RISK TOLERANCE AND ATTITUDES AMONG HEALTHCARE PROFESSIONALS AND PATIENTS REGARDING LOCATION OF CARE DECISION-MAKING

by

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ABSTRACT

Introduction

There has been growing pressure on inpatient hospital beds for many years, and this, along with the risks of inpatient hospitalisation both for patients and health systems, has required the use of alternative care locations for patients, such that only those who require inpatient admission should be admitted to hospitals. However, it is important that this decision about where patients are treated is made appropriately, as all the available care locations have risks and benefits. The purpose of this study, therefore, was to investigate the risk tolerance of patients, staff and carers in hospital front-door and ambulatory care units, and to interview physiotherapists and patients in these same types of departments to explore their views and attitudes towards risk, and how location of care (LoC) decisions for acutely unwell patients are made.

Methods

This mixed methods study quantitatively investigated risk tolerance and qualitatively explored physiotherapists' and patients' views and experiences. Staff, patients and carers in front-door and ambulatory care units completed a series of 'lotteries', in which they made hypothetical financial and health choices. They chose between a guaranteed option (e.g. £70) and an option with uncertain outcomes (e.g. 50% chance of £20, 50% chance of £180), the health lotteries' options were similar, but related to 'days in full health'. Risk tolerance in each lottery set was determined via multiple means, and compared based on various characteristics. Physiotherapists were interviewed about their views around risk and LoC decisions, and physiotherapists were also asked about their decision-making process, using semi-structured interviews. Interviews were transcribed and analysed using Thematic Analysis, with Fuzzy Trace Theory as the theoretical framework, which states that people reason based on a combination of ‘verbatim’ (specific) and ‘gist’ (interpretation and understanding) representations of information.

Results

106 professionals, 197 patients and 35 carers completed the questionnaires, demonstrating a wide range of risk tolerance levels, and patterns within sub-group analyses. They represented people with a diverse range of demographics, including ages from 16 to over 85 years, multiple ethnic backgrounds, and various professions and experience levels. In the interviews, 14 physiotherapists participated, including physiotherapists from all levels of seniority (band 5 to band 8+) with experience ranging from less than two to more than 20 years. Six key themes were identified - Physiotherapist identity, Working with Risk, the Discharge Decision, Considerations for Referrals, Communication, and Wider Context.

Discussion

This study is the first to have used lottery set questionnaires of this type in the acute care environment, and is one of very few studies to have done so in a healthcare setting. Physiotherapists’ decision-making and attitudes towards risk in this setting has also been under-researched. Collectively, the results of this study can contribute to improving understanding and communication in managing risk and making LoC decisions at the front-door, in a collaborative and patient-centred way.

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LIST OF ABBREVIATIONS AND DEFINITIONS

AC = Ambulatory Care

AMU = Acute Medical Unit

COPD = Chronic Obstructive Pulmonary Disease

CODE = Coping in Deliberation framework

ED = Emergency Department

EOU = Emergency Observation Unit

ESD = Early Supported Discharge

EUT = Expected Utility Theory

FD = Front-Door

FTT = Fuzzy Trace Theory

GP = General Practitioner

HaH = Hospital at Home

MDT = Multi-Disciplinary Team

MRI = Magnetic Resonance Imaging

OT / OTs = Occupational Therapist/s

SW / SWs = Social Worker/s

TIA = Transient Ischaemic Accident / Attack

UK = United Kingdom

US = United States

Lottery Set = full set of seven questions given to participant, where they are asked to choose between option A (certain outcome) and option B (uncertain outcome). Each participant was asked to complete six lottery set

CHAPTER 1: RATIONALE AND INTRODUCTION TO ACUTE MEDICINE

1.1 Rationale

Every year, increasing numbers of people are presenting to hospitals in need of acute care. For example, presentations to NHS Emergency Departments (EDs) increased by an average of 2% each year between 2010-11 and 2019-20 (1), and while these patients need care, available resources and beds are stretched, and it is not possible, or appropriate, for all of them to be admitted to an inpatient bed. Therefore, alternative methods for providing acute care are required (2).

Making decisions about appropriate location of care for patients is an integral component of acute care, and with these increasing numbers of patients presenting for unplanned care (1), along with known risks of hospital admission (3-5), it is vital that these decisions are made well, such that only those patients who need an inpatient bed are admitted to hospitals. To facilitate this, there are a variety of health services available, including Ambulatory Care (providing acute, hospital-level care, without use of an inpatient bed overnight (6)) and Front-Door services (where patients first access unplanned hospital care, with a short length of stay prior to discharge or admission (7)), that can be used to help reduce pressure on inpatient beds, without compromising patient care or safety. In the wake of the COVID19 pandemic NHS England has put a higher focus on expanding virtual wards (8), which are a form of Ambulatory Care, and as such there is an expectation that more patients will be cared for in non-inpatient settings. However, there are risks to using these services, as there are to hospital admission, and this element of risk is therefore present in every location of care decision. As such, it is important to understand how those involved in location of care decisions (patients, carers and healthcare professionals) view and tolerate risk, and investigation of this will be central to this study.

Given the expectation of increased use of non-inpatient services, and the suggestion that these services may be under-utilised (9), this PhD will seek to quantitatively investigate risk tolerance of patients, carers and healthcare professionals in Front-Door and Ambulatory Care services, then use interviews to explore how location of care decisions are made in Ambulatory Care and Front-Door settings. These two key components both centre around risk and decision-making in acute care, with the hope of increasing understanding of how location of care decisions are made in this setting and how those involved in these decisions view risk. The thesis will also include a systematic review investigating front-door discharge decision aids, specifically looking at their mortality thresholds, because such decision aids can contribute to the location of care decision and generally work by stratifying or estimating risk.

This study will use both quantitative and qualitative methods to explore this topic. The approach used for the quantitative investigation of risk tolerance has not been used in this clinical setting before, has never been used with acutely unwell patients, and has rarely been used in any clinical environment. Deeper exploration of how location of care decisions are made will use qualitative interviews, focusing on physiotherapists’ decision-making as, despite their involvement in these decisions, this professional group is under-researched in this area, and will also seek to explore patients’ views and experiences of location of care decisions. Specific aims of the project will be shown at the end of this chapter.

This thesis will begin with two chapters introducing the clinical area in which the research is based (Acute Medicine) and Risk, along with theories of decision-making under uncertainty. This will be followed by a review of discharge decision support tools in use at the hospital front-door, then separate chapters detailing the methods of the quantitative and qualitative components of the study. The results of these two components will then be presented separately, before a final discussion chapter which will place the findings in the context of other research, as well as detailing how the results of the two separate components connect to each other.

1.2 Introduction to Acute Medical Services, including Ambulatory Care

Globally, there is increasing pressure on healthcare resources and, as demand for services increases, alternative methods of providing healthcare, beyond traditional inpatient care, are required (2). In a number of countries, including the UK, providing acute healthcare in alternative locations and settings is being looked to as part of the solution to these challenges (7, 9-14). This may be achieved through the provision of acute, hospital-level care without the patient remaining in a hospital bed overnight, which is referred to as Ambulatory Care (6), or the use of ‘front-door’ services, such as Acute Medical Units within the hospital and frailty units in the Emergency Department (ED), to provide rapid assessment, treatment and discharge (or transfer if appropriate) (7, 15). Each of these concepts is discussed in more detail below.

For many patients, especially older people, who attend hospitals seeking urgent care, their point of entry is the ED (16), and rates of ED attendance are increasing. For example, in the UK, there has been an average of a 2% increase in ED attendance year on year for the decade leading up to 2019-20 (compared to 1% annual population growth), equating to 25 million ED attendances in 2019-20 (1). In Australia, a 3.4% increase in ED attendances was reported for 2017-18 compared to the previous year, (compared to an average of a 2.7% increase each year from 2013-14), which is also above the rate of population growth for the same period, and translates to 8 million patient presentations to EDs in public hospitals (17). Given this trend, and the established iatrogenic risks of hospital admission (3-5, 18), finding alternative locations of care, accessible from the ED, is vital for both patient health and safety, and the continuing functioning of health services internationally.

1.3 Ambulatory Care, including Hospital at Home

The core concept of Ambulatory Care is that it provides acute, hospital-level care, without the use of a hospital bed overnight (6). There are two main ways that this is achieved in the UK – hospital-delivered acute ambulatory care, and Hospital at Home (HaH). The first of these involves the patient attending a department in the hospital, potentially over a number of days, to receive care, but returning to their own home overnight, and the latter involves the patient remaining in their own home, and hospital-level care going to them. Each of these approaches will be described in further detail below. In both cases, there is significant international variation in both interpretation and delivery of these services, which will be explored as appropriate below, but the terms will be used as they are interpreted within a UK, NHS context.

Providing acute healthcare at home is not a new concept, it was the model of care for many years prior to the current widespread reliance on centralised, hospital-based care (19), but concerns have been raised over its safety and suitability (20). Partially in response to these concerns, a number of reviews have been conducted into the safety and efficacy of Ambulatory Care services internationally (21-27). These reviews have included Ambulatory Care services provided through a wide variety of service models, within a range of political and social backgrounds, due to the wide-ranging ways in which the definition of 'Ambulatory Care' has been interpreted to suit local and national needs in the countries in which it has been implemented, but many of them are assessing HaH, in various forms. Overall, HaH aims to provide acute hospital-level care at home, through professionals visiting the patient, and providing assessment and treatment in their home (8), but the way that this is operationalised varies nationally and internationally. For example, Australia has a number of well-established HaH services fully replacing admission (9, 28), the 'Home Hospital' service in Torino, Italy has been in operation for over 30 years, accepting patients with a range of conditions (29-31), and HaH programmes have been described in at least two US states (11, 32). Other countries, meanwhile, have focussed more on early supported discharge (ESD) type services (33, 34), particularly for patients who have had a stroke (35-38), although there are also admission replacement (or combined ESD and admission replacement) services in some of these countries (14, 39, 40), and ESD services in those countries where admission replacement has been the focus (41). Others have investigated ways in which ambulatory care is expanding, for example in moving units out of the hospital environment (42), and focussing on the role of specific professionals working in Ambulatory Care, such as nurse practitioners (43). However, despite this variation in service provision, funding and socio-political background factors, the reviews of Ambulatory Care services have commonly concluded that these services produce equivalent or better clinical outcomes (such as functional ability, mortality rate and readmissions) when compared to ‘standard’ inpatient management (21-26, 44). Additionally, the experience of service users – both patients and their carers, has been investigated (40, 45, 46), and many of the reviews which have considered this have concluded that Ambulatory Care may produce increased patient and carer satisfaction (21-24, 47).

1.3.a Cost-Effectiveness

Given that this form of service seems to produce equivalent, or improved, clinical outcomes and service user satisfaction, it would appear to be an appealing option for healthcare providers to implement, as long as it also represented value for money. There have been a number of investigations, both primary studies and reviews, which have endeavoured to determine whether these services are cost-effective and how their costs compare to the inpatient care they are intended to replace (12, 13, 24, 26, 43, 48-51). However, investigation of this aspect of the services is complicated by numerous factors. These include differences in underlying healthcare funding structures, disparity in service models and variation in what costs were included in analyses of different services (e.g. considering only direct healthcare costs, inclusion or exclusion of social care costs, inclusion or exclusion of informal care costs, and inclusion of different costs in the HaH and inpatient arms of the same study). These problems are exacerbated by a lack of agreement on an exact definition of ‘cost-effectiveness’, which has previously been identified as a challenge when attempting to compare studies in this area (52).

As a result of these challenges, there is not yet a consensus on whether HaH services cost more or less (23, 24) and whether they are cost-effective or not. Adding to these complications is the fact that there may be higher costs early in the development of a HaH service (53), which are then potentially being compared to the costs of much more established services within the health system. However, a recent large, randomised trial of HaH, in multiple UK locations, found the HaH service to be cost-effective, costing less than admission, including when informal care costs were incorporated and a societal perspective was taken, which provided strong evidence supporting the cost-effectiveness of HaH (49). Studies have also found Ambulatory Care to be cost-effective for managing a variety of conditions, including primary spontaneous pneumothorax (50) and Transient Ischaemic Accident (TIA) (51). However, as with HaH, the evidence for this is not conclusive, as shown in a review of the role of nurse practitioners in Ambulatory Care, which found patient outcomes to be equivalent or greater than alternatives, but could not definitively comment on cost-effectiveness, although it did indicate a tendency towards cost-effectiveness (43).

1.3.b Service Design and Parameters

Within the broad definition of Ambulatory Care being the provision of acute healthcare without the use of a hospital bed overnight (6), there are different service models, and even within the two main forms mentioned above – HaH and acute ambulatory care – there is variation.

The primary types of HaH are Admission Avoidance, whereby the patient's entire episode of care is delivered without them being admitted to an inpatient bed (23), and Early Supported Discharge (ESD), where the patient leaves hospital before the end of their episode of care, and the remaining care is provided at home instead of within a hospital (24). Admission avoidance services are usually accessed either from the ED, with patients moving directly into the HaH service instead of being admitted to a ward in the hospital, or via a referral from a general practitioner (GP) in the community, without the patient attending a hospital at all (12, 14, 22, 32). By providing all of the patient's care in their own home (which can in some cases also include care homes (54, 55)), many of the iatrogenic risks of hospital admission may be avoided or minimised (29, 31). This includes minimising risks such as hospital-acquired infections, as the patient is not directly exposed to any other patients. The risks of deconditioning and pressure damage, which are both highly problematic, especially amongst older people in hospitals (5, 56, 57), may also potentially be reduced as people may remain more active in their own home than in a hospital environment (58, 59) and increased mobility levels have been shown to reduce functional decline in hospitalised patients (60). Admission avoidance HaH services are being used around the world, although they have been running in some places for longer than others (9, 11, 14, 31, 61-63). There are also services that accept patients both for admission avoidance and for ESD (39, 64).

Many ESD services were developed to provide ongoing rehabilitation for patients who had had a stroke (10, 24, 65). Typically, they were for patients who had been admitted to hospital, but who, having recovered sufficient medical stability, had ongoing rehabilitation and therapy needs preventing them from being discharged (66, 67). From this basis, other ESD services have since been developed internationally, catering for patients with a wider range of needs, for example, rehabilitation following orthopaedic surgery (34, 68), medical patients (69), patients with respiratory compromise (70, 71), and patients requiring rehabilitation after a hospital stay regardless of initial cause of admission (72), amongst others. The core similarity between these ESD services is that they all accept patients into their service from inpatient beds in a hospital. The length of time that patients have been in the hospital prior to moving to the ESD service varies, and may range from less than 48 hours to more than two weeks, in different services (66, 71). This variation may be due to patient-specific factors, such as presenting condition, service-level factors, such as staffing and capacity, or external factors, such as availability of other local support services.

Acute, hospital-based ambulatory care essentially allows outpatient management of conditions that would normally require inpatient hospitalisation, and is part of the service plan advocated by the Royal College of Physicians to adapt to changing patient needs (2). Unlike traditional outpatient care, patients may return more frequently to an ambulatory care unit, such as on a daily basis (73), or they may be seen once and discharged on the same day (74). Management of a range of conditions through acute ambulatory care has been reported and investigated, including spontaneous pneumothorax (73), deep vein thrombosis, pneumonia (47, 75), and TIA (51, 75), among others. Where comparisons to inpatient care have been appropriate these have shown comparable clinical outcomes (47, 51, 73). Within the hospital, the ambulatory care unit may be in different places, but is commonly a component of the acute medical unit, day case unit or emergency access area (75). Throughout the UK, there is considerable variation in provision and set-up of acute ambulatory care, including in conditions that are managed, access times and appropriate protocol use (75). However, it is important that all of them have access to skilled decision-makers (2), which may include physicians and/or nurse practitioners (43), and their intention is generally to provide rapid access to diagnostics, treatment and community support for safety-netting (74). Due to the limited time that patients spend in the ambulatory care unit, many of the iatrogenic risks that are reduced or avoided through HaH may also be reduced through using ambulatory care, such as lower risk of hospital-acquired infection (2), and some of the reasons for variation between services may also be similar to those for HaH, since they are serving a similar group of patients and will have similar external factors to consider.

The intention of any of these services is to replace inpatient care, the specifics of which are determined by multiple factors, from the overall healthcare system to the presenting complaint of the individual patient. As such, the services that Ambulatory Care and HaH teams provide can range from only very specific interventions – such as Outpatient Parenteral Antibiotic Therapy (76), to a broader range of inputs. These broader inputs cover the same stages that would be achieved from an inpatient admission, from diagnostics - such as point-of-care blood testing (11, 31) or ultrasound (31, 61), to treatments - such as blood transfusions (28, 31), drug prescription (43) and administration (77) and rehabilitation (77-80), through to onward referral (39, 43, 81, 82). Strategies may be required to accommodate for some in-hospital aspects of care with HaH, while the patient continues to be managed primarily at home, due to availability and practicality considerations. This is most often true of scanning requirements, such as x-rays, echocardiography (12), computerised tomography, MRI and endoscopy (61). This may be achieved through allowing Ambulatory Care patients equal levels of priority in access to scans as they would have had if admitted within the hospital (12).

The remit that a given service is designed for will be influenced by many factors, at both a national and local level. These are likely to include considerations such as the care that is available in hospitals within the country, or locality, within which the service is running, and local and national policies and guidelines, which may direct what interventions can, and cannot, be offered to patients. Additionally, issues of practicality will influence what a given team is able to provide. All of these factors combine to produce differences in service model, even between services operating in the same city (9). The community services which already exist will also influence what care is considered to be within the remit of an Ambulatory Care team. This can be demonstrated by the description of ‘Hospital at Home’ teams providing services such as palliative care (83) in some countries, which in the UK and others would not fall under the remit of Ambulatory Care, as they are routinely conducted by district nurses (84), although there are some palliative care HaH services (85).

1.3.c Staffing

This variation in service provision is also reflected in team staffing (86), although this may differ between HaH and acute ambulatory care services. In HaH, the importance of having medical, nursing and allied health professionals has been noted (87), and as with the inpatient care that it replaces, a multi-disciplinary team (MDT) is usually responsible for the patients in HaH, although the professional who leads the team can differ. The most common ways that these teams are set up is either to be run on an outreach basis from a hospital (13, 28, 41, 88), to have a dedicated team within the community (14, 70, 89), or a combination of these (e.g. with hospital-based doctors and community nurses) (11, 90). Often, the patient group being cared for will determine the appropriate staff mix, since the staff required in a service designed to care specifically for patients with COPD may differ significantly from that required to manage patients who have had a stroke, or those required to manage a general medical caseload of older patients with frailty (91-93). However, even when considering teams caring for the same types of patient population, there is a lack of standardisation, with differences by location or study (24, 25), which may also be representative of the variation seen in acute inpatient teams (94). Despite the lack of consistency in professional composition of these teams, some common elements are present in most HaH services. Among the core components of many HaH services are regular visits by nursing staff, which may occur multiple times per day in some teams, and physician visits, which may be less frequent (10, 11, 28, 32, 77, 95), alongside advice accessible by telephone (29, 89, 95). In addition to these regular core components, teams may include other professionals such as therapists (10, 13, 14, 29, 77, 95), social workers (10, 13, 29), psychologists (10) or cultural link workers (14), among others. In the same way as their in-hospital counterparts, different professionals have different roles in both patient management and service organisation within Ambulatory Care teams. There is also variation in the roles that individuals of the same profession have in different teams (96). Part of this variation, for at least some of the team members, may be influenced by external factors, such as the allowable scope of practice for that profession in a given country. For example, UK-based physiotherapists can undertake additional training to allow them to prescribe medications, but this is not true of physiotherapists in other countries (97). Physiotherapists are also frequently involved in decisions with regards to whether a patient needs ongoing input, and where this may be best provided, such that one of their reported roles within Hospital at Home services is to make referrals (96), which they decide on based on their own clinical assessments and clinical reasoning.

One potential explanation for some of the variation in team composition may be geographical and financial – for example, in the US, when treating patients in receipt of Medicare, there are limitations on what will be reimbursed, and this can influence staff involvement. Previously for these patients, a co-ordinating nurse, a physical therapist, speech therapist, occupational therapist, and a social worker consultation could be reimbursed, but physician home visits received poor levels of reimbursement and were therefore much more uncommon (although other reasons also contribute to this low rate of home visits). The physicians, therefore, referred patients to HaH services, but may have had more limited involvement after this point (98). In more recent years, although they are still low, rates of home visits from physicians in the US overall have increased (99, 100), and efforts have been made to design a billing and payment model that is specific to the needs of HaH (101, 102). In Canada, nurses are often the key provider of home-based acute care services (98), with clear access routes to physician input as required (35), although physicians may retain overall responsibility for the patients in some services (40). In contrast, physicians working in HaH units in Israel are more involved in care provision, and potentially co-ordination, alongside nurses, but there is limited involvement of rehabilitation professionals (98). In Australia, where there are a number of long-established HaH services, a variety of models exist regarding staff roles and involvement. These models can vary even among services within a single city, with comparable funding systems, due to the lack of state direction over service model (9). For example, some services have doctors in ‘director’ roles, providing both clinical input at home and overall leadership, while others have hospital-based doctors, or GPs, that patients have to travel to, to be reviewed (9).

Unlike HaH services, which may have multiple professions, acute, hospital-based ambulatory care services tend to have a smaller range of professionals routinely staffing them, although they may have access to other professionals via referrals. Typically, acute ambulatory care will be staffed by nurses and doctors, potentially including nurse practitioners (74, 103), either in addition to or instead of physicians (43). What is most important with staffing these services is that patients have timely access to a senior decision-maker (74). Some services may have other MDT members, such as therapists, dedicated to their teams, but others will access these professionals via agreements with clinically similar areas (such as ED), and many ambulatory care services will benefit from having access to pharmacists (74). Alongside these clinical professionals, non-registered staff (e.g. healthcare support workers) and administrative staff can be vital to the successful functioning of acute ambulatory care (74).

1.3.d Accessing Ambulatory Care, including Hospital at Home

An important aspect to consider in Ambulatory Care is how patients access the service. In many cases, this will be via a referral, often from a hospital-based doctor or GP (10, 28, 75, 98, 104). Although previous research has focussed on referrals from doctors to these kinds of services, other members of the multi-disciplinary team can also be involved, and one group in particular who can advocate for referral to Ambulatory Care, is physiotherapists. The person advising on or making this referral will need to consider a number of factors, to ensure that only the most appropriate patients are referred, meaning that those treated in Ambulatory Care services gain the most benefit from them, while those who require in-hospital admission also benefit through reduced bed pressures within the hospital. The factors that are considered by professionals involved in this decision may vary – for example doctors may focus more on medical concerns, while physiotherapists may focus more on functional concerns (105, 106). Two main strategies exist to support this decision-making process – utilising evidence of outcomes of ambulatory treatment in individual conditions; or determining a standardised set of non-condition-specific risk criteria which are used to identify suitable patients who do not have any presenting feature that means in-hospital care is indicated (6).

There are some clinical prediction tools available to support this process, and the primary ones within the UK are the Amb score (107) and Glasgow Admission Prediction (GAP) score (108). Both of these scores aim to predict same-day discharge, which may be beneficial as a prediction, but does not necessarily equate to predicting successful management through Ambulatory Care. As such, clinician judgement still forms a significant proportion of decisions regarding location of care for patients, whether that is to be in-hospital care, Ambulatory Care or community/outpatient management. Additionally, neither of these scores can perfectly predict which patients may be suitable for Ambulatory Care, although GAP may be better than Amb (109), and there are some potential limitations to their use. For example, the Amb score was found to have lower sensitivity than in the original study when it was tested in a population with a higher proportion of older people and men (age and gender are two of the scoring factors in the Amb score) (110). By including age as a scoring criterion (set cut-off in Amb, point per decade in GAP), one may potentially reduce the number of older people who may be deemed appropriate for Ambulatory Care, even if all other aspects of their presentation are identical to a younger patient. Given the proportion of the population presenting for unplanned healthcare who are older, this is an important consideration, and highlights again the importance of an element of clinical judgement being employed.

There have been suggestions that Ambulatory Care services are being under-utilised (9), and one potential contributor to this may be a lack of referrals, including in cases where referral would have been appropriate. Given that no prediction tool currently exists to help identify clinically safe discharges to Ambulatory Care, and the difficulty in determining what constitutes a ‘clinically safe discharge’, clinician and patient perceptions of the relative risks of Ambulatory Care versus in-hospital care, and their individual risk tolerances, may be contributing to a lack of referrals, despite scientific evidence supporting the equivalence of clinical outcomes between in-hospital care and Ambulatory Care. The two main places that these referrals would occur are at the ‘front-door’ of hospital services (for admission replacement HaH and hospital-based acute ambulatory care) and on hospital wards (for ESD). This difference in setting for the decision may make a significant difference to how it is reached. For example, on a ward, clinicians and patients often have longer to establish the patient’s individual needs and level of support, potentially over multiple treatment sessions and conversations, whereas at the front-door these decisions commonly have to be reached following only one, or very few, interactions between the patient and clinician. In both settings, however, there is likely to be input from multiple members of the MDT, including physiotherapists.

One of the key factors that should be considered when making a location of care decision is patient safety, and a determination of this will often require multidisciplinary assessment and discussion, with the doctor aiming to determine the patient’s safety from a medical stand-point and therapists aiming to determine their safety from a practical stand-point (106). This prediction has a degree of inherent uncertainty in it, and although prediction tools do exist for clinical outcomes, such as mortality and re-admission (111-115), these will still only give an indication of the patient’s likelihood of reaching the end-point, not give a definitive answer. Given these challenges, and established differences in individual physicians’ referral practices (116), shared decision-making with patients on where they receive their care should be engaged in. Doing this effectively would allow for the integration of the level of risk that both patients and clinicians feel is acceptable, and incorporate the patient’s values into the decision-making process (117).

1.3.e Advantages and Disadvantages of Ambulatory Care

Ambulatory Care has potential advantages and disadvantages, and these should be considered by those deciding whether or not to use it for a particular patient, when making their decision. A number of studies have demonstrated lower negative cognitive impacts on patients, when they are treated through HaH rather than traditional hospital care (87, 118). It has been suggested that the lower delirium rates among those treated in HaH services may also signal an improvement in longer-term outcomes, such as reduced mortality and increased function, as delirium can be an early indicator of poorer long-term outcomes (118). As discussed previously, Ambulatory Care also reduces some of the other risks associated with hospital admission, such as hospital-acquired infection (75). In addition, it facilitates more continuity of familiar surroundings and activities, allowing patients to more easily see their friends and family, have their own food, mobilise more confidently in their own environment, and use their own bed, with less disturbed sleep patterns due to not being woken repeatedly by staff (58).

As well as the physical benefits of using Ambulatory Care services, by definition the time that patients spend in hospital is reduced, compared to traditional care, and as many people dislike being in hospitals, this reduction in time spent there can be viewed as a benefit in its own right. In addition, patients have reported being happier and more comfortable being treated through HaH than in a traditional hospital setting (119), and ambulatory care can improve both patient (74, 75) and staff experience (74). Families and carers have also reported benefits to their loved ones being treated in a HaH service, as this allows them to be more involved and supported in providing care (119). Parents of children treated through HaH have identified a number of areas of this method of care provision which benefit the whole family, including greater comfort and freedom, less disruption to family life, lower cost to the family and increased personal interaction with healthcare staff (120). The impact on family members of their loved one being in hospital, especially for partners describing the loneliness that this situation creates (45), can also be mitigated through the use of Ambulatory Care services meaning that families are not separated.

From a broader health service perspective, Ambulatory Care services help to reduce inpatient bed occupancy, and thus reduce resource requirements for these (75), and it has been shown that introducing an acute ambulatory care unit in the hospital can also reduce average length of stay within the acute medical unit (AMU, which is separate from the ambulatory care unit) and increase their proportion of same-day discharges (103), as well as reducing length of stay for those managed through the acute ambulatory care unit itself (74). Additionally, all of this can combine to save significant amounts of money (103), which could then be invested elsewhere to improve patient care and/or experience.

However, despite these advantages, there are also potential challenges and disadvantages to using Ambulatory Care. One of the main concerns that people may have is the lower level of supervision that not being in a hospital produces. This is most obvious in the potential case of a medical emergency, such as a cardiac arrest, where the patient would have been very rapidly attended by a specialist arrest team had they been in a hospital, but this speed of response is not possible with Ambulatory Care (87). To overcome this, Ambulatory Care services may use clear protocols to identify patients who are at risk of deterioration early, so that interventions to avoid this can be implemented (87), and some HaH services use continuous monitoring of observations, mobility and falls (58) to provide an extra layer of safety for their patients. Patients have also reported feeling safe in HaH services (45), suggesting that, although this may be a theoretical concern, it is not one that frequently manifests for patients actually treated in these services. However, care must be taken to communicate effectively with patients, especially about expectations of the service, as many patients are not familiar with the term ‘Ambulatory’ and an explanation of the service can help reduce anxiety about using it (74).

Another concern that has been raised, particularly around HaH, is the increase in pressure on family, or other informal caregivers, from having to take on more responsibility for caring for the patient at home, or of patients feeling that they would be a ‘burden’ (72). A number of studies have found, however, that informal caregivers generally view this role positively and have felt able to manage it (40, 45), with less stress than those whose loved one has been admitted to traditional hospital care (29), and without the role being more burdensome (104). Some patients and carers have even reported that they found receiving care in a HaH service put less pressure on the carer (45). One potential disadvantage of HaH, that some services have struggled to overcome, is the limits to availability of testing and imaging outside of hospitals. This can be a concern for patients and carers (45), although an increase in use of point-of-care testing technologies and strategies (58, 121, 122) is likely to help with reducing this challenge, and has also been introduced in some hospital-based acute ambulatory care services (103).

From an institutional standpoint, there are also some challenges to overcome when implementing these services. These include the increase in acuity of patients seen in clinically adjacent areas, such as AMU, when altering or creating an acute ambulatory care unit and challenges surrounding using new governance practices (103). Good quality data collection can help to prove the benefits of these services though, such that they may be continued beyond initial trial periods, as initial challenges are resolved (103), and data can also help staff see how effective their service is (74). Hospital-based acute ambulatory care units are also at risk of being used as ‘bedded-areas’ when service demand increases, which is detrimental to their effective functioning and needs careful management to limit this occurrence (74).

1.4 Front-Door Services

Front-door services comprise the areas of a hospital that patients first access when they present to urgent or emergency care (16, 123) and present a unique setting for healthcare delivery, due to the varied and unpredictable nature of the patients presenting to them. There are a wide range of service delivery designs nationally, including Acute Medical Units, Emergency Observation Units and the ED itself, among others (15, 124, 125). These services have many different names, although they serve a similar purpose, which can cause confusion, even among those working in them (126). As the purpose of front-door services is to assess and treat people efficiently, so that they can return home or be transferred to another ward as soon as possible (7, 15), location of care decisions are a key component of everyday practice for qualified clinicians working in these services.

1.4.a History and (clinical) Safety

A key component of front-door services are Acute Medical Units (AMU), which were introduced in the 1990s in the UK, and have since also been implemented in other countries (93). There are multiple terms used for these (15). They are intended to provide acute medical care to patients who arrive at the hospital with a medical emergency, after being seen in the ED or community, and most patients requiring admission will be seen and treated in an AMU, prior to being admitted to an inpatient ward (93). For those patients who do not require inpatient admission, but cannot be discharged straight home, the AMU is often where they will receive care for a short period of time prior to discharge (7). The exact components and set-up of individual AMUs vary, and may be influenced by factors such as the national healthcare system and the specific hospital's pre-existing design and aims (127). Regardless of the exact characteristics of each AMU, one of the key attributes of these services is that they are *acute* medical wards, designed to facilitate prompt multidisciplinary assessment and treatment, with a common limit on length of stay of 24 to 72 hours (7, 127).

Another common form of front-door care is the Emergency Observation Unit (EOU), which has both similarities and differences to AMUs. EOUs are often co-located with the ED, and provide protocol-driven care for ED patients, which is very different to the care provided in other forms of observation service within health systems (128). Similarly to AMUs, they aim to facilitate patients to be discharged rapidly, without being admitted to the hospital, following a short period of monitoring. Patients' length of stay in these units, however, tends to be even shorter than in AMUs, and is frequently less than 18 hours (128). There is some cross-over in the patient groups managed in EOUs and AMUs, especially as in some studies the terms are used synonymously (129). Examples of conditions that may lead to patients being referred to an EOU include atrial fibrillation (130) and other circulatory system problems (131), respiratory conditions (128, 129, 131), chest pain (128, 129), syncope, dehydration, back pain and cellulitis (128), among others.

Despite the differences in location, design and staffing model, front-door services have a common goal – to efficiently assess, treat and discharge patients from the hospital, and they have been shown to be safe and effective in reducing length of stay (130) and admission rates, even among older patients (128). They have also been credited with reducing all-hospital mortality (132), especially among younger patients (133), reducing length of stay (134, 135), increasing direct discharges to home (135, 136), and reducing both rates of medical outliers (136) and numbers of patients awaiting a hospital bed in the ED (137).

In addition to their clinical benefits, studies have shown that patients are more satisfied when an observation ward exists (129), and that they are more likely to recommend the service, as well as being more satisfied overall, than those treated as inpatients (138). When surveyed, patients have reported high levels of satisfaction with care provided in an EOU, with clinically comparable levels of satisfaction between the ED and EOU (139). Multiple studies have demonstrated a similar trend in AMUs, with high levels of both patient and staff satisfaction (15).

It has also been suggested that observation units reduce ED staff workloads, leading to greater flexibility and patient flow (129). Development of these types of services, including recruiting staff to run them who maintain strong generalist knowledge and skills, has been viewed very positively by staff, especially where managing their previous workload had become untenable (136). It has also been demonstrated that staff working in these types of services report higher scores on a safety culture survey than an international benchmark, for teamwork and safety climates, stress recognition and job satisfaction (140), which may be related to some of the positive clinical outcomes that have been demonstrated.

1.4.b Cost-effectiveness

As with all components of health services, cost is a significant factor that must be considered. Although there are established problems with determining the cost-effectiveness of health services (52), attempts have been made to assess this for front-door services (137, 141, 142). Comparisons of costs of front-door services compared to inpatient care have generally been more straight-forward than those comparing Ambulatory Care to inpatient care, in terms of what components of care are included. These comparisons have tended to be within single hospitals, or health Trusts, where direct comparisons can be made, and data, especially around reducing length of stay, can be extrapolated to give an indication of any cost savings.

One way that the cost impact of front-door services is calculated is through analysis of the cost of episodes of care before and after a front-door unit is introduced. This type of analysis was conducted following the introduction of an Acute Medical Admissions Unit in a tertiary referral hospital in Dublin. They found that (excluding those with a length of stay greater than 30 days), although the bed-day cost for patients increased, their length of stay reduced to such a degree that there was an overall cost saving from bed-days saved, in excess of €1.5 million (137). They also reported that the costs for patients managed by generalists were significantly lower than those for patients managed by specialist consultants (137). The higher bed-day costs being partially compensated for by reduced length of stay and improved patient flow were acknowledged in the relevant 2018 NICE guidelines, where they also indicated that improved patient survival may be considered to justify potentially increased costs (123).

One explanation for the increased bed-day cost may be the higher staffing requirements of an AMU compared to other wards (123). Additionally, the reported bed-day costs are averaged across patients' stays, and costs are likely to be higher in the earlier stages, when patients are more acutely unwell. Therefore, AMUs may appear to have higher bed-day costs because only those more acute (and thus more expensive) days are measured, whereas inpatient stays also include days when patients have less acute needs, which reduces the average daily cost. However, in any health system, a strong business case is required to introduce a new service, and this has been demonstrated for ED observation units, to support their implementation (143), and it has been suggested that through the use of observation units to avoid inpatient admissions significant savings could be made at a national level (141). Despite a lack of good quality evidence, and acknowledging the possibility of higher costs, NICE guidelines still recommended that AMUs be used to manage patients who are admitted with “undifferentiated medical emergencies” (123).

1.4.c Service Design and Parameters

As has been highlighted above, front-door services may be designed differently in different hospitals, although their overall aims remain similar. Unlike ambulatory care services, front-door services tend to accept patients for a range of specialities, including both body-system specific specialities (e.g. cardiology, nephrology, respiratory) and more generalist specialities (e.g. geriatrics, internal medicine, oncology) (144). Some front-door services may also accept surgical (53, 145, 146) or paediatric patients (146, 147).

In order to care for the patients in front-door services, there needs to be co-ordination with other teams within the hospital, such as pathology (146), radiology (132, 146), therapies and social services (132, 137), as well as a wide range of skills within the front-door team. This may involve up-skilling of some staff, for example to undertake phlebotomy to increase decision-making speed (146). Other investigations that may be available in front-door services include conducting ECGs (130, 143), running laboratory investigations (130, 143, 148), cardiac stress testing (128, 143), ultrasound scanning (137), undertaking comprehensive geriatric assessment and cognitive assessments (16) and continuous cardiac monitoring (148).

Treatments and interventions that may be provided in either AMUs or EOUs can include pharmacologic control of symptoms, cardioversion (130), intravenous antibiotic provision (137) and medication review (16). Referrals to outpatient and specialist services are commonly made from the AMU or EOU (7, 15, 129, 130). It is also important that carers are included in decision-making, where appropriate, especially around discharge, and suitable referrals (such as for home care support) can be made to support them from front-door services (16). The lack of consistency in service design also extends to inputs that are available to patients. Subsequently those listed above represent only a small proportion of the assessments and treatments provided to patients seen in these services, as different hospitals will provide different inputs, in line with national and local guidelines, technical capabilities of their staff and hospital, and patient requirements, among other considerations.

1.4.d Staffing

Staffing structures within front-door services are not dissimilar to those of ambulatory care teams, although it is more common for front-door services to be consultant-led, with patients being directly assessed by a senior decision-maker early in their episode of care. For front-door teams to be most effective they benefit from being multi-disciplinary (144), with doctors of different grades and nursing staff within the core team, and other healthcare professionals either as direct members of the team (124, 137) and/or providing rapid response when they receive referrals (132, 137).

Much of the discussion about staffing of front-door units centres around medical provision. A number of models have been trialled, including ‘consultant of the day’ (132, 133) (which has been identified as the most frequent design (7)), ‘consultant of the weekend’ (135), ‘consultant of the week’ (149) and appointing consultants specifically to work in the service (133, 136, 146). In all these models, the consultant is supported by a team of junior doctors, and spending time in these services can be a key component of junior doctor training during medicine rotations (149, 150). The value of having a consultant providing face-to-face assessments of patients, to make decisions and expedite discharges, instead of relying on the junior doctors to make these decisions – ‘consultant-delivered’ instead of ‘consultant-led’ care - has been assessed (53). It was found that having a consultant present reduced patients’ length of stay, without significantly increasing readmissions or mortality rates (151), thereby reducing inpatient bed pressures and increasing patient satisfaction (53). This may be part of why it is advised that, for AMUs to succeed, they should have strong consultant leadership, and patients should be seen within 12 hours of admission by a consultant (7). Different services have chosen to have different specialities of doctors staffing their front-door services, some are staffed by acute medicine clinicians (133, 136), some by ED clinicians (130, 142), some by a combination of both (146) and some by a rotating range of specialities (137). Some have argued that the optimal medical staffing of admission units is to have staff with a combination of generalist and specialist skills, in order to provide high-quality care, while still managing the unpredictable workload (137), and integrating staff from the ED and admissions unit has been found to reduce mortality and admission rates (146).

It is also vital for these services to have sufficient nursing provision. The pattern of this nursing provision varies (144), with the proportion of nurses to patients varying between services, but a ratio of less than 1 nurse per 5 patients has been identified as inadequate for this clinical setting (15, 142). Regardless of the quantity of nurses staffing any given unit, it is essential that they have sufficient training to manage their patient population (144). This training may be more or less formal, whether through a specific training programme (152), or experiential learning, rather than through front-door specific education sessions (153). There are specific demands on nurses caring for patients at the front-door, which are different to those faced by their ward-based counterparts (153). Part of this may relate to upskilling to expand their scope of practice to undertake medical tasks (129, 154), while also continuing more traditional nursing tasks, managing high levels of bed pressures and unpredictable demand for their service (153), and ensuring their diagnostic and assessment skills are suitably developed (152). In order to manage these patients, nurses in these services need to have a broad knowledge base, as their patients present acutely with numerous, often undifferentiated, clinical problems (123, 152, 153). There are also some front-door services which are either nurse-led (147), or primarily staffed by nurses, with doctors conducting ward rounds in the front-door unit alongside their work in other areas of the hospital (128). As well as staff nurses, Advanced Nurse Practitioners can also have an important role to play in front-door services, both through their extended scope of practice and by improving links and communication between nursing and medical staff (152).

In addition to medical and nursing provision, a number of other healthcare professionals are either present on, or readily accessible to, front-door teams. These may include therapists, pharmacists, social workers (140) and physician assistants (128), among others. Each of these professionals bring their own specialist skills and knowledge, to facilitate efficient, high-quality assessment, treatment and discharge of patients in front-door units. Therapists, including physiotherapists, can be instrumental in leading identification and facilitation of safe discharges, and prevention of unnecessary admissions, at the front-door, through their assessments and connections with other teams, such as those in the community (155). In some cases, physiotherapists, such as musculoskeletal physiotherapy practitioners in emergency departments, are in roles in which they can assess and diagnose patients at the front-door, without requiring input from medical or nursing teams, and use their own clinical reasoning to support these decisions. Meanwhile, in other units, therapy teams may focus on particular patient groups, such as those living with frailty, and facilitate high rates of same-day discharges (156). In addition to facilitating discharges, physiotherapists are also involved in providing holistic assessments and interventions at the front-door, especially for those patients who may have complex social or functional needs, and may set early therapy goals with patients, with the aim of improving overall care and helping to reduce patients' length of stay (157).

In order for these teams to work, all members must be committed to working together in a multi-disciplinary manner (144), as it has been identified that the combined skill set of professionals working in an AMU has an important impact on its success (123). To support this multi-disciplinary working, effective communication is key, and some services have introduced short daily MDT meetings, to discuss both individual patients and logistical challenges facing the service (144). A further role that multiple members of the MDT may have, which can in itself build team-working, as well as achieving its primary goal, is contributing to the education of other professionals within the team (152).

1.4.e Accessing Front-Door Services

Generally, patients access front-door services in a similar manner to accessing Ambulatory Care services – i.e. by referral from either the ED (e.g. (123, 130, 136)) or the community (7, 123, 153). It is often the nurses on these wards who are responsible for actually locating a bed for each patient, as well as facilitating patients' onward transfer out of the unit (153), most often to home or a ward within the hospital. Those patients who are discharged directly home may be followed up in an outpatient clinic shortly after discharge, potentially one run by the front-door unit acute medicine physician, which helps to reduce readmissions (136). A significant focus of many AMUs and EOUs is ensuring that patients do not remain in them longer than necessary, therefore emphasis is placed on ensuring that procedures exist to facilitate referrals and transfer or discharge out of the unit, in a safe and efficient manner (7, 129). This necessitates frequent location of care decisions, which the multi-disciplinary team caring for patients must engage in, in order to maintain the function of these front-door units, and facilitate accepting more admissions by releasing beds through discharge or transfer of the current patients.

1.4.f Advantages and Disadvantages of Front-Door Services

Although there are many advantages to front-door services, for both service users and health systems, there are also some disadvantages. From a patient perspective, front-door services can reduce both their length of stay in hospital (137, 149) and their waiting time in the ED (137), as well as reducing unnecessary admissions (129).

Additionally, patients in these services tend to see a senior doctor sooner (129, 145), and report higher satisfaction than those treated as inpatients (138), and have been shown to feel safe being treated in an AMU (129, 158).

Staff have also reported positively on their experiences working in front-door units, although these findings have been mixed, with other studies reporting increased staff stress and concerns related to these units (144), such as concern around the risk of inappropriate admissions to the front-door unit (129). There is likely to be some variation in staff satisfaction and concerns, in part due to the variation in service design leading to different experiences for different staff, along with diverse experiences and expectations prior to working in their front-door unit.

Due to the reduction in length of stay, and the subsequent bed days saved, lower costs to the health system have been demonstrated in some units (137), although this may vary between countries and services (129). The beneficial impacts of front-door services in increasing efficiency through merging resources and focussing on a more restricted clinical area have also been highlighted, especially for smaller hospitals (123), and national guidelines support the use of AMUs, despite their potentially higher cost, due to the improvements they can bring in patient survival (123).

1.5 Conclusion

While traditional, inpatient hospital care will remain a mainstay of modern healthcare, and there will always be patients for whom this is the correct, and necessary, location for them to receive care (9, 159), there are also other patients who do not require this. For those patients who do not require a full in-hospital stay after presenting to hospital, ambulatory care and front-door services provide two credible alternatives, each with their own advantages and disadvantages. For those patients for whom they are appropriate, ambulatory care and front-door services can shorten length of stay, increase patient satisfaction and provide equivalently effective clinical care, compared to in-hospital care. At a health service level, they can also reduce pressure on inpatient beds and potentially reduce costs. For all of these reasons, and others, encouraging appropriate use of these services is vital.

Further investigation of how both patients and referring staff feel about such services could help to improve communication between staff and service users around location of care decisions, especially as they are being made. Additionally, since both admission to an inpatient bed and management through either Ambulatory Care or front-door services carry risk, investigating the risk tolerance and attitudes of those involved in location of care decisions may help to understand aspects of how these decisions are currently made, and how this could influence future decision-making in this area. To address these considerations, this project will explore both of these areas – risk tolerance of relevant parties and how location of care decisions are made in the settings described in this chapter.

The primary aims of the quantitative work will be to explore risk tolerance, in financial and health domains, of patients, carers and healthcare professionals in acute medical services, and identify any patterns in sub-groups within this, as well as investigating the acceptability, and possibility, of discussing risk in a structured way with these populations. The keys aims of the qualitative interviews will be to explore physiotherapists' views and attitudes towards risk in location of care decisions, and to determine what factors influence physiotherapists' location of care decisions. The primary aim of the systematic review will be to determine whether front-door discharge decision aids operate at different mortality thresholds, and will explore readmission rates as a secondary outcome.

Given the centrality of risk to these decisions, and the importance of how participants in the decision treat that risk, the next chapter will explore concepts of risk, including exploration of theories of decision-making under uncertainty, since all clinical decisions, including location of care decisions, involve a degree of uncertainty. Following on from this, will be a systematic review focussing on discharge decision aids for use at the front-door. The methods and results of the two core components of this study will then be presented, bringing together the concepts and theories around risk and decision-making that will be discussed in the next chapter, with the clinical areas described in this chapter.

CHAPTER 2: INTRODUCTION TO RISK

Having explored the clinical area in which this research will be conducted in the previous chapter, this chapter will introduce relevant concepts about risk and theories of decision-making, including the theory that will be used as the theoretical framework. Risk is a key concept within location of care decisions in front-door and Ambulatory Care units, as all the potential care locations carry elements of risk, and as such it is important to explore this and have an understanding of some of the key concepts surrounding risk in assessing both risk tolerance and how location of care decisions are made, which are the key areas being investigated in this study. This chapter will initially explore key terms and concepts surrounding risk, and then discuss some of the key theories of decision-making, from both economics and qualitative perspectives, along with discussion of their strengths and weaknesses, especially in relation to this study. Finally, the key theory that will underpin the qualitative component of this study, Fuzzy Trace Theory (160), will be introduced.

Every individual has their own level of risk tolerance and risk preference, and their everyday behaviour, including in making healthcare decisions, will be influenced by this (161-163). This includes healthcare professionals and their patients. The influence of risk tolerance, acceptance of risk-taking behaviour, risk and time preferences, and attitudes towards uncertainty have all been investigated in the context of doctors and medical decision-making (161, 164-166). Some investigation has also been conducted into some of these factors among patients (161) and other healthcare professionals (167, 168), but the contexts in which this research has been conducted thus far are limited.

2.1 Key risk terms and concepts

There are many terms that are used in relation to risk research, some of which are used interchangeably and others which have more consistent definitions. The way relevant terms will generally be used in this work will be drawn from behavioural economics research. They generally fall into two categories - concepts directly about risk (e.g. risk tolerance, risk preference), and concepts about response to other circumstances (e.g. reactions to uncertainty (169)).

The term '*Risk'* itself can relate to cases where the probabilities of each potential outcome are known (170), or be used in a broader sense, encompassing many areas of people's lives (171). *Risk tolerance* refers to the amount of risk an individual is willing to take, while *risk preference* refers to their inclination to take a particular gamble (161) and incorporates a broader range of traits (172). An individual's risk tolerance can be influenced by numerous factors, including societal values (173), time at which the risk will pay-out (174), personality type (175), national per capita gross domestic product (162) and knowledge level (176) among others. An individual's risk tolerance for a given decision may also vary based on factors or "modifiers" specific to that decision which vary slightly from those of a very similar decision, such as accepting different levels of physical re-injury risk when considering allowing a sports player to 'return to play' in response to different potential mental health or financial outcomes for different people (173). An important aspect of how risk tolerance translates into actual decisions that are made is *risk perception*, which will be discussed later, as risk tolerance is the level of risk that the individual is willing to accept, and as such this decision must therefore be made on the basis of how much risk they perceive each potential outcome to carry.

Alongside risk tolerance is risk preference, which incorporates a range of traits. These traits may include risk aversion, positive / negative reciprocity, trust and altruism, and time discounting (172). *Risk aversion*, as the name suggests, refers to an individual's level of inclination or otherwise to take on a risk, and leads to people prioritising a definite outcome over expected value, even when the definite outcome is a lower quantity than the expected value (170). It relates to the experience of discomfort that one may have when facing uncertainty and may be associated with relevant prior life experiences, and how these are remembered, in relation to the decision in question (177). It is present in decision-making in many areas of life and has been researched in domains ranging from finance, to health, to life event milestones (178).

Positive and negative reciprocity refer to the actions one takes in response to the actions of others. Positive reciprocity is when someone rewards the kind or giving actions of another, potentially incurring a cost to themselves in the process, whereas negative reciprocity is the opposite – responding to unkind actions with punishment, even if this causes a cost to the 'punisher' as well (179, 180). *Trust* is closely tied to reciprocity when these traits are tested in experimental conditions, because they are commonly tested by asking two strangers to decide how much money to transfer to each other, in sequence, from an assigned quantity that the experimenter provides (172, 181). This requires trust to be extended on the part of the first person to make their decision (trusting that the other person will reciprocate) and honoured by the second person (in their choice to reciprocate) (182). In the context of risk literature, trust tends to be defined much as it is in everyday language, although there is not yet one agreed upon definition of it, even within individual fields which include its study (181). Trust is integral to decision-making where risk is involved, if there is another party involved in the situation, however, it has less importance in situations where one party is making a decision in isolation from any other, which is why it is tested in experiments involving two people, as opposed to selecting from price list lotteries (172).

Altruism in risk research has a similar definition to its commonly used one - behaving in an unselfish way, for the benefit of others unrelated to the individual (183, 184). An extension of this, which is linked to trust and positive reciprocity, is ‘reciprocal altruism’, wherein an individual behaves altruistically at one time, with the expectation that they will later gain a, potentially larger, pay-off from their partner in the interaction (183, 184), or even from an unrelated individual who has been the recipient of good deeds from separate donors (185). Altruism as a component of personality has been explored in some areas of healthcare, such as among physicians and paramedics, as decision-making behaviour is influenced by the individual’s personality characteristics (186).

Time discounting refers to the choices that people make when they trade-off between anticipated costs and benefits at various time points when faced with intertemporal choices, and includes any rationale for demonstrating less regard for future consequences, even elements that may reduce the expected utility in future (187). This is different to *time preference*, which relates to how much the decision-maker values the present over the future (161), and prioritises immediate pay-offs or outcomes above future ones, even if this potentially results in worse outcomes later (188). This is usually tested by providing choices between a pay-off immediately vs at a defined future time.

A further contributing factor to decision-making in any situation that involves risk is *risk perception*. This refers to the “mental representation” a person has of the risk, expressed through emotions and cognitive states (181), and influenced by their impressions and opinions of potential negative consequences from their choice (189). The level of risk that a person perceives to be associated with a choice will influence their behaviour regarding it, although this relationship does not always follow a negative correlation where a perception of increased risk reduces one’s inclination to engage in the behaviour, as might be expected (190). The role that risk perception plays in the decisions people make regarding health and lifestyle decisions has been investigated in various contexts (176, 189, 191) and it is a key component of many behavioural theories in a health context (189). One of the key considerations regarding risk perception in ‘location of care’ decisions in healthcare, centres around the level of risk that the decision-maker believes to be present in each of the possible care locations – e.g. iatrogenic or social risks of hospital admission, risks of not having 24 hour monitoring if not admitted, risks of moving in and out of a hospital repeatedly if being managed in an Ambulatory Care unit.

In addition to these concepts relating directly to risk and its management, how people respond to external, related factors will also influence their decision-making and actions when faced with risk. Two of the key concepts in this area, which may be particularly impactful in clinical decision-making, are ‘reaction to uncertainty’ (169, 192) and ‘tolerance of ambiguity’ (193). There are a number of potential definitions of these concepts (193). The terms may be interpreted similarly to how they would be in a lay context, although ‘uncertainty’ and ‘ambiguity’ are not synonymous with one another within behavioural economics, and do have separate definitions. ‘*Ambiguity*’ relates to a situation where the probability of each outcome is not known (170) or there is insufficient reliable evidence on which to base one’s decision (193); whereas ‘*uncertainty*’ is a broader term, incorporating both risk and ambiguity (194) – i.e. ‘Uncertainty’ relates to a situation where one does not know what the outcome will be (for example, whether a patient will develop a given condition, or how well a specific treatment will work (195)), and ‘Ambiguity’ relates to a specific part of uncertainty, where the decision-maker does not have enough information about the options they are choosing between, such as not knowing the probabilities of each potential outcome (for example, the probability of specific complications from two treatment options). Tolerance of uncertainty may be defined as the combination of various psychological responses, both good and bad, which are generated by being cognizant of not knowing certain things about a specific area (193). When considering these concepts as they relate to health-based decision-making the uncertainty and ambiguity that they incorporate tend to refer specifically to potential clinical diagnoses or outcomes (192, 194, 196). Reactions to, and comfort with, uncertainty may change with growing experience, and are not inherently positive or negative, but evidence suggests that discomfort with uncertainty among doctors can have potentially negative impacts on patients, such as increased testing and referrals, slower decision-making and the potential for differential diagnoses to be dismissed too quickly (192). Potentially negative effects of aversion to ambiguity among healthcare professionals have also been identified, such as high levels of aversion being associated with therapeutic inertia (where there is no escalation of treatment, or starting of new treatment(s) in response to current treatments not producing the desired benefits) (194). In addition to the impact on patients, high levels of ‘intolerance of ambiguity or uncertainty’, have been linked to poor psychological wellbeing among doctors and medical students (193). Many of these concepts around risk and decision-making are inter-linked and therefore cannot truly be viewed in isolation from each other.

There have been various studies into these characteristics in medical decision-making, including the development of scales specifically designed to identify physicians’ response to uncertainty (169, 175), which is a frequent component of clinical decision-making. Numerous factors will influence an individual’s risk tolerance and reaction to uncertainty, including whether the decision being faced involves a risk with a chance of gain or a risk with a chance of loss (165). In the case of medical decision-making, the determination of whether the risk involves a chance of gain or loss may not be clear-cut, and it is important to remember that there are multiple individuals involved in the decision, each of whom may have different risk preferences and tolerances, and therefore understanding whether these are similar or not is a key consideration (161).

In the context of many of the experiments that have been done to investigate these phenomena, it was clear whether the choice being faced related to a risk with a chance of gain or a risk with a chance of loss, as they were framed with financial rewards or losses (162, 172, 180, 197). However, in the context of healthcare decision-making, this differentiation may be less clearly defined, as both (or all, if there are more than two options) choices will carry potential rewards and risks. Complicating this further, is the fact that there are multiple stakeholders in making healthcare decisions, and they may view the potential rewards and risks of each option differently, and may perceive there to be different potential risks and rewards from those perceived by other stakeholders.

2.2 Experimental approaches to investigating risk tolerance and behaviour

Much of the work on identifying people’s risk tolerance and behaviour under uncertainty, and attempts to explain these findings, was done from an economic perspective (197-199). This was then extrapolated to other domains, including health. Debate remains over whether measures of risk tolerance in the financial domain can be linked or extrapolated to non-financial settings, but studies support the concept of making these links (163). Work has also been conducted specifically focusing on health or medical decision-making (160, 200-202), although much of this has centred on professionals' decision-making, while there is very limited investigation of risk preferences among actual patients (203) . Both methods are important, as some aspects of how people make decisions will be apparent in making both financial and health-related decisions, while there are other aspects that will not translate directly from financial to health contexts. For example, effects of health-related decisions may have more long-lasting, or permanent, impacts on multiple areas of a person's life, and quality of life, in a way that financial decisions may not.

One reason for conducting specific health-focussed decision-making research is that the potential outcomes of a financial decision can be pre-determined, but the outcomes of a health-based decision cannot. Efforts have been made to overcome this by presenting hypothetical health-related situations in a comparable way to financial ones, in experiments investigating participants' risk preferences in health and financial domains (203, 204). For example, participants may be asked to imagine that they have an unspecified disease and are being given two treatment options, either providing a higher probability of a short period of good health versus a lower probability of a longer period of good health; or a certain period of good health versus a 'lottery' option which may give a longer or shorter period of good health (204). This aims to mirror the way in which financial options are presented in these experiments (203, 204), and will be used in this study. One of the main differences between such lotteries is that in the case of financial experiments the participants may be given 'real' choices in which they can actually receive money (e.g. (163, 174, 205)), whereas this is not possible in health-based decisions. In other experiments, the financial lotteries are presented as hypothetical choices (e.g. (203, 204)), or combine hypothetical and real pay-offs or questions (e.g. (206, 207)). In addition, there may be further ethical concerns with conducting experiments involving real money, especially in a healthcare context, and therefore some studies conducted in a healthcare setting have used hypothetical payments and/or periods of ‘healthy time' to assess and compare health and financial risk preferences (203, 204).

A variety of theories of risk and decision-making have been developed based on these types of experiments, primarily from the financial lottery experiments. A number of the key theories in the field of decision-making under conditions of risk are discussed below.

2.3 Key theories of decision-making and theories developed in relevant settings

Multiple theories exist in the field of decision-making (197, 198, 208), some have also been investigated and developed specifically in a healthcare context (160, 200-202, 209, 210). A brief introduction to some of these key theories is given below.

2.3.a Expected Utility Theory (208, 211)

Expected Utility theory (EUT) was first suggested in the early 18th century (208), and although it was not initially accepted, it became the leading accepted theory for analysis of decision-making under risk for a considerable portion of the 20th Century

(197, 212), after it was re-examined and extended upon (211-213), and it remains a cornerstone of many economic theories (213). It is based on the principle of individuals making rational choices, and was developed in an economic context (197, 208), to address various observations about behaviour in relation to taking financial chances (208). A key consideration that inspired this theory was to address a conundrum (the Petersburg paradox) proposed originally by the author's cousin, in which, despite the theoretical potential for an infinite pay-off from a coin-flip game, people would only stake small amounts of money to play (211, 213). To address this, EUT posits that people choose to optimise 'expected utility' instead of expected financial value when making economic choices. 'Expected utility' accounts for the individual background circumstances of those making decisions, and therefore acknowledges that although the financial gain (or loss) may be equal for different people, their circumstances will influence the 'utility' of that gain, or loss, for them. Thus the expected utility varies between people, as an individual with greater pre-existing wealth will value a given pay-out less than an individual with less pre-existing wealth (208). This initial theory was expanded upon in the mid-20th century by von Neumann and Morgenstern (214), who developed a series of axioms that explained the choices made according to EUT as being rational (211, 212). Ultimately, the core principle of EUT is that decision-makers will prefer the option with the higher expected utility (211). However, a number of issues were identified with this theory when it was tested experimentally, as people did not always make the 'rational' choice (as defined by EUT), and a series of behaviour patterns were identified, which contravene the axioms of EUT (197, 213). This led to alternative theories being developed in more recent years (213), which seek to address these findings.

2.3.b Prospect Theory (197)

One of the leading theories that was developed as an alternative to Expected Utility Theory, which sought to explain the experimental findings that were inconsistent with EUT, is Prospect Theory (197). Over time, a series of behavioural economics experiments were run, in which participants made hypothetical choices between pairs of financial options ('prospects'), in which at least one option included an element of risk. These experiments highlighted a number of systematic violations of the axioms of EUT. One of the most important experimental findings for the initial development of Prospect Theory was what is now known as the 'Allais paradox' – participants are asked to indicate their preference in two pairs of options:

1. Please choose whether you would prefer Option A or Option B:
   A. Definitely receiving 100 million
   B. An 89% chance of winning 100 million, a 10% chance of winning 500 million and a 1% chance of winning nothing
2. Please choose whether you would prefer Option C or Option D:
   C. An 11% chance of winning 100 million and an 89% chance of winning nothing
   D. A 10% chance of winning 500 million and a 90% chance of winning nothing

When presented with these options, most people chose Option A and Option D, which violates the independence axiom of EUT (215). This problem was presented in 1953 by Maurice Allais, a French economist, and the 'certainty effect' that it demonstrates, in which decision-makers value definite outcomes over probable ones, is a key underpinning principle of Prospect Theory (197).

Further experiments like those described above were conducted to investigate how people responded when faced with decisions between prospects involving potential losses instead of potential gains. To do this, the authors used the same numbers and probabilities as used in some of their previous experiments, but with the potential gains now as potential losses. When they analysed the responses, they found that preferences in the loss experiments were the reverse of those in the gains experiments – i.e. most people chose a lower definite gain over a possible higher one when faced with potential gains, but chose a higher possible loss over a definite lower one when faced with potential losses. This was termed the "reflection effect" (197). Other experiments investigated how people dealt with multi-step decisions (e.g. where the actual outcome is determined based on the outcome of multiple chances or decisions), during which they discovered that people tend to dismiss common elements between options, in order to make a choice based on only the elements that are different between options. This finding was extended in experiments investigating the impact of option framing on the choices made. For example, the following problems were presented to people:

3. You are given 1000, and asked to choose option A or B:
    A. 50% chance of gaining 1000
    B. Definitely gaining 500
4. You are given 2000, and asked to choose option C or D:

C. 50% chance of losing 1000
D. Definitely losing 500

Most people chose option B in question 3 and option C in question 4, despite the fact that the potential end results are identical – options A and C both result in the person having either 1000 or 2000, and options B and D both result in the person having 1500. This perceived ignoring of the common element in the two problems, to focus on the resulting change in wealth instead of the end result, became the key underpinning concept of Prospect Theory – that the utility which people consider when making a choice is the change in wealth the choice may produce, not what their total wealth (including pre-existing wealth) will be as a result (197).

This concept is interpreted to mean that people will make rational choices, driven by the change in circumstance (e.g. financial) from a reference standard (e.g. zero) that could result from either choice, not on the final state the person could reach (as EUT would suggest). Prospect Theory proposes that there are two key phases of decision-making, an ‘editing phase’, in which people simplify the choices (prospects) presented to them in a number of ways, followed by an ‘evaluation phase’, in which people choose between the edited (i.e. simplified) prospects, to pick the one with the highest value. Examples of ways that prospects may be edited include separating outcomes that are certain to occur from ones that may occur, rounding of probabilities and/or outcomes, and discarding extremely unlikely outcomes. The authors also report that when evaluating prospects, the perceived differences in quantity reduce as the magnitude of the baseline increases (e.g. the difference between gaining (or losing) 100 or 200 seems greater than the difference between gaining (or losing) 1100 or 1200). The context in which a prospect is presented may influence how it is edited and interpreted, but ultimately it is assumed that the decision-maker will select the prospect that they view as having the greatest value (197).

Although this is a very well-established theory, it has two main limitations in the context of the decisions being investigated in this project: 1) it was developed using economic decisions, which may vary from healthcare ones, especially as the reference standard that one starts from in health will differ between potential participants; and 2) it assumes that humans will always act rationally, and does not accommodate for the role of emotion in decision-making, although it does accept the possibility of outside circumstances influencing choices. It has been shown that humans do not always make decisions in a purely rational manner, and emotions and previous experiences can, and do, influence their decisions (216-218). Others have tried to address this in their theories of decision-making.

2.3.c Regret Theory (198)

Regret Theory was proposed in response to Prospect Theory, and aims to offer an alternative, simpler explanation for Kahneman & Tversky’s (197) findings showing that people make choices that violate the tenets of Expected Utility Theory (EUT), while still asserting that people make rational choices (198). It was developed using the results of Kahneman and Tversky’s experiments. The basic principle Regret

Theory is based on is that one’s experience of the consequences of an action is mediated by what the consequences would have been if another action were taken, given that there are a set number of potential ‘states of the world’ which result from different actions (decisions) that the individual makes. This requires that by discovering the outcome of the action they did take the individual now knows what the outcome would have been had they taken a different action. If taking a different action to the one taken would have resulted in a better outcome, the individual will experience “regret”, while if another action would have led to a worse outcome the individual will experience “rejoicing”. Experiencing either of these will moderate how the individual experiences the actual outcome of their decision by increasing the intensity with which the individual feels negatively or positively about the outcome, compared to how they would have felt if the same outcome had arisen through circumstances outside their control. For example, the pleasure of winning £50 on a bet that the individual placed will exceed the pleasure from gaining a £50 reduction in tax, and vice versa for losses. This theory therefore posits that individuals will account for the potential to experience regret or rejoicing when making decisions, and choose the action that they believe gives the greatest “mathematical expectation of modified utility” (198).

This theory does account for some of the common violations found in Expected Utility Theory, but it does not account for them all, and still relies on a number of assumptions, which continue to be violated in some circumstances. At its core, Regret Theory requires less assumptions than Prospect Theory does, while still explaining many of the same violations of EUT, which may be seen as an advantage of Regret Theory over Prospect Theory. When applied to medical decision-making, Regret Theory has some relevance – for example, it is logical to accept that people will endeavour to anticipate the outcome of decisions and aim to minimise regret, and by extension maximise rejoicing. However, as with Prospect Theory, Regret Theory was developed based on people's responses to financial choices, which may not be directly applicable to health-based choices. Additionally, as it includes a component of accounting for emotional response to outcomes, the experience of these (regret and/or rejoicing) may be experienced differently when the outcome relates to health rather than finance, and this difference in anticipated reaction may alter the decision-maker's choices. Finally, it is based on the assumption that, once the decision has been made and the actual outcome revealed, one would know what the alternative outcome would have been. This is generally not the case in medical decision-making, where it is unusual for any choice to have an entirely predictable outcome, and therefore even knowing the outcome of the choice that was made would not prove what the outcome of a different choice would have been. This could allow for either regret or rejoicing in response to the actual outcome, since not definitively knowing what the outcome would have been if a different choice was made means that one may assume that the alternative outcome would have been better or worse than the actual outcome. These factors may undermine Regret Theory's relevance to health-based decision-making to some degree.

2.3.d Game Theory (210)

Attempts have been made to apply some theories of decision-making that were developed in non-healthcare contexts to clinical decision-making. One of these is Game Theory (210). Game theory was developed in the first half of the 20th Century (219), and accounts for situations where more than one person has an impact on the outcome. In the context of medical decisions, this could be the doctor and the patient, since the patient remains able to accept or reject the doctor’s suggestions as they wish. Where other decision theories, such as Expected Utility theory, calculate the expected utility of each potential outcome and then advise that the choice with the greatest expected utility be taken, Game Theory allows for more than one person to make a choice, and calculates expected utilities for all of these combined options, against one stated goal. For example, if there are two treatment options, with a potentially risky way to decide which to implement, and the goal is to maximise survival rate, the doctor can suggest taking the risky test or not, and the patient can choose to accept or reject that suggestion. This leads to four potential outcomes (both agree to testing, doctor suggests not testing but patient disagrees and has testing elsewhere, doctor suggests testing and patient rejects it, or both reject testing), for each of which a utility can be calculated. By entering those utilities into an equation, an ‘optimal strategy’ can be identified to achieve the goal (maximising survival rate), which advises the frequency with which each party in the decision should choose each option – e.g. how frequently the doctor should suggest testing, and what proportion of patients should agree to this. However, it does not give a suggested choice for the individual, only for how often each choice should be taken if the situation is repeated (210).

One of the challenges of applying Game Theory to clinical decision-making is that it cannot, and does not, account for all the nuances and specifics of an individual situation, and using it necessitates ignoring some of these factors despite their potential relevance (210). In the context of healthcare decisions, there are likely to be multiple factors and considerations in play, and the likelihood of the decision-makers basing their choice on only one goal (e.g. survival rate), without any reference to other factors (e.g. quality of life) is low. In addition, Game Theory does not account for conflicts in decision-makers' goals, and assumes that these are aligned. For example, in the scenario presented above, maximising survival rate was given as the goal of the patient and the doctor, but if the patient's goal is improved quality of life, or the doctor's goal is avoiding development of other co-morbidities, then their goals do not align with one another, and the calculation cannot be used in the same way. Its application becomes more complex and the choices that each party should make to achieve their optimal strategy can become contradictory to one another (210). Finally, Game Theory can be reliant on knowing specific probabilities of outcomes given different choices, and this information may not be readily available to those faced with such a decision. Even when these probabilities are known, and the patient and professional share one goal, Game Theory still cannot be used to guide that specific decision, as it is designed to maximise a set goal overall. Therefore, given that there are likely to be multiple competing goals for each individual involved in the decision, that these are unlikely to align fully with those of other decision-makers, that specific probabilities may be needed but are often unknown and that Game Theory aims to guide decisions overall to maximise a given outcome rather than relating to an individual decision, Game Theory may not be practically applicable to individual healthcare decisions. It may, however, have a role in public health decision-making (220).

Where attempts have been made to investigate using Game Theory to inform healthcare decision-making, some important considerations have been addressed, which are not present in the previously discussed theories. The most relevant of these is the interaction between multiple parties involved in a decision that affects both themselves and the other ‘player’ (i.e. healthcare professional and patient). This interdependence between the players, in which the eventual outcome is determined by the decisions of both parties, is a core assumption of Game Theory (220). This, in turn, has contributed to showing how previous experiences of interactions, and anticipation of future interactions, can influence choices as parties act in line with how they anticipate the other ‘player’ deciding, and as such can increase co-operation and care quality if they anticipate future interactions (219).

Overall, although Game Theory has theoretical applications to the healthcare decision-making process, and it does account for the fact that healthcare decisions involve more than one party, who may each make different choices, it is not especially applicable when making individual healthcare decisions (although it may be more useful when considering public health decisions). It is also still based on the idea that humans will act in a rational and strategic manner, which evidence has shown they do not always do (219). Therefore, although it may be more applicable to health-based decision-making than the previously discussed theories, Game Theory will not be used for analysis in this study, as its relevance in application to choices about specific, individual decisions is limited.

2.3.e Threshold Approach (200)

There are some theories of decision-making that have been developed specifically in relation to clinical or health-based decisions. One of these is the ‘Threshold Approach’ (200), which aims to describe and guide clinical decision-making. Initially it considered decisions where physicians’ choices were limited to providing or withholding treatment, and focussed on a ‘therapeutic threshold’, at which the value of providing or withholding the treatment is equal. By estimating the probability of the disease in question existing in the patient, and comparing this probability to the ‘therapeutic threshold’, a determination of whether to provide (if the disease probability is above the threshold) or withhold (if the disease probability is below the threshold) treatment can be made. This approach was then expanded to situations where the clinician has three options – to withhold treatment, give treatment without testing, or to test to determine appropriate treatment (200). This version of the theory uses two ‘thresholds’ to guide clinicians’ decisions – a ‘testing’ threshold (the point where the value of testing and of withholding treatment is equivalent, i.e. they have equal expected utility), and a ‘test-treatment’ threshold (the point where the value of testing and of providing treatment is equivalent, or have equal expected utility), in combination with the probability of disease. By identifying the probability of disease relative to these two thresholds, the clinician can be guided in what course of action to take – if the probability of disease is less than the ‘testing’ threshold, treatment should be withheld, if the probability of disease exceeds the ‘test-treatment’ threshold, treatment should be started without testing, and if the probability of disease falls between the thresholds, testing should be done to determine whether to start treatment. In this theory, ‘disease’ can refer to any single cause of ill-health (excluding trauma) and is not limited to any particular group of diagnoses. The treatment under consideration is assumed to have clear benefits if the patient has the disease, but also has side effects, which will occur regardless of whether the patient has the disease or not. The potential test that can be done is assumed to provide additional diagnostic information, which can be used to guide the treatment decision, but it does not have 100% sensitivity and specificity (200). Due to these, realistic, concerns the goal is to provide the treatment only to those patients who have the disease, and will therefore benefit from it despite the side effects, without unnecessarily exposing them to the testing, which may produce false positives or negatives, and without withholding treatment from any patients who do have the disease.

The thresholds are determined using information about the risks and benefits of the treatment in those with and without the disease, the risks of testing, and the reliability of the test. The risks and benefits of treatment, and the risks of testing, are calculated by considering the utilities of each potential outcome. How utility varies between providing and withholding the treatment, in patients who are known to have the disease determines the overall benefit of treatment. The overall risk of treatment is the difference between the utilities of providing or withholding treatment as well, but in patients who are known not to have the disease. The overall risk of testing is determined from the difference in utilities of a given outcome occurring, when the patient has and has not been exposed to the risk that testing poses. Test reliability relates to the test's sensitivity and specificity, which will vary between tests. Where sensitivity and specificity for the specific situation cannot be determined from published evidence, expert opinion may be used. All of these factors contribute to determining the expected utility of any given outcome, with the clinician expected to select the option with the maximum expected utility. The eight possible outcomes are to provide treatment (when the patient does or does not have the disease, with or without testing) or to not provide treatment (when the patient does or does not have the disease, with or without testing) (200).

Having determined the thresholds, the clinician then needs to estimate the probability of the patient having the disease, so that this probability can be compared to the thresholds, to determine the course of action to be taken. Probability of disease is determined by the clinician from published evidence on disease prevalence, alongside clinical examination and any laboratory results that are available. Once a numerical value has been attached to each threshold, this is compared to the probability of the patient having the disease, and the point where this probability falls in comparison with the thresholds determines the course of action to be taken, with each of the thresholds being the points where the clinician has no preference one way or the other regarding either withholding treatment vs testing ('testing' threshold), or between treating vs testing ('test-treatment' threshold) (200).

This theory was developed specifically for clinical decision-making of physicians, does incorporate both ‘hard’ and ‘soft’ outcomes when considering treatment value and allows integration of data from multiple sources. As long as the utility of each potential outcome is expressed on the same scale, the specifics of what the scale measures can vary to accommodate what is most important to the people involved in the decision. This may be, for example, mortality, quality-adjusted life years, proportion of patients surviving without complications, or more personal, potentially subjective, considerations such as the patient’s personal views on risk, among of other factors. This means that the Threshold Approach can be adapted to individual situations, and accounts for some of the factors specific to healthcare decision-making, but may not be applicable in decision-making in other life domains. It also accounts for some of the realities of healthcare decision-making, such as the fact that diagnostic tests do not generally have flawless accuracy (221), and that testing itself has risks. Also, by requiring the decision-maker to select a risk threshold, it forces consideration of the benefits and risks of each of the available options, which in turn means that the net benefit of each option is considered, which is a good way to compare rules around test usage (222).

However, it is also reliant on calculation of specific thresholds and disease probability for each individual or situation, for which adequate data, and time, may not be available. Additionally, correct use of the Threshold Approach is reliant on an accurate, numerical estimate of the probability of disease, and it has been shown that there is notable inter-rater variation between doctors in this, and that they tend to over-estimate the probability of diseases in patients (223). Compounding this challenge is the issue of variation in stated diagnostic test accuracy, with different studies using different cut-offs for abnormal results, leading to differences in sensitivity and specificity of the same test in different studies (224). In addition, the Threshold Approach is only applicable to certain clinical decisions, and there will be others, for example where testing is needed in order to treat, where the decision is between multiple treatment options, or where there is no suitable diagnostic test available, where it cannot be applied. It allows for some variations away from a strict ‘start treatment vs don’t start treatment vs test’ situation, such as when deciding whether or not to continue a treatment that has already begun, but ultimately this approach can still only be used when the eventual outcome is whether or not the patient is receiving a specific treatment at the end of the decision process. It also focuses specifically on decisions regarding treatment, which may not be directly applicable to the present study, as the key decision under consideration relates to location of care, which in itself is not a provision or withholding of treatment, and treatments can potentially be provided (or withheld) in any of the possible care locations.

2.3.f Prism model of ethical decision-making (202)

The prism model was presented to explain the ethical decision-making process of occupational therapists (OTs). The key principle of this theory is the centrality of the individual decision-maker to the process of decision-making, visualised as them being centrally placed within a prism with separate points around them. It highlights the importance of factors intrinsic to the individual decision-maker, especially their “dominant personal ethics foundation and personal values” (202). One’s ‘dominant personal ethics foundation’ is an intrinsic and deep-seated approach to scenarios where a potential ethical concern exists, and it influences the decisions that the individual makes in these situations. An individual may not be aware of what their dominant ethical foundation is, but it still provides a point of reference that they can return to, to help them navigate ethically challenging situations and decisions. This foundation may include concepts such as treating others as you would wish to be treated, respecting autonomy, or aiming to achieve the most good for the most people, among others. This does not mean that decision-makers do not take other ethical perspectives into account, but their dominant foundation is the principle that they can always depend on as a basis. People may be more explicitly aware of their personal values than they are of their ethical foundation and may be able to discuss how they incorporate these values when making ethical decisions. In some instances, these personal values may align with professional values, which can make ethical decision-making easier, but in other scenarios personal and professional values may contradict each other, which can make ethical decision-making more difficult (202). With these concepts at its core, the prism model of ethical decision-making then states that ethical decisions are made by OTs in three stages – Consideration of key factors to the decision, Discussion with others (if appropriate) and “Doing what’s right” (202). It is in this last stage that an actual decision is reached and actioned.

The first stage, where key factors are considered, involves thinking about the various factors that are important for the decision, and are referred to as being part of the “fundamental checklist”. In the prism representation, these factors are placed as points of the prism, getting progressively further from the central decision-maker in order of relevance, with the most important (commonly the service user) being closest to the centre. These factors are then considered iteratively, with each factor being progressively added, and considered in reference to all previous factors, until all those that the decision-maker feels are relevant have been considered and incorporated, each generating a “push and pull” effect on the direction of decision-making. VanderKaay et al. (202) identified six key contributing factors (although others may be relevant to specific situations): service user and family, influences from an organisation standpoint, “theories and evidence”, “professional regulations”, the MDT and legal considerations.

In some situations, a decision can be made and acted upon immediately after considering the fundamental checklist factors, but in other situations another step follows – discussing the situation with others. There could be a range of people and institutions who may be engaged in this discussion process, for their differing perspectives or relevant expertise. This may include colleagues and/or other healthcare professionals (both peers and senior team members), legal or ethical resources and staff, regulatory bodies, and in some circumstances those external to the organisation or team (such as influential community leaders or expert clinicians or researchers). The form that these discussions can take varies as well, and essentially involves reviewing the considerations of the ‘fundamental checklist’ with the other party, or parties. This may facilitate developing a wider clinical perspective or allow additional ideas to be raised through discussion, it may also provide the decision-maker with support and/or protection, and may allow them to access specialist advice or knowledge that is beneficial to the decision-making process for the specific clinical situation they are facing.

The final stage of the decision-making process in the Prism model of ethical decision-making is referred to as “Doing What’s Right” (202). This is the stage at which a decision is reached and action is taken. The overarching aim of OTs in making ethical decisions was reported to be reaching a decision that they felt comfortable with and felt was the best they could do for the patient. There are three main routes to achieving this – satisfying all requirements (the simplest option, where accounting for all contributing factors is achievable without conflict), “accepting limitations” (when not all needs could be met, due to external factors over which the decision-maker has little to no control, so the best decision within that situation is made. Achieving acceptance may be aided through documentation and advocating), or “assuming the consequences” (when at least one contributing factor is deliberately bypassed in an effort to act in a way that feels right, despite the possible risks or consequences of this. These consequences tend to be the potential for a negative effect on the OT professionally, in order to achieve a better outcome for their patient) (202).

As this model was developed specifically from interviews with OTs, and is thus closely tied to how clinical decisions are made, it accounts for many of the ‘real-world’ challenges these decisions can pose, and may be more easily ‘translated’ to be applied to other healthcare professionals. This may be especially true of applying it to physiotherapists as they often work closely with OTs, and there can be notable overlap in their professional boundaries and roles (225), especially with increased skill-sharing between professionals (226). However, it may be less applicable to how patients make decisions, since the population from which it was developed only included OTs, who may be more used to making ethical decisions, and reflecting on both their decisions and how they were reached. In addition, this theory relates to how OTs make ethical decisions in the context of their job, and thus relates to a more common type of decision in their life than if the theory were applied to patients, who may be making such decisions far less frequently. Further to this, a number of the steps that OTs are reported to take in making ethical decisions, according to the prism theory, directly relate to their use of, or reference to, professional resources, which would not be available, or appropriate, to patients. As with many decisions in healthcare, the circumstances of location of care decisions around Ambulatory Care and front-door services could often mean these decisions may be considered to be ‘ethical decisions’, at least from the perspective of the staff. There are some aspects of this theory that may be applicable to patients as well as OTs, or other healthcare professionals, such as the centrality of the decision-maker and their underlying values and ethical foundation to the decision that is made, but this does not outweigh the limitations of applying this theory in this study.

2.3.g Coping in Deliberation (CODE) framework (227)

In contrast to the two previously discussed theories, which concentrated on the decision-making process of healthcare professionals, the Coping in Deliberation

(CODE) framework instead focuses on the inter-linked processes of deliberation and coping in patients who are faced with health-based decisions. Specifically, it applies to situations when patients need to make ‘preference-sensitive’ healthcare decisions, i.e., those where there is no obvious, medically advised option, and therefore the patient’s values are vital to the decision-making process.

‘Deliberation’ refers to the multi-step process that patients go through when faced with a health threat, about which they need to make decisions. This process, and the decisions made, will be influenced by a number of factors, including the information provided to the patient (including what parts of that information they retain and how they understand it), the patient’s beliefs and values, previous experiences, emotions (both at the time and those that the patient anticipates) and available social support. The stages in this deliberation process can be broken down into three groups – Pre-decisional deliberation (comprised of presentation of the health threat, for example a diagnosis or risk assessment, and the patient’s choices, which the patient begins to interpret), Decisional deliberation (during which the patient constructs their preferences, based on the information gathered and interpreted in the first stage, and reaches a decision), and Consolidation (which is in part a type of coping, and helps defend the patient against future regret over their decision). Emotions can play a large role in this process, as they are used as a proxy for risk interpretation when people have difficulty understanding their risk, and, although people have been shown to be poor at accurately predicting the potency and length of time over which they will experience future emotions (228), consideration of these anticipated emotions contributes to the decisions people make. Therefore, emotions can contribute to both cognitive and emotional decision-making during the deliberation process in patients faced with healthcare-based decisions (227).

The second element of this framework relates to Coping. Patients who are engaged in making decisions about their care need to cope with a range of issues, including the fact that they are, or are at risk of becoming, unwell, that there are multiple options available to them and they have to participate in picking one, and they need to think about all these available options and what the possible outcomes of each one could be to support the decision-making process. A two-stage cycle of coping processes is described, based on the earlier work of other academics. The stages, which do not have to occur in order, and can each be returned to as needed, comprise a ‘primary appraisal’ stage, where one assesses the health threat from an emotional and cognitive perspective, and a ‘secondary appraisal’ stage, where one considers their available coping resources (227, 229). The primary appraisal will be based upon the information the patient has, and how they interpret it, with regards to the threat’s impact or pertinence in their life, its cause, timeframe, chances of control, severity and potential results, among other things. The ‘coping resources’ that are considered in the ‘secondary appraisal’ stage are of two types, although they can overlap – problem-focussed and emotion-focussed. Problem-focussed resources are more practical and aim to address the health threat and other practical concerns, while emotion-focussed resources concentrate more on managing the emotional effects that the threat generates. These resources may be external (e.g. social, economic) or internal (e.g. previous experience, self-esteem) to the individual, and may vary between individuals faced with the same threat (229). The specific coping strategies available to an individual, and how they are able or willing to implement them, will vary greatly between people. The appraisal and application of coping strategies continues in an iterative process, until the outcome that the person wishes for is achieved, with different strategies being applied depending on the requirements and specifics of the situation (227).

These two core components, Deliberation and Coping, are combined in the Coping in Deliberation (CODE) framework, where it is highlighted that engaging with situation appraisal and using coping strategies allows people to effectively deliberate and reach a decision, which is informed and accounts for their personal values. These two components complement each other, as the coping strategies help the decision-maker to manage their emotions, such that they can productively deliberate and reach a decision. In their presentation of the CODE framework Witt et al. (227) represent it visually, with the components of deliberation on one axis, and those of coping on the other. This aims to demonstrate that people do not have to progress through the steps in a unidirectional way, and may instead move backwards and forwards among them, only engaging with those that are relevant to them and their current situation. The framework is designed to be adaptable to many scenarios in making healthcare decisions, with broad questions to guide thinking, which can be used, adapted, skipped or added to as appropriate for the individual and the decision they are facing. The final stage shown in the framework is ‘Consolidation’, which is a form of coping, and occurs to try to protect the decision from future regret. Its inclusion in the framework is a way of recognising that whatever decision is made will have a longer-term impact on the patient’s life after the decision is made and action taken (or not taken) as a result (227).

This framework was developed to explore the patient perspective in making preference-sensitive healthcare decisions, and may be useful to them in guiding this process. It could also be used by healthcare professionals to help them gain a better understanding of how their patients make these decisions, and subsequently may help them engage more effectively in shared decision-making, as well as contributing to development of patient decision-support aids, by providing a theoretical basis, which has been missing from a number of those developed previously (230). However, these benefits are somewhat theoretical, as the framework is designed to be as broadly applicable as possible, and therefore requires some adaptation for use with specific decisions, such as the version adapted for decisions around risk-reducing salpingo-oophrectomy (231). This framework could be applicable to the decisions that are being studied in the current project, around location of care choices for acutely unwell patients, as the reason that these decisions can be difficult is because there is not an obvious, medically advised option – there may be multiple viable locations of care. However, as this framework was developed from the patient perspective, and a significant component of it focuses on factors that are very individual to each patient, it may not be especially applicable to examining how healthcare professionals reach their decisions in a professional capacity. The CODE framework provides both a theoretical understanding of how patients reach decisions in circumstances where they need to make a health-based decision that does not have an obvious choice, and a tool that could be used by patients and their healthcare team to help them make these decisions. As such, it could theoretically be used as a basis for developing a decision-support tool for patients and healthcare professionals to use in future to support location of care decision-making, but due to its strong patient perspective on the decision-making process it cannot be readily applied to professionals' decision-making, and thus is not suitable for this study.

All of these theories have benefits and drawbacks in relation to the current study and assessing the risk tolerance and views of staff, patients and carers in a healthcare context. The initially discussed theories are heavily focussed on an economic basis, which may not fully capture the impact of the type of decision being made – i.e. there may be differences in people's risk tolerance when faced with economic decisions compared to being faced with healthcare-related decisions, as the potential impact on one's life from the outcomes of these two types of decisions is very different. The latter theories discussed above are applicable to health-based decisions, however they focus heavily on only the healthcare professionals, and not the patients (or carers) who should also be involved in the decision-making process, or vice-versa. Therefore, a different theory will be used in this study: Fuzzy Trace Theory (FTT) (232), which focuses on the way in which people make decisions and access information to support this process, and as such is not limited to one domain or group of people. FTT is outlined below, with the rationale for its use in this study, and the theory will be discussed in greater depth in Chapter 5.

2.3.h Fuzzy Trace Theory

Fuzzy Trace Theory (FTT) states that humans reason based on two ways of representing the relevant information – ‘gist’ and ‘verbatim’, of which they are more reliant on gist, especially as age and experience increase (233). In this context, these two concepts can be interpreted similarly to how they may be in more general language, although ‘verbatim’ includes a wide range of specific information, as opposed to only that which is delivered verbally. ‘Gist’, meanwhile, is the individual’s qualitative or subjective understanding and interpretation of the information, which has multiple influences (160) and varies between individuals. People tend to rely on a combination of gist and verbatim representations when making decisions, but tend towards using the most basic gist that they appropriately can for a given situation (160).

In comparison to the other theories outlined above, FTT has some notable advantages for this study. Although FTT was not developed specifically for clinical decision-making, unlike some of the latter theories described above (200, 202, 227), it has been more successfully applied to this field than a number of the economic theories described, and does incorporate some proportion of the inherent uncertainty in healthcare-based decisions, which may not be present in financial decision-making. It has also been offered as an alternative, potentially better, explanation to Prospect Theory for the apparently irrational choices that people make in relation to framing effects (234). Additionally, its more general approach to theory development means that it can be applied to multiple parties in location of care decisions, such as staff, patients, and carers, rather than focussing on just one of these parties, as some theories developed specifically within healthcare do. It also incorporates both specific (verbatim) information, which may align more closely with evidence-based medicine, alongside human nature and interpretation (i.e. gist), which vary in all stakeholders in the decision, and thus accounts for how different parties may view the same information differently. This may lead to decision stakeholders having different goals, which some previous theories have tried to address (e.g. (200)), but others have not (e.g. (210)). Since FTT focuses on the decision-making process, as opposed to being developed around any specific decision, it may thus be a widely applicable theory to explain decision-making processes among all those involved in making healthcare-based decisions.

However, there are some criticisms of Fuzzy Trace Theory. Among these, it has been raised that FTT does not account for differences in an individual's ability to remember some things with more clarity than others, for example being able to recall breeds of fish with excellent clarity but struggling to remember more basic details about another topic (235). FTT does not generally seem to differentiate between these differences within one individual when explaining their decision-making. This may pose a challenge in applying FTT in practice, as it would not necessarily be known which topics an individual would retain a clearer verbatim representation of, and therefore how this may affect their decision-making. Additionally, there may be occasions when comparisons based on the simplest gist interpretation (as FTT states people will try to use) are not possible, for example due to information being framed differently, and thus more complex representations may be resorted to (234), although this does not negate the benefit of FTT, it is simply a facet of it. Another criticism of FTT, specifically the reliance on gist, in a healthcare context, is that use of intuition and gist is counter to evidence-based practice, which would be worsened by the use of simplest possible gist interpretation. However, this is not a universal criticism, with some arguing that using pattern recognition and only pertinent information in decision-making allows for faster decisions while maintaining more mental space to incorporate, and adapt to, new information as it becomes available (236). A further potential issue with using FTT in research to analyse decisions is the different ways in which different parties could view a particular risk and therefore how this may disrupt interpretation of choices from an investigative standpoint. For example, adults and adolescents may view a particular activity as similarly risky, which may lead the adults to view it negatively and avoid it, but the adolescents to view the risk as beneficial or enjoyable, and thus take the risk, due to their different gist interpretations (237).

Overall, despite these criticisms and challenges, FTT has advantages over the other theories discussed, in that it is widely applicable, rather than being limited to one group of people, but also accounts for the uncertainty in many healthcare decisions, even after a choice is made. It has previously been explored in healthcare decision-making (e.g. (176, 238-242)) and successfully used to inform education strategies and encourage lifestyle changes in various areas of healthcare (243-245), but it has not been investigated in the context of general front-door or Ambulatory Care decision-making. Additionally, doctors' and/or medical students' decisions have been investigated more than physiotherapists' decisions (e.g. (176, 241, 246)). It is possible that physiotherapists' gist interpretations of situations may differ from doctors’, due to differences in their training and experience, which merits investigation in this study. It also incorporates consideration of individual differences between various stakeholders in a decision, and how they may therefore understand, interpret and respond to the same verbatim information differently. Therefore, FTT will be used as the theoretical basis for analysis in this study.

2.4 Conclusion

As has been discussed above, most decisions in healthcare are made under conditions of uncertainty and include an element of risk. This is as true of decisions regarding location of care as it is about decisions of what treatment to provide to patients, and decisions about location of care necessarily involve patient participation. When making location of care decisions, none of the potential locations can be described as ‘risk-free’ - there may be a perception that providing acute, hospital-level care with the patient staying in a location other hospital (i.e. Ambulatory Care) is risky, but remaining in a traditional hospital also carries a number of established risks. Given this, and the fact that different people may interpret the risk levels differently, and have different levels of risk tolerance, further investigation is merited, in terms of both people’s risk tolerance, and how the decision is made. Further to this, through better understanding of risk tolerance and decision-making processes among those involved in these decisions, communication between all parties may be improved, allowing for more targeted and effective communication regarding factors that matter most to stakeholders.

Therefore, this project will seek to address a number of these areas, through both quantitative and qualitative approaches. This chapter and the previous one have provided background to the clinical area (Chapter 1) and key concepts and theories around risk and decision-making (Chapter 2) that underpin the research presented in this thesis. The subsequent chapters will include a review of front-door decision support tools which may be used to guide location of care choices, followed by chapters detailing the methods for the quantitative and qualitative components of the study, and the results of both of these. The quantitative component will seek to explore risk tolerance of patients, carers and staff in front-door and/or ambulatory care units, and the qualitative component will use interviews to explore location of care decision-making in more depth with physiotherapists, whose role in these decisions (as discussed previously) has received little research focus previously. Finally, the results of both of these components will be discussed, in light of both each other and other published research.

CHAPTER 3: SYSTEMATIC REVIEW

A systematic review involving hospital front-door location of care decision aids was undertaken, with a focus on whether such tools operate at different mortality thresholds. This review is presented below.

This review was undertaken because discharge decision aids can contribute to location of care decisions at the front-door, which are a key focus of this work, although they should always be used alongside clinical judgement. Additionally, these tools operate by identifying the risk level of patients (for example their risk of major adverse cardiac events, or risk of stroke), or stratifying their risk, in order to generate their suggested management or care location (or to determine whether or not to advise discharge). Given that they are designed to provide a guide for clinicians using them, but not to override clinical judgement, and that they generally do this by indicating a risk level for the patient, their implementation relies on the risk tolerance level of the clinician, and potentially the patient, involved in the decision. Mortality thresholds were chosen as the primary outcome due to anecdotal evidence suggesting that different mortality thresholds may be being used, dependent on presenting condition. This review therefore sought to investigate if this is indeed the case.

3.1 Do tools aimed at avoiding hospital admission operate at different mortality thresholds? A systematic review

3.1.a Introduction

The emergency department (ED) is often where people first present to a health system seeking urgent care, and a proportion of them can be discharged home straight from the ED – this applies to approximately one third of people in the UK aged over 85 years presenting to an ED (16). Simultaneously, there has been a sustained increase in the number of people presenting to EDs every year (247). Therefore, correctly identifying those patients who may be safely discharged from the front door of hospitals is critical.

One way to support this decision is through the use of risk prediction tools, or discharge decision aids. These tools use a combination of clinical findings, patient history and test results to form their predictions or diagnosis, and their use has developed from simple predictions intended to add information for clinicians making decisions (i.e. clinical prediction rules), to directly helping or guiding clinicians on which decision to take (248). Where they are used, decision rules should be used alongside other decision aids, including practice guidelines (248), and the final decision always remains with the clinician, who can use clinical reasoning to over-rule the choice advised by a decision rule.

Clinical prediction and decision aids are used in various settings within healthcare, including predicting outcomes in acute assessment units (249), predicting mortality in critical care (250), identifying which patients in homecare should be prioritised for nursing assessments (251) and predicting the likelihood of subsequent clinical events after initial presentation (e.g. predicting stroke risk after Transient Ischaemic Attack (252), or myocardial infarction or death after presenting with acute coronary syndrome (253)). Using high quality clinical decision rules can bring benefit to multiple parties, including patients, physicians and health systems (254). Given the nature of ED, and the fact that rapid decisions about various aspects of care are often required with limited information, this is a prime setting for the use of clinical decision aids. Numerous risk scores and stratification tools, risk and outcome predictors and decision tools have been developed for use in the ED and front-door of hospitals (110, 255-257), to help guide ED clinicians' clinical decision-making. National guidelines also advocate the use of validated tools for identifying patients' risk of certain conditions to assist in their management (258, 259).

An important consideration when using decision aid tools is their sensitivity and specificity, especially as the stakes in these decisions are high – if the sensitivity of the tool is too low, this could mean that, although unnecessary admissions are reduced, potentially too many patients could be discharged and have negative health events, such as increased mortality, in unmonitored situations (e.g. at home) (248). To determine what level of sensitivity and specificity are acceptable therefore requires agreement on what level of mortality, or serious adverse events, are deemed 'acceptable' among those patients who the tool advises may be sent home (potentially with outpatient management). There has been some debate over this (260), with different percentages of miss-rates suggested as being acceptable to clinicians, e.g. ≤1% for major adverse cardiac events (261) vs up to 9.2% for mortality with community acquired pneumonia (262). Therefore, the aim of this review was to determine whether tools aiming to support discharge decisions operate at different mortality thresholds.

3.1.b Methods

Search strategy and data sources

A systematic search of the MEDLINE, Embase and OVID databases was undertaken up to July 2019, from their respective earliest dates. The search was updated in June 2020. No language restrictions were applied, and all primary research study designs were eligible for consideration for inclusion. The search terms used covered a combination of terms focussing on unplanned admission, hospital admission and discharge, and decision and risk prediction tools. Any conference abstracts that described potentially eligible studies were followed up to search for full text publications of that study, and these were assessed for eligibility.

Study selection

Retrieved citations were screened by title and abstract, and full texts were accessed for all potentially eligible articles. Two reviewers (CH and AI or TK) independently assessed all potentially eligible full texts to determine inclusion, using a pre-determined list of criteria. The criteria for inclusion were that the study tested, derived or validated a risk prediction tool or discharge decision aid, which was designed to be used at the ‘front-door’ of the hospital; that the tool was actually used to discharge patients; that the article provided a suggested ‘cut-off’ point for the tool at which clinicians should discharge, or consider discharging, patients; and that the number or rate of mortality and/or readmission was reported among participants who were sent home using the tool. Eligibility was not influenced by the presenting condition that the tool was used for, the key criteria was that it was used to guide discharge decisions, at the hospital front-door. Due to the nature of the tools in question, the ‘front-door’ in this context primarily referred to the emergency department, as this is where admission decisions are more frequently made.

Assessment of quality and bias, and data extraction

All included studies were assessed for risk of bias using an appropriate tool – Revised Cochrane risk-of-bias tool for randomized trials (RoB 2) for RCTs, relevant sections of the CASP Clinical Prediction Rule checklist for derivation and/or validation studies, and Joanna Briggs Institute Checklist for quasi-experimental studies (non-randomized experimental studies) for the non-randomised studies. Each of these tools comprises a checklist assessing for quality and risk of bias in multiple areas of study design, conduct and reporting. Quality assessments were used to inform interpretation of reliability of results for each study, but no studies were excluded on the basis of risk of bias score. Data extraction was conducted using a pre-designed data extraction form, which gathered information on the study population, the tool under investigation, the outcome of interest, mortality and/or readmission rates, and descriptive information regarding study design.

3.1.c Results

Included studies

Searches generated 3378 unique results for screening, of which 3257 were excluded from title or abstract, thus 121 full-texts were reviewed. Of these, 104 were excluded, leaving 17 included studies (Figure 1). Reasons for exclusions are detailed in figure 1, with the most common reasons being that a risk or prediction tool was not being tested (36 exclusions), and that the tool being assessed was not used to discharge patients (35 exclusions).

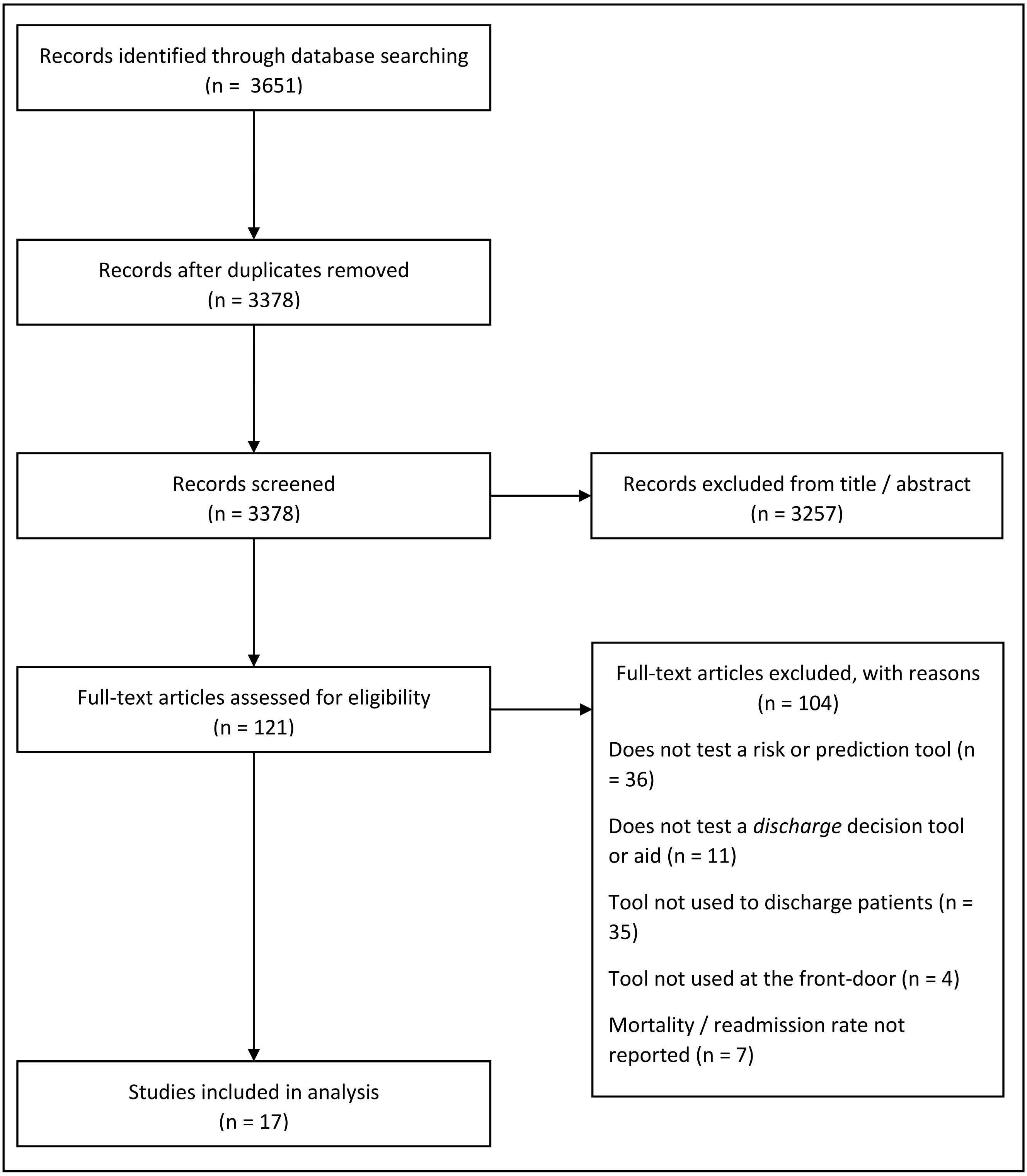

Figure 1. Flowchart of identification of studies

Among the included studies, a variety of tools and diagnoses of interest were considered. The most commonly assessed tool was HEART (History, ECG, Age, Risk factors, Troponin I), or a modification of it, which was designed for use with patients presenting with acute chest pain and was assessed in eight of the included studies (263-270). Three other included studies also investigated use of a tool for managing patients with acute chest pain – the Chest Pain Choice Tool (271, 272) in two and a set protocol for possible Acute Coronary Syndrome in the third (273). The other six studies investigated tools for assessing patients with other presenting conditions, including paediatric asthma (274), TIA (275), febrile neutropenia in oncology patients (276), H1N1 influenza (277), heart failure (278) and syncope (148).

Study characteristics are shown in Table 1. Most of the included studies explicitly or implicitly included only adult patients, although their stated minimum ages ranged from 17 to 50 years, but one study was of paediatric patients (274). The studies were conducted predominantly in the United States (11 studies), with the remaining studies being conducted in China, Germany, Belgium, England, Canada and Australia (1 study each). The study designs also varied, and the included studies comprised eight randomised trials, three validation and/or derivation studies, and six non-randomised experimental studies. Notably, two of the included studies were secondary analyses of the same initial trial (269, 270), one of which was a one year follow-up (270), and a third was an original report of that trial (266).

Study	**Tool name**	**Presenting condition**	**Components of Tool**	**Population age range**	**Location and Year of study**	**Study type**
Baugh et al. (2016) (263)	HEART	Clinical concern for Acute Coronary Syndrome	History, ECG, Age, Risk factors, Troponin I	Adult patients (≥18 years)	Massachusetts, USA. July – Oct 2014	Non-randomised experimental study
Chew et al. (2019) (273)	1-Hour Troponin T Protocol	Chest pain or suspected Acute Coronary Syndrome	Baseline troponin T values at >3 hours after symptom onset, change in troponin T values over 1 hour	Adult patients (≥18 years)	Adelaide, Australia. August 2015 - April 2019	RCT
Dai et al. (2018) (264)	HEART	Acute chest pain	History, ECG, Age, Risk factors, Troponin I	Adult patients (≥18 years)	China. Oct 2016 – Oct 2017	Non-randomised experimental study
Frisoli et al. (2017) (265)	Modified HEART Score	Clinical suspicion of AMI, excluded with cTnI results, suitable for observation unit	History, ECG, Age, Risk factors, Cardiac troponin levels <0.04 ng/mL at 0 and 3 hours	Adult patients (≥21 years)	Michigan, USA. Feb 2014 – May 2015	RCT
Gorelick et al. (2008) (274)	Unnamed	Acute asthma	Requirement for supplementary oxygen, frequency of inhaled brochodilator requirement	Paediatric patients (24 months to 18 years)	USA. Year not stated.	Derivation and/or validation

Hess et al. (2016) (271)	Chest Pain Choice Tool	Chest Pain, considered for observation unit and cardiac stress-testing	Age, gender, race, chest pain reproducible by palpation, Personal history of CAD, diaphoresis, EKG ST Depression >0.5mm , T wave inversion deeper than -0.5	Adult patients (≥18 years)	California, Minnesota, Indiana, Pennsylvania and Florida, USA. Oct 2013 – Aug 2015	RCT
Hess et al. (2012) (272)	Chest Pain Choice Tool	Chest Pain, considered for observation unit and cardiac stress-testing	Age, gender, race, if chest pain increases with manual pressure to the chest, history of coronary artery disease, whether chest pain causes perspiration, ECG	Adult patients (≥18 years)	Minnesota, USA. Feb – Nov 2010	RCT
Hörer et al. (2011) (275)	Unnamed	TIA / Totally resolved neurological dysfunction in <24 hours	ABCD2 ≥4 points and TIA within 72h, or symptomatic stenosis, or new AF, or recurrent TIA, or monitoring required due to other cause	Not stated. Demographics indicate adult patients	Germany. Feb – Dec 2009	Non-randomised experimental study
Klastersky et al. (2006) (276)	Multinational Association for Supportive Care in Cancer (MASCC)	Febrile neutropenia in patients with cancer treated with chemotherapy	Burden of febrile neutropenia (severity of symptoms), hypotension (systolic BP <90 mmHg), COPD, solid tumour or hematologic malignancy with no previous fungal infection, dehydration requiring parenteral fluids, outpatient status, age <60 years	Adult patients (≥17 years)	Belgium. Jan 1999 – Nov 2003	Non-randomised experimental study

Mahler et al. (2015) (266)	HEART pathway -	Acute Coronary Syndrome	HEART score (History, ECG, Age, Risk factors, Troponin) and serial troponins at 0 and 3 hours after ED presentation	Adult patients (≥21 years)	North Carolina, USA. Sept 2012 – Feb 2014	RCT
Morton et al. (2017) (277)	Unnamed	H1N1	Oxygen exchange (based on estimated P/F ratio) and CRP levels	Adult patients (≥18 years)	England. Nov 2010 - Jan 2011	Derivation and/or Validation
Nowak et al. (2016) (267)	Modified HEART Score	Possible Acute Coronary Syndrome, considered for observation unit and cardiac testing	History, ECG, Age, Risk factors, with serial negative cardiac troponin values	Adult patients	Michigan, USA. Year not stated.	RCT
Smulowitz et al. (2018) (268)	HEART score and HEART pathway	Chest pain	History, ECG, Age, Risk factors, Troponin	Adult patients (≥30 years)	Massachusetts, USA. Nov 2014 – June 2016	Non-randomised experimental study
Sorelle (2017) (278)	Ottawa Heart Failure Risk Scale	Heart Failure	Initial Ax - History of stroke or TIA, History of intubation for respiratory distress, HR on ED arrival, SaO2 on RA at EMS / ED arrival Investigations - acute ischaemic changes on ECG, Urea, Serum CO2, Troponin I or T elevated to MI level, NT-ProBNP	Not stated. Demographics indicate adult patients	Canada. Year not stated.	Derivation and/or validation

			Walk Test after ED Rx - SaO2 <90% on RA or usual O2, or HR ≥110 during 3 minute walk test, or too ill to walk			
Stopyra et al. (2016) (269)	Comparing ADAPT and HEART pathways	Clinical concern for Acute Coronary Syndrome	HEART (History, ECG, Age, Risk Factors) + serial troponins at 0 and 3 hours ADAPT - TIMI score, new ischaemia on ECG (Y/N) and serial troponins at 0 & 2 hours after ED arrival	Adult patients (≥21 years)	North Carolina, USA. Sept 2012 – Feb 2014	Secondary analysis of RCT (quality assessed as non-randomised experimental study)
Stopyra et al. (2019) (270)	HEART pathway - HEART score and serial troponins at 0 and 3 hours after ED presentation	Clinical concern for Acute Coronary Syndrome	HEART (History, ECG, Age, Risk factors, Troponin), with troponins at 0 & 3 hours	Adult patients (≥21 years)	North Carolina, USA. Sept 2012 – Feb 2014	Secondary analysis of RCT (quality assessed as RCT)

Sun et al. (2014) (148)	Unnamed - ED observation syncope protocol	Syncope or near syncope	Presence or absence of high risk criteria (Serious condition identified in the ED; History of ventricular arrhythmia; Cardiac device with dysfunction; Exertional syncope; Presentation concerning for acute coronary syndrome; Severe cardiac valve disease; Known cardiac ejection faction <40%; Electrocardiogram findings of QTc>500 mS, pre-excitation, non-sustained ventricular tachycardia) and Emergency physician judgment	Adult patients (≥50 years)	USA. March 2010 - Oct 2011	RCT

Table 1. Included studies’ characteristics

Quality of included studies

Design-appropriate quality assessments were conducted for all included studies, and identified variable quality. Among the RCT's, most included studies had low risk of bias in the randomisation, deviation from intervention, missing outcome data and outcome measurement domains, but half of them raised some concerns regarding selection of results that were reported. Among the derivation and validation studies, there was also mixed levels of quality, but all of them lacked detail about assessor blinding and selection processes for predictor variables and outcome evaluations.

Mortality and readmission rates

One included study did not report mortality data (274), but all of the others did, of which ten studies reported no deaths in either group (148, 263-267, 269, 271, 272, 275) (note that one of these (269) is a secondary analysis of data reported in another (266)), and one reported no deaths in the group who were discharged but did not report mortality rate of those who were admitted (268).

Among the remaining five studies, which reported at least one death among their participants (270, 273, 276-278) (Table 2), the mortality rate in those who were assigned to the use of a tool or were discharged (as appropriate to the study), was lower than that of those who were assigned to usual care or admitted (as appropriate to the study). In two of these studies, none of those who were discharged early, having been identified by the tool under investigation as being low risk (276) or predicted to have a successful early discharge (277) died, compared to a mortality rate of 2.02% and 14.3% respectively among those who were admitted in these studies. Participants in the first of these studies (276) were all identified by the tool under investigation as being low risk, but were not all discharged early. In the remaining three studies, two included use of a tool that generated specific disposition recommendations based on the score and was compared against usual care (270, 273) and one generated a risk category (indicating risk of serious adverse outcomes), which the treating doctor was aware of, but was advised not use as their sole determining factor for disposition (278). In both cases where use of a tool was compared to usual care, there was a lower mortality rate in the group who were randomised to use of the tool. These mortality rates were 1.42% vs 2.84% (270) (both deaths in the 'Tool group' were in patients classified as 'high risk', therefore a one-year mortality rate of 2.67% in the high risk group), and 0.1% vs 0.4% (273), for use of tool vs usual care respectively. The first of these studies was a one year follow up of another included study (266), which reported no deaths in either group in the original study (266). In the final study, which informed treating doctors of a risk score, but did not dictate disposition, mortality rates were compared between those who were discharged from ED (1.7% mortality) and admitted from ED (5.3% mortality).

Therefore, overall mortality rates among those who were discharged from the ED, based on decision tools or predictions, or whose disposition was guided by a decision tool, ranged from 0% to 1.7%, and among those who were admitted mortality rates ranged from 0% to 14.3%. It should be noted that reported mortality rates among those whose disposition was guided by a tool may include patients who were admitted if they were identified by the relevant tool as being at high risk.

Nine of the included studies did not report readmission data (148, 263-265, 268, 269, 272, 277, 278). Readmission rates among those who were discharged early or categorised as low risk ranged from 0% to 8%, and ED re-attendance rates in these groups ranged from 0% - 13.6%. One study reporting one year follow-up data differentiated readmission and ED re-attendance rates between the decision aid arm overall and only those within this arm who were stratified as low risk, when those in this group stratified as high risk were included the readmission rate increased to 21.3% and the ED re-attendance rate increased to 14.9% (compared to 16.3% and 10.6% respectively in the usual care arm) (270). Another study, which compared early discharge to observation and cardiac stress testing in patients who had been assessed as being low risk by a discharge support tool reported no readmissions in either group (267), and another reported a 3% readmission rate in their derivation cohort but no readmissions in their validation cohort (274). When comparing overall readmission rates between studies, it should be noted that their follow-up periods varied between two weeks and a year, and the study reporting the highest readmission rates was that which was a one-year follow-up (270) of another included study (266), which reported a 3.54% readmission rate at 30 days among those randomised to the arm of the study using a decision aid. All studies which reported readmission rates with less than one year follow-up (ranging from 14 to 90 days), reported rates of less than 5% among those who were discharged early or assigned to the ‘decision tool’ group, dependent on the study type, and among the comparison groups if they had them. Among those with readmissions, who reported readmission rates separately for the groups assigned to ‘decision tool’ and usual care, three reported higher re-admission rates in the ‘decision tool arm’ (270, 271, 273), and one reported lower rates in the ‘decision tool arm’ (266). One of those that reported higher rates in the ‘decision tool arm’ (270) was the one-year follow-up data of the study that reported lower readmission rates in the ‘decision tool arm’ (266).

Study	**Presenting condition**	**Mortality rate**	**Readmission rate**
Baugh et al. (2016) (263)	Clinical concern for Acute Coronary Syndrome	0% (0 deaths in low or intermediate risk groups)	Not reported
Chew et al. (2019) (273)	Chest pain or suspected Acute Coronary Syndrome	Use of tool = 0.1% Usual care = 0.4%	Use of tool = 1.4% Usual care = 0.9% (Cardiovascular rehospitalisation rate)
Dai et al. (2018) (264)	Acute chest pain	0% (Low-risk group = 0 (no MACE), high-risk group = 0 (2 MACE, both non-ST segment elevation acute MI and had PCI))	Not reported
Frisoli et al. (2017) (265)	Clinical suspicion of AMI, excluded with cTnI results, suitable for observation unit	0% (No patients died in either group)	Not reported
Gorelick et al. (2008) (274)	Acute asthma	No mortality stats	Derivation cohort – 3% of those discharged re-presented or were readmitted Validation cohort – 0% re-presented or were readmitted

Hess et al. (2016) (271)	Chest Pain, considered for observation unit and cardiac stress-testing	0% (No patients died in either group)	Decision aid group = 4.8% Usual care group = 4.5% (Readmission rates not differentiated between patients who went home and those who chose to be admitted to the observation unit following use of decision aid)
Hess et al. (2012) (272)	Chest Pain, considered for observation unit and cardiac stress-testing	0% (No patients died in either group)	Not reported
Horer et al. (2011) (275)	TIA / Totally resolved neurological dysfunction in <24 hours	0% (No deaths in whole study population)	Discharged group = 1.80% (Readmission rate based on reported rate of strokes)
Klastersky et al. (2006) (276)	Febrile neutropenia in patients with cancer treated with chemotherapy	Early discharge group = 0% Hospitalised group = 2.02%	Early discharge group = 3.80%
Mahler et al. (2015) (266)	Acute Coronary Syndrome	0% (No patients who were discharged died, in decision aid group or usual care group)	Decision aid group = 2.84% ED re-presentations, 3.54% readmissions Usual care group = 4.26% ED re-presentations, 2.84% readmissions (Estimated risk level of these participants not stated)

Morton et al. (2017) (277)	H1N1	Early discharge group = 0% Admitted group = 14.3%	Not reported
Nowak et al. (2016) (267)	Possible Acute Coronary Syndrome, considered for observation unit and cardiac testing	0% (No deaths in either group)	0% (No hospitalisations in either group)
Smulowitz et al. (2018) (268)	Chest pain	Early discharge group = 0% Not reported in any other group	Not reported
Sorelle (2017) (278)	Heart Failure	Early discharge group = 1.7% Admitted group = 5.3%	Not reported
Stopyra et al. (2016) (269)	Clinical concern for Acute Coronary Syndrome	0% (No deaths in whole study population)	Not reported
Stopyra et al. (2019) (270)	Clinical concern for Acute Coronary Syndrome	Decision aid group = 1.42% Usual care group = 2.84% (Both decision aid group patients were deemed high risk, therefore assumed admitted (2.67% of high risk group))	Decision aid group = 21.3% re-presented to ED (13.6% among low-risk group), 14.9% readmitted (8% among low-risk group) Usual care group = 16.3% re-presented to ED, 10.6% readmitted (cardiac-related readmissions)
Sun et al. (2014) (148)	Syncope or near syncope	0% (No deaths in either group)	Not reported

Table 2. Mortality and Readmission rates reported in included studies

3.1.d Discussion

The mortality and readmission rates reported in the studies included in this review were both relatively low for those discharged early or whose disposition was informed by use of a decision aid tool, which may provide reassurance to clinicians considering their use in practice, as the goal of these types of tools is to facilitate safe discharges, and ensuring as many patients as possible are safely discharged is ever more important given the growing number of ED attendances (1), and risks to patients of unnecessary hospital admissions (279). Such tools can also be used as the basis for shared decision-making with patients, as was the case in two of the included studies (271, 272), by giving patients an indication of their personal risks of set outcomes, and then facilitating a conversation with healthcare professionals about their best course of action, such as the need for further observation or cardiac testing.

It should also be noted that where deaths were reported in the groups assigned to use of a decision tool, it is possible that these occurred in patients who were determined to be at high risk, and were thus admitted, and where deaths occurred in the comparison groups who were admitted to hospital, this admission could have been due to greater clinical need or the patient being more unwell at the outset. Overall mortality rates among all participants in the included studies were low, with the exception of those admitted in the study investigating early discharge in patients presenting with H1N1 influenza (277), which could be an indication of the lower acuity of patients being included in studies of this type. However, since it may be unlikely that early discharge would be appropriate for patients with high acuity, inclusion only of similarly low acuity patients may allow for improved comparison of mortality rates between those admitted and discharged early, in studies specifically investigating early discharge. Not all of the included studies in this review only included patients with low acuity, for example one study investigating the use of the HEART pathway for patients presenting with possible acute coronary syndrome (ACS) identified approximately half of those randomised to the HEART pathway arm as being in the high-risk group (266), and two further analyses of this study (one at one year follow-up) were also included (269, 270).

Hospital readmission rates among those discharged early or deemed low risk by decision aids were also low, with no study reporting a hospital readmission rate in these groups above 8%. However, among those studies where readmissions in both a ‘usual care’ group and a ‘decision tool’ group were reported, readmissions did tend to be higher in the groups whose disposition was guided by use of a decision aid, including when the tool had been used to facilitate shared decision-making, although these differences were small in those studies with a follow-up period of less than a year. The difference in ED re-presentations and hospital re-admissions was more marked in the study with one-year follow up data (270).

The most common presenting condition for tools in this review was chest pain, with clinical investigations focussing on the possibility of ACS, and only a small number of studies investigated tools for other conditions. It was therefore not possible to identify if there was a pattern of different mortality thresholds for different conditions, as there was only one study each looking at TIA, febrile neutropenia, H1N1 influenza (all had no deaths in the decision tools or early discharge group) and heart failure (1.7% mortality in the early discharge group), and the range of mortality rates in the decision tool or early discharge group in studies investigating decision tools for patients presenting with chest pain ranged from 0% to 1.42%.

The need for clinical decision tools to be developed to help guide admission decisions for patients presenting with anterior chest pain has previously been identified as a high priority by emergency physicians (280), which may help explain why this was the most common presenting condition among tools in this review. The rate of major adverse cardiac events (MACE), which includes death, is often reported in studies investigating location of care decisions for patients presenting with chest pain. The chance of missing a significant cardiac event, such as acute myocardial infarction (AMI), which leads to a patient experiencing a MACE can be a point of significant concern in deciding to discharge patients who present in this way (281, 282). A previous study asked ED clinicians to indicate what they felt an acceptable rate of missing this diagnosis was in patients recently discharged from the ED, and they found that most staff indicated an acceptable miss rate to be 0.5% or lower (261). Given that MACE incorporates more than just mortality, one would therefore expect the early mortality rate that ED staff find acceptable to be lower than this, which was achieved by all studies of tools relating to acute chest pain in this review – the majority had a mortality rate of 0%, and the only study with deaths reported at 30 day follow-up in the group whose disposition was decided by a decision tool had a mortality rate of 0.1% in this group (273).

In previous studies of the use or development of discharge decision support tools, various rates of serious adverse outcomes, which include but are not limited to mortality, have been reported. These rates of adverse outcomes can be considerably higher than those reported for mortality in this review, which indicates that the majority of these outcomes are likely to be non-fatal ones, such as AMI or unstable angina (283). Where the data is available, reported rates of serious adverse outcomes can also vary greatly between patients who are identified as being at high risk versus lower risk (e.g. (284)), or when the tool is applied to different patient groups (e.g. (285)). Therefore, it is important that this data is clearly differentiated, both in terms of the actual outcomes, such that conversations with patients can more clearly communicate what their risksof various outcomes are, and in terms of differentiating outcomes for patients who were deemed to be at higher risk at the outset. This is especially important, since this group are all at higher risk of negative outcomes occurring, and as such may be expected to have a higher rate of serious adverse outcomes, which has been found where appropriately admitted patients had a significantly higher rate of serious adverse outcomes compared to appropriately discharged patients (279).

Another potential factor in the variation in mortality and readmission rates, and in the appropriate use of decision support tools, is the system in which they are used. There may be considerable variation in how health services are designed in different countries or areas, such that different interventions or assessments may be more immediately available in some places than others, which may influence both the usefulness and applicability of a given decision support rule. For example, in tools that require patient data that may not be available for a high number of hours after arrival, a wait of this long in the ED may not be appropriate in a different health system, in which case the patient may need to be admitted to a different area, such as an observation unit, to await those results (286). If the original tool development was based on a decision of whether the patient would be safe to be discharged directly from the ED, then the requirement for observation unit care as a pre-requisite of completing the tool could complicate its use. Additionally, local management practices for specific conditions may vary, which could in turn influence both patient outcomes and which patients a tool may be deemed appropriate for use with, beyond the scope of its original design, such as generalising a syncope decision support tool from only those with no evident cause for their syncope to all patients, which led to an increase in reported prevalence of adverse outcomes (285). In all cases, the use of a discharge decision tool is designed to support clinician decision-making about location of care, not dictate it, and therefore a clinician always has the power to over-rule a suggestion by a tool in light of other assessment findings (266, 276, 287), and to undertake further investigation of symptoms beyond the scope of the tool (285).

Limitations

There were a number of limitations to this review. Firstly, the primary aim of the review was to investigate mortality thresholds with use of decision support tools, and as such only those studies that reported mortality numbers or rates, and/or readmission rates, were eligible for inclusion. This meant that some established decision tools, such as some which predict need for admission, were not included as they did not report mortality, or readmission, rates. Additionally, it was a requirement of inclusion that the tool was used in assisting disposition decisions, such that mortality, or readmission, rates among those who were actually discharged could be assessed. This meant that a number of studies developing, but not actually using, decision support tools were not eligible for inclusion. It is also possible that non-indexed studies in grey literature may have been overlooked. However, no restrictions were placed on language or presenting condition, and all primary study designs were eligible.

The overall mortality rates among almost all included studies were also fairly low, for both those whose disposition was guided by a decision support tool and, where relevant, for those managed via usual care. This may indicate a bias in the types of conditions such tools are developed and reported in, or in the participant selection criteria, towards lower acuity patients or conditions with lower overall mortality, where mortality rates are reported. Also, the quality of the included studies was variable, with areas of concern in many of them.

3.1.e Conclusion

It is important for both patients and health systems that only those patients who require a hospital bed are admitted, and decision support tools may be beneficial in helping patients and clinicians to determine whether individual patients should be admitted to hospital or undergo further testing. One major consideration in discharging patients early from the hospital front-door is the risk of death, and therefore we sought to investigate the mortality thresholds of different decision support tools.

A variety of tools, for use in a range of conditions, were identified, with the majority being applicable to patients presenting with acute chest pain in whom the possibility of ACS is present. Across all of these tools, low mortality rates were reported for patients whose disposition was guided by a decision support tool, with the majority of studies reporting no participant deaths. Among those who did report at least one death, these were more common among patients who were admitted, and did not exceed 2% in any group whose disposition was guided by a decision tool, or who were discharged early from the ED (dependent on study type). Readmission rates were also relatively low, in those studies which reported it, ranging from 0% to 8% among those who were discharged early or categorised as low risk.

Future studies investigating the use of disposition decision support tools at the front-door would benefit from reporting both mortality and readmission rates for participants whose disposition is guided by the tool, as well as the need for more studies which include trialling the use of such tools in practice to actually guide discharge decisions.

3.2 Relation of findings to wider thesis aims

Overall, both mortality and readmission rates among those who were discharged early were low in the included studies. This supports the idea that early discharge, or non-inpatient-based care, can be a viable option for patients presenting at the front-door of hospitals, provided that their risks related to receiving care in this way are considered.

The finding that not all those patients in whom early discharge was advised by the decision aid were actually discharged early indicates two things of particular importance to the aims of this study – firstly, it implies that there are other factors involved in clinicians' decisions about location of care, beyond those incorporated in these tools, and this will be investigated from a physiotherapist perspective through the qualitative interviews, which seek to explore the factors that they consider when making these decisions. Secondly, this finding suggests that there may be differing risk tolerance levels among staff, and potentially patients, when using these tools, since there were occasions on which patients were not discharged early, despite the tool determining that their risk level was low enough to justify this course of action. Investigating these risk tolerance levels, including the potential for differences between participants, is a key aim of the quantitative component of this study.

Finally, two of the included studies in particular (271, 272) specifically include shared decision-making with patients about location of care, through conversations based around providing the patient with information about their personal risk of adverse outcomes. The fact that they successfully did this, while maintaining a low readmission rate and reporting no participant deaths, contributes to the aim in this study of investigating the possibility of having structured discussions about risk with acutely unwell patients.

The next two chapters of this thesis will describe the quantitative and qualitative methods that will be used to conduct the study, in pursuit of achieving the key aims. Following these, the results of these two key components will be presented separately, before being more broadly discussed in the final chapter.

CHAPTER 4: QUANTITATIVE METHODS

The quantitative component of this project consisted of a series of questionnaire ‘lottery sets’ (Appendix 1), which patients, carers and staff from front door and Ambulatory Care units completed. Participants also provided demographic information prior to completing the questionnaires. The questionnaire lottery sets were developed based on adaptation of lottery sets used in previous work (172). In this, and other, previous research investigating risk behaviours using questionnaire lotteries similar to those in this study, the participant populations have tended to be entirely or primarily university students (162, 172, 174, 206, 288), although a smaller amount of research has been done with healthcare-based populations (203). This indicated a relatively high baseline level of numeracy, literacy and language proficiency in the language being used in the questionnaire among their study participants. However, this is not necessarily representative of the general population, and therefore could not be assumed for the participants in this work, especially among the patient and carer groups. In this study, the questionnaire options and explanations were simplified, to facilitate easier understanding and clearer instructions, in order to account for the varying educational levels and English language proficiency of participants.

In each lottery set, participants were asked to imagine a scenario where they were given a series of choices between a guaranteed pay-off or an uncertain outcome, in which they could receive either a higher or lower pay-off. These pay-offs related to either varying financial quantities or a treatment for an imaginary health problem. An example of one of the financial lottery sets is shown in Figure 2. Each participant completed six lottery sets – four relating to financial domain pay-offs and two in the health domain. These are described in more detail below.

Question	Option A	Option B	Your Choice
1	Guaranteed £7	50% chance of £2 and 50% chance of £11	A or B ☐ ☐
2	Guaranteed £7	50% chance of £2 and 50% chance of £12	A or B ☐ ☐
3	Guaranteed £7	50% chance of £2 and 50% chance of £13	A or B ☐ ☐
4	Guaranteed £7	50% chance of £2 and 50% chance of £14	A or B ☐ ☐
5	Guaranteed £7	50% chance of £2 and 50% chance of £16	A or B ☐ ☐
6	Guaranteed £7	50% chance of £2 and 50% chance of £18	A or B ☐ ☐
7	Guaranteed £7	50% chance of £2 and 50% chance of £20	A or B ☐ ☐

Figure 2. Example of financial lottery set. *The following explanation accompanied this lottery set:* ***Questions related to financial risk.*** *For each of the following questions, please select whether you would choose option A or option B, by selecting the relevant box. Option A guarantees £7 in each case; Option B gives a 50/50 chance of differing amounts each time. For example, in question 1, option A*

guarantees you £7, while option B gives you a 50/50 chance of getting either £2 or £11.

4.1 Financial-domain lottery sets

The financial lotteries asked participants to imagine that they were being given a choice between a guaranteed amount of money (‘option A’), or a chance of getting a higher or lower financial pay-off (‘option B’). They were asked to make this choice seven times, with the higher possible pay-off in option B increasing each time. This is shown in figure 2, where the guaranteed amount is £7 in each instance, and the chance options are a 50/50 chance of £2 or a gradually increasing amount, from £11 to £20. The same principle was applied to a second financial lottery set, but in this case, the monetary values were increased ten-fold, so that the guaranteed amount each time was £70, and the option B chances were a 50/50 chance of £20 or increasing amounts from £110 to £200. Including both high and low financial pay-off lottery sets allowed comparison of the impact on risk tolerance when the potential gains, or perceived losses, were raised or lowered. The orders of magnitude of these pay-offs, relative to each other, were chosen so that the high and low financial pay-off quantities were sufficiently different from each other, but the higher amounts were not quantities of money that are hard to conceptualise or so high as to be life-changing. However, the theoretical impact of winning the amounts in the ‘high financial pay-off’ lotteries could potentially be very different for those with different levels of income – for example a consultant doctor versus someone whose only income is from their state pension, whereas this is unlikely to be as true for the winnings in the ‘low financial pay-offs’ lotteries.

In addition to these lottery sets, where the chances in option B were known, and there was an equal chance of getting the higher or lower amount if one chose option B, there was another pair of financial lottery sets, with the same financial options presented, where participants did not know how likely each of the option B outcomes were. These ‘ambiguous lottery sets’ are discussed further below and can be seen in (Appendix 1).

In all cases, the payments were hypothetical - participants were aware that they were being asked to imagine they were actually being given these choices, but that they would not receive any money in reality. This approach has been used previously, in both laboratory and healthcare settings (203, 206, 288, 289) and in this case was used for similar reasons to those applied in previous risk preference work in a healthcare setting (203). The two most important considerations for deciding to use hypothetical rewards in this study were the ethical challenges with the provision of actual money in a healthcare setting, and the attempt to make the financial and health lottery sets as comparable as possible, and since it is clearly not possible to generate real-life outcomes based on lottery choices in the health domain, these had to be hypothetical. Previous experiments have demonstrated a “hypothetical response bias” exists, in which participants tend to demonstrate more risk aversion in experiments with actual rewards (or costs) than they do in ones with hypothetical rewards (or costs) (206, 290). Despite this, the ethical and practical considerations involved in providing real financial payments outweigh the effect of the ‘hypothetical response bias’, and therefore, all pay-offs from the lotteries remained hypothetical in this study.

4.2 Health-domain lottery sets

In addition to the financial lottery sets, participants were also asked to imagine that they had a health condition, which stopped them from working or doing their normal daily activities, and that they were being offered two treatment options. One treatment option guaranteed 70 days of full health, and the other treatment option offered a chance of either 20 days of full health or a period longer than 70 days. As with the financial lottery sets, this choice was posed seven times, with the longer potential time-period in option B increasing each time. These longer periods gradually increased from 110 days to 200 days. The way these lottery sets were asked was laid out in the same manner as the financial lottery sets, and the numbers of days were the same as the number of pounds in the higher quantities financial lotteries.

Similarly to the financial lottery sets, one version of the health lottery sets was asked when the likelihood of each outcome in option B was not known, and a second version of the health lottery set was asked where the chances of each outcome in option B were known – 50% chance each of the lower and higher number of days. In both versions, the potential number of days of recovery were identical.

4.3 Ambiguous

Each of the financial and health lottery sets were presented to participants twice, once with known probabilities in option B (50% chance of either outcome) and once with unknown probabilities in option B (represented by “?% chance”), thus requiring participants to make their choices under conditions of ambiguity. An example of an ‘ambiguous lottery set’ is shown in Figure 3. These ambiguous lottery sets were created for this study and had not been used before.

Question	Option A	Option B	Your Choice
1	Guaranteed £7	?% chance of £2 and ?% chance of £11	A or B ☐ ☐
2	Guaranteed £7	?% chance of £2 and ?% chance of £12	A or B ☐ ☐
3	Guaranteed £7	?% chance of £2 and ?% chance of £13	A or B ☐ ☐
4	Guaranteed £7	?% chance of £2 and ?% chance of £14	A or B ☐ ☐
5	Guaranteed £7	?% chance of £2 and ?% chance of £16	A or B ☐ ☐
6	Guaranteed £7	?% chance of £2 and ?% chance of £18	A or B ☐ ☐
7	Guaranteed £7	?% chance of £2 and ?% chance of £20	A or B ☐ ☐

Figure 3. Example of ambiguous lottery set*. The following explanation accompanied this lottery set:* ***Questions about financial risk, with ambiguity.*** *For each of the following questions, please select whether you would choose option A or option B, by selecting the relevant box. Option A guarantees £7 in each case; Option B has an unknown chance of a lower or higher amount, which differs each time. For example, in question 1, option A guarantees you £7, while option B gives you an unknown chance of getting either £2 or £11 (indicated by ?%).*

The quantities (of money or healthy time) in the ambiguous lottery sets matched those in the lottery sets where participants knew the probabilities when they made their choices. The ambiguous lottery sets were all presented before the non-ambiguous ones, to minimise the risk of participants assuming a 50/50 chance due to having seen this level of chance presented previously. They were also presented in the same order as the non-ambiguous lottery sets (low financial stakes, then high financial stakes, and finally health). By using the same quantities of pay-offs for the ambiguous and non-ambiguous lottery sets, it was possible to compare the impact on participants' choices of knowing outcome probabilities against not knowing them, independent of the level of pay-off. Finally, it was possible to investigate whether ambiguity resulted in different changes in risk tolerance in financial vs health-related decisions, by comparing how the differences in risk tolerance level between financial and health domain lottery sets in ambiguous situations differed from the differences between those outcomes in non-ambiguous situations.

4.4 Populations and Recruitment

All participants worked in, were treated in or were the carer of an adult treated in, an Ambulatory Care or Front-Door unit in the UK. In addition, patient and carer participants were aged ≥16 years, had capacity to consent and were able to understand written and/or spoken English. The primary inclusion criterion for staff participants was that they were a qualified healthcare professional, employed in one of the relevant services, who contributed to location of care decisions as part of a multi-disciplinary clinical team. All inclusion and exclusion criteria are shown in Table 3.

Patients	**Carers**	**Staff**
Inclusion: • Adult (age ≥16 years) patient, being assessed and/or managed within an Ambulatory Care or front-door service • Has capacity to provide informed consent to participate in study • Able to understand English (either written or spoken)	Inclusion: • Adult (age ≥16 years) • Friend, Family member or other carer of an adult patient being assessed and/or managed within an Ambulatory Care or front-door service • Has capacity to provide informed consent to participate in study • Able to understand English (either written or spoken)	Inclusion: • Qualified healthcare staff member, currently employed in an Ambulatory Care or front-door service, who contributes to location of care decisions as part of a multi-disciplinary clinical team
Exclusion: • Lack of capacity to provide informed consent • Inability to understand English (either written or spoken)		Exclusion: • In a job role that does not include making ‘admit or discharge’ decisions or advice within ambulatory care or front-door services

Table 3. Inclusion and exclusion criteria for participants in lottery questionnaire study

Patients and carers were recruited in person, while they were present in a relevant unit. They were either made aware of the study by a member of their clinical treating team (or the team treating their friend or relative in the case of carers), or the treating team approved them being approached by the researcher, following which they were approached and offered the opportunity to discuss the study. Patient and carer participants completed the demographics and lottery questionnaires while they were still in the Ambulatory Care or Front-Door department, after providing written consent to participate.

Staff participants were recruited from the same types of units, but recruitment occurred both in person, on the same units through which patients and carers were recruited, and remotely. The study was highlighted to participants through emails, sent from relevant professional bodies, and through other electronic means, such as twitter. Information about the study, including the Participant Information Sheet and contact details of the research team, were shown on the first page of the link to the questionnaire that potential staff participants accessed.

All participants provided written consent, and were unable to progress to begin answering any of the demographics questions or complete the questionnaire until written consent had been completed. This study received ethical approval, REC reference 20/YH/0072.

4.5 Data Collection

All data was collected via a computer-based questionnaire, which comprised a consent form, demographics questions and the lottery set questions, hosted on the Jisc ‘Online Surveys’ system. All staff participants completed the questionnaire independently, at a time that suited them, between August and December 2020. Although staff participants had details available to contact the research team for support with questionnaire completion should they wish to, no such support was requested.

All patient and carer participants were recruited from Sandwell and West Birmingham Hospitals NHS Trust, between September and December 2020. They were each given the options of independently completing the questionnaire on a laptop provided by the researcher, being asked each question verbally by the researcher who recorded their responses in the online questionnaire, or any intermediary level of support that they requested. Where participants opted for the researcher to verbally ask them the questions, they were also able to see the laptop screen which showed the written version of each question at the same time. This meant that in some cases, participants chose to read the questions themselves, but requested that the researcher physically entered their responses into the laptop, and in others participants opted for the researcher to verbally ask the initial questions in each lottery set, but they then read the remaining questions themselves, or indicated what their responses would be as they knew the pattern of the changing potential outcomes in ‘option B’ of each lottery set. Additional explanations were sometimes requested by patient and carer participants, and provided by the researcher, for example, an explanation of the 50/50 choice was presented as the equivalent of flipping a coin when participants expressed that they were unsure how to interpret 50/50 chance. Care was taken to try to avoid influencing people's choices in either direction on the lotteries when they asked for clarification or further explanation.

Additionally, if patients or carers spontaneously offered commentary on their choices or decision-making process, these were collated and are shown in Appendix 2. These were not formally analysed, but key comments are discussed.

4.6 COVID19 related impact

Although this study was designed prior to the beginning of the COVID19 pandemic, all data collection happened during the pandemic. Due to temporary bans on recruitment to research studies that were not related to COVID19 in the UK (291), the pandemic had been going on for many months by the time data collection began. This meant that there had been considerable changes to both general life and to health services in response to the pandemic and the infection control measures that were implemented. One of the most significant changes with regards to this study was the reduction in visitor access to hospitals (292), which extended to the areas from which patients and carers were recruited for this study. Due to these restrictions, the number of carers who were with patients in the department, and who were therefore eligible to be approached about recruitment, was considerably lower than it may have been, had the pandemic and its resulting visiting restrictions not been in existence.

In addition, there was considerable public health messaging to the population and numerous social and policy changes related to COVID19 in the UK prior to, and at the time of, data collection (293). Knowledge about both COVID in general, and the message to try to reduce pressure on the NHS may have influenced some participants' thought processes in relation to the questions asked in this study. For example, there was a far greater emphasis on health risks facing the entire population (in this case the risk of COVID infection) than there had been prior to the pandemic, which may have fed into participants' decisions regarding the health domain lottery questions, as well as financial instability for many people as a result of furloughing and changes to people's ability to go to work (294), which may have influenced individuals' choices in the financial domain lotteries.

4.7 Demographics

Demographic information was gathered from all participants. Patients and carers provided data on gender, age bracket, ethnicity (as per UK census categories) and type of service used (Ambulatory Care or Front-Door unit). Staff were asked to provide demographic data including gender, current job role (including seniority level), years worked since qualification, previous clinical experience, and type of service that they currently work in (Ambulatory Care or Front-Door unit). Definitions were given for Ambulatory Care and Front-Door services, and staff were free to determine which option their service most closely fitted, patients and carers could request that the researcher made this differentiation for them. All participants could choose not to provide their gender (options available: male, female, other, prefer not to say), and patients and carers could choose not to provide information about their ethnicity. The full demographics forms can be seen in (appendix 3a and 3b).

4.8 Outcomes

Risk tolerance was calculated in two ways. Firstly, the number of times that a participant chose the guaranteed, or ‘safe’, option (option A) in each lottery set, and secondly by identifying the point at which a participant switched from option A (certain outcome) to option B (uncertain outcome).

By identifying how often a participant chose the guaranteed option, an indication of their risk tolerance could be established – the more frequently the guaranteed option was selected, the more risk averse the person is. This method of determining risk tolerance has been used previously (206) and allows all participants’ data to be included in analyses, regardless of whether they only switched once between the certain and uncertain outcome, they switched multiple times or they did not switch at all. Since each lottery set consisted of seven choices, the maximum number of times someone could choose the guaranteed outcome in each lottery set was seven (indicating high risk aversion) and the minimum was zero (indicating high risk tolerance). The number of times each participant chose the guaranteed option in multiple lottery sets was also combined, such that analyses could be conducted to establish and compare risk tolerance across all six lottery sets, across the financial lottery sets, across the health lottery sets, across the ambiguous lottery sets and across the non-ambiguous lottery sets.

In the second method for establishing risk tolerance, the actual point at which participants switched from the certain to the uncertain outcome was used. The earlier this switch happened, the less risk averse, and therefore more risk tolerant, the participant was deemed to be. Risk tolerance was divided into four categories for each lottery set (Table 4) – highly risk tolerant (choosing option B for all choices, or all except the first), moderately risk tolerant (swapping to option B from the 3rd, 4th or 5th choice), mildly risk tolerant (swapping to option B from the 6th or 7th choice) and risk averse (choosing option A for all choices).

Question number	**Risk tolerance rating if participant switches to option B (uncertain outcome) from this question onwards**
1 (Option B throughout)	Highly risk tolerant
2	Highly risk tolerant
3	Moderately risk tolerant
4	Moderately risk tolerant
5	Moderately risk tolerant
6	Mildly risk tolerant
7	Mildly risk tolerant

Does not switch to option B (All A)	Risk averse

Table 4. Risk tolerance scoring*, based on point at which participant switches from choosing option A (certain outcome) to choosing option B (uncertain outcome)*

Each lottery set was scored separately, therefore it was possible for a single participant to be scored as highly risk tolerant on one lottery set (for example, non-ambiguous, high financial pay-offs) but risk averse in another lottery set (for example, ambiguous, high financial pay-offs). These individual lottery set risk tolerance scores were compared, to allow investigation of how changes to the content of the lottery sets, for example, ambiguous health vs ambiguous financial risks, non-ambiguous health vs non-ambiguous financial risks, or ambiguous vs non-ambiguous health options, effected risk tolerance in individuals and across groups.

Given that this approach is based on an exact switch point, those who switched multiple times between the certain and uncertain outcomes in a given lottery set were excluded from analyses incorporating that lottery set. However, as noted, an individual's switch point could vary between lottery sets, therefore if a participant had multiple switch points in one lottery set, but only one (or none) in another lottery set, they would only be excluded from analyses including the lottery set in which they had multiple switch points, and would be included in any analyses where they had a single switch point (or did not switch) in all lottery sets included in that analysis. In the uncommon case of participants who chose the uncertain outcome (option B) initially, and then switched to the guaranteed option (option A) part-way through a lottery set, analyses were conducted both including and excluding them. This is an unusual pattern of choice, because it implies taking less risk as the potential rewards increase, and thus it was not anticipated that many participants would follow this pattern. As with those who switched multiple times, it was possible for a participant to choose to switch from the uncertain to the certain option in one lottery set, but to choose differently in another lottery set, and therefore inclusion in analyses was based on the choices made only in the lottery set being included in a given analysis, not on choices in any other lottery set (or sets). The number of participants who fell into the ‘multiple switch points’ and ‘B to A switch’ groups were identified, and the frequency of these compared to previous studies.

4.9 Analyses

Patterns of risk tolerance were calculated in the overall sample population and in various sub-groups, including patients, carers, different professional groups and different age groups, using IBM SPSS Statistics 27 software. These were calculated for overall risk tolerance, financial and health risk tolerance, and risk tolerance under conditions of ambiguity. Trends and patterns within individual and combined groups (e.g. patients & carers, all professionals) are presented separately.

A range of sub-group analyses of risk tolerance were conducted, allowing comparisons between different participant sub-groups. These included comparisons between professional groups, and different lengths of professional experience among staff participants, age and ethnicity within the patients and carers group, and genders within the whole sample. This allowed for analysis of any patterns of risk tolerance that could be identified among these different groups. Within-group analyses were also undertaken, to identify whether patterns found across the population as a whole were still present within particular groups, which also helped to identify potential confounders. In addition, patterns of risk tolerance in this study were compared to patterns identified in other populations in previous research, to explore level of similarity with broader UK-based and international samples.

Comparisons of risk tolerance patterns used histograms to visually represent patterns of responses in different groups. The Mann-Whitney U test (for two-way comparisons) and Kruskal-Wallis H test (for comparisons with more than two groups) were used to assess differences between groups. Averages for both ‘number of times the safe option was chosen’ and for switch points (among those who only switched once or not at all) were calculated and presented as mean (standard deviation) or median (IQR) as appropriate.

Two types of regression analyses were conducted, dependent on whether analysis was done using the number of times that participants chose the safe option (multiple regression) or the point at which they switched (ordinal logistic regression). These analyses were conducted on the staff and patient & carer data separately, due to the difference in independent variables between these groups. Both types of regression analyses investigated relationships between lottery set types (e.g. between health and financial domains, or between lottery sets with known and unknown probabilities in option B), and relationships between risk tolerance and different demographic variables. The Ordinal Logistic Regressions were based on the specific point at which participants switched between the certain and uncertain outcome, and as such excluded those who switched multiple times or switched from the uncertain to the guaranteed outcome (but did include those who did not switch at all). The multiple regression analyses included all participants. Additionally, due to the small number of participants whose ethnicity was within the ‘Any other’ group, sensitivity analyses were conducted for the ordinal and multiple regressions, with these participants (and thus the ‘Any other’ ethnicity group variable) excluded.

CHAPTER 5: QUALITATIVE METHODS

The qualitative component of this project was comprised of one-to-one, semi-structured interviews (295, 296), with physiotherapists who work in an Ambulatory Care or front-door NHS service. The data was analysed using Framework Analysis (297), and Fuzzy Trace Theory (232) was used as the theoretical framework. A small number of interviews with patients were also conducted.

5.1 Theoretical Framework

Fuzzy Trace Theory (FTT) was developed in response to findings from experiments on many aspects of memory, reasoning, and decision-making. One of the major experimental findings which contributed to FTT being further researched and developed (160, 232), was the finding that accurate memory of specific information was not a pre-requisite for reasoning (160, 232, 298). This is crucial to FTT, as it led to the core concept within FTT, which states that humans reason based on two ways of representing the relevant information – ‘gist’ and ‘verbatim’, of which they are more reliant on gist, especially as age and experience increase (233). These two concepts are meant similarly to how the words may be interpreted in more general language, although ‘verbatim’ in this context incorporates a wide range of specific information, including exact numbers, images, and event details, as opposed to only that which is delivered verbally. ‘Gist’, meanwhile, refers to the person’s qualitative or subjective understanding and interpretation of the information, and varies between individuals. It can be influenced by many factors, including previous experience or knowledge, emotion, outlook, and education, among others (160), and can include interpretation in relation to other available information, such as representing information as ‘more’ versus ‘less’ or ‘taller versus ‘shorter’, or more simply as ‘tall’ versus ‘short’, or ‘some’ versus ‘none’ (233). Due to the more variable and subjective nature of gist representations, they can vary between individuals, but verbatim representations cannot, as they relate to exact information.

Although they are different, verbatim and gist representations are also not entirely separate from each other, instead they exist on a spectrum with the most specific verbatim at one end and the “fuzziest gist” at the other (233). People tend to rely on a combination of both of these representations when making decisions, and they can be accessed both independently and in parallel, although people tend towards using the most basic gist that they appropriately can for a given situation (160). As people develop, and their experience increases, they tend even more towards use of gist representations, using only the most pertinent information to make decisions in an ‘all or nothing’ manner, which has been shown to produce better choices in that area (e.g. cardiologists making triage decisions for patients presenting with chest pain (240)).

FTT has been applied to healthcare decision-making previously, including to professionals’ decision-making (176, 239-241), patients’ decision-making (241, 242, 245) and people’s lifestyle decisions that may influence their health (238, 299-301), although it has not been investigated in the context of acute location of care decisions. In these decisions each of the participants in the decision will have their own gist interpretation of the scenario, even if they are all agreed on the verbatim representation of the information, which could help explain some of the differences of opinion that may arise in such decisions, as well as some of the ‘irrational’ decisions that previously discussed theories have tried to address. Where previous research has investigated healthcare professionals’ clinical decision-making, this has often centred on doctors and/or medical students (e.g.(176, 241, 246)), but less work has investigated physiotherapists’ clinical decision-making in the context of FTT. Since their training and professional experiences differ from that of doctors, this could have an impact on their gist interpretation of situations, and thus on their clinical decision-making.

Through explaining how people reason and make decisions, FTT could be used to inform communication strategies, including helping with communication between healthcare professionals and patients when discussing location of care decisions. FTT indicates that focussing on communicating the gist of the information being supplied, as opposed to focussing on the specific, verbatim information, will be more useful and effective (160).

As previously discussed, FTT has a number of advantages for the current study over the other decision-making theories outlined in Chapter 2. In particular, it incorporates some proportion of the inherent uncertainty in healthcare-based decisions, which may not be present in financial decision-making, and as it was not developed with a specific healthcare-based population, and is a general theory of decision-making process, it may be applied to all those involved in location of care decisions, including both healthcare professionals and patients. Additionally, it allows inclusion of both specific (verbatim) information, which may be drawn from research evidence or clinical assessments among other areas, and which professionals may rely on when making clinical decisions, alongside human nature and interpretation (i.e. gist), which will be influenced differently in all those involved in the decision, and thus accounts for how different parties may view the same information differently. There are some criticisms of FTT as well, mainly centred around differences in an individual's ability to remember different pieces of information clearly (235), situations not being amenable to decisions based on simplest gist (234) and that, in a healthcare context, reliance on intuition and gist is counter to the application of evidence-based practice. This final point is not an inherent criticism of FTT, but of its use in health decisions, and it has alternatively been argued that using pattern recognition in this way can allow for faster decisions while allowing mental space to incorporate new information as appropriate (236).

Overall, despite these criticisms and challenges, FTT has advantages over the other theories discussed, in that it can be applied equally to all parties involved in a decision, while accounting for the uncertainty, even after a choice is made, that is present in many healthcare decisions, and individuals' different interpretations of the same information. It has previously been investigated in other healthcare contexts (176, 239, 244, 245), but not in Ambulatory Care or the front-door, and the aim of using it in this study is to assess whether, and to what degree, it could explain decision-making in this context. It was valuable for this role, as it helped to identify the different ways in which participants reasoned around location of care decisions, but it did not fully explain this, and further research may be required, especially around the interpersonal component of these decisions. Each of the key themes identified were assessed against the tenets of FTT to establish if, and to what extent, the decision-making process of interview participants related to the FTT principles of using gist and verbatim representations to make decisions.

5.2 Design

One-to-one, semi-structured interviews (296) were conducted with physiotherapists, and a small number of patients, who had experience of Ambulatory Care or Front-Door NHS services. In the case of physiotherapists, this meant qualified physiotherapists who worked in an Ambulatory Care and/or Front-Door NHS service, although this did not have to be their exclusive place of work, they could still participate if only a portion of their clinical work was undertaken in one (or more) of these services. Patients were also invited to give their views, and to be eligible to participate, they had to have received care in either a Front-Door or Ambulatory Care unit. The interviews focussed on the interviewee’s perceptions of the risks and benefits of receiving care at home or in hospital, their involvement in location of care decisions and how they make these decisions, and interviewee’s more general views on risk in their personal or professional lives.

Physiotherapists and patients were chosen as the two groups to be interviewed due to their respective roles in making location of care decisions. Physiotherapists were chosen because, while they play an important role in supporting safe discharges in this context, their location of care decision-making has not been investigated, unlike that of other healthcare professionals, such as doctors (302, 303). Physiotherapists are often involved in making location of care and ‘admit or discharge’ decisions (304). Their input on these disposition decisions is often centred on anticipated patient safety (305) in different locations, especially if the patient were to return home (304). It is therefore possible that this may be their focus when making disposition recommendations, which may be different to the perspective of other professionals involved in the decision-making process, such as doctors, whose focus may be on medical stability or treatment requirements (306, 307). Given this difference in focus, it may be understood that the roles of physiotherapists and doctors in making location of care decisions are different, but complementary, to each other, and as such both merit investigation. Although the risk tolerance and discharge decision-making processes of some healthcare professionals at the front-door have been studied (302, 303), it is less common for allied health professionals, such as physiotherapists, to be the subject of this type of study in this setting, despite the important role that they play in contributing to these decisions, and the possibility of their process being different to that of other professionals. Therefore, their views and experiences were elicited for this study, in order to contribute to the wider understanding of how healthcare professionals make clinical decisions, under conditions of uncertainty and risk.

Patients should be included in the decision-making process of any decisions made about their care, in line with the concept of “No decision about me without me” (308). The location in which patients receive care, and/or whether they are admitted or discharged after presenting to a hospital, are important decisions, which should always be discussed between the patient and the clinical team treating them, therefore developing a better understanding of the patient perspective on this decision is vital.

Semi-structured interviews were used for this study because they allow the researcher to determine the overall topic outline that the interview will cover, but still have the flexibility to allow interviewees to guide how the interview progresses, thus allowing for new ideas and perspectives to be uncovered (296). A key component of semi-structured interviews is the topic guide (296), which was prepared in advance of the interviews, with open-ended questions based on relevant literature, personal and professional experience, and inter-professional discussions among the research team (Appendices 4a and 4b). This was used as a basis for the interviews, but, in keeping with the principles of semi-structured interviewing, it was possible for discussions during interviews to deviate from this, in line with participants’ responses (296), both their own and those of previous interview participants.

Sample size for the physiotherapist interviews was determined by the point at which no new ideas or information were being identified from the interviews. The point when this was reached was determined by conducting data analysis concurrently with data collection, allowing for identification of the point at which no new codes were being generated as part of the framework analysis (309). The model of using information power to determine sample size for qualitative interviews suggests that the Breadth of the study aim, Specificity of the sample, Application of theory, Quality of dialogue, and Strategy for analysis should all contribute to determining sample size (310). In this study, the aims were relatively broad, although with a focus on a specific decision and a defined population, and the theory was applied mainly in analysis, both of which would increase the number of participants required. However, the specificity of the sample was high, as it expressly involved physiotherapists working in defined clinical areas, with experience of location of care decisions, and this aspect of their experiences had not previously been explored, and the quality of the dialogue, which was assessed on an ongoing basis during interviews, was discovered to be good in this study, due to the detail in participants' answers and level of rapport between interviewer and participants. Both of these elements would reduce the number of required participants. Finally, although the analysis was conducted on a cross-case basis, it was an exploratory analysis to investigate factors influencing physiotherapists' location of care decisions and their views towards risk, and thus was not anticipated to capture every possible component of these, but instead to stop data collection when new themes were no longer being identified. It was anticipated that this would require a sample size of approximately 15-20 (295).

Multiple approaches were used for recruitment, with purposive sampling within that framework (311), aiming for variety within the sample. Physiotherapists represent a diverse population, in terms of personal and professional characteristics, therefore this was determined to be an appropriate sampling technique, in order to ensure that the interview participants represented this diversity. Characteristics that were considered in trying to appropriately represent this population included gender, type of front-door or Ambulatory Care unit, duration of professional experience, length of Ambulatory Care or Front-Door unit experience and previous clinical specialities. Physiotherapist participants were approached via both digital means and face-to-face. They were identified via membership of relevant professional organisations, and could also self-identify as being eligible if they saw information regarding the study in another setting. Physiotherapists were approached via email, through other digital means of publicising the study online, including Twitter, and face-to-face in the units where patients were recruited. A participant information sheet, with contact details of the research team, was sent to all physiotherapists who expressed an interest in participating (Appendix 5a).

When patients were recruited for the quantitative component of this study, they were given the opportunity to provide contact details with which they could be contacted to be invited to participate in an interview. Patients' clinical treating teams gave permission for the researcher to approach each potential patient participant to discuss the overall study, and it was made clear to patients that they were free to choose whether or not to provide contact details regarding the interview component, and that if they did so this was not indicative of a commitment to participate in an interview, only that they may be contacted with an invitation. Eligible patients were later contacted via their chosen contact method (primarily email or telephone) to be invited to participate. A participant information sheet (Appendix 5b), including contact details for the research team, was sent to all those who initially provided an email address or provided an address when they spoke with the researcher on the phone and consented to being sent this information. Although purposive sampling (311) was anticipated, due to the restraints of COVID-19 on research, all eligible patients were contacted. Despite this, patient recruitment for interviews was very low, and only two patients participated in interviews.

5.3 Data Collection

The interviews were conducted on a one-to-one basis, using telephone or other telecommunication strategies, such as Zoom (San Jose, USA: Zoom Video Communications Inc.), while the participant was in their own home or workplace. All interviews were conducted in English, therefore one of the inclusion criteria was the ability to speak English to a sufficient degree to participate, but English did not have to be a participant’s primary language. The options to participate in person or via telephone or other telecommunication strategies were used to make the interviews as convenient as possible for participants, and to comply with COVID-19 infection control measures. All interviews were recorded and transcribed, then transferred to NVivo software to support coding, alongside the use of Excel software for manual coding (295). In addition to the interview transcripts, the researcher also kept a research diary (312) recording non-verbal details from interviews, researcher reflections on interviews and data, reflections during transcription and reflections on analysis during the study (297). This was used to support data analysis and aid reflexivity. Although it is more challenging to identify non-verbal details via video-conferencing, due to the reduced view of the participant via their webcam, it was generally still possible to see participants' facial expressions and at least some of their body language via video. There was only one occasion when part of an interview had to be conducted via telephone (due to technical difficulties), and therefore it was possible to see most participants on-screen during interviews.

5.4 Data Analysis

The data in this study was analysed using a Framework Analysis method, which consists of seven key stages (297), the processes of which are detailed below. Framework analysis is a form of Thematic Analysis, and is defined by the 'matrix' that is developed and used for the analysis. This matrix, and the way that data is charted into it, has a number of benefits, including the increased ease with which it allows members of the multi-disciplinary team, with different professional backgrounds, to contribute to the analysis, without necessitating that they all read all the transcripts, as well as supporting pattern recognition by any team member, because of the visual layout of the matrix. Alongside supporting team contributions to analysis, by using a matrix layout, data can be seen within its wider context, which facilitates more in-depth data analysis and thick description, and non-interview data (for example, notes from the research diary relating to non-verbal communication) can be incorporated into the matrix (297), which further supports accurate and comprehensive interpretation of the data, and thicker description (313). It also makes it easier to group data from different individuals on the same theme, which helps with clarity for analysis.

The processes used to complete the seven key stages of Framework Analysis were as follows.

1. Transcription – Verbatim transcription of each interview was completed, with a focus on content. This meant that dialogue conventions, such as pauses, were not always noted, as the content was the main focus of data analysis.
2. Familiarisation with the interview – In the process of transcription, the audio recordings of the interviews were listened to, and research notes relating to each interview were reviewed. This helped to increase familiarity with the data, to help with later analysis.
3. Coding – Initial coding was open, and all members of the research team (CH and her supervisors) reviewed two transcripts independently to generate codes. They then met to discuss the initial codes that they had generated, in order to undertake the next stage.
4. Development of the working analytical framework – An initial working framework was developed, using the codes that had been generated from the initial transcripts that had been independently coded. As further coding was undertaken on subsequent transcripts, and new codes emerged, further developments were made to the framework, until no further codes were identified from the transcripts. Similar codes were grouped into ‘categories’ as appropriate. Relevant elements of FTT were used to guide code development for the framework.
5. Application of the framework – The codes and categories that formed the framework were used to index and code the remaining transcripts.

6. Charting data into the framework matrix – A spreadsheet was created, using the analytical framework, and the coded data was entered into the cells of this spreadsheet by category. This ‘charting’ process aimed to condense the data, while retaining the meaning and sense of it, with links to direct quotes within the transcripts to illustrate points.
7. Data interpretation – Interpretation was ongoing throughout the research, concurrent with other elements, including ongoing interviews for data collection. Impressions and ideas emerging from interpretation of the data were noted as analytical memos and discussed among the team, in order to facilitate exploration of these ideas and connections within the data.

Through development of the coding framework, and mapping each participant’s responses to this list of codes and categories, it was also possible to conduct comparisons between sub-groups of participants, based on various characteristics, including both the personal (e.g. gender, professional seniority, number of years working) and the institutional (e.g. service type (Front-Door or Ambulatory Care)). The research team who undertook the coding was multi-disciplinary, which helped to ensure that a range of perspectives were included. CH is a physiotherapist, which meant that she had an ‘insider’ role with the physiotherapist interviews, but an ‘outsider’ role regarding the patient interviews (295). Meanwhile, the other members of the research team have different professional backgrounds – SG is a Professor of Medical Sociology and DSL is a Professor of Ambulatory Care and a medical doctor – therefore, independent coding of a selection of the transcripts, as detailed above, was used to help counter the potential downsides of CH’s insider role with the physiotherapist interviews. All research team members independently read two transcripts and identified key themes. They then jointly discussed these, to incorporate all views and agree themes, which were used to develop the analytical framework, which was further developed as more transcripts were analysed. By incorporating diverse viewpoints among those undertaking coding, who therefore had varying interpretations of the data, a broader and deeper understanding of the data and findings was facilitated.

Incorporation of codes drawn from relevant elements of FTT (160) in the coding framework allowed for assessment of the extent to which this theory (FTT) applied to the decisions under discussion, among the populations in this study. Coding was initially done inductively, with no restraints put on codes, and then deductively to incorporate codes informed by FTT (297), and to identify those codes that had been identified via inductive coding which were applicable to FTT. As FTT's core principle is that people make decisions based on 'verbatim' and 'gist' representations of information, care was taken when coding and analysing to try to identify when these representations were, or may have been, being discussed. For example, references to the use of clinical scores or specific information elicited from patients are both demonstrations of using verbatim representations, whereas sub-codes such as 'confidence in clinical judgement' and 'attitudes to risk changing with time' are both more heavily referencing 'gist' representations that physiotherapists use in their decision-making.

In writing up and analysing the results, each theme is presented individually, with a description of its sub-themes and components, followed by investigation of the applicability of FTT to that theme. This method of presentation was chosen because the goal of this work overall is to have the potential to impact clinical practice, and the specific components of each theme are likely to have greater use in doing this than the investigation of the applicability of FTT to them. For example, it may be more useful for a HaH clinician to know that potential referrers want to know about the specific interventions their service can provide, than to know that this desire is based on needing ‘verbatim’ representations of information.

5.5 Positionality in Research

The interviews were conducted by CH. As she is a practicing physiotherapist this may have had an impact on multiple stages of the research, including recruitment, data collection and data analysis. Other researcher characteristics may also have impacted the research, such as her gender (female, along with 75% of practicing physiotherapists in the UK (314)), age and ethnicity (Caucasian, as are approximately 86% of chartered UK physiotherapists (315)).

The ‘insider’ role (295) that CH had when interviewing physiotherapists, had both benefits and drawbacks. During recruitment, it may have helped to encourage participation (316), and increased access to potentially eligible physiotherapists through personal and professional connections. Having a connection and some shared experience with participants also allowed for shared understanding of certain technicalities and nuances when interviewing physiotherapists, as others have found in studies where interview participants have shared experiences with the interviewers (317, 318). Sharing participants' profession may also have suggested a degree of "trustworthiness" (319), and thus facilitated physiotherapists being more open. However, this perceived 'shared understanding' also posed a risk of the interviewer and interviewee thinking that they had a shared understanding in regard to certain points, due to their shared profession, while they in fact did not, as each could interpret the same point or situation differently in response to their individual experiences. Additionally, it has previously been found that health professionals can feel as though their knowledge of a topic is being tested when interviewed by another professional, especially one who shares their profession, despite reassurance to the contrary (318, 320), which was apparent among some physiotherapists in the current study. Therefore, while the 'insider' role could play a positive role in recruitment, and could add to understanding and analysis of data, it also created a risk of incorrect assumptions or interpretation being 'coloured' by CH's experience and knowledge, which could differ from that of physiotherapist participants, as well as other potential drawbacks.

When interviewing patients, CH had more of an 'outsider' role (295), as she was not a patient herself. Her role as a researcher was made clear to patients, and her professional background as a physiotherapist was not hidden from them. This knowledge that she was a healthcare professional meant that it was possible that some patient participants may have moderated their answers, in order to provide the responses they thought she wanted (321). However, it was made explicitly clear to all participants that she had no role in their clinical care and was there only in a research capacity, not a clinical one. Participants were also made aware that what they discussed during the interview would be kept confidential, in order to try to encourage honest and open discussion. Conversely, knowing that CH is a health professional may have had positive effects as well, as it may have provided an added level of reassurance for some participants, and engendered more trust and openness in their interviews. It also avoided the risk of patient participants discovering this during or after the interview and thereby feeling that they had been misled.

A research diary was kept during the study by CH, in which she made field notes and recorded personal reflections. This was done in part to ensure that CH engaged effectively in reflexivity during the research (312), which is an important element in maintaining high standards in qualitative research (317). This diary also helped to ensure that the experiences and responses of participants were more accurately represented and reflected, by incorporating notes on non-verbal communication, to deepen understanding of interviewees’ meaning during specific elements of discussions, and allowing clearer reflection and interpretation of how the researcher and research process were influencing the outcomes and interpretations.

CHAPTER 6: QUANTITATIVE RESULTS

A total of 338 participants were included in this study - 106 staff members and 232 patients and carers. All of these participants completed all the demographics and lottery questions, and therefore none were excluded. They were drawn from multiple Front-Door and Ambulatory Care units, representing a range of professions, age categories, genders and ethnicities.

6.1 Demographics

6.1.a Staff Participants

Among the 106 staff participants in this study, 62 (58.5%) were female and approximately half (54 participants, 50.9%) had been working for 15 years or more since qualification. Respondents included doctors, physiotherapists, occupational therapists and nurses, and included those working in either Ambulatory Care (AC) or Front-Door (FD) units, or both (Table 5). The ability to indicate that one worked in both Ambulatory Care and Front-Door areas (indicated in Table 5 as ‘Service Type – Not Binary’) was only available to participants who completed the questionnaire in the later part of the staff recruitment period. Therefore, it is possible that a proportion of those who completed the questionnaire earlier, and did not have this option, may work in both service types, but selected their primary work location, due to being unable to select both. Overall, including those who reported working in both AC and FD units, 52 participants (49.1%) worked in AC and 80 participants (75.5%) worked in FD departments (note that this total is greater than 100% due to those who reported working in both service types). All staff participants completed the questionnaire online, independent of the research team.

Characteristic	**All Staff (n = 106)**
Gender [a] (%) female	62 (58.5)
Job Role (%)	Doctor: 67 (63.2) Physio: 26 (24.5) OT: 4 (3.8) Nurse: 7 (6.6) Other: 2 (1.9)
Years working since qualification (%)	15+: 54 (50.9) 11-14: 15 (14.2) 6-10: 21 (19.8) 2-5: 13 (12.3) Less than 2: 3 (2.8)
Service Type – Binary (% of binary group) [b]	Ambulatory Care: 21 (30.9) Front-Door: 47 (69.1)
Service Type – Not Binary (% of non-binary group) [c]	Ambulatory Care only: 5 (13.2) Front-Door only: 7 (18.4) Both: 26 (68.4)

Table 5 – Staff demographics. *a = all participants reported their gender as either female or male; b = participants who were asked their service type as a binary question (n = 68); c = participants who could choose one or both service types as the type of service they worked in (n = 38)*

The largest professional group among staff participants was doctors, who comprised 63.2% of the included staff population. They had a lower proportion of female participants (44.8%) compared to the overall staff population but a similar pattern of distribution of years working since qualification. A broad range of clinical specialties were represented, covering both adult and paediatric medicine, and including individual (e.g. Geriatrics) and joint (e.g. Acute and Respiratory Medicine) specialities. The most commonly reported specialty was Acute Internal Medicine or Acute Medicine. Compared to the overall distribution of service types in which staff work, doctors reported a more equal split between working in AC (45.9%) and FD (54.1%) services when asked as a binary choice than was present for the participant group as a whole, and predominantly reported working in both AC and FD services (83.3%) when given the option to select both (Table 6).

Characteristic	**Doctors (n = 67)**
Gender (%) female [a]	30 (44.8)
Job Title (%)	Consultant: 49 (73.1) Registrar: 9 (13.4) Speciality Trainee: 7 (10.4) FY1 / FY2: 2 (3.0)
Years working since qualification (%)	15+: 40 (59.7) 11-14: 8 (11.9) 6-10: 12 (17.9) 2-5: 6 (9.0) Less than 2: 1 (1.5)
Clinical Specialities (%)	Anaesthetics = 1 (1.5) ACM = 1 (1.5) Acute and Ambulatory Care = 1 (1.5)

	Acute and General Medicine = 1 (1.5) Acute and Respiratory Medicine = 4 (6.0) Acute Care at Home = 2 (1 stated as geriatrics) (3.0) Acute Internal Medicine / Acute Medicine = 35 (52.2) Acute Medicine and ID = 1 (1.5) Ambulatory Fellow = 1 (1.5) Care of the Elderly / Geriatric Medicine = 9 (13.4) Emergency Medicine = 2 (3.0) General / Geriatric Medicine = 1 (1.5) Infectious Diseases = 1 (1.5) Medicine = 1 (1.5) Paediatric Emergency = 3 (4.5) Paediatrics = 1 (1.5) Respiratory = 2 (3.0)
Service Type – Binary (% of binary group) [b]	Ambulatory Care: 17 (45.9) Front-Door: 20 (54.1)
Service Type – Not Binary (% of non-binary group) [c]	Ambulatory Care only: 2 (6.7) Front-Door only: 3 (10.0) Both: 25 (83.3)

Table 6 – Demographics of doctors only. *a = all participants reported their gender as either female or male; b = participants who were asked their service type as a binary question (n = 37); c = participants who could choose one or both service types as the type of service they worked in (n = 30)*

Among the non-doctor staff participants, the largest professional group represented was physiotherapists, who accounted for nearly a quarter of staff participants (24.5%). The remaining 13 participants (12.3%) were nurses (7), occupational therapists (4), a physician associate (1) and a nurse consultant (1). The demographics of all of these participants are shown in Table 7. The proportion of female participants in these professions was much higher than for the staff participants overall (82.1%) and their years working since qualification were more evenly spread across the categories, which was also reflected in the distribution of bands (i.e. level of seniority) for this group when compared to the distribution of job titles for doctors. Additionally, a higher proportion (87.1%) of therapist and nurse participants worked in FD services (rather than AC), compared to the overall proportions when asked as a binary question, and when the option to select both was available only one nurse reported working in both AC and FD, while 50% of respondents from these professions reported that they worked in FD only.

Although the pattern of banding among physiotherapy participants was similar to that of all therapists, nurses and other non-doctor professions combined, they had a higher proportion of participants with 15 or more years' experience (46.2%) than in the combined group. Also, the skewing of the distribution of work locations towards FD, as opposed to AC, was even more pronounced in physiotherapists than when combined with the other non-doctor professions, with only one physiotherapist reporting working in Ambulatory Care and the other 25 physiotherapists reporting that they work in Front-Door services.

Characteristic	**Therapists, Nurses and Other (n = 39)**
Gender [a] (%) female	32 (82.1)
Current Band	Band 8 (and above): 7 (17.9) Band 7: 17 (43.6) Band 6: 10 (25.6) Band 5: 5 (12.8)
Years working since qualification (%)	15+: 14 (35.9) 11-14: 7 (17.9) 6-10: 9 (23.1) 2-5: 7 (17.9) Less than 2: 2 (5.1)
Service Type – Binary (% of binary group)[b]	Ambulatory Care: 4 (12.9) Front-Door: 27 (87.1)
Service Type – Not Binary (% of non-binary group)[c]	Ambulatory Care only: 3 (37.5) Front-Door only: 4 (50.0) Both: 1 (12.5)

Table 7 – Demographics of therapists, nurses and 'others' only. *a = all participants reported their gender as either female or male; b = participants who were asked their service type as a binary question (n = 31); c = participants who could choose one or both service types as the type of service they worked in (n = 8)*

6.1.b Patient and Carer Participants

A total of 356 patients and carers were approached regarding participation, of whom 232 (197 patients, 35 carers) consented, completed the questionnaire and were included in analyses. A further 8 people completed the consent form, but did not complete the questionnaire, none of their data was included in any analyses. The number of carers who participated was considerably lower than the number of patients due to the lower number of carers who were allowed into the department where recruitment occurred, and could thus be invited to participate, as a result of COVID19 visiting restrictions.

Table 8 details the key demographics of these participants. Almost half (49.1%) of the participants were aged between 16 and 40, and 152 (65.5%) patient and carer participants were female. The hospital from which patients and carers were recruited to this study is in Birmingham, which has an ethnically diverse population. This population diversity was reflected in the ethnicity of participants, with the largest groups being White British (96 participants, 41.4%), Pakistani (28 participants, 12.1%), Indian (25 participants, 10.8%) and Caribbean (25 participants, 10.8%). All patient and carer participants were offered the opportunity to complete the questionnaire independently on a provided laptop, or for the researcher to verbally ask them the questions. 43 participants (18.5%) chose to complete the lotteries independently, 180 participants (77.6%) requested to complete them verbally, and data is missing on method of completion for 9 participants (3.9%).

Characteristic	**All Patients & Carers (n = 232)**	**Patients only (n = 197)**	**Carers only (n = 35)**
Gender ^{a} (%) female	152 (65.5)	129 (65.5)	23 (65.7)
Age Category (%)	16-20: 14 (6.0) 21-30: 48 (20.7) 31-40: 52 (22.4) 41-50: 34 (14.7) 51-60: 43 (18.5) 61-64: 8 (3.4) 65-74: 18 (7.8) 75-84: 14 (6.0) 85-94: 1 (0.4) 95+: 0	16-20: 13 (6.6) 21-30: 38 (19.3) 31-40: 49 (24.9) 41-50: 29 (14.7) 51-60: 35 (17.8) 61-64: 6 (3.0) 65-74: 14 (7.1) 75-84: 12 (6.1) 85-94: 1 (0.5) 95+: 0	16-20: 1 (2.9) 21-30: 10 (28.6) 31-40: 3 (8.6) 41-50: 5 (14.3) 51-60: 8 (22.9) 61-64: 2 (5.7) 65-74: 4 (11.4) 75-84: 2 (5.7) 85-94: 0 95+: 0
Ethnicity (%)	All White: 112 (48.3) All Mixed / Multiple ethnic groups: 5 (2.2) All Asian / Asian British: 63 (27.2) All Black / African / Caribbean / Black British: 43 (18.5) All Other ethnic groups: 3 (1.3) Prefer not to say: 6 (2.6)	All White: 98 (49.7) All Mixed / Multiple ethnic groups: 5 (2.5) All Asian / Asian British: 47 (23.9) All Black / African / Caribbean / Black British: 39 (19.8) All Other ethnic groups: 2 (1.0) Prefer not to say: 6 (3.0)	All White: 14 (40) All Mixed / Multiple ethnic groups: 0 All Asian / Asian British: 16 (45.8) All Black / African / Caribbean / Black British: 4 (11.4) All Other ethnic groups: 1 (2.9) Prefer not to say: 0
Method of questionnaire completion (%)	Laptop: 43 (18.5) Verbal: 180 (77.6) No data: 9 (3.9)		

Table 8 - Patient and carer demographics. *a = all participants reported their gender as either female or male*

6.2 Risk Tolerance – Number of times safe option chosen

For all participants, the number of times they selected the ‘safe’ option (i.e. the guaranteed outcome) in each lottery was calculated. The higher the number of times the ‘safe’ option was chosen, the more risk averse the person was deemed to be in that domain, conversely, the less frequently it was chosen the more risk tolerant they were deemed to be. Calculating the number of times option A (the ‘safe’ option) was chosen, allowed all participants’ data to be included, while accounting for the fact that some people alternated repeatedly between the ‘safe’ and ‘risky’ option in a given lottery.

6.2.a All Lotteries

A broad range of risk tolerance levels were demonstrated when comparing the number of times people chose the ‘safe’ option across all six lotteries (figure 4). The total number of choices people made across the lotteries was 42 (six lotteries, with seven choices each), meaning that those who chose the safe option 42 times were the most risk averse. This pattern was the most frequent among participants, with 46 participants (13.6%) choosing the safe option in every choice of every lottery. Overall, the mean number of times the safe option was chosen was 24.3 (s.d. 11.52; median 24.0, IQR 15.0 – 34.0), and the majority of participants were among those who swapped from the safe to the risky option at least once (i.e. chose option A between 1 and 41 times). Additionally, there were a small number of participants (8, 2.4%) who chose the risky option in every choice of every lottery.

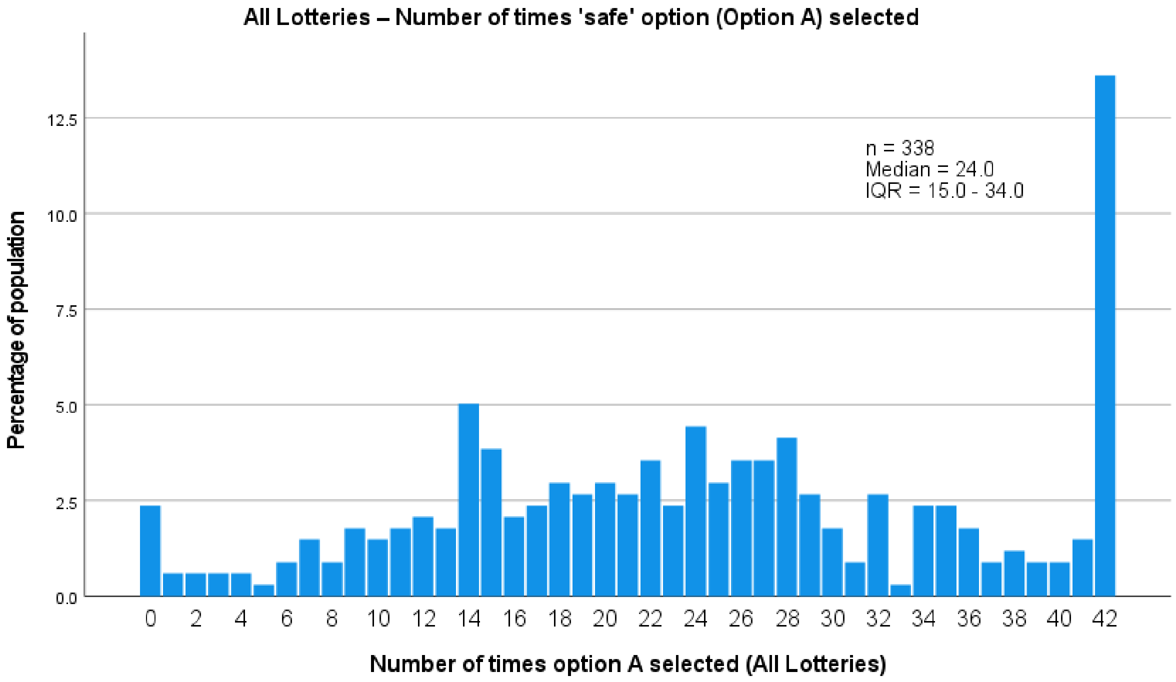

Figure 4. Distribution, by percentage, of number of times the ‘safe’ option was chosen by participants, across all six lottery sets

When considered separately, both male and female participants demonstrated a similar pattern of high risk aversion being the most popular choice (10.7% of female participants and 18.5% of male participants chose the guaranteed option in every choice), and had a visually similar distribution of risk tolerance, based on how frequently they chose the ‘safe’ option (Figure 5). Although female participants had a lower median (24.0, IQR 15.0 to 32.25) than male participants (25.0, IQR 17.0 to 35.0), indicating a higher level of risk tolerance, this difference was not statistically significant when assessed by a Mann-Whitney U test (U = 14296.5, z = 1.190, p = .234).

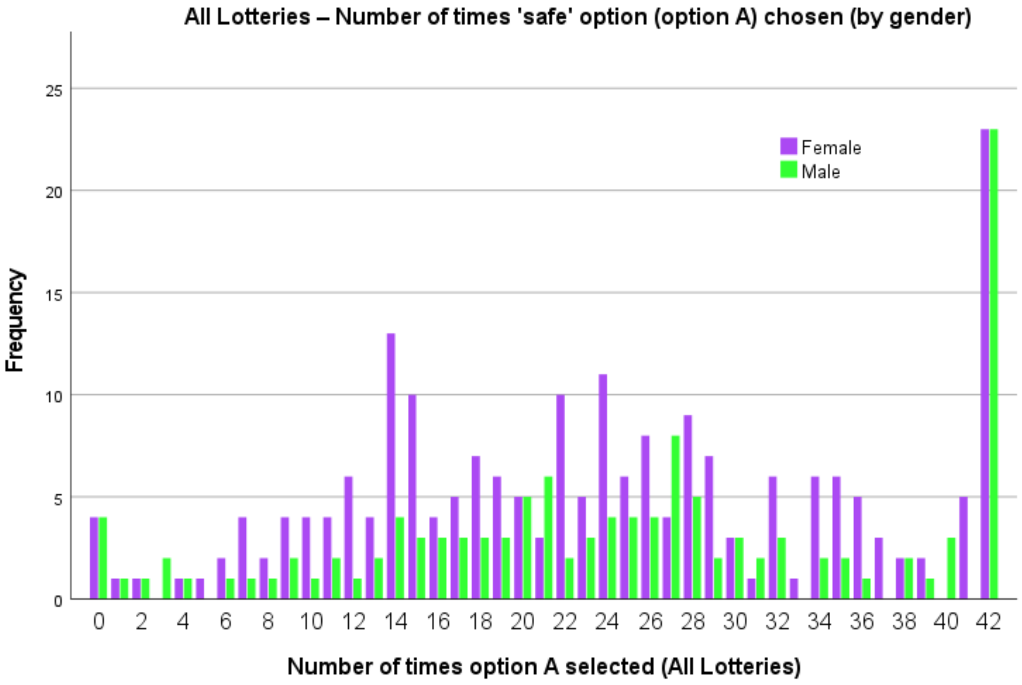

Figure 5. Distribution of number of times the ‘safe’ option was chosen, across all six lottery sets, split by gender. *Female participants, n = 214; Male participants, n = 124*

No statistically significant differences were identified between medians when comparing Staff and ‘Patients & Carers’ groups, using the Mann-Whitney U test (U = 12139.0, z = -0.189, p = 0.850). The overall median number of times that the guaranteed option was chosen in both participant groups was 24.0, and the results of each of these groups are discussed in more detail below.

Healthcare Professionals

Staff participants (n = 106) demonstrated a clearer pattern towards risk tolerance compared to the overall participant population, with 7.5% of participants choosing the guaranteed option 20 times, and 8.5% choosing it 27 times, out of a total of 42 potential times. However, the most common choice pattern was still those who chose the guaranteed option in every choice (42 times), i.e. the most risk averse choices, which applied to 9.4% of staff participants (figure 6). As for the overall population, the median number of times that the guaranteed option was chosen by staff was 24, however, the IQR was narrower for staff than for all participants (IQR 19.0 – 29.25).

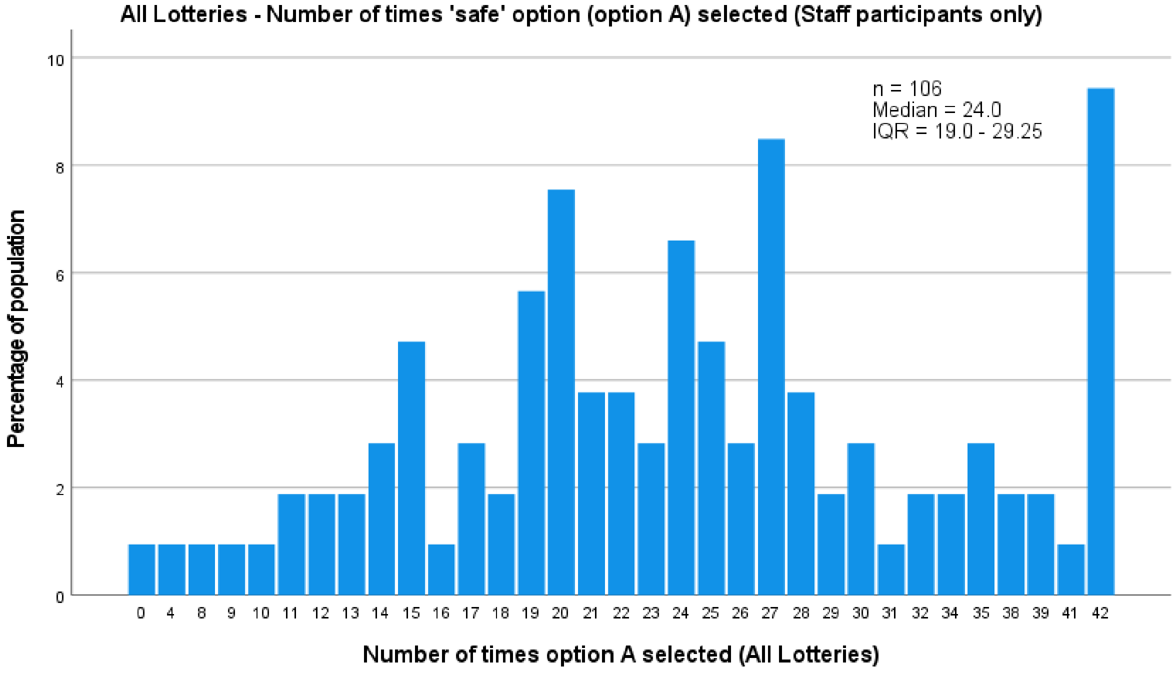

Figure 6. Distribution, by percentage, of number of times the ‘safe’ option was chosen by staff participants, across all six lottery sets

When comparing between professions, doctors’ risk tolerances tended to follow a similar pattern to the overall staff group, with peaks at the guaranteed option being chosen 27 times (9.0%), and every time, i.e. 42 times (9.0%), and the same median as the overall staff group (24.0, IQR 19.0 - 29.0) (Figure 7a). However, physiotherapists’ risk tolerances skewed towards being more risk tolerant, with a median number of times the guaranteed option was selected of 20.0 (IQR 15.0 – 27.0) (Figure 7b).

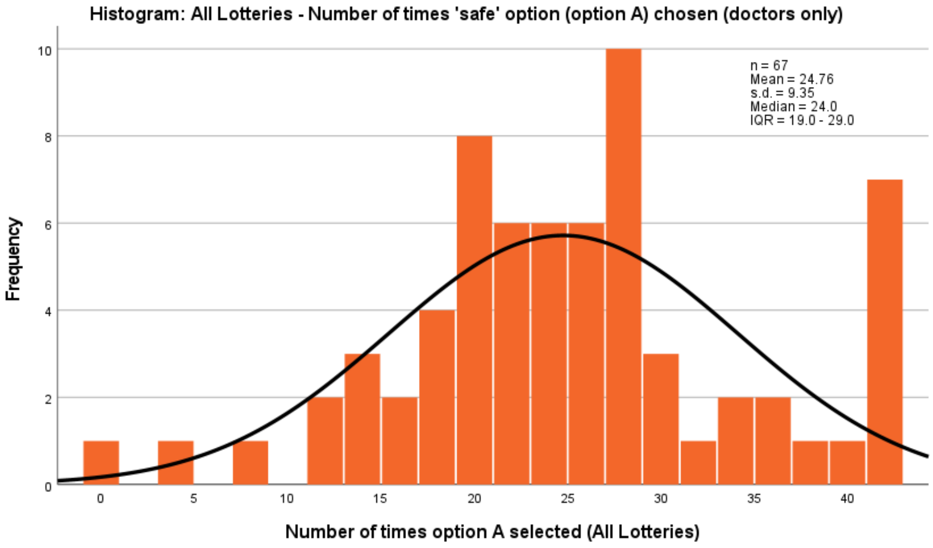

Figure 7a. Histogram of distribution of number of times the ‘safe’ option was chosen by doctors, across all six lottery sets

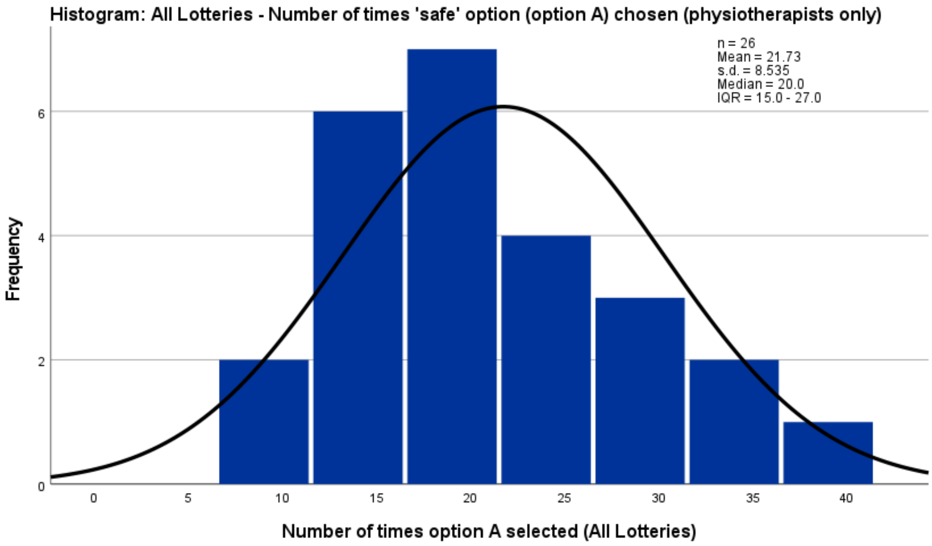

Figure 7b. Histogram of distribution of number of times the ‘safe’ option was chosen by physiotherapists, across all six lottery sets

Comparisons of risk tolerance between more and less experienced staff demonstrate similar levels of risk tolerance between those with up to ten years of professional experience and those with more than ten years of experience (figure 8). Both groups have a median of 24.0 (less experienced staff IQR = 19.0 – 29.5; more experienced staff IQR = 18.0 – 29.5), and a large proportion of participants in each group chose the guaranteed option every time (10.8% of those with up to ten years’ experience, and 8.7% of participants with more than ten years’ experience). However, in both groups there was also an earlier peak, with 10.8% of less experienced staff choosing the safe option 15 times, and 8.7% of more experienced staff choosing the guaranteed option 27 times, implying that among those who were willing to take at least some risk, the less experienced staff may be more risk tolerant than the more experienced staff. There were no statistically significant differences in the number of times the guaranteed option was chosen between the more and less experienced staff groups, as assessed by a Mann-Whitney U test (U = 1320.0, z = .289, p = .773). Additionally, the slope co-efficient for years of experience was not statistically significant, as assessed by multiple regression (Slope coefficient = 0.140, 95% CI -0.054 to 0.335, p = 0.157).

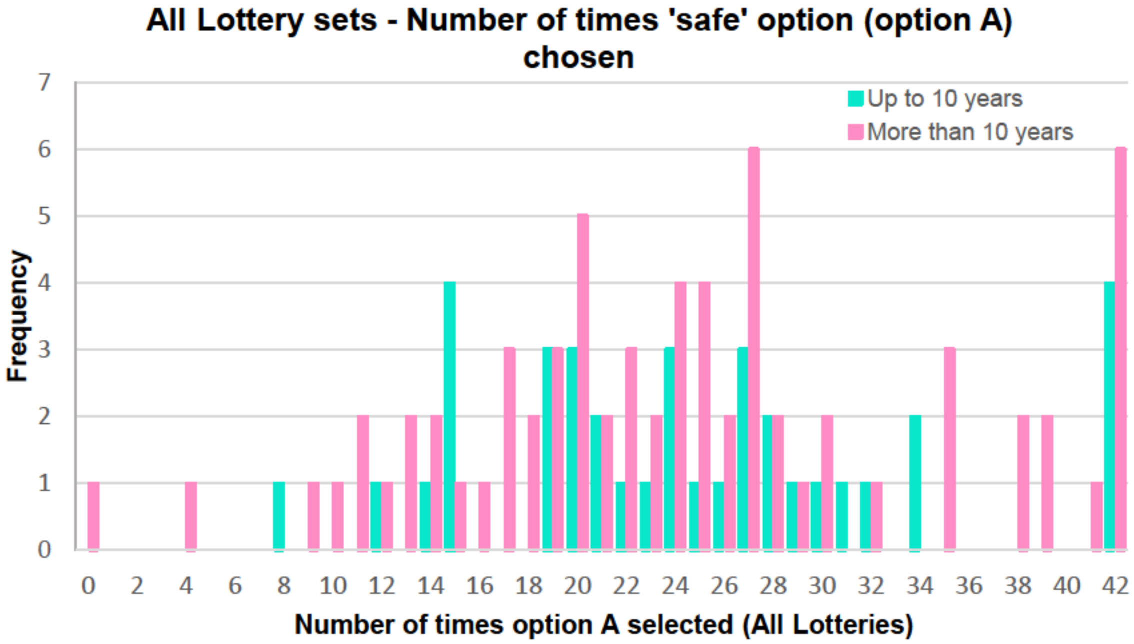

Figure 8. Distribution of number of times the ‘safe’ option was chosen by staff, across all six lottery sets, split by years of professional experience. *Participants with up to 10 years’ experience, n = 37; Participants with more than 10 years’ experience, n = 69*

Patients and Carers

Among the 232 patient and carer participants, the most common pattern of lottery choices was to choose the guaranteed option every time, which 15.5% of patient & carer participants chose, no other number of times that the guaranteed option was selected was chosen by more than 6.0% of participants. However, the median number of times that the ‘safe’ option was selected was the same as for the population as a whole (24.0, IQR = 14.0 – 35.0) (figure 9).

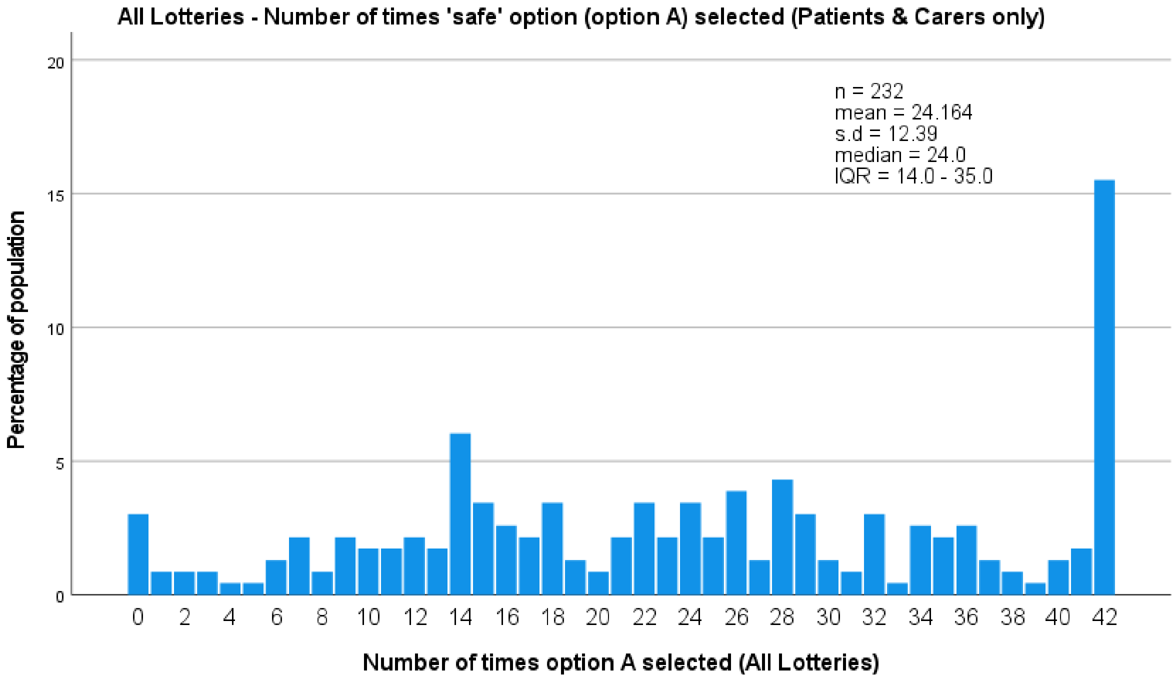

Figure 9. Distribution, by percentage, of number of times the ‘safe’ option was chosen by patient & carer participants, across all six lottery sets

Risk tolerance of older people (aged 65 years or older, n = 33) was compared with risk tolerance of younger people (aged less than 65 years, n = 199), and a statistically significant difference in risk tolerance distribution was identified via a Mann-Whitney U test, with older people demonstrating higher risk tolerance than younger people (U = 2225.50, z = -3.077, p = .002) (figure 10). While the median number of times younger people chose the ‘safe’ option was 25 (IQR = 15.0 – 35.0), older people chose the ‘safe’ option a median of only 16 times (IQR = 9.5 – 33.5), although in both groups the most frequent pattern of choices was to select the guaranteed option every time (i.e. 42 times), as was the case for the population overall. Among younger people, 15.1% chose the guaranteed option every time, and among older people 18.2% did so. As with the patient and carer population overall, the proportion of participants choosing the guaranteed option every time was dramatically higher than any other choice pattern.

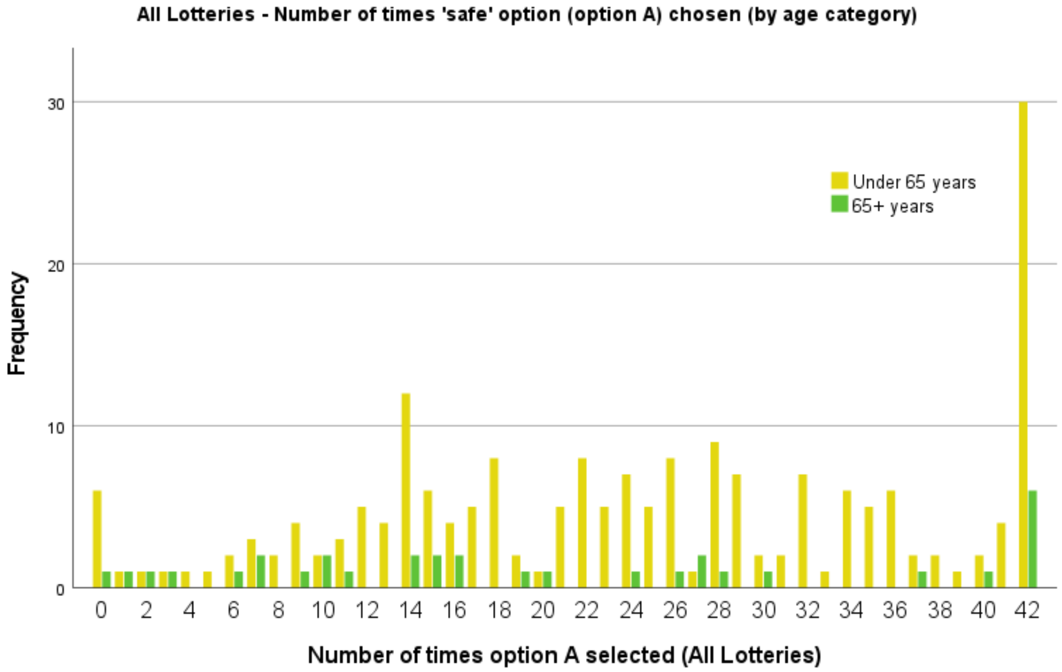

Figure 10. Distribution of number of times the ‘safe’ option was chosen by patients & carers, across all six lottery sets, split by age category. *Participants aged less than 65 years, n = 199; Participants aged ≥65 years, n = 33*

Comparisons of risk tolerance between patients and carers of different ethnicities were also conducted. The three largest groups of self-reported ethnicity were White (n = 112), Asian / Asian British (n = 63) and Black / African / Caribbean / Black British (n = 43). All other ethnicities accounted for the remaining 14 participants. Although a statistically significant difference was found (assessed by the Kruskal-Wallis H test) between groups in the distribution of number of times the guaranteed option was chosen (H(3) = 7.972, p = 0.047), post-hoc pairwise comparisons, with a Bonferroni correction for multiple comparisons, showed that the only statistically significant difference in medians was between ‘White’ and ‘Any Other’ groups (adjusted p value = 0.037), noting that the ‘Any Other’ group has a much lower number of participants in it than any of the other groups. Although the median number of times the guaranteed option was chosen varied between the groups, from 21.5 (IQR = 14.0 – 34.75; White participants) to 34.0 (IQR = 27.5 – 42.; Any Other ethnicity participants), there was a large sub-set of each group choosing the guaranteed option every time – 16.1% of White participants, 11.1% of Asian / Asian British participant, 16.3% of Black / African / Caribbean / Black British participants, and 28.6% of participants of any other ethnicity (figure 11).

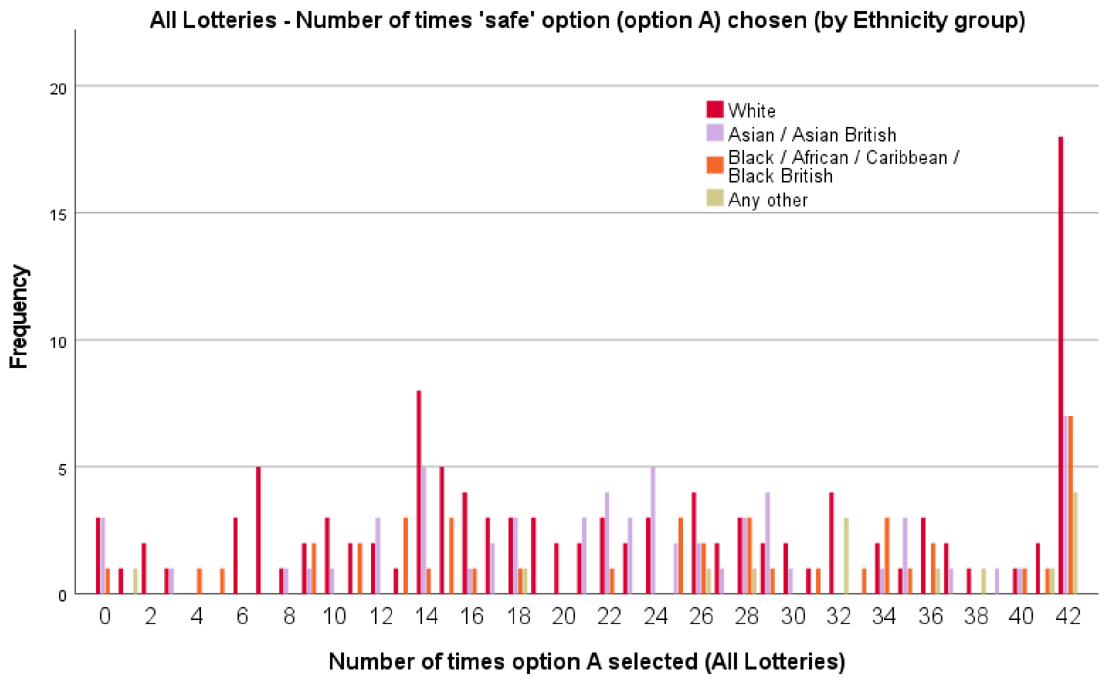

Figure 11. Distribution of number of times the ‘safe’ option was chosen by patients & carers, across all six lottery sets, split by self-reported ethnicity group. *Participant numbers in each group: White, n = 112; Asian / Asian British, n = 63; Black / African / Caribbean / Black British, n = 43; Any Other ethnicity, n = 14*

6.2.b Financial Lotteries

There were four lotteries based on financial choices in this study, therefore the number of times that participants could choose the guaranteed option (option A) across all four financial lotteries ranged from 0 (very risk tolerant) to 28 (very risk averse). The median number of times that participants chose the guaranteed option across the financial lotteries was 15.0 (IQR = 9.75 – 22.0), with 16.9% of participants choosing the guaranteed option every time. The next most popular choice pattern was at the other extreme – 7.7% of participants chose to take the risky option every time (figure 12).

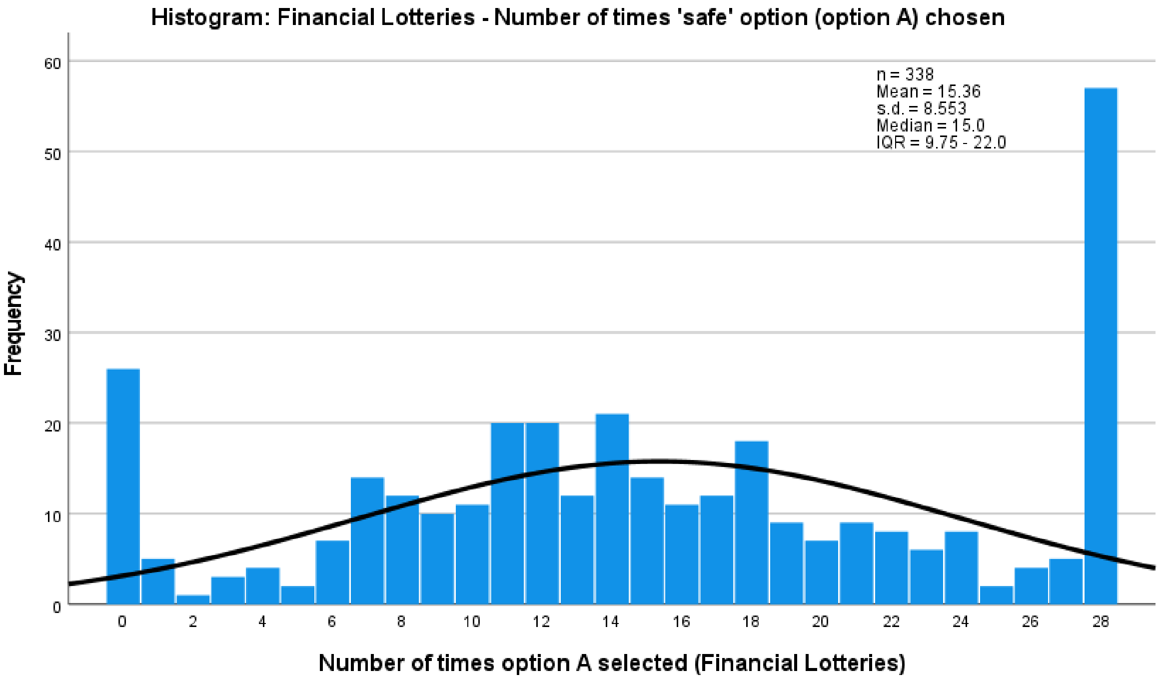

Figure 12. Histogram of distribution of number of times the ‘safe’ option was chosen, across the four financial lottery sets, for all participants

The median number of times female participants chose the guaranteed option in the financial lotteries was 14.0 (IQR = 9.75 – 21.25), and the median for male participants was 15.5 (IQR = 9.25 – 24.0), implying slightly higher risk tolerance among female participants, but this difference was not statistically significant (U = 14080.50, z = .941, p = .346).

Although staff participants demonstrated slightly less risk tolerance than patient and carer participants (staff median = 15.0, IQR = 11.0 – 18.25; patient and carer median = 14.0, IQR = 8.0 – 24.0), they also demonstrated a smaller IQR, and the difference was not statistically significant (U = 12009.5, z = -.345, p = .730).

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Although the median number of times that staff participants chose the safe option was the same as for the whole population (15.0), the IQR was narrower, and the distribution was different (Figure 13). Similarly to the overall population, the most frequent choice pattern was to chose the guaranteed option every time (10.4% of participants), however, among staff this was closely followed by choosing the safe option 14 (9.4% of population), 18 (8.5% of population), and 16 or 17 times (both 7.5% of population). No significant differences were found in choices between staff with more or less years of experience (p = 0.801).

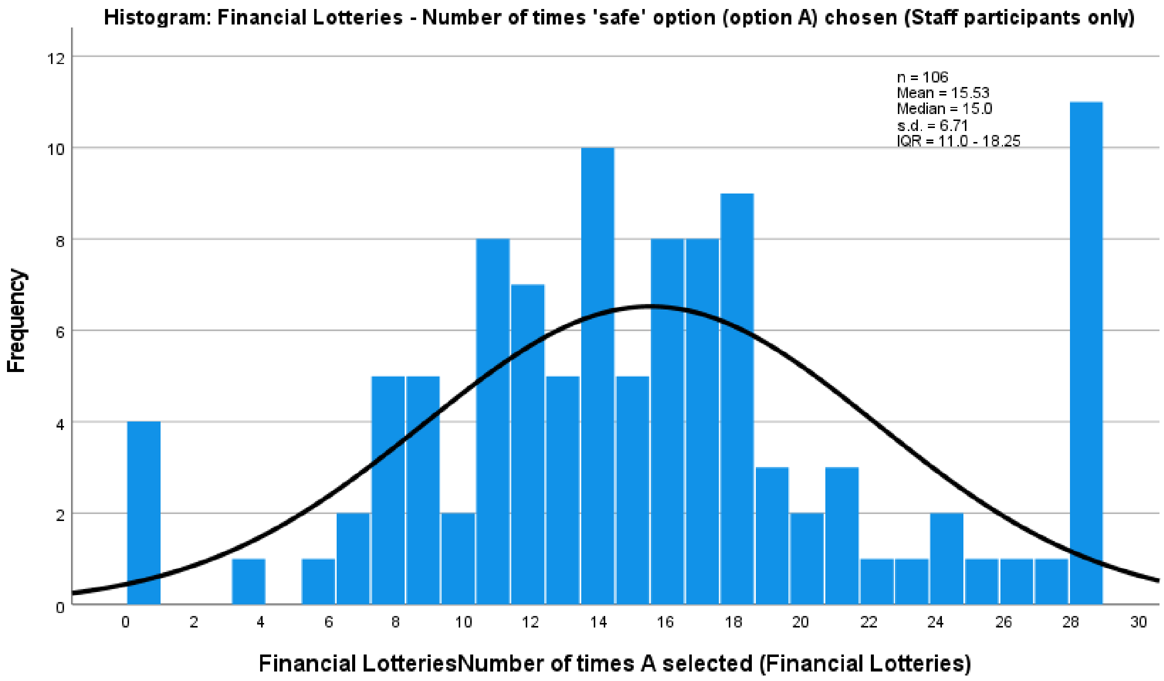

Figure 13. Histogram of distribution of number of times the ‘safe’ option was chosen by staff participants, across the four financial lottery sets

Patients & Carers

The pattern of patients' and carers' choices in the four financial lotteries more closely mirrored the overall pattern of choices among the whole participant population, although patients and carers had a slightly lower median number of times option A was chosen (14.0, IQR 8.0 – 24.0), implying slightly more risk tolerance. Similarly to the staff and overall data, the most common choice was to pick the guaranteed option every time in the financial lottery sets, which 19.8% of participants did. Among patients and carers, the next most common choice pattern was at the opposite extreme – choosing the uncertain outcome every time, which was done by 9.5% of participants (Figure 14).

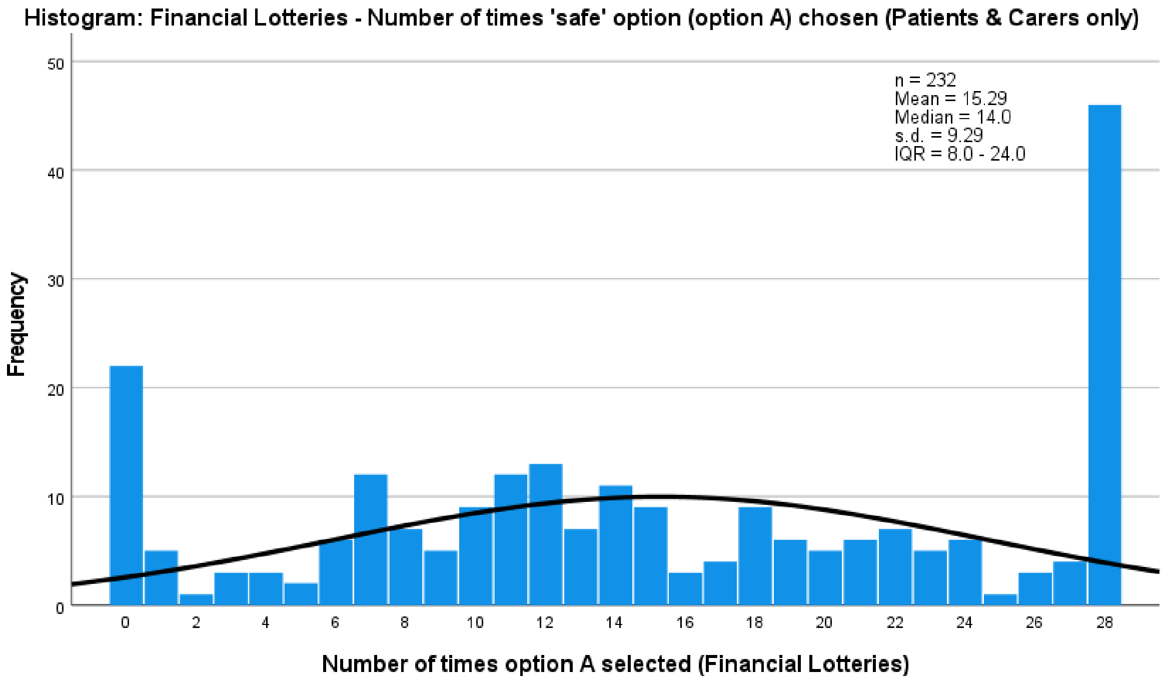

Figure 14. Histogram of distribution of number of times the 'safe' option was chosen by patient and carer participants, across the four financial lottery sets

When comparing sub-groups within the patient & carer dataset, no statistically significant differences were identified between older people (aged 65 years and older) and younger people (aged less than 65 years) (p = 0.616), or between people from different ethnic communities (p = 0.181).

6.2.c Health Lotteries

The questionnaire included two health lottery sets, one with unknown probabilities and one with known, each of which gave the option to select the guaranteed option up to seven times. Therefore, the number of times option A was selected in the health lottery sets by participants ranged from 0 (very risk tolerant) to 14 (very risk averse). The median number of times the guaranteed option was chosen was 9.0 (IQR = 5.0 – 14.0), which indicates a tendency towards more risk aversion, with over a third of participants (36.4%) selecting the guaranteed option every time, although the next most popular choice pattern was to take the risk on every choice (10.9%) (Figure 15). No statistically significant differences were identified between the median scores of female and male participants (p = 0.426), or between the staff and ‘patients & carers’ populations (p = 0.522).

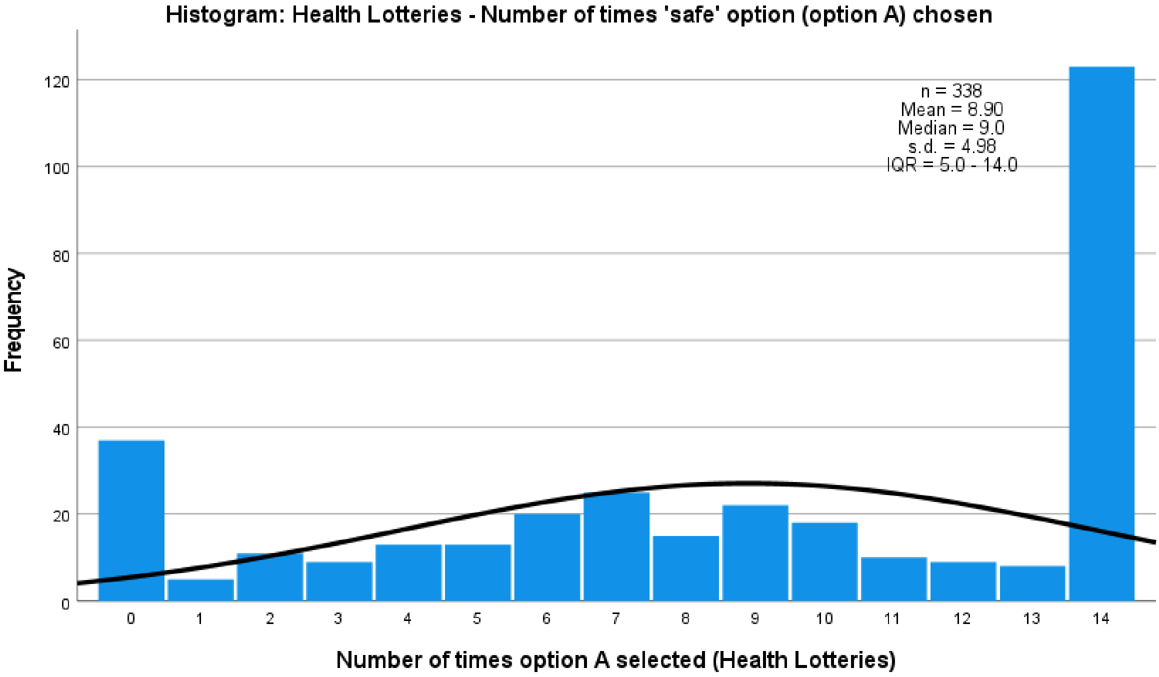

Figure 15. Histogram of distribution of number of times the 'safe' option was chosen, across the two health lottery sets, in whole population

Healthcare Professionals

Staff participants had a very similar mean (8.95, s.d. = 4.03) and median (9.0, IQR = 6.0 – 14.0) to the participant population as a whole, and approximately a quarter (26.4%) of staff participants chose the guaranteed option every time in the two health lottery sets, but unlike when the participant groups were combined, the next most popular choice patterns were to choose the guaranteed option 6 times (13.2% of staff) or 9 times (9.4% of staff) (Figure 16). No statistically significant differences in number of times the guaranteed option was chosen were found between participants with less than 10 years' experience and those with 10 years or more of professional experience (p = 0.748, both medians = 9.0).

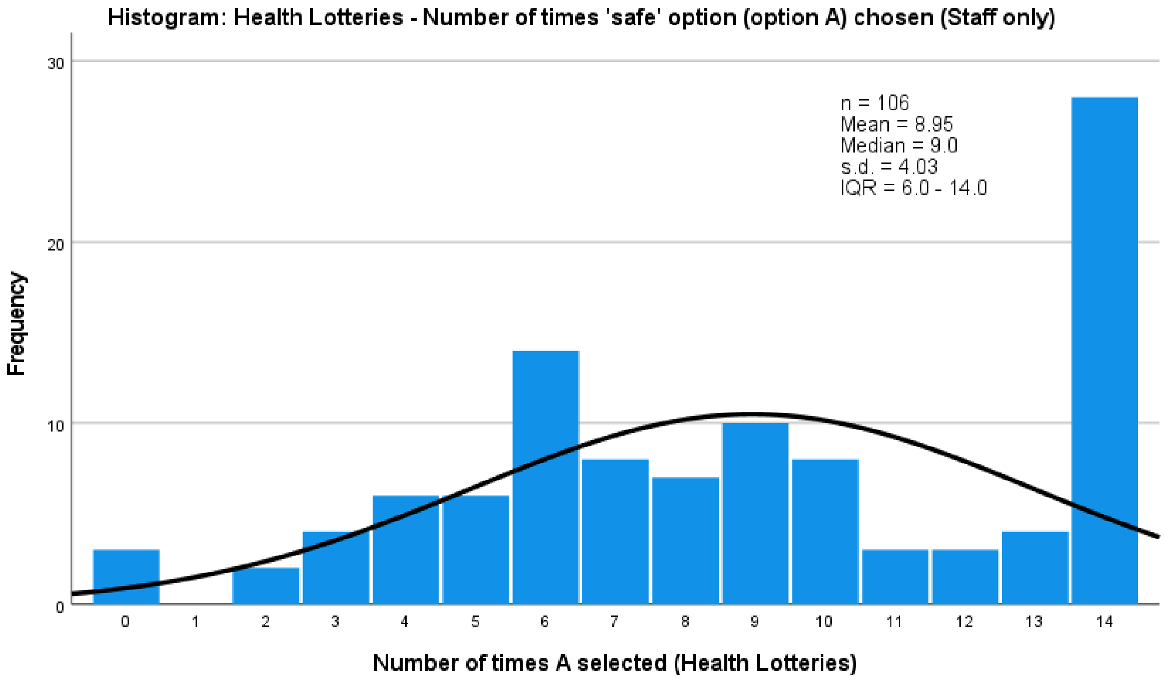

Figure 16. Histogram of distribution of number of times the ‘safe’ option was chosen by staff participants, across the two health lottery sets

Patients and Carers

Patient and carer participants overall followed a similar pattern of choices to the whole participant population, but with a higher proportion of participants (40.9%) choosing the guaranteed option every time. While 14.7% of patients and carers chose to take the risky option every time, all other choice patterns were chosen by less then 10% of participants (Figure 17). The median number of times that patients and carers chose the guaranteed option was 10 (IQR = 4.0 – 14.0), thus implying a slightly higher risk aversion than staff participants, although this was not a statistically significant difference.

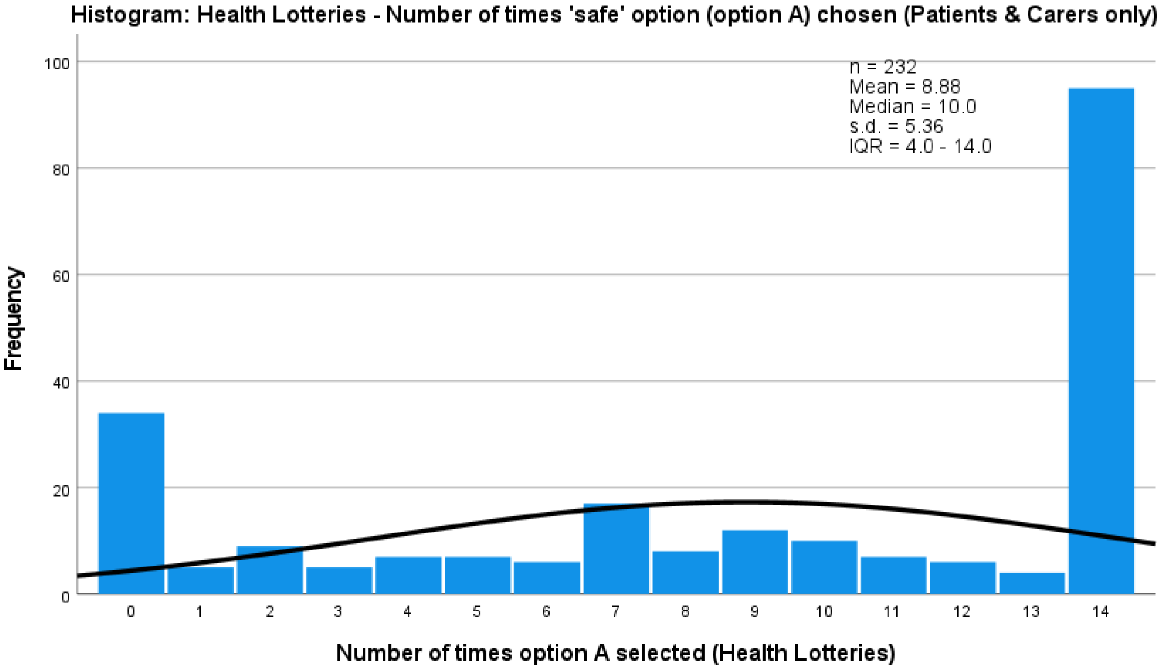

Figure 17. Histogram of distribution of number of times the ‘safe’ option was chosen by patient and carer participants, across the two health lottery sets

In sub-group analyses, a statistically significant difference (p = 0.002) in distributions was identified between participants aged younger than 65 years (n = 199) and participants aged 65 years and older (n = 33). Older people exhibited more polarised approaches to health risks than younger people, with most choices reflecting either high risk tolerance or high risk aversion, whereas younger people tended towards risk aversion, with smaller proportions choosing to take any risks (Figure 18). Unlike younger people, or the participant population overall, the most popular choice pattern for people aged 65 years or older was to choose the uncertain option every time, which 27.3% of this group chose. In comparison, among younger people, almost half (44.2%) chose the guaranteed option every time. This difference in distribution also led to older people having a lower median number of times the guaranteed option was chosen (6.0, IQR = 0.0 – 13.0), compared to younger people (11.0, IQR = 5.0 – 14.0).

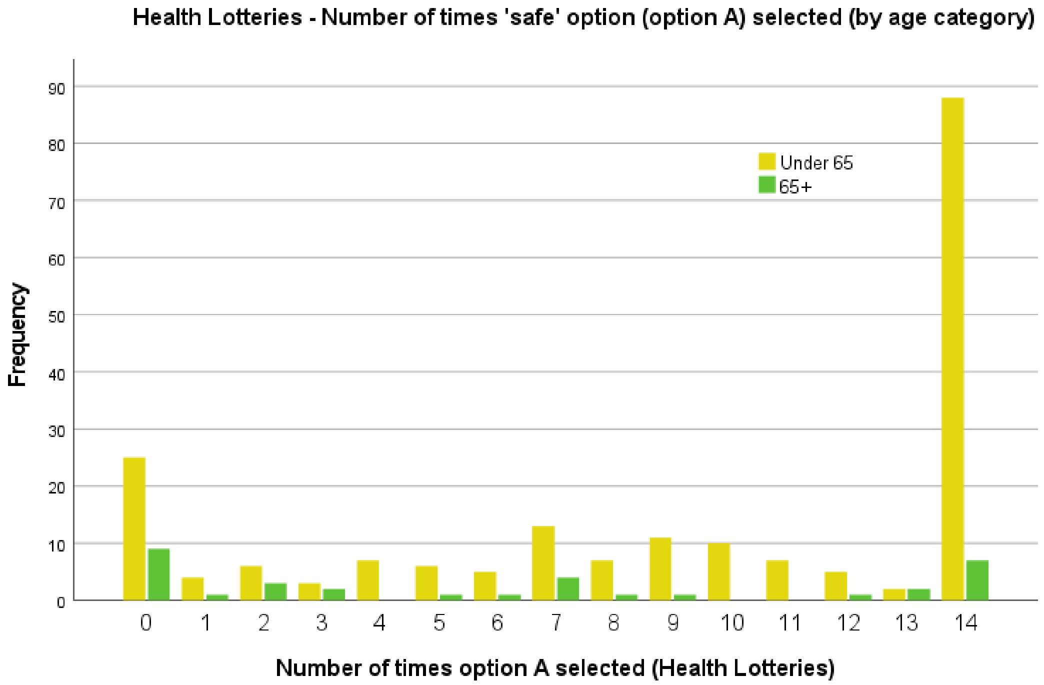

Figure 18. Distribution of number of times the ‘safe’ option was chosen by patients & carers, across the two health lottery sets, split by age category. *Participants aged less than 65 years, n = 199; Participants aged ≥65 years, n = 33*

Further sub-group analyses, investigating if there were any difference in the number of times the guaranteed option was chosen in the health lottery sets by people from different ethnic communities, identified a statistically significant difference in distribution between the ‘White’ and ‘Any Other’ groups (p = 0.044) (Figure 19). No statistically significant differences were found between any other pair of ethnicity categories. Medians in the four ethnicity categories ranged from 9.0 (White participants, IQR = 3.0 – 14.0) to 14.0 (‘Any Other’ ethnicity participants, IQR = 11.5

– 14.0), but it should be noted that there were far fewer participants who reported their ethnicity as one of the ethnicities included in the ‘Any Other’ category (n = 14), than in any of the other ethnicity categories.

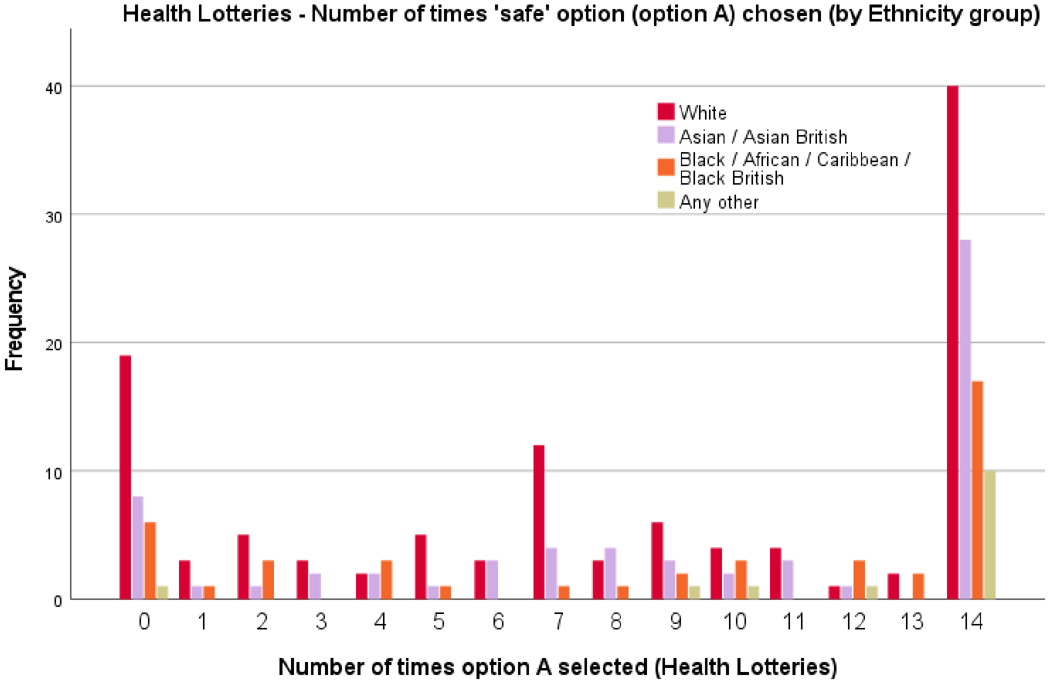

Figure 19. Distribution of number of times the ‘safe’ option was chosen by patients & carers, across the two health lottery sets, split by self-reported ethnicity group. *Participant numbers in each group: White, n = 112; Asian / Asian British, n = 63; Black / African / Caribbean / Black British, n = 43; Any Other ethnicity, n = 14*

6.2.d Comparing Lotteries

Comparisons were conducted between different types of lotteries to identify any systematic differences in how frequently participants chose the guaranteed option, based on the context of the question. These included comparing between health and financial lottery sets, and between lottery sets with known and unknown chances in the uncertain option (option B).

Health vs Financial domains

Due to the difference in the number of lottery sets that asked about financial (4 lottery sets, 28 choices) and health (2 lottery sets, 14 choices) choices, comparisons of medians are presented between the median of the health lottery sets and the median of the higher financial pay-off lottery sets (2 lottery sets, 14 choices). The number of possible ‘days in full health’ in the health lottery sets was equal to the possible quantity of money in the high financial lottery sets (Appendix 1). The median number of times that the guaranteed option was chosen in the health lottery sets (9.0, IQR = 5.0 – 14.0) was higher than in the high financial lottery sets (7.0, IQR = 4.75 – 12.0), suggesting greater risk aversion when making health-related choices compared to financial ones. This is also apparent in the distribution patterns of how many times the guaranteed option was chosen in these two pairs of lottery sets (Figures 20a and 20b). While in both lottery types the largest proportion of participants chose the guaranteed option every time, this proportion was larger for the health choices (36.4% vs 21.3%), and the proportion of participants who chose the uncertain option every time was lower in the health lottery sets than the high financial ones (10.9% vs 12.4%).

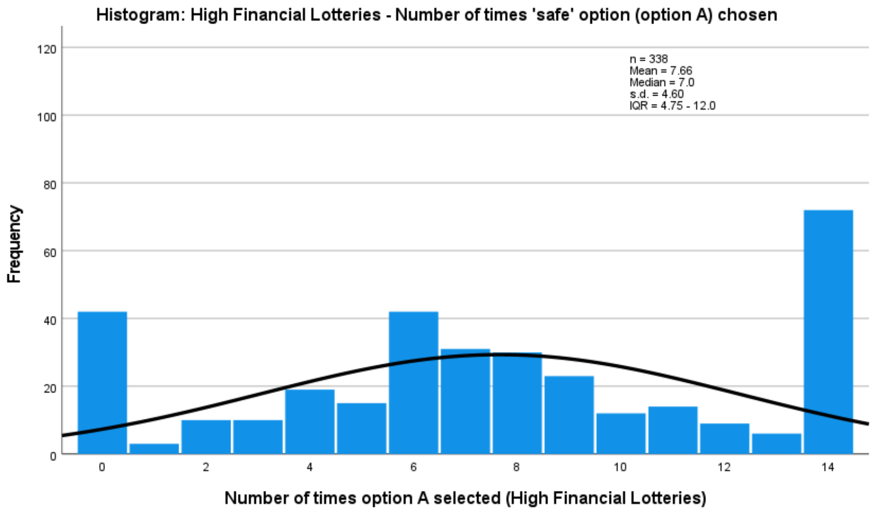

Figure 20a. Histogram of distribution of number of times the ‘safe’ option was chosen by participants, across the two high financial pay-off lottery sets

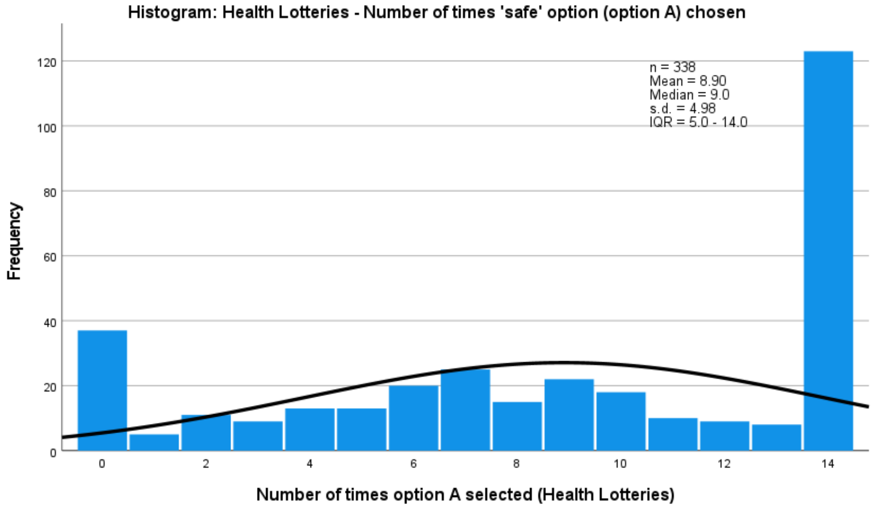

Figure 20b. Histogram of distribution of number of times the ‘safe’ option was chosen by participants, across the two health lottery sets

Multiple regression, including all the lottery sets, identified a statistically significant slope co-efficient of -0.492 (95% CI -0.971 to -0.013, p = 0.044) for lottery type among staff, indicating that the number of times the guaranteed option was chosen in financial lottery sets was 0.492 less than in health lottery sets. This is in line with the findings when comparing only the high financial pay-off lottery sets to the health lottery sets, and supports the idea that participants were more inclined to take the uncertain option (and thus more risks) when making financial choices compared to health choices. A similar finding was apparent among patients & carers, with a slope co-efficient of -0.612 (95% CI -0.922 to -0.302, p <.001), suggesting that the number of times the guaranteed option was chosen in financial lottery sets was 0.612 less than in health lottery sets, indicating a similar trend towards more risk-taking in the financial than health domain. In a sensitivity analysis, excluding those in the ‘Any other’ ethnicity group, the patients & carers’ slope co-efficient remained similar and statistically significant, and was -0.581 (95% CI -0.904 to -0.259, p < .001).

Known vs Unknown chances

Finally, analyses were conducted investigating whether any significant differences in choice patterns existed between lottery sets in which participants knew the chances in the uncertain option (i.e. knew that there was a 50% chance of either outcome in option B) and the lottery sets in which they did not know the chances in the uncertain option. In the case of both known and unknown chances, two financial lottery sets and one health lottery set were presented to participants. Therefore, participants made 21 choices each for the ‘unknown chances’ and ‘known chances’ lottery sets.

The median number of times that participants chose the guaranteed option was lower in the lottery sets where the chances in the second option were known (11.0 vs 13.0), indicating that participants were more risk tolerant when they knew the chances of each of the uncertain outcomes. The distributions of the number of times the guaranteed option was chosen in lottery sets with known and unknown chances were similar, with approximately the same number of participants choosing the guaranteed option every time in both cases (Figures 21a and 21b).

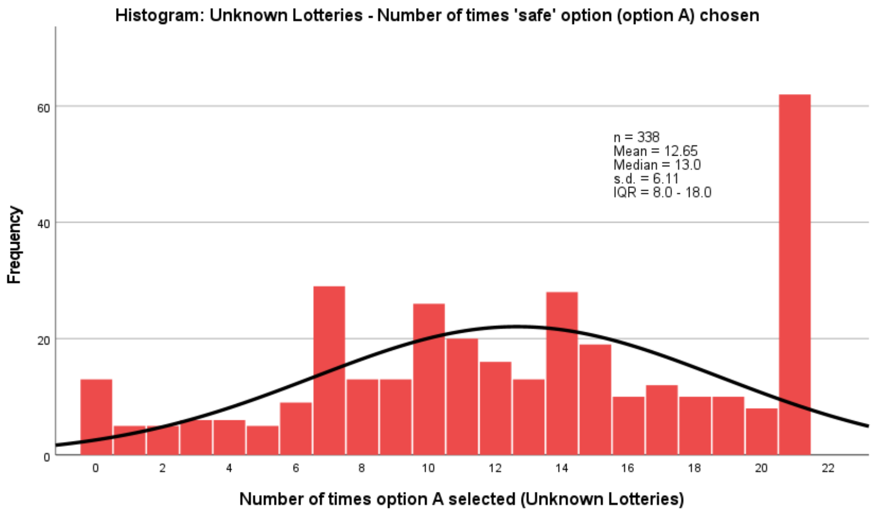

Figure 21a. Histogram of distribution of number of times the ‘safe’ option was chosen by participants, across the three lottery sets with unknown chances in option B

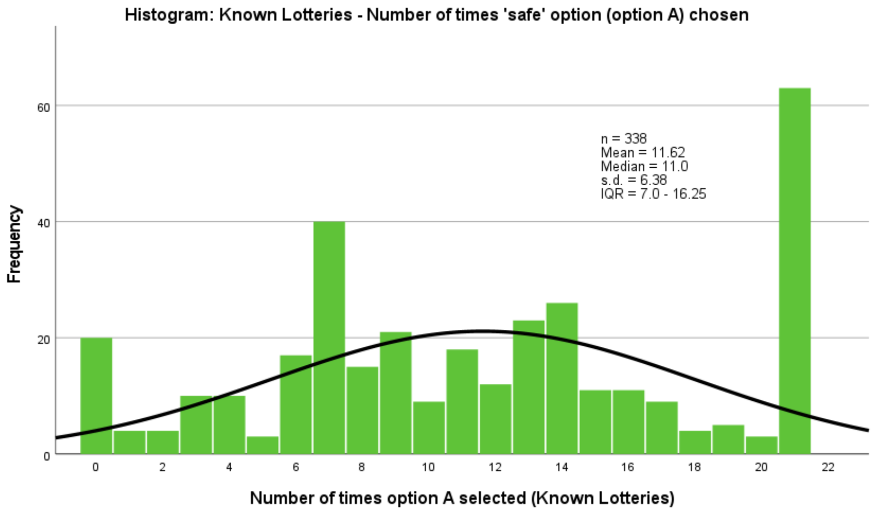

Figure 21b. Histogram of distribution of number of times the ‘safe’ option was chosen by participants, across the three lottery sets with known chances in option B

Multiple regression analysis did not identify a statistically significant slope coefficient for known vs unknown chance lottery sets for staff (Slope coefficient = -0.409, 95% CI -0.860 to 0.043, p = 0.076) or patients & carers (Slope coefficient = -0.182, 95% CI -0.475 to 0.110, p = 0.221), and this remained non-statistically significant in sensitivity analysis of the patient & carer data excluding those in the ‘Any other’ ethnicity group (Slope coefficient = -0.194, 95% CI -0.498 to 0.110, p = 0.210).

Comparisons between the lottery sets with known and unknown chances in option B for financial choices (14 choices) and health choices (7 choices) were conducted. They found a similar median number of times that the guaranteed option was chosen for financial choices between the lottery sets with unknown chances (8.0, IQR = 5.0 – 13.0) and known chances (7.0, IQR = 4.0 – 12.0). Health choices also demonstrated similar medians between the lottery set types (unknown: 6.0, IQR = 2.0 – 7.0; known:

5.0, IQR = 2.0 – 7.0). In both cases, the median in the lottery sets with unknown chances in the uncertain option was one higher than in those with known chances, implying slightly more risk tolerance when participants knew the chances in the uncertain option. There was a notable difference in the proportion of participants who chose the guaranteed option every time for the health lottery sets, between the lottery set when the chances were known (41.4%) and unknown (49.1%). There was a much smaller difference in the proportion of participants who chose the guaranteed option every time in the financial lotteries when the chances were known (22.5%) compared to when they were unknown (23.7%). Notably, the proportion of participants choosing the guaranteed option every time in the financial lottery sets, for both known and unknown chances, was less than half the proportion who took the guaranteed option every time in the health lotteries, which is in line with the finding that participants were generally more risk averse when making health choices than when making financial ones.

6.3 Risk Tolerance – Switch Points

In addition to the analyses based on how many times participants chose the guaranteed option, further analyses were conducted investigating the point at which participants switched from one option to the other. Most people who switch from one option to the other start by choosing the guaranteed option (option A) in the initial choices, then switch to the uncertain one (option B) when they feel that the higher amount they could potentially gain in the uncertain choice is worth risking getting only the lower quantity. This is referred to as an ‘AB switch’, as participants are switching from choosing option A to choosing option B. A smaller number of participants do the opposite of this, and start by choosing the uncertain option, then switch to the guaranteed option – this is referred to as a ‘BA switch’. There is also a group of participants, who have been highlighted in the previous section, who do not switch, and instead choose either the guaranteed or uncertain outcome for every choice in a given lottery set. Finally, a small proportion of participants switch more than once, this is referred to as having multiple switch points. A participant’s switch point (or the option that they choose throughout if they do not switch) can be used as a measure of risk tolerance – the earlier they begin choosing option B, the uncertain outcome, the more risk tolerant they are. The exception to this is those who switch from option B to option A, either as a single BA switch, or through having multiple switch points.

Due to the nature of these analyses, those with multiple switch points cannot be included, and it may not be appropriate to for those with a single BA switch point to be included in all analyses, due to the inverted nature of this choice pattern. The number of participants in each of these groups (AB switches, BA switchers, did not switch and multiple switch points) are detailed below, however, those with multiple switch points were excluded from all subsequent analyses. Where participants with a single BA switch point have been excluded from analyses, this will be noted.

6.3.a Each Lottery

Across the six lottery sets there were a range of response patterns, with around half of all participants choosing not to switch between the guaranteed and uncertain outcome in most lottery sets, and the majority of those who did switch at least once doing so from the guaranteed to the uncertain option (A to B) (Table 9). The proportion of the population who chose to switch at least once ranged from 55% (in financial lottery set 1 – low financial pay-offs, unknown chances) to 35.8% (in health lottery set 1 – health domain, unknown chances). Only a very small proportion of participants had a single switch point from the uncertain to certain outcome (B to A), as this choice was made by less than 5% of participants in each lottery set. Those with multiple switch points accounted for less than 20% of the population in each lottery set.

Overall, more participants who did not switch between options chose option A (guaranteed outcome) than option B (uncertain outcome), although the proportion of participants choosing the guaranteed option every time varied from 76.5% (in health lottery set 1 – health domain, unknown chances) to 56.9% (in financial lottery set 4 – high financial pay-offs, known chances).

		Financial (Low) Lottery Set 1	Financial (High) Lottery Set 2	Health Lottery Set 1	Financial (Low) Lottery Set 3	Financial (High) Lottery Set 4	Health Lottery Set 2
Participants who switched	**Total (%)**	186 (55.0)	172 (50.9)	121 (35.8)	173 (51.2)	178 (52.7)	143 (42.3)
	Switched once A to B (%)	150 (80.6)	147 (85.5)	104 (86.0)	154 (89.0)	159 (89.3)	124 (86.7)
	Switched once B to A (%)	4 (2.2)	0 (0)	5 (4.1)	2 (1.2)	0 (0)	5 (3.5)
	Multiple switch points (%)	32 (17.2)	25 (14.5)	12 (9.9)	17 (9.8)	19 (10.7)	14 (9.8)
Participants who Did Not Switch	**Total (%)**	152 (45.0)	166 (49.1)	217 (64.2)	165 (48.4)	160 (47.3)	195 (57.7)
	A only (%)	94 (61.8)	108 (65.1)	166 (76.5)	95 (57.6)	91 (56.9)	140 (71.8)
	B only (%)	58 (38.2)	58 (34.9)	51 (23.5)	70 (42.4)	69 (43.1)	55 (28.2)

Table 9 – Switch Points in each Lottery Set. *All participants (n = 338). Percentages in sub-groups are for within that overall group only, e.g. percentages in ‘A only’ row are the percentage of those who Did Not Switch in that lottery*

Compared to the participant population as a whole, a larger proportion of staff participants chose to switch options at least once, and of these, a higher proportion than in the overall population switched from the guaranteed to the uncertain outcome (range: 89.6% (in financial lottery set 1 (low financial)) to 98.7% (in financial lottery set 4 (high financial))). Additionally, a smaller proportion of staff participants switched from the uncertain to the guaranteed option, with this only occurring in three lottery sets (as opposed to four), and no more than 3.0% of staff participants choosing to do this. Multiple switch points were also less common among staff participants than the population overall, with a maximum of 9.4% of staff participants switching repeatedly in any given lottery set, and in the majority of lottery sets this account for less than 5% of participants.

The tendency among those who did not switch to choose the guaranteed option every time was more pronounced in the staff participants than in the overall population. For every lottery set, the proportion of staff participants who chose the guaranteed option (option A) was higher than for the same lottery set among the whole population.

In contrast to the staff participants, a lower proportion of patients and carers chose to switch between options than in the overall participant population, with between 48.7% (financial lottery set 1 (low financial)) and 69.4% (health lottery set 1) of this group choosing not to switch at all. Additionally, among those who did switch at least once, a lower proportion in each lottery set did so from the guaranteed to the uncertain outcome, and a higher proportion switched multiple times, with each lottery set having between 14.1% (health lottery set 1) and 22.7% (financial lottery set 1 (low financial)) of patient and carer participants switching multiple times. Notably, the lottery set with the highest proportion of patient and carer participants choosing to switch at least once (financial lottery set 1 (low financial)) also had the highest proportion of people switching multiple times, and vice versa for the lottery set with the lowest proportion of patient and carer participants switching at least once (health lottery set 1). The distributions of patient and carer participants who chose only the guaranteed option or only the uncertain option in each lottery set was similar to the distribution of the overall population, with only a slightly smaller proportion of patients and carers choosing the guaranteed option every time.

The differences in distributions between staff participants and patient & carer participants matched the comparisons of each of these groups with the overall population, but with those differences being more pronounced between the staff and patients & carers than they were when compared to the population overall.

As previously discussed, it was not appropriate to include those who switched multiple times in further analyses of switch points. Therefore, all analyses and discussion in the remainder of this chapter will exclude those who switched multiple times in the lottery set in question, although having switched multiple times in one lottery set does not preclude a participant from being included in another lottery set analysis, where they switched only once or not at all in that lottery set. Overall, 50 participants switched multiple times in at least one lottery set (8 professionals, 42 patients & carers), of whom 27 switched multiple times in multiple lottery sets (5 professionals, 22 patients & carers) and 5 switched multiple times in every lottery set (1 professionals, 4 patients & carers).

In each lottery set, among those who switched once, the highest proportion in most lottery sets chose to switch at Switch Point 4 (except for health lottery set 1, in which the largest proportion chose to switch at Switch Point 5). Switch Point 4 is the point in each lottery set at which the higher potential pay-off in option B (the uncertain option) is double the guaranteed pay-off (option A). As can be seen from Figure 22, very few participants chose to switch from the uncertain to the certain option, and no participants chose to do this in either of the high financial pay-off lottery sets (Lottery sets 2 and 5), or at either of the highest two potential switch points.

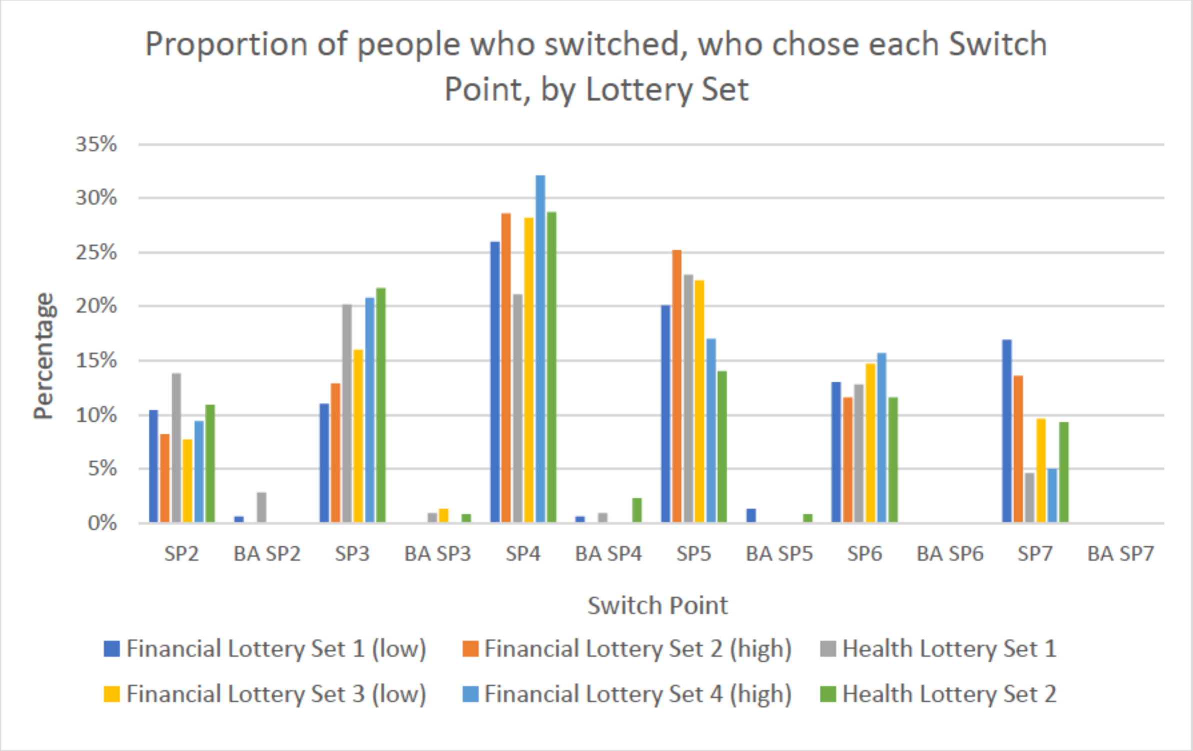

Figure 22. Proportion of participants who switched at each switch point, per lottery, among those who switched once. *SP = Switch Point, BA SP = B to A Switch Point (i.e. switch from uncertain to certain outcome); Note that as these proportions are among those who switched once in each lottery set, the total population included for each lottery set varies.*

Similarly to the overall population, among staff participants Switch Point 4 was generally the most popular switch point in each lottery set, although staff most commonly chose Switch Point 4 in health lottery set 1, but Switch Point 5 in financial lottery set 2 (high financial), unlike the overall population. The proportion of staff participants choosing Switch Point 4 was approximately a third in each lottery set (range = 31.0 – 33.9%), with no other option being chosen by more than 26% of ‘single switch’ participants, apart from Switch Point 5 in financial lottery set 2 (high financial) (Figure 23a). Patients & carers, however, had a wider range of preferences, choosing Switch Point 7 most commonly in financial lottery set 1 (low financial), Switch Point 5 in financial lottery set 3 (low financial), and Switch Point 4 in lottery sets 2, 5 and 6. In health lottery set 1, an equal percentage (21.3%) of participants chose Switch Points 2, 3 and 5 (Figure 23b). The tendency towards higher switch points among patients & carers in some lottery sets indicates more risk averse choices in this population than in the staff population, and the more even distribution of switch point choices suggests a wider range of risk tolerance levels among patients and carers than among staff.

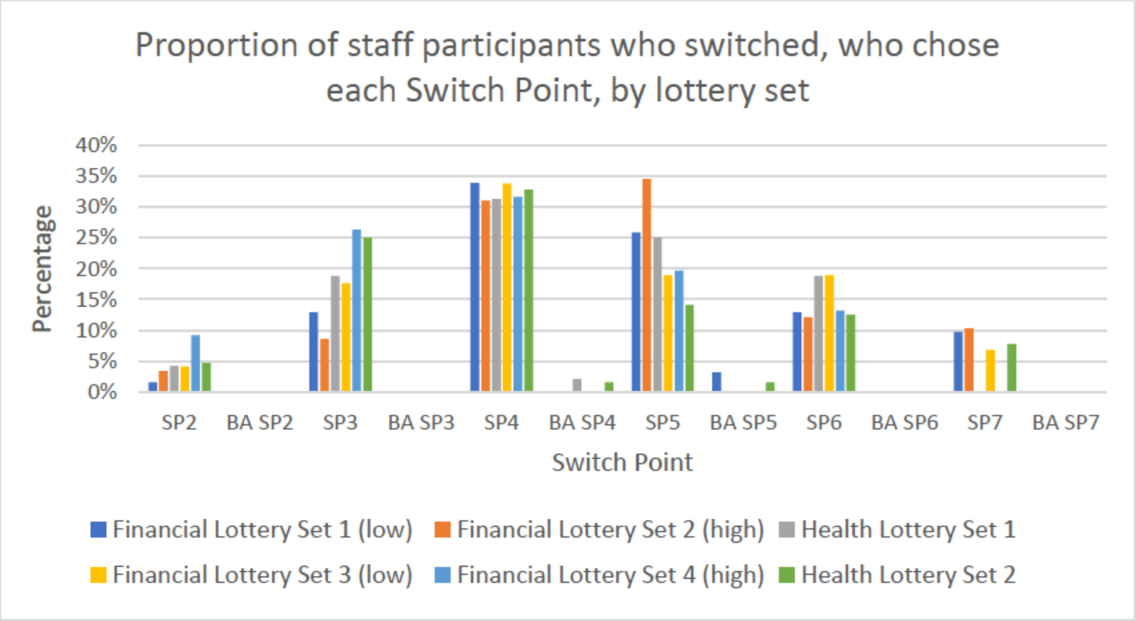

Figure 23a. Proportion of staff participants who switched at each switch point, per lottery, among those who switched once. *SP = Switch Point, BA SP = B to A Switch Point (i.e. switch from uncertain to certain outcome); Note that as these proportions are among those who switched once in each lottery set, the total population included for each lottery set varies.*

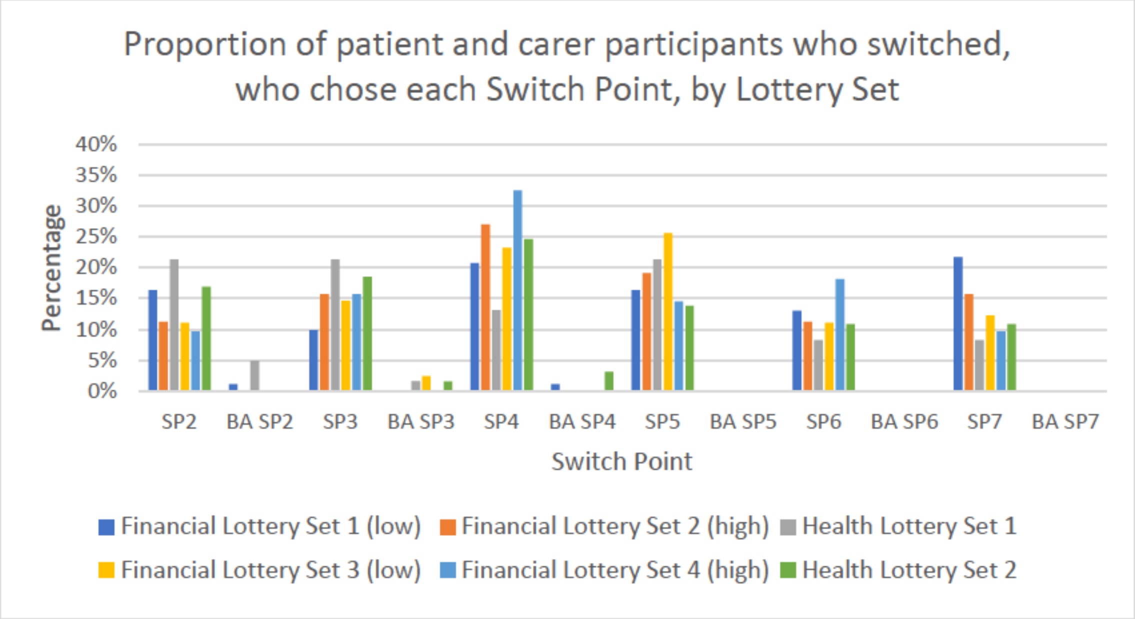

Figure 23b. Proportion of patient & carer participants who switched at each switch point, per lottery, among those who switched once. *SP = Switch Point, BA SP = B to A Switch Point (i.e. switch from uncertain to certain outcome); Note that as these proportions are among those who switched once in each lottery set, the total population included for each lottery set varies.*

The median switch point was calculated for each lottery set, for the whole population and for the staff and the patients & carers populations separately (Table 10). These analyses excluded those who switched multiple times, but included those who did not switch. For all four financial lottery sets, the median switch point was Switch Point 4 or 5, for all analysed groups, both including and excluding those who switched from the uncertain to the certain option (BA switchers), with a wider IQR for the patients & carers than the staff participants. Both health lottery sets had a higher median switch point than the financial lottery sets, in all groups. The median switch point for the health lottery sets was consistently higher among patients and carers than among staff, indicating more risk aversion among patients and carers than among staff when making health choices. The higher median switch points for health lottery sets than financial ones also indicate greater risk aversion when making health choices than financial ones among the whole population, with a more pronounced difference among patients and carers than staff. There were no occasions on which the inclusion of participants who switched from the uncertain to the certain option made a difference to the median switch point for a lottery set or influenced the IQR.

	All participants		**Staff only**		**Patients & Carers only**	
	n	**Median (IQR)**	**n**	**Median (IQR)**	**n**	**Median (IQR)**
Financial (Low) Lottery set 1	302	5.0 (3.0 – 8.0)	99	5.0 (4.0 – 8.0)	203	5.0 (2.0 – 8.0)
Financial (High) Lottery set 2	313	5.0 (3.0 – 8.0)	100	5.0 (4.0 – 8.0)	213	5.0 (2.0 – 8.0)
Health Lottery set 1	321	8.0 (3.0 – 8.0)	103	6.0 (4.0 – 8.0)	218	8.0 (2.0 – 8.0)
Financial (Low) Lottery set 3	319	5.0 (2.0 – 8.0)	104	4.0 (3.0 – 6.0)	215	5.0 (1.0 – 8.0)
Financial (High) Lottery set 4	319	4.0 (2.0 – 8.0)	105	4.0 (3.0 – 6.0)	214	5.0 (1.0 – 8.0)
Health Lottery set 2	319	6.0 (3.0 – 8.0)	102	5.0 (3.0 – 8.0)	217	7.0 (2.0 – 8.0)

Table 10 – Median (IQR) switch point in each lottery set, excluding participants who switched multiple times or switched from the uncertain to certain outcome (BA switch)

6.3.b Comparing Between Lotteries and Demographic Characteristics

When comparing switch point choices, a number of potential factors were considered in ordinal regressions, among staff (Table 11) and patients & carers (Table 12). Some of these factors related to characteristics of the lottery sets, and others to demographic characteristics of the participants. These analyses included those participants who switched from the guaranteed to the uncertain option, and those who did not switch at all, but did not include those who switched multiple times or those who switched from the uncertain to the guaranteed option.

Among patients and carers, the odds of having a higher switch point in health lottery sets was 1.613 (95% CI, 1.303 to 1.996) times the odds of this in financial lottery sets, which was a statistically significant effect (p < .001). A similar pattern was found among staff participants for lottery set type, with a statistically significant odds ratio of 1.576 (95% CI, 1.167 to 2.128; p = .003) when comparing health to financial lottery sets. This indicates that participants tended to be more risk tolerant in the financial lottery sets than the health ones, as demonstrated by their willingness to choose the uncertain option earlier in the financial lottery sets, but continuing to choose the guaranteed option for longer in the health lottery sets, this was demonstrated among both staff and patients & carers. In sensitivity analysis of the patients & carers data, excluding those in the ‘Any other’ ethnicity group, the odds ratio remained similar and statistically significant (OR = 1.560, 95% CI 1.254 to 1.940, p < .001).

When comparing switch points in lottery sets where participants did or did not know the chances of each outcome in the uncertain option (option B), this did not have a statistically significant effect on the switch point that patient and carer participants chose (OR = 1.109, 95% CI = 0.909 to 1.354, p = .308), and this remained statistically non-significant on sensitivity analysis (OR = 1.104, 95% CI 0.900 to 1.354, p = .343). However, there was a statistically significant effect found among staff when comparing these types of lottery sets, with the odds of having a higher switch point in the lottery sets with unknown chances of each outcome in the uncertain option being 1.876 (95% CI, 1.413 to 2.492; p < .001) times the odds of this in the lottery sets with known chances in the uncertain option. This suggests that staff seemed to respond differently to patients & carers when comparing switch point choices between lottery sets with known versus unknown chances of each outcome in the uncertain option – staff demonstrated more risk aversion in the lottery sets with unknown chances than those with known chances, with almost double the odds of choosing a higher switch point in the lottery sets with unknown chances, meaning they chose the guaranteed, and thus less risky, option for longer when they did not know the chances of each outcome in the uncertain option. No such difference was found for patients and carers when comparing switch points between these types of lottery sets.

Among staff participants, gender had no statistically significant effect on the odds of choosing a higher switch point (OR = 1.320 95% CI = 0.991 to 1.758, p = .057), although there was a trend towards the odds of men having higher switch points (indicating greater risk aversion) than women. On the other hand, the number of years of professional experience that staff participants had did have a statistically significant effect on their odds of choosing a higher switch point. Each increase in category of years working was associated with an increase in the odds of a higher Switch Point, with an odds ratio of 0.877 (95% CI = 0.780 to 0.986, p = .029). This indicates that as years of professional experience increased, so too did risk aversion, since the higher switch point demonstrates participants waiting longer before switching to the risky option.

When considering patient & carer characteristics, neither age nor gender had a statistically significant effect on the odds of participants choosing higher switch points, with Odds Ratios for both these comparisons being very close to 1 (Age: OR = 1.012, 95% CI = 0.956 to 1.072, p = .0.672; Gender: OR = 1.019, 95% CI = 0.822 to 1.265, p = .861). Pairwise comparisons between ethnicity groups were conducted, some of which demonstrated a statistically significant effect. The four ethnicity groups that were compared are the same as when comparing the number of times the guaranteed option was chosen – White (n = 112), Asian / Asian British (n = 63), Black / African / Caribbean / Black British (n = 43), and Any Other ethnicity (n = 14, incorporating all participants who reported their ethnicity in any group other than those previously listed). Among these comparisons, a statistically significant effect was found when comparing the ‘Any Other’ group to each of the other ethnicity categories, with Odds Ratios of 0.326 (95% CI = 0.202 to 0.527, p < .001), 0.359 (95% CI = 0.218 to 0.590, p < .001) and 0.458 (95% CI = 0.271 to 0.768, p = .003) for comparisons with White, Asian / Asian British and Black / African / Caribbean / Black British participants respectively. Additionally, the odds of Black / African /

Caribbean / Black British participants having a higher switch point was 1.406 (95% CI = 1.063 to 1.859, p = .017) times the odds of this among White participants, implying that participants whose ethnicity was Black, African, Caribbean or Black British are less risk tolerant than participants whose ethnicity was White, since they chose to swap from the guaranteed option to the uncertain one later. No other statistically significant effects were identified in switch points between participants of different ethnicities. When a sensitivity analysis was run, excluding those whose ethnicity was captured in the 'Any other' group, ethnicity was found not to have a statistically significant effect on Switch Point overall (p = .070), although a statistically significant odds ratio was still identified when comparing the odds of having a higher Switch Point between White participants and Black / African / Caribbean / Black British participants (OR = 1.389, 95% CI 1.050 to 1.837, p = .021).

Parameter	**Hypothesis Test**			**Odds Ratio**	**95% CI**
	Wald Chi-Square	**df**	**Sig.**		
Lottery type – Health	8.814	1	0.003	1.576	1.167 - 2.128
Ambiguity - Unknown chance in option B	18.885	1	0.000	1.876	1.413 - 2.492
Gender – Male	3.614	1	0.057	1.320	0.991 - 1.758
Number of years working	4.792	1	0.029	0.877	0.780 - 0.986

Dependent Variable: Switch Point
Independent Variables: Lottery type (Finance or Health), Known or Unknown chance in option B, Gender, Number of years working

Table 11 – Ordinal Regression results table for Staff, Switch Point analyses. *Reference categories for comparisons as follows, Lottery type: Finance, Ambiguity: Known, Gender: Female*

Parameter	Hypothesis Test			Odds Ratio	95% CI
	Wald Chi-Square	df	Sig.		
Lottery type – Health	19.295	1	0.000	1.613	1.303 - 1.996
Ambiguity - Unknown chance in option B	1.040	1	0.308	1.109	0.909 - 1.354
Gender – Male	0.031	1	0.861	1.019	0.822 - 1.265
Ethnicity - White	20.961	1	0.000	0.326	0.202 - 0.527
Ethnicity - Asian / Asian British	16.298	1	0.000	0.359	0.218 - 0.590
Ethnicity - Black / African / Caribbean / Black British	8.768	1	0.003	0.458	0.273 - 0.768
Age category	0.179	1	0.672	1.012	0.956 - 1.072

Dependent Variable: Switch Point
Independent Variables: Lottery type (Finance or Health), Known or Unknown chance in option B, Gender, Ethnicity, Age category

Table 12 – Ordinal Regression results table for Patients & Carers, Switch Point analyses. *Reference categories for comparisons as follows, Lottery type: Finance, Ambiguity: Known, Gender: Female, Ethnicity: 'Any other'*

6.4 Patient and Carer comments

Spontaneous comments that patients or carers offered about their choices or their rationale were collated in Appendix 2, but were not formally analysed. These comments generally involved people describing their rationale for individual choices, their more general approach to risk or finance, or their interpretation of the symptoms of the 'imaginary health condition'.

6.5 Conclusion

Overall, a wide range of risk tolerance levels were identified among the populations studied. These ranged all the way from very risk tolerant to very risk averse, with most intermediate levels also represented and some patterns of choices became apparent within certain groups and between lottery sets. Most notably, people are generally more risk averse in health choices than financial ones, older people (aged 65 years or older) have more dichotomised approaches to health risks than younger people, staff with more years of experience tended towards higher risk aversion (although this was not consistently shown between analysis approaches), and there were no significant differences in risk tolerance between female and male participants. Two different approaches to characterising risk tolerance were taken, using the number of times participants chose the guaranteed (‘safe’) option, and using the point at which they switched from the guaranteed to the uncertain option. Some differences in significance of outcomes were identified between these two approaches to analysing risk tolerance, such as older people appearing significantly more risk tolerant than younger people when assessed by number of times the guaranteed option was chosen, but no significant difference being found when assessed by switch point, however, there were no occasions on which the results of the two approaches directly contradicted each other.

CHAPTER 7: QUALITATIVE RESULTS

Sixteen interviews were conducted, fourteen with physiotherapists and two with patients. The physiotherapist interviews were analysed in full with thematic analysis methods, and six key themes were identified surrounding risk, decision-making and factors contributing to how physiotherapists make their location of care decisions. Each of these key themes will be discussed, with exploration of how well they fit with the framework used - Fuzzy Trace Theory (160). Due to the low number of patient interviews, it was not possible to complete a full, meaningful analysis of patients' experiences and attitudes towards risk and location of care decisions. However, the two patient transcripts were coded, and these codes were grouped into initial themes and compared to those of the physiotherapists.

7.1 Participants

7.1.a Physiotherapists

The fourteen physiotherapists, worked in various front-door and ambulatory care (AC) units in the UK. They were primarily female (85.7%), and the majority worked in a front-door service. Approximately half (57.1%) of the participants had been working for at least 10 years, and the group included physiotherapists of every level of seniority from band 5 (most junior qualified band) to band 8 and above (Table 13).

Characteristic	**Physiotherapy participants (n = 14)**
Gender - female	12
Band [a]	
5	1
6	4
7 (%)	6
8+ (%)	4
Years working since qualification	
Less than 2	1
2 – 5	2
5 – 10	3
10 – 14	3
15+	5
Service Type	
Ambulatory Care	3
Front-Door	10
Both	1

Table 13 – Demographics of physiotherapy interview participants. *a = one participant had a split role, and therefore worked across multiple bands*

7.1.b Patients

Patient recruitment was especially challenging due to additional limitations resulting from the COVID19 pandemic. This meant that all interviews had to be conducted virtually, and there was less capacity for in-person recruitment, which resulted in recruitment efforts being primarily via email and telephone calls. As a result, only two patients were interviewed. Both patients were female, aged between 51 and 60 years old and reported their ethnicity as White. Both had received care in the Ambulatory

Care unit where recruitment for the quantitative lotteries component of this study was carried out. One possible contributor to this is the possibility that the requirement for interviews to be conducted virtually, due to COVID19 infection control measures (322), may have put some potential participants off participating, when compared to the possibility of face-to-face interviews. It has previously been highlighted that some people may have issues with accessing internet connections, lack technological skills (322) or devices, or lack privacy if being interviewed in their home, which COVID19 lockdowns may have exacerbated (323), any of which could limit their ability, or willingness, to participate in virtual interviews. Additionally, in most cases, patients were contacted sometime after they first met the researcher in the Ambulatory Care unit, which may have meant some people had forgotten about agreeing to be contacted, or were now too busy to participate.

Due to the small number of patient participants, it was not appropriate to conduct full, formal analysis of their interviews as the number and depth of interview data was small and may not be as meaningful. However, it has been argued that in some cases, sample sizes of as little as one may be appropriate and generate important insights (324), therefore, the results of coding these two transcripts will be presented after the results of the physiotherapist interviews, as both participants provided insights and views that could be beneficial in exploring patient perspectives on the topics of these interviews. It should be noted that as there were such a small number of patient interviews, these can only give an initial insight into potential views that patients may have, and they should not be interpreted as being more widely applicable or as having explanatory power, in the way that the physiotherapist interviews can be interpreted.

7.2 Key Themes - Physiotherapists

Analysis of the interview data identified six key themes relating to location of care decisions and risk among physiotherapists. These key themes are the Physiotherapist Identity, Working with Risk, the Discharge decision, Considerations for referrals (to Ambulatory Care services), Communication and Wider Context. These themes are related to, and have an influence on, each other, as shown in figure 24. The physiotherapist identity is related to all of the other themes. In the case of Communication, the Discharge decision, and Considerations for referrals, these are all influenced by elements of the Physiotherapist identity and experience, which itself will be influenced by factors incorporated in Wider Context. Working with Risk and the Physiotherapist identity have a bidirectional link, since experience of Risk and its management influences development of physiotherapists' clinical reasoning and skills, while these developments influence how physiotherapists approach risk in their jobs. In addition to its relationship with the Physiotherapist identity, Working with Risk also influences both the Discharge decision and Considerations for referrals, as each of these carries inherent risk within them, and therefore require consideration and balancing of these risks. Wider context influences Working with Risk by altering external elements which alter what the risks may be, and therefore how they may be treated. As well as the influences of the Physiotherapist identity and Working with Risk, Considerations for referrals and the Discharge decision are both impacted by Communication and Wider context. These two themes are influenced similarly, as they both relate to decisions about the care location changing from the place in which the patient is at the time of the decision. Communication between various parties, including physiotherapists, patients, families and other healthcare professionals all play a role in reaching these decisions, and the available options and external influences on those location of care decisions will be affected by the Wider Context in which the decision is made.

Each of these themes will be explored in more detail below.

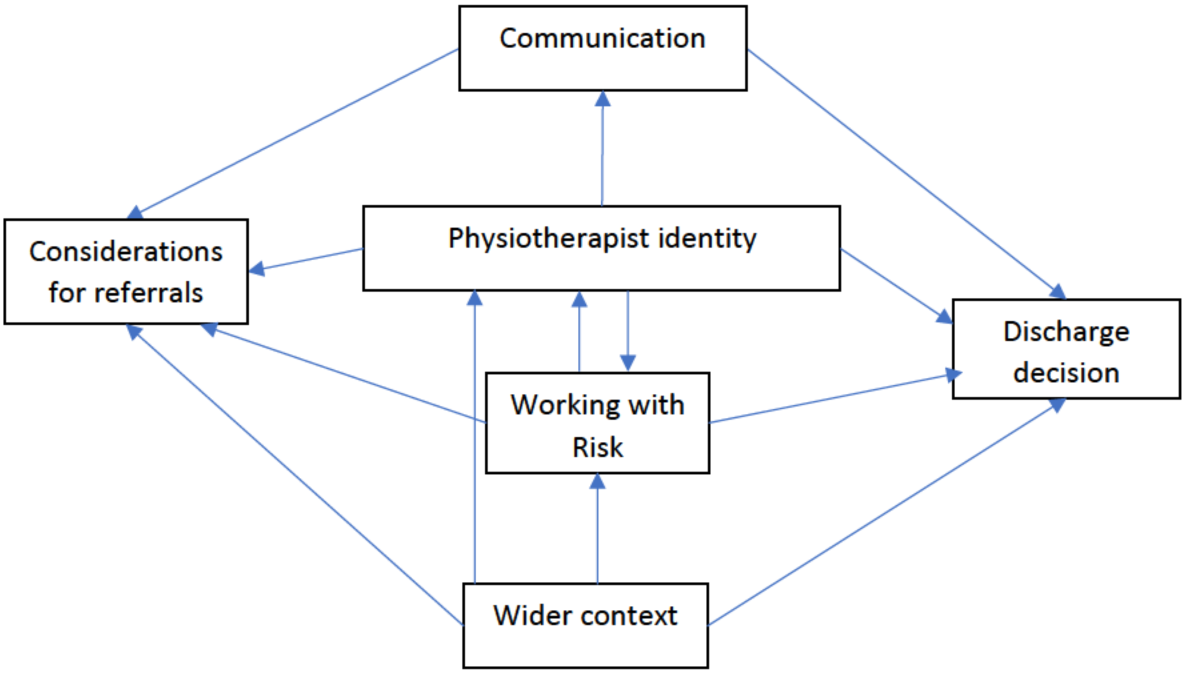

Figure 24. Interactions between six key themes from physiotherapist interviews

7.2.a Physiotherapist Identity

Specific aspects and attributes of being a physiotherapist, and how physiotherapists may differ from other healthcare professionals, were discussed, along with how their roles changed and expanded over time. These discussions included reflections on the role of the physiotherapist as participants saw it, in relation both to relationships with patients and in comparison to other healthcare professions, as well as comments or implications around participants' level of confidence in their own clinical judgement as a physiotherapist, and how this related to their choices and interactions with others. Finally, professional learning and development were raised, ranging throughout whole careers up to the point of the interview, with different participants commenting on physiotherapy training, peer learning in practice and extending professional scope in various ways.

Almost all the physiotherapists described having a wide range of clinical experiences prior to their current job in AC and/or front-door services, with most having gained greater experience in one or more relevant clinical specialties prior to their current job role. In some cases, this was described as a necessity for all healthcare professionals in the teams they worked in.

> *"So anybody who's been on our team … they have to have at least two to three years with Care of the Elderly experience and worked in a hospital setting"* – Physio 14 (HaH service, Female, Band 7)

In addition to having a range of previous experience, participants also talked about how they came to choose their current speciality, often through having rotated to the area as part of a previous job and enjoying their experience, thus leading them to choose to seek a job in that area. In describing this process, some physiotherapists highlighted the need for those working in this type of environment to have a certain disposition or attitude, especially towards risk, which may be less present in physiotherapists working in other clinical specialties. One participant did highlight that this willingness to take risks may not apply outside of work, but within their job it did occur.

> *"I feel like if you're gonna work in, the emergency department you have to, be willing to take, some level of risk, otherwise, you probably need to go and get a job somewhere else"* – Physio 8 (Front-Door service, Female, Band 6)

Having established how participants reached their current jobs, and some of the attributes that may be common to many physiotherapists working in these services, the data also allowed exploration of broader attributes and roles that may be more widely shared by physiotherapists, beyond only those who work in front-door or AC services. These tended to centre around two connected points, the relationships that physiotherapists develop with patients, and the perspective of physiotherapists being different to that of their multi-disciplinary team (MDT) colleagues. Where it was raised, the difference in the relationships that physiotherapists may develop with their patients, compared to the patient-clinician relationships other healthcare professionals may develop, was often seen as being based around the time they spend with patients and the contents of their assessments.

> *“sometimes if we, we’re the ones that have assessed them, we’ve spent a bit longer with them as well so we have potentially more of a bond with that patient”* – Physio 2 (Front-Door service, Female, Band 7)

> *“I think, as physios, we .. have a very different perspective on risk, to a lot of the other members of the MDT because we see patients in their own environment and we see how they interact with their environment and their carers”* – Physio 12 (HaH service, Female, Band 7)

Participants reported that this ability to spend more time with patients was especially important, as it was not necessarily something that other MDT members, especially doctors, had the “luxury” of. Through having this time for assessments, participants reported gaining a fuller understanding of patient concerns and developing a “rapport”, which helped to develop relationships and thus facilitated gaining a more holistic view of the patient’s situation.

> *“I think we question and listen a lot more, than sort of some of our counterparts … and I think we are often sometimes that first contact point that we actually, listen, to the patient which then allows us to do that more holistic assessment”* – Physio 7 (Front-Door service, Female, Band 8+)

This can clearly lead to potentially having a different perspective or thought process around decision-making for a particular patient when compared to team members who may not have the opportunity to spend as much time with the patient, or whose assessment is more focussed on the patient’s presenting condition than on their wider life. Participants felt that physiotherapists can sometimes bridge this gap by combining their knowledge and experience from multiple areas, such as their understanding of both medical and functional concerns, through communication with other MDT members.

> *"We don’t always agree with the doctors ... around that [referring to medical stability]. I know it’s their decision to make them medically stable, but if their blood pressure’s crashing every time they stand up that’s not particularly helpful for going home"* – Physio 6 (Front-Door service, Female, Band 8+)

In addition to having an understanding of multiple perspectives, participants also talked about extending their skill-set to incorporate cross-professional skills, and more broadly extending both their scope and the physiotherapy role. Learning cross-professional skills was discussed in the context of both learning skills from specific professions, such as occupational therapists, and more generally. In the context of more general cross-professional learning, this included both the physiotherapists learning skills from their MDT colleagues, and their colleagues learning from them, such that all team members up-skilled.

> *"my physio skills are still my core skills, and .. I think that when you’ve got such a, when you work in the community in this kind of area, you become such a holistic practitioner, that it’s almost not about your, profession, it’s about your experience of working with that type of patient."* – Physio 12 (Front-Door service, Female, Band 7)

As well as learning from their MDT colleagues, participants also discussed learning with and teaching their physiotherapy colleagues as part of continuous professional development in their jobs, and some discussed experiences from their degrees to become a physiotherapist. While the former was discussed in a positive or neutral way, comments about the latter mainly focussed on the lack of training in risk or acute care, and although one physiotherapist reported that they thought this may have improved since they qualified, the most recently qualified physiotherapist who was interviewed reported very similar concerns.

> *"I didn't have any training in at university at all, .. and actually no training around risk and the fact that as therapists we would be dealing with risk, I don't think"* – Physio 3 (Front-Door service, Female, Band 7)

Given the relative newness of physiotherapists working in these environments, at least in some areas (325, 326), and the historic tendency of physiotherapy as a profession to extend its scope of practice in response to changing circumstances (327), it was unsurprising that a number of participants spoke about their experiences of, and/or desire to, extend their own scope of practice. This was most prevalent in participants who were working in extended or advanced practitioner roles, although it was also brought up by a small number of other participants. The focus of these comments was generally around developing skills that are outside the normal scope of physiotherapy practice, such as venepuncture, ordering scans and prescribing medications.

> *"it's something that I definitely want to look at in the future that, if I'm going out I could, maybe help with an admission and do bloods, or help with an admission"* – Physio 14 (HaH service, Female, Band 7)

> *"I work for the advanced clinical practice team, so I'm a physio by background but, I work in an ACP team" … "so the advanced clinical practitioners can prescribe medication that might be able to support the patient to stay at home"* – Physio 12 (HaH service, Female, Band 7)

Finally, almost all participants alluded to having confidence in their clinical judgement and decision-making, based on their knowledge, skills and experiences as a physiotherapist. This included those participants whose roles had extended beyond 'traditional' physiotherapy to become extended or advanced scope practitioners. This tended to be discussed primarily in two contexts, in discussions with patients (or families), where the physiotherapist and patient (or family) may disagree about the optimal location of care, and in discussions with the MDT, where physiotherapists may feel that a patient is not ready to be sent home while other MDT members feel that they are. In the case of discussions with patients, physiotherapists indicated being willing to discuss their reasoning with patients and reach a shared decision, whereas in the case of MDT discussions they indicated being more direct, while still explaining their reasoning.

> *“Sometimes it might be that she is medically fit for discharge and I’m like ‘oo well, actually, she probably needs a day or two’ and I think sometimes we need to be .. direct, with the MDT and say ‘these are the reasons why I think she needs a day or two. I don’t think that we can safely manage her at home with this support"* – Physio 11 (Front-Door service, Female, Band 6)

Overall, participants had confidence in their abilities and reasoning, derived from their training and ongoing professional development and learning, with both other physiotherapists and MDT colleagues. They also valued the time that they had to assess patients, and the wider focus of these assessments, as it allows development of a greater rapport and facilitates more holistic considerations when making decisions. Although this could sometimes lead to disagreements with patients and/or colleagues about optimal location of care, physiotherapist participants reported engaging in discussions to explain their reasoning, in order to reach mutually agreed upon decisions.

Physiotherapists discussed using both verbatim and gist information throughout their work, as is suggested by Fuzzy Trace Theory (FTT) (160). Many of the verbatim representations that they alluded to related to specific information and knowledge that had been gained through training and education, primarily post-qualification. This information could be learnt from multiple sources, including inter- and intra-professional learning opportunities and clinical experience. They also described using gist representations of information, both to understand and represent information that patients (and families) shared with them, and in interpreting their assessment findings. These gist representations allowed them to think more holistically when assessing patients and determining optimal location of care.

7.2.b Working with Risk

Within the broad theme of ‘Working with Risk’ there were a number of key areas. These comprised Risk being a frequent part of the job for physiotherapists in these clinical areas, Balancing risks between various considerations, Viewing risk differently in different settings, and Increasing experience and learning over time.

The majority of the physiotherapists who were interviewed expressed that risk-taking was an integral part of their job, with some highlighting that this may be especially true of physiotherapists working at the front-door or in acute care, and that it was important that they were able to manage taking these risks in an appropriate way.

> *“I think, across physiotherapy as whole is, and specifically at the front-door is, there is, there is always gonna be an element of risk"* – Physio 11 (Front-Door service, Female, Band 6)

> *“I’m an acute physio, so it’s, I would say the whole of my job is about managing risk"* – Physio 6 (Front-Door service, Female, Band 8+)

There was, however, one outlying physiotherapist who felt differently, in that they did not feel that physiotherapists traditionally tended to take risks, although they did acknowledge that some of the decisions they make professionally do carry risks.

> *“I think I probably, am taking risks, on some of the decisions that I make." … “I think we, as physios, I would say, are traditionally not risk takers, we’re almost over-cautious with our patients”* – Physio 7 (Front-Door service, Female, Band 8+)

Much of the focus on how these risks are managed was discussed in terms of balancing the risks of different options or actions. This included considering the risks of admission versus discharge home for those assessing patients in a hospital environment, and the converse of this, i.e. the risks of remaining at home vs being admitted to hospital, for those assessing patients in their own homes. Many of the physiotherapists were cognizant of the fact that none of the potential locations of care available to patients were risk-free, therefore, their decision-making was based on identifying the optimal location for the patient, where the benefits outweighed the risks for that individual.

> *“I think, risk, is always, throughout with a patient I think there’s always a risk of sending somebody home, it’s just weighing that ... what’s the benefit of keeping them in hospital because, there’s, there’s lots of numbers and figures that would suggest that being in hospital is not a good place to be for patients, if they can be managed elsewhere .. it’s just weighing that risk up against the benefit of actually sending them home.”* – Physio 10 (Front-Door service, Male, Band 5)

There was also discussion of some of the specific risks of both hospital admission and discharge home. More participants discussed the risks of admission, in either general or specific terms, than the number who discussed the risks of being at home, and this was present in interviews with physiotherapists based in both hospitals and community settings. However, although some participants did discuss specific or general risks of being at home, these were not encountered in interviews with community-based physiotherapists. Several specific risks of hospital admission were mentioned, the most frequent of which was the risk of deconditioning and/or functional decline, which is a well-established risk of inpatient admission, especially for older people (328-330). Other concerns that were raised included hospital-acquired infections, falls, pressure damage and delirium, all of which have been identified in previous literature as potential risks for hospitalised patients (331-335).

> *"we know that hospital brings a lot of risk in itself"* – Physio 3 (Front-Door service, Female, Band 7)

> *"you become deconditioned, institutionalised .. she's not gonna be ... doing the things that she normally would, and therefore actually her ability to, like .. functionally improve from her pneumonia will reduce"* – Physio 9 (Front-Door service, Female, Band 7)

Conversely, risks of being at home were also raised, although there were less specific risks highlighted.

> *"obviously everyone's .. got the risk of being unsafe at home"* – Physio 10 (Front-Door service, Male, Band 5)

Those that were, included inactivity, falls (as had also been raised as a risk of admission) and the idea of 'social admissions'. This latter concern relates to hospital admissions for reasons other than medical need, although one of the physiotherapists who raised this possibility did clarify that "nothing's ever truly a social admission" (Physio 11, Front-Door service), and tends to occur when there is a social reason that precludes someone from being sent home from the hospital front-door. This could be that their main caregiver has been admitted to the hospital, or that there are longer-standing issues in their life, such as substance abuse or homelessness. Although these factors do not directly constitute 'risks of discharge' themselves, they are factors that preclude discharge occurring, due to real or perceived risks if someone were to be discharged. Overall, physiotherapists tended to discuss risks of admission more than risks of discharge, and posit that patients should only be admitted to hospital if the benefits outweighed the risks of this, while balancing the risks that returning home carries.

> *"actually in a lot of ways hospital isn't the best place, for people and, and actually, whilst there may be risks associated with them going home, if they aren't .. at a particularly great level functionally or cognitively, if they want to be at home, actually the impact physically, mentally on them staying in hospital may be worse"* – Physio 4 (Front-Door service, Female, Band 7+)

Beyond balancing the risks of these two main care locations, consideration was also given to other balances, such as risks to patients versus risks to staff, providing physiotherapy input prior to patients being medically fit for discharge to minimise other risks, and balancing different risks that are presented by being in hospital (such as the risk of falls if mobilising versus the risk of pressure damage if not mobilising). Discussions of balancing these additional risks were only brought up by physiotherapists who worked in hospital-based units or services.

> *"it's not necessarily just the patients' risk, it's also about the staff risk"* – Physio 6 (Front-Door service, Female, Band 8+)

> *"yes they may be at risk of a fall but are there other risks from keeping them in bed"* – Physio 11 (Front-Door service, Female, Band 6)

As well as attempts to balance specific risks, or groups of risks, against one another, some physiotherapists also discussed managing and incorporating different parties' views on risks. This could include professionals' views, those of the patient and/or those of the patient's family, and included considering the possibility of allowing people to take a higher level of risk, often in the context of a high-risk discharge, than might otherwise be acceptable, for a potentially greater gain. This may be, for example, that the person manages better at home than the physiotherapist anticipated, and therefore the patient is able to remain there, or it could be that the patient does not cope as well as they had hoped or thought they would, and therefore they are more willing to discuss alternative options. When making these decisions, the importance of communication with relevant people was highlighted, such that all relevant people’s views are accounted for, and a joint decision may be negotiated.

> *“I think is about negotiating that risk, because we might be happy to take a risk but maybe their husband, wife, daughter, son isn’t happy to take that risk”* – Physio 6 (Front-Door service, Female, Band 8+)

Alongside considering and balancing the risks of admission and discharge, physiotherapists also discussed what they felt were some of the more unique elements of working in front-door or ambulatory care services, and how this related to their views and management of risk. This tended to centre on the fact that the decisions they are making are potentially fairly high-risk, given the short amount of time that they have known each patient for, and the aforementioned risks involved in all the potential places they could advise that the patient receives care. Those who addressed how they personally managed this, reported relying on their clinical assessment skills and clinical reasoning to ensure that they were only taking a level of risk with which they were comfortable, while accounting for the time pressures and other influences that are present in the front-door environment.

> *“I think problem-solving is probably .. one of the biggest strengths of front-door working, the ability to do that, but then back that up with the comprehensive assessment, and I think ultimately that’s probably how we then judge risk and whether we’re comfortable with the level of risk that that poses”* – Physio 3 (Front-Door service, Female, Band 7)

Comparisons were made between the areas in which participants worked, and other areas of the health service, such as between front-door or ambulatory care units and inpatient wards, between acute medical units and the emergency department (ED), or between the ED and outpatients.

> *"Whereas obviously, different departments or different areas, you may feel like you've got to know the patient, but equally they've been in hospital for like a longer amount of time so just the risks are different in those areas"* – Physio 8 (Front-Door service, Female, Band 6)

In general, the comparisons between areas within the hospital tended to focus on the increase in time available as patients progress through the system (from ED to acute medical unit (or equivalent) to inpatient wards), and thus the change in urgency of decision-making and risk tolerance that this time availability produces. Physiotherapists tended to indicate that as more time became available (e.g. once patients are admitted to a ward), the urgency of decision-making for discharge seems to reduce, and thus more time and less risks may be taken.

> *"we almost sometimes I think slow down as part of that and don't actually push and go forwards and look at taking those risks and getting them home"* – Physio 6 (Front-Door service, Female, Band 8+)

Although their perspective was different, as it was focussed on keeping people at home and avoiding arrival at, or admission to, hospital, physiotherapists working in

Ambulatory Care units based in the community expressed similar views, in as far as admission to hospital tended to increase the difficulty of facilitating patients to be at home, and that the longer patients were admitted for, the harder it becomes to discharge them. They also discussed some areas of difference in how they view risk, compared to their hospital-based colleagues, with a specific example being given of whether or not to allow patients to sleep in chairs at home. This was presented as something that hospital-based physiotherapists are not happy to allow on discharge, whereas those working in community settings are comfortable with, as part of an ongoing situational review with the patient.

> *"I think it's probably a hospital versus community thing … once patients have moved out of AMU and they're on a ward or they're in, an intermediate care bed .. it almost becomes, harder to get them home if they were to choose to sleep in the chair. … but almost the longer that they stay in hospital the more opportunity there is for, therapists to get involved and for problems to arise that seemingly have to be fixed in hospital."* – Physio 12 (HaH service, Female, Band 7)

A number of the hospital-based physiotherapists did highlight benefits that they saw in being able to review patients in their own environment, for example one participant said that "recognising actually how well people can manage when they're back in their own home" gave them confidence, and others described the ability to follow patients up at home themselves, or within their team, as being "lucky". This ability and experience may feed into their future decision-making and help to bridge the gap between how hospital and community-based physiotherapists make these decisions. However, some community-based physiotherapists, while agreeing that seeing patients within their own environment has benefits, also acknowledged some of the practical challenges of this, particularly around health and safety concerns.

> *"But we've had a lot of like risk .. in the, the health and safety of, of treating that patient, like safely, d'you know, with obstacles that you have to climb over and, and stuff like that."* – Physio 14 (HaH service, Female, Band 7)

A final comparison that was raised regarding how risk may be viewed differently depending on context, was among those physiotherapists who had experience of different roles, especially when comparing 'traditional' physiotherapy roles with extended scope or advanced practitioner roles. In these extended contexts, participants spoke about using their physiotherapy skills and knowledge as their basis, but then expanding upon this to incorporate a wider range of cross-professional skills and responsibilities, and the potentially different risk this carries, as a more independent decision-maker in acute scenarios.

> *"the kind of traditional physio role is more around the discharge planning and risk in relation to safety … Then in my ACP role it's around being that primary, that sort of clinician, and the risks associated with your clinical diagnosis and your ongoing management."* – Physio 4 (Front-Door service, Female, Band 7+)

A major component of how physiotherapists described their evolving attitudes towards risk at work, and how they described the attitudes of their colleagues, centred around the influence of professional experience and learning over time. In general, it was reported that with time and experience, confidence in both decision-making and informed risk-taking grew, such that more senior physiotherapists reported being less cautious than they had been as juniors and/or less cautious than junior therapists they worked with. This caution tended to be reported as taking the form of more inexperienced staff being more inclined to admit patients, even if just for a short time, thus implying that the greater risk-taking was in sending patients home.

> *"so you are quite risk averse .. as a newly qualified, new graduate and it's only once you've got a breadth and depth of experience that you probably become much more comfortable and tolerant of risk"* – Physio 3 (Front-Door service, Female, Band 7)

> *"Quite naturally, your more junior staff, whether that's OT or physio staff, I think will always tend to err on the side of caution for fear of, of repercussions and, and doing something wrong"* – Physio 4 (Front-Door service, Female, Band 7+)

One way in which this learning, and by extension change in attitude to risk, is achieved is through reflection on clinical cases. Some individuals reported that they would not necessarily apply learning from one patient experience to future patients, although one of these physiotherapists clarified that this was because of the need for personalised care, and avoiding the assumption that the experience of one patient in a given situation would be replicated for others in the same scenario.

> *"it's about personalised care isn't it, and not just assuming because it happened to one patient that that's gonna happen to, everybody else in exactly the same situation."* – Physio 12 (Hospital at Home service, Female, Band 7)

Other physiotherapists discussed the use of team discussions of cases in order to develop the learning and skills of the whole team, in order that all team members can improve and develop. Given the importance placed by participants on experience within this setting in developing appropriate risk-taking, the use of team discussions and learning from ‘real-life cases’ may help to facilitate a faster learning curve for staff who are newer to these clinical areas, both through the second-hand experience and through hearing the decision-making process of more experienced staff.

> *“we’re gonna go through the notes of that as a team and actually look at where were our opportunities to actually discharge that patient … so we actually learn .. from things like that”* – Physio 6 (Front-Door service, Female, Band 8+)

With regards to working with risk within their jobs and decision-making, much of what the physiotherapists described related to the FTT concept of gist representations (160). This was especially apparent among those who talked about making decisions that carried a level of risk with which they, and their patients, were comfortable. Although there were some examples of situations in which physiotherapists used more verbatim representations of information, this tended to act as a component of their more general impression of the risk level, rather than being used very directly to make decisions. Even in the case of participants who referred to specific numbers or data, such as physio 10 quoted above, this tended to be reported in a general manner that suggested the participant had amalgamated the main message of these data in their head, and was thus representing it in gist understanding, as opposed to using the specific numbers (i.e. verbatim representation) to guide their decisions. As physiotherapists spoke about their views on risk and risk-taking changing with experience and learning, this is further suggestive of them using gist representations of information to reach decisions, and how experience and professional discussions can alter their gist interpretation of a situation. This is particularly apparent when participants spoke about the decisions made by more junior staff and how these may vary from the decisions that more experienced staff may make in those same situations. As the verbatim details of the patient's individual case would be the same regardless of the experience level of the decision-maker, the difference in the ultimate decision must arise from different gist interpretations of that same verbatim information, and potentially how that information is then framed to the patient by the physiotherapist.

7.2.c Discharge decision

The two central tenants around which physiotherapists reported basing their discharge decisions were safety and patient choice. They reported that ensuring their patients would be safe at home, and not sustain further injuries or require readmission, were very important, and that in facilitating discharges they try to manage risks to make these as safe as possible.

> *"manage risk, to allow patients to return home, but to make that as safe as possible"* – Physio 4 (Front-Door service, Female, Band 7+)

Participants also reported feeling that they were the people who are asked to determine if a patient is safe to return home, and that they may be "used as a safety net" in this context. Part of the reason that some physiotherapists gave for this was their ability to consider the patient's situation holistically, drawing on their knowledge of the patient's medical situation, but also the wider picture of their function and requirements for managing at home following discharge. In this way, some participants felt that physiotherapists viewed discharge and safety differently from other MDT members, especially their medical colleagues.

> *"I think we're used as a safety net" … "whereas we do, we can judge and reason through the medical side, but also, the whole side and be holistic around what their function is and what they have to be able to do to go, go home, but safely be at home."* – Physio 3 (Front-Door service, Female, Band 7)

In reaching their decision about the safety of a discharge, physiotherapists incorporate multiple perspectives, including discussions with family members, and/or carers, who can provide further insight into the patient's home situation and likelihood of being safe if discharged there.

> *"she could give another perspective on how her mum was coping at home" [referring to speaking to patient's daughter]* – Physio 1 (Ambulatory Care service, Female, Band 6)

In these efforts to facilitate safe discharges, physiotherapists talked about how they may provide additional support, beyond what the patient had prior to admission, in order to make home a safe environment for the patient. However, participants also acknowledged that there are occasions when admission to hospital can be the right choice for a patient, with specific examples given of how cognitive deficits or confusion may lead to a patient exhibiting unsafe behaviour, and therefore discharge home would not be in their best interests at that time, on the basis of safety, or lack thereof.

> *“if they need to be in hospital, sometimes that’s where the right treatment is for them at that particular time”* – Physio 5 (Front-Door and Ambulatory Care service, Female, Band 6)

All of the physiotherapists interviewed spoke about respecting patients’ wishes and/or providing patient-centred care. This was valued highly by physiotherapists, including in the context of respecting patients’ preferences and wishes regarding location of care. Many of the physiotherapists were very clear on the fact that, provided the patient had capacity to make the decision, it was ultimately up to the patient where they received care, and that the physiotherapist could only advise, and try to make the ultimate location of care as safe as possible.

> *“if somebody really wanted to go home, then you know, and they’ve got the capacity to make that decision, you have to let them take that risk”* – Physio 1 (Ambulatory Care service, Female, Band 6)

As part of this, physiotherapists also discussed establishing patients' understanding of their own risk. Ensuring that the person in question fully understands their own risk for each potential location of care is integral to establishing that the person has capacity to make that decision. This means that, even if it is deemed to be an unwise decision by others, patients are supported to receive care in the location they prefer, accepting the risks associated with this.

> *"it's actually establishing if the patient is aware themselves of that level of risk and has capacity to understand and make those decisions"* – Physio 4 (Front-Door service, Female, Band 7+)

One concern that was raised by a small number of physiotherapists around respecting patient autonomy when one disagrees with the patient's decision, was the concerns that some staff have about blame or professional backlash if there is a negative outcome for the patient, after having supported them to receive care in a location that the physiotherapist disagreed with.

> *"I think a lot of people's worry is that if you, do go with what the patient's wishes are, and something happens, whether you're gonna be blamed for it really, and I've seen that quite a lot"* – Physio 8 (Front-Door service, Female, Band 6)

One potential protective factor against this blame that was suggested was to ensure that all discussions and provided options are clearly documented. Additionally, many of the physiotherapists talked about shared decision-making, including sharing decision-making with the patient, with their family and/or with other members of the MDT. This was deemed especially important when taking risks, which many of the participants felt was a very frequent part of their job, such that the decision and responsibility does not rest with them alone. Engaging in shared decision-making is also a beneficial way of respecting patients' wishes regarding location of care and treatment decisions, while giving the opportunity for a meaningful discussion of the potential risks associated with all the available options, and incorporating the views of those closest to the patient.

> *"this is a joint decision with, with the patient and with the family and then I suppose with me and [OT] being involved"* – Physio 14 (Ambulatory Care service, Female, Band 7)

A wide range of more specific factors that physiotherapists consider when making location of care decisions, were mentioned. These included functional and practical assessments, availability of care and support, gaining an understanding of the patient's normal function and home set-up, the patient's current health status, and the wider context of the health service they are working in, among other things. Almost every physiotherapist who was interviewed said that they would assess patients' functional ability, which may include mobility, transfers, stairs, ability to complete activities of daily living (such as washing and dressing, or cooking).

> *“it’s just seeing on initial assessment .. you know, how she manages in terms of bed transfer, mobility, toilet transfer, chair transfer, things like that”* – Physio 5 (Front-Door and Ambulatory Care service, Female, Band 6)

> *“I would see what ability she’s got now in regards to her mobility .. her ADL’s, domestic ADL’s and personal ones, I would see how she can manage those, and then obviously looking at her on the stairs”* – Physio 10 (Front-Door service, Male, Band 5)

> *“when we go on the initial visit we do a thorough holistic assessment of the patient … looking at the problem that they’ve referred themselves in for … home environment, carers, mobility, falls risk, safety to remain at home, pain relief, medication, compliance, nutrition, hydration, pressure relief, all of that kind of stuff”* – Physio 12 (Hospital at Home service, Female, Band 7)

Some physiotherapists also discussed other specific assessments that they may carry out, such as assessing range of movement, strength and sensation or proprioception. In some cases, participants reported that they would also use specific outcome measures for particular assessments, such as Tinetti (336) or Berg (337, 338) for balance assessment, the Elderly Mobility Scale (339), CURB-65 (262) or other outcome measures to quantify risk.

> *“Have we used outcome measures in order to kind of quantify their risk? So kinda, especially the falls risk, have we done a Tinetti? Have we done a Berg? Have we done an EMS, something like that? .. That’s sometimes just a quantitative measure, to kind of justify your thinking”* – Physio 11 (Front-Door service, Female, Band 6)

Alongside these assessments, physiotherapists also said that they would gather information about how the patient in question was managing functionally prior to admission, this includes both immediately prior to admission and their usual functional level, as well as other relevant history, such as asking about previous falls.

> *“A big one for me is finding out what their, what their normal level is, what their normal function is”* – Physio 2 (Front-Door service, Female, Band 7)

Related to this, some participants explained that they would also try to glean what the patient must be able to do in order to return home, i.e. the minimum requirements for managing safely at home, such that they could return home and continue recovering there, even if they were not back to their normal baseline prior to discharge. This is separate from what the person may want to do when they get home, which is also important to consider, when determining if someone will be safe if they are discharged home.

> *“you really need to have a good idea about what they need to do, but also are going to want to do”* – Physio 3 (Front-Door service, Female, Band 7)

> *“we often have to consider risk in trying to weigh up the options of what things are essential for discharge there and then or are there certain things that can be continued post-discharge”* – Physio 4 (Front-Door service, Female, Band 7+)

Having assessed a patient’s current functional ability, and determined how similar or different this is to their normal baseline, physiotherapists then considered the support that would be available to the patient, should they be discharged home. This includes both formal and informal support, such as a package of care or family visiting them, as well as community services who may be able to support ongoing medical or rehab needs, for example if the patient needs further antibiotics, or has returned home prior to re-establishing their previous functional abilities.

> *“So it will make a huge difference if you’ve got a very able partner at home to help you, as to if you’re at home on your own”* – Physio 6 (Front-Door service, Female, Band 8+)

> *“probably availability of things, so community hospital, they go through waves I think, sometimes they’ve got no beds and sometimes they’ve got loads of beds … The same with care really, sometimes … the care providers sometimes has less care available than other times so, it’s just what’s available at that time”* – Physio 10 (Front-Door service, Male, Band 5)

The availability of ongoing therapy and/or medical and nursing input in the community, or a community hospital, was brought up as being a very important consideration by most physiotherapists, with many indicating how knowing that these services are available and will provide ongoing input with that patient helps them feel more confident or “comfortable” in their decision and the risk of discharging the patient from the hospital.

> *"Access to urgent therapy at home as well, that's a big one. If you know that they're going to have care and therapy go in, specifically physio, to, to progress them at home you're more likely to be happier sending them home earlier"* – Physio 2 (Front-Door service, Female, Band 7)

Some, however, did highlight some of the practical considerations of this, such as ensuring that those services will be able to access the patient's property, and the speed at which they can first attend a patient. The length of time that the patient would have to wait at home before being seen by the community team was felt to be important, especially where there may be some higher risk involved in the discharge, as physiotherapists indicated that they would be more comfortable sending a patient home with this sort of input if they knew that the patient would be seen within a few hours, as opposed to having to wait until the following morning for a review if they were sent home during the early evening. This consideration was also the justification that some physiotherapists gave for why time of day can influence their location of care decisions, if they know that the community service will not see patients after, for example, five o'clock, then they may be more reticent about sending patients home close to this time, knowing that they will not be seen again until the following day.

> *"The other thing I suppose is the services that are available to support them, how quickly we can actually get those services in."* – Physio 6 (Front-Door service, Female, Band 8+)

Alongside community health services, physiotherapists also commented on the importance of access to, and availability of, social care. This is important to facilitate the patient being able to remain at home through packages of care to support activities of daily living, as appropriate, but some physiotherapists cited challenges that they have experienced due to conflicts with social workers, who, in their opinion, may have different viewpoints or request additional assessments before being willing to implement a package of care for a patient.

> *"an influencing factor in facilitating discharge and making decisions around discharge .. if it's been felt that additional support's needed, with say packages of care .. this challenges and .. kind of conflicting views and expectations between professionals, particularly in relation to .. medical social workers"* – Physio 4 (Front-Door service, Female, Band 7+)

Even for those patients who do receive a package of care via social services, there is often still an expectation that family or friends will assist them with other aspects of their life on discharge, and it was therefore raised by some participants that it is important to consider this wider impact when making a location of care decision. They highlighted the fact that their role is not only to support the patient, but also the network surrounding them, to ensure that they too receive adequate support at this time.

> *"sometimes it isn't just thinking about the patient, it's thinking about how that discharge is gonna have that impact on that wider family and on that wider support group"* – Physio 11 (Front-Door service, Female, Band 6)

Ultimately, these considerations boil down to the physiotherapists being satisfied that the patient will have appropriate and sufficient support at home, if they are discharged from their service, and the steps that they try to take to ensure this.

> *"I think you can only become comfortable with risk if you've got the wrap-around services available"* – Physio 3 (Front-Door service, Female, Band 7)

As well as considering the patient's function and abilities, and the support that they will receive at home, physiotherapists also consider other, wider patient factors when determining their optimal location of care. These factors may contribute to the patient's functional ability, and to the level and type of support that they would need on discharge, as well as their ability to engage in the decision-making process. Some of these factors relate directly to the patient's presentation on assessment, including their presenting condition, symptoms and ongoing treatment, while others relate to their life more broadly, such as socioeconomic or lifestyle considerations and safeguarding, and some may cover both of these categories, such as the patient's cognition and capacity.

With regards to symptoms, the main one that physiotherapists focussed on was pain, and whether the patient had adequate pain control, which was described as being a "massive" part of working in front-door services. More general medical stability was also raised by many of the physiotherapists, indicating that if a patient was not medically stable then it would not be appropriate to discharge them.

> *"Pain is massive .. so front-door wise, and sort of CDU and things like that, pain is huge in what we're doing, control the pain generally we can probably get patients out, but if they can't, do what they need to do because of pain then you need to control the pain for them to be able to do that"* – Physio 6 (Front-Door service, Female, Band 8+)

Linked to this, some physiotherapists also said that the specifics of any ongoing treatment from other members of the MDT, such as medication, would have a bearing on their decision, and some indicated that the presenting condition itself may also have an impact on their decision-making. This may also involve the use of specific outcome measures to help guide decisions, such as the CURB65 (262) tool to predict mortality in community acquired pneumonia.

Beyond the specific episode of ill health that has led to the patient presenting to health services at a given time, physiotherapists also reported considering wider socioeconomic and lifestyle factors that may impact where the best location of care is for a given patient. The participants were clear that the options they offered to patients would not necessarily be influenced by the patient's socioeconomic status, but the implementation of them may be altered, or the patient may choose differently due to this. For example, one participant reported that more economically deprived patients sometimes choose to be admitted for rehab repeatedly, in preference to having to pay for social care at home. Some participants also discussed how they may consider the socioeconomic status of the patient's family, if this was relevant, for example, if a family member would have to take time off work in order to provide care if the patient was discharged and this was going to put an undue strain on them financially, this may be discussed and considered when determining location of care.

> *"it does have quite a big impact on actually .. maybe not, what my plan would be, but actually sometimes the implementation of it ... so actually I think it does make, have a bit of an effect, and people would often rather do the rehab route multiple times, than end up paying, than have to pay for, care at home"*
> – Physio 9 (Front-Door service, Female, Band 7)

Some participants also discussed lifestyle challenges that they experience with their patients, which may influence their decision or options for location of care, such as if it is known that the patient is abusing drugs or alcohol, and that this will continue when they leave the hospital, or if the patient is homeless. One of the challenges that this raises for staff, beyond practicalities of providing care after discharge, is the ethical challenges of this situation, especially in relation to drug or alcohol abuse – if this is the patient's normal routine, and they wish to return to it (and have capacity to make that choice), then this is can be very difficult for staff, who see the choice as unwise, but have to respect the patient's right to choose this.

> *“you’re put with a lot of risk there, because you’ve potentially got patients who you’re sending home, and are abusing drugs or alcohol. So I think you can feel very ethically .. challenged between what is their .. usual routine, and what is, how, how can I put it .. it’s an unwise decision I guess, versus absolutely their decision to make”* – Physio 3 (Front-Door service, Female, Band 7)

Broadly linked to this, or to any other information that is uncovered in the course of assessing and treating the patient, are safeguarding concerns. A number of physiotherapists spoke about making referrals to the safeguarding team or ensuring that patients remain somewhere safe until this is resolved if there was any concern about safeguarding, for the patient or anyone else in their household.

> *“if you’ve got maybe a .. you’re worried about a possible ... how to say, concern or children safe concern, so … if, if, if you think that discharging this patient … may put her at higher risk, I would keep her in .. just to fit the possible risks”* – Physio 13 (Front-Door service, Male, Band 8+)

The final wider area of patient-specific consideration that was raised by many of the physiotherapists was patient cognition and capacity. This is especially important when trying to determine whether a patient is likely to be safe at home, and in determining whether to allow a patient to make an ‘unwise’ decision, for example to return home against professionals’ advice. The two main forms of cognitive impairment that were discussed were an acute impairment, such as delirium, which may resolve with treatment (340), and a chronic impairment, such as dementia, which is not likely to resolve and may have been present prior to admission (341). In both cases, participants were clear that cognitive impairment alone was not a sufficient reason to admit a patient, and in fact that home may be a preferable location for confused or cognitively impaired patients to receive care, despite the risks of this. The main reason for this potential preference for home was that patients with cognitive impairments may recover better, both from the cognitive impairment and other acute health problems, in a familiar environment than they would do in an unfamiliar hospital environment. Being at home also means that people can be visited and cared for by people who they know, which may help avoid or reduce distress. However, safety was still paramount in these cases, and physiotherapists talked about only doing this for confused patients, as for non-confused patients, if they could be sure that the patient would get appropriate care at home, such as from a Hospital at Home team, and if they were confident that the patient would be safe between these calls.

> *“obviously delirium improves better at home but obviously there’s a balance that you need to take from the risk of it”* –
> Physio 9 (Front-Door service, Female, Band 7)

One way that participants talked about assessing for patient safety between professionals’ visits at home was through the use of safety questions, where the patient is asked what they would do in various circumstances, such as if a fire broke out or if they had a fall.

> *“with the confusion as well if then, you are worried I usually go on to ask some safety questions, y’know like ‘what would you do if there was a fire?’, ‘what would you do if you had a fall?’, things like that and see whether they could, although she might be confused whether she would actually be able to … reason through a .. safety issue”* – Physio 8 (Front-Door service, Female, Band 6)

A further reason that physiotherapists raised for considering cognitive function was the potential impact that this may be having on patients’ function at the time of assessment – a cognitive impairment could be leading to, or at least contributing to, a decline in function, and this is incorporated into the physiotherapists’ clinical judgement and reasoning when considering potential care locations.

> *“the delirium might also have a bit of a impact on her function as well, but we wouldn’t know that until we carried out a functional assessment”* – Physio 11 (Front-Door service, Female, Band 6)

In relation to cognition and decision-making, participants highlighted the importance of capacity assessments, since having a cognitive impairment does not necessarily mean that someone lacks capacity to make a location of care decision. Despite their importance, or possibly because of it, some physiotherapists also reported that they have faced challenges in their Trust, either with people not taking responsibility for conducting capacity assessments, or when health professionals have separately assessed capacity and reached different conclusions.

> *“there’s definitely an argument in our Trust about capacity assessments and whose responsibility it is”* – Physio 8 (Front-Door service, Female, Band 6)

Beyond the individual patient, and factors specific to them, some physiotherapists also discussed wider factors that may be considered when making location of care decisions, such as the broader context of the hospital or Trust, external pressure on them, and the impact of patient location and time in hospital on assessments and risk-taking. The broader context of the Trust and wider health service can directly impact on pressure that staff feel to discharge patients, and some participants commented on this having escalated during the COVID19 pandemic, with increased pressure being put on them to avoid admitting patients.

> *“There’s also been .. a lot of .. pressure, I would say is probably the right word, placed on clinicians to be .. avoiding hospital admission where at all possible.” [in context of COVID]* – Physio 4 (Front-Door service, Female, Band 7+)

The reasons for this are likely two-fold – the high existing pressure on beds meaning that Trusts do not want to add to the list of people awaiting a bed, and the risk of hospital-acquired COVID19 that increases with admission. Although bed pressures and the risk of iatrogenic infection are not unique to the COVID19 pandemic (342, 343), they were visibly increased by it, which may explain the escalation in existing pressure on location of care decisions in this way. The impact that participants discussed COVID19 having on their experience and practice is discussed in more detail later in this chapter. One of the ways in which this increased pressure that participants reported was felt was through an increase in the level to which their clinical reasoning was questioned by other MDT members, which will be discussed further in the ‘Communication’ theme.

An additional pressure that some participants highlighted, specific to the environments in which they were working, was the high level of time pressure they were under, especially in the Emergency Department (ED) where the four-hour target (344, 345) was still in place. The ‘four-hour target’ is an NHS-wide goal of 95% of patients not waiting longer than four hours in the ED, which was introduced to try to improve patient experience and reduce adverse clinical events. There have been mixed results in this regard, with some clinical outcomes being more positive than others (345), and studies of ED time targets such as this have found increased staff stress and pressure as a result of them (344, 345). When considering time, some participants commented on how they feel that the length of time staff have known a patient can influence their risk tolerance and decision-making. Specifically, one participant reported that they feel like staff risk averseness increases with the time that a patient is in hospital, as staff get to know the patient a bit better, for example comparing support for discharge from the ED to when the patient has been in a front-door unit for a few days.

> *“So I think, when they’ve nearly been in hospital a wee bit longer they’re less likely to take a risk with patients”* – Physio 5 (Front-Door and Ambulatory Care service, Female, Band 6)

In their assessments and considerations regarding location of care, almost all of the physiotherapist participants reported, either explicitly or implicitly, that they had a ‘Home First’ mentality when deciding on location of care – i.e. their first preference was for patients to be managed at home, with admission being suggested only when care at home was not safe or was otherwise inappropriate.

> *“for most people, the best place for them will be home with the right support, and that’s what we try and promote”* – Physio 2 (Front-Door service, Female, Band 7)

> *“we operate on a ‘home first’ basis, always, so we, we try to make sure that, every base has been covered, before .. we, come to an admission perspective”* – Physio 12 (Hospital at Home service, Female, Band 7)

In order to support this approach, having assessed the patient and accounted for all the relevant considerations discussed above, physiotherapists then endeavoured to minimise risks of discharge through various means, as applicable to the individual patient’s situation. The reason for this ‘Home First’ approach was generally reported as being because patients recover better in their own home and that it is better for patients to be in their own environment, with appropriate support, than to be in a hospital. However, some participants did report that this drive to facilitate patients returning to their own homes can be considerably slowed once a patient is admitted to the hospital.

> *“as soon as you transfer somebody to an inpatient ward, I think that then risk going right down because it’s accepted they’re admitted, and there’s a pathway to go through … we almost sometimes I think slow down as part of that and don’t actually push and go forwards and look at taking those risks and getting them home”* – Physio 6 (Front-Door service, Female, Band 8+)

Therefore, participants were keen to support patients to remain independent and to return to their own homes, in a safe and supported manner. Physiotherapists acknowledged that there is risk involved in patients returning home, and that they try to mitigate, or at least minimise, this. Two of the ways that physiotherapists reported doing this, was through the provision of equipment and ‘safety netting’. ‘Safety netting’ will vary by patient, but may involve a temporary increase in package of care or family support, provision of information on specific signs or symptoms to be alert for and actions to take if they arise, booking an appointment with their GP for a few days after discharge, or other actions appropriate to the specific patient circumstance.

> *“help to minimise … any identified risks in the home environment so if there’s any pieces of equipment that could be put in place, to try and, maintain independence and minimise risk we can do that there and then” [when doing a home visit]* – Physio 4 (Front-Door service, Female, Band 7+)

> *"I think sometimes it is just kinda having that safety net for patients"* – Physio 11 (Front-Door service, Female, Band 6)

Participants also discussed potential adaptations to patients' home environment, such as temporary downstairs living or setting up a "micro-environment" in which the patient can safely manage until they are recovering and return to their pre-admission functional level, designed in response to assessment findings.

> *"if maybe she then can't .. walk distances that she needs to to get to the toilet, it's about does she then need a micro-environment"* – Physio 6 (Front-Door service, Female, Band 8+)

Doing this requires one to have gathered a good social history from the patient, or their next of kin, so that the required adaptations can be identified, or, where appropriate, it can be identified that it is not going to be possible for someone to return home immediately, and this too can be managed. One notable difference in the approach that physiotherapists working in front-door services may take to this home adaptation process compared to those working in Hospital at Home (HaH) services, is that front-door physiotherapists are doing this to facilitate discharge, whereas HaH physiotherapists are continuing to treat the patient in their home environment, and thus may have different perspectives on the adaptations required, and what is acceptable. One example that was given by a HaH physiotherapist was how to facilitate patients to remain at home if this means that they sleep in an armchair – most hospital-based physiotherapists may consider this unacceptable and therefore suggest that the patient remains in hospital until this is no longer required (e.g. until the patient is able to climb their stairs to reach the bedroom), while HaH physiotherapists may be happy to accept the patient sleeping in their armchair for a short time while they recover and regain their ability to manage the stairs, or bed transfers.

> *"People sleeping in recliner chairs, we, which we see a huge amount … and once the patient's in hospital, if you know that they're sleeping in the chair it's very difficult to discharge them home without having, a solution to replace that, 'sleeping in the chair' scenario … but when we see patients in their own home in the community, we'll happily let them sleep in the chair as long as they're not developing pressure sores, for days and weeks until we can negotiate a different solution. So it, it, it's very different when the patients are in their own home."* – Physio 12 (Hospital at Home service, Female, Band 7)

HaH physiotherapists tended to report more flexibility in both what level of function they would deem acceptable for a patient to remain at home with, and in how they may carry out home adaptations. The goal of these adaptations, whether they are facilitated by a HaH or a front-door physiotherapist, is to try to maintain patients' independence as far as possible, with a specific example being given of ensuring that the patient is able to get to the toilet independently, if this was possible for them prior to presenting with this episode of ill health.

> *“are they able to get to the toilet by themselves in between any care calls that we’re putting in, if they can do that then pretty much I’m sending them home”* – Physio 6 (Front-Door service, Female, Band 8+)

When participants were asked if they used a hierarchy among their considerations for location of care decisions, or if they placed more importance on some factors than others, they tended to be able to say what they valued most highly, and in some cases could also describe where other factors were located in a scale of importance. However, there were low levels of agreement between participants about what this order should be. Six factors were deemed to be of high importance by more than one physiotherapist – safety, pain, functional ability, care availability, patient preference and medical stability – but none of them were agreed upon by more than three physiotherapists. Additionally, some of these factors (e.g. pain and functional ability) were deemed to be of medium or low importance by other physiotherapists, and a range of other factors were highly valued by individual physiotherapists.

Overall, physiotherapists use their assessment skills and a broad knowledge base to consider myriad factors when making location of care decisions, both patient-specific and more broad factors, and use all of this to work collaboratively with their patients, their next of kin or families, and other MDT members to reach shared decisions about location of care, generally employing a ‘Home First’ mentality. Physiotherapists report that their main guiding principles when determining the optimal location of care for patients are safety, and respecting patient choice and autonomy.

When considering this process in relation to Fuzzy Trace Theory (FTT) (160), there are a range of both verbatim and gist interpretations being used. Physiotherapists use verbatim information from their assessments, such as functional ability, mobility, strength, and specific outcome measures, among others, along with information gathered from the patient and other relevant parties, such as care availability, pre-admission functional level, availability of community services and medical fitness or stability, to inform their decisions. They also use gist interpretations and information, including seeking the views of the patient and their family, especially around their interpretation of the patient's safety at home, and the wider impact of location of care on the patient's network. Some factors also incorporate both representation types simultaneously, for example, when assessing mobility, the physiotherapist may make a specific assessment of the patient's gait pattern and requirement for walking aids, while simultaneously making a gist interpretation of their safety level when mobilising and how similar this is likely to be to their pre-admission mobility. These factors are jointly considered and interpreted, ultimately resulting in a gist representation of how safe the physiotherapist believes the patient will be, which directly informs their decision on the optimal location of care. This overall interpretation may also vary depending on specific, verbatim information about factors within the community (e.g. the length of time before the community team will first assess the patient), and how this is interpreted in a gist way by the physiotherapist (e.g. whether they believe that the patient will be safe waiting for that long before being seen by the community team, but also their increased comfort level when knowing that the patient will receive ongoing care in the community). One of the most important factors that physiotherapists raised when discussing facilitating discharges was patient capacity, which is essentially verbatim information, although the potential for different opinions on whether a patient has capacity does indicate a level of subjectivity to this determination. This in turn can raise an issue when the gist interpretation of safety level on discharge differs between the physiotherapist and the patient, as this may contribute to the occasions where a patient who has capacity chooses to return home, despite this being contrary to the advice of the healthcare team.

Finally, some factors were raised by participants which, while not verbatim or gist representations in themselves as FTT defines them (160), do appear to have an influence on how physiotherapists think, and therefore may significantly contribute to their gist interpretations. These factors include the ‘home first’ mentality that was described by a large proportion of physiotherapists – if their standard ‘starting point’ is to aim for home, this is likely to influence how they view information and findings that either support or counter this plan, and external pressure, especially in relation to the wider health service or Trust situation – similar to having a ‘home first’ mentality, if there is significant pressure being applied (either directly or indirectly) to avoid admissions, this could influence people to be more open to interpreting assessment findings as being compatible with discharge than they may have been if there were more inpatient beds available. Additionally, some participants spoke about how the location in which the patient is assessed may influence their decision, and this could be through the effect that it has on their gist representation of the information they receive. This was especially the case when participants compared risk tolerance for discharging patients from the ED compared to when they had been in the hospital for longer (e.g. on a ward, or having been on an admissions unit for a few days), and when community-based physiotherapists compared their risk tolerance for patients remaining at home to their hospital-based colleagues. This latter comparison, and difference in gist interpretation of the same verbatim assessment, may be influenced by various things, including experiences of managing patients in this setting, specific education and discussions of acute care delivered in patients' homes, and seeing the patient in their own home, all of which may influence how they interpret a patient's safety if they remain at home, and how they may ultimately decide differently to their hospital-based colleague if they were to assess the same patient.

7.2.d Considerations for referrals to Ambulatory Care / HaH-type services

When considering location of care for patients who are acutely unwell and require hospital-level care, this location does not have to be a physical hospital – it can be (where such services exist) an Ambulatory Care, admission avoidance service, such as HaH, which provides hospital-level care in an out of hospital location, such as a patient's home (23, 346). However, patients cannot generally self-refer to these services, their admission criteria are via referral. Therefore, it is important to understand what contributes to the decision to make referrals to these services specifically, as this may be different from referrals to other services, which may be appropriate when patients are less acutely unwell. Participants in this study included physiotherapists who make (or could make) referrals to these kinds of services, as well as physiotherapists who work in these types of services and receive referrals.

A number of key considerations were raised by physiotherapists, starting with knowledge both of services' existence and of what they can provide to patients. Some participants raised the importance of being aware that services exist, which is reliant on communication, from the HaH team itself, and/or the Trust more widely.

> *"I: Is there anything that would make you more likely to discharge to them [HaH-type services] .. or less likely?*
>
> *PT: I think knowledge of services. .. Sometimes we're not even aware of services, services that exist out there"* – Physio 3 (Front-Door service, Female, Band 7)

Closely linked to this was the importance of understanding of the services themselves and what they could provide for patients. This incorporates knowing what their eligibility and referral criteria are, knowing what specific care and interventions can be provided to patients, knowing how quickly patients will be seen after referral, and knowing what professions are part of the team. Examples were given of the type of interventions that physiotherapists would want to know a service could provide before referring, including observations, point of care diagnostics, medication checks and provision, oxygen provision, and regular carer support.

> *"I think you're more likely to then engage with a service if you can understand their processes and how to refer and exactly what that's going to offer a patient"* – Physio 3 (Front-Door service, Female, Band 7)

> *"unless I'm sure that treatment in the community includes .. carers, nurses, someone, four times per day .. for the medication and checking, if she's y'know coping or not"* – Physio 13 (Front-Door service, Male, Band 8+)

When discussing this topic, physiotherapists who worked in HaH services talked about the awareness that their hospital-based colleagues had of what their services could provide, such as intensive rehabilitation, as well as discussing some of the interventions that they do provide and want to build on, such as education. Physiotherapists also considered the beginning and end points of a patient's involvement with a HaH team. Referring physiotherapists highlighted that knowing that someone would be able to review the patient quickly after they first got home was a "reassurance".

> *"how quickly they can see the patient as well, do you know, if it's someone that we feel that is, you know, being seen immediately it's just making sure that that service is there for them"* – Physio 5 (Front-Door and Ambulatory Care service, Female, Band 6)

However, one of the physiotherapists based in a HaH service also discussed this, in the context of different perceptions of the urgency of reviews, as all the referrals their service receives may be deemed ‘acute’ or ‘urgent’, and therefore they may “down-prioritise” seeing a patient who has already been seen in the ED, which the referring clinician felt was more urgent. This participant acknowledged that this may have a negative impact on that referrer’s willingness to refer to a HaH service in future.

> *“when you’re a referrer, you perceive the situation to be, a certain level of, of need, of immediacy. As the people who work in a service where everybody has a very acute need, you have to then prioritise those patients. So sometimes … If we then down-prioritise that patient because they’ve been seen in hospital, we know they’re safe .. we see them in four hours, that might make that referring clinician think ‘well actually they didn’t do what I wanted them to do’ and therefore, not refer, a similar sort of patient and maybe keep them in”* – Physio 12 (Hospital at Home service, Female, Band 7)

Regarding the end of patients’ involvement with HaH services, some participants reported that they would want to be confident that patients could be referred on appropriately if they needed ongoing care after the HaH intervention time, and one of the HaH-based physiotherapists gave an example of a service that they can refer to at this point. Ultimately, having a good knowledge base of the service that they are referring to was felt to be a major contributor to physiotherapists’ willingness to refer to these services.

> *"I know some of the services that we have are really short-term and it's having that reassurance that if that patient still has needs they're then gonna refer them on"* – Physio 6 (Front-Door service, Female, Band 8+)

To address this, education was suggested as an important tool in increasing referrals, and physiotherapists based in HaH services talked about specific ways in which their teams try to facilitate this, such as encouraging hospital-based staff to spend time working with the team, presentations to GPs and provision of written information to potential referrers.

> *"we have done so much with regards to that y'know we have been down the GP practices, and .. done little presentations then about what we're all about and we have been into hospitals and we've told them all that … we've done the booklets, we hand out the sheets … if a patient becomes on our team from the hospital and they go out to that, that GP we, we forward the GP saying 'look they were part of our service in the community and, will you please re-refer to us at any time if you feel like this patient is, is unwell?'"* – Physio 14 (Hospital at Home service, Female, Band 7)

Participants also reported that decisions to refer patients to services such as HaH, or other Ambulatory Care services, are rarely taken in isolation, and often involve multiple members of the MDT.

> *"I think in relation to, the going home and returning for treatment, it tends to be .. like an MDT decision really'"* – Physio 4 (Front-Door service, Female, Band 7+)

Part of this is due to concerns about ensuring that patients are medically stable before they leave the hospital, and the risk of deterioration after discharge from the hospital environment. This may be deterioration from a medical standpoint, such as pain levels, or a more functional standpoint, such as falling. Therefore, physiotherapists reported wanting to ensure that patients would be safe upon returning to their own homes. In order to facilitate this, a number of participants talked about communicating directly between the referring and receiving team, or clinician. The benefit of having clinician to clinician conversations when referring patients was highlighted by one of the physiotherapists working in a HaH team, who reported that they found that this increased referrer comfort in referring, allowed a more comprehensive hand-over of risk and facilitated good 'safety-netting' for patients between the time they get home and when the HaH team first reviews them.

> *"an ability to have the clinician to clinician referral makes a massive difference … you are much more likely to feel that you've handed the risk over safely, and that the patient is very well kind of safety netted in their, kind of those two hours where they're at home"* – Physio 12 (HaH service, Female, Band 7)

Another crucial component when considering referrals to Ambulatory Care services, such as HaH, is the patient's opinion, and family expectations. Communication with the patient and their family or carers, and ensuring that they have adequate information about the service and care that can or will be provided, was raised by a number of physiotherapists as being important in their decision-making process or comfort level when referring. In order to facilitate this, participants spoke about ensuring that patients were willing to receive care through an Ambulatory Care service, although some also highlighted that patients tend to be happy with using HaH services, as they allow them to remain in their own home while receiving care.

> *"in a way that the patient's comfortable with that too . Nine times out of ten I know here that, patients usually are in terms of hospital at home , and also that the family know kinda .. their expectations from, from hospital at home as well , and that kinda level of care that they, they get."* – Physio 5 (Front-Door and Ambulatory Care service, Female, Band 6)

Suggestions to increase family and carer comfort and confidence with patients being managed in a HaH-type service centred around information provision, possibly in writing, and ensuring that they (and the patient) had direct contact details for the team who would be providing their care.

> *"it's having … the literature to be able to explain to, relatives and give them information and contact points, because sometimes it's not the patient that's the problem, it's their husband or wife or son or daughter who's saying 'no', but … you can give them a service that they can contact, and explain what that service can do"* – Physio 6 (Front-Door service, Female, Band 8+)

One participant also discussed how public perception of hospital admissions may play a role, especially around perceptions of how unwell one ‘needs’ to be to be admitted to a hospital, and that attendance at ED does not necessarily mean that admission is required. As this perception changes, this may facilitate increased use of admission avoidance services.

> *“I think it’s one of those things where actually, people’s perception globally needs to change a little bit that if you come to A&E it doesn’t necessarily mean that, you have to go into hospital … whereas … I think it is that actually, they’d be able to use their services more, if there was, that better understanding of, you’re, there’s a difference between how unwell you have to be within a hospital and, being unwell. ”* – Physio 9 (Front-Door service, Female, Band 7)

In general, physiotherapist participants were supportive of the idea of care being provided in out-of-hospital locations if possible and safe, with some caveats attached, primarily around patient safety. To facilitate this, appropriate services need to be available to refer patients to, and currently this is not always the case.

> *“it’s much better to be seeing patients at home, Hospital at Home is a really good option for that .. and I think, like, I would happily use those as services, it’s just having them, available to be able to do it”* – Physio 9 (Front-Door service, Female, Band 7)

When considered in light of FTT principles (160), many of the key elements that physiotherapists raised in relation to making referrals to HaH-type services related to verbatim information about the services themselves – knowing about their existence, knowing what care they can provide, knowing that onward referrals will be made if appropriate, and knowing what the service’s eligibility and referral criteria are. These elements are not generally open to gist interpretation, although there is some cross-over in terms of determining whether the patient will be safe at home, given the input that the referrer knows can be provided, and whether the patient will be safe at home until this input starts. Similarly to other community services, participants reported that they found knowing that patients would receive HaH care reassuring, which may influence their decisions of whether to use these services. Also similarly to some of the points raised previously, there was discussion of how work location may influence physiotherapists’ interpretations of the urgency of referrals, as there was for safety of remaining at home – HaH team members may interpret a given patient’s care needs to be less urgent than they were assessed to be by a hospital-based staff member, based on differences in professional experience. Finally, participants talked about discussing these services with patients and their families, or next of kins, and how they are perceived by service users – this perception is heavily influenced by gist representations and interpretations, potentially including previous experiences of using services such as HaH.

7.2.e Communication

The central importance of communication in healthcare (347-350), and more widely (351-353), has been established in various settings. It was also highlighted by physiotherapist participants in this study, with an emphasis on the importance of communication for facilitating assessments, decision-making and conflict resolution.

> *"I think as with everything in the NHS, communication is always at the centre of it all"* – Physio 3 (Front-Door service, Female, Band 7)

All the physiotherapists in this study discussed communicating with patients, and with patients' families, with a number of the participants also highlighting that they find it beneficial to hold joint conversations involving both the patient and their family simultaneously.

> *"if they had family, or, or a family or friend, whoever their next of kin was then .. I, I make sure that I involve them in all of those discussions"* – Physio 4 (Front-Door service, Female, Band 7+)

One of the reported benefits of communicating with patients' families, or other carers, either alone or with the patient present, was the perspective that they can bring to an assessment, especially in relation to the patient's normal functional level and any recent changes. This was highlighted as being especially important in the case of patients who have any cognitive impairments, as gaining an accurate social history from them may be additionally challenging. The reassurance that family members can gain from seeing a patient managing tasks in an assessment setting, as well as the opportunity for a group conversation to address any concerns, was also raised as a benefit of joint sessions with the physiotherapist, patient and family member present, or at least in a joint discussion.

> *"if you think it's needed, especially if the patient's a little bit muddled … not very great on their feet, I'd try and get the family in, in the afternoon so that you can assess them with the family"* – Physio 2 (Front-Door service, Female, Band 7)

Beyond the general importance of communication, which was highly valued, some participants also alluded to how important it is in building a rapport with patients, and how this may differ from the way in which some other healthcare professions are able to interact with patients.

> *"I think we are often sometimes that first contact point that we actually, listen, to the patient which then allows us to do that more holistic assessment"* – Physio 7 (Front-Door service, Female, Band 8+)

Given the importance placed on the relationships that physiotherapists are able to build with patients, both in facilitating their assessments and in reaching joint decisions with patients, and the centrality of communication to building these relationships, it is little wonder that communication was a high priority for interview participants, and that it was so frequently discussed. Most physiotherapists also spoke about communication with colleagues, within and outside of their own organisations. Compared to when they spoke about communicating with patients and families, where participants tended to focus on the fact and importance of communicating, when talking about discussions with other health and care professionals, participants also raised some problems that they can experience with this, alongside more positive experiences.

> *"I'm increasingly faced with quite difficult conversations from an MDT perspective"*– Physio 4 (Front-Door service, Female, Band 7+)

Physiotherapists tended to describe positive interactions and imply supportive professional relationships when discussing interactions with other health professionals within their teams, or with whom they work directly. This was especially true among the physiotherapists working in Hospital at Home services, who described close team working and multi-professional discussions, although some Front-Door based physiotherapists also gave examples of good cross-professional communication and support.

> *"Especially in emergency department, it's like this. Nurses ask you, you ask nurses, you ask doctor, doctor ask you and yes … it's nice"* – Physio 13 (Front-Door service, Male, Band 8+)

One thing that came across in examples or situations that a number of physiotherapists described in the context of cross-professional communication was the confidence that participants had in their own clinical judgement, even when this was at odds with the opinions of other members of the MDT. This could occur, for example, when the physiotherapist felt that a patient was not fit to be discharged but another MDT member felt they were, or vice versa. In these situations, physiotherapists highlighted the importance of clear communication with those colleagues, to explain their reasoning, but also spoke about the challenges this can cause and how “difficult” these conversations can be, when physiotherapists feel that their judgement is being questioned. However, the physiotherapists still appeared to remain confident in their clinical reasoning, and were prepared to discuss and defend this if needed, to ensure that they did not discharge a patient if they felt that this was unsafe, regardless of pressure on them to do so.

> *“I’m challenged with ‘but we don’t want this patient to stay in’ or ‘there’s no bed for this patient’ .. and so having to have conversations that essentially is, ‘it’s not about whether there’s a bed for this patient, or not, they can’t return home”* – Physio 4 (Front-Door service, Female, Band 7+)

> *“I think ultimately it just comes down to that kind of open communication with everybody that’s involved in the care of that patient .. kinda sometimes you have to argue your point, but if you are clear and concise saying you can clinically reason why that’s your argument, I don’t think that anybody can .. undermine that”*– Physio 11 (Front-Door service, Female, Band 6)

As mentioned previously, another area of communication that was raised by some participants as causing challenges was communication with external teams, especially social care. This was highlighted as an area where good communication was very important, but could be lacking, and that some of the problems with this had been exacerbated by COVID-19. Two main issues were highlighted – a lack of communication between the health and social care systems, which may be overcome by having a social worker, who has access to the social care system, directly working with the health team; and direct challenges from social workers (SWs), outside the hospital, when speaking to physiotherapists about patients they have assessed and referred. Some of these challenges may have derived from differing views on both risk and the assessments required to determine what social care input was necessary. Participants who discussed this expressed frustration with being questioned on their clinical judgement and their advice regarding care needs, reached as an outcome of their assessment, especially when the SWs had not actually assessed the patient themselves.

> *"I can quite commonly be faced with, social workers, being resistant to organising care and saying that further functional assessments need to be done prior to, to returning home or making a judgement around the level of care needed."*– Physio 4 (Front-Door service, Female, Band 7+)

Part, but not all, of this frustration seemed to be borne from issues with the systems in place, as opposed to the individuals they were dealing with. The difference in the risks that SWs were felt to be willing to take, or not take, was highlighted, especially in regards to levels of care following discharge. In this context, two levels of risk tolerance were described – "very, very risk averse", where SWs were reported to not be happy to allow patients to return home until absolutely everything, including multiple items of paperwork, had been completed; and being willing to allow a patient to return home with a maximal package of care, if this is what they had prior to admission, regardless of the findings of the therapy assessments, as they were felt by interview participants to be more willing to accept that risk when an increase in care provision requires residential care.

> *“from a … social care point of view, they can be … depending what services they already have, can sort of alternate, sometimes they’re very, very risk averse and they won’t send anyone home until this, that and the other’s been completed … and other times once they’ve got the maximum, that’s it, they go back to their maximum regardless of all the things that we’ve already know about … because actually then the next step up is so big, they’re happier to take that risk”*– Physio 9 (Front-Door service, Female, Band 7)

Overall, communication was central to how physiotherapists described their practice, and was a highly valued component of their assessment, treatment and decision-making approaches. Every participant talked about communicating with their patients, and their patients’ families or carers, and most also discussed communicating with other professionals, highlighting how important this is to their professional interactions, and to their decision-making process.

While important in gathering and sharing information related to location of care decisions, communication in and of itself was not described in such a way as to conform with Fuzzy Trace Theory (160). This may be because it is a tool to facilitate information gathering to reach (and communicate) a decision, as opposed to a direct component of the decision-making and reasoning process.

7.2.f Wider Context

The final key theme that was identified was the wider context that physiotherapists considered as part of their clinical practice and location of care decision-making. The three main areas that these considerations fell into were the wider healthcare system, the multi-disciplinary team (MDT) and COVID-19 impacts.

Participants in this study were cognizant of the impacts that wider health system and service issues can have on their decisions, and on their ability to follow through on plans that are made for individual patients’ location of care. Part of this derived from changes in the healthcare system, and changes in expectations alongside this, especially around the point in a patient’s recovery journey at which they are discharged. Previously, there was felt to be more of an expectation that patients would remain as an inpatient until their function was fully recovered, however, this has changed over time, and as lengths of stay reduce (354-357), patients may now be returning home at an earlier point in their recovery (354, 357). The reasoning behind this is inextricably linked to the pressures on the health service, which physiotherapists also discussed – as pressure builds from patients arriving and requiring beds, a primary means of delivering those beds is to discharge patients who are currently in them, and as such, patients may now be discharged earlier than they would have been in the past (24, 70, 77).

> *“historically, the view used to be for, for therapists in general but for physios, to be trying to get patients back to their optimum level, prior to returning home, and as I alluded to previously I think in the changing healthcare climate you don’t really have that luxury any more”*– Physio 4 (Front-Door service, Female, Band 7+)

In order to facilitate these earlier discharges, it is sometimes appropriate to refer patients to community services, which are themselves often over-stretched. Thus, the pressure levels on the hospitals, services, and Trusts that the physiotherapists work in can be a consideration in their decisions, as can the pressure on services outside of their own organisations, such as community services and social care.

> *“there’s huge pressures on the community, so it just depends what they can kinda pick up on the, the other side and how quickly they can see the patient as well”*– Physio 5 (Front-Door & Ambulatory Care service, Female, Band 7+)

However, although these pressures were discussed, there were comments from some physiotherapists indicating that they did not necessarily directly feel this pressure from their own organisations, but this was described as “a nice thing”, thus implying that it was not a given that they would not be pressurised in this way. It is also notable that, although physiotherapists were aware of and talked about these pressures, they were also clear that they would not lead them to make a decision that they felt was unsafe, and if they felt that a patient needed to be admitted, they would not allow the pressure on beds to derail this.

> *“you can’t really send someone home who’s not safe just because management are saying there’s no beds”*– Physio 5 (Front-Door & Ambulatory Care service, Female, Band 6)

One way in which these pressures were described as being managed among physiotherapists was through support between teams, especially support between community and hospital-based teams. This involved support in both directions – when the hospital is under pressure the community services could sometimes expand their remit to accept more patients, and equally physiotherapists in the hospital would remain aware of pressure levels on their community colleagues and not refer patients if they were going to be too busy to see that patient in a sufficiently timely manner. Despite these pressures, which may be felt to varying degrees in different organisations and teams, patient safety remained central to physiotherapists’ decisions.

> *“Sometimes if we’re, if the site’s under pressure the community services will step-up and do a little bit more work outside of their remit, so that kind of, comes into it as well”*– Physio 6 (Front-Door service, Female, Band 8+)

The second ‘Wider Context’ topic that physiotherapists spoke about was the multi-disciplinary team (MDT). They spoke about working with a range of other health and care professionals, and how physiotherapists’ views were similar and different from those of other professions. The most frequently mentioned MDT members were other therapists (e.g. Occupational Therapists (OTs)) and therapy assistants. Participants reported close working relationships with OTs, including conducting joint assessments and presenting joint arguments for ongoing therapy input after medical discharge. They also reported, in some cases, having a similar view of risk to OTs, although other physiotherapists reported feeling that physiotherapists were, at least historically, more risk tolerant than their OT colleagues.

> *“historically perhaps physios, have maybe been known to, take a little bit more risk in comparison to say OTs, occupational therapists”*– Physio 4 (Front-Door service, Female, Band 7+)

> *“I think we’re very similar to other therapists, so I think we treat risk similarly to, OTs”*– Physio 6 (Front-Door service, Female, Band 8+)

Other members of the MDT were also mentioned, along with discussion of their attitude towards risk, and how this compares to different team members. The main healthcare team members who were discussed, apart from other therapists, were doctors and nurses. Although there were some comments indicating agreement or similar views on risk and discharge decisions between physiotherapists and these professionals, there were also examples given of where physiotherapists’ actions may differ from those of nurses or doctors. The main reason for these differences was explained as differences in clinical reasoning or background. For example, one participant talked about doctors ordering more investigations than physiotherapists, and another talked about nurses’ reticence to get patients out of bed due to concerns about falls. In both cases, the participant in question reported physiotherapists taking a different approach, i.e. less investigations or more efforts to negotiate transferring patients out of bed, than their MDT colleagues. In the case of the nurses, this was viewed as the physiotherapists being more risk tolerant than the nurses, while with the doctors this was viewed more as being different, as opposed to one professional group being more or less risk tolerant than the other.

> *“as physios yes we investigate much less than the med-, than the medics … the medics would seem to investigate anything and everything, with an investigation generally … and I think, we are, we do sort investigate things less, we can clinically reason why”*– Physio 7 (Front-Door service, Female, Band 8+)

> *“I think the other thing that we run up against massively around risk is with the nurses, in that .. they’re obsessed with preventing falls [...] so we spend, huge amounts of our time, I would say a lot of the time not successfully, trying to negotiate actually getting patients out of bed … I would say, we are much happier to embrace those risks within the MDT, than the nurses are, I think they’re way more risk averse than we are”*– Physio 6 (Front-Door service, Female, Band 8+)

The possibility, and experience, of staff of the same profession but different specialities having different views towards discharge decisions was also highlighted, for example between acute physicians and geriatricians. Ultimately, however, these differences in risk tolerance and decision-making could potentially be viewed as positive, as they facilitate discussion from different perspectives, to achieve the safest option for patients. Some physiotherapists also discussed learning from and alongside other professionals, and how increasing experience for both parties can lead to increasing similarity in the risks they consider.

> *"I think it helps to have multiple people's perspectives because different clinicians have really different levels of acceptable risk."*– Physio 12 (Ambulatory Care service, Female, Band 7)

> *"professions learn from one another a little bit more and, understand some of .. of different professions' clinical decision-making and, and clinical reasoning skills"*– Physio 4 (Front Door service, Female, Band 7+)

The final professional group who a small number of participants discussed were social workers (SWs). The challenges that were reported in this working relationship have previously been discussed, in the 'Communication' theme.

One thing potentially exacerbating the challenges that physiotherapists faced in regards to their professional relationships with SWs was the impact that COVID19 has had. The impact of COVID19 was discussed more broadly by participants, and was the third major area that was discussed within the 'Wider Context' theme.

A range of negative effects on practice and patients were reported by participants, particularly around the problems the pandemic caused for communication, and the fact that family and carers could not visit patients in their hospitals. These two issues are closely connected, as the fact that visitors were not allowed into the hospitals directly reduced opportunities for communication with them, and for joint conversations between patients, carers and staff. This, in turn, meant that communication with families and carers had to be conducted over the phone, which was not always easy to access. It also caused problems when patients were agitated or confused, as it was not possible for those with whom they were familiar to be present to reassure or calm them.

> *"You're left .. fighting to get to a phone, of a carer from a care home to get some history … communication with .. carers and trying to reassure a distressed or agitated patient is now much more difficult"*– Physio 3 (Front-Door service, Female, Band 7)

All of these issues were also reported to have a direct, negative impact on discharge planning, since communication was interrupted, and it was not possible for families and carers to see how patients were managing with functional and mobility tasks. This had previously been an important component of physiotherapists' assessments, as patients' families are more familiar with their 'normal' level of function than staff who have only recently met them, as well as the reassurance that it can provide to families to see for themselves how their loved one is managing, prior to discharge.

> *"not being able to allow that family or friends to be able to see patients has been very, very difficult in the discharge planning process"*– Physio 4 (Front-Door service, Female, Band 7+)

> *“So it is a lot harder to assess them, because we’ve, we’ve never met them before whereas family know them inside out”*– Physio 2 (Front-Door service, Female, Band 7)

Participants also spoke about how COVID19 had generated changes to their normal, or previous, practice. In some cases, this was around the availability of services and space, as well as how patient flow was managed. For example, areas that had previously been used as a Clinical Decisions Unit being re-purposed into a streaming location for the ED to facilitate trying to separate patients with suspected COVID19 away from patients without, and altered referral pathways to therapies as part of infection control measures.

> *“we used to have a CDU unit … But unfortunately because of COVID we don’t have that option at the moment, that’s been turned into a, like, that’s a cordoned off area at the moment for, patients, so we haven’t got that same level of flow”*– Physio 9 (Front-Door service, Female, Band 7)

In both these cases, there could be a direct impact on both workload and time management for physiotherapists, as well as increased pressure to make more complex discharge decisions, with potentially less time in which to make them, and a higher pressure to discharge due to the risk of hospital-acquired COVID.

> *"I feel like … it goes up and down like some days we're really, really, really busy, and then some days it's a little bit quieter and, whereas we'd, maybe previously get loads of referrals in the morning, we're probably seeing it a bit later on in the day … I feel like the complexity of the patients we're getting now is, is worsened as well, like they're taking, more time for us to sort out"*– Physio 8 (Front-Door service, Female, Band 6)

The impact on, and reduced availability of, services beyond those in which participants worked, such as community services, was also reported to have a knock-on effect on their work and discharge decision-making, since without these services available there were occasions on which patients could not be safely discharged.

> *"there aren't other options of, say intermediate care, or, or other things that we would normally consider"*– Physio 4 (Front-Door service, Female, Band 7+)

In addition to the changes in practice that occurred within health services, a difference in patient behaviour was also reported, especially around healthcare-seeking behaviours, due to people's concerns about hospital transmission of COVID19. This led, in some circumstances, to patients delaying seeking care, and thus being more unwell when they did present to hospital, or to families being unwilling to support patients returning home, as they were concerned about infection transmission to other, potentially vulnerable, household members.

> *“we went through a stage of … like I had a patient that .. had fallen over six days before, he was adamant he didn’t want to come to hospital because of COVID … but actually maybe, if … we’d seen him straight off … he might, he might not have even needed to be admitted”*– Physio 9 (Front-Door service, Female, Band 7)

> *“people are scared if a family member’s been in hospital, especially maybe if they’ve got another vulnerable adult at home, so especially early on people were scared to have family members home, because of the risk of COVID as well, and infecting other family”*– Physio 2 (Front-Door service, Female, Band 7)

This concern about hospital transmission of COVID19 also affected both how physiotherapists made decisions and took risks, and the pressure they felt on their decisions. A greater pressure from others to discharge patients out of the hospital was reported by a number of participants, which was attributed to the desire to minimise risks of transmission to people by not admitting them. However, with this increased pressure to avoid admission, some participants reported feeling that they were more supported to take risks in discharging people, since the risk of admission had now grown.

> *“I like to think that maybe I do take more risks for getting people out, just because, we’ve got this really, really big obvious, big risk for coming in”* – Physio 9 (Front-Door service, Female, Band 7)

Despite all the negative impacts of the COVID19 pandemic that participants discussed, a small number of physiotherapists also commented on positive effects of the pandemic. These were primarily around an improvement in actively providing patients' families and carers with updates on progress, as these would generally have previously been done when visitors were present, and a reduction in unnecessary referrals to therapies, due to efforts to reduce unnecessary contact between staff and patients, for infection control.

> *"So the silver lining to all of this is that I think we are probably better at communicating now with next of kins … I think it's definitely highlighted .. the importance of someone providing an update"* – Physio 3 (Front-Door service, Female, Band 7)

Notably, none of the physiotherapists who work only in HaH services mentioned any negative effects of the COVID19 pandemic. One possible explanation for this is that since they were going to people's homes, where their patients may live with family, or have family nearby who were able to visit them, the opportunities for communication with family members or carers were not impeded in the same way that they were in hospitals. Patients being cared for in their own homes also circumvented the concerns that some people had about attending hospital, and the risk of transmission that this carries, therefore they may not have avoided seeking care in the same way that was observed by some hospital-based physiotherapists.

When considering the applicability of FTT (160) to this theme, there are a number of factors that are not relevant, as they do not constitute verbatim or gist representations – such as the reduced visiting for hospital inpatients. However, some factors were applicable in the context of FTT, most of which centred around COVID19, including specific, verbatim information about changes to service availability and practice, and broader, gist influences, such as concerns about hospital-acquired COVID19 (which influenced physiotherapists', patients' and carers' location of care preferences). There were also some overlapping factors, such as the level of pressure on both acute and community teams – physiotherapists may be specifically aware of how much pressure is being placed on a service at a given time (i.e. verbatim information), and their interpretation of this (i.e. gist), and whether that level of pressure influences the safety of any particular care location, may then influence their decision. Other influences on gist interpretation in this wider context include more general views towards risk, and how this may compare with MDT colleagues' views, and the increased level of support for taking risks that some participants spoke about having experienced during the COVID19 pandemic. Where participants spoke about cross-professional learning, both in learning from other professionals and learning alongside them, this could have an influence on their gist interpretation of future situations, if their reasoning is altered as a result of what they have learnt in that multi-professional learning environment. It is also plausible that this would be true of other MDT members whose reasoning and decision-making may be influenced by their experiences learning with, and working closely with, physiotherapists.

7.3 Patient interviews

Although there were only two patient interviews, both patients discussed a range of areas in the interviews, and it has previously been argued that small numbers of interviews (as few as one) can offer important perspectives and insight (324). Therefore, although the results of the patient interviews may not be as generalisable, they can still offer potential insights into possible patient views or attitudes towards risk and location of care decisions. There were some areas of overlap between the two patient interviews, including that they both spoke about aspects of Risk, Considerations for Hospital at Home type services and Communication, and they both discussed the location of care decision and COVID19. Finally, both patients spoke about their Experiences of being a patient. Each of these themes will be discussed in turn, and the relevance of Fuzzy Trace Theory (160) to how patients describe their decision-making across all these themes collectively will follow.

7.3.a Managing Risk

Both patients commented on their own risk tolerance levels and ways that they manage risk in their lives, although their self-reported risk tolerance levels and methods for managing these were different. Both practical measures and the importance of knowledge were raised as important routes to managing risk, and both patients spoke about how experience can alter risk tolerance.

> *“I suppose it’s just, life experiences, isn’t it”* – Patient 1
> (Female, 51-60 years)

One patient also highlighted how their risk tolerance may vary based on the situation, such as taking risks for themselves or someone else.

These concepts of experience and situational changes influencing risk tolerance are similar to that described by physiotherapists when considering risk in their jobs, as they also spoke about attitudes to risk changing with experience, and how risk may be viewed differently in different settings, although they were referring to different clinical settings as opposed to different areas of life, and as there are far fewer patient participants than physiotherapists, less can be interpreted from the patient interviews. However, this similarity may suggest that experience influencing risk tolerance is true in multiple domains of life, although the current interviews cannot conclusively support this.

7.3.b Considerations for Hospital at Home

Patients’ considerations regarding Hospital at Home (HaH)-type services were very practically focussed, mainly around the risk of deterioration and access to staff. It was felt to be important that the patient knew what to expect while being cared for by the service, and that they would be able to contact staff who would provide appropriate care if needed.

> *"if she [hypothetical patient from 'vignette' question] becomes unwell, then whether or not she's got access to somebody, or y'know a phone, to be able to speak to somebody, immediate-, 'cos obviously if you're in hospital and you, you're sat on a ward there are people coming and, y'know staff members all the time if you suddenly felt unwell, or, or something like that, and .. yeah, I think that would be it really"* – Patient 1 (Female, 51-60 years)

One other concern that was raised with regards to HaH was who the staff would be, as they felt that district nurses were under significant pressure already and GP-based staff no longer provided home-based care, and instead tended to advise attending hospital if one cannot visit the GP. In this case, when HaH was presented as hypothetically being sufficiently funded to employ more staff, the patient reported no other concerns with the concept of receiving care this way.

> *"say, in this hypothetical scenario the district nurses were given, a bunch more money and they were able to hire a lot more nurses, so they definitely would have the capacity to be able to see you … at home, would you have any concerns about being managed at home if you*
>
> *P: no*
>
> *I: no, [small laugh] in a word!*
>
> *P: no, none at all"* – Patient 2 (Female, 51-60 years)

Although these two, demographically similar, participants cannot represent the views of all patients more broadly, the fact that they were both comfortable with the concept of acute care at home, provided that it was adequately staffed, is notable, and could provide a basis for further discussions of this type with patients. These comments also help to highlight the importance of educating people about HaH, and having clear conversations with patients about expectations of the service at the time they are referred.

7.3.c Communication

Both patients spoke about conversations that they had had with healthcare staff, and how they were involved in discussions about where they received care. In relating their recent experiences of this, they reported working with staff to facilitate an appropriate location of care plan – in one case this was a requirement for admission, and in the other facilitation to return home. Both patients reported these experiences as having felt collaborative, even though in both cases one party was essentially dictating the ultimate location of care. One patient also highlighted the importance of clear communication about expectations, in facilitating such discussions, so that patients are fully informed.

> *"I was given the choice, well I was told I needed to be admitted but I actually was given the choice not to be admitted, if you see what I mean"* – Patient 1 (Female, 51-60 years)

> *“They know I have a fear of staying in hospitals, because I’ve been there that many times, so they try to make it where I get the treatment that I need to get and then they can let me go home, ‘cos they know I’ll just sort myself out regardless of how bad I am. If I’m conscious, I would be signing myself out”* – Patient 2 (Female, 51-60 years)

7.3.d Location of Care decision

The largest theme from patient interviews was ‘Location of Care decision’. This was characterised as ‘Location of Care’ for patient interviews as opposed to ‘Discharge’ because of the way that the questions were phrased and how participants approached answering them.

Both patients reported experiences of being informed that they needed to be admitted to hospital, but also reported elements of having autonomy and being able to express their preference for location of care. When considering potential care locations, including for a hypothetical patient (referenced in their quotes below) as opposed to only themselves, both patients raised multiple areas of consideration, including current and usual functional ability, cognition and safety, care availability, speed of community input, pressure on staff, and adapting the home environment, although the only one they both mentioned was functional ability.

> *“it depends on how poor her mobility is, and … would she be able to answer the door to people who were coming to visit .. or, if she needs … to have eaten before they do some treatment, or to have had something to drink, is she still able to … maybe she got, an underlying health condition maybe, she was forgetful or had some dementia that sort of thing, whether or not she’d be safe, at home”* – Patient 1 (Female, 51-60 years)

> *“what she’s normally like … – is she active, is she able to cope, on her own like doing the housework, cooking her food?... I’d take into account, what she’s like beforehand … then I know the only reason she’s struggling now is the chest infection, so then I have to stop and think ‘well, if she had a bit of support, people going in to help her, could she feed herself? Would she still be able to go to the toilet on her own? To get up the stairs to bed?’”* – Patient 2 (Female, 51-60 years)

Both patients highlighted benefits of remaining at home, such as being in one’s own environment, continuing with normal activities and recovering faster, and one echoed the ‘home first’ principle that some physiotherapists had raised. Both patients also raised the risk of hospital-acquired infection if admitted, especially the risk of COVID19.

> *“she would probably recuperate and get better quicker, at home”* – Patient 2 (Female, 51-60 years)

> *“[if treated at home] she wouldn’t be exposed to, other, infections or anything else that was happening in hospitals … other, patients or, obviously nowadays, with COVID”* – Patient 1 (Female, 51-60 years)

Practical considerations regarding admission were also raised, such as not having anything with one when admission is advised, and the fact that COVID19 has worsened this, as your things cannot be brought to the hospital by friends or family.

7.3.e COVID19

COVID19 was spontaneously addressed by both patients, who spoke about it in the contexts of impact on admissions, pressure on staff and changes to their general life due to shielding. In terms of admission impact, they spoke about people not being able to visit while they were admitted to the hospital, and about staff being under increased pressure as a result of caring for patients with COVID19.

> *"the only, really effect is that, is the fact that I knew, that, as such nobody could visit, and I didn't know how long I would be in … and that, again, it's not like anybody could come in and bring me, I hadn't got anything with me, you know"* – Patient 1 (Female, 51-60 years)

> *"My concern with the hospital if she stayed in, during the time, of this COVID that's going around is that staff are so far stretched trying to keep up with the patients that have got COVID"* – Patient 2 (Female, 51-60 years)

The problem of patient visitors not being allowed into hospitals was raised by physiotherapists as well, although they focussed on the problems this caused around communication, discharge planning and reassurance to distressed patients, whereas the patient participant focussed on this from more of a practical level while they were admitted. However, as there were only two patient interviews this difference in focus may not be more broadly applicable in how patients consider the impacts of COVID19.

7.3.f Patient Experience

Finally, the interviewed patients spoke about their experiences of Ambulatory Care and accessing other health services. Neither spoke negatively about their experiences in Ambulatory Care, and one of the patients praised the staff in the unit where they were seen (the other spoke informatively but did not express an opinion on the care directly).

> *"I can't knock the experience. I was taken into that department, you can say the name because I can't remember it, and I was well looked after, and I won't have anybody knock .. hospitals at the moment, because they're doing a damn good job under very hard circumstances they've got, and they looked after me really well."* – Patient 2 (Female, 51-60 years)

Due to the small number of patients involved it is not appropriate to discuss further specific details of their experiences.

7.3.g Relevance of Fuzzy Trace Theory

Some of the aspects that patients discussed clearly indicated verbatim and/or gist representations of information (as per Fuzzy Trace Theory (FTT) (160)) in their reasoning, while others fell outside of these boundaries. However, these should be interpreted with caution, due to the small number of participants, and their demographic similarities.

Similar to the physiotherapists, many of the factors considered around the location of care decision were verbatim representations, such as availability of care, the patient’s baseline and current functional level and their age, while others were gist representations, such as the perceived benefits of being at home. There were also some factors that fall within both of these representations, such as the risk of hospital-acquired infection and visitors not being allowed in hospitals during COVID19. When considering HaH-type services, patients raised some factors that were verbatim representations (such as the need for team contact details) and others that incorporated both verbatim and gist (such as the risk of deterioration). Public perception of HaH services, which arose in both patient interviews, is essentially a gist representation of the service type as a whole, and thus is very important to address if we are to increase use of these services.

There were a number of other areas that patients described in interviews which demonstrated more gist-like representations, such as the level of pressure on healthcare staff and patients’ impressions of their own risk tolerance levels. Notably, they both discussed that experience had influenced their risk tolerance and behaviour, which is in direct agreement with the principle of FTT that experiences influence gist representations of information, which in turn influence the decisions that people make. Therefore, although only two patients were interviewed, this suggestion does appear to be supported by theory.

Despite these areas of agreement with FTT, there were also some factors raised in patient interviews, that fell outside the scope of FTT. These mainly centred around communication. Communication could be used to express verbatim information and influence gist representations, but it in itself (in the ways it was mentioned in these interviews) does not conform to verbatim or gist representations.

Overall, although many of the factors that patients discussed considering in location of care decisions and risk more generally do conform with FTT, and potentially support it being a good explanation of their reasoning and decision-making process, as only two interviews were analysed it is not possible to more broadly determine how applicable FTT may be to their reasoning and decision-making.

CHAPTER 8: DISCUSSION

This mixed-methods study has investigated the risk tolerance of key people involved in front-door and Ambulatory Care location of care decisions in UK health services, and investigated the location of care decision-making process and risk tolerance of physiotherapists working in front-door and Ambulatory Care units. These are both important considerations in facilitating decisions about appropriate location of care for individual patients, and with high pressure on hospital services, increasing emergency department (ED) attendances and a trend of reducing bed availability (358) it is ever more important that only those patients for whom it is appropriate are admitted to inpatient beds, and that services providing alternatives to inpatient admission are appropriately referred to and used.

Through this research, a wide range of risk tolerance levels were found among staff, patients and carers in acute medical services, six key themes were identified around how physiotherapists make location of care decisions, and similar themes were identified in patient interviews. Importantly, this study demonstrated that it is possible to engage patients, and carers, in this type of research in an acute care setting despite their acute health needs, and that these populations are able to meaningfully engage with a structured discussion of risk, which is important when discussing the risks and benefits of potential care locations.

Different patterns of risk tolerance were found between lottery types, e.g. lower risk tolerance in health choices compared to financial ones, and in sub-groups within the study population, e.g. people aged 65 years and older showed more dichotomised approaches to health risk than younger people. The themes identified from interviews with physiotherapists included practical areas, such as Communication and Wider Context, alongside wider-ranging, conceptual areas, such as Working with Risk and the Physiotherapist identity. Themes identified in the patient interviews, had less depth due to the smaller number of interviews, and therefore cannot be interpreted to have the same power. Both the quantitative and qualitative components of this study had novel elements, especially with regards to their participant populations. The quantitative element of this study marks the first time that risk tolerance questionnaires such as those used in this study have been conducted with acutely unwell patients, their carers, and the healthcare professional staff caring for them. Although similar questionnaires have occasionally been used in a healthcare context previously (161, 203, 204), this was done in an outpatient department, where patients were presenting for planned care, as opposed to the setting of this study, which involved patients presenting, primarily, for acute, unplanned care. Additionally, in the previous study in a healthcare setting including staff (161, 203), the only staff who participated were doctors, unlike this study, which was open to all healthcare professionals who were involved in location of care decisions in front-door or Ambulatory Care services.

Most other studies which have used questionnaires similar to those used in this study have drawn their participants from a university setting (162, 172, 174, 288, 359). While some have attempted to reduce the homogeneity of their population by deliberately including participants from a range of disciplines (e.g. (162, 360)), others have recruited only those involved in economics (e.g. (174, 288, 359)), and even attempting to include participants from different subject backgrounds would not represent the wider population, which an undifferentiated group of people presenting with acute health needs to a public hospital may do. There are only a small number of studies which have included a broader range of participants from across a national population (361). Additionally, previous research in this area has not included commentary from participants on their decision-making process or thoughts while completing the lottery sets.

With regards to the qualitative interviews, there was limited previous research on physiotherapists' location of care decision-making process, especially at the front-door or in Ambulatory Care. Although there is some existing research around how physiotherapists make clinical decisions in other clinical settings (e.g. (362, 363)), and how other professionals make location of care decisions in front-door services (105, 364), the cross-over of physiotherapists' location of care decision-making in acute care has been less researched (304).

The key aims of the quantitative component of this study were able to be achieved, as it was determined that discussing risk in a structured way with patients (and carers) presenting with acute ill health was both possible and acceptable, and it is possible to measure risk tolerance in both health and financial domains, although the decisions made remained hypothetical, which was a potential limitation, which will be discussed in further detail later in this chapter. The key qualitative aims were also achieved, relating to physiotherapists' location of care decision-making and attitudes towards risk, with specific components influencing their decisions especially highlighted within the ‘Discharge Decision’ theme, but all themes contributing to this overall. However, due to low recruitment numbers, it was not possible to adequately explore patients’ views towards risk in location of care decisions.

The findings from the questionnaires and the interviews complemented each other, as well as each providing unique insights. One of the key findings from the lottery set questionnaires was that there was a wide range of risk tolerance levels demonstrated, which supports the central tenet of the theoretical framework used in the qualitative work, Fuzzy Trace Theory (FTT) (160), that decisions are based on more than just the specific, verbatim information available. Since all participants were given the same verbatim information, but their choices varied, in some cases in consistent patterns (such as being more risk averse in health decisions than financial ones), this suggests that other, potentially more personal factors must have contributed to their decisions, which was confirmed by some of the comments that patient and carer participants spontaneously made while completing the lottery sets. Additionally, most of the physiotherapists who were interviewed reported feeling that risk was a regular or continuous part of their job, and some reported that they felt physiotherapists viewed risk differently to other staff. This is supported by the fact that the quantitative findings showed that physiotherapists appeared more risk tolerant than doctors, and there was a tendency towards higher risk tolerance among staff than among patients & carers, when assessed using switch point as the measure of risk tolerance. This finding also fits with the notion that arose in the physiotherapist interviews, that there is a certain type of person who chooses to work in these settings, and that this involves being comfortable with managing risk. Finally, every interviewed physiotherapist discussed respecting patients’ wishes and/or autonomy, and some spoke about incorporating different views of risk into decision-making (including carers’ views). The quantitative findings supported both the concept that stakeholders in the decision may have different risk tolerance levels, and thus views on taking risks, and that this is therefore important to acknowledge and account for in location of care decision-making.

There were also unique insights brought by the interviews and questionnaires separately, which can add depth to overall understanding, as well as some minor points of disagreement between qualitative and quantitative findings. The risk tolerance questionnaires asked very specific questions, about financial and health choices, which allowed for data to be gathered on these different domains from a wide range of people, but did not generally allow for greater exploration of how these decisions were reached. Conversely, the qualitative interviews asked more wide-ranging questions, and focussed mainly on health (with only very minor mentions of finance), which allowed deeper consideration of the factors contributing to these decisions. By bringing these insights together, it may be possible to better understand both how risk tolerant people are, and also why their risk tolerance is as it is for a given decision.

One interesting point of contradiction between the quantitative and qualitative findings was around risk tolerance and years of clinical experience. In the quantitative component, longer clinical experience was associated with either higher risk aversion or no significant difference, dependent on the method of analysis employed. However, multiple physiotherapists discussed more junior, or less experienced, physiotherapists being more cautious, and growing in confidence in their decisions as experience increased. There are multiple potential explanations for this apparent contradiction. It is possible that there is a difference in risk tolerance levels when making decisions primarily for others (as in location of care decisions) versus for oneself (as in the lottery sets), or that physiotherapists do become more risk tolerant as their experience increases, but this quantitative study did not have a sufficient number of physiotherapists to explore this separately from other healthcare professionals. It is also possible that a reduction in caution and an increase in confidence in decision-making do not necessarily translate to an increase in risk tolerance per se, but instead lead to more nuanced decision-making. This apparent contradiction, as well as the confirmation of higher risk tolerance levels and wider components influencing quantitative decisions, could not have been identified in this way if either component of this study had been conducted in isolation from the other.

In addition to the formal answers to the lottery sets in the questionnaires, a number of patient and carer participants spontaneously provided verbal insights into their rationale or reasoning for making the choices they did. These were not formally part of the questionnaire, and not all participants did this, but where participants offered insights they were collated, and a commentary on them is included in appendix 2. These participants discussed the reasons for their choices and sometimes the source of this rationale (e.g. previous experiences with gambling, perceived source or anticipated use of the money, childhood advice not to gamble). Many of these factors could form components of each individual’s ‘gist’ representation of the choice before them, in line with the core principles of FTT (160), which was the theoretical framework for the qualitative component of this research, but may be applicable to this aspect of the quantitative choices that participants made. An example of how the same perceived ‘verbatim’ (literal) information could be interpreted differently as a result of gist arose around the source of the money in the hypothetical lotteries, exemplified by two participants’ comments - one was unable to complete the questionnaire as they reported that they would be too suspicious of anyone offering ‘free money’ to choose either option, whereas another participant chose the risky option every time on the basis that they ‘may as well take the risk’ because it was ‘free money’. Another participant specifically reported that they felt that emotions would influence decisions, such that if asked the same questions on a different day they may answer differently, which also closely fits with the idea that gist representations of information influence decisions.

Among those participants who provided verbal information about their decision-making, some provided insight into their decisions about the health domain lottery sets. Although this reasoning could be broadly similar to that used for the financial choices, such as previous experiences, much of it was not. When considering the health choices, those participants who chose to comment tended to focus more on the nature of the hypothetical health condition and what the specific number of days in ‘full health’ would mean to them, such as choosing based on the effect on their children. This demonstrated that participants were trying to make their decisions as closely to how they would if the situation were not hypothetical as possible. This is reassuring as a ‘hypothetical response bias’, in which participants in previous financially-based studies similar to this one make different choices when their options have hypothetical versus real rewards, has been reported (206, 365), and there is no way in which it would be possible, or ethical, to generate ‘real’ outcomes of lotteries such as these in the health domain. Additionally, given the setting in which participants completed the questionnaires, it was understandable that some used their current or recent experience of ill health as the basis for their decisions regarding health choices, and that some indicated that their choices may be different dependent on the symptoms that the hypothetical health condition presented.

A small number of participants also either explicitly or implicitly commented on differences in how they treated financial and health risks. Generally, this presented as taking less risks with health than finance, which was supported by the quantitative finding across all participants that people had statistically significantly lower risk tolerance in health choices than financial ones.

In contrast to the hypothetical nature of the quantitative component of this study, the physiotherapist interviews were grounded strongly in their real professional experiences and clinical reasoning, as the interview questions asked them to discuss the topic based on their experiences. Their core considerations in making location of care decisions, and in managing risk more generally in their jobs, were safety and patient autonomy. They captured within the interviews some of the complexities of making and facilitating these decisions in the ‘real world’, accounting for various factors, such as differing opinions between decision participants, available support at home (whether in the context of discharge from the service or transfer to a community-based or Hospital at Home service), practical considerations for the patient (including functional ability, home environment, access for others coming to support them and cognition) and wider considerations such as service availability or pressure on the wider health system. Within this, physiotherapists highlighted the central place of safety, including when managing and balancing risks, and the importance of respecting patient choice. As with many areas of healthcare, communication was described as being key (347-349), for reaching location of care decisions, for managing risk and for use of Ambulatory Care and Hospital at Home services. Through clear communication, both listening and sharing information, considerations of the type that participants in the quantitative component of this study raised, especially those around the healthcare decisions, could be collaboratively addressed, in order for the best outcome for the patient to be achieved.

Although there was an insufficient quantity of data for full, formal analysis of patient interviews in the qualitative component of this study, the coding of the two patient transcripts identified initial themes, which included the desire for care to be delivered closer to home if safely possible, an approach that was described by some physiotherapists as a ‘Home First’ approach, approaches to risk, the importance of communication and a wide range of factors being incorporated when considering location of care. Although these may be of interest, they can only be interpreted as initial themes, and do not have the same power to inform as the physiotherapist interviews, thus should not be interpreted in the same way.

The physiotherapist interview participants represented a wide range of professional demographics, including physiotherapists of every level of seniority from a recently qualified band 5 to very experienced Advanced Clinical Practitioners (or equivalent), and worked in a range of clinical settings, including having different clinical foci. Physiotherapists from both front-door and Ambulatory Care services were present, and among those who worked in front-door services there was additional clinical variation, as some participants managed a primarily musculoskeletal caseload, while others managed a more undifferentiated caseload. This gave a broad range of experiences and perspectives among participants, although common themes were identified across the interviews.

Across the six key themes identified from the physiotherapist interviews, the tenets of Fuzzy Trace Theory (160) were present to varying degrees in the decision-making process. In some themes, such as Physiotherapist identity, the Discharge Decision and Considerations for Referrals, both verbatim and gist representations were clear, in others one of these representations was more apparent than the other, such as Working with Risk and Wider Context (which demonstrated mainly gist representations), and in others both of these representations were much less apparent, such as in the Communication theme.

It logically follows that physiotherapists would use both verbatim and gist reasoning when alluding to Physiotherapist identity, as much of what this theme refers to is built on a combination of specific learning, alongside professional experience, which incorporates both learning verbatim information and developing ways of understanding and interpreting this information. Through experience and learning from other physiotherapists (throughout both pre-registration training and careers), it is plausible that a perspective that is increasingly physiotherapist-specific may be learnt and that it may influence gist representations in a profession-specific way, such that physiotherapists may interpret the same verbatim information in a more similar way to each other than they do to those from other professions. This may go some way to explaining the reasoning behind physiotherapists' attitudes to risks changing over time, as their gist interpretations evolve.

Given that the risks involved in the decisions being investigated in this study mainly relate to individuals (most obviously patients, but also staff, and patients' families or equivalent), the fact that many of the sub-themes within the overall 'Working with Risk' theme fitted more with gist than verbatim representations makes sense. When risks relate to an individual, and all of the potential options that can be decided upon carry risks, considering the preferences, thoughts and experiences of the individual in question are vital in reaching the optimal decision, and all of these elements feed into a gist representation of all those potential options. This was also apparent in the informal verbal comments that some participants made while completing the quantitative questionnaires, which were noted down contemporaneously, and in the fact that there was a range of risk tolerance levels demonstrated in the lottery sets, since all participants were presented with identical verbatim information, and if there was not variation in their gist interpretations of this, one may expect them all to make the same pattern of choices.

The broad range of components considered when reaching location of care or discharge decisions requires both verbatim and gist representations to be used, as FTT posits (160). In the case of physiotherapists' decisions in this context, the verbatim representations include elements such as specific assessment outcomes, availability of care or community services, and social history including pre-admission function. The gist representations, meanwhile, centre more around the influence of these verbatim findings on the patient's anticipated safety, and the preferences and risk tolerance of the physiotherapist, patient and potentially their family. Notably, while the verbatim information may remain the same for all stakeholders in the decision, physiotherapists have to incorporate both their own gist interpretation and that of their patient (and their family or carers as appropriate). These same principles also apply to how verbatim and gist representations present and are used when physiotherapists are considering referrals. In the case of Considerations for Referrals, additional verbatim representations are present with regards to information about the service that they are considering referring to, while the gist representations are similarly focussed on the influence of this verbatim information on safety, and the views of those involved in the decision.

Discussions about the theme of 'Wider Context' mainly related to gist representations, which may be considered surprising, as these wider context considerations include specific elements that may be represented in a verbatim manner, but physiotherapists mainly discussed their broader perception and interpretation of their impact, as well as how they had observed patients to do this (such as patients expressing concerns about contracting COVID-19 if admitted).

When speaking about components of the final theme, ‘Communication’, physiotherapists did not tend to describe either verbatim or gist representations of information, thus FTT may be less applicable if considered only in the context of this theme. There were also other sub-themes and perspectives raised within each of the other themes that spoke to factors outside of either verbatim or gist in their reasoning. Therefore, it may be concluded that although FTT goes some way to explaining how physiotherapists reach location of care decisions and manage risks, it does not fully explain their whole decision-making process or account for everything that they incorporate into these decisions. The variation in risk tolerance levels and choice patterns found in the lottery sets does support the concept that participants were using more than only verbatim representations of the information in reaching their decisions, and the fact that there were some demographic factors associated with significant differences in risk tolerance levels also suggests that there may be some components of these gist representations that are shared among people with similar demographics, to at least some degree.

8.1 Results in the Context of Other Research

Most other studies using lottery sets to investigate risk tolerance have focussed on financial choices, as opposed to health choices, and, as mentioned previously, none have previously been conducted with the same population as was studied in this research. Therefore, the results of the current quantitative study will primarily be contextualised to previous studies investigating financial choices and risk, with links made to the small number of studies which have investigated health choices and risk in a similar way to this study, as appropriate.

Overall, participants in this study tended to be risk averse, in both financial and health lottery sets, when measured based on the number of times the guaranteed option was chosen. This is in line with the findings of previous research, which found that participants tend to be risk averse when making financial choices regarding gains (204, 206, 288, 360, 361), and when making health choices (161, 203). In contrast to this, some healthcare-based studies have found patient participants to be risk neutral in financial choices (203) and health choices (204). All three of the healthcare-based studies included patients (161, 203, 204), and two of them also included doctors (161) or community members (204). This common tendency towards risk aversion is important to consider when making location of care decisions, as it implies that people are not working from a perspective of accepting risk neutrality, and instead tend to want to avoid risks, at least to some degree beyond the neutral point.

The key individual demographic factors that have previously been considered for their potential influence on risk tolerance, which were also considered in this study, are gender, age, and ethnicity. In the current study, no significant differences in risk tolerance were found between male and female participants, although there was a tendency toward higher risk tolerance among women. Previous studies in the financial domain have shown mixed results regarding the impact of gender on risk tolerance, with a number of them finding female participants to be more risk averse than male (162, 288, 360), while others did not identify any statistically significant difference in risk tolerance levels between genders (161, 203, 204, 361), or found that any difference disappeared as the stakes were raised (206). Notably, none of the studies that included assessing risk tolerance in the health domain identified any statistically significant differences in risk tolerance based on gender (161, 203, 204), and another study looking at risk tolerance in multiple domains found that health was one of very few areas with no statistically significant difference in self-reported risk tolerance between female and male participants (162).

Findings regarding the impact of age on risk tolerance levels are also mixed, but it should be noted that as many of the studies have been done using university students as their participants, as discussed previously, their age distribution may be skewed and have limited participants from older age categories, thus limiting their ability to comment on any potential impact that this variable may have, and making them less comparable to the current study. For example, one study which found that older people were more risk tolerant in choices about financial gains clarified that less than 1% of their participants were aged more than 40 years (288). The current study included participants of a wide range of ages and found mixed results regarding the impact of age on risk tolerance, depending on analysis technique – people aged 65 years and older demonstrated significantly higher risk tolerance than younger people in financial choices when assessed by the number of times the guaranteed option was chosen, but this effect was not present when risk tolerance was assessed based on Switch Point. Previous research which has included nonstudent participants, as this study did, has found no statistically significant differences in financial risk tolerance (161, 203, 204, 206). In those studies which provided patients' demographics, their mean or median age was in the 30s (161, 203, 204). A different study, which sought to include a representative national sample of participants, found that those aged between 40 and 50 years were more risk tolerant in financial lottery sets than those of other ages (361).

As mentioned earlier, when making choices in health lottery sets, people aged 65 years and older in the current study had more dichotomised approaches to risk than younger people. Previous studies which included assessment of health risk tolerance have not found a statistically significant difference based on age (161, 203, 204). This is similar to the findings of this study when risk tolerance was assessed by Switch Point, but differs from the finding of more dichotomised health risk tolerance levels among older people, when assessed by the number of times participants chose the guaranteed option.

The mixed findings regarding the impact of age on risk tolerance, based on different analysis techniques, contribute to this body of research overall. Most previous studies have not used both 'Switch Point' and 'number of times the guaranteed option was chosen' approaches to assess risk tolerance, but have instead chosen only one approach, which may contribute to the difference in findings. Additionally, it should be noted that the age at which the current study defined 'older people' (65 years) is considerably higher than that used in other studies (40 years).

Ethnicity has more rarely been considered in relation to risk tolerance, and when it has the categories used have varied, both between studies and from this study. The fact that some of these comparisons have been based on the country in which the participant is residing at the time of participation, as opposed to their self-reported ethnicity, and the different ways in which ethnicity, countries and “cultural clusters” were defined in those studies that have considered this, mean it is not possible to make direct comparisons with the findings of the current study.

The further demographic data that were used for sub-group analysis of staff data in this study has not, to the knowledge of the author, previously been investigated (with the exception of gender) in these types of studies, and therefore it is not possible to compare the findings of these sub-group analyses with previous literature.

Limited previous work has compared the risk tolerance of doctors and patients using a lotteries approach, and it identified no significant differences in their risk tolerance for health-based decisions, but did identify a statistically significant difference in financial risk tolerance, with doctors being more risk averse than patients (161). This is different from the findings of the current study, which identified no statistically significant difference in financial or health risk tolerance between patients & carers, and healthcare professionals. Another previous study aimed to investigate the risk tolerance of emergency physicians specifically, but did this via use of clinical vignettes (192), as opposed to the type of lottery sets used in the current study.

Unlike the findings of the current study, which identified no statistically significant differences based on experience level, this previous study found that more experienced doctors were less risk averse than their less experienced colleagues. There may be a number of explanations for this difference, including the difference in study design and the outward focus of making disposition decisions for patients as opposed to making health or financial choices for oneself.

Similarly few previous lottery-based studies have explored the possibility of differences in risk tolerance in health and financial domains, when they are assessed in a comparable way. However, in line with the findings of the current study mentioned previously, statistically significantly greater risk aversion was identified in health lottery choices compared to financial ones (203).

As has been found in other research using these types approaches to investigating risk tolerance (172, 206, 361), some participants in this study switched multiple times between the safer and risker options. In recognition of this issue, some previous studies investigating financial risk tolerance have prohibited participants from switching multiple times (162), but others have not included such an instruction, which was the approach taken in the current study. In those cases, reported rates of multiple switching (around 20-25% (172, 206)) are slightly higher than in this study, where 50 participants (14.8%) switched multiple times in at least one lottery set, of whom 27 (8.0% of all participants) switched multiple times in more than one lottery set and 5 (1.5%) switched multiple times in every lottery set. These are again lower than the proportion of participants (9%) who switched multiple times in both lottery choice experiments in Falk et. Al.'s study (172). One possible explanation for the lower rate of participants who switched multiple times in this study is the way in which the lottery sets were designed. Given that it was intended that they would be understandable to a wide range of people, potentially with variable education levels and English language skills, the lottery sets in this study were designed to be less complex than those in some other studies, for example, they consistently used 50-50 chances (in the lottery sets with known chances) and involved a choice between a guaranteed option and a risky option, as opposed to a choice between two risky options. Additionally, the effect of the low number of staff who switched multiple times (8 staff participants, 7.6%) compared to patients & carers, brought the overall proportion of 'multiple switcher' participants down, although the patients & carers who switched multiple times still represented less than 20% of that population (42 participants, 18.1%). The reason that staff in this study made the choice to switch multiple times at a lower rate than both patients & carers, and previous studies' populations, may merit further investigation. There was also a small proportion of participants in this study who chose to switch from the risky option to the guaranteed one (from option B to option A), the rate of which was similar, although once again lower, to the proportion of participants reported to do this in a previous study (206). In that study, the proportion of participants reported to make this type of switch in hypothetical lotteries was 8-10%, and in incentivised lotteries it was 5.5-6.6%, while in this study it ranged from 0-4.1%.

As referred to earlier, previous research has investigated physiotherapists' decision-making in other clinical contexts, and their practice in similar clinical contexts to those of the participants in this study who work in front-door services. In a number of these studies, patient-centredness or incorporation of patient preferences is highlighted as being an important consideration (304, 362, 363), as was found in this study. Communication was also highlighted as an important component of physiotherapy practice, both in decision-making and in making assessment and treatment decisions (363, 366, 367), which aligns with the importance placed on it by physiotherapists in the current study, and incorporates communicating with other healthcare professionals, patients and their families. As was described by some physiotherapists in this study's interviews, previous research has found that there was particularly close sharing between physiotherapists and occupational therapists in acute care (304, 368). This communication with other healthcare professionals, including presenting a united front with professional colleagues, such as occupation therapists or social workers, has been found to be especially important when working in a system where physiotherapists may advise on discharge decisions, but do not directly make these decisions themselves (368). While a small number of participants in the current study expressed working in a service where they advised on, but did not directly make, discharge decisions, others were very clear that they were making these decisions directly, especially those working in extended scope or advanced practitioner roles. In both this study and previous work (368) respect for professional opinions between multi-disciplinary team (MDT) members has been found, highlighting that even in a system where physiotherapists may have less power to directly make discharge or location of care decisions, they do have power to influence them, and as such, understanding how they reach these decisions remains important.

Studies investigating the decision-making of physiotherapists in a different clinical setting (cardiorespiratory care), have also demonstrated that physiotherapists consider the wider context in which their clinical decisions are made, as well as highlighting some patient-specific factors (362). This consideration of the wider context of their patients' lives is similar to the aspects of various themes in the current study, and although some aspects are different, most notably physiotherapists in the current study discussed the impact of COVID19 when considering the context of their decisions, which did not exist at the time of Smith et al.'s study, other aspects demonstrate a high level of cross-over between the findings of these two studies. Some of these relate to sub-themes within 'Wider Context', while others are more closely linked to components of the 'Considerations for Referrals' and 'Discharge Decision' themes. Notably, these factors, such as equipment and resource availability, opinions of the wider MDT, personal experience of interventions, and patient capacity and cognition, were raised in the context of making decisions about interventions in Smith et al.'s study (362), but in the context of location of care decisions and referrals in the current study. The physiotherapists in that study (362) also demonstrated efforts to balance risks and benefits in their clinical decision-making, with increased consideration of this as decisions increased in difficulty, as physiotherapists in the current study did when reaching location of care decisions. These similarities, despite the difference in clinical context, highlight how physiotherapists' clinical reasoning more widely is applied to location of care decisions. There were however some factors they raised which were not as present among physiotherapist in the current study, such as local procedures and use of research.

Where previous work has considered physiotherapists’ roles in acute care or front-door services, which includes making location of care or discharge decisions, this has tended to consider their role more broadly in this setting as opposed to their decision-making specifically. In these cases, a high level of importance was placed on physical therapists’ roles in assessing and managing mobility (366, 367). While mobility was discussed by many physiotherapists in the current study, this was only one of many factors that they incorporated into their assessment, treatment and decision-making within acute care. One potential explanation for this difference in priority of assessment factors may the different contexts in which these studies were conducted – both Plummer et al. (367) and Masley et al.’s (366) studies were with physical therapists in America, where the scope of practice can be different to that of physiotherapists in the UK, especially with regards to extended scope practitioners (369). Despite this difference, there were, however, other components of care that were reported in both these studies (366, 367) and the current study, most notably, communication and a focus on safety of discharge locations.

Masley and colleagues also described physical therapists’ feeling that acute care has marked differences to other clinical areas, and their experiences of “professional responsibility” at various levels, from their individual patients to their employers and profession overall, which they enacted through advocating for, and providing high quality care to, their patients, supported by ongoing learning and educating (366). Similarly to this, physiotherapists in the current study discussed teaching and learning, including cross-professionally, and ways in which they advocate for their patients, including when this involves expressing a view that opposes that of other MDT members. They also highlighted some of the specific attributes that they felt are required of physiotherapists working in these settings, which may not be as important in other clinical settings, as was raised by the physical therapists interviewed by Masley and colleagues (366).

A more recent study from New Zealand explored the risk management process of patients and clinicians, including physiotherapists, in managing location of care transitions for patients near the end of their life, from hospital to either their own home or a care home (370). This study did not generally single out the decision-making of separate professions, but nonetheless there were some areas of similarity to the considerations that physiotherapists in the current study discussed. One of the most important of these was the focus on risk minimisation and safety in discharges – in both studies professionals aimed to take steps to reduce risks and facilitate discharges to patients' own homes where possible. There were also similarities in the factors considered in making these assessments, such as the level of support the patient would have, and availability of community services. The fact that disposition decisions have to be made early in the patient's journey, along with the fact that patients are aware of how their descriptions of home or discussions of concerns may lead to not being able to return home, and therefore the possibility of moderating the information they share, were raised in both Coombs et al.’s study (370) and the physiotherapist interviews.

Finally, the impression that some physiotherapists shared of tolerance for discharges that carry risk reducing once a patient was admitted to hospital was echoed by the findings of Coombs et al.’s work (370). Although that study focussed on decisions around where patients would be discharged to (own home or a care home), rather than the broader disposition decision with more potential locations, many of the factors raised were very similar to those that physiotherapists in the current study considered.

One study which specifically investigated physiotherapists’ decision-making around discharge in acute care is the work done by Jette and colleagues (304), who interviewed physical therapists and occupational therapists (Ots) about their decisions with regards to discharge placement. Three of the four main themes that they identified have significant overlap with those found in the current study – Patients’ functioning, Patients’ wants and needs, and Context of patients’ lives (304). As mentioned previously, physiotherapists in the current study also discussed assessment and consideration of patients’ functional ability as being important, although they included a wider spectrum of factors in this, including ability to carry out activities of daily living, which Jette et al. had found to be the focus of occupational therapists, while physical therapists concentrated more on mobility. In addition to the possibility that this difference derived from differences in the health systems the respective participants were working in, a number of physiotherapists in the current study talked about cross-professional learning and skills building, which may help account for them taking on this more traditionally OT assessment. Both “Patients’ Wants and Needs” and “Context of Patient’s Life” were reported as being important in these decisions by therapists in both studies, which helps to highlight the importance that therapists place on making patient-centred decisions and on making these decisions on the basis of the patient’s whole life (including consideration of their support network), rather than only on what they immediately assess in a healthcare context. Having considered the patient-specific factors, the therapists in Jette et al.’s study (304) discussed the influence that their professional experience and learning had on how they used this information to make decisions, a sentiment also found within the ‘Physiotherapist identity and ‘Working with Risk’ themes in the current study, wherein junior physiotherapists were felt to be more cautious and/or less confident, which was similar to the findings of previous work (304, 362).

There is very little research focussing on physiotherapists within Hospital at Home settings, and what there is has tended to focus on their roles more generally, rather than their location of care decision-making (e.g. (96)), therefore, it is challenging to make any specific comparisons with the findings of this study in this physiotherapist population. It has been highlighted, however, that working with patients in their own home can help to shift power from the physiotherapist to the patient, leading to a more collaborative approach (363), which relates to some of the ways in which HaH-based physiotherapists spoke about their interactions with their patients.

Although some research into how other professionals, especially doctors, make disposition decisions in the ED has been conducted, as referred to previously, this remains limited (105, 364). In some areas, there is considerable overlap between how physiotherapists were found to make location of care decisions in this study and how other professionals make these decisions. In particular, geriatricians leading an MDT in the ED and carrying out comprehensive geriatric assessments included multiple similar factors in their assessment, such as mobility and function assessments, consideration of cognitive impairments and assessment of functional baselines, although they also included other interventions, such as medication reviews (124), which physiotherapists in the current study did not. It should be noted that the geriatricians in this study were "supported by a MDT" (124), including multiple professionals, and as such it is not clear which team members conducted which components of assessments.

Other studies have also found that emergency doctors consider both clinical and social aspects of patients' presentations (105, 371, 372), and in some cases this extends to level of social support or community service availability (124, 371, 372). In two studies, time of day was mentioned as a consideration in relation to availability of community services (124) or more general safety (371), as was raised by some physiotherapists in the current study. Notably, even those that discussed consideration of social factors tended to relate this strongly to where patients lived (e.g. own home, nursing or care home, homelessness) (105, 371), and possibly consideration of support networks (105), but wider and social factors was not found to be considered in the same depth and breadth as physiotherapists described doing.

There are occasional mentions of the use of guidelines in making clinical decisions (364), but clinical “gestalt” or “gut feelings” appeared to be an important component of decision-making in some studies (105), potentially informed by learning to identify patterns in patient presentations (364), alongside shared learning (124), which some physiotherapists discussed engaging in. These ‘gut feelings’ may contribute to the view that experienced emergency physicians can identify whether a patient is likely to require admission within a very short timeframe (e.g. under five minutes) (364). This confidence in their own clinical judgement, potential for pattern recognition, and increased confidence in decision-making with increased levels of experience were all found in the interviews with physiotherapists as well.

One notable point of difference between physician and physiotherapist decision-making appears to be the level of importance placed on patient, and family, views and input. These were highly valued by physiotherapists, with every interviewed physiotherapist in this study speaking about patient-centred care and/or respecting patients’ wishes with regards to location of care, and other studies of therapists’ decision-making highlighting the importance of this, as discussed above. However, this was less commonly referred to in studies relating to doctors’ decision-making, although when it was it was indicated that their opinions would be valued (371). This is not to say that doctors do not seek and value patients’ location of care preferences, but this was not reported as often in studies exploring their disposition decision-making. There has, however, been other work focussing more specifically on this, and on shared decision-making between providers and patients in the ED (e.g. (272, 373-375)).

Risk tolerance among emergency physicians, and the possibility of this changing with time or experience has also been explored in a small number of studies (192, 364, 372), although the methods used were different to those in the current study – Lawton et al. used a questionnaire with clinical vignettes and asked participants to select which of four management options (of varying risk levels) they would choose (192), Wright et al. interviewed doctors and during this asked them to quantify the percentage risk of an adverse outcome at which they would not discharge a patient (364), and Capan et al. asked participants to complete a survey in which they were asked to quantify the percentage risk of readmission or ‘negative outcome’ at which they would willingly discharge a patient home (372). Similarly to the pattern described by physiotherapists in the current study, more experienced doctors in Lawton et al.’s study demonstrated lower risk aversion and higher tolerance for uncertainty (192). The ways in which risk tolerance were assessed in both of the other studies (364, 372) cannot be directly compared to the data from physiotherapists in this study, as they relied on participants providing specific numerical values to quantify their risk tolerance in making discharge decisions, which none of the physiotherapist in the current study were asked to do. This consideration of risk tolerance was closely related to the importance of making ‘safe’ decisions, which was a theme strongly found among physiotherapists, as well as in other research exploring ED doctors’ disposition decisions (105, 364, 371). In the case of doctors, the importance of identifying or ruling out immediately life-threatening diagnoses (364) and estimating likelihood of serious negative events (105) was prioritised, which is different from the type of risks and safety concerns that physiotherapists prioritised. Risks of discharge were also found to be a major component of admission decisions for some doctors, although there was no indication of their consideration of risks of admission (371). In contrast to this, physiotherapists in this study were more likely to consider the risks of admission than of going home, and all except one of those who raised risks of discharge also discussed risks of admission.

As has been previously noted, different professional groups are involved in, and have different perspectives on, disposition decisions (105). Along with physiotherapists and doctors, this may also include nurses, social workers (SWs) and administrators, among others. Although there is limited research on how doctors make disposition decisions in front-door services, there is even less research into how other professionals make these decisions. This may be partially due to the fact that in some health services these professionals are not decision-makers for disposition (e.g. (372)). Calder et al. used focus groups to elicit the processes of various stakeholders in ED disposition decisions, including nurses and SWs (as well as doctors, whose approaches have been discussed previously) (105). For all groups, they found that triage and location of assessment were important factors, which is different from the physiotherapists in this study, who did not mention triage at all, and although there was some discussion by physiotherapists of the difference between assessing patients in their own home versus in a hospital setting, the stakeholders in Calder et al.'s study were referring more to where within the ED patients were assessed (e.g. 'emergency monitored area' or urgent care). SWs also reported considering whether standards of care are being routinely met and documented, while nurses considered patient and environmental factors related to their medical presentation, treatment and response (105). Similarly, some physiotherapists spoke about the importance of patients’ medical stability or presenting condition in their decision-making, although this was not consistently their highest priority in decisions, which suggests that they may be more inclined to make decisions based on their more unique clinical expertise than nurses and SWs in Calder’s study, whose priorities more closely align with the expertise of doctors. The work by Calder and colleagues also highlighted a difference in how physicians perceived the contribution of other MDT members compared to how nurses and SWs did. They found that nurses and SWs felt involved in disposition decisions, and that they affected them, while physicians did not stress the roles of other professionals as much, including allied health professionals (105). Similarly to the nurses and SWs, the physiotherapists in the current study certainly felt that they made disposition decisions, but there were also a number of times in the physiotherapist interviews where participants highlighted the value that they felt their medical colleagues placed on their clinical judgement, such as keeping a patient on the HaH service past the point of medical discharge, in order to facilitate further rehabilitation, or asking for therapists to make a final decision on discharge. This seems to vary from Calder et al.’s findings of physicians not stressing other MDT members’ roles as much. One possible explanation may be that physicians were focussing on their route to determining disposition, and may view the role of allied health professionals to occur after this and thus they did not include it in their process maps, for example, if a referral says that a patient can be discharged if therapists are happy, the physicians may not have considered this part of their own process, and therefore not included it, in a similar way to the lower focus on medical stability than other considerations in physiotherapists’ discussions of decision-making.

8.2 Impact of COVID19

Due to the timing of this study, all initial planning was undertaken prior to the COVID19 pandemic, but data collection began a number of months after COVID19 had become widespread, and as such it may have had an influence on the answers that participants gave, in both the lottery questionnaires and the qualitative interviews, as well as having broader impacts on the study overall.

One of the biggest impacts it had on this study was in recruitment. Due to visitor restrictions in hospitals, there were fewer carers present in the department where patients and carers were recruited for the questionnaire study than there were prior to COVID restrictions, and as such a lower number of carer participants were recruited than anticipated. However, the overall number of patients and carers collectively recruited still met recruitment targets, with patients making up the majority of this group. Staff recruitment strategies for the questionnaire component of this study were less notably impacted by COVID19, as the intention throughout was to recruit widely and to use social media and other electronic communication methods to share information and invite participants. The possibility of in-person recruitment of staff was severely limited, but recruitment targets were met through other means. Although there were, as discussed, challenges to recruiting participants for the quantitative component of this study, these were not as severe as the challenges of recruiting patients for qualitative interviews. Communicating with potential patient participants about participation in an interview was limited by COVID, with communication having to be via telephone or email, which some patients had limited access to, as well as COVID19 infection control precautions necessitating that all interviews be conducted virtually. This precluded participation by some patients who were unable or unwilling to participate in an interview remotely. However, not all patient recruitment challenges were attributable to the COVID19 pandemic, and these will be discussed in further detail in the ‘Limitations’ section below. A final, overarching recruitment challenge that COVID19 posed was the NIHR moratorium on recruitment to non-COVID19 studies. This was enacted in March 2020 (291), and delayed the beginning of recruitment for this study by a number of months.

Among those who did participate in the lottery questionnaire component of this study, it is possible that their experiences during the COVID19 pandemic, up to the point at which they participated, could have had an impact on their decision-making, especially in the health domain lottery sets. As discussed previously, some patient and carer participants provided additional insight into their decision-making process during or after completion of the lottery sets. One of these participants discussed the additional challenges that COVID19 has introduced to healthcare decision-making, especially around people having to make decisions without the support of their family, or equivalent, available due to visitor restrictions. Although this specific challenge is not necessarily directly applicable to the lottery sets in this study, it does demonstrate an awareness of one of the ways in which COVID19, and its resultant social restrictions, may influence decision-making. An argument could also be made that participants in this study were expected to make a health-based decision, in the health lottery sets, without input from their family or equivalent, albeit it was a hypothetical decision, and some of those who were in the department with (or as) a carer did discuss their choices with the patient / carer accompanying them. Although it cannot be confirmed whether experiences during the COVID19 pandemic influenced participants' choices, and if so, in what way, some patient participants did report that they were using experiences of previous ill health to inform their decision-making, especially in the health lottery sets, and previous life experiences to inform their more general decision-making in the lottery sets, thus it is a justifiable possibility that experiences in the months preceding their participation may have influenced the decisions that participants made in this study.

The impact of the COVID19 pandemic was explicitly clear in some of the physiotherapist interviews, where participants referred to changes in their practice and/or working environments as a result of it. The specific impacts of COVID19 on physiotherapists' decision-making around location of care have been discussed within the relevant theme in chapter 7 - Wider Context: COVID. However, it is also plausible that COVID19 had an impact on the interviews themselves. The most direct impact was that all of the interviews were conducted virtually, which required participants to be willing and able to use video-conferencing software, or to be interviewed over the telephone. Although it was anticipated that a number of physiotherapist interviews would be conducted in this way, due to the wide geographical spread of potential participants, initial planning also allowed for face-to-face interviews being an option for participants. There are various advantages and disadvantages to using video-conferencing software for qualitative research. They provide the capacity to facilitate interviews with participants who are spread over a wide geographical area and who may have limited time (including the need to change their interview time at short notice due to clinical demands), as well as allowing participants to join the interview from an environment in which they feel comfortable, while still facilitating a feeling of having a conversation and allowing communication of non-verbal cues (376-378). Of specific relevance to COVID19, video-conferencing interviews do not require the interviewer and interviewee to be physically near each other, and are thus better than face-to-face interviews for infection control. However, there are also potential disadvantages to using video-conferencing for qualitative interviews, including increased risks of interruptions (e.g. if participants are in a shared office, or at home where family may interrupt), less ability to see body language due to the limited view via a web-cam, inequity of access to the hardware or software required to participate, and technical challenges such as internet connection issues or variable sound quality (376-378). An additional potential challenge when using video-conferencing to interview participants in NHS settings is the possibility of their employer having blocked certain software, such as Zoom. Given that all the physiotherapists who were eligible to participate in this study were employed in health services, the issues of inequity of access to hardware and unstable internet should have been mitigated, if they were able to use a computer at their place of employment, and alternative software options were available if a participant’s employer blocked access to particular video-conferencing software. Despite these, and the possibility of a telephone interview, it is possible that some potential participants were unwilling, or unable, to participate due to the requirement for interviews to be conducted remotely. However, the pandemic did generate a rapid increase in the use of technology for communication and in some clinical settings, including using video-conferencing, so it is also possible that some participants may have felt more able to manage the technological requirements of video-conferencing as a result of this than they would have done prior to the pandemic. Additionally, healthcare professionals, including physiotherapists, were under significantly increased pressure during the pandemic which had multiple impacts both at work and in home lives (379, 380).Therefore, the emotional and physical toll that this took on staff may have made some people less inclined to want to, or be able to, participate in a research interview.

8.3 Limitations

There were a number of limitations to both the qualitative and quantitative elements of this study. The primary limitation of the qualitative component was the lack of patient interviews. Patient recruitment for interviews was limited by a number of factors, which were exacerbated by COVID19, as discussed previously, including difficulty contacting potential patient participants and technical challenges as all interviews had to be completed remotely. Although some patients did provide contact details for the purpose of potentially being invited to participate in an interview, there was a very low response rate to the invitation to interview, despite reminders of the information and invitation. Additionally, COVID19 infection control measures necessitated that all interviews be conducted remotely, which may have prevented some potential participants from being willing, or able, to participate, and also meant that some participants had more difficulty with accessing the information sheet, upon which to base their decision regarding participation, due to not having access to email. Had there been sufficient patient interview data, comparisons could have been drawn with the physiotherapist interviews, and additional information regarding patient views, concerns and perspectives of location of care decisions and acute care provision in non-traditional settings could have been gathered, which could, in turn have contributed to suggestions about communication strategies and service design.

Although enough data was gathered from physiotherapist participants for no new themes to be being identified during analysis, there were still some demographic characteristics that were under-represented in the physiotherapist participants. Namely, the number of participants who worked in front-door services outnumbered those who worked in Ambulatory Care (mainly Hospital at Home (HaH)) services, and there was a lack of male physiotherapists and junior (i.e. band 5) physiotherapists. Those participants who did work in HaH services provided detailed and in-depth responses, and many of the interview questions were equally applicable to physiotherapists based in either service type, therefore the unbalanced number of participants from front-door vs HaH services was unlikely to be a significant problem overall, although it did limit the ability to undertake some comparisons between physiotherapists working in different service types. The low number of male physiotherapist participants may be due, in part, to the lower proportion of male compared to female physiotherapists in the profession overall, therefore it was never expected that there would be an even gender split between participants. It is also possible that the low number of junior physiotherapists was partially due to the clinical area being studied. Due to the nature of the decisions being made, and the environment in which they are being made, it may be that these kinds of services have a lower proportion of junior therapists working in them, which may have been reflected in the recruitment proportions, although this employment pattern is more likely to be the case in HaH services than hospital-based ones. Although the lack of more junior physiotherapists was a limitation, there were a relatively high number of more senior and experienced physiotherapists, including those in advanced practitioner roles, who were able to reflect on both their own experiences at varying seniority levels, and the experiences of their teams, which partially corrected for the lack of data directly from more junior or less experienced physiotherapists.

A further challenge during the physiotherapist interviews surrounded the vignette question. This question, and its follow-up prompts, surrounded the management of a fictional patient who was presented to participants during the interview. This ‘patient’ was described as having presented with a community-acquired pneumonia. This presentation was selected as it was theoretically possible that physiotherapists in any of the included clinical areas could manage patients presenting with pneumonia, as respiratory conditions are not an unusual presentation to unplanned care (381). However, in the course of the interviews it was identified that some of the participants, especially those working in advanced practice or extended scope roles, had a greater focus on musculoskeletal presentations among the patients they managed. This was addressed by altering some specific details of the presentation, when required, but maintaining the same social history and retaining the possibility of admission or discharge, with the same length of stay hypothesised. The second challenge that using pneumonia as the presenting condition posed was that, while the questions were designed pre-COVID19, they were asked during the pandemic, and as both pneumonia and COVID19 are primarily respiratory conditions (382, 383), the possibility that the patient may in fact have COVID19 was raised by some participants, although all of those who raised this possibility willingly continued to discuss their management on the assumption that it was not COVID19. The way in which this vignette question was presented and how any participant clarifications were answered was likely heavily influenced by the interviewer's background as a physiotherapist. For example, when a participant indicated that they would consider specific oxygen saturation levels when making their decision, the interviewer was able to provide hypothetical readings, at rest and on exertion, as may be assessed clinically. The possibility for inconsistency in these additional details was minimised by having the same interviewer for all participants, and the interviewer keeping a research diary, which included commentary on instances when additional details had been provided, as appropriate.

Finally, all of the interviews in this study were conducted remotely, primarily via video-conferencing software (using either Zoom or Microsoft Teams). As discussed previously, this was both beneficial and necessary due to geographic spread of participants and COVID19 infection control measures, and both of these platforms allow screen-sharing, which meant that information about the fictional patient in the vignette question could be shared with participants, as it would have been on paper, had the interviews occurred face-to-face. Additionally, by holding the interviews virtually, all organisation could be done by the researcher, without requiring the participants to either travel to a location organised by the researcher or identify and access a location local to them which the interviewer could come to.

While there are a variety of advantages to using video-conferencing for qualitative research, it also has some drawbacks. One of these potential problems is privacy and interruptions (376, 378). In this study, no especially personal or sensitive topics were being discussed, and all the participants were healthcare professionals and were therefore aware of the importance of confidentiality, and appropriate measures to take to ensure this is maintained. Some participants joined from their homes, and others from their workplaces. Both of these locations carry a risk of interruption, although the nature of those interruptions could be different. The only interruptions during interviews with participants who were at home were from family members directly interacting with the participant, in this instance the interview (and recording) was temporarily paused, then re-started when the participant was ready; while interruptions to interviews when the participant was at work were more likely to be from other staff entering a shared workspace and this causing noise that obscured some words in the recording. Additionally, background noise can be an issue based on where the interviewer is as well, although the risk of direct interruptions is lower as they could inform relevant parties that an interview was in progress.

Challenges of developing rapport between researchers and participants have also been raised as concerns for video-conferencing interviews (376, 378), but others have highlighted that some participants may feel more relaxed and in control if they are physically in their own space for the interview (384), and even that rapport may be built more quickly in some video interviews than face-to-face (385). To facilitate rapport building in this study, all interviewees had exchanged emails with the interviewer prior to the interview, and there was time for discussion prior to the interview officially beginning. Additionally, the interviewer readily confirmed their background as a physiotherapist if asked, which may have helped with relationship and rapport building in some cases.

Another frequent concern with using video-conferencing for interviews is the potential for technical problems to arise (376-378). These may result from hardware or software issues or from lack of confidence in using the technology. Given the increased use of technology such as Zoom and Microsoft Teams for video meetings over the COVID19 pandemic, the issues of lack of confidence with the technology were likely lower than they may otherwise have been, and although some health Trusts do limit access to certain software on their sites, two video-conferencing platforms were available, and participants also had the option to participate outside of their place of work if they wished. There was only one instance of an unstable internet connection causing a significant problem for an interview in this study, and in that case the interview moved to being via telephone instead. However, by the time that occurred the researcher and participant had already spoken and begun the interview via video, which helped reduce the additional challenges of creating rapport via audio only conversation. Overall, although there are potential disadvantages and challenges to conducting qualitative interviews virtually, there are ways to minimise these, which were used in this study, and there are also potential advantages to this means of interviewing, which were leveraged for this study to increase ease for the participants.

Among the patients and carers who completed the lottery set questionnaires, there were a range of demographic factors represented, although these did not fully match the local population of Birmingham. For example, patient & carer participants who reported their ethnicity as White or Mixed / Multiple ethnic groups were under-represented relative to the general population of Birmingham (48.3% vs 57.9%, and 2.2% vs 4.4% respectively) and patient & carer participants who reported their ethnicity as Black / African / Caribbean / Black British were over-represented (18.5% vs 9.0%) (386). However, the percentage of patient & carer participants reporting their ethnicity as Asian / Asian British or Any Other Ethnic Group were fairly similar to the overall population in Birmingham (386). Additionally, the proportion of women who participated in the study overall was higher than the proportion in the local Birmingham population (65.5% vs 50.4%) (387), and there was a slightly greater proportion of people younger than 65 years among the patients & carers than in the Birmingham population (85.8% vs 83.1%) (388). Although the distribution of ethnicities among patient & carer participants in this study did not match the local population, it did have a high proportion of participants who reported their ethnicity as Asian / Asian British or Black / African / Caribbean / Black British, which can be seen as a positive outcome, as it has been found that people from Black, Asian and Minority Ethnic groups are less likely to participate in medical research than people from a White British background (389). It is somewhat surprising that there was a lower proportion of participants aged 65 years or older, given that, overall, older people have a higher rate of hospital admissions than younger people, and although female patients account for more inpatient episodes than male patients (390), this is a less pronounced difference than in the proportions in this study. It is possible that the relative under-representation of people aged 65 years and older could be related to the nature of the department that patient and carer participants were recruited from, or could indicate a lower inclination to participate in this study among those in older age groups. It is also possible that some older patients who attended the department, who did not speak English as a first language, may have been less able or confident in speaking it as a second language than some younger people.

Related to this latter point, a further limitation of this study was that the questionnaires were only available in English, which meant that those who were not able or confident in communicating via English were unable to participate. This was partially overcome by having the option of the researcher verbally asking all the questions, which avoided participants needing to be able to read in English, but it did not fully resolve this potential problem. An additional advantage of the researcher offering all participants the options of completing the questionnaire independently, reading the questions independently and dictating their answers to the researcher (i.e. the researcher managing the technical component of the laptop but not reading the questions aloud), or the researcher verbally asking the questions and managing the technology was that participants who were not literate, or who struggled with managing technology, were not excluded, but also had the option to participate without any requirement to reveal their level of literacy. This is important as it has previously been found that 16.4% of the working age population of England have low literacy levels and 9.9% of the working age population have never used a computer or do not have basic computer skills (391). Previous research involving a patient population has used a similar approach of having a member of the research team near the patient while they complete the questionnaire, to provide clarification and ensure understanding, if needed (203).

Among staff participants, there was closer to an even, though not equal, distribution by gender (58.5% female) than among patient and carer participants. However, age group was not asked in this population, which means that no direct comparisons could be made to identify any systematic differences in risk tolerance between staff of different ages, and it was not possible to rule age in or out as a confounding factor when assessing if ‘years of professional experience’ had any impact on risk tolerance among staff. Additionally, the majority of staff participants were doctors (63.2%), followed by physiotherapists (24.5%), with only a small number of participants from other professions. Further work may benefit from including a higher number and range of other professions, in order to allow analysis of whether profession has a significant impact on risk tolerance (or vice versa).

A further limitation of the quantitative component of this study was that all of the lottery sets referred to hypothetical choices. As discussed previously, this has some potential disadvantages, but was deemed to be the most appropriate approach for this study. A primary concern with using hypothetical methods is that a reduction in risk aversion has been shown when using them compared to experiments involving ‘real rewards’ (203, 206, 365), although others have found this not to be the case

(288, 360), and have developed tools to assess various elements of financial decision-making using a survey instrument, including use of hypothetical versions of lottery sets (172). Despite this potential bias, it was determined that hypothetical choices would be asked for in this study, to increase comparability between financial and health (which are hypothetical by necessity) choices, and to avoid ethical challenges involved in actual payments within an NHS setting. Similar arguments have been made for the use of hypothetical options in other healthcare-based studies of this type (203). Participants were asked to imagine that they were ‘really’ being given the choice, and asked to answer as though it was not hypothetical, but this is unlikely to have avoided this bias in choices occurring. However, since all participants in this study were presented with hypothetical choices, comparisons between sub-groups are still likely to be appropriate, as the potential for bias applied equally to all participants.

An additional potential issue with hypothetical choices is that they may cause some participants to act more “erratically”, in terms of making illogical choices (206), as was seen in a number of participants in this study who switched multiple times or switched from the uncertain to the certain option. It may also be noted that the lottery sets with low financial pay-offs were presented before those with high financial pay-offs, when the chances in the uncertain option were known and when they were unknown, but it has previously been found that the difference in risk tolerance between high and low financial pay-off choices is not significantly affected by whether these choices are presented in an ordered or unordered manner (359).

A final limitation of the quantitative element of this project is the focus that it places on individual risk tolerance, without consideration of the broader impacts of external factors, especially those produced by the organisations where these decisions are made. This is especially relevant when considering its applicability to healthcare staff, who must consider a range of other factors, such as organisational actions or policies, the needs of other patients who they are simultaneously providing care to, and expectations of others involved in a given decision, among other considerations. In some cases, organisational procedures may have a direct influence on the decisions that staff are able to make – for example, the appropriate use of protocols and guidelines for management of certain conditions or presentations has been highlighted as an important component of facilitating safe, high-quality emergency care (392), but following these protocols or guidelines may mean that sometimes clinicians are making their decision based on the appropriate protocol, with limited reference to their own risk tolerance level. External circumstances, or service changes, may also lead to alterations in location of care decision-making procedures in an effort to prevent or reduce harm, such as happened in many services during the COVID19 pandemic, when an additional need to protect bed capacity and limit infection transmission led to changes in discharge policies (e.g. (393)).

Additionally, it is often a target of Trusts to minimise readmissions, due to their multiple negative impacts on patients and the health service (394, 395), and awareness of this target, alongside knowledge of how readmission rates are viewed in their service, may have an impact on clinicians' willingness to discharge patients. This may be closely aligned with concerns that some staff may have, as was raised in physiotherapist interviews, regarding blame and professional backlash if there is a negative outcome for the patient, following a decision that the clinician makes. Some of these factors were discussed by physiotherapists in their interviews, especially within the ‘Wider Context’ theme, but they were not accounted for in the quantitative element.

Additionally, this lack of wider context in the quantitative questionnaires is a potential limitation for patients and carers as well, as they may also consider risks for others beyond themselves (especially when carers are involved in decisions) and other wider factors when making healthcare decisions. It was not possible to incorporate all of this into the current study, while maintaining comparability with other research, and within time constraints of completing the research, however the impact of including some of these factors could be explored in future studies investigating risk tolerance in similar groups to this study.

8.4 Implications for Clinical Practice

One of the simplest, but most important, implications for practice from the quantitative data is the evidence of the wide range of risk tolerance levels that patients, carers and healthcare professionals in Front-Door and Ambulatory Care services have. This is important because many discussions around location of care in this setting centre around the potential risks of the possible care locations, and in so doing it is beneficial for clinicians to remember that although those involved in the decision may understand that a given option carries a set risk, their willingness to take that risk may reasonably vary. This can be particularly important in cases where a patient is willing to take more risk than the professional may be comfortable with, and in order to respect their autonomy and provide patient-centred care, which the physiotherapist interviews highlighted as being of great importance, the clinician would have to allow the patient to take the higher level of risk.

Additionally, the finding that people aged 65 years and older have more dichotomised approaches to health risk than younger people could have practical implications in front-door and Ambulatory Care services. In particular, this could influence how discussions about locations of care, and other assessment and treatment options, could be framed to generate the most productive conversations. In this case, it may be appropriate to focus more on the high and low risk elements of options, as opposed to trying to focus on finding a ‘middle road’, such that patients are able to more clearly express where their preference lies. However, this is only one component contributing to these discussions, which should always be adapted to the individual patient and should focus on the elements that are important to them individually.

Healthcare professionals may also find it reassuring to know that when participants did not know the chances of each potential outcome in an uncertain option this did not consistently alter their risk tolerance, and in most cases there was no statistically significant effect of this change. Within healthcare, and certainly in location of care discussions, it is unusual to be able to provide patients with very specific percentage (or equivalent) chances of every possible outcome of a given decision. Therefore, it is more normal for staff, patients and carers to have to make these decisions without knowing the chances of the potential risky outcomes occurring, and as such, knowing that even having this information may not influence their risk tolerance in the situation may be beneficial.

The results of the physiotherapist interviews could be used to inform teaching around front-door and Ambulatory Care physiotherapists' decision-making, both to new therapists in these clinical areas and to other members of the MDT. Through doing this, communication between MDT members may be improved via greater understanding of each other's clinical reasoning strategies, and it may facilitate staff who are newer to these clinical areas gaining confidence more quickly in making appropriate location of care decisions.

Finally, the findings within the 'Considerations for referrals' theme specifically could be used to increase and improve appropriate referrals to services such as Hospital at Home (HaH). These findings were drawn from physiotherapists both making and receiving these referrals and may be of particular benefit to new HaH teams and to teams who are aiming to increase the referrals they receive. The key components of doing this primarily centred around information exchange about the existence, scope and capabilities of the HaH team, and communication between hospital and HaH staff and between staff and patients.

8.5 Future directions

Future work could seek to explore whether other demographic factors have an impact on risk tolerance among the groups investigated, such as previous or current occupation among patients and carers (and any previous occupations among staff), deprivation index, education level, and previous experience of significant ill health (of the participant themselves or someone they are close to). Additionally, future work may aim to increase representation of healthcare professions which were under-represented in this study, to allow for better investigation of whether there is any pattern or difference in risk tolerance in professions other than doctors and physiotherapists. Further investigation of the rationale, interpretation and decision-making process of people undertaking questionnaires such as these, to better understand the basis on which people make these choices could also be beneficial.

Additionally, future investigations could explore what specific risks patients and healthcare professionals are more or less willing to accept when considering location of care decisions, including the level of these risks they are willing to accept. This could also allow exploration of whether the risks patients and staff are willing to accept, or the level of these risks they are willing to accept, change in response to the introduction of other risks, when considering these decisions, and what they consider to be risks.

Further interviews with patients, and potentially with carers, surrounding location of care decisions and use of admission-alternative services would also be beneficial, as they could help build a more complete picture of the views of these vital groups in making such decisions. This would also allow exploration of any perceived benefits and concerns that these groups have with regards to Ambulatory Care services, which may be different to those raised by staff members, and could help improve communication around these decisions in practice. It would be of benefit for such interviews to include people who did and did not have experience of Ambulatory Care services, to allow investigation of whether views are different between these groups, and whether experience of a service reduces any concerns raised by those without experience of this service type. Additionally, interviews conducted with other healthcare professionals involved in these decisions, based in the same clinical areas as the physiotherapists in this study, and including both services making and receiving referrals, would be of benefit. They may capture the process, considerations and opinions of the wider multi-disciplinary team, in order to feed into a wider understanding of how these decisions are made, and how appropriate referrals to Ambulatory Care and Hospital at Home type services may be increased.

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APPENDICES

Appendix 1: Questionnaire ‘Lottery Sets’ for quantitative study

Please follow the instructions below and answer the following 6 series’ of questions.

For each one, remember that there are no right or wrong answers, it is your personal choices that we are interested in.

1) Questions about financial risk, with ambiguity

For each of the following questions, please select whether you would choose option A or option B, by selecting the relevant box. Option A guarantees £7 in each case; Option B has an unknown chance of a lower or higher amount, which differs each time.

For example, in question 1, option A guarantees you £7, while option B gives you an unknown chance of getting either £2 or £11 (indicated by ?%).

Question	Option A	Option B	Your Choice
1	Guaranteed £7	?% chance of £2 and ?% chance of £11	A or B ☐ ☐
2	Guaranteed £7	?% chance of £2 and ?% chance of £12	A or B ☐ ☐
3	Guaranteed £7	?% chance of £2 and ?% chance of £13	A or B ☐ ☐
4	Guaranteed £7	?% chance of £2 and ?% chance of £14	A or B ☐ ☐
5	Guaranteed £7	?% chance of £2 and ?% chance of £16	A or B ☐ ☐
6	Guaranteed £7	?% chance of £2 and ?% chance of £18	A or B ☐ ☐
7	Guaranteed £7	?% chance of £2 and ?% chance of £20	A or B ☐ ☐

2) Questions about financial risk, with ambiguity (higher payoffs)

For each of the following questions, please select whether you would choose option A or option B, by selecting the relevant box. Option A guarantees £70 in each case; Option B has an unknown chance of a lower or higher amount, which differs each time.

For example, in question 1, option A guarantees you £70, while option B gives you an unknown chance of getting either £20 or £110 (indicated by ?%).

Question	Option A	Option B	Your Choice
1	Guaranteed £70	?% chance of £20 and ?% chance of £110	A or B ☐ ☐
2	Guaranteed £70	?% chance of £20 and ?% chance of £120	A or B ☐ ☐
3	Guaranteed £70	?% chance of £20 and ?% chance of £130	A or B ☐ ☐
4	Guaranteed £70	?% chance of £20 and ?% chance of £140	A or B ☐ ☐
5	Guaranteed £70	?% chance of £20 and ?% chance of £160	A or B ☐ ☐
6	Guaranteed £70	?% chance of £20 and ?% chance of £180	A or B ☐ ☐
7	Guaranteed £70	?% chance of £20 and ?% chance of £200	A or B ☐ ☐

3) Questions about health risk, with ambiguity

Please imagine that you have a health condition which stops you from working / doing your normal daily activities. You have 2 treatment options – Treatment A guarantees full recovery for 70 days, Treatment B gives an unknown chance of 2 recovery periods, which vary in each question. For each of the following questions, please select whether you would choose option A or option B, by selecting the relevant box.

For example, in question 1, treatment A guarantees 70 days of full health, while treatment B gives you an unknown chance of either 20 days of full health or 110 days of full health (indicated by ?%).

When the treatment is finished, you will go back to how you are at the moment, regardless of which treatment option you choose, and there will be no further treatment.

Question	Treatment A	Treatment B	Your Choice
1	Guaranteed 70 days in full health	?% chance of 20 days in full health and ?% chance of 110 days in full health	A or B ☐ ☐
2	Guaranteed 70 days in full health	?% chance of 20 days in full health and ?% chance of 120 days in full health	A or B ☐ ☐
3	Guaranteed 70 days in full health	?% chance of 20 days in full health and ?% chance of 130 days in full health	A or B ☐ ☐
4	Guaranteed 70 days in full health	?% chance of 20 days in full health and ?% chance of 140 days in full health	A or B ☐ ☐
5	Guaranteed 70 days in full health	?% chance of 20 days in full health and ?% chance of 160 days in full health	A or B ☐ ☐
6	Guaranteed 70 days in full health	?% chance of 20 days in full health and ?% chance of 180 days in full health	A or B ☐ ☐
7	Guaranteed 70 days in full health	?% chance of 20 days in full health and ?% chance of 200 days in full health	A or B ☐ ☐

4) Questions related to financial risk

For each of the following questions, please select whether you would choose option A or option B, by selecting the relevant box. Option A guarantees £7 in each case; Option B gives a 50/50 chance of differing amounts each time.

For example, in question 1, option A guarantees you £7, while option B gives you a 50/50 chance of getting either £2 or £11.

Question	Option A	Option B	Your Choice
1	Guaranteed £7	50% chance of £2 and 50% chance of £11	A or B ☐ ☐
2	Guaranteed £7	50% chance of £2 and 50% chance of £12	A or B ☐ ☐
3	Guaranteed £7	50% chance of £2 and 50% chance of £13	A or B ☐ ☐
4	Guaranteed £7	50% chance of £2 and 50% chance of £14	A or B ☐ ☐
5	Guaranteed £7	50% chance of £2 and 50% chance of £16	A or B ☐ ☐
6	Guaranteed £7	50% chance of £2 and 50% chance of £18	A or B ☐ ☐
7	Guaranteed £7	50% chance of £2 and 50% chance of £20	A or B ☐ ☐

5) Questions related to financial risk (higher payoffs)

For each of the following questions, please select whether you would choose option A or option B, by selecting the relevant box. Option A guarantees £70 in each case; Option B gives a 50/50 chance of differing amounts each time.

For example, in question 1, option A guarantees you £70, while option B gives you a 50/50 chance of getting either £20 or £110.

Question	Option A	Option B	Your Choice
1	Guaranteed £70	50% chance of £20 and 50% chance of £110	A or B ☐ ☐
2	Guaranteed £70	50% chance of £20 and 50% chance of £120	A or B ☐ ☐
3	Guaranteed £70	50% chance of £20 and 50% chance of £130	A or B ☐ ☐
4	Guaranteed £70	50% chance of £20 and 50% chance of £140	A or B ☐ ☐
5	Guaranteed £70	50% chance of £20 and 50% chance of £160	A or B ☐ ☐
6	Guaranteed £70	50% chance of £20 and 50% chance of £180	A or B ☐ ☐
7	Guaranteed £70	50% chance of £20 and 50% chance of £200	A or B ☐ ☐

6) Questions related to health risk

Please imagine that you have a health condition which stops you from working / doing your normal daily activities. You have 2 treatment options – Treatment A guarantees full recovery for 70 days, Treatment B gives a 50/50 chance of 2 recovery periods, which vary in each question. For each of the following questions, please select whether you would choose option A or option B, by selecting the relevant box.

For example, in question 1, treatment A guarantees 70 days of full health, while treatment B gives you a 50/50 chance of either 20 days of full health or 110 days of full health.

When the treatment is finished, you will go back to how you are at the moment, regardless of which treatment option you choose, and there will be no further treatment.

Question	Treatment A	Treatment B	Your Choice
1	Guaranteed 70 days in full health	50% chance of 20 days in full health and 50% chance of 110 days in full health	A or B ☐ ☐
2	Guaranteed 70 days in full health	50% chance of 20 days in full health and 50% chance of 120 days in full health	A or B ☐ ☐
3	Guaranteed 70 days in full health	50% chance of 20 days in full health and 50% chance of 130 days in full health	A or B ☐ ☐
4	Guaranteed 70 days in full health	50% chance of 20 days in full health and 50% chance of 140 days in full health	A or B ☐ ☐
5	Guaranteed 70 days in full health	50% chance of 20 days in full health and 50% chance of 160 days in full health	A or B ☐ ☐
6	Guaranteed 70 days in full health	50% chance of 20 days in full health and 50% chance of 180 days in full health	A or B ☐ ☐
7	Guaranteed 70 days in full health	50% chance of 20 days in full health and 50% chance of 200 days in full health	A or B ☐ ☐

Appendix 2: Patients’ and carers’ spontaneous comments when completing questionnaire study

Patient and Carer comments while completing questionnaire study

- Some patient participants provide more context for answers when answering questions
- Participant 66337166 (patient) reports that they like to gamble on horse-racing, therefore liked to take the gambles when odds were unknown, but felt that 50:50 odds were not very good, so took the certain money more often when known; but had previously had a health experience (taking a risky option which paid off) that meant they would always chose to ‘take the gamble’ when faced with health choices
- Participant 66344488 (patient) – reported that having taken the first definite financial amount (e.g. £70), they were happier to take the gambles, as it was adding to the amount that they already had. Participant reported being less willing to take a gamble with the health lotteries, as this meant they had a guaranteed amount of time they could continue working. Note that this participant started questionnaires, was seen by clinical team, then returned to continue & complete questionnaire
- Participant 66390408 (patient 37) comments while doing questionnaire – took the gambles on financial lotteries, because ‘it’s free money, may as well take the risk’; more cautious re. health options, which participant reported having been influenced by having to attend the hospital today (made them more cautious / more aware of importance of having your health)
- Participant 66488269 (patient) reported that their choices re. finance were based on the idea of donating the money they got, therefore chose the guaranteed options each time because this could be given to someone ‘to get a couple of meals, or to pay the electric’
- Participant 66950053 (patient) said when asked health questions “I can’t stand being sick”, therefore consistently chose the option that may lead to more healthy days
- Participant 66988067 (patient) reported that as they were due to be paid the day after when they were completing the questionnaires, this was having an impact on their financial decisions. In discussion with researcher after completing the questionnaires, participant agreed that the idea of poor health, and it impacting life, is harder to imagine when not that unwell. Participant reported that when considering health questions they were ‘thinking about what [they] could do with that time’
- Participant 67086948 (patient) reported having had to make significant health decisions that were similar to the odds given in health lotteries, and having chosen the more sure option, although this had not worked as well as hoped. This experience therefore influenced making decisions in health lotteries
- Potential patient participant agreed to complete questionnaire on [date] (F, 84-95), but could not progress with answering lottery questions, as she reported that she would be very dubious of anyone offering money, as she would be concerned that it was a scam, and therefore would not choose to accept either amount of money
- Participant 67437572 (patient) when considering the health lotteries was talking through some of her reasoning aloud, and concluded that ‘if it is serious I wouldn’t take the risk [i.e. take guaranteed option], if it wasn’t so serious I’d take the second option [i.e. the risk]’ (this is paraphrased, as it is written in retrospect). When researcher clarified that the imaginary health condition would be enough to stop her working / completing housework / doing

activities she enjoyed, participant indicated that this would therefore be considered ‘serious’ and she made decisions based on this

- Participant 67435299 (patient) was speaking some of her reasoning aloud when considering the health lotteries, mainly to herself as opposed to explaining to researcher, but from this researcher was able to determine that participant was considering main symptom from imaginary health condition that was limiting activities to be pain, and that this was the basis on which she was making decisions
- A few patient participants have said / indicated when asked the first health lottery question that they do not really have to imagine a health condition that is having this negative impact on their life, as the reason that they are in [department name] fits the description, therefore they are likely, at least in part, basing their decisions on the symptoms / experience they have at the time of being asked the questions, as opposed to an imaginary one
- Participant 67492410 (patient) reported that they will generally prefer to take risks in life, because you may get the higher amount (in the context of the lotteries)
- Participant 67500155 (patient) spontaneously reported that they did not tend to gamble, as they had been told as a child not to by their grandfather, and generally stuck to that ever since
- Participant 67605624 (patient) said a few times [during study completion] that they did not like gambling / would always take the certain option
- Potential participant [initials] (on [date]) agreed to participate and completed demographics and lotteries 1 & 2, but declined to answer lottery 3 (health / treatment choice lottery), therefore withdrew from participating
- Participant 67949325 (patient) while answering the financial questions in lottery 1 said that they had been brought up / taught to believe that “money isn’t everything”, and later picked option B in financial lotteries saying ‘you get a surprise then’ (paraphrased)
- Participant 67950631 (patient) on hearing the first lottery options (in lottery 1) spontaneously reported that they ‘like to take a bit of a risk’ (paraphrased)
- Participant 67990772 (carer) when first considering the health lottery (lottery 3) said “you’ve primed me with the money ones” when considering this, but also felt that it was harder to choose options regarding the health choices than the financial ones
- Participant 67993190 (patient) was making choices in health lotteries (lottery 3 & 6) on the basis of looking for other treatment after having the treatment offered by option A or B
- A patient in AMAA waiting room declined to participate in questionnaire study, but after hearing what the project was about she spontaneously reported that her biggest concern in deciding where she would choose to receive healthcare is that it is close to home, and not a really long way away
- Participant 68520071 (carer) reported not generally being ‘a gambler’ / not tending to take risks. They were surprised / interested that they chose to take a risk more frequently with the health questions (identified this themselves, not prompted by researcher) than the financial ones, and explained it as taking the chance that you may get the higher amount of time
- Participant 68670595 (patient) reported that they selected the risky options for all the health lotteries because ‘there’s always research going on that can help’ (paraphrased), and they wanted to support this, for the possibility of progress in medicine / treatment options

- Participant 68704253 (patient) when asked the health lottery question, reported that the ‘imaginary health problem’ was a similar situation to what had led to them presenting to [department name] on the day that they completed the questionnaire
- Participant 69003004 (patient) reported that they had always been happy to take more of a risk with money, therefore chose option B each time, but less willing to take a risk with health, especially as they have a child / children and therefore would prefer the known amount of time in good health
- Participant 69031655 (patient) reported that they are ‘not struggling for money’, therefore chose the guaranteed option on financial lotteries. Answers on health lotteries informed by experience of a relative (in-law) having dementia, and therefore this participant saying that they would rather have a known period of health before becoming more unwell / ‘going with dignity’, than risk being unwell, especially with significant cognitive decline, for a prolonged period
- Participant 69049464 (patient) discussed what they thought the findings would be from the study. They felt that it is likely that younger people will be more ‘money-orientated’ than ‘health-orientated’, and that older people will be more ‘health-orientated’ than ‘money-orientated’, with a minority in each group who are the opposite. This participant was categorising themselves in the ‘older’ group, and saying that they were more willing to take a chance with money, but not with health, so were ‘health-orientated’. They also said that they were not normally a gambler, and had never actually gambled in their life. Participant reported that they felt that they had “always been working class” but had enough money, which was contributing to their decisions in the financial lotteries, but that amount of money that one has would / may influence your decisions, and gave the examples of their adult sons, who both work in high-paying jobs.
- Participant 69102798 (patient) reported that they chose guaranteed options on health lotteries because they weren’t willing to take a risk with health, and wanted the longest possible time, but was not willing to take the chance of only having 20 days. Also reported that they were not generally a gambler (e.g. with financial lotteries), therefore only chose riskier option on last of each financial lotteries to ‘have a flutter’
- Participant 69116869 (patient) picked to take the risk on questions 3 and 6 of lottery 1 on the basis of ‘third time lucky’, and reported that they play bingo, so are willing to take some gambles. This participant found the health questions much more difficult to decide on an answer than the financial ones – they asked if they could skip those questions, and were advised that they could, if they withdrew from the study, therefore participant chose to continue, choosing the guaranteed days as this was less of a risk
- Participant 69238011 (carer) reported not generally being a gambler, partially because they never think that they will win, which influenced decisions in all lotteries in questionnaire. Re. health lotteries: participant reported that they ultimately chose the guaranteed option each time because they would be so anxious about day 21 (i.e. the day where they would find out whether they were going to become unwell again or get the longer period of good health) that this may / would undermine the potential benefit and/or could make them more unwell, also participant reported that “knowing my luck I would get the 20 days”. Participant spontaneously reported that they thought that emotion / how they felt at the time of being faced with the options, would influence their choices, such that they may answer differently if they were in a different mood when asked the same questions. Participant also specifically

said that knowing the chances in lotteries 4 & 5 were 50:50 made a difference to the choices they made

- Participant 69414412 (patient) chose certain option every time, as they reported that they preferred to know what they were getting, “it’s not worth it otherwise” (i.e. not worth taking the risky option)
- Participant 69512852 (patient) indicated in discussion that they have a distrust of medicine and the medical research process, etc. They reported that they had made their choices in lotteries 1-3 on the basis of the odds in each option B being 50:50
- Participant 69771468 (patient) reported choosing option A in lotteries because “I’m unlucky”, and therefore feeling that they would probably get the lower amount in the risky options
- Participant 69772118 (patient) reported choosing option A in financial lotteries because “I started without anything, so any extra is good” (paraphrased), although they then changed to taking the risky options on other financial lotteries. Participant made choices that they did in health lotteries (option B throughout) because “you have to think about health differently” and wanted the chance of longer in good health
- One participant specifically said that they struggled to understand written English, but could understand & speak spoken English. This means that they were still eligible, but I thought that it might be helpful to justify why we said eligibility was based on ability to understand written OR spoken English
- Participant 69778200 (patient), in discussion about my PhD, was discussing the additional challenges that COVID has introduced to decision-making in healthcare, as people have to make decisions on their own (i.e. people cannot have anyone with them to support their decision-making). This participant therefore said that they ultimately made their decision based on advice of doctors when asked what they would advise their daughter if she were in the same situation
- Participant 69783075 (patient) struggled to answer health lotteries initially, as they were considering their own previous (significant) diagnosis, which would require multiple treatments to manage, therefore neither option A or B would have been acceptable. Therefore tried re-framing question by suggesting it as specific symptoms (e.g. pain, dizziness), but participant still felt that neither option was ‘choose-able’, because you would want a permanent solution to symptoms. Therefore re-framed as delaying onset of symptoms by time periods presented in options, and participant felt able to answer when framed this way. Note: researcher did make clear that participant could choose to not answer health lottery questions and withdraw from study. Re. financial lotteries: participant expressed the opinion that they felt that, although you cannot live without money, you do not need loads of it, and it can be more useful if donated to charity or others who need it, therefore they were willing to choose option B, which gave the option of a higher amount although the smaller amount was possible. Participant also reported that they generally have a positive attitude, and therefore thought that it was likely / possible that they would get the higher amount in the risky options
- Participant 69807203 (patient) reported that they used to be a physio assistant, prior to stopping work when children were born. This participant also reported that they were aware their choices in the lotteries were “random” / they deliberately alternated between option A and B in some lotteries / did not want to take too much risk, therefore chose option B for one choice in one lottery, but then swapped back to option A.

- Participant 69818035 (patient) reports that they are a student as well, therefore happy to participate. Participant reported that they were “playing it safe” when choosing option A a lot

Appendix 3a: Staff demographics questions

Risk Preferences in Acute Medical settings

Thank you for agreeing to complete this questionnaire, which forms part of a research project being undertaken at the University of Birmingham by Ciara Harris.

Please be aware of the following:

- Completion of this questionnaire is **voluntary** – you do not have to complete it
- Your answers are **anonymous** – you cannot be identified from your answers
- Your answers are **confidential** – only the researcher will know what answers you give

If there is anything that you would like to ask, please feel free to ask the researcher at any time.

Section 1: Background

Please answer the following questions

What gender do you identify as?

Male   Female   Other   Prefer not to say

What is your current job role?

Doctor (please indicate speciality):

Consultant   Registrar   Speciality Trainee   FY1/FY2

Therapist or Nurse:

Physio   OT   Nurse   Other (please specify):

Band 8 (or above)   Band 7   Band 6   Band 5

If Physio: Would you be willing to be contacted regarding being interviewed for a second component of this study? If yes, please provide contact details (e.g. email address or telephone number)

Number of years working since qualification?

15+ 11 - 14 6 - 10 2 - 5 Less than 2

Previous clinical experience:

(Please indicate how many years / months you have worked in Ambulatory Care or Front-Door services, and please indicate any other clinical areas in which you have worked for a significant period of time)

Type of service that you currently work in:

Ambulatory Care Front-Door Unit

[<u>Ambulatory Care</u> = service which replaces at least a portion of inpatient care episode, with a stay elsewhere, often in patient's own home (e.g. Hospital at Home, Early Supported Discharge, Ambulatory Care unit);

<u>Front- Door Unit</u> = short stay unit / area which patients are admitted to following unplanned presentation, where they receive care and are discharged in a short time period, often a maximum of 72 hours (e.g. acute medical unit, emergency department observation unit)]

Appendix 3b: Patient and Carer demographics form

Risk Preferences in Acute Medical settings

Thank you for agreeing to complete this questionnaire, which forms part of a research project being undertaken at the University of Birmingham by Ciara Harris.

Please be aware of the following:

- Completion of this questionnaire is **voluntary** – you do not have to complete it
- Your answers are **anonymous** – you cannot be identified from your answers
- Your answers are **confidential** – only the researcher will know what answers you give

If there is anything that you would like to ask, please feel free to ask the researcher at any time.

Section 1: Background

Please circle the correct response.

What gender do you identify as?

Male	Female	Other	Prefer not to say

Which age category are you in (years)?

16-20	21-30	31-40	41-50	51-60	61-64
65-74	75-84	85-94	95 and over		

What is your ethnicity?

White:

British	Irish	Gypsy or Irish Traveller

Any other White background

Mixed / Multiple ethnic groups:

White and Black Caribbean   White and Black African   White and Asian

Any other Mixed / Multiple ethnic background

Asian / Asian British:

Indian   Pakistani   Bangladeshi   Chinese

Any other Asian background

Black / African / Caribbean / Black British:

African   Caribbean   Any other Black / African / Caribbean background

Other ethnic group:

Arab   Any other ethnic group

Prefer not to say

What type of service are you using?

Ambulatory Care   Front-Door unit

Are you a patient or a carer (during this episode of care)?

Patient   Carer

If patient: Would you be willing to be contacted regarding being interviewed for a second component of this study? If yes, please provide contact details (e.g. email address or telephone number)

Appendix 4a: Physiotherapist interview topic guide

Interview Schedule – Physios & Risk

Introduce self, explain nature of study and ensure that consent form has been signed:

Hi, my name is …

Thank you for agreeing to meet with me today.

You kindly agreed to be interviewed for this study, which is looking at how physiotherapists view risk, in particular when thinking about admit/discharge decisions, so I am going to ask you some questions about your thoughts and experiences of that today. It should take around 30 minutes, but please remember that if at any point you wish to stop the interview you can ask to do so. There are no 'right' or 'wrong' answers, we are aiming to gain an understanding of how physiotherapists manage these situations, so we just want to know your thoughts and experiences.

Just to remind you, as you signed on the consent form, your name won't be used and you will not be personally identifiable in the data or any publications, and the specifics of what we talk about today will only be accessible to me and other members of the research team. The only instance where this would be different is in the very unlikely event of a disclosure of actions that could be considered harmful to a patient, in which case I would have a professional responsibility to share this. Also remember, you can request that the interview stops at any time if you wish to do so.

Ensure the recorder and microphone are working correctly.

I am going to read out your ID number for the study, so that the interview remains anonymous, before we start.

Read out participant ID number and date.

1. Can you please tell me a bit about your professional background / experience?

   Prompts: How long have you been qualified? What clinical areas have you worked in previously, since qualifying? How long have you worked in your current team / area?

2. Can you tell me about the role of risk in your current job?

   Prompts: Do you think taking risks is an important part of a physio's job? Why / Why not? Can you give me any examples of where a physio takes risks in their job? Do you think physios have a different view towards risk compared to other healthcare professionals? Can you give me any examples? Whose responsibility do you feel it is to take risks or make decisions about risk?

3. When you are considering whether to discharge a patient, what factors contribute to this decision?

   Prompts: What information do you find useful / do you like to have to inform this decision? Is there anything in particular that would mean you would not send a patient home? Do you have any options other than admission to hospital or discharge to the patient's home? What criteria do you use to determine whether to use those other options? Are there any institutional factors that impact on your decision-making? What do you think is the most important factor in your decision about whether or not to discharge a patient?

4. Can you tell me about a difficult situation / difficult situations you face in your job where risk has been an issue?

   Prompts: How do you manage 'difficult' situations – e.g. a situation where you do not feel a patient is safe to go home, but the patient is adamant that they will not be admitted / will not go to rehabilitation? Or the opposite, where you (and the rest of the MDT) feel that a patient can go home, but the patient and/or family disagree? Have you faced any other 'ethical dilemmas' when considering patients' location of care, and how did you manage them? Do you think that 'bad experiences' (e.g. where the outcome of one of the scenarios you have talked about has been bad) impact on your future decision-making? If yes – in what way?

5. Vignette: *[see separate document]*

   Prompts: How would you manage this if the patient did have capacity? If the patient did not have capacity? If the patient's family were the ones who would not accept admission or rehab? If the patient and/or family had been told by another member of the MDT that they could go home, but you disagree? How would you manage the opposite situation – where you (and the rest of the MDT) feel that a patient can go home, but the patient and/or family disagree? …

6. Is there anything that you think would be likely to encourage you to discharge more people to Ambulatory Care services?

   Prompts: Interviewer to describe / define what is meant by Ambulatory Care in this context. What information would you like to have to make you more confident in referring patients to AC instead of admitting them? Is there anything that would make you not want to refer patients to AC? Aim to gain information on practical aspects – e.g. service availability, referral pathways, etc., and on internal motivators – e.g. teaching on benefits of AC, confidence to take the decision, etc.

We have discussed x, y and z, is there anything else that you would like to ask or add, that we have not already discussed?

Thank you very much for your time, that is the end of the interview.

End of interview

Information re. 'Ms H' for vignette question (question 5)

Name:	Ms H
Age:	70 years old
Housing:	Lives alone, in a house with stairs
Family Support:	1 daughter, who lives nearby but works full time
Daily Activities:	Does her own shopping, cooking and housework. Visits her friends nearby independently
Usual Health:	Normally fit and well
Current Health:	Has community acquired pneumonia, for which she needs treatment. This treatment could be provided while she stays at home, or she could be admitted to the hospital for treatment. Either treatment option will require approximately 7 days of healthcare input.

Appendix 4b: Patient interview topic guide

Interview Schedule – Patients & Risk

Introduce self, explain nature of study and ensure that consent form has been signed:

Hi, my name is …

Thank you for agreeing to meet with me today.

You kindly agreed to be interviewed for this study, which is talking to people who have been treated in NHS ‘front door’ or ambulatory care services. These are the areas of the hospital where patients may go for a relatively short time (usually no more than a few days) after being in the emergency department, before they can go home, or where patients receive care instead of being admitted to the hospital overnight. Since some people feel that there are different levels of risk in healthcare being delivered in different places, we are also interested in your views about risk.

This study is considering how patients treated in these services make decisions about where they receive care and how they view risk, especially when thinking about those decisions, so I am going to ask you some questions about your thoughts and experiences of that today. It should take around 30 minutes, but please remember that if at any point you wish to stop the interview you can ask to do so. There are no ‘right’ or ‘wrong’ answers, we are aiming to gain an understanding of how people think about, and are involved in, making decisions about their own healthcare, including how they see risk, so we just want to know your thoughts and experiences.

Just to remind you, as you signed on the consent form, your name won’t be used and you will not be personally identifiable in the data or any publications, and the specifics of what we talk about today will only be accessible to me and other members of the research team. Also remember, you can request that the interview stops at any time if you wish to do so.

Ensure the recorder and microphone are working correctly.

I am going to read out your ID number for the study, so that the interview remains anonymous, before we start.

Read out participant ID number and date.

1. Can you tell me about your experience of your last [or current, if being interviewed during admission] visit to the hospital, after you were seen in the emergency department?
    Prompts: if you are happy to, could you tell me a bit about where you were seen? Did you feel that you were able to make your views clear, about any concerns and where you wanted to be treated? If there was anyone accompanying you, such as a friend or relative, could they contribute to the discussions?

2. Thinking about that same visit, when you were last in hospital, can you tell me about how decisions were made about where you were treated?

   Prompts: Was the decision discussed? Who was involved in the decision / discussion (patient, doctors, nurses, therapists, other staff, family, friend, etc)? Did you have a preference about whether to be treated in the hospital or at home?
   If yes - Can you tell me why you had that preference? Do you feel that your views were listened to?
   Did you have any concerns about being admitted / being sent home?
   If Yes - Do you think you would still have those concerns if the same thing happened again? Why / why not?
   If No – Do you think you would have any concerns if the same thing happened again? Why / why not?

3. I am going to tell you about an imaginary patient, and then ask you a little about where you think they should receive healthcare. I would like you to please imagine a woman, named Ms H, who is 70 years old, who has come to the hospital with a chest infection. She normally lives on her own, and manages her own shopping and housework. She has a daughter who lives nearby, but who works full time. Apart from the chest infection, she is otherwise fit and well. Ms H could either be admitted to the hospital for treatment, or she could be treated at home. Either treatment option would last approximately 7 days.
   Do you think Ms H will recover best at home, or in the hospital?

   Prompts: Can you tell me why you think that? Are there any particular concerns you would have about Ms H being treated in hospital / at home? Is there anything that would make you change your mind (e.g. different health condition, different baseline functional level, different level of family support, etc)? Is there anything else that you would like to know about Ms H, which may have influenced your decision?

4. I mentioned to you at the beginning that I would like to ask you a bit about risk, and I would like to do this now, if that is alright with you. Can you tell me about how comfortable you feel you are with risk?

   Prompts: Do you think that risk plays a role in your life? Are there different areas of your life where you think about risk more (e.g. health, finance, mobility, etc)? Can you give me any examples? Do you think that anything in particular has influenced how you think / feel about risk in your life?

We have discussed x, y and z, is there anything else that you would like to ask or add, that we have not already discussed?

Thank you very much for your time, that is the end of the interview.

End of interview

Appendix 5a: Physiotherapist Participant Information Sheet – Interview study

Participant Information Sheet – Staff

We would like to invite you to participate in an interview-based research study, but before you decide whether or not to do so, it is important that you read the information below. Please feel free to discuss this with others, if you wish to do so, and to ask us any questions you may have.

Title of Project: *Qualitative investigation of physiotherapists' and patients' perceptions of, and attitudes towards, risk and decision-making, in an Ambulatory Care and Front-Door setting*

What is the purpose of this study?

This study is investigating how physiotherapists who work in front-door and/or ambulatory care services make decisions (especially around discharge and location-of-care) and manage risk as part of their job. Front-door services are defined as those where patients are first admitted following unplanned presentation, where they receive care and are discharged within a short time (typically a maximum of 72 hours), they may include acute medical units and emergency department observation units. Ambulatory Care services are defined as those providing care in a service which replaces at least a portion of the inpatient care episode with a stay elsewhere (typically the patient's home), they may include Hospital at Home, Early Supported Discharge and ambulatory care units.

The aim of the study is to gain a greater understanding of how physiotherapists working in these services make these decisions, and their attitudes towards risk, in the context of their work. There is another arm of the study investigating patient views on similar topics.

What will I have to do?

If you choose to participate, you will be invited to take part in an interview, which can be over teleconferencing or the telephone, in line with all relevant social distancing requirements at the time of the interview. If it is not possible for you to participate via teleconferencing or telephone, the interview may be conducted face-to-face, employing all relevant social distancing and PPE as required at the time of the interview. The interview will be with Ciara Harris (a physiotherapist and the lead researcher on this PhD project), and will last approximately 30-45 minutes. You will also be asked for some demographic information about yourself, but you will have the option of answering 'prefer not to answer' for each of these questions. The interview will be audio recorded, for later transcription and analysis. The date and time of the interview will be discussed with you, to find a time that is convenient for you. You are free to stop or pause the interview at any time. It is possible that after completing the interview you may be asked to take part in a second interview, if there is anything from the first interview that would benefit from being followed up, however you can choose not to take part in a second interview.

Why have I been invited to take part?

You have been invited to take part in this study because you are a physiotherapist and work in a front-door or Ambulatory Care unit in the NHS, and make (or advise on) decisions about patients' location of care and discharge.

Do I have to take part?

No. It is up to you whether you take part or not, participation is entirely voluntary. If you do agree to take part, you can choose to withdraw at any time during the interview, or up to seven days after it by contacting the researcher. If you do decide to withdraw during the interview, you will be asked whether the components of the interview that have already been recorded can be kept as data, you are free to decide whether or not you would be happy with this.

Are there any disadvantages or risks to taking part?

We believe that there are minimal risks to participating in this study. The interview will be conducted at a time that suits you, as we understand that you have multiple time commitments, and you are free to withdraw at any time during the interview or for seven days afterwards. It is possible that you may experience strong emotions during the interview, in discussing challenging situations you have faced professionally. As well as the option to withdraw from the study, you would also be able to request that the interview is paused, and re-started when you feel ready.

What are the benefits to taking part?

If you wish to receive a certificate of participation, you will have an opportunity to indicate this at the end of the questionnaires. It is also hoped that the results of this study will ultimately improve patient care, in the future.

What will happen to my data?

We (University of Birmingham, the study sponsor) will need to use information from you for this research project. This information will include your gender (which you will have the option to not disclose) and job role. People will use this information to do the research or to check your records to make sure that the research is being done properly.

People who do not need to know who you are will not be able to see your name or contact details. Your data will have a code number instead, which will be assigned when you enrol in the study, and will be used to identify you throughout the study, instead of using your name or any other personally identifiable information. We will keep all information about you safe and secure. The only time that we would share any identifiable information is in the unlikely event of a disclosure of unsafe clinical practice, in which case the research team would be obligated to report this to appropriate authorities. The recording of the interview will be securely stored on university servers, as will the transcript of the interview. Audio recordings of the interview will be deleted 7 days after transcription, to allow the researcher to check the accuracy of the transcription against the recording. If you completed the consent form on paper this will be stored securely, in line with University of Birmingham policies, for 10 years, following which they will be securely destroyed. If you completed the consent form via recorded verbal consent, the recording of consent will be separate to the main interview recording and will be stored securely, until data collection and analysis is complete, following which they will be securely destroyed.

Once we have finished the study, we will keep some of the data so we can check the results. We will write our reports in a way that no-one can work out that you took part in the study. The electronic data will be stored for 10 years, using the University of Birmingham secure data storage service, then securely destroyed. Members of the research team will have access to this data. Since we need to manage your records in specific ways for the research to be reliable, we won’t be able to let you see or change the data we hold about you. You can find out more about how we use your information by asking one of the research team or contacting us on the details given below. Information is also available at www.hra.nhs.uk/information-about-patients/

The University of Birmingham is the sponsor of this research, and has in force a Public Liability Policy and/or Clinical Trials policy which provides cover for claims for "negligent harm" and the activities here are included within that coverage. These insurance and indemnity arrangements are in place to ensure any issues that arise due to the design or conduct of the research are addressed. If you do have any concerns about this, please contact the research team, on the details provided below, in the first instance.

What will happen to the results of the study?

This study forms part of a PhD project, so the results will be presented as part of a PhD thesis at the University of Birmingham. It is also hoped that the results of this study will be published in scientific journals. Additionally, the results may be presented in other formats, such as at scientific conferences. If you wish to see a copy of the published results, please email the research team, using one of the email addresses provided below, and these could be sent to you. You will not be identifiable in any publication or presentation of the results of this study.

How to contact us

If you would like any further information, please contact Ciara Harris (PhD student) by email at [redacted] or by telephone at [redacted]

If you have any complaints or concerns regarding this research, you can contact the PALS team in your NHS Trust (____________), or Ciara Harris' supervisor at the University of Birmingham, Professor Greenfield, by email at [redacted]

Thank you for taking the time to read this information and please feel free to ask any questions you may have

Appendix 5b: Patient Participant Information Sheet – Interview study

Participant Information Sheet – Patients

We would like to invite you to participate in an interview-based research study, but before you decide whether or not to do so, it is important that you read the information below. Please feel free to discuss this with others, if you wish to do so, and to ask us any questions you may have.

Title of Project: *Qualitative investigation of physiotherapists' and patients' perceptions of, and attitudes towards, risk and decision-making, in an Ambulatory Care and Front-Door setting*

What is the purpose of this study?

This study is investigating how patients who are treated in specific NHS services, such as the one you are being treated in, are involved in decisions about where they receive healthcare, and how they decide where they would prefer to be treated, as well as their views about risk. The aim of this study is to gain a better understanding of how patients feel about risk and how decisions about where people receive healthcare are reached. There is another arm of the study investigating physiotherapist views on similar topics.

What will I have to do?

If you choose to participate, you will be invited to take part in an interview about your experiences in those NHS services, which can be done using teleconferencing (such as skype) or the telephone, in line with all relevant social distancing requirements at the time of the interview. If it is not possible for you to participate via teleconferencing or telephone, the interview may be conducted face-to-face, employing all relevant social distancing and PPE as required at the time of the interview. The interview will be with Ciara Harris (a physiotherapist and the lead researcher on this PhD project), and will last approximately 30 minutes, at a time that is convenient for you. You will also be asked a small number of background questions about yourself (your gender, age group, etc), some of which provide a 'prefer not to answer' option, this data will not be sufficient to identify you individually. The interview will be audio recorded, for later transcription and analysis. You are free to stop or pause the interview at any time. It is possible that after completing the interview you may be asked to take part in a second interview, if there is anything from the first interview that would benefit from being followed up, however you can choose not to take part in a second interview.

Why have I been invited to take part?

You have been invited to take part in this study because you are a patient in one of the NHS services that we are interested in investigating. You are an adult, and can speak English for the interview.

Do I have to take part?

No. It is up to you whether you take part or not, and it will not have any impact on your clinical care whether you choose to participate or not. If you do agree to take part, you can choose to withdraw at any time during the interview, or up to seven days after it by contacting the researcher. If you do decide to withdraw during the interview, you will be asked whether the components of the interview that have already been recorded can be kept as data, you are free to decide whether or not you would be happy with this.

Are there any disadvantages or risks to taking part?

We believe that there are minimal risks to participating in this study, as it does not involve any alteration to your clinical care. It is possible that you may experience strong emotions during the interview, in discussing your experiences. As well as the option to withdraw from the study, you would also be able to request that the interview is paused, and re-started when you feel ready.

What are the benefits to taking part?

There are no direct benefits to you as a result of taking part in this research, but it is hoped that the results of this study will ultimately improve patient care, which may be beneficial to you or those you care about in the future.

What will happen to my data?

We (University of Birmingham, the study sponsor) will need to use information from you for this research project. This information will include your gender, age group and ethnicity. For most of these you will have the option to not disclose the information. People will use this information to do the research or to check your records to make sure that the research is being done properly.

People who do not need to know who you are will not be able to see your name or contact details. Your data will have a code number instead, which will be assigned when you enrol in the study, and will be used to identify you throughout the study, instead of using your name or any other personally identifiable information. We will keep all information about you safe and secure. The recording of the interview will be securely stored on university servers, as will the transcript of the interview. Audio recordings will be deleted 7 days after transcription, to allow the researcher to check the accuracy of the transcription against the recording. If you completed the consent form on paper this will be stored securely, in line with University of Birmingham policies, for 10 years, following which they will be securely destroyed. If you completed the consent form via recorded verbal consent, the recording of consent will be separate to the main interview recording and will be stored securely, until data collection and analysis is complete, following which they will be securely destroyed.

Once we have finished the study, we will keep some of the data so we can check the results. We will write our reports in a way that no-one can work out that you took part in the study. The electronic data will be stored for 10 years, using the University of Birmingham secure data storage service, then securely destroyed. Members of the research team will have access to this data. Since we need to manage your records in specific ways for the research to be reliable, we won't be able to let you see or change the data we hold about you. You can find out more about how we use your information by asking one of the research team or contacting us on the details given below. Information is also available at www.hra.nhs.uk/information-about-patients/

The University of Birmingham is the sponsor of this research, and has in force a Public Liability Policy and/or Clinical Trials policy which provides cover for claims for "negligent harm" and the activities here are included within that coverage. These insurance and indemnity arrangements are in place to ensure any issues that arise due to the design or conduct of the research are addressed. If you do have any concerns about this, please contact the research team, on the details provided below, in the first instance.

What will happen to the results of the study?

This study forms part of a PhD project, so the results will be presented as part of a PhD thesis at the University of Birmingham. It is also hoped that the results of this study will be published in scientific journals. Additionally, the results may be presented in other formats, such as at scientific conferences. If you wish to see a copy of the published results, please email the research team, using one of the email addresses provided below, and these could be sent to you. You will not be identifiable in any publication or presentation of the results of this study.

How to contact us

If you would like any further information, please contact Ciara Harris (PhD student) by email at [redacted] or by telephone at [redacted]

If you have any complaints or concerns regarding this research, you can contact the PALS team within the NHS Trust you are being treated in (___________), or Ciara Harris' supervisor at the University of Birmingham, Professor Greenfield, by email at [redacted]

Thank you for taking the time to read this information and please feel free to ask any questions you may have