	2	42.9	2	2	0
You've had to stop a particular drug, even though licensed for reason being prescribed, as CCG [clinical commissioning group] is following guideline	3	1	19.4	2.5	1	14.3	3	2	23.6
[My] prescribing not reviewed by pharmacists in the same way as medic or other NMPs prescribing	2	2	19.4	2	2.25	21.4	2	2	17.7
Lack of clear requirements to what is competent	2	2	19.4	2	1.5	21.4	2	2	17.6
Lack of acceptance by [medics]	2	2	19.4	2	1.25	14.3	2	2.5	23.5
Lack of immediate medical advice/support	2	2	19.3	2	2	14.2	2	2.5	23.5
Lack of pharmacology exposure during undergraduate training	2	2	19.3	1	1	0	3	3	35.3
[Lack of] Funding for time spent prescribing	2	2	19.3	2	1.5	21.4	2	2	17.7
I have no other IP [independent prescriber] to chat things through with quickly & easily	1	1	19.3	1	1	7.1	2	3	29.4
Community/lone working [as] we only ever see patients on our own, so I'm unable to gain advice from other sources immediately	3	1	16.2	3	1.25	7.1	3	1.5	23.6
Trust application process lengthy and still waiting to be allowed to prescribe. Director of nursing does not know me and has been reluctant to sign paperwork	2	2	16.2	1.5	1	14.2	2	2	17.7

Sometimes junior clinicians feel an NMP is prescribing because their own prescribing is inadequate	3	2	16.1	1.5	2.25	21.4	3	1.5	11.8
Colleagues may feel prescribing should only occur after all the usual duties have been completed	2	2	16.1	3	2.25	35.7	2	2	0
[Lack of] a defined reason to prescribe	2	2	16.1	2	2.25	21.4	2	2	11.8
[Medic] instead of increasing the dose may change the drug instead of discussing with me	2	2	16.1	2	2	14.3	3	2	17.6
[Lack of] acceptance as NMP by nurses	1	2	16.1	1	1	7.1	2	2.5	17.6
NMP in clinic is not recognised as not commissioned	3	2	9.7	3	1	7.1	3	2	11.8
Rely on external company to register NMPs, print pads etc... sometimes delays someone being able to prescribe	1	2	6.5	1	2	0	1	2	11.8

Appendix 8.26 Consensus results for facilitator statements, Round Three—grouped by all participants and for each profession.

Round Two results included for comparison (see key): Chapter 4

Key:

Rd 2 = Round Two results	All participants (n=31)	Pharmacist (n=14)	Physiotherapist (n=17)
Rd 3 = Round Three results	All participants (n=20)	Pharmacist (n=10)	Physiotherapist (n=10)

Statement	All participants						Pharmacists						Physiotherapists					
	Median		IQ range		% agreement		Median		IQ range		% agreement		Median		IQ range		% agreement	
	Rd 2	Rd 3	Rd 2	Rd 3	Rd 2	Rd 3	Rd 2	Rd 3	Rd 2	Rd 3	Rd 2	Rd 3	Rd 2	Rd 3	Rd 2	Rd 3	Rd 2	Rd 3
When you see others doing, I think it gives you the confidence to do it yourself	4	4	2	0	67.7	80	4	4	0.25	0	85.7	90	4	4	3	1.25	52.9	70
Nursing and medical staff very open to pharmacist NMP role	4	4.5	2	1.75	67.7	75	5	5	0.25	0	92.9	90	3	4	1	1.5	47.1	60
Ongoing mentorship [supports] CPD [continuing professional development] and keeping up to date with current medication regimes	4	4	2	1.75	64.5	75	3	4	1	1.25	42.9	60	4	5	1	1	82.4	90
[Benefit of] NICE Guidelines	4	4	1	1	67.8	70	3.5	4	1	1	50	60	4	4	1	1.5	82.4	80
Effective personal development reviews	4	4	1	1	64.6	70	3	4	1.25	1	42.9	60	4	4	0	1.25	82.3	80
Joint working / shadowing opportunities with the specialist prescribers or GPs	4	4	2	2	67.7	65	4	4	2.25	1.25	71.5	80	4	3.5	2	3	64.7	50
Supportive pharmacy leadership allowing prescribing without insisting on a second check by pharmacist	4	4	2	2.75	58.1	65	4	4	2	1.5	57.2	80	4	3.5	2	4	58.8	50
My experience working as alongside a consultant/[GP] for many years	4	4	1	1.75	61.3	60	4	4	1.5	1.25	78.5	70	3	3.5	1.5	2.5	47	50
Attendance of MDT [multidisciplinary team] meeting [as] patients are discussed allowing the prescription to be discussed with the team	4	4	2	1.75	61.3	60	4	4	1.25	3	64.3	60	4	4	2	1.25	58.8	60
All patients rated the NMP experience as high and highly value their NMP prescribing as part of their care	4	4	1	1	61.3	55	4	3.5	1	1	57.1	55	4	4	1.5	1.25	64.7	60
Good NMP support group with regular meetings	4	4	1	1	51.7	55	3	3	2	1.25	28.5	40	4	4	2	2	70.6	70
Manager prompting [me] to do the course and plan how to introduce it in the department.	4	4	2	1.75	51.7	55	4	5	2	2	71.2	70	3	3.5	2	1.25	35.3	40
My manager is keen to develop non-medical prescribers within the trust so is supportive of my role and helping me to negotiate a clinic slot again.	4	4	2	2	71	55	4	4	1.25	2.25	78.6	70	4	3	3	2	64.7	40

Evidence base from investigations	4	3.5	1	1	61.3	50	4	3	1	1	57.1	30	4	4	1.5	1.25	64.7	70
As an NMP I have much better knowledge of OTC [over the counter] medication and can advise patients accordingly	4	3.5	2	1	67.7	50	3	3	2.25	1	42.8	10	4	4	1	1	88.2	90
Clinical Lead pushing the project forwards	4	3.5	1	1	58.1	50	4	3.5	1.25	1.25	78.6	50	3	3.5	1	1.75	70.6	50
Having an electronic patient record mean that I can use all patient data available to base my prescribing upon	4	3	2	2	51.6	45	3	3	2	1.25	42.9	30	4	4	2	2	58.9	60
We are well supported with NMP training opportunities, including 2 full in-house training days a year	3	3	2	1.75	48.4	45	3	3	2	2	35.7	40	4	3.5	1.5	1.5	58.8	50
Process for registering, getting prescription pads etc... in place	3	3	1	1	45.2	30	3	3	2.25	1	28.5	30	4	3	1	1.25	58.8	30
Prescribing regularly in primary care, a most advantageous skill	3	3	2	1	35.5	30	3	3	1.25	0	14.2	10	4	3.5	1.5	2	52.9	50
Medical colleagues informed by my frequent prescribing habits and have begun prescribing common drugs I often start a patient on	3	3	2	2	29	30	3	3	2	1.25	28.6	20	3	3.5	2.5	2	29.4	40

Appendix 8.27 Consensus results for barrier statements, Round Three—grouped by all participants and for each profession.

Round Two results included for comparison (see key): Chapter 4

Key:

Rd 2 = Round Two results	All participants (n=31)	Pharmacist (n=14)	Physiotherapist (n=17)
Rd 3 = Round Three results	All participants (n=20)	Pharmacist (n=10)	Physiotherapist (n=10)

Statement	All participants						Pharmacists						Physiotherapists					
	Median		IQ range		% agreement		Median		IQ range		% agreement		Median		IQ range		% agreement	
	Rd 2	Rd 3	Rd 2	Rd 3	Rd 2	Rd 3	Rd 2	Rd 3	Rd 2	Rd 3	Rd 2	Rd 3	Rd 2	Rd 3	Rd 2	Rd 3	Rd 2	Rd 3
My confidence. I do sometimes doubt my abilities and worry a great deal about the legal/professional implications of making an incorrect decision	4	4	2	2	67.8	60	4	4	2	2	57.1	70	4	3.5	0.5	2	76.4	50
Skills learnt during NMP course cannot be put into practice until [professional] registration which took 2 months	4	4	3	2	51.6	60	2.5	3.5	2.25	2.5	42.9	50	4	4	3	1.5	58.8	70
Lack of time to prescribe as core/clinical duties take priority	4	4	3	3	54.8	60	4	4.5	3	1.5	64.3	80	3	2.5	2	2.25	47	40
Lacking confidence as it is a new skill and not enough exposure	4	3	2	2	51.6	45	2	3	3	2.25	42.8	40	4	3.5	2	2.25	76.4	50
Lack of allotted time resulting from new management role	3	3	3	1.75	32.3	45	3.5	4	2	1.25	50	80	3	2.5	2	2	17.6	10
Variable access to patient records. I would not be happy to prescribe when I did not have access to patient record with up to date medication/allergies etc.	3	3	4	3	45.1	45	2	4.5	3.25	2.25	35.7	60	4	3	3	2.25	52.9	30
Unable to prescribe [certain drugs] and have to ask a [doctor] to do this	3	3	3	2	45.2	40	2	2	1.25	1.25	7.1	0	4	4	1.5	1.25	76.5	80
Lack of diagnostic skills makes primary prescribing more difficult	3	3	3	2.75	38.7	40	4	4	2	1.5	57.2	70	2	2	2.5	2	23.5	10
[Lack of time] time available for prescribing activities. Facilitating attendance on ward round to allow full patient history and inpatient episode history	3	3	3	2.75	32.3	40	4	4	2	3	57.1	60	2	3	2	3	11.8	20
I am starting a new service, without much peer/managerial support to set it up	3	3	2	2	32.3	35	2	2.5	2.25	2	28.5	40	3	3	2.5	2	35.3	30
Starting a new speciality with new medicines to learn about	3	3	3	2.75	32.3	35	3	3.5	2	2.25	35.7	50	3	3	3	2.25	29.4	20
Lack of communication from university following course completion	2	2.5	3	2	32.3	35	2	2	1.5	3	21.4	40	3	3	3	2.25	41.2	30
[Lack of] time to specialise	2	2	2	3	32.3	35	2	2.5	2	3	28.6	40	3	2	2.5	3	35.3	30
Nurses are cheaper	3	3	3	2.75	38.7	30	4	3	2.25	2.5	57.1	40	2	2.5	2.5	2.25	23.5	20
Nurse led clinic introducing nurse prescribers so no need for other prescribers	3	3	3	2.75	32.3	30	3.5	3.5	2	2.25	50	50	2	2	2	2	17.7	10

Lack of access to ongoing development out of Trust	2	2	2	2	29	30	3	2	1.25	2.25	21.4	30	2	2	2.5	2.25	35.3	30
Lack of immediate medical advice/support	2	2	2	2	19.3	30	2	2	2	0.5	14.2	20	2	2	2.5	3	23.5	40
[Lack of] a defined reason to prescribe	2	2	2	3	16.1	30	2	2	2.25	3	21.4	40	2	2	2	2.25	11.8	20
Poor integration between the community team and the hospital team	3	3	2	1.5	32.2	25	3	3	3	2.5	28.6	30	3	3	1.5	0.75	35.2	20
Lack of clinic rooms	2	3	3	1.75	32.3	25	3.5	3	3.25	2.25	50	40	2	2	2	1.25	17.6	10
Lack of medical cover at times means I cannot prescribe opioids	3	3	3	2.75	32.3	25	1	2	2	2	7.1	10	4	3	3	1.75	52.9	40
Lack of organisational funding	2	2	2	1.75	22.6	25	2	2	1.25	2	14.2	30	3	2	3	2.25	29.4	20
The department is not very supportive within the context of expanding my role and utilising the practical aspects of my prescribing such as patient examination	2	2	1	2.75	22.6	25	2	2	1.25	2.25	21.4	20	2	2	2.5	3	23.6	30
New ways of working from joining new team	3	3	2	1	38.7	20	3	3	2	1.25	42.9	30	3	3	3	2	35.3	10
Limitations of [legal] prescribing guidelines [with a disparity between practitioner roles]	3	3	3	1.75	29	15	1.5	2	1	2	7.1	0	3	3	2	2.5	47	30
Cost of professional indemnity	2	2	3	1	25.9	20	2.5	2.5	2.25	2	35.7	40	2	2	1.5	1	17.8	0
NMP role not well established for [my profession]	2	2	3	1	32.3	20	2	2	2	2	14.3	10	3	2	2.5	2	47	30
The availability of a pharmacist to clinically screen the prescriptions	2	2	3	1.75	25.9	20	2	3	2.25	2.25	42.9	40	2	2	1.5	1	11.8	0
A lack of clinicians wanting to share their skills	2	2	2	1.75	22.6	20	2	2	2.25	1.25	21.4	10	2	2.5	2.5	3	23.5	30
[My] prescribing not reviewed by pharmacists in the same way as medic or other NMPs prescribing	2	2	2	1.75	19.4	20	2	2	2.25	3	21.4	30	2	2	2	1	17.7	10
Colleagues may feel prescribing should only occur after all the usual duties have been completed	2	2	2	1.75	16.1	20	3	2.5	2.25	2.25	35.7	40	2	2	2	2	0	0
[Unable to prescribe certain drugs and have to use] supplementary prescribing, [which] requires a slight change to the pathway of the team and doctors need to be educated	2	2	3	2	29.1	20	1	1.5	1.25	1.25	7.1	10	3	2	3	3.25	47.1	30
Lack of training structure within the department[/workplace]	3	2.5	2	1	42	15	3	3	1.25	1.25	21.4	20	4	2	2	2	58.8	10
I have no other IP [independent prescriber] to chat things through with quickly & easily	1	1	1	1	19.3	15	1	1	1	1	7.1	10	2	2	3	2.25	29.4	20
Professional indemnity is a challenge to acquire - need updated JD [job description] and employer slow to produce	3	2.5	2	1.75	22.6	10	2	2	2.25	2	21.4	10	3	3	1.5	1.25	23.6	10
Lack of pharmacology exposure during undergraduate training	2	2	2	2	19.3	10	1	1.5	1	2	0	0	3	2	3	1.5	35.3	20
Sometimes junior clinicians feel an NMP is prescribing because their own prescribing is inadequate	3	2	2	2	16.1	10	1.5	2	2.25	2.25	21.4	20	3	2.5	1.5	2	11.8	0

Appendix 8.28 Published paper: Chapter 5

Graham-Clarke *et al.*
BMC Health Services Research (2022) 22:223
<https://doi.org/10.1186/s12913-022-07559-5>

BMC Health Services Research

RESEARCH

Open Access



Exploring the barriers and facilitators to non-medical prescribing experienced by pharmacists and physiotherapists, using focus groups

Emma Graham-Clarke^{1*} , Alison Rushton² and John Marriott¹

Abstract

Background: Non-medical prescribing (NMP) was introduced into the United Kingdom to enhance patient care and improve access to medicines. Early research indicated that not all non-medical prescribers utilised their qualification. A systematic review described 15 factors influencing NMP implementation. Findings from a recent linked Delphi study with independent physiotherapist and pharmacist prescribers achieved consensus for 1 barrier and 28 facilitators. However, item ranking differed for pharmacist and physiotherapist groups, suggesting facilitators and barriers to NMP differ depending on profession. The aim of this study was to further explore the lived experiences of NMP by pharmacists and physiotherapists.

Method: Study design and analytical approach were guided by Interpretative Phenomenology Analysis principles. Focus groups (November and December 2020) used the 'Zoom[®]' virtual platform with pharmacist and physiotherapist prescribers. Each focus group followed a topic guide, developed a priori based on the Delphi study results, and was audio recorded digitally. Transcripts underwent thematic analysis and data were visualised using a concept map and sunburst graph, and a table of illustrative quotes produced. Research trustworthiness was enhanced through critical discussion of the topic guide and study findings by the research group and by author reflexivity. The study is reported in line with COREQ guidelines.

Results: Participants comprised three physiotherapists and seven pharmacists. Five themes were identified. The most frequently mentioned theme was 'Staff', and the subtheme 'Clinical team', describing the working relationship between participants and team members. The other themes were 'Self', 'Governance', 'Practical aspects' and 'Patient care'. Important inter-dependencies were described between themes and subthemes, for example between 'Governance' and 'Quality and Safety'. Differences were highlighted between the professions, some relating to the way each profession practises (for example decision making), others to the way the prescribing role had been established (for example administration support).

Conclusions: The key finding of collaborative working with the clinical team emphasises its impact on successful implementation of NMP. Themes may be inter-dependent, and inter-profession differences were identified.

*Correspondence:

¹ School of Pharmacy, Institute of Clinical Sciences, College of Medical and Dental Sciences, University of Birmingham, Birmingham, UK
Full list of author information is available at the end of the article



© The Author(s) 2022. **Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>. The Creative Commons Public Domain Dedication waiver (<http://creativecommons.org/publicdomain/zero/1.0/>) applies to the data made available in this article, unless otherwise stated in a credit line to the data.

Specifically designed prescribing roles were beneficial for participants. For full NMP benefits to be realised all aspects of such roles must be fully scoped, before recruiting or training non-medical prescribers.

Keywords: Barriers, Facilitators, Pharmacist, Physiotherapist, Prescribing

Background

Non-medical prescribing (NMP) was introduced into the United Kingdom (UK) to enhance patient care and improve access to medicines [1]. Initially this enabled district nurses and health visitors to prescribe from a limited formulary [2] but in 1999, following the second Crown Report, the concept of independent and supplementary prescribing for nurses and other healthcare professionals was introduced [3]. Since then, the number of professions with independent prescribing rights has gradually increased and now includes nursing, optometry, pharmacy, podiatry, physiotherapy, paramedics and therapeutic radiography [4]. Demand exists for other professions to gain independent prescribing rights, with the Health Foundation commenting that until physician associates are able to prescribe independently, they will be limited in their activities [5]. Since the introduction of NMP, the UK National Health Service (NHS) has experienced increased patient demand, workforce shortage pressures, and funding shortfalls, driving policy emphasis to provision of streamlined care for patients, with NMP playing a pivotal role [6–8]. For example, prescribing physiotherapists, the first point of contact for many patients with musculoskeletal problems, are able to provide the complete treatment course without referral to other healthcare professionals [7, 9, 10]. A further example is that of pharmacists involved in the care of long term conditions [11]. These plans will be hindered if qualified non-medical prescribers are deterred, for whatever reason, from utilising their skills. Earlier research indicated that approximately 25% of Allied Health Professionals, qualified as prescribers, may not use this skill in comparison to 10% of qualified prescribing nurses [12, 13]. Establishing factors that facilitate or prevent NMP and investigating if these are generic to different NMP professions, or are professional, situational or person specific will aid NMP development.

A previous systematic review described 15 factors or themes that had the potential to influence the implementation of prescribing by non-medical professions [14]. It was noted that the majority of the included studies focused on prescribing by nurses, with the remainder addressing prescribing by pharmacists. The four most common themes identified included the influence of medical staff, the prescriber's area of competence, the impact on their time and impact on service. No papers were found that reviewed the experiences of any other

NMP profession. It is unclear whether or not the factors that affect prescribing by nurses and pharmacists are also experienced by other non-medical prescribing professions, or if they experience different factors.

To investigate this further a three round Delphi study investigating facilitators and barriers to independent non-medical prescribing was conducted with qualified independent prescribers from an established prescribing profession (pharmacy) and a newer, and relatively unexamined, prescribing profession (physiotherapy) [15]. The two professions were chosen as they have similar numbers of registrants in the UK (approximately 56,000), may work as individuals or in teams, and may work in all healthcare sectors [16, 17]. They differ in the length of time that each profession has had prescribing rights, with pharmacy gaining independent prescribing rights six years earlier than physiotherapy [18, 19]. Consensus was gained for 1 barrier and 28 facilitators, however, item ranking orders differed for the pharmacist and physiotherapist groups. This suggested that the facilitators and barriers to NMP differ depending on profession. However, it was possible that the differences arose from chance and did not accurately reflect experiences.

This paper presents the results of focus groups to further investigate the findings of the Delphi study, to explore if the findings reflected the experiences of pharmacist and physiotherapist prescribers, or if additional factors affecting implementation of NMP were also present. This would indicate how generalisable the Delphi study findings are to the wider pharmacist and physiotherapist prescribing populations.

Aim

To further explore the lived experiences of non-medical prescribing by pharmacists and physiotherapists.

Method

Research team and reflexivity

EGC, JM and AR developed the study protocol and topic guide and EGC conducted the focus groups. EGC is a doctoral student, researching influences affecting NMP utilisation and inter-professional differences. The research question was prompted by her activity as an independent pharmacist prescriber, and her role as NMP lead for an acute NHS Trust in the Midlands. Her researcher standpoint is balanced by the other two researchers, neither of whom is a prescriber, but who

have extensive research experience and represent the pharmacy and physiotherapy professions.

EGC acted as the contact point for participants during recruitment. Participants were made aware of the background to the research via the participant information sheet, issued at the time of recruitment, and this information was reinforced at the start of each focus group.

Study design

The study design and analytical approach were guided by the principles of Interpretative Phenomenology Analysis (IPA) [20]. IPA acknowledges that the lived experience of each participant reflects their world view, and that interpretation is affected by the researcher's own experiences. This study sought to understand how non-medical prescribers perceived their practice was affected by outside influences, whether procedural or people. Each participant will have had different formative experiences, shaping their view of NMP, and IPA will aid in interpretation of this, whilst recognising the potential influence of the lead researcher.

Focus groups enable discussion between participants on selected specific topics. The discussion and interaction between the participants allow ideas and views to be developed and refined, and thus provide a deeper understanding of the issues being considered [21, 22]. There is also the potential for unanticipated ideas to be expressed, supporting further understanding of the research topic [22]. Research indicates that 80% of ideas are generated within the first two or three focus groups, and these comprise the most frequently mentioned themes [23, 24]. Furthermore, Hennink describes focussed research questions requiring fewer focus groups to generate ideas than research questions where the issues are unknown [25]. A pragmatic approach to the groups was adopted, balancing available resources and the level of information anticipated from the closely defined topic guide [25]. Two focus groups were planned, using the 'Zoom®' virtual platform (Zoom.us), hosted by the University of

Birmingham. Each group was led by a moderator (EGC) and the conversation was audio recorded digitally, using the virtual platform record feature, and handwritten fieldnotes were taken. Each focus group followed a similar format of introduction, main discussion and closing stage, and followed an a priori developed topic guide [21, 26–28]. The topic guide was drafted by EGC, using the previous Delphi results as a guide, and debated within the research group to ensure that the guide was clear, followed a logical progression and was appropriate for the aim of the study (Additional File 1). The topics chosen were those where there were apparent differences in the Delphi results between the professions when reviewing the ranked statements by profession. The discussion was summarised after each topic and at the end of each focus group, enabling participants to comment and correct any misinterpretation.

Choice of setting

Focus groups are conventionally run face to face, using a location suitable for researchers and participants. However, to reduce transmission of Covid-19, people were advised to physically distance themselves, to meet outdoors rather than inside and to wear face masks [29], making physical meetings difficult to conduct. Virtual focus groups have been previously reported, with researchers using a variety of techniques such as message boards and video conferencing, with cost of equipment (e.g., webcams) and programmes listed as potential disadvantages [30, 31]. The restrictions imposed to limit the spread of Covid-19 accelerated the widespread adoption of virtual meeting platforms such as Zoom® for both work and social uses. Indeed, many participants in this study described the benefits of online meetings, indicating that many of the earlier challenges with virtual platforms, such as equipment availability, had been overcome. Table 1 lists potential advantages and disadvantages of physical (under Covid-19 restrictions) and virtual meetings. The

Table 1 Comparison of physical and virtual meetings for focus groups

	Physical meeting, under Covid-19 restrictions	Virtual meeting
Advantages	<ul style="list-style-type: none"> ● No special equipment required e.g., cameras ● Conversation and discussion can flow easily ● No specialist knowledge (e.g., computer literacy) required 	<ul style="list-style-type: none"> ● No travel required; participants may be able to join who would otherwise be time restricted ● Virtual platform includes record function ● Face masks may not be required, dependent on participant's location ● Participants can join from any suitable location
Disadvantages	<ul style="list-style-type: none"> ● Large room required to enable social distancing ● Face masks need to be worn, hiding facial expressions ● Recording equipment required ● Travel, and travel time, required to attend meeting location 	<ul style="list-style-type: none"> ● Only one person can speak at once, potentially stilted conversation ● Depends on internet connectivity ● Requires computer or smartphone or similar, with audio and camera ● Participants required to have basic computer literacy

assessment was made that, with the ongoing pandemic associated restrictions, the virtual platform was the most appropriate technique to enable the focus groups to be conducted.

Participants and recruitment

Participants for the focus groups included independent prescribing pharmacists or physiotherapists working in primary or secondary care in the West Midlands region. No easily accessible list for pharmacist and physiotherapist independent prescribers was available and therefore participants were recruited indirectly using groups such as the United Kingdom Clinical Pharmacy Association and West Midlands NMP leads. An email, including study details, participant information sheet, screening questionnaire and contact email address, was sent to these groups and recipients were requested to forward the email to potential participants.

The number of qualified independent pharmacist and physiotherapist prescribers in the West Midlands region is unknown, as this information is recorded by individual healthcare providers, and not centrally. Therefore, the intention was to recruit 10 prescribing pharmacists and 10 prescribing physiotherapists, allowing for non-attendees, but providing sufficient participants for a meaningful discussion [21, 25, 32]. The literature on focus groups recommends a group size of 6 to 8 participants, with recommendations to over recruit by approximately 20% in case of non-attendance [21, 25, 32]. Participants were required to have obtained their prescribing qualification since the beginning of 2013 (when physiotherapists gained independent prescribing rights [19]), and the final selection was guided by the sample matrix in Table 2.

Participants were asked to sign and return a consent form, including consent to record the focus group, prior to the focus group being conducted. Recruitment was closed in October 2020.

Ethical considerations

Ethical approval for the study was obtained from the University of Birmingham's Science, Technology, Engineering and Mathematics Ethical Review Committee (ERN_19-1900) and all data were held securely in accordance with university policy. Participation was voluntary and participants were free to withdraw at any time, however they were made aware that if they had already participated in the discussion, then it would not be possible to remove their contribution. All participants gave written consent, including for digital audio recording, prior to the focus group. All recordings were transcribed verbatim and anonymised to ensure that participants, locations, or other identifiable information were removed, and participants were assigned an identification code.

Data analysis

Digital transcripts of each conversation were produced by the virtual platform, and these were checked for accuracy, corrected, and verified by EGC. This process required repeated listening to the recording, hence ensuring all information was captured accurately, and permitting immersion in the data. Following transcription, data were imported into NVivo® 12 (QSR International) for thematic analysis [21, 33, 34]. The transcript for Focus Group One was read and reread to identify emergent themes and patterns, and coded line by line, with new codes created as themes emerged. The process was repeated for Focus Group Two, with further themes added as they emerged. Coding was an iterative process, with repeat reviewing of the coded data to ensure consistency and initial thoughts on the findings recorded using the NVivo memo function. Finally, the themes were reviewed and consolidated where appropriate. A codebook was produced to support the coding process. Data was visualised using a concept map of the major and minor themes and interdependencies, and a sunburst graph which depicted the frequency that themes were mentioned. Quotations illustrating each theme were presented as a table (Table 4). The initial coding was done by EGC, and the themes and hierarchy were discussed critically by the research team.

The study is reported in accordance with the COREQ statement (Additional file 2) [35].

Results

Eighteen participants initially expressed an interest in participating in the focus groups. The recruitment window was extended, and further invitation emails sent to encourage further interest in participation, but the response remained low. The decision was taken to conduct the focus groups with the existing pool of potential

Table 2 Target sample matrix for focus group participants

Criteria	Pharmacist	Physiotherapist	Years of professional practice	
Profession	10	10	≤5	0-5
Length of time qualified as a prescriber:			6-10	0-5
≥ 12 months	1-6	1-6	11-15	0-5
< 12 months	1-6	1-6	16-20	0-5
Main practice area:			>21	0-5
Primary Care	1-6	1-6		
Secondary care	1-6	1-6		

participants, rather than risk a high dropout rate as participants were called to care for Covid-19 patients. Even with this approach, five potential participants who had previously expressed an interest failed to respond to the focus groups emails. A further three participants were excluded: two were ineligible, and dates were unsuitable for one, leaving ten participants. Three participants participated in Focus Group One and seven participated in Focus Group Two. Brief demographic data are included in Table 3. Focus Group One was held on 23 November 2020 in the evening and Focus Group Two on 3 December 2020 during the day, each lasting just over one hour.

Initial coding was reviewed by EGC by reading the results for each node coded and the matrix tool in NVivo utilised to check that coding was appropriate. A concept map of themes was derived by EGC following coding of the transcripts, and the map and derived themes were debated by EGC, AR and JM to ensure they reflected participants views. After further discussion, the hierarchy and concept map were re-drawn to reflect the lived experiences of the participants more accurately. For example the original hierarchy did not contain a 'self' theme and hence 'personal competence' was grouped under 'governance' instead. However, as this quote highlights, 'personal competence' is derived from the participant's views and feelings, not externally driven:

'...as long as it's, it's, something that, you know, you feel comfortable within your competence, because I think that's where sometimes, some of my colleagues have got more experience in sexual health, whereas I haven't so it might be something that I'll say 'I'm not comfortable. I would refer you to this service'..'
FG1-P2

Obsolete or duplicate codes were also removed, for example the original codebook included an 'advisory role'

code, but on review the 'team role' code was deemed to be more appropriate.

Thematic analysis identified five themes each comprising several subthemes. Figure 1 depicts the themes as a sunburst chart. The size of each segment reflects the number of references to the item, and hence the relative importance of the topic to the participants. The inner ring contains the themes, with subthemes radiating out.

Figure 2 is a concept map depicting the hierarchy and interrelationships between themes and subthemes. Table 4 lists the themes and sub themes, their code book descriptions, and illustrative quotes from the participants.

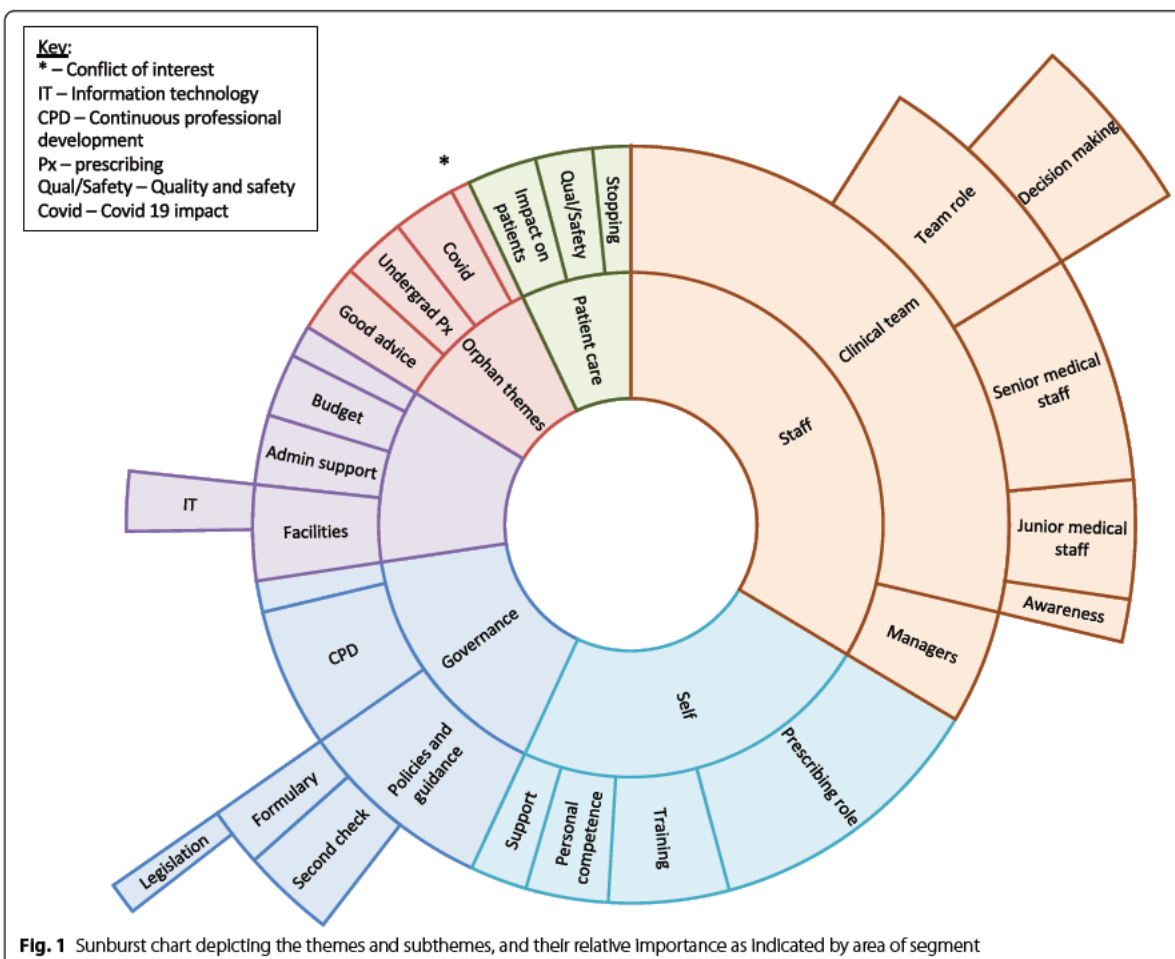
The five themes identified were 'Staff', 'Self', 'Governance', 'Practical aspects' and 'Patient care'. Some subthemes did not fall easily under any of these themes, rather they linked disparate themes or subthemes, and are described as orphan themes. These were 'Conflict of interest', 'Covid', 'Undergraduate prescribing', and 'Good advice'.

Staff

This was the most frequently mentioned theme, particularly in relation to the clinical team but also to managers. The theme described the relationship between participants and senior and junior medical staff as well as other team members. Differences were highlighted in interactions between participants and senior or junior medical staff. The role within the clinical team was described and who lead on decision making. A lack of awareness of non-medical prescribing was identified by some, mainly physiotherapist, participants. Managers who prescribed were more supportive compared with non-prescribing managers, who may be unaware of prescribing governance issues. The 'Managers' subtheme linked to 'Training' and 'CPD' through the provision of funding and time.

Table 3 Brief participant demographic data

Participant ID	Profession	Practice area	Years qualified in profession	Active prescriber	Focus Group
FG1-P1	Pharmacist	Ward, secondary care	16–20	Yes	One
FG1-P2	Pharmacist	Clinic, secondary care	16–20	Yes	One
FG1-P3	Pharmacist	Ward, secondary care	6–10	Yes	One
FG2-P1	Physiotherapist	Clinic, primary care	16–20	Yes	Two
FG2-P2	Pharmacist	Clinic, secondary care	6–10	Yes	Two
FG2-P3	Physiotherapist	Ward, secondary care	16–20	No, temporarily stopped	Two
FG2-P4	Pharmacist	Ward, secondary care	16–20	Yes	Two
FG2-P5	Physiotherapist	Clinic, primary care	> 21	Yes	Two
FG2-P6	Pharmacist	Clinic, secondary care	11–15	Yes	Two
FG2-P7	Pharmacist	Ward, secondary care	11–15	No, never prescribed	Two



Self

This was the second most important theme, describing the participants' practice. It encompassed the role prescribing took within their job and, for some, the challenges associated with incorporating this into their existing role, as well as prescribing within their personal competence, and support they gained from others, such as the clinical team. The theme highlighted training aspects including access to, and skills gained on, the course. The 'Prescribing role' subtheme linked to the 'Stopping' subtheme as part of 'Patient care'.

Governance

This theme incorporates aspects such as policies and guidelines supporting NMP, organisation NMP registers, formulary and continuing professional development (CPD). Participants highlighted other policies affecting their practice, including accountability for patient care, which may influence senior medical approach to

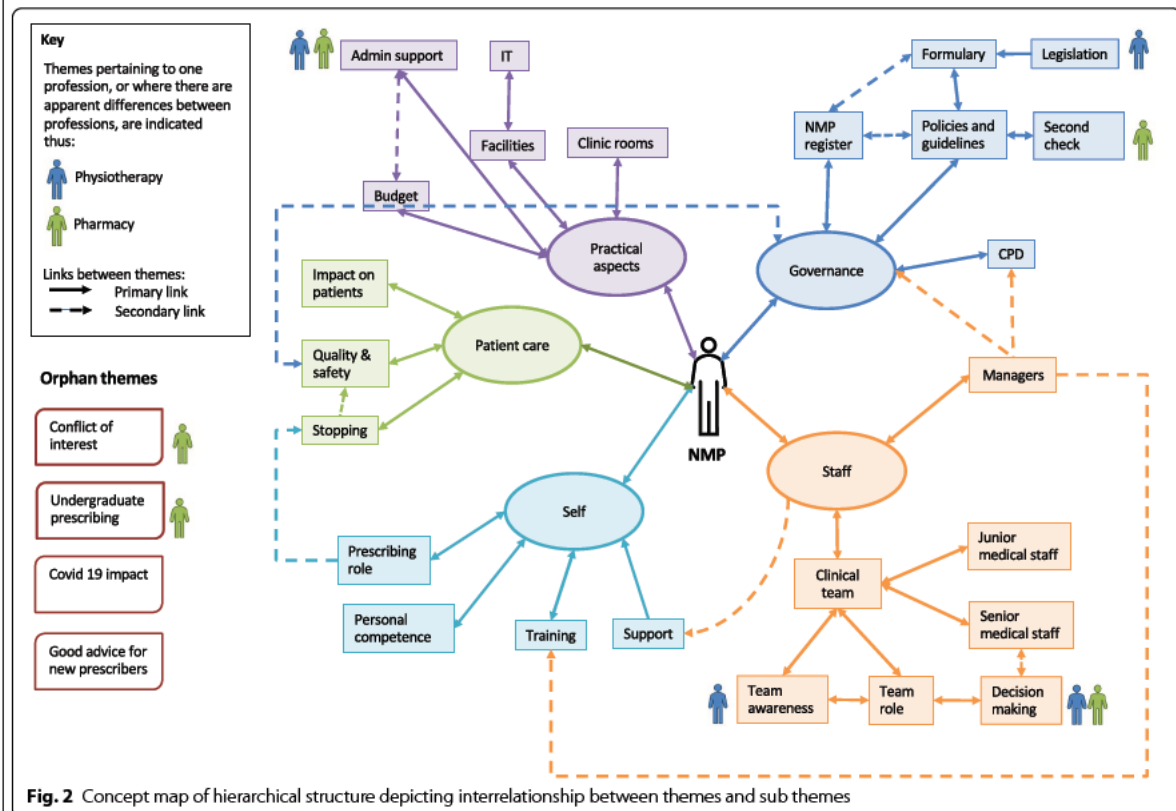
non-medical prescribing. Two minor subthemes were identified, which were profession specific: 'Legislation' affecting physiotherapists and 'Second check' affecting pharmacists.

Practical aspects

This theme incorporates those resources required to undertake prescribing, such as access to clinic rooms, information technology, appropriate budget and administrative support. Administration time was built into the roles for physiotherapist participants, whereas pharmacist participants described a lack of provision for administration time.

Patient care

This theme incorporates aspects of patient care including the impact on patients by ensuring prescriptions were appropriate and completed in a timely manner. Other benefits included improvements in quality and safety for



example by stopping inappropriate medication and having sufficient clinic time to check adherence. 'Quality and safety' linked with 'Governance'.

Orphan themes

Two of these themes were only mentioned by pharmacist participants and they were 'Conflict of interest' and 'Undergraduate prescribing'. Several participants highlighted the impact the Covid-19 pandemic had on their practice and the final theme collated the advice the participants would give to new prescribers.

Discussion

This study enabled an in-depth investigation of issues affecting pharmacist and physiotherapist non-medical prescribers. Participants' lived experiences supported further exploration of the findings from a Delphi study [15]. Five themes, describing the experiences of the participants were identified.

Themes

The theme of "Staff" reflected the previous Delphi findings whereby the clinical team (medical, nursing

and peer support) accounted for approximately 40% of factors affecting NMP achieving consensus [15], and further confirming the role of medical professionals and colleagues in supporting NMP, identified in the preceding review [14]. This is unsurprising as all participants described working collaboratively to share the patient caseload, within a multidisciplinary team usually led by a medical professional. Traditionally senior medical staff were accountable for the patient's care, and team members had closely defined roles. More latterly the move has been towards advanced practice in the non-medical professions, to develop a flexible workforce that is able to adopt innovative ways of working. This was described in the 2017 draft workforce strategy, which highlighted the increasing demand on the NHS, and the limited number of clinicians to provide care [36], and which built on earlier work such as developing primary care services [9, 37]. In addition, NMP courses require the trainee to complete a period of practice-based training supervised by an experienced prescriber. Until recently all regulatory bodies required this trainer to be a member of the medical profession, fostering closer links between

Table 4 Code book description of themes and sub themes, with illustrative quotes

Name	Description/Code book entry	Illustrative quotes
Staff Clinical team	Overarching theme bringing all staff related themes together Prescribing within, or supported by, multidisciplinary team. Degree of integration into the team. Team or autonomous working	<p>"I say that because I work in a really small MDT and I, and I work with consultants that because we're such a small team it's all first name terms, we can easily kind of have a dialogue and get hold of each other..." FG1-P2</p> <p>"I think, for us being able to prescribe has kind of made me more part of the medical team. Yeah, because they kind of see me as more similar to them. So, they've sort of accepted me a little bit more, if that makes sense?" FG2-P3</p> <p>"I sometimes feel like I'm not fully part of any one team because I sort of dip in and out of different teams;" FG2-P4</p> <p>"Um, for me, because we mostly work on our own and autonomously, a lot of the decisions fall with just myself with prescribing unless there is an issue, and then I would refer, would ask for advice from our specialist that we have meetings with every week." FG2-P1</p> <p>"... so it is actually taking a lot of workload out of that system for the junior staff particularly so they can focus on things I can't do like bloods..." FG1-P3</p> <p>"I think the junior medics appreciate having a specific point of call. I, like, during the day I get often get bleeps and queries from all over the hospital about oh I've got this patient on this and we want to switch them to this for discharge." FG2-P2</p> <p>"... the junior doctors accept that it's normal to have an ACP, and they prescribe, and it's normal that they're from a variety of backgrounds, because that's what they've been exposed to." FG2-P3</p> <p>"The only thing I was gonna say is some of the consultants, particularly those when they're sort of new to having an ACP around still feel that they are responsible and accountable for what you do." FG2-P3</p> <p>"I think there is a shift now of um understanding as sort of more junior consultants have come through. Um, it's fine now, but I think this is, I mean, this has been happening over several years now. Now it's, it's much more accepted that physios don't just do exercises or patting on the back, (laughs)" FG2-P1</p> <p>"And I think the consultants probably work with me in a slightly different way. They tend to ask if they've got more complex queries or areas where there's less evidence for kind of my interpretation of it, and that tends to be more of a discussion" FG2-P2</p> <p>"But as for junior doctors, I'm not even sure if they know that I'm a prescriber because I suppose I don't go around saying 'I'm a prescriber.'" FG2-P4</p> <p>"... my, my colleagues, that I've been working with for many years, have gone through that process with me because obviously they've been my supervisors and stuff, so, um yeah, it's kind of more the not, not the inexperienced but the ones that haven't been part of the team that are unaware of that." FG2-P5</p>
Junior medical staff	Working relationships with junior medical staff. Impact on junior medical staff workload. Potential for deskilling junior medical staff by prescribing. NMP teaching junior medical staff	
Senior medical staff	Working relationships with senior medical staff. Building trust between NMP and consultants. Constructive discussions with senior medical staff. Consultant concern regarding accountability	
Team awareness	Team awareness of prescribing role, or lack of awareness	

Table 4 (continued)

Name	Description/Code book entry	Illustrative quotes
Team role	NMP role within the team. Includes team interest in prescribing or lack of, and the effect on the NMP workload and role. Also, is the team in a better position to prescribe than NMP or are NMP's non-prescribing skills utilised more than prescribing	<p>"I feel like I'm very much part of the team and they recognize my area of expertise and things like that (nods from FG2-P6). So, I think I feel like we work like well together. And it's, it's a really good job. I wouldn't want to give it to someone else!" FG2-P2</p> <p>"So, I work with consultants, with clinical specialist nurses as well and psychologists. ... So, you know, I don't think it's imperative for my role that I needed to, I need to prescribe. I need to have an understanding, though, of the, of the drugs because I work with, you know, other members that can prescribe. I suppose my skills are elsewhere." FG2-P5</p>
Decision making	Who makes the initial prescribing decision—NMP or medical team? Does the NMP make full use of their taught skills or not? Outcome dependant on role within the team, and medical staff attitude	<p>"I sometimes feel amongst, that certainly some of the doctor teams, I work with, it's, it feels the opposite, and they very much want to palm off work. ... So, I haven't left on time for a long time ... a large part of that is because I'm constantly being stopped by nurses that now know I'm a prescriber and want me to write things up." FG1-P3</p> <p>"So, I think they're finding it useful to have like an extra prescriber who's physically there, who can, if he says, 'I want to increase this dose', I can physically do the writing of that on the chart. Yes, I think, I mean in psychiatry it's usually the consultant who makes a decision about which medication to use, but they're quite open to discussion about that and tweaking things." FG2-P4</p> <p>"The thought I want to throw in is do you, do you sometimes feel though as if you are... do you feel sometimes you just seen as the person just doing the writing of the prescription rather than doing the decision making of the prescription or, or is that ... is that accepted now so that we can make the full decision process?" FG1-P1</p> <p>"No, I'd say, I don't really find that find that I feel like I'm just kind of writing out some-body else instructions, either, so, any new antiretroviral it's always a very sort of team led decision." FG1-P2</p>
Managers	Impact on NMP. Support for NMP and NMP role and understanding of NMP role. Differences highlighted between prescribing and non-prescribing managers. Links with 'CPD', 'Training' and 'Governance' themes	<p>"... my line manager is, had completed the prescribing course before me. So was very well versed in what it involved and what it could, how it could enhance my role and then has put me in a, in a position to use it in a really effective way." FG1-P3</p> <p>"Yeah, I was gonna say so my line manager is nonclinical. They are from management background, so they have no real understanding of the role when they started. So, it was an explanation of the role and what it meant. Um, so they have quite limited understanding about the issues that might be involved." FG2-P3</p> <p>"... because often like quite a few people have said your actual line manager doesn't have an understanding of what you might be doing clinically or the risks you might be taking." FG2-P2</p> <p>"So, the new one, I think she's just happy that she's got a prescriber, because I was a first pharmacist prescriber in the team. ... she's always kind of offering me out to people, and 'oh, FG2-P4 can come and do some clinics'. But I think it's, I don't know if she understands the logistics and sort of how it'd be." FG2-P4</p>
Self	Overarching theme containing themes relating to the NMP themselves, their views and practice	

Table 4 (continued)

Name	Description/Code book entry	Illustrative quotes
Personal competence	Personal competence around prescribing. When they refer on to someone else and which areas the NMP is comfortable to prescribe in	<p>"Okay, yeah, I would just say I suppose know what your specialist area is, it's not that you can't ever prescribe off your, your limited formulary. But know what your limits are because I think I know people go, oh I've got to get a doctor to need to sign this, can you just sign this and you think well no, that's not what I'm here to do." FG2-P4</p> <p>"I just want to say I don't always necessarily agree with the prescribing of the consultants So, I tend to, I wouldn't prescribe that myself and I wouldn't rewrite that because then it's got my signature on it. I'll certainly prescribe what I'm happy with prescribing." FG2-P4</p> <p>"... some of my colleagues have got more experience in sexual health, whereas I haven't so it might be something that I'll say 'I'm not comfortable. I would refer you to this service'." FG1-P2</p> <p>"... but I've never thought as a prescriber that I've ever been given that allocation of time to make sure that, you know, you can function in the role when you're doing clinics." FG2-P6</p> <p>"I think it's probably easier, like my role was a new role and the expectation from the medical side was that this person would prescribe, whereas I think it's maybe slightly harder if you've got an existing role and then do it, because then you need to create the time to do it and some other part of your job has to go somewhere or to someone else, ... " FG2-P2</p> <p>"So, you know, I don't think it's imperative for my role that I needed to, I need to prescribe." FG2-P5</p> <p>"you know, we've taken on that role and, er, and, particularly sort of with more some more clinical competencies coming along we're properly taking on newer roles' um, but we need to make sure that, then the sort of traditional roles are either filled or taken up" FG1-P1</p> <p>"... so I asked to have a professional kind of supervisor in a way, that I could go to if there were any issues and to make sure that I sort of safety netted myself..." FG2-P3</p> <p>"... so if I see a patient that's more complex or slightly unusual, that doesn't fit the usual pattern, then I can just catch him between patients or if it's less urgent I'll discuss that patient with him at the end of the clinic." FG2-P2</p>
Prescribing Role	Role that prescribing plays within the job. Whether or not prescribing is an essential part of role. For existing jobs, who covers aspects of the existing role. Blurring, or clarity, between NMP and professional role aspects. Links with 'Stopping' theme	
Support	Who, or when, to ask for help. Support from different areas and people. Use of networks for support. Links with 'Staff' theme	

Table 4 (continued)

Name	Description/Code book entry	Illustrative quotes
Training	Ease of access to training course, or challenges. Personal development during the training course. Medical supervisor support and change in working relationship resulting from the course. Benefit of an area of expertise when undergoing the course	<p>"And it comes with a whole host of other skills, isn't it, that you're learning as well. It's about, you know, your history taking, examination skills and a whole host of other skills as well" FG1-P2</p> <p>"...my line manager has supported me in terms of the prescribing, are quite happy for me to go on the course..." FG2-P7</p> <p>"The, the course itself really enhanced my practice because although it was an absolutely mission, getting the hours in around full time work ... I really do think it helped me hugely because the um so spending time one on one with consultants in their clinics, for example. ... I think they then saw me as more of an integrated member of the team." FG1-P3</p> <p>So, so that, yeah, that took a little while to actually get the agreement for the, for the for the funding to, to do that, because they couldn't just quite understand what the purpose of it is, yeah." FG1-P1</p>
Governance	Overarching theme which incorporates aspects such as policies and guidance, formulary, legislation etc. Certain aspects have cross links with other themes, for example 'CPD' links with 'Managers'	
CPD	Support to attend CPD, including provision of time and funding. Availability of CPD within work environment and outside. Self-directed or directed by manager/organisation. Benefits of web-based meetings and conferences	<p>"If it's something that costs money, then it can be a bit more difficult to arrange" FG2-P2</p> <p>"I book my own diary. Um so I if I need to do CPD, I can just build it in but also, I can attend the monthly non-medical prescribing meetings that we have at our trust, which also has an element of CPD as part of the meetings...." FG2-P1</p> <p>"In fact, this, this Covid's been a wonder, because I can actually get to all these webinars, instead of having to go to stuff" FG1-P3</p> <p>"... we have a monthly pharmacists clinical supervision meeting and also the monthly NMP supervision meeting so there's various things that built in that you can do CPD but obviously you can go off and do more reading and things in your own time as well" FG2-P4</p> <p>"I think I've signed a form but I'm really not quite sure what actually happened with it." FG1-P1</p> <p>"Um, yeah, I think it's just that attitude in Trusts that NMPs have to jump through many hoops, don't they, and they have to, once you're qualified, you can't just start prescribing, you have to then go to a committee to be stamped, and they have to prove evidence of things." FG2-P4</p> <p>"We've got a non-medical prescribing policy, haven't we, but it seems quite a vague in its limitations." FG1-P3</p> <p>"So, I think our, our, I guess, policy and things are quite clear that you, you have like an allocated clinical supervisor, as such, and you should be meeting them like once or twice a year to kind of check in..." FG2-P2</p> <p>"And I had to give a list of a maximum of 10 drugs I could prescribe..." FG2-P3</p> <p>"Have your small, very small personal formulary and build up so that you're prescribing really well, just a small handful of drugs to begin with and then slowly expand it." FG2-P1</p>
NMP register	Ease of registering as an NMP with organisation. Maintenance of registration. Amending register entry	
Policies and guidance	Policies and guidelines relating to NMP: the clarity and value of them, or absence of them. The support given by them	
Formulary	Personal or organisation formulary affecting NMP role	

Table 4 (continued)

Name	Description/Code book entry	Illustrative quotes
Legislation	Effect of legislation on prescribing, particularly affecting physiotherapists	"...the main sort of medications you would have used, we weren't able to as physio's, um so, your gabapentin, obviously, and pregabalin's changed, codeine we weren't, we weren't able to, so co-codamol we weren't able to prescribe." FG2-P5
Second check	Value of second check by a pharmacist when prescribing. Mentioned by pharmacist prescribers within the context of safety	"I think, I think, I think it's probably both true, isn't it, because FG1-P2 you've got a very, very specialist role and, and so have, I and we can both, our prescriptions will go and be checked by somebody else...." FG1-P1 "...in reality, a lot of TTOs don't come through pharmacy, a lot of them are nurse lead TTOs, so I am, I then become the technician, pharmacist and pharmacist prescriber for that patient. I'm the only pharmacist contact, pharmacy contact, that that patient sees or gets and I'm prescribing as part of that role, which probably opens me up to some risk of error in terms of not getting a second check." FG1-P3
Practical aspects	Overarching theme which incorporates aspects such as access to clinic rooms, budget, availability of administrative support. Allocated time to complete NMP associated administration	
Admin support		"...like some weeks I might do three clinic sessions, which then generates a significant amount of after clinic work but there's no, there's not the recognition that you also need time to do that work." FG2-P2 "I do a mixture of home visits and clinics and we have as much admin time as we need really." FG2-P1
Budget	For post and equipment. Source of budget – single or multiple departments	"Because I think, particularly I think in pharmacy, they look to get that financial support from the directorates that they're prescribing for rather than just coming out of the pharmacy budget." FG2-P6 "...I've had to sort of justify why I need a laptop, why I need a mobile phone, why I need headset and camera..... my role is jointly funded by pharmacy and the ID directorate as well so it's the barrier I find sometimes is, is well which budget is it going to come from." FG1-P2
Clinic rooms	Access to, and availability of, clinic rooms	"In our trust, clinic rooms are at a premium. They are really struggling for space and that has been one of, one of the barriers...." FG2-P7
Facilities	Access to facilities needed for prescribing. Includes drug charts, notes etc	"Still on paper. So sometimes it's just physically getting hold of the flaming drug chart." FG1-P3 "we have a very clear process in the trust, I get my pads from a....lockable drawer from a named person, everything's secure where I work, so I've got no problems." FG2-P1
IT	Access to IT. Integration, or lack of, across areas. Issues using IT	"...the IT infrastructure in our place is just, it's just woeful...." FG1-P3 "we also share in, in our trust, it's community and acute services, and I have access to the electronic patient record that's used in the hospital, which I can also add records on, if I'm managing a patient that's also managed by the respiratory consultant, so we've got a really seamless um patient record...." FG2-P1
Patient care	Overarching theme exploring the use of NMP in patient care	

Table 4 (continued)

Name	Description/Code book entry	Illustrative quotes
Impact on patients	Direct or indirect impact on patients and patient care	<p>"... make sure it's happening in a time efficient manner, so patients are, you know, getting the prescriptions when they need because, particularly with the home care prescriptions as you have to work a month ahead." FG1-P2</p> <p>"For me, it's definitely reduced the time to treat, so before we'd have to write, request from GPs to prescribe inhalers or, urgent medications, whereas now writing a script in the patient's home, it's just so much quicker." FG2-P1</p>
Quality & Safety	NMP improving quality and safety of prescribed medicines for the patient. Links to 'Governance' theme	<p>"I guess for the inpatient side, um, when I do more of that, I guess more of patients are more likely to be started on the appropriate anticoagulation, at the right dose, etc." FG2-P2</p> <p>"I suppose, and I probably said this, I think the probably the influence I have on the consultants is their, is their you know, assessing the use of their pain meds now, and is that appropriate. whereas consultants, if that's been their practice for years and years and years, it, you know, it wouldn't, er wouldn't change unless it was challenged and I think we've got a good environment now that we can, we can have those discussions. And I think we bring a more balanced view possibly (nods from FG2-P4)." FG2-P5</p> <p>"And also, that they get the medication they need stopping, stopped a lot quicker (nods from FG2-P4, FG2-P5 and FG2-P6)." FG2-P3</p> <p>"... we do more deprescribing now so I'm using it a lot less and when I do use it, it's more to give advice to GPs on how to maybe rationalize medication more than anything." FG2-P5</p>
Stopping	Function as NMP to stop medication/refer back to main prescriber/GP	<p>"... they don't want to push the case too hard, because they also want additional consultants, and they feel if they're saying I can do it than that weakens their case. So, it's almost like a conflict of interest there at the moment." FG2-P7</p> <p>"But I suppose, even, even with herself, there is a conflict of interest because if I'm off prescribing that's time taken away from delivering our service which she needs to manage." FG2-P7</p>
Orphan themes	These themes do not fall easily under one overarching theme. They may cross link to several other themes or stand alone	<p>"... they don't want to push the case too hard, because they also want additional consultants, and they feel if they're saying I can do it than that weakens their case. So, it's almost like a conflict of interest there at the moment." FG2-P7</p>
Conflict of interest	Theme highlighting conflicts of interest identified by participants	<p>"But I suppose, even, even with herself, there is a conflict of interest because if I'm off prescribing that's time taken away from delivering our service which she needs to manage." FG2-P7</p>
Covid	Impact that Covid-19 pandemic has had on NMP and /or their prescribing practice	<p>"... particularly with Covid that aspect of the service has become more and more NMP led. I think at one point I was actually the only prescriber prescribing for that group of patients." FG1-P2</p> <p>"my most recent experience was during Covid and being redeployed to wards for a couple of, well it was eight weeks, and you know generally junior medical staff did receive the prescribing well" FG1-P2</p>
Good advice	What advice would the participants give new or prospective non-medical prescribers	<p>"I would say you need to have decided with your organization where you're going to use it before you do the course, because otherwise you end up kind of stuck in limbo maybe without either the time or a role to use it." FG2-P2</p> <p>"I think it's really important that it's not just an additional duty that you take on as part of your role, have a dedicated area, have that time, time carved out so you can actually carry out that role." FG2-P6</p> <p>"Don't be afraid to ask for help. You're independent, but you're not alone." FG1-P3</p>

Table 4 (continued)

Name	Description/Code book entry	Illustrative quotes
Undergrad Px	Prescribing taught at undergraduate level. Preparedness of new prescribers to take on role. Impact on rest of service	<p>"...I share both your concerns, that I think at the moment the undergrads coming out too green to be independently prescribing and what we've already discussed about being not just the prescriber in, on paper, but actually it changes your role and becoming far more embedded into your team." FG1-P3</p> <p>"...having undergrads coming out as prescribers, from a trust point of view, they're just going to be really expensive junior doctors, aren't they?" FG1-P3</p> <p>"...I think that when you've got a lot of junior people applying for jobs and you always say 'Where do you see yourself in five years'; and they always say they want to do the prescribing course and you think, well, who's going to be left just to do the day job, if everybody sees themselves as a prescriber..." FG2-P4</p> <p>"...they're not really taught an awful lot about medications, never mind prescribing at undergraduate level so I think that's got a long way to come." FG2-P1</p>
ACP advanced clinical practitioner, CPD continuing professional development, GP general practitioner, IT information technology, MDT multidisciplinary team, NMP non-medical prescriber, TTO 'to take out' – discharge medication		

trainer and trainee, which many participants commented on.

The “Self” theme, accounting for approximately a quarter of all references, focused on the “Prescribing role”; the role that prescribing had within the participant’s job and whether prescribing was integral to that role. All prescribers are required to prescribe within their scope of practice and the prescriber’s role implicitly defines that scope, together with guidance from regulatory and professional bodies [38–40]. Some pharmacist prescribers described challenges when prescribing had been added into their existing role, implying that for this group, the potential impact of prescribing had not been fully considered.

The “Practical aspects” and “Governance” themes together highlighted the importance of ensuring adequate facilities for the prescriber, and a strong governance framework to support their prescribing practice. Covid-19 was found to affect some prescribers, either by altering how they practice, or by temporary changes to their role, as found by the “Covid-19” theme. However, changes brought about by the Covid-19 pandemic also appeared in the “CPD” theme, with many participants describing online conferences and meetings becoming routine practice; enabling participation by a wider audience.

The relatively limited number of references to patient care may be considered surprising when compared with the Delphi study, where the top ranked statement concerned the effectiveness and benefits of prescribing for patients [15]. However, this finding partially reflects the different research methods, with Delphi seeking consensus whereas focus groups enable deeper exploration of lived experiences of the participants. It also reflects the topics chosen for discussion, which were those where there were areas of potential disagreement between the two prescribing professions, and hence patient care was a subsidiary aspect of the discussion.

Inter-dependencies

The previous review exploring barriers and facilitators to non-medical prescribing identified that many of the factors involved were inter-dependent [14]. The experiences of the participants in this study supported this finding, with the important secondary co-dependencies depicted in Fig. 2. The “Quality and safety” theme was interdependent with all aspects of the “Governance” theme, resulting in improved care for patients. For example, participant FG2-P5 described constructive discussions with senior medical staff, informed by policies and guidance, resulting in team-wide changes in prescribing practice and improved patient care. For pharmacy managers, there was an implicit conflict between service delivery

and governance, inferred by the “Second check” theme. Pharmacists are experts in medicines [41]; clinically screening prescriptions, the so called ‘second check’, to ensure appropriateness for the patient. Pharmacy managers are required to maintain the governance structure surrounding medicines supply, within a limited staffing establishment, and this can result not only in limiting time for pharmacist prescribing, but also difficulty in providing the second check. Evidence indicates that pharmacist prescribers make fewer errors than medical staff [42], but pharmacist participants perceived that they had been left without an important safety net. Further co-dependencies described by participants included the impact on senior medical staff of policies regarding patient accountability, with concern by some senior medical staff that they were accountable for the non-medical prescriber’s actions. This lack of clarity regarding accountability was identified in the previous review [14]. The prescribing competency framework for all prescribers states that the prescriber is accountable for their prescribing decisions [39], however if a policy regarding patient accountability states that the consultant is responsible for the actions of their entire team, then this could result in confusion.

Inter-professional differences

Differences were highlighted between professions, many of which could be anticipated from the way in which each profession traditionally works. For physiotherapists, prescribing forms another treatment option when caring for patients, fitting in to existing roles such as in musculoskeletal clinics [43], whilst also supporting the development of new roles based on existing skills [10]. For the secondary care pharmacist participants, prescribing in many instances was in addition to their existing role, without due consideration to restructuring job plans to allow sufficient time. Consequently, physiotherapist participants felt well-supported for administration time, whereas for the pharmacist participants, unless expressly included in their job plan, administration time was a source of stress. Similarly, pharmacist participants, used to working in a team, described a team approach to decision making, compared with physiotherapists, used to planning treatment courses for patients, who were more inclined to make their own decisions.

For the physiotherapist participants, the choice of medicines that they can prescribe is limited by their professional scope of practice and legislation [38, 44], compared with pharmacists who can prescribe any medication, except certain drugs for the treatment of addiction [45, 46]. For the physiotherapists, probable changes in controlled drug legislation have the potential to influence how advanced practice roles develop, particularly if physiotherapists continue to have restricted access to

controlled drugs [47]. One physiotherapist participant described the constraints imposed by controlled drug legislation in chronic pain management, but commented that current guidance was moving away from drug treatment and hence expanding the choice of controlled drugs physiotherapists could prescribe may have limited impact in their case [47, 48].

Physiotherapist participants were more likely to describe lack of awareness of physiotherapist prescribing by the clinical team, than pharmacist participants. This reflects both the relatively short time span in which physiotherapists have had prescribing rights (independent prescribing rights since 2013) and the small numbers registered as prescribers (1017 independent prescribers in 2019) [17, 19]. In comparison, pharmacists gained independent prescribing rights in 2006, with 8077 independent prescribers on the register in 2019 [49, 50].

Planned changes in pharmacist pre-registration training, including at undergraduate level, will result in newly registered pharmacists registering as independent prescribers [51]. Pharmacist participants expressed concerns about this development, including detraction from training aspects and potential exacerbation of prescribing errors, as previously identified with junior medical staff [52]. The participants placed their views in the context of their own prescribing training, highlighting the struggle that less experienced pharmacists had with the course, and commenting that routine pharmacy work still needed addressing. However, the development is in line with the Carter report and draft workforce strategy, which both envisaged a clinical pharmacy workforce, with pharmacy technicians adopting some of the traditional pharmacist roles [36, 53]. The concerns expressed by pharmacist participants regarding time pressures to complete their tasks suggest that advanced pharmacy technician roles, which would release pharmacist time for prescribing, have still to be adopted.

Trustworthiness of the data is supported by the approach to analysis. Full, in-depth discussion of the findings by all authors, with challenge of the derived themes to ensure that they reflected the participants experiences was undertaken. The differences in background and experiences of the research team composition ensured that EGC's longstanding prescribing experience in critical care, and possible preconceptions, were counterbalanced by the other team members, who were non-prescribers but clinicians in both physiotherapy and pharmaceutical fields. Data saturation was achieved, with the themes and main subthemes identified by each focus group and profession. This is supported by the answers to the final question regarding advice to new prescribers, added as a positive end note to each session. No new ideas were articulated but participants emphasised the need for a

prescribing role, ensuring facilities were in place beforehand, asking for advice and not being pressurised to prescribe medication that they deemed outside their personal competence.

Strengths and limitations

The study allowed in-depth discussion of issues affecting pharmacist and physiotherapist prescribers, with ideas developed by the participants throughout the discussion. Participants drew on their experiences to describe issues affecting them, allowing a greater understanding of the background and contributory factors. As the themes were derived directly from these lived experiences, they acquired content and face validity.

The virtual platform, with choice of dates and times, allowed participants to join who may otherwise have been unable to because of constraints such as work commitments.

The Covid-19 pandemic limited recruitment: in particular fewer physiotherapist participants were recruited than planned. However, findings appeared unaffected with no new themes emerging from the second focus group. This supports the assertion that data saturation was achieved for the major themes identified.

It is acknowledged that recruitment may have been enhanced by widening the geographical catchment area. However, it was possible that some of the variation seen in the previous Delphi results [15] may have arisen from the wide range of practice and geographic areas in which participants were employed. Therefore a deliberate decision was made to limit recruitment to pharmacist and physiotherapist prescribers working in the NHS West Midlands area (either primary or secondary care), to reduce the risk of introducing variability into the findings.

Conclusion

The key finding from this study related to the theme of collaborative working with the clinical team; emphasising the impact this has on successful implementation of NMP. When their role was specifically designed to include prescribing, this was a benefit for pharmacist participants. Multiple factors contribute to the themes of governance, practical aspects and patients, and each factor is important for successful implementation of NMP. Crucially, the identified themes and subthemes cannot be considered in isolation but are inter-dependent on each other.

Differences between the professions were illustrated from the analysis, most reflecting the way each profession practises and, for pharmacists, the way that prescribing has been introduced into their role. For the pharmacists, managers need to address the skill mix to enable pharmacist prescribers to practise with support.

To ensure NMP is fully enabled, all aspects must be fully scoped before recruiting or training a non-medical prescriber. Failure to do so may limit full utilisation of prescribing skills and result in a poorly motivated workforce.

Abbreviations

CPD: Continuing professional development; IPA: Interpretative Phenomenology Analysis; NHS: National Health Service; NMP: Non-medical prescribing; UK: United Kingdom.

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12913-022-07559-5>.

Additional file 1. Focus group topic guide.

Additional file 2. Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist.

Acknowledgements

Not applicable

Authors' contributions

EGC conceived the protocol, conducted the study, analysed the data, wrote the first draft, and edited the manuscript. JM and AR conceived the protocol, reviewed the data analysis, and edited the manuscript. The author(s) read and approved the final manuscript.

Funding

The author(s) received no specific funding for this work.

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

Ethical approval for the study was obtained from the University of Birmingham's Science, Technology, Engineering and Mathematics Ethical Review Committee (ERN_19-1900). All methods were carried out in accordance with the relevant guidance and regulations. All participants gave written informed consent, including for digital audio recording, prior to commencement of the focus group.

Consent for publication

Not applicable.

Competing interests

The author(s) declare(s) that they have no competing interests.

Author details

¹School of Pharmacy, Institute of Clinical Sciences, College of Medical and Dental Sciences, University of Birmingham, Birmingham, UK. ²School of Physical Therapy, Western University, London, Canada.

Received: 7 August 2021 Accepted: 24 January 2022
Published online: 18 February 2022

References

- Department of Health. Improving Patients' Access to Medicines: A Guide to Implementing Nurse and Pharmacist Independent Prescribing within the NHS in England. Leeds: Department of Health; 2006.
- Department of Health and Social Security. Neighbourhood nursing: a focus for care. (The Cumberlege Report). London: HMSO; 1986.
- Department of Health. Review of prescribing, supply and administration of medicines. Final report (Crown II Report). London: The Stationery Office; 1999. (http://webarchive.nationalarchives.gov.uk/20130105143320/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4077153.pdf).
- Non-medical prescribing [<https://bnf.nice.org.uk/guidance/non-medical-prescribing.html>]
- The Health Foundation. Staffing matters; funding counts. London: The Health Foundation; 2016. (<http://www.health.org.uk/sites/health/files/StaffingMattersFundingCounts.pdf>).
- NHS England. Five Year Forward View. London: The Stationery Office; 2014. (<https://www.england.nhs.uk/wp-content/uploads/2014/10/5yfv-web.pdf>).
- NHS Wales. A Planned Primary Care Workforce for Wales: Approach and development actions to be taken in support of the plan for a primary care service in Wales up to 2018. Cardiff: Welsh Assembly; 2015.
- Graham-Clarke E, Rushton A, Noblet T, Marriott J. Non-medical prescribing in the United Kingdom National Health Service: A systematic policy review. *PLoS ONE*. 2019;14(7):e0214630.
- Health Education England. The future of primary care: Creating teams for tomorrow. London: Health Education England; 2015. (<https://www.hee.nhs.uk/sites/default/files/documents/The%20Future%20of%20Primary%20Care%20report.pdf>).
- Health Education England, NHS England, Skills for Health. Musculoskeletal core capabilities framework for first point of contact practitioners. London: Health Education England; 2018. (<https://www.skillsforhealth.org.uk/news/latest-news/item/689-new-musculoskeletal-core-capabilities-framework>).
- Royal Pharmaceutical Society. Improving care for people with Long Term Conditions. London: Royal Pharmaceutical Society; 2016. p. 20 (<https://www.rpharms.com/Portals/0/RPS%20document%20library/Open%20access/Policy/LTC%20-%20England.pdf>).
- Latter S, Blenkinsopp A, Smith A, Chapman S, Tinelli M, Gerard K, Little P, Celino N, Granby T, Nicholls P. Evaluation of nurse and pharmacist independent prescribing. University of Southampton; Keele University; 2010: 374. Available from: <https://eprints.soton.ac.uk/184777/3/ENPIFullreport.pdf>.
- Courtenay M, Carey N, Stenner K. An overview of non medical prescribing across one strategic health authority: a questionnaire survey. *BMC Health Serv Res*. 2012;12:138.
- Graham-Clarke E, Rushton A, Noblet T, Marriott J. Facilitators and barriers to non-medical prescribing – A systematic review and thematic synthesis. *PLoS ONE*. 2018;13(4):e0196471.
- Graham-Clarke E, Rushton A, Marriott J. A Delphi study to explore and gain consensus regarding the most important barriers and facilitators affecting physiotherapist and pharmacist non-medical prescribing. *PLoS ONE*. 2021;16(2):e0246273.
- General Pharmaceutical Council. Council Meeting. London: General Pharmaceutical Council; 2019. (<https://www.pharmacyregulation.org/sites/default/files/document/gphc-council-meeting-papers-01-02-2019.pdf>).
- Number of registrants with prescribing rights - August 2019 [<https://www.hcpc-uk.org/resources/freedom-of-information-requests/2019/number-of-registrants-with-prescribing-rights-august-2019/>]
- The National Health Service (Miscellaneous Amendments Relating to Independent Prescribing) Regulations 2006, Stat. 913. London: The Stationery Office; 2006.
- The Human Medicines (Amendment) Regulations 2013, Stat. 1855 London: The Stationery Office; 2013.
- Peat G, Rodriguez A, Smith J. Interpretive phenomenological analysis applied to healthcare research. *Evid Based Nurs*. 2019;22(1):7–9.
- Finch H, Lewis J, Turley C. Focus Groups. In: Ritchie J, Lewis J, Nicholls CM, Ormston R, editors. *Qualitative Research Practice*. 2nd ed. London: Sage Publications Ltd; 2014. p. 211–42.
- Hennink MM. Introduction to focus group research. In: *International Focus Group Research: A Handbook for the Health and Social Sciences*. Cambridge: Cambridge University Press; 2007. p. 1–17 (<https://www.cambridge.org/core/books/international-focus-group-research/introduction-to-focus-group-research/CE2C6D772805302A6A522DB57EB3CF6f>).

23. Hennink MM, Kaiser BN, Weber MB. What Influences Saturation? Estimating Sample Sizes in Focus Group Research. *Qual Health Res*. 2019;29(10):1483–96.
24. Guest G, Namey E, McKenna K. How Many Focus Groups Are Enough? Building an Evidence Base for Nonprobability Sample Sizes. *Field Methods*. 2017;29(1):3–22.
25. Hennink MM. Number of groups and group size. In: *International Focus Group Research: A Handbook for the Health and Social Sciences*. Cambridge: Cambridge University Press; 2007. p. 135–51 (<https://www.cambridge.org/core/books/international-focus-group-research/number-of-groups-and-group-size/B1AF4CD1C4FFC1E76ED55B1240AD82C4>).
26. Hennink MM. Conducting the group discussion. In: *International Focus Group Research: A Handbook for the Health and Social Sciences*. Cambridge: Cambridge University Press; 2007. p. 165–92 (<https://www.cambridge.org/core/books/international-focus-group-research/conducting-the-group-discussion/626BE4ACD9373F43DAE93180A015488D>).
27. Ritchie J, Spencer L. Qualitative data analysis for applied policy research. In: *Analyzing Qualitative Data*. edn 1. Edited by Bryman A, Burgess RG. Taylor & Francis Books Ltd; 1994. p. 173–94.
28. Arthur S, Mitchell M, Lewis J, Nicholls CM. Designing fieldwork. In: Ritchie J, Lewis J, Nicholls CM, Ormston R, editors. *Qualitative Research Practice*. 2nd ed. London: Sage Publications Ltd; 2014. p. 147–76.
29. Coronavirus disease (COVID-19) advice for the public [<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public>].
30. Rupert DJ, Poehlman JA, Hayes JJ, Ray SE, Moultrie RR. Virtual Versus In-Person Focus Groups: Comparison of Costs, Recruitment, and Participant Logistics. *J Med Internet Res*. 2017;19(3):e80–e80.
31. Hill JC, Patterson C. Assessment from a Distance: A Case Study Implementing Focus Groups at an Online Library. *Coll Undergrad Lib*. 2013;20(3–4):399–413.
32. Onwuegbuzie AJ, Dickinson WB, Leech NL, Zoran AG. A Qualitative Framework for Collecting and Analyzing Data in Focus Group Research. *Int J Qual Methods*. 2009;8(3):1–21.
33. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol*. 2006;3(2):77–101.
34. Vaismoradi M, Turunen H, Bondas T. Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. *Nurs Health Sci*. 2013;15(3):1442–2018.
35. Tong A, Sainsbury P, Craig JC. Consolidated criteria for reporting qualitative research (COREQ): A 32-item checklist for interviews and focus groups. *Int J Qual Health Care*. 2007;19(6):349–57.
36. Public Health England. Facing the Facts, Shaping the Future: A draft health and care workforce strategy for England to 2027. London: Public Health England; 2017.
37. NHS Wales. Our Plan for Primary Care in Wales up to March 2018. Cardiff: Welsh Assembly; 2014.
38. Practice Guidance for Physiotherapist Supplementary and/or Independent Prescribers (4th Edition) [https://www.csp.org.uk/system/files/publication_files/PD026_PracticeGuidancePrescribing_4thEd_2018.pdf].
39. Royal Pharmaceutical Society. A competency framework for all prescribers. London: Royal Pharmaceutical Society; 2016. (<https://www.rpharms.com/resources/frameworks/prescribers-competency-framework>).
40. General Pharmaceutical Council. In practice: Guidance for pharmacist prescribers. London: General Pharmaceutical Council; 2019. (<https://www.pharmacyregulation.org/sites/default/files/document/in-practice-guidance-for-pharmacist-prescribers-february-2020.pdf>).
41. What does a pharmacist do? [<https://www.pharmacyregulation.org/raising-concerns/raising-concerns-about-pharmacy-professional/what-expect-your-pharmacy/what-does-0>].
42. Baqir W, Crehan O, Murray R, Campbell D, Copeland R. Pharmacist prescribing within a UK NHS hospital trust: nature and extent of prescribing, and prevalence of errors. *Eur J Hosp Pharm-Sci Pract*. 2015;22(2):79–82.
43. Department of Health. The Musculoskeletal Services Framework - A joint responsibility: doing it differently. London: The Stationery Office; 2006. (http://webarchive.nationalarchives.gov.uk/20130124073659/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@env/documents/digitalasset/dh_4138412.pdf).
44. The Misuse of Drugs (Amendment) (No. 2) (England, Wales and Scotland) Regulations 2015, Stat. 891. London: The Stationery Office; 2015.
45. The Misuse of Drugs (Amendment No. 2) (England, Wales and Scotland) Regulations 2012, Stat. 973. London: The Stationery Office; 2012.
46. The Human Medicines Regulations 2012, Stat. 1916. London: The Stationery Office; 2012.
47. England NHS. Consultation on proposed amendments to the list of controlled drugs that physiotherapists can independently prescribe across the United Kingdom. Leeds: NHS England; 2020.
48. Chronic pain (primary and secondary) in over 16s: assessment of all chronic pain and management of chronic primary pain [<https://www.nice.org.uk/guidance/ng193>].
49. Enventure Research. Survey of registered pharmacy professionals 2019. London: General Pharmaceutical Council; 2019. (<https://www.pharmacyregulation.org/about-us/research/gphc-survey-registered-pharmacy-professionals-2019>).
50. The Medicines for Human Use (Prescribing) (Miscellaneous Amendments) Order 2006, Stat. 915. London: The Stationery Office; 2006.
51. General Pharmaceutical Council. Standards for the initial education and training of pharmacists. London: General Pharmaceutical Council; 2021. (<https://www.pharmacyregulation.org/sites/default/files/document/standards-for-the-initial-education-and-training-of-pharmacists-january-2021.pdf>).
52. Dornan T, Ashcroft D, Heathfield H, Lewis P, Miles J, Taylor D, Tully M, Wass V. An in depth investigation into causes of prescribing errors by foundation trainees in relation to their medical education. EQUIP study - final report. London: General Medical Council; 2009. (https://www.gmc-uk.org/-/media/documents/final-report-prevalence-and-causes-of-prescribing-errors_pdf-28935150.pdf).
53. Lord Carter of Coles. Operational productivity and performance in English NHS acute hospitals: Unwarranted variations. London: The Stationery Office; 2016. (<https://www.gov.uk/government/publications/productivity-in-nhs-hospitals>).

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Ready to submit your research? Choose BMC and benefit from:

- fast, convenient online submission
- thorough peer review by experienced researchers in your field
- rapid publication on acceptance
- support for research data, including large and complex data types
- gold Open Access which fosters wider collaboration and increased citations
- maximum visibility for your research: over 100M website views per year

At BMC, research is always in progress.

Learn more biomedcentral.com/submissions



Appendix 8.29 BMCHSR, Response to reviewers: Chapter 5

No.	Editor and reviewer's Comments	Line numbers in amended manuscript	Authors Response
1	133 -134 What informed the choice of 2 FGDs? Is this consistent with norms related to ensuring data saturation? Will conducting just 2 FGDs ensure data saturation?	136 et seq	We have added the following to the study design section: 'Research indicates that 80% of ideas are generated within the first two or three focus groups, and these comprise the most frequently mentioned themes [246, 247]. Furthermore, Hennink describes focussed research questions requiring fewer focus groups to generate ideas than research questions where the issues are unknown [248]. A pragmatic approach to the groups was adopted, balancing available resources and the level of information anticipated from the closely defined topic guide.'
2	180 Data about the number of participants in the 2 FGDs is inconsistent with the findings presented. Only 10 participants were reported to have participated in the FGDs. Authors should clarify this inconsistency.	Table 2 234 et seq	We have amended the caption for Table 2 to indicate that this was the target sample matrix. We have added the following to the results section to clarify the numbers: 'Eighteen participants initially expressed an interest in participating in the focus groups. The recruitment window was extended, and further invitation emails sent to encourage further interest in participation, but the response remained low. The decision was taken to conduct the focus groups with the existing pool of potential participants, rather than risk a high dropout rate as participants were called to care for Covid-19 patients. Even with this approach, five potential participants who had previously expressed an interest failed to respond to the focus groups emails. A further three participants were excluded: two were ineligible, and dates were unsuitable for one, leaving ten participants. Three participants participated in Focus Group One and seven participated in Focus Group Two.'
3	284 -285 Authors stated that participants' lived experiences supported further exploration of the findings from the Delphi study but the details regarding this lived experiences and how these shaped their responses during the FGDs were scanty. Authors should	259 et seq 486 et seq	Please see the amended section in response to comment 5 We have also amended this paragraph in 'strengths and limitations' The study allowed in-depth discussion of issues affecting pharmacist and physiotherapist prescribers, with ideas developed by the participants throughout the discussion. Participants drew on their experiences to describe issues affecting them, allowing a greater understanding of the background and

	provide sufficient details in the revised manuscript to show how this was achieved.		contributory factors. <i>As the themes were derived directly from these lived experiences, they acquired content and face validity.</i>
4	The actual citation of direct participants' quote from the transcript of the FGDs was not done anywhere in the manuscript, especially in the result section. Relevant direct quotes should be included to buttress the discussion of the study results and its implication for practice.	Table 4	We have moved additional file 2 (now Table 4) into the main body of the text. This table contains both the code book description for each theme and subtheme, and direct quotes from the participants to illustrate each theme/sub theme.
5	399 – 401 Authors stated that “Trustworthiness of the data is supported by the approach to analysis, with full discussion of the findings by all authors, and challenging of the derived themes to ensure they reflected the participants experiences” However, this was not evident in the details provided in the result section. This should be addressed in the revised manuscript.	259 et seq	<p>We have added this to the results section:</p> <p><i>‘Initial coding was reviewed by EGC by reading the results for each node coded and the matrix tool in NVivo utilised to check that coding was appropriate. A concept map of themes was derived by EGC following coding of the transcripts, and the map and derived themes were debated by EGC, AR and JM to ensure they reflected participants views. After further discussion, the hierarchy and concept map were re-drawn to reflect the lived experiences of the participants more accurately. For example the original hierarchy did not contain a ‘self’ theme and hence ‘personal competence’ was grouped under ‘governance’ instead. However, as this quote highlights, ‘personal competence’ is derived from the participant’s views and feelings, not externally driven:</i></p> <p><i>‘...as long as it's, it's, something that, you know, you feel comfortable within your competence, because I think that's where sometimes, some of my colleagues have got more experience in sexual health, whereas I haven't so it might be something that I'll say ‘I'm not comfortable. I would refer you to this service’...’ FG1-P2</i></p> <p>Obsolete or duplicate codes were also removed, for example the original codebook included an ‘advisory role’ code, but on review the ‘team role’ code was deemed to be more appropriate.’</p>
6	401 -404 Author stated that “The research team composition ensured that EGC’s longstanding prescribing experience in critical care, and possible preconceptions, were counterbalanced by the other team members who were non-prescribers but clinicians in their own spheres”. However, the details regarding	463 et seq	<p>Please see the amended section in response to comment 5.</p> <p>In addition, we have amended the following in the discussion section:</p> <p>‘Trustworthiness of the data is supported by the approach to analysis. Full, <i>in-depth</i> discussion of the findings by all authors, <i>with</i> challenge of the derived themes to ensure <i>that</i> they reflected the participants experiences <i>was undertaken</i>. The differences in background and experiences of the research</p>

	the procedure used to achieve this is missing in the manuscript? Where are details regarding this? What specific theme or sub-theme were challenged? And how was this resolved?		team composition ensured that EGC's longstanding prescribing experience in critical care, and possible preconceptions, were counterbalanced by the other team members, who were non-prescribers but clinicians in both physiotherapy and pharmaceutical fields. '
7	404 -405 Authors stated that "Data saturation was achieved, with the themes and main sub-themes identified by each focus group and profession". However, the manuscript lacked the details regarding how this was achieved. Data saturation is linked with the number of FGDs and the number of FGDs done in this study is certainly inconsistent with the standard number of FGDs required for data saturation. Authors should clarify this.		Please see the response to comments 1 and 8
8	418 – 420 The details provided in the limitation section is scanty, inadequate and does not acknowledge the inherent gaps in the methodology adopted. Only one limitation was mentioned in the limitation section. This should be addressed in the revised manuscript.	495 et seq	We have expanded this section: 'The Covid-19 pandemic limited recruitment: in particular fewer physiotherapist participants were recruited than planned. However , findings appeared unaffected with no new themes emerging from the second focus group. This supports the assertion that data saturation was achieved for the major themes identified. It is acknowledged that recruitment may have been enhanced by widening the geographical catchment area. However, it was possible that some of the variation seen in the previous Delphi results may have arisen from the wide range of practice and geographic areas in which participants were employed. Therefore a deliberate decision was made to limit recruitment to pharmacist and physiotherapist prescribers working in the NHS West Midlands area (either primary or secondary care), to reduce the risk of introducing variability into the findings.'
9	Reviewer 1 The work is well presented and of interest to healthcare practitioners. The methodology is clearly described with appropriate conclusions drawn from the results. The abstract is appropriate and the introduction gives an appropriate background to the study.		Thank you for your comments.
10	Reviewer 2	151 et seq	We have added this to the methods section:

	How interview guide was developed and validated? How did you maintain rigor in your research?	486 et seq	<p>“The topics chosen were those where there were apparent differences in the Delphi results between the professions when reviewing the ranked statements by profession.”</p> <p>We have amended the strengths: ‘The study allowed in-depth discussion of issues affecting pharmacist and physiotherapist prescribers, with ideas developed by the participants throughout the discussion. Participants drew on their experiences to describe issues affecting them, allowing a greater understanding of the background and contributory factors. As the themes were derived directly from these lived experiences, they acquired content and face validity.’</p> <p>Please also see the response to comments 5 and 6.</p>
11	Why to loop in physiotherapists for non-medical prescribing? Please elaborate in detail.	87 et seq	<p>We have amended the introduction to elaborate on why these two professions were chosen: “... was conducted with qualified independent prescribers from an established prescribing profession (pharmacy) and a newer, and relatively unexamined, prescribing profession (physiotherapy).”</p> <p>The professions investigated in the FGD were dictated by the prior Delphi study</p>
12	As it is mentioned in the manuscript there is an intention to recruit 10 participants from each healthcare profession, what is the need of this? Why to be predetermined to recruit 10? Is not adding more bias to qualitative research?	174 et seq	<p>The literature advises that there should be over-recruitment to allow for a 20% drop out rate, and that group sizes of 6-8 are generally optimal (with smaller groups finding it difficult to sustain conversation and larger groups making it difficult for all participants to be heard equally. We have expanded this section to clarify this point. Furthermore Hennink [248] states that group sizes of 6 are appropriate when participants have in-depth knowledge of the discussion topic as detailed information on their experiences can be obtained. Smaller groups may also be appropriate if there are few eligible participants.</p> <p>‘The literature on focus groups recommends a group size of 6 to 8 participants, with recommendations to over recruit by approximately 20% in case of non-attendance’</p>

Appendix 8.30 Topic guide: Chapter 5

Focus group topic guide

Preamble/introduction

- Thank participants for logging in
- Introduce moderator role, to conduct the meeting
- The session will be recorded so that the full discussion is captured, do all participants consent to that?
 - As it is audio recorded please only one person speak at a time
- Background to research.
 - Investigation into the utilisation of non-medical prescribing by pharmacists and physiotherapists.
 - Follow on from Delphi study which investigated barriers and facilitators experienced by physiotherapist and pharmacist participants to the utilisation of NMP.
 - 29 statements describing facilitators and barriers to prescribing reached consensus, but there were differences between the professional groups regarding the relative importance of each of these.
 - Focus group aim is to explore these findings in more depth from each profession's perspective (i.e. pharmacist and physiotherapist).
 - Findings will form part of doctoral research thesis by moderator.
 - Intention is to publish results
- Emphasise that it is participants views that are wanted, all opinions are valued and there are no right or wrong answers
- Participants do not have to discuss information that they are uncomfortable with.
- If a serious patient safety issue is disclosed, then confidentiality will be broken so that the information can be reported to the relevant authority (as stated in the PIS).
- Participation is entirely voluntary
- Discussion will remain confidential, and the transcript of the meeting will be anonymised before analysis. Only anonymous quotes will be used in any thesis or publication.

Start recording!

Introductory question

Can everyone introduce themselves, and just say a little bit about **where** they use their prescribing?

Opening topic

Can you say something about/describe how you use NMP?

What impact has it had for you in caring for your patients?

Influence of medics

We'd like to explore your relationships with other staff now

Can you describe your working relationship with medical staff?

Probe – please give an example

Issues may include: senior and junior medical staff, mentor, included in team, isolated

Probe negative and positive comments to see if others have a similar viewpoint

What effect has this relationship had on your practice as an NMP?

Probe – please give an example

Issues may include: mentor, support, encouragement, negativity, blocking, enabling, giving confidence

Probe negative and positive comments to see if others have a similar viewpoint

Is there anything else you wish to add about your working relationships with medical staff?

Moderator to summarise discussion regarding medics

Influence of managers

How about your managers, how would you describe their attitude to NMP?

Probe – please give an example

Issues may include: support for course, support for CPD, support for NMP in general, job plan,

Probe negative and positive comments to see if others have a similar viewpoint

What effect has this relationship had on your practice as an NMP?

Probe – please give an example

Issues may include: support, encouragement, negativity, blocking, enabling

Probe negative and positive comments to see if others have a similar viewpoint

Is there anything else you wish to add about your working relationships with managers?

Moderator to summarise discussion regarding managers

Organisational aspects

Turning to the organisations you work in now

What practical aspects have influenced your ability to prescribe, for example access to facilities?

Probe – please give an example

Issues may include: joining the NMP register, policies NMP and other, scope of practice, limitations, access to prescriptions/electronic prescribing, access to patient records, access to clinic rooms, time, access to information to support prescribing

Probe negative and positive comments to see if others have a similar viewpoint

What about the way you work? Some of you describe working in a team, some on your own, what impact has the way you work had on your prescribing practice?

Probe – please give an example

Issues may include: isolation, freedom to make decisions, constrained by team, supported by team, advantages, disadvantages

Probe negative and positive comments to see if others have a similar viewpoint

Is there anything else you wish to add about the practical side of prescribing?

Moderator to summarise discussion regarding medics

Final question

What one bit of advice would you give to new non-medical prescribers to enable them to utilise their new qualification?

Closing stage

Summarise discussion

Check that nothing has been missed that participants feel should have been included

Stop recording

Thank participants for their help

Appendix 8.31 Invitation to participate: Chapter 5

Invitation email to NMP leads, CHAIN etc.

Re: Exploring the barriers and facilitators to non-medical prescribing experienced by pharmacists and physiotherapists, using focus groups

My name is Emma Graham-Clarke and as part of my doctoral research I am investigating the barriers and facilitators to non-medical prescribing experienced by pharmacists and physiotherapists. I have contacted you to ask your help in bringing the next stage of my research to the attention of potential participants. I am seeking to recruit pharmacists and physiotherapists who:

- have qualified as independent prescribers since 2013
- work in the West Midlands region in primary or secondary care

Research study

The research aim of this study is to further explore the barriers and facilitators to non-medical prescribing experienced by the pharmacy and physiotherapy professions and to investigate whether the findings from the Delphi study are generalisable to the wider professional groups. Identification of barriers and facilitators, including profession specific barriers and facilitators, will enable strategies to be developed to support future non-medical prescribers.

I will be using focus groups to explore the Delphi findings with pharmacist and physiotherapist independent prescribers.

Background

Earlier research suggests that a quarter of Allied Health Professionals (AHP) who qualified as prescribers may not use this skill, compared to approximately 10% of nurses. I have already completed a literature review investigating the barriers and facilitators to non-medical prescribing, which identified 15 factors that may affect the utilisation of prescribing. Most of the research was conducted in nursing, with only a few papers reporting research in pharmacists. As it is unknown if similar barriers and facilitators are experienced by other professions, in the second part of this research I conducted a Delphi study to investigate the facilitators and barriers to non-medical prescribing experienced by pharmacist and physiotherapist independent prescribers. The findings from a Delphi study represent the opinions of the participants and may or may not be representative of the wider study population (in this case, other physiotherapist and pharmacist independent prescribers). Further research is recommended to 'verify' the results of a Delphi study.

The participant information sheet enclosed with this email contains further details on the study, including the study design and anticipated time commitment. I also include a demographic questionnaire for potential participants to complete, which will enable them to confirm their eligibility for the study.

I would be grateful if you could kindly forward this email and attachments to pharmacist or physiotherapist independent prescribers in your networks.

If there are any questions, then please do not hesitate to contact me:

This study has been approved by the University Ethics Committee.

Appendix 8.32 Participant information sheet: Chapter 5

UNIVERSITY OF
BIRMINGHAM

Participant Information Leaflet

Title of the proposed study

Exploring the barriers and facilitators to non-medical prescribing experienced by pharmacists and physiotherapists, using focus groups

Description of the proposed study

The main aim of this study is to use focus groups to further explore some facilitators and barriers to non-medical prescribing that have been experienced by pharmacists and physiotherapists.

The study forms the third part of doctoral research into non-medical prescribing, at the University of Birmingham. The first part of this research identified several barriers and facilitators from the literature, but these mainly concerned nurse prescribers. As it is unknown if similar barriers and facilitators are experienced by other professions, a Delphi study was used in the second part of this research to investigate the facilitators and barriers to non-medical prescribing experienced by pharmacist and physiotherapist independent prescribers. The findings from that study need to be explored further to determine if they represent general or specific experiences, and therefore how useful they are to other non-medical prescribers.

In a focus group the participants are encouraged to discuss a range of pre-selected topics, guided by a moderator. The moderator is not there to influence the discussion but will ensure that all topics are able to be discussed and that all participants have the opportunity to contribute. There are no right or wrong answers to the topics; it is the participants' experience and opinion that is important.

All discussion remains confidential to the group. All personal data will remain confidential to the Principal Investigator, and a unique ID will be used when analysing data.

The results will be analysed to establish if physiotherapist and pharmacist prescribers experience similar barriers and facilitators or if there are differences. These results have the potential to support future physiotherapist and pharmacist prescribers.

Invitation to participate and explanation of what participation entails

You are invited to participate in this research study. Please read this information sheet carefully before deciding if you would like to participate.

if you are interested in taking part, then please complete the brief questionnaire included in this email and return it to the Principal Investigator (Emma Graham-Clarke: [REDACTED]) The information from the questionnaire will be used to select participants to join a focus group. Completing

the questionnaire does not mean you have agreed to take part in the study, only that you are interested in taking part.

If you are selected, you will be invited to join a focus group held using a virtual platform (Zoom Video Communications). The group will consist of 6-10 participants, and a moderator (who will guide the discussion, but not take part in it). The moderator will introduce topics for discussion and encourage everyone to contribute their experiences and opinions. The main part of the discussion will be recorded using the virtual platform record feature. You can expect the focus group to last between 1 ½ to 2 hours.

If you are not selected, then you will be informed by email. Your personal details would then be securely destroyed.

Do I have to take part?

Your participation is entirely voluntary, and you do not have to choose to take part. If you do decide to participate then you are free to withdraw from the study, at any stage, without giving a reason. If you decide to withdraw after the discussion starts, it will not be possible to remove your contribution to the discussion and it will be included in the analysis.

Why have I been contacted?

You have been contacted because you are either pharmacist or a physiotherapist independent prescriber. If you have qualified as a prescriber since the beginning of 2013 then you are eligible to be involved in this research.

The study aims to include up to 10 pharmacist and 10 physiotherapist prescribers.

What do I have to do?

If you are interested in taking part, please complete the demographic questionnaire and return it to the Principal Investigator by email (Emma Graham-Clarke:)

How may the study affect me and are there any risks and benefits to taking part?

The study is unlikely to affect you and no direct risks are anticipated. It is possible, but unlikely, that you may feel uneasy during the parts of the discussion, particularly if there is disagreement. You do not have to contribute to the discussion if you find it difficult.

You will have no personal immediate benefit from taking part in the study. The results from this study could help future pharmacist and physiotherapist prescribers to use their skills.

if you disclose information during the course of the discussion that may have serious patient safety implications, then the researcher will need to break confidentiality so that the relevant authorities can be informed. You will be informed before this happens.

Further information

If there is anything that you are unclear about then please do not hesitate to contact the Principal Investigator for further information and clarification. Full contact details are given at the end of this sheet.

Fair Processing Statement

This information is being collected as part of a doctoral research project concerned with non-medical prescribing by the School of Pharmacy in the University of Birmingham. The information which you supply and that which may be collected as part of the research project will be entered into a filing system or database and will only be accessed by authorised personnel involved in the project. The information will be retained by the University of Birmingham and will only be used for the purpose of research, and statistical and audit purposes. By supplying this information, you are consenting to the University storing your information for the purposes stated above. The information will be processed by the University of Birmingham in accordance with the provisions of GDPR 2016 and the Data Protection Act 2018. No identifiable personal data will be published.

Confidentiality/anonymity and data security

Your personal data will be confidential, and you will be assigned a unique ID code for use when analysing the transcripts. Once the transcript has been checked for accuracy against the recording, the recording will be securely destroyed. Any identifiable details mentioned during the course of the discussion will be anonymised on the transcripts.

All electronic information held securely on central University servers will be encrypted and password controlled, and the password will be held by the Principal Investigator. The anonymised results will only be shared by the research team during the analysis. The secondary, totally anonymised, data will be kept securely for 10 years following completion of the research and will then be destroyed in accordance with University of Birmingham research guidance.

Results of the study

The results from this study will form part of a doctoral research thesis. The results may be presented at scientific conferences and published in peer reviewed scientific journals. The results may be shared with relevant people or institutions to improve practice. No individual participant details would be included in any report or publication.

You will be offered the opportunity to have feedback on the study and this will be provided as tabulated results.

Who is funding the study?

Funding to cover transcription fees has been received from the WMAHSN

The Principal Investigator will not receive any funding for undertaking this study.

Who has reviewed the study?

The study had been reviewed and given a favourable opinion by the University of Birmingham Ethics Committee.

Contact details

Emma Graham-Clarke

University of Birmingham

Email: [REDACTED]

Prof John Marriott

University of Birmingham

Email: [REDACTED]

Prof Alison Rushton

Western University

Email: [REDACTED]

Appendix 8.33 Screening questionnaire: Chapter 5

UNIVERSITY^{OF}
BIRMINGHAM

Participant demographic questionnaire

Title of proposed study: Exploring the barriers and facilitators to non-medical prescribing experienced by pharmacists and physiotherapists, using focus groups

Thank you for your interest in taking part in this study. Please answer the questions below and return the form electronically to [REDACTED]

1. Are you working in the West Midlands and a qualified:
Pharmacist Yes ☐ No ☐
Physiotherapist Yes ☐ No ☐
2. Please indicate how long (to the nearest year) you have been qualified in your profession

≤5 years ☐ 6-10 years ☐ 11-15 years ☐
16-20 years ☐ >21 years ☐
3. What is your primary practice area?

Primary care ☐
Secondary care ☐
Other ☐
4. Are you an active qualified independent prescriber?

Yes ☐ No ☐
5. Did you qualify as an independent prescriber after 1 January 2013?

Yes ☐ No ☐
6. Have you been qualified as an independent prescriber longer than 12 months?

Yes ☐ No ☐

Please provide your name and preferred e-mail address below. This information will only be used to contact you in regard to this study.

Name: _____

E-mail: _____

Appendix 8.34 Consent form: Chapter 5

UNIVERSITY OF
BIRMINGHAM

CONSENT FORM

Title of the proposed study

Exploring the barriers and facilitators to non-medical prescribing experienced by pharmacists and physiotherapists, using focus groups

Participant Identification Number:

Name of Researcher: Emma Graham-Clarke

Fair Processing Statement

This information is being collected as part of a doctoral research project concerned with non-medical prescribing by the School of Pharmacy in the University of Birmingham. The information which you supply and that which may be collected as part of the research project will be entered into a filing system or database and will only be accessed by authorised personnel involved in the project. The information will be retained by the University of Birmingham and will only be used for the purpose of research, and statistical and audit purposes. By supplying this information, you are consenting to the University storing your information for the purposes stated above. The information will be processed by the University of Birmingham in accordance with the provisions of GDPR 2016 and the Data Protection Act 2018. No identifiable personal data will be published.

Statements of understanding/consent

Please initial box

1. I confirm that I have read the information sheet dated 17/8/2020 (version 1.2) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.
2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason. If I withdraw after the discussion starts it will not be possible to remove my contribution to the discussion and it will be included in the analysis.
3. I understand that my personal data will be processed for the purposes detailed above, in accordance with GDPR 2016 and the Data Protection Act 2018.
4. I understand that the discussion will be digitally recorded using the record function on the Zoom virtual platform and that transcripts produced may be looked at by responsible individuals from the University of Birmingham.
5. Based upon the above, I agree to take part in this study.

☐☐☐☐☐

Name of Participant

Date

Signature

Emma Graham-Clarke

6/11/2020

Name of Person

Date

Signature

taking consents

A copy of the signed and dated consent form and the participant information leaflet should be given to the participant and retained by the researcher to be kept securely on file.

Appendix 8.35 Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist: Chapter 5

Page numbers relate to submitted manuscript

No	Item	Guide questions/description	Page
Domain 1: Research team and reflexivity			
Personal Characteristics			
1.	Interviewer/facilitator	Which author/s conducted the interview or focus group?	7
2.	Credentials	What were the researcher's credentials? <i>E.g. PhD, MD</i>	6
3.	Occupation	What was their occupation at the time of the study?	6
4.	Gender	Was the researcher male or female?	6
5.	Experience and training	What experience or training did the researcher have?	6
Relationship with participants			
6.	Relationship established	Was a relationship established prior to study commencement?	6
7.	Participant knowledge of the interviewer	What did the participants know about the researcher? <i>e.g. personal goals, reasons for doing the research</i>	6/Af1
8.	Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? <i>e.g. Bias, assumptions, reasons and interests in the research topic</i>	6
Domain 2: study design			
Theoretical framework			
9.	Methodological orientation and Theory	What methodological orientation was stated to underpin the study? <i>e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis</i>	7
Participant selection			
10.	Sampling	How were participants selected? <i>e.g. purposive, convenience, consecutive, snowball</i>	9
11.	Method of approach	How were participants approached? <i>e.g. face-to-face, telephone, mail, email</i>	9
12.	Sample size	How many participants were in the study?	12
13.	Non-participation	How many people refused to participate or dropped out? Reasons?	12
Setting			
14.	Setting of data collection	Where was the data collected? <i>e.g. home, clinic, workplace</i>	8
15.	Presence of non-participants	Was anyone else present besides the participants and researchers?	7
16.	Description of sample	What are the important characteristics of the sample? <i>e.g. demographic data, date</i>	12
Data collection			
17.	Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Af1
18.	Repeat interviews	Were repeat interviews carried out? If yes, how many?	N/A
19.	Audio/visual recording	Did the research use audio or visual recording to collect the data?	7
20.	Field notes	Were field notes made during and/or after the interview or focus group?	7
21.	Duration	What was the duration of the interviews or focus group?	12
22.	Data saturation	Was data saturation discussed?	23
23.	Transcripts returned	Were transcripts returned to participants for comment and/or correction?	8
Domain 3: analysis and findings			
Data analysis			
24.	Number of data coders	How many data coders coded the data?	11
25.	Description of the coding tree	Did authors provide a description of the coding tree?	13,14, AF2
26.	Derivation of themes	Were themes identified in advance or derived from the data?	11
27.	Software	What software, if applicable, was used to manage the data?	11
28.	Participant checking	Did participants provide feedback on the findings?	8
Reporting			
29.	Quotations presented	Were participant quotations presented to illustrate the themes / findings? Was each quotation identified? <i>e.g. participant number</i>	Af2
30.	Data and findings consistent	Was there consistency between the data presented and the findings?	16 et seq
31.	Clarity of major themes	Were major themes clearly presented in the findings?	16 et seq
32.	Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	16 et seq