UNDERSTANDING SELF-HARM AMONG LESBIAN, GAY, BISEXUAL, TRANSGENDER, QUEER AND QUESTIONING YOUNG PEOPLE

by

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ABSTRACT

Self-harm is recognised as a global health concern. Among LGBTQ+ young people, self-harm is particularly prevalent. While studies have investigated potential stressors which may relate to high rates of self-harm, there are still gaps in the literature. The purpose of this thesis was to conduct an in-depth exploration of the processes underlying self-harm among LGBTQ+ young people, thereby extending the understanding of self-harm within this population.

To do this, an exploratory, sequential, mixed-method approach was taken. This allowed for different methods to be used to better inform the overall research aim. The empirical studies were codesigned with the LGBTQ+ Advisory Group. This was to ensure that relevant and meaningful research was undertaken. Firstly, a systematic review of risk factors associated with LGBTQ+ young people with self-harm experiences was conducted. Key risk factors were meta-analysed to determine their prevalence within the population (Chapter 3). These results demonstrated a pooled prevalence of 36% victimisation and 39% for mental health difficulties within LGBTQ+ young people with experiences of self-harm. Furthermore, these key risk factors were greater than those calculated for heterosexual, cisgender counterparts (Victimisation OR=3.74; mental health difficulties OR=2.67).

Following this, perspectives of LGBTQ+ young people were explored. This was to determine what LGBTQ+ young people felt were underlying causes leading to their self-harm (Chapter 4). Using thematic analysis and member-checking a thematic framework was developed. This highlighted that self-harm was perceived to be related to i) young people struggling to process and understand their LGBTQ+ identity, ii) negative responses to being LGBTQ+ from others, and iii) life stressors. Across these two studies, mental health difficulties, bullying, stigma or discrimination, and internal perceptions of LGBTQ+ identity were highlighted as key experiences relating to self-harm.

Therefore, these were built into an experience sampling study (Chapter 5), a novel methodology exploring real-time monitoring of daily experiences. This was the first study ever to use experience sampling methods with LGBTQ+ young people who self-harm. The findings from this study indicate that such studies are feasible, acceptable, and worthwhile. Highlighting significant research, clinical, and ethical implications.

The overall findings from the thesis, indicate that there is a high degree of stigma and discrimination facing LGBTQ+ young people. These experiences may also be having negative consequences to the young people's perception of their own identity, which then further their self-harmful thoughts and behaviours. Further work is needed to identify the exact mechanisms to reduce the impact of these experiences. This thesis offers several theoretical enhancements and evidenced-based implications. The principle of theoretical extensions being: i) the Minority Stress Model, such that this is considered in relation to young people's experiences leading to self-harm and includes transgender and gender diverse accounts; and ii) the Integrated Motivational-Volitational Model, offering a specialised understanding of how LGBTQ+ young people may move through a pathway to self-harm. Furthermore, key implications offer insight into LGBTQ+ presentations to primary care settings may be managed, how experience sampling can be used to understand and track self-harm in the community, and how education can be used to reduce peer and family discrimination.

To conclude, this thesis offers a holistic understanding of how specific experiences underlying self-harm in LGBTQ+ young people, potentially explaining the high prevalence within this group. Through suggested implications, it is possible that self-harm and mental health difficulties more widely could be reduced in this population.

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AUTHOR CONTRIBUTION

All studies were proposed and managed by the author, Amy Jessica Williams (AJW) and supervised by Prof. Jon Arcelus (JA), Prof. Ellen Townsend (ET) and Dr Maria Michail (MM) (Chapters 3-5). All studies were conceptualised between AJW, JA, ET, and MM; (Chapters 3-5).

Study 1 (Chapter 3): AJW completed the study protocol which was reviewed by JA, ET and MM. Data was curated by AJW and extracted by AJW and Aikaterini Lazaridou (AL). Inclusion decisions were made by AJW, AL, and MM. Data was narratively analysed (AJW) and numerical analysed (AJW, Christopher Jones; CJ). The original paper drafts were completed by AJW, with CJ, JA, ET, and MM reviewing and editing the final draft.

Study 2 (Chapter 4): AJW devised the study protocol and obtained study ethics (ERN_19-1032) and was solely responsible for recruitment and data collection. Qualitative data analysed was conducted by AJW and JA. The original paper drafts were completed by AJW, with JA, ET, and MM reviewing and editing the final draft.

Study 3 (Chapter 5): AJW devised the study protocol, completed an Open Science protocol, obtained ethical approval (ERN_201745) and was responsible for recruitment, data collection and analysis. Write up was completed by AJW. JA, ET, and MM reviewed the final chapter draft.

PEER-REVIEW PUBLICATIONS FROM THIS THESIS

i) Chapter 3

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PAPERS CURRENTLY UNDER REVIEW

i) Chapter 5

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PRESENTATIONS RELATED TO THIS THESIS

i) Conference presentations (oral)

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Williams, A. Jess., Arcelus, J., Townsend, E., & Michail, M. Feasibility and acceptability of experience sampling methods among LGBTQ+ young people with experiences of self-harm and suicide. Society for Ambulatory Assessment 2021, online. 30th June 2021.

Williams, A. Jess., Arcelus, J., Townsend, E., & Michail, M. Feasibility and acceptability of experience sampling methods among LGBTQ+ young people with experiences of self-harm and suicide. Economic and Social Research Council Midlands Graduate School Conference online. 23rd June 2021.

Williams, A. Jess., Arcelus, J., Townsend, E., & Michail, M. Understanding self-harm and suicide in LGBTQ+ youth: A thematic analysis. International Network of Early Career Researchers in Suicide and Self-harm (netECR) E-Conference 2020, online. 27th November 2020.

Williams, A. Jess., Arcelus, J., Townsend, E., & Michail, M. Understanding causes of self-harm and suicide among LGBTQ+ young people: A qualitative study. 3rd International Social Work & Sexualities Conference: Laws, policies, guidelines and gender-sexuality identities, online. 26th November 2020.

Williams, A. Jess., Arcelus, J., Townsend, E., Lazaridou, A., & Michail, M. A systematic review examining risk factors for self-harm and suicide in LGBTQ+ young people. 30th World Congress of the International

Association for Suicide Prevention (IASP 2019), in Derry-Londonderry, Northern Ireland. 20th September 2019. Co-chair: *IASP19 Session LGBTQI*

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ii) Conference presentations (poster)

Williams, A. Jess, Arcelus, J., Townsend, E., & Michail, M. (2022). Experience Sampling Methods with LGBTQ+ young people at-risk of self-harm: Feasibility, acceptability, and thinking forward. 19th European Symposium on Suicide and Suicidal Behaviour, in Copenhagen, Denmark. August 2022.

Williams, A. Jess, Arcelus, J., Townsend, E., & Michail, M. (2019) Understanding self-harm and suicide in LGBTQ+ young people. SURAGth: Research Day: Research Informing Clinical Services – What can we do differently? at the University of Nottingham, England. 11th July 2019.

Williams, A. Jess, Arcelus, J., Townsend, E., Lazaridou, A., & Michail, M. (2019) A systematic review examining risk factors for self-harm and suicide in LGBTQ+ young people. School of Psychology Postgraduate Conference, at University of Birmingham, England. 29th May 2019.

iii) Conference symposiums (organised, chaired, oral presentation)

Williams, A. Jess., Wright, T., Gosling, H., & Brendan Dunlop. What's really going on? Exploring self-harm and suicide experiences within LGBTQ+ people. 31st World Congress of the International Association of Suicide Prevention (IASP 2021), virtual/Gold Coast, Australia. 21st-24th September 2021.

Williams, A. Jess., Wright, T., Gosling, H., & Brendan Dunlop. LGBTQ+ and Self-Harm. International Society for the Study of Self-Injury (ISSS – Virtual), online. 23rd-25th June 2021.

iv) Invited presentations (oral)

Williams, A. Jess., Arcelus, J., Townsend, E., & Michail, M. Experience sampling with LGBTQ+ young people; findings from a thesis and next steps. Improving Care in Self-Harm. University of Bristol. 17th of May 2022.

Williams, A. Jess., Arcelus, J., Townsend, E., & Michail, M. So what? Discussing my PhD findings and the future implications. Suicide and Self-Harm Research Group. University of Birmingham. 24th of November 2021.

Williams, A. Jess., Jones, C., Arcelus, J., Townsend, E., Lazaridou, A., & Michail, M. Meta-analysis and systematic review of risks associated with self-harm and suicide among transgender and gender non-conforming young people. British Association of Gender Identity Specialists. 19th March 2021.

Williams, A. Jess. Experiences of doing a PhD in Psychology. Online Psychology Research and Careers Conference. University of Derby. 23rd of January 2021.

Williams, A. Jess., Arcelus, J., Townsend, E., & Michail, M. Understanding self-harm and suicide in LGBTQ+ youth: A thematic analysis. Suicide And Self-Harm. University of Bristol. 11th January 2021.

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Williams, A. Jess., Arcelus, J., Townsend, E., Lazaridou, A., & Michail, M. A systematic review examining risk factors for self-harm and suicide in LGBTQ+ young people. 'Reaching out': Exploring interdisciplinary approaches to self-harm and suicide prevention in young people. University of Birmingham. 13th September 2019.

v) Workshop contributions

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Williams, A. Jess. Understanding self-harm among LGBTQ+ young people. QTBIPOC PD: Exploring the Intersections of Race, Gender, and Sexual Orientation in Participatory Design. ACM CHI Conference on Human Factors in Computing Systems. 30th April 2022.

vi) Podcast dissemination

Williams, A. Jess. LGBTQ+ Self-Harm with Jess. Research Zone Podcast, hosted by Lizzie Mitchell.

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LIST OF ABBREVIATIONS

A&E	Accident & Emergency
AL	Aikaterini Lazaridou
aOR	Adjusted Odds Ratio
APA	American Psychological Association
BPS	British Psychological Society
CaTS	Card Sort Task for Self-harm
CI	Confidence Intervals
CJ	Christopher Jones
CoP	Cry of Pain
COVID-19	Coronavirus Disease 19
CPRD	Clinical Practice Research Datalink
ESM	Experience sampling methods
ESRC	Economic and Social Research Council
ET	Ellen Townsend
EU	European Union
GAD-7	Generalised Anxiety Disorder assessment
GCLS	Gender Congruence and Life Satisfaction Scale
GP	General Practitioner
GPs	General Practices
HADS	Hospital Anxiety and Depression Scale
HIC	High Income Countries
IMV	Integrated Motivational-Volitional Model
IPA	Interpretative Phenomenological Analysis
IPT	Interpersonal Psychotherapy
IPTS	Interpersonal Theory of Suicide
ISAS	Inventory of Statements about Self-Injury

JA	Jon Arcelus
LGB	Sexual orientation minorities
LGBTQ+	Umbrella term for sexual orientation and gender identity minorities
LMIC	Low- and Middle- Income Countries
M	Mean
MHD	Mental Health Difficulties
MM	Maria Michail
MSM	Minority Stress Model
MSPSS	Multidimensional Scale of Perceived Social Support
NICE	National Institute for Health and Care Excellence
NOS	Newcastle-Ottawa Scale
NSRF	National Suicide Research Foundation
NSSI	Non-Suicidal Self-Injury
ONS	Office of National Statistics
OR	Odds Ratio
OSI	Ottawa Self-Injury Inventory
PABAK	Prevalence- And Bias-Adjusted Kappa
PhD	Doctor of Philosophy
PHQ-9	Patient Health Questionnaire-9
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
QEM	Quality Effects Model
SD	Standard Deviation
SRQ-R	Suicidal Behaviours Questionnaire-Revised
TA	Thematic Analysis
TGD	Transgender and gender diverse minorities
U.S.A.	United States of America
UK	United Kingdom
USA	United States of America

WHO	World Health Organisation
YPAR	Youth Participatory Action Research

CHAPTER ONE: GENERAL INTRODUCTION

1.1. INTRODUCTION

This thesis aims to conduct an in-depth exploration of the processes underlying self-harm among LGBTQ+ young people. An outline of terminology used can be found in table 1, rationale is found in Appendix A, this includes considering of how terms are used across the thesis. Three study chapters (Chapters 3-5) are presented as individual papers contained by this thesis. The first two (Chapters 3-4) have been published during the PhD programme (Williams et al., 2021a; Williams et al., 2021b), while the third study (Chapter 5) is currently under review. This first introduction chapter provides an overview of the key literature areas which new research is based on. Gaps are highlighted and rationale is offered for the overarching research objective and the additional aims which are covered across the study chapters.

Table 1.

Outline of terminology used in this thesis

Term used	What is meant
Self-harm	Intentional harm to self, with or without suicidal intentions (De Leo et al., 2021; NICE, 2011)
Attempted suicide	Only used when previous authors or participants explicitly state there was intention to complete suicide
Suicide	Only used to refer to deaths occurring from self-harm
Young people	Emerging adults aged 16-25 years
LGBTQ+	All whose sexual or romantic orientation, or gender identity, is outside of heterosexual or cisgender
LGB	Only referring to those who are sexual orientation minorities
TGD	Only referring to those who are transgender or gender diverse

Following this, I present the methodology for this thesis (Chapter 2). This describes the exploratory, sequential, mixed-method design which the thesis and related research follows. Methodological choices are considered and explained, alongside the engagement process of the LGBTQ+ Advisory Group. The

rationale for individual study designs is offered, alongside their analytical approaches. Finally, I offer ethical considerations which span across the two empirical studies (Chapters 4-5).

LGBTQ+ young people are considered an at-risk population due to their high rates of self-harm experiences. To understand why this might be, the first study considers risk factors which are associated with LGBTQ+ young people who experience self-harm (Chapter 3; Williams et al., 2021a). This chapter reviews current evidence to form a systematic review and meta-analysis. The prevalence of risk factors is analysed in relation to LGBTQ+ young people as a whole group, by sexual orientation (LGB) or gender identity (TGD), and finally by dimension of self-harm (suicide ideation, self-harm, suicide attempt).

To further this understanding of LGBTQ+ young people's self-harm, it is important to recognise their own perspectives and experiences. As such, the second study (Chapter 4; Williams et al., 2021b) explores LGBTQ+ young people's views of the underlying causes of their self-harm. This was conducted through semi-structured interviews. Thematic analysis presents the common and influential experiences which were felt to lead to self-harm.

Key experiences were highlighted from Chapters 3 and 4. To better understand how these are related to self-harm, they were built into the design of the final empirical study (Chapter 5). This was the first study to use experience sampling methods (ESM) with LGBTQ+ young people, who have current experiences of self-harm. Therefore, this firstly informed whether these methods were feasible and acceptable. Furthermore, by examining parameters of the study, I explored whether there was value in developing future, successive ESM studies.

In the final chapter, I present the overarching findings from this thesis (Chapter 6). To increase understanding of how these studies have extended research knowledge, the findings are integrated and reviewed with current literature and theoretical models. Practical implications of the findings are

considered, as well as future directions for research. Finally, I discuss my considerations of the thesis, this highlights the strengths and limitations of the conducted research, as well as my research practice.

1.2. EPIDEMIOLOGY FOR SELF-HARM

Within this section, an overview of self-harm epidemiology is provided. Initially, this is presented as a broad, global issue of suicide. This is then narrowed to rates of self-harm, with and without suicidal intentions, within the U.K. and Republic of Ireland. The aetiology of self-harm is discussed using the structure of three leading self-harm models. Finally, risk factors of self-harm are offered.

1.2.1. An overview of self-harm worldwide

Globally, over 700,000 people die from suicide each year, representing an annual suicide rate of 9.0 per 100,000 population (WHO, 2021). While women tend to have a higher rate of suicide attempt (Nock et al., 2008), rates for suicide completion are consistently higher among men (WHO, 2021). Across countries, it is indicated that men are 2.3 times more likely to die from suicide than women (WHO, 2021). This has been related to men using more lethal methods (WHO, 2014). Over three quarters of suicides occur within low- and middle- income countries (LMIC; WHO, 2021). Such high prevalence of self-harm may occur in LMICs due to the availability and low cost of methods, such as pesticides (Gunnell & Eddleston, 2003). Given cultural or religious factors, it is possible that self-harm is less likely to be discussed in these locations or that those struggling have access to viable treatment options (WHO, 2014).

Internationally, suicide attempt is thought have a prevalence of 0.4-5.1% (Nock et al., 2008). Within European countries, this is estimated as 0.63% (Castillejos et al., 2021), closer to lower prevalence within the previous study. Potentially, this is related to limited inclusion of LMIC samples, but also more accurately reflects of suicide prevalence within Europe currently. This would suggest that despite most

completed suicides taking place in LMIC (WHO, 2021), there are concerning rates of self-harm with suicidal intention present within HIC and western countries.

1.2.2. National perspective of self-harm

It is well established that self-harm, with and without suicidal intention, is a key public health issue. In England and Wales during 2020, the Office of National Statistics registered 5,691 people who died by suicide (ONS, 2021). This accounts to 10 for every 100,000 people in the UK per year. While this is a decrease from the preceding year (11/100,000; ONS, 2020a), this is still higher than the global average (WHO, 2021). Furthermore, it is possible that this decrease may represent a delay in death registrations due to the COVID-19 pandemic (ONS, 2021). Therefore, it is timely to consider self-harm within the U.K.

To better understand self-harm prevalence, it is wise to consider the figures of self-harm presentations to medical services (Carr et al., 2016; Geulayov et al., 2019; Joyce et al., 2020; Tsiachristas et al., 2020). The Multicentre Study of Self-harm estimated that there were 228,075 presentations in 2013, representing 159,875 patients (Tsiachristas et al., 2020). Considering follow-ups of self-harm presentations, between 2000-2013, 1.4% of 49,783 patients had died by suicide (Geulayov et al., 2019). Suicide completion was most likely to occur in the first year, following hospital release (Geulayov et al., 2019). Given that self-harm is often a repetitive and escalating behaviour (Chan et al., 2016; Griffin et al., 2019), this follow-up study demonstrates the fatality of self-harm. This is unsurprising given that historical self-harm behaviour is the strongest predictor of completed suicide (Mars et al., 2019; Sakinofsky, 2000).

A considerable challenge is that those who self-harm often do not present to medical or clinical services (Arensman, Corcoran & McMahon, 2017; Geulayov et al., 2018). Prior research has explored

reasons for this non-presentation and highlighted the impact of stigma (Long, Manktelow & Tracey, 2013), whether this is personal, social, or medical (Bathje & Pryor, 2011; Long et al., 2013). Perceptions of such stigma can be related to fear of disclosure or consequences when presenting to clinical services (Williams, Nielsen & Coulson, 2018). From online self-harm communities, accounts indicated concerns of being sectioned for presenting with self-harm, being misunderstood, or being labelled (Williams et al., 2018). Therefore, it is unsurprising that medical presentation rates are estimated to be lower than the self-harm rates within general or community settings (Geulayov et al., 2018). Thus, self-harm may be much further spread than currently estimated. Given the widespread impact of self-harm, including its repeated nature and escalation trajectory (Chan et al., 2016; Griffin et al., 2019), research should aim to understand how and why these thoughts and feelings develop. From this, learnt knowledge could be used to help develop effective treatments and interventions, and aid further help-seeking behaviours.

1.2.3. Aetiology of self-harm

To enhance the understanding of self-harm, it is prudent to understand why these thoughts and behaviours develop. A mechanism to do this is to critically consider psychological models. Some models aim to explain how an individual may develop self-harmful thoughts. By acknowledging different diatheses, cognitions or lived experiences models can offer a structure for the aetiology of self-harm. Early models of self-harm suggested that this was a method of problem solving (Baechler, 1979, 1980) or an escape from problematic self-awareness (Baumeister, 1990). Both models propose self-harm as a way to cope with difficult situations which the individual feels unable to solve. However, these models are too simple, as they give a one-dimensional pathway to self-harm. More recent models have a focus of exploring how self-harm risk can develop, moving from ideation to behaviour. In this section, I will outline robust models of self-harm; i) The Cry of Pain (CoP; Williams, 2001; Williams & Pollock, 2000;

2001); ii) Interpersonal Theory of Suicide (IPTS; Joiner, 2005; van Orden et al., 2010); and iii) Integrated Motivational-Volitional Model (IMV; O'Connor, 2011; O'Connor & Kirtley, 2018).

1.2.3.1. The Cry of pain

The Cry of Pain (CoP) model builds on the premise presented by Baumeister (1990), where an individual attempts to escape themselves. The CoP model indicates that self-harm is caused by feelings of defeat, alongside the individual perceiving themselves to be trapped in a stressful situation, with no means of escape or rescue (Williams, 2001; Williams & Pollock, 2000; 2001). The underlying intention of self-harm is to act firstly as an emotional response to mental distress, but also as a communication attempt to call for help or indicate a "cry of pain" (Williams, 2001; Williams & Pollock, 2000; 2001). The key constructs of this model are defeat, entrapment, and no chance of rescue. From this perspective, anyone who experiences these difficult thoughts may self-harm as a response to a situation. Later research has provided evidence that indicates that these constructs can lead to self-harm (O'Connor, 2003; Rasmussen et al., 2010). For example, O'Connor (2003) demonstrated that having higher levels of hopelessness, intrusive thinking, and defeat, while having lower levels of escapability is associated with self-harm (O'Connor, 2003). Among those who report repeated self-harm, there has been evidence of higher rates of defeat and entrapment, both of which were connected with suicidal ideation (Rasmuseen et al., 2010). These findings support the model constructs as predictive of self-harm.

One of the limitations of this model is that there is ambiguity concerning the construct of "no rescue". Hopelessness is often used interchangeably as seen in O'Connor's study (2003). However, no rescue could imply a lack of external support or help, while hopelessness is an internal perception, often related to the future. Therefore, further specification of key constructs is needed. Furthermore, as anyone can experience these constructs and are likely to experience stressful situations during their lives, the CoP model does not explain why only some people self-harm.

1.2.3.2. Interpersonal Theory of Suicide

Some models go further than explaining what thoughts lead to self-harm, also considering how self-harmful ideation moves into actions, potentially with suicidal intention (Joiner, 2005; van Orden et al., 2010; O'Connor, 2011; O'Connor & Kirtley, 2018). The first model to propose this is the Interpersonal Theory of Suicide (IPTS; Joiner, 2005; van Orden et al., 2010). The IPTS consists of three constructs which interact to cause self-harm (Joiner, 2005). These are the perception of thwarted belongingness (whereby an individual feels as though they do not belong), perceived burdensomeness (the belief that one's death is of more worth than their life to others) and acquired capability.

IPTS offers two different sets of thoughts which can cause self-harm ideation (perceptions of thwarted belongingness and burdensomeness) (Joiner, 2005). This provides two pathways to how self-harm may develop and intertwine. Following this, ideation becomes behaviour for those who have acquired capability (Joiner, 2005), e.g., reduced fear of death. It is possible that acquired capability could explain why some people go on to self-harm, while others do not. For some, it may be impossible to look beyond fears of death.

The IPTS has been supported by further research (Chu et al., 2017). In this systematic review and meta-analysis, cross-sectional studies indicated strong associations between all three constructs and self-harm (Chu et al., 2017). This relationship was even stronger among prospective studies, with 100% of studies which considered the three-way interaction and self-harm reporting significant association at follow-up (Chu et al., 2017). Together, thwarted belongingness and perceived burdensome demonstrated similar trends, being significantly associated with ideation. However, when including acquired capability this did not statistically link with self-harm behaviour (Chu et al., 2017). Importantly, such evidence indicates that there is value to this model, which explains some aetiology of self-harm.

Nonetheless, there are criticisms of the IPTS. This model has been discussed as "reductionist" and without offering sufficient context for the self-harming individual (Hjelmeland & Knizek, 2019a; Paniagua et al., 2010). For example, two constructs are based on the perceptions of social positionality (thwarted belongingness and burdensomeness), which represent proximal stressors (Hielmeland & Knizek, 2019a). Hjelmeland and Knizek (2019a) argue that these thoughts must be, for some at least, based on realities of negative social interactions. Therefore, thwarted belongingness and burdensomeness may be masking potentially relevant distal experiences which relate to self-harm independently. This argument has some merit, as does the need for context to understand what precisely causes self-harm. However, I disagree with these authors statements that there is little utility for the IPTS, as it just explains the proximal causes of self-harm (Hjelmeland & Knizek, 2019a; Hjelmeland & Knizek, 2019b). There is value in understanding these causes, and much importance in distinguishing between ideation and behaviour. However, further context is always needed to truly understand what leads to self-harm.

1.2.3.3. Integrated Motivational-Volitional Model

The final model discussed does offer such context. When considering the aetiology of self-harm, the Integrated Motivational-Volitional Model (IMV) has several advantages (O'Connor, 2011; O'Connor & Kirtley, 2018), see figure 1. Firstly, it considers the individual context of a person. It then presents how self-harm ideation can develop or reduce through internal and external processes. Finally, the IMV distinguishes between ideation and what is needed for someone to engage with self-harm behaviours.

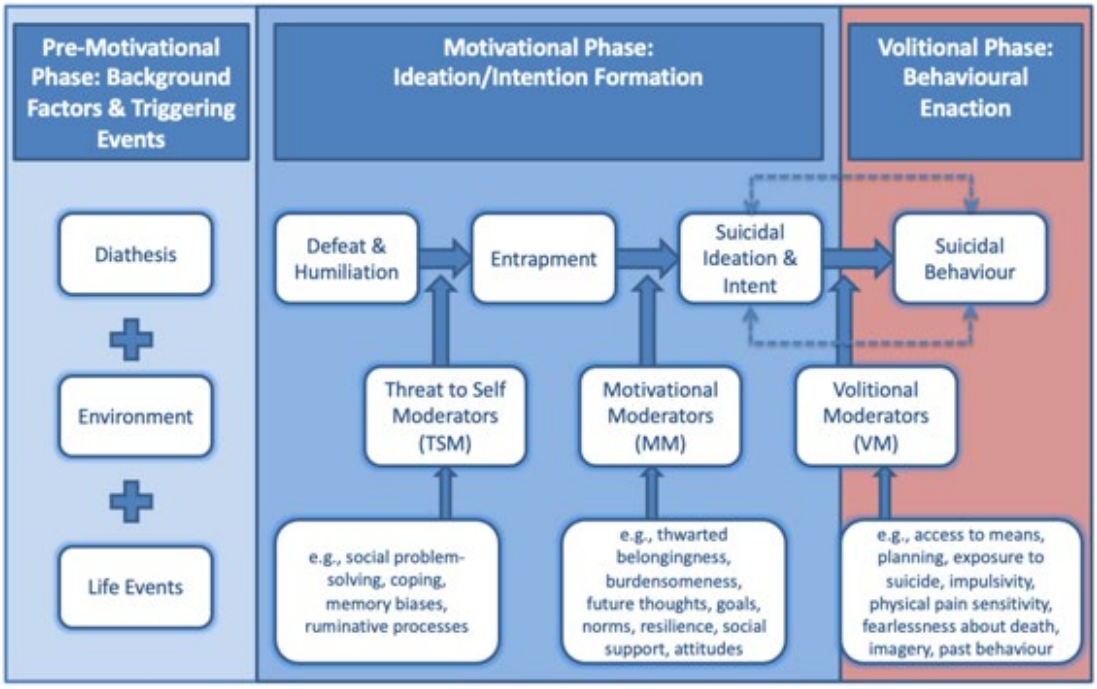

Figure 1.

Integrated Motivational-Volitional Model (O'Connor, 2011; O'Connor & Kirtley, 2018)

The IMV is based on the Diathesis Stress Hypothesis (Schotte & Clum, 1987); which highlights individual vulnerabilities or diatheses. These vulnerabilities then become problematic when stress is encountered. Within the model, vulnerabilities are accounted for within the pre-motivational phase, alongside stressors which are noted as environmental factors and life events (O'Connor, 2011). This initial phase offers the individual's context and highlights potential risks which could lead to self-harm.

Another influence on the IMV is the Theory of Planned Behaviour (Ajzen, 1985). This theory considers the factors relating to the development of a health behaviour (self-harm), intention, and whether an individual does engage with this behaviour. The IMV model uses this basis to offer pathways from development of ideation to behaviour. This is seen in the motivational and volitional phases. The

IMV motivational factors focus on key concepts which have been suggested to lead to self-harm ideation. These are drawn from the CoP model, such that psychological distress is developed from feelings of defeat and entrapment (Williams, 2001). These lead to self-harm being the only perceived outcome. However, O'Connor (2011) extends this as he offers factors which explain how someone moves from feelings of defeat to entrapment to self-harm behaviours; self-moderators and motivational moderators. Therefore, greater detail is offered to explain why ideation may develop. A focus of the IMV is that the pathway of developing ideation can be bidirectional. For example, through enhanced coping skills, an individual may be able to reduce their feelings of entrapment, stunting the development of ideation.

Finally, ideation and intention can become self-harmful behaviour by an individual's decision or action. The distinction between ideation and behaviour is then related to volitional moderators e.g., capability, impulsivity, intention, or planning (O'Connor, 2011). These can be considered as related to the construct of acquired capability discussed in the ITPS (Joiner, 2005). The IMV was originally presented as a linear process of suicidality (O'Connor, 2011). This was updated to consider the potentially cyclical nature between ideation and behaviours (O'Connor & Kirtley, 2018), as the linear structure did not necessarily account for repeated behaviours. This develops the understanding of repeated behaviours and acquiring the means for further self-harm.

Several studies support the IMV (Dhingra, Boduszek & O'Connor, 2015; Dhingra, Boduszek & O'Connor, 2016; Wetherall et al., 2018a; Wetherall, Robb, & O'Connor, 2018b). In their study, Dhingra et al., (2016) directly tested the IMV through latent variable modelling analysis, assessing the utility of the constructs. The model was found to explain a good amount of variance of self-harm behaviour (79% defeat, 83% entrapment, 61% ideation, 27% attempt) (Dhingra et al., 2016). Many of their strongest results are supportive of the motivational phase of the model, highlighting relationships between

constructs such as entrapment, perceived burdensomeness, thwarted belongingness, disengagement of goals, ideation, and self-harm exposure (Dhingra et al., 2016). Therefore, there is strong evidence that the IMV can be used as a conceptual framework to structure risk and the development of self-harm ideation. Extending this, a recent study provided evidence to support the volitional moderators of the IMV. This study demonstrated that adults with a history of suicide attempt scored more highly for volitional variables (capability, exposure, impulsivity) than those who had ideation only (Branley-Bell et al., 2019). This supports the concept of transition from ideation to intention via specific variables highlighted by the IMV. Overall, the IMV is a valuable model on which self-harm aetiology can be better understood.

All these models present similar constructs which relate to the development of self-harm. Foremost among them are defeat and entrapment, which are associated with self-harm, with and without suicidal intention (Rasmussen et al., 2010; Russell, Rasmussen & Hunter, 2020), as well as suicide attempts (Taylor et al., 2010). Between models there is also mention of acquired capability as a form of transition between ideation to action (Joiner, 2005; O'Connor et al., 2011). This is moderated by alternative conceptualisation of acquired capability; for example, Joiner suggests that this is developed through reduced fear of death and high pain tolerance (2005). While O'Connor (2011) considers that this is linked to access to means, an example of which could be higher impulsivity and a stash of medications. Thus, between models the pathways to self-harmful behaviour vary with additional or changing factors of variables being considered (Joiner, 2005; O'Connor, 2011; O'Connor & Kirtley, 2018). Through these models it is useful to understand how self-harmful thoughts and behaviours may develop, and how they transition from ideation to life-threatening behaviours. Despite this utility, there is still no overarching model which has been globally accepted among researchers and clinicians. While these models have

been useful as a framework to understand self-harm aetiology, there may well be other causes or risk factors which cause someone to be more prone to self-harm.

1.2.4. Demographic risk factors

As there is some agreement presented by models as to the aetiology of self-harm, it is also important to consider the wider context; this being factors which determine whether an individual is at-risk for developing self-harmful thoughts and behaviours. These factors may directly relate to difficult life events and experiences that the individual encounters, resulting in greater risk for self-harm. However, there are also specific demographic characteristics and circumstances which are important to consider first. The following section will present three common, demographic risk factors; i) ethnicity; ii) socioeconomic status; and iii) age.

1.2.4.1. Ethnicity

In their systematic review Al-Sharifi, Krynicki, & Upthegrove, (2015) identified 10 studies to update a previous review (Bhui, McKenzie & Rasul, 2007); these indicated that Black women in the U.K. were more likely to self-harm than Asian or White groups. This contrasted with the previous review which found that Asian women were more likely to self-harm (Bhui et al., 2007). However, both reviews focused on assessing self-harm in only two ethnic backgrounds (Black and Asian), so there is limited comparison across other ethnicities.

When considering self-harm presentations, most of an English cohort were White (88%) (Turnbull et al., 2015). This study indicated that there was lower risk of death following self-harm presentation in South Asian and Black respondents (Turnbull et al., 2015). This may be related to the high White representation in the sample, which is akin to the prevalence of White English citizens (86%) (ONS, 2020b). Turnbull and colleagues (2015) interpreted this data by inner-city deprivation; despite South

Asian and Black people more often living in these areas, the White members were often individually deprived (e.g., unemployed) and had fewer social supports around them (Turnbull et al., 2015). The authors suggest that these factors were likely to relate to greater self-harm among White people within their study.

From these studies, it is unclear whether a specific ethnicity is at greater risk of self-harm than others. Thus, to obtain a clearer understanding of ethnicity as a risk factor, it would be beneficial to conduct a meta-analysis of self-harm prevalence across populations. However, as suggested by Turnbull et al., (2015) ethnicity as a risk factor may be related to being part of a minority group within a larger population, which would explain why White respondents living in areas with a high South Asian population may be at greater risk of self-harm. Therefore, focusing on minority groups is a key area for self-harm research.

1.2.4.2. Socioeconomic status

Constructs of low socioeconomic status such as job insecurity, unemployment, economic hardship, and economic uncertainty are all associated with self-harm (Vandoros et al., 2019; Milner et al., 2018; Milner et al., 2013). However, these associations are stronger in men than women (Vandoros et al., 2019). This is possibly greater among men due to stereotypical gender roles, which some men still perceive and face. Economic uncertainty was identified as a trigger for suicide attempt, as it produced excessive fears for the future and feelings of hopelessness (Vandoros et al., 2019), which may translate to concerns of emasculation or being unable to provide. Socioeconomic status may therefore be a risk factor compounded by fears of prejudice or stigma.

A recent living review has been assessing the impact of COVID-19 on self-harm (John et al., 2021; John et al., 2020). At the point of publication there was no consistent evidence of suicide rates rising,

John et al., (2020) highlighted the distress relating to economic concerns. In their latest update, they also mention that these economic effects are likely to evolve over time (John et al., 2021). Therefore, while socioeconomic status may be a consistent risk factor, national and global events can have significant impacts which can cause damage on personal levels.

1.2.4.3. Age

Self-harm is a particular concern among young people (WHO, 2021), as highlighted by rising rates in both self-harm and suicide attempts in recent years (Gillies et al., 2018; Griffin et al., 2018; WHO, 2020). The Office of National Statistics indicated that for every 100,000 young people, 4.9 died of those aged between 15-19 and 9.1 among 20–24-year-olds (ONS, 2021a). While these rates show a decrease from the previous year (5.7 and 11 respectively), I previously highlighted there is likely a delay in trends due to COVID-19. Consistently younger populations tend to present more persistently to medical services for self-harm (Hawton et al., 2015). Between 2000-2010, nearly 40% of self-harm presentations in England were from people aged between 10-24 years (Hawton et al., 2015). This was much greater than other age groups, despite ages ranging from 7 to 97 years. While suicide deaths may be lower than other age groups (ONS, 2021a), persistent and alarming rates of self-harm remain across the U.K. and Republic of Ireland (Griffin et al., 2018; Hawton et al., 2015; McManus et al., 2019).

Among young adults internationally, lifetime prevalence of self-harm is indicated to be 16.9% (Gillies et al., 2018). For those emerging adults in the U.K. and Ireland, this is suggested to peak during the period of 16-25 years (Griffin et al., 2018; McManus et al., 2019). Within their Irish study, peak rates for girls were seen between ages of 15-19 years (564/100,000); in boys this was between 20-24 years (448/100,000) (Griffins et al., 2018). Rates of self-harm presentations to medical services were recognised as having greatly increased between 2007-2016 (Griffin et al., 2018). Comparatively across 16–24-year-olds in England 15.7% engaged with self-harm, with girls between 16-24 having the greatest

increased behaviours (McManus et al., 2019). Despite disparity between gender identity, young people between the ages of 16-25 years are clearly at high risk of self-harm. This appears to be consistent between countries. Therefore, there is a need to focus on this age-range (16-25years) such to better understand why rates of self-harm are so high.

1.2.4.3.1. Community rates of self-harm in young people

Key reports calculate self-harm incidence through medical records or hospital presentations (Griffins et al., 2018; McManus et al., 2019; ONS, 2021), however, this overlooks the number of young people who do not present to clinical services. As previously discussed, self-harm is often a hidden behaviour due to stigma (Bathje & Pryor, 2011; Long et al., 2013; Williams et al., 2018). In their paper, Hawton, Saunders and O'Connor (2012) refer to this as the iceberg model. The tip of this model represents deaths by suicide, followed by a middle chunk which presents as those who attend services, the final bottom section (which is the largest and submerged) represents all the hidden young people who self-harm in the community (Hawton et al., 2012). This presents an issue, as deaths and presentation rates are already very high in this population, but it is recognised that the larger percentage is still not seen. Therefore, self-harm is likely to be even more prevalent.

One study analysed several datasets to offer insight into how these rates may be comparable (Geulayov et al., 2018). These datasets represented each part of the iceberg model. The national mortality statistics of suicidal deaths corresponding to the tip of the iceberg, results from the Multicentre Study of Self-Harm which were used for hospital presentations, and a school survey was used to reach community samples. It was found that across both age groups (12-14; 15-17) community-occurring self-harm was much greater than hospital-presenting or deaths (Guelayov et al., 2018). In boys, for each suicidal death, there were approximately 3000 self-harm incidents in the community, whereas for girls

this was as high as 22,000 self-harm community incidents per death (Guelayov et al., 2018). Given that the statistics presented are highly alarming, this thesis will focus on self-harm among young people.

1.3. AETIOLOGY OF SELF-HARM IN YOUTH

There have been many suggestions as to why the prevalence of self-harm in young people is so high. Potential causes for self-harm can be broadly broken down into groups, such as i) physical changes; ii) psychosocial causes; and iii) identity formation and transitions. An overview of these is presented in figure 2, with constructs from self-harm models. While these causes may overlap with adults, young people are uniquely positioned to face certain challenges relating to each. However, previous research has also demonstrated that there is rarely one cause for self-harm (Hjelmeland et al., 2002; McAuliffe et al., 2007), these are likely to interact with each other and present differently among young people.

Given that self-harm appears to peak between 16-25 years, I will focus on causes among this age range. This age range represents "emerging adulthood" where young people are experiencing many transitional periods and exploring their own wants and needs (Arnett, 2007). While rates of self-harm are concerning within teenage years (Griffins et al., 2018; Guelayov et al., 2018; McManus et al., 2019), some groups are shown to have greater self-harm and completed suicide rates in their early twenties (Griffins et al., 2018; ONS, 2021a). This presents a need to consider self-harm across both teenage years and early twenties. Although, it is important to consider how different age groups within this range (16-18; 19-25) may have different reasons leading to their self-harm, which will be presented.

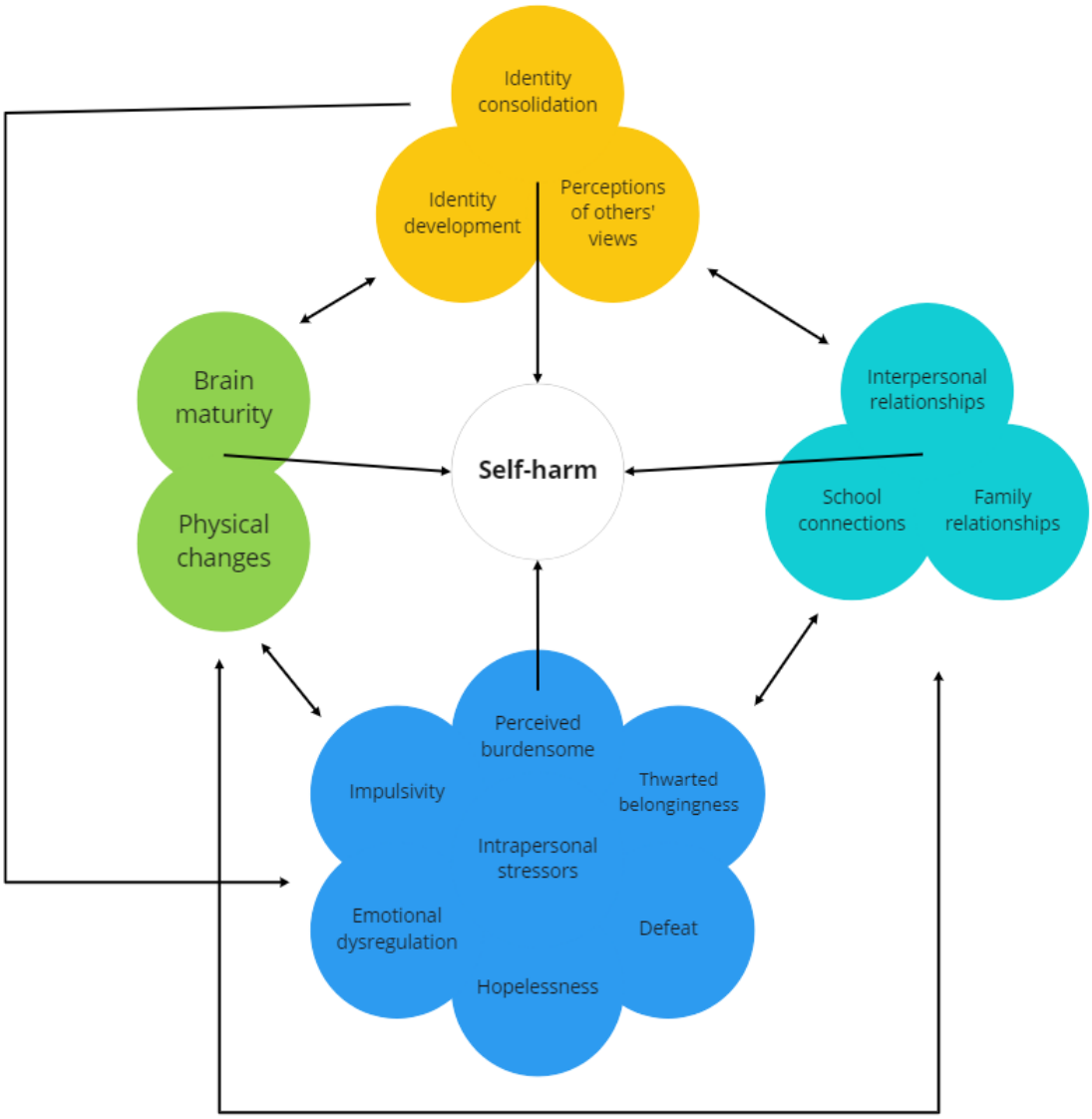

Figure 2.

Overview of self-harm aetiology in young people; potential causes and stressors

1.3.1. Physical changes

1.3.1.1. Physical changes related to brain development

During adolescence, the brain changes. This is to develop the abilities and capacities needed for adulthood, such as emotional maturity and enhancing cognitive skills (Yurgelun-Todd, 2007). In part this is related to neurobiological changes within the brain, specifically in the prefrontal and frontal cortex (Yurgelun-Todd, 2007). As these regions mature, young people develop greater capacity to inhibit their emotional or communication responses, process information, and conduct abstract reasoning. These are related to changes in their emotional capacity, such as being able to distinguish between emotional cues from others (Yurgelun-Todd, 2007). Together, these changes should enhance one's cognitive and interpersonal skills (Blakemore, 2012). However, among those who self-harm these abilities can be stunted or disrupted (Hawton et al., 2012). Such delayed development may reflect why within adolescence, self-harm rates are high.

For example, those who self-harm often experience difficulties with regulating or controlling their emotions (Brausch, Clapham & Littlefield, 2021; Wolff et al., 2019). This is the process by which emotions are influenced, expressed, and experienced by an individual (Gross, 1998). Self-harm has been linked to various dimensions of emotional regulation deficits (Hemming et al., 2019; Wolff et al., 2019). These include: i) the lack of emotional awareness; ii) problematic understanding of emotions; iii) being unable to accept emotional distress; iv) impulsive responses to emotions; v) inability to respond appropriately to distress; and vi) struggling to attend to goals (Gratz & Roemer, 2004). For young people, it may be that they self-harm as they have not yet acquired the capacity to fully emotionally regulate, therefore self-harm acts as a coping mechanism. Alternatively, these skills may have not fully been developed during their brain reorganisation (Yurgelun-Todd, 2007), causing them to cope maladaptively through self-harm. In such a case, the young person may need more time to mature or additional

support (such as therapeutic intervention) to acquire these capabilities or need to explicitly learn effective strategies to emotionally regulate and prevent self-harm (Braush et al., 2021).

1.3.1.2. Physical changes related to puberty

Puberty is associated with many physical changes e.g., voice change or hair growth. Previous literature has shown links between puberty timing and mental health problems (Kaltiala-Heino et al., 2003), as well as self-harm (Roberts et al., 2020). In their study Roberts et al., (2020) found that self-harm was highly associated with growth spurts in adolescents. This indicates that physical changes can cause heightened levels of distress and self-harm. These findings were maintained over girl and boy participants (Roberts et al., 2020). It is unlikely that puberty is the cause of more girls self-harming in this age-range than boys (Griffin et al.,2019; McManus et al., 2019), however, self-harm may be a mechanism through which girls deal with the stress caused by rapid physical changes without having brain maturity occur at the same speed. Puberty typically begins in early adolescence. Considering the target age-range within this thesis, puberty is likely to be more influential to self-harm among the younger ages (below 18 years). However, specific rationale for not including adolescents below the age of 16 years is presented in section 1.4.

1.3.2. Psychosocial causes

Like adults, young people have a range of psychosocial stressors which can relate to their self-harm, taking the forms of internal cognitions or traits. During adolescence, impulsivity is known to fluctuate to larger degrees than in adulthood (Romer, 2010), which is thought to be related to brain maturity. It has been shown that young people who self-harm are also highly impulsive (Madge et al., 2011). Separating out constructs of impulsivity, mood-based impulsivity was associated with initial incidence of self-harm (Lockwood et al., 2017). Whereas cognitive-based impulsivity caused young people to act on their self-harm before considering other coping strategies or consequences (Lockwood

et al., 2017) This has been associated with the maintenance of self-harm over time. Therefore, impulsivity could be linked to two key aspects of adolescent development: learning to cope and responding appropriately to emotions and cognitions. To an extent, this explains why young people are more likely to self-harm.

Interactions with others can also be associated with self-harm, such as continually experiencing poor interpersonal dynamics. In their qualitative study, Hill and Dallos (2011) consider young people's own narratives of their self-harm. The initial cause of their self-harm was often related to interpersonal difficulties; parents splitting up, being bullied, emotional or physical abuse (Hill & Dallos, 2011). As others' opinions are particularly important to young people, these interactions can have detrimental impacts to the young person's self-esteem (Brechwal & Prinstein, 2011; Robinson, Espelage, & Rivers, 2013). In these accounts, it appeared that such interpersonal difficulties did go on to influence young people's own self-perceptions and esteem, which reinforced their self-harm (Hill & Dallos, 2011). Following the initial cause of self-harm, the young people's narratives explained how they felt unable to seek social support, which was related to perceptions of being misunderstood, and as though their self-harm was stigmatised (Hall & Dallos, 2011). This caused additional interpersonal stressors, such as arguments with parents and being mocked. Thus, this offers evidence as to how interpersonal interactions can cause self-harm.

Similarly, semi-structured interviews with young people indicated several interpersonal causes related to self-harm (Wadman et al., 2017). Interpretative phenomenological analysis (IPA) revealed that arguments and concerns relating to family breakdown were key stressors for self-harm (Wadman et al., 2017). Here, negative interactions among the family and uncertainty for future stability appear to lead to self-harm for young people. Commonalities between narratives indicated that they had strong emotional responses to these conflicts, such as anger, concerns, and anxiety, which were then directed inwards

(Wadman et al., 2017). This can be linked back towards young people struggling to emotionally regulate. Therefore, these young people may have self-harmed as a strategy to cope with their inability to regulate emotion (Braush et al., 2021). The second key cause identified was long-term bullying (Wadman et al., 2017). This was discussed in the context of a long-standing cause rather than the emotional trigger which directly caused self-harm. This offers an insight into how causes may vary between directly causing self-harm and being an established cause of distress.

1.4.3. Identity formation and transitions

Rates of self-harm peak between 16-25 years (Griffin et al., 2018; McManus et al., 2019). This age range is related to a period of emerging adulthood (Arnett, 2000), which is roughly categorised between late teens to mid-twenties. During this period, transitions are likely to occur within the young person's life, alongside their identity development (Briggs, 2008). Such events are often difficult for young people, causing distress or self-harm.

Developing one's identity during adolescence and emerging adulthood is theorised as a conflict between identity and identity confusion (Erikson, 1950). This being that a young person is determining what is important to them, evaluating past identifiers and aiming to resolve their identity to closely fit their new sense of self (Erikson, 1950). Identity confusion is the portion of this where the young person is failing in this task (Erikson, 1950). Yet it is expected that this process will take many attempts as they explore and question their beliefs, goals, and values (Erikson, 1950; 1968). During identity formation, young people go through processes of adapting and dismissing alternative identities (Briggs, 2008), which can be dissatisfying due to the large amount of identity conflict and confusion. This may begin during early adolescence (under 16 years), however identity is thought to become increasingly important to a young person throughout their adolescent and emerging adulthood. This is related to individuation

from family, having greater autonomy over one's own action and the changing of relationships with friends and sexual relationships.

At this time, young people are also expected to understand social dynamics and have future-oriented goals (Briggs, 2008), including big life transitions, such as moving away from home, being independent from guardians or parents, and making life choices. Yet at the same time, young people are still trying to work out their own identity and how this will build into what they want from life (Briggs, 2008; Erikson, 1950; 1968). Therefore, external pressures are placed on identity formation as well. An example of which is societal disapproval due to the formation of non-heterosexual thoughts or feelings. This can cause further identity conflict or confusion.

Healthy identity development is thought to predict better adjustment to dealing with problems, whereas being unable to develop one's identity is linked to maladjusted problem solving (Schwarts et al., 2011). This has been extended to rumination, depression, lower self-esteem, struggling with commitments and identity commitment difficulties (Beyers & Luyckx, 2016). This suggests that during this transition period, the development of an independent identity is key to healthy mental wellbeing and could potentially be protective against self-harm. Failure to do so or struggling with identity confusion could cause further difficulties.

Through analysing online narratives, previous research has highlighted that self-harm can impact identity formation in a range of ways (Breen, Lewis, & Sutherland, 2013). It was suggested that in these incidents, young people had committed themselves to an identity of "self-harmer" (Breen et al., 2013); perceiving this to be unique or as a way to define oneself. A challenge with such cognitions is that the young person is less likely to seek help or attempt to stop self-harming, because they perceive self-harm as a defining aspect of themselves. Secondly, self-harm was a response to poor self-appraisals (Breen et

al., 2013). This meant that self-harm was reinforcing the negative thoughts they were having about themselves. These are likely to be frequent if a young person is alternating between identity conflict and confusion (Erikson, 1950). Briefly, this study offers ways in which self-harm can poison healthy identity development. However, only 40.8% of accounts had identifiable ages, these indicated narratives were written by people around 23 years. It is possible that these findings may also relate to those beyond the scope of the age range specified (16-25).

Self-harmful thoughts and behaviours are complex experiences irrespective of age. However, young people are also experiencing a time of development and growth which will lay the foundation leading into adulthood. Experiences, transitions, and decisions during emerging adulthood impact how the young person is able to cope with certain circumstances, as well as influencing how they perceive themselves. It is useful to understand the pressures which are impacting people within this age-range while they are still evolving their own identity and skillsets, as these are influential to mental health generally, as well as self-harm.

1.3.3. Sociological stressors among young people

Like the general population, specific stressors are more likely to increase the chance of a young person experiencing self-harm. Several of these stressors overlap with adult populations, such as mental health difficulties or interpersonal problems. However, young people are uniquely at-risk of certain stressors, such as those within the education system or in their family and home environment, which can be related to power-dynamics and interpersonal relationships within these environments.

1.3.3.1. Stressors associated with education systems

Between the ages of 16-25 years, young people are highly likely to be in some form of education (school, college, or university), at which point important exams need to be taken. It has been found that

concerns relating to academic performance have been associated to self-harm (Carballo et al., 2020), linking to being fearful of failure and feelings of perfectionism. Given that these exams can cause big life changes (getting into university, setting one up for a job) it is unsurprising that these stressors can precipitate self-harm behaviour. There is a great deal of pressure on young people during this time, whether internal or external. Within their review, Fortune and colleagues (2016) found that exam pressure was a cause of low academic performance, with young people saying support in this area would be protective against self-harm.

Additional self-harm stressors include poor attendance (Epstein et al., 2020), and problematic behaviour at school (Anderson, 1999; Sandin et al, 1998). Both of these may indicate that the young person is struggling with schoolwork or that there are external factors which are impacting the young person's wellbeing. Multiple reviews have also found that in-school bullying is related to self-harm (Brown & Plener, 2017; Carballo et al., 2020; Clarke, Allerhand & Berk, 2019). This may explain why young people act out or simply do not attend school (Epstein et al., 2020). Education systems require students to be present physically (or more recently digitally) for many hours during which time, they are unable to escape interactions with other people. Bullying may cause the young person to feel trapped, as though they have no control of a situation and may result in an outburst of behaviour (e.g., shouting, arguing), for which they may be punished. Instead of responding to negative interactions from others, self-harm may be an emotional response turning inwards (Wadman et al., 2017) or feeling as though they do not belong with their school peers. Nonetheless within education systems, it is possible to identify stressors for self-harm. Therefore, prevention strategies could be put in place to reduce the impact of these experiences and enhance wellbeing.

1.3.3.2. Family and home environment

As young people attempt to be more independent, already complex relationships within the family home can be disrupted (Briggs, 2008). Self-harm can be related to stressors, such as arguments between family members (Clarke et al., 2019; Fortune, Cottrell & Fife, 2016). High levels of family dysfunction or conflict were related to having stressful or unsatisfactory relationships. Therefore, these stressors may cause a young person to feel misunderstood, as though they do not belong, or as though they are being victimised, all of which have been independently associated with risk of self-harm (Hatcher & Stubbersfield, 2013; Hill & Dallos, 2011; Wadman et al., 2017).

Young people are uniquely impacted by changes to a family unit or dynamic (Carballo et al., 2020; Clarke et al., 2019; Fortune et al., 2016); such as parental divorce or separation, remarriage or only living with one parent. As young people they have limited or no control over their parents and living arrangements. Events such as divorce, or separation are considered as adverse childhood experiences (Capuzzi & Stauffer, 2021) and have been associated with harmful impacts to attachment lasting into adulthood (D'Rozario & Pilkington, 2021). So, while a child or young person may not self-harm immediately following these changes within the home, these experiences may leave a lasting impact which causes self-harm at a later stage. For example, this could be a diathesis of the IMV (O'Connor, 2011), which is triggered by a current life event, such as a partner suddenly leaving. Together, these experiences then cause self-harm ideation to form for that young person.

A key risk factor for self-harm is childhood maltreatment and abuse. Broadly such experiences can increase self-harm risk by odds of 2.5 (Angelakis, Austin & Gooding, 2020), whereas past sexual abuse increased this risk by 4 times (Angelakis et al., 2020). While maltreatment and abuse does not always take place at home, it is often perpetrated by someone within the family or close to the young person (Kellogg & Menard, 2003). Furthermore, young people may be used to witnessing violence

between family members (Kellogg & Menard, 2003), therefore, normalising their mistreatment. However, they also have limited ability to escape due to their age and financial reliance on family members. Thus, maltreatment and abuse are particularly relevant stressors within this population due to a power-imbalances.

A selection of stressors has been discussed as influential to self-harm motivation. However, this is not an exhaustive list. During emerging adulthood, a huge number of changes are occurring internally and externally for young people. These can be stressful and distressing, especially when they are accumulating and interacting with each other. This offers some explanation as to why self-harm is such a big issue among young people generally. Yet more research is needed to understand what leads to self-harm among minority young people.

1.4. LGBTQ+ YOUNG PEOPLE AND SELF-HARM

WHO (2021) has recognised that LGBTQ+ people are specifically at-risk of self-harm, due to high levels of social adversity. Given that young people who are LGBTQ+ likely face the difficulties presented to young people generally, as well as those facing LGBTQ+ populations, the focus of this section will be on the related experiences these young people during emerging adulthood (16-25 years). Despite the importance of early adolescence (11-15 years), this is not the focus of this thesis, this is primarily due to self-harm peaking between 16-25 years, however the secondary reason is the need for parental consent in the UK for participants below the age of 16 years. As explored in the coming sections, there is still stigma surrounding diverse sexual orientations and gender identities, which could potentially cause harm for young people within their lives and among family members.

1.4.1. Epidemiology

Among LGBTQ+ populations, self-harm is thought to be between 30-50% more common than within their cisgender, heterosexual peers (King et al., 2008; Liu et al., 2019; Marshal et al., 2011). In their meta-analysis, Liu et al., (2019) broke down lifetime NSSI prevalence for sexual orientation minorities (LGB; 29.7%) and transgender and gender diverse (TGD; 46.7%) people. These figures were not limited to just LGBTQ+ young people (16-25 years); yet authors highlighted LGBTQ+ youth as a particularly vulnerable group (Liu et al., 2019).

Within cross-sectional studies, LGBTQ+ young people have shown more high rates of self-harm than cisgender, heterosexual peers (Berona et al., 2020; Hatchel et al., 2019a; Taliaferro et al., 2019). Berona et al., (2020) assessed prevalence of self-harm and suicide attempt from those presenting at psychiatric emergency services. Of the young people who presented as LGBTQ+ 41.2% had attempted suicide, with between 57.1-79.0% having engaged with self-harm, with or without suicidal intention (Berona et al., 2020). Comparatively, heterosexual, cisgender individuals had lower rates of suicide attempt (31.9%) and self-harm (48.8-59.6%) (Berona et al., 2020). To gain a better understanding of self-harm among community-based LGBTQ+ young people, Hatchel et al., (2019a) presented findings from surveys taken by students at 20 North American schools. In the last 6 months, 42% of LGBTQ+ students had considered suicide, with 29% making an attempt (Hatchel et al., 2019a). This was compared to 14% who had suicidal thoughts and 9% who attempted within cisgender, heterosexual samples (Hatchel et al., 2019a). Among TGD young people, self-harm prevalence was comparable with 34% reporting NSSI and 18% having also made a suicide attempt (Taliaferro et al., 2019). So, 52% of TGD young people experienced some form of self-harm. The rates presented for young people, supersede those among adult populations (King et al., 2008; Liu et al., 2019).

Recently, a survey was conducted in association with Stonewall, the U.K. based LGBTQ+ charity (Jadva et al., 2021). Across 11-19-year-olds, it was found that 65.3% endorsed self-harm, 73.8% had experienced suicidal thoughts, and 25.7% had made a suicide attempt (Jadva et al., 2021). It appears that in the U.K., self-harm prevalence is higher than other Western countries. It is also concerning that these rates are like those of young people presenting to medical services (Berona et al., 2020). Therefore, it is crucial to explore self-harm among LGBTQ+ young people.

To reduce and prevent self-harm, a better understanding is needed of the processes underlying self-harm within LGBTQ+ young people. This would explore any additional unique stressors which this population faces that place them at greater risk of self-harm, even when compared to other emerging adults. Therefore, in this next section I will present; i) aetiology of self-harm for LGBTQ+ young people; ii) self-harm risk factors; iii) the Minority Stress Model as a framework on which to base sources of self-harm; and iv) highlight gaps within the literature which require further exploration.

1.4.2. Aetiology of self-harm among LGBTQ+ young people

Certain aetiology, and self-harm models (CoP, ITPS, IMV) are applicable with LGBTQ+ young people, as well as the generalised populations. For example, defeat or entrapment can be felt by anyone regardless of sexual orientation, gender identity or age, and stressors within the education systems are likely to impact many young people. However, it is likely that some stressors are more acutely felt by LGBTQ+ young people. Additional steps are needed within their identity formation; physical changes to the body are particularly relevant to those who are gender diverse; and those stressors can then impact interpersonal relationships, which may be strained by internal perceptions or cognitions.

This section will present several unique experiences which can face LGBTQ+ young people; i) holding a diverse identity; ii) stigma, prejudice, and discrimination relating to minority identity; iii)

responses to stigma, prejudice, and discrimination, and iv) shame relating to being a minority. All these stressors can individually or collectively affect one's self-perceptions and sense of belonging which can then precipitate self-harm (Joiner, 2005), thereby, offering some utility to why self-harm is so high within this population.

1.4.2.1. Diverse identities

During emerging adulthood, LGBTQ+ young people are developing an independent identity and their physical body is changing, which can be very impactful to their wellbeing. For TGD young people, their diverse identity is even more impactful due to physical changes in their body. These physical changes which carry the young person further away from their gender identity and closer to physical characteristics which relate to their assigned sex, can cause MHD such as depression, anxiety, and lead to self-harm (Hodak et al., 2020). Feeling able to accept one's identity is critical to overall health (Herrick et al., 2014).

Cass (1996) states that the pre-stage to developing an LGBTQ+ identity is to assume that you are part of societal norm (cisgender, heterosexual). Then the young people start to realise that they may hold a diverse sexual orientation and/or gender identity. This is followed by formation and acceptance of LGBTQ+ identity, which are characterised by 6 stages: confusion, comparison, tolerance, acceptance, pride, and synthesis (Cass, 1984). The pre- and earlier stages of this model relate to feelings of disconnection and alienation, as the young person feels distinctly different from others. Feelings of social isolation, such as disconnection or alienation from others, have been widely associated with self-harm (WHO, 2014).

While young people generally are changing between identities to find those that are most appropriate for themselves (Briggs, 2008), LGBTQ+ young people also have a distinctive separation from

others due to perceptions of social norms. Therefore, holding a minority identity is likely to be associated with self-harm; rather than directly causing self-harm, it is possible that having a minority identity opens an individual up to several vulnerabilities or stressful experiences on top of being a young person.

1.4.2.2. Stigma, prejudice, and discrimination relating to minority identity

A potential hypothesis of high self-harm among LGBTQ+ young people is that these thoughts and behaviours are caused by high levels of stigma, prejudice, and discrimination due to being a minority group (Daniolos, Boyum & Telingator, 2018; Hendricks & Testa, 2012; Meyer, 2003). Goffman (1963) brings forward the notion that the stigmatised person is not fully socially accepted; they are expected to conform somehow to the social norms e.g., being a heterosexual, cisgender person. Stigma, essentially, is a response to a trait which brings some attention and people who do not have this trait, for whatever reason, turn against those that do. These include character traits (beliefs, mental health, identifying as LGBTQ+), physical traits (injury or disability), or group identity (religion, nationality, ethnicity) (Goffman, 1963).

Stigma can easily be related to prejudice and discrimination, where an individual takes these hostile opinions or attitudes and shares them with others or acts on them (Allport, Clark & Pettigrew, 1954). Allport et al., (1954) outlined different stages of prejudice which increase in action severity. This ranges from one group discussing their negative thoughts of another group (hate speech) through to discrimination actions (denying opportunity or services) and finally ending in execution of the “less desirable” group (Allport et al., 1954).

The LGBTQ+ population has long struggled with the impacts of stigma, prejudice, and discrimination, such as bullying, persecution, economic alienation, and various forms of abuse (Bostwick et al., 2014; European Union Agency for Fundamental Rights, 2014; United Nations, 2011). Such

discrimination is not limited to individual-level experiences, these actions also take place at national levels, such as the legality of conversion therapy in the U.K., the removal of LGBTQ+ rights from the White House website by President Trump, the ban of TGD adults from the U.S. army, and the controversy around transgender Olympians in Tokyo 2020. The EU LGBTQI survey II demonstrated that in Europe the largest life satisfaction gap for LGBTQ+ individuals and the general population was in Poland (European Union Agency for Fundamental Rights, 2020) where LGBTQ+ couples are unable to marry or adopt children (European Court of Human Rights, 2021). In 11 countries LGBTQ+ people can be killed due to their sexual orientation or gender identity, and in many others being LGBTQ+ is still criminalised (Human Dignity Trust, 2021).

1.4.2.3. Responses to stigma, prejudice, or discrimination

Initially, these perceptions of being different and negative responses from others can cause LGBTQ+ young people to reject or dislike their identity as it is developing (Cass, 1984). This then influences the young person's sense of belonging, which in turn is necessary for identity development and security (Scroggs & Vennum, 2021). This can lead to self-stigma, seen when the portrayed stereotype of the minority population causes negative beliefs about oneself and their identity (Corrigan & Watson, 2002). Self-stigma can cause low self-esteem or self-efficacy (Corrigan, Larson & Ruesch, 2009), which can impact how the individual may respond to prejudice and discrimination (Corrigan & Watson, 2002). Among LGBTQ+ populations this can be linked to internalised homonegativity, a process whereby the young person internalises the societal messages against minority sexual orientation or gender identities as part of their own self-reflections (Berg, Munthe-Kaas & Ross, 2016; Meyer 1995). This can lead to many challenges, such as psychological dilemmas between desires and negative self-beliefs, poor mental health, and risk-taking behaviours (Berg et al., 2016). Internalised homonegativity has been shown to have direct and indirect associations with self-harm (Gibbs & Goldbach, 2015;

Hendricks & Testa, 2012; Rehamn, Lopes & Jaspal, 2020; Staples et al., 2017), indicating a complex relationship between self-perception, stigma, and self-harm.

Goffman (1964) suggests that responses to being stigmatised leads to people either; i) compensating (lashing out at other LGBTQ+ people), or ii) hiding their identity or traits which invites this stigma from others. This can be seen by LGBTQ+ people who may avoid disclosing or sharing their LGBTQ+ identity with others (Hendricks & Testa, 2012; McDermott, Hughes, & Rawlings, 2018; Schmitz & Tyler, 2018). This is specifically relevant in health care settings or the workplace, due to concerns of discrimination (Brooks et al., 2018; Dietert & Dentice, 2009; Rossman, Salamanca & Macapagal, 2017). Strategies to avoid disclosure may include avoidance of discussion of romantic or sexual relationships, denying sexual orientation or gender identity, or telling half-truths (McDavitt et al., 2008). These strategies are used to reduce the likelihood of being stigmatised or isolated due to their LGBTQ+ identity. Masking or concealing a large portion of one's identity has been associated with poorer wellbeing (Baiocco et al., 2014; Feinstein et al., 2020; Rood et al., 2017). This is then associated with feeling isolated (Johnson & Amella, 2014), or high levels of self-contempt (Goffman, 1963). Through these interpersonal difficulties and compensatory strategies, young people can struggle with intrapersonal factors. For example, they feel like they do not belong or are a burden which leads them to engage with self-harm (Joiner, 2005; Hatchel, Merrin & Espelage, 2019b). It seems evident from this that stigma, discrimination and prejudice can influence a LGBTQ+ young person in several ways, which can have profound impacts on their wellbeing and mental health. It is therefore essential to understand how and to what extent these experiences relate to self-harm.

1.4.2.4. Shame relating to being a minority

Interrelated with self-stigma and stigma generally is shame (Corrigan et al., 2010). Shame has many descriptors. Lewis (2003) considers shame to be uniquely negative self-reflections. He discusses

that shame is built from specific thoughts regarding set standards, rules, or goals, and how the individual behaves in relation to these standards and perceives themselves (Lewis, 2003). It has been suggested that shame is the emotional response to stigmatising experiences and causes internalisation of stigma (Luoma & Platt, 2015; Tangney, Stuewig & Mashek, 2007), e.g. self-stigma, which can cause social disengagement and issues with interpersonal relationships (Covert et al., 2003). Shame has also been associated with many mental health difficulties (Luoma, Chwyl & Kaplan, 2019; Straub, McConnell & Messman-Moore, 2018).

Shame is also thought to play a significant role in processing and formulating one's identity (Czub, 2013). In their article, Czub (2013) argues that the unpleasant experience of shame encourages an individual to remove that aspect of themselves or the behaviour which has caused their shame. This is thought to influence identity formation, as it limits exploration of identity boundaries and hinders commitment to an identity (Czub, 2013). This is important to consider given that young people are going through this transitional period where they are developing their identities and understanding how they feel about themselves. Given that LGBTQ+ people often experience much social adversity, this may mean that they are more vulnerable to experiencing shame. When considering LGBTQ+ discrimination as a potentially traumatic event, it was demonstrated that these experiences were associated with greater shame (Scheer et al., 2020). Shame was in turn associated with worse mental and physical health (Scheer et al., 2020). Such evidence suggests that shame is highly influential to LGBTQ+ individuals and their overall wellbeing. However, there appears to be no current evidence to indicate that shame relating to being LGBTQ+ has directly caused young people's self-harm.

Some LGBTQ+ young people have adopted shame-avoidance strategies to negate adverse anti-LGBTQ+ experiences, such as discrimination (Scourfield, Roen & McDermott, 2008). Not only does this show that shame is a real issue for LGBTQ+ youth but that for some, strategies are used to reduce the

impact of shame associated with discrimination. Here, the young people would normalise or minimise their experiences, or position oneself as an adult (McDermott et al., 2008). Young people would also take responsibility for these experiences suggesting that it was their fault (McDermott et al., 2008). This might suggest that the young person was facing some internalised stigma. A final strategy to avoid shame was to be proud of being LGBTQ+, which demonstrates an interesting and important resilience ability to combat shame. This could potentially be used to prevent or reduce self-harm related to shame and self-stigma among this population.

1.4.2.5. Risk factors among LGBTQ+ young people

Considering the influential stressors facing LGBTQ+ young people, there is only one systematic review and meta-analysis which discusses the self-harm risk factors facing LGBTQ+ young people (Hatchel, Polanin, & Espelage, 2019c). Although this is a recent study, it is limited by the fact that they only consider one dimension of self-harm; suicidal thoughts and behaviours (Hatchel et al., 2019c). At present there is no overarching systematic review which captures risk factors across the dimension of self-harm among LGBTQ+ young people.

In their review, Hatchel et al., (2019c) define LGBTQ "youth" as 13-25 years. Three databases were searched for studies including LGBTQ identities, youth, and suicide between 1990-2017, resulting in 44 included studies. Seven risk factors were estimated to strongly correlate to suicide (above 0.30), these were considered the top risk factors for LGBTQ+ young people (Hatchel et al., 2021). Three of these risk factors are based solely on one estimate (perceived burdensomeness, exposure to suicide, thwarted belongingness), therefore are not reliable as an indication of risk across LGBTQ+ youth. The remaining top risk factors were previous experience of self-harm (.51), sexual risk (.40), depression (.32) and intimate partner violence (.32). In this context, Hatchel and colleagues (2021) use "sexual risk" to label a number of experiences (high number of sex encounters, not using sexual protection, having sex while

under the influence of drugs or alcohol). LGBTQ+ victimisation was also presented as a moderator of suicide. Between sexualities there was no difference in heterogeneity explained by victimisation, nor did this explain any variance between suicidal thoughts and behaviours (Hatchel et al., 2019c).

Of these risk factors, depression and previous experience of self-harm have been highly associated with self-harm across populations (Carballo et al., 2020; Clarke et al., 2019; Hawton et al., 2013; Knipe et al., 2019). Among LGBTQ young people, intimate partner violence was also associated with sexual risk-taking behaviours (Reuter et al., 2017). From stand-alone papers it is possible that these risk factors have mediating effects on each other (Reuter et al., 2017). Such interactions were not discussed by Hatchel and colleagues (2019c). While constructs of the IPTS (Joiner, 2005) were key risk factors within their review, there was little evidence to support the strength of these stressors. Furthermore, one of the most frequent risks they found was peer victimisation (N=27), however this did not receive a correlation of .30, thus was not considered a key risk factor. LGBT peer victimisation (N=9) also did not meet the threshold of interest (.19). Therefore, bullying either specifically relating to LGBTQ+ identity or otherwise, is considered a weak risk for self-harm (Hatchel et al., 2019c).

From their review, it seems that research is exploring a wide range of self-harm risk factors, however there was limited functionality of this review; as frequently cited risk factors had weaker correlations to self-harm, while strong correlations were often underrepresented. These could be misinterpreted to what the most prevalent and concerning self-harm risk factors are among LGBTQ+ young people. It was also not possible to determine whether these risk factors were unique to LGBTQ+ young people, as no comparison was offered. Therefore, a gap within the literature is to understand how prevalent these risk factors are among LGBTQ+ young people and whether these are unique risk factors.

1.4.2.6. The Minority Stress Model

In the preceding sections, experiences of stigma and discrimination related to being a minority can cause distress and self-harm were discussed. This is thought to be compounded by internalised responses to these adverse experiences. To better understand how these causes lead to self-harm, a leading theory within LGBTQ+ research is presented, the Minority Stress Model (MSM; Meyer, 1995, 2003, Figure 3). This model offers a framework for LGB mental health as it is impacted by unique stressors linked to their sexual orientation. These stressors are broken down into distal processes, such as violence due to being LGBTQ+ or discrimination, and proximal processes. Proximal processes represent internal stressors which relate to self-identity; internalised homonegativity, concealing one's identity, and expecting prejudice from others. Additionally, the model accounts for general stressors which are experiences less unique to being LGBTQ+. These stressors are influenced by environmental circumstances, the minority status of the individual and how important the minority status is to one's identity. Importantly, stressors do not impact all LGBTQ+ people in the same way, for example a stressor may be that someone lost their job. This could be a generic stressful experience, alternatively, this could be related to discriminatory practices in the workplace, thus be a distal stressor. This distinction may be a personal understanding or experience of the situation, resulting in how the stressor is classified.

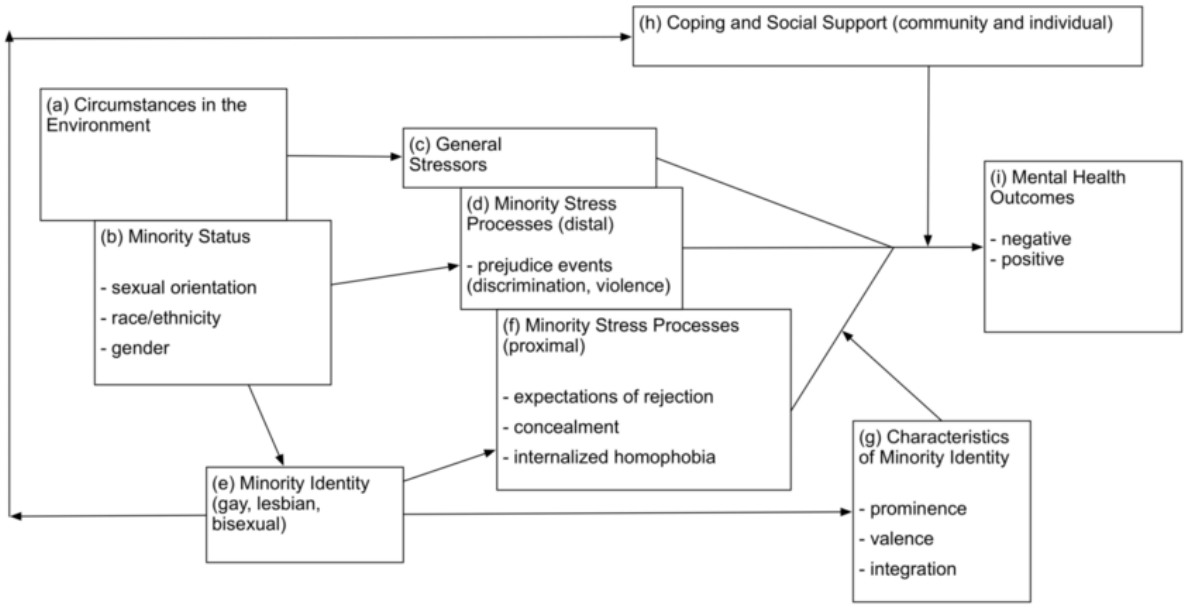

Figure 3.

The Minority Stress Model (Meyer, 1995; 2003)

Meyer (1995; 2003) clearly shows the predictive pathways of stigma, prejudice, and discrimination to mental health, alongside the self-stigma characterised by varied internal thoughts and behaviours, to psychological distress. These minority stressors were associated with 2-3 times more psychological distress, compared with those who only faced a low level of these events (Meyer, 1995). More recently, the MSM has been applied TGD (Hendricks & Testa, 2012). This highlights TGD specific minority stressors, such as dissatisfaction with natal body (Wilson & Cariola, 2020), body dysphoria (Bailey, Ellis & McNeil, 2014), and the impact of transition (Beek et al., 2015; Coleman et al., 2012; Wylie et al., 2014). TGD populations are disproportionately impacted by some stressors, gender-based violence and internalised transphobia, and often hold more than one minority status (e.g., a transgender man who is gay) (Hendricks & Testa, 2012). As stressors stack, this could explain why TGD rates of self-harm are even more prevalent than those in LGB young people.

There is a great deal of support for the MSM and how these processes go on to impact self-harm (Baams, Grossman & Russell, 2015; Fulginiti et al., 2021; Meyer et al., 2021; Tebbe & Moradi, 2016). Within the Generations study, the health and well-being of LGB groups across age cohorts was examined (Meyer et al., 2021). The highest endorsements of psychological distress and lifetime suicide attempts were among the youngest cohort (18-25 years), as were the levels of everyday discrimination (Meyer et al., 2021). LGBTQ+ youth who reported higher rates of minority stressors across their lifetimes, were more likely to report self-harm with suicidal intentions (Fulginiti et al., 2021). It was also noted that minority stress was also indirectly associated with self-harmful experiences through mental health variables and hopelessness (Fulginiti et al., 2021). This research suggests that minority stressors do not only directly impact self-harmful experiences, but indirectly influence these thoughts and behaviours too (Fulginiti et al., 2021). Minority stressors are also thought to enhance young people's perceptions of burdensomeness and thwarted belonging, which is associated with their self-harm (Baams et al., 2015). This could lead to movement from self-harmful ideation to behaviours as discussed in the IPTS and IMV models (Joiner, 2005; O'Connor, 2011; O'Connor & Kirtley, 2018). These studies evidence the strong yet complex dynamic between minority stressors and self-harm.

The MSM has recently been extended to focus on self-harm (Meyer, Frost & Nezhad., 2015). This has distinguished self-harm from mental health more generally and includes macro- and micro-level dispositions. These dispositions are described as vulnerabilities or strengths, either relating to social and physical environment (macro-level) or to the individual (micro-level). It is suggested that self-harm is predicted by suicide diathesis, specifically genetic and neurobiological factors (e.g., impulsivity). This latest version of the MSM draws more closely to the self-harm models discussed previously, highlighting the vulnerabilities and strengths similar to the personal diathesis as mentioned in the IMV model (Meyer et al., 2015; O'Connor, 2011; O'Connor & Kirtley, 2018). One difference from this version of the MSM, is

that it seems to explain some of the personal ambiguity which was left regarding how stressors may be perceived by an individual. Offering additional information, such as how socio-economic-status influences one's environment, is better to visualise someone's pathway towards self-harm.

The last portion of the MSM is the influence of coping and social support (Meyer et al., 2015; Meyer, 2003). These processes may mediate the impact of minority stressors to poor mental health, psychological distress, and self-harm. It is suggested that someone who has better coping skills will be less likely to struggle with self-harm than others (Meyer et al., 2015). However, these may transcend the individual level by an LGBTQ+ individual having additional support and shared coping through their association with LGBTQ+ communities (Meyer et al., 2015). This can produce affirmation in one's identity and potentially inhibit the internalised negativity relating to their LGBTQ+ status. Perceived social support is considered to have a protective role against self-harm (Mustanski & Liu, 2013; Padilla, Crisp & Rew, 2010; Tebbe & Moradi, 2016). Whereas Meyer (1995) specifies the utility of LGBTQ+ communities in their model, social support may also come from friends and family members.

Understanding the minority stress model gives a useful framework to explore how being LGBTQ+ may influence young people's self-harm. This said, self-harmful thoughts and behaviours are complex, and there is less specific evidence for the MSM focused just on LGBTQ+ youth. Much evidence focuses on one facet of self-harm, particularly suicide attempt. So, there is a smaller evidence base to understand the broad spectrum of self-harm in the context of minority stress. Furthermore, much evidence comes from quantitative data, rather than aiming to understand how LGBTQ+ young people perceive their self-harm. A gap in the literature is to explore young people's understanding of their self-harm, what leads to this, and how this might relate to the minority stress model on a wider scale.

1.5. GAPS IN LGBTQ+ AND SELF-HARM LITERATURE

Despite the high rates of self-harm found among the LGBTQ+ population, there is still a relatively small pool of research exploring the processes which lead to self-harm within LGBTQ+ young people. Therefore, research is needed to explore processes underlying self-harm within LGBTQ+ young people. Currently, there are several research gaps.

Firstly, at present there is no comprehensive understanding of risk factors across the umbrella of LGBTQ+ identities exploring the dimension of self-harm, in young people. As seen, previous research has either been limited to only one dimension of self-harm; suicide (Hatchel et al., 2019c) or NSSI (Liu et al., 2019). Furthermore, only Hatchel et al., (2021) exclusively looks at young people across all LGBTQ+ identities. Therefore, a broad understanding of all risk factors impacting these young people is needed. This should present prevalence of risk factors such that these can be compared across identities and to cisgender, heterosexual peers. Insight could then be presented as to what is likely to be related to self-harm in this population. This would also highlight specific risk factors which may not be faced by other populations.

Secondly, it is unclear what LGBTQ+ young people themselves believe to lead to their self-harm. Much of the evidence presented has been quantitative, which is often led by theory, models, previous data, or researcher opinion. While models, such as the MSM, may have much adult evidence, this does not necessarily translate to young people. Young people have their own sets of difficulties and risk factors relating to their age and development. It is possible that constructs such as stigma, prejudice, discrimination, and shame are less relevant to this population than other experiences. Therefore, it is necessary to explore young people's own perceptions of what leads to their self-harm.

Currently, all literature uses retrospective accounts to understand self-harm in this population, so, there is no evidence as to how experiences may relate to self-harm in real-time. This would provide

insights into what leads to self-harm in the short-term. In turn, this evidence would be suited to inform in-situ interventions tailored to LGBTQ+ young people.

1.6. THESIS OUTLINE

As highlighted by this chapter of relevant literature, LGBTQ+ young people are particularly vulnerable to self-harm. The overall research question answered by this thesis is to explore the processes underlying self-harmful thoughts and behaviours, with and without suicidal intention, among LGBTQ+ young people. This aim will be addressed in specific chapters which relate to the gaps in the literature, through a systematic review and meta-analysis, a qualitative interview study, and an experience sampling study (Chapters 3-5). These individual studies will each fill gaps within the literature and build on each other, using an exploratory, sequential mixed-method approach. Further methodology details will be discussed in Chapter 2. Following this, all findings will be discussed and compared with the intention of answering the overall research question, Chapter 6.

CHAPTER TWO: METHODOLOGY

This chapter provides an overview of key elements of this thesis and critical evaluation of methodological decisions that were made. Specifically outlined are the; i) thesis aim; ii) adoption of a mixed-method, sequential design; iii) involvement of the LGBTQ+ Advisory Group; iv) philosophical standpoint; v) individual study designs; vi) analytic approaches; and vii) ethical considerations. Further methodological details for each study can be found within individual study chapters (3-5). Given that this thesis was completed during the COVID-19 pandemic, the impact of this to the overall project has been considered.

2.1. THESIS AIM

The overarching aim of this thesis is an in-depth exploration of the processes underlying self-harmful thoughts and behaviours, with and without suicidal intentions, among LGBTQ+ young people. This section will walk through the development of research aims which could clarify or extend the current literature. These specific aims are then listed.

2.1.1. Development of specific research aims

The original remit of this project was to explore the impact of self-stigma and shame on self-harm within LGBTQ+ young people. However, following a brief scoping search of 3 databases (SCOPUS, Web of Science, and EMBASE), self-stigma and shame were not identified as key constructs among self-harm in LGBTQ+ literature. This was reinforced by consideration of key papers within the field. Instead, this scoping search indicated a wide range of risk factors which may be associated with self-harm. There were numerous differences between risk factors (e.g., name of risk factor, whether this was significantly linked to self-harm, associated LGBTQ+ identity), and it was unclear whether these were specific to LGBTQ+ young people. Therefore, the focus of the research was broadened to examine these self-harm risk factors and their prevalence. Following this initial step, I wondered whether LGBTQ+ young people

would organically relate their self-harmful experiences to self-stigma and shame. By not directly assessing the constructs of self-stigma and shame, research would offer insights as to whether LGBTQ+ young people felt self-stigma and shame are important to their self-harm and whether other experiences are more influential. As most research considers time-invariant experiences (e.g., experiences from childhood, prior bullying, previous self-harm), I considered how influential experiences would be temporally associated with self-harm. This has not previously been conducted or examined. Therefore, this would determine whether such methods were possible within this population. From this, future research would be able to explore real-time influencers of self-harm within LGBTQ+ young people.

2.1.2. Specific research aims

The work within this thesis explores various processes underlying self-harm within LGBTQ+ young people. While protective factors could also have been explored, the aim of this thesis were to understand what specifically is important to these young people and their self-harm. These findings will add to the understanding of why self-harm is so prevalent among LGBTQ+ young people (Liu et al., 2019; Marshal et al., 2011). Specifically, the research presented within this thesis aims to:

1) Investigate associated risk factors among LGBTQ+ young people who experience self-harm and the prevalence of these risk factors (Chapter 3).
2) Investigate whether there are differences in risk factor prevalence between LGBTQ+ identities (Chapter 3).
3) Explore the views of LGBTQ+ young people to understand the perceived underlying processes which lead to self-harm (Chapter 4).
4) Determine whether it is feasible and acceptable to conduct an experience sampling study with LGBTQ+ young people with current self-harm experiences (Chapter 5).

5) Examine parameters of the ESM study using preliminary data, through sample size calculation and examining patterns of influential variables (social context, mental health difficulties, perceptions of LGBTQ+ identity, and minority stressors) associated with self-harm within real-time contexts (Chapter 5).

2.2. METHODOLOGICAL CONSIDERATIONS

This section discusses crucial choices of the thesis design. These give structure to individual studies which have been conducted as part of the thesis.

2.2.1. LGBTQ+ Advisory Group involvement

Within mental health research, public engagement is being used more frequently (Ennis & Wykes, 2013) with recognised value (Ghisoni et al., 2017; Tarpey & Bite, 2014). Researchers have recognised that members of the public with lived experience can offer insights to enhance the relevance of research (Mawn et al., 2015), and aid research impact (Ghisoni et al., 2017; Gomez & Ryan, 2016; Hayes, Buckland, & Tarpey 2012; Tarpey & Bite 2014). For those with lived experience, engaging with research, as an advisor, has been associated with feelings of being valued, improved confidence, and empowerment as their lived experiences offer positive influences (Brett et al., 2014; Mawn et al., 2015).

With these benefits in mind, I established the LGBTQ+ Advisory Group. The aim of the LGBTQ+ Advisory Group was to co-design studies to better address the overall aim of the thesis. This group involvement ensured that the studies were relevant and impactful for LGBTQ+ young people by utilising their lived experience as expertise. Initial recruitment took place between October 2018-February 2019, resulting in 4 advisory members. A secondary recruitment period was conducted between June-November 2020, one of the original members stayed with the group and two new members joined. Interested individuals were recruited through online advertisements (Appendix B), approaching LGBTQ+

youth organisations (e.g., OutCentral), and through word of mouth. This call for advisors asked for; i) young people (16-25 years); ii) who identified as any part of the LGBTQ+ umbrella; iii) had experiences of self-harm; and iv) wanted to advise future research, to contact me via email. As part of the call, I highlighted that, advisory members would not need to share any personal information with the group. During 2019, I was able to offer an involvement allowance (£10 voucher per session) to advisory members. This was due to a public engagement grant I received from the University of Birmingham (Engage, Public Engagement with Research). I was unable to provide involvement allowances following this.

At the onset of the PhD, all advisory members were aged between 16-25 years to represent the ages of study participants. However, across the PhD programme, one advisory member aged out of this range but remained within the advisory group. From the two recruitment calls, 6 young people were involved with the advisory group. Four group members were cisgender (3 assigned female, 1 assigned male), one was a transgender man and the last was currently questioning their gender identity. A range of sexual orientations were represented: bisexual, lesbian, gay, and queer. The LGBTQ+ Advisory Group were involved with study 2 (4 advisors) and study 3 (3 advisors). While no formally explicit safety procedures were in place for the LGBTQ+ Advisory Group, the fostered culture was such that members could approach me with concerns or needs individually. This allowed members to step away from involvement if they did not have the time available, or in one case they were experiencing a period of significant low mood. For this individual, I would touch base with them to ask about their wellbeing but reminder them that they were under no pressure to return to involvement tasks. Once they were in a better mental state, they did come back to engage with some of the final tasks for the ESM study. Members were also aware that if they wanted support from my supervisors to discuss anything this

could and would be arranged for their convenance. All members had contact details for my supervisors so that they did not need to inform me of this.

To aid co-design with young people, Orygen (2021) offers some key principles. A number of these were followed within this body of work. Firstly, I set clear expectations for advisory members. In layman's language I presented tasks, asked for their expertise, opinions, and thoughts, and gave instructions as necessary. I was also flexible with my approaches, these did however come with their own challenges. For example, several advisory members wished to remain anonymous from the group, I mostly discussed tasks with them individually through asynchronistic emails. This meant that the young people could respond in their own time. Within this instance, the challenge was ensuring that advisory members remembered to respond to emails in a timely manner given their own personal prioritises and life circumstances. This required reminder emails, offering different types of communication, and indication that if advisory members were not available that was understandable. Although in some case I was able to meet with some members in-person or via Zoom as they were comfortable with direct communication. Where funds were available, I reimbursed advisory members for their time and expertise with the involvement allowance. However, this was not always possible. As the main researcher this poses a challenge as there is a need to ensure that advisory members know they are valued. Likely I was successful with an engagement grant during the PhD study. Alternatively, throughout their time as advisory members I offered young people opportunities to disseminate research (if they felt this would build their skills), provide a reference for them, and asked if there was any way I could ensure that they mutually benefited from their involvement work. Finally, all were reminded of the value of their shared experience and the gratitude that I had for their involvement at each point.

Several co-design strategies have been recognised as effective when involving young people with research (Orygen. 2021). The Double Diamond Design Process is a commonly used co-design strategy

(Design Council, 2015). This is built of 4 phases; discovery of a problem, defining the problem, designing a study to address the problem (develop), and producing a solution to the problem (delivery). Here, advisory members were involved in several phases per study. Discovery of the problem included advisors offering their insight to self-harm (e.g., in their lived experience what might be useful to explore) and being LGBTQ+ (e.g., how might these relate). Secondly, defining the problem; advisors were asked what they believed should be focused on within the research. For specific studies this would relate to interview questions or survey items, and study designs to best reflect the research aim. Thirdly, advisors engaged in development of potential solutions for the study design. This namely took the shape of safeguarding procedures and sharing their understanding of up-to-date, inclusive language. A variety of methods were used to generate engagement. Across studies 2 and 3, advisory group members created priority lists, brainstormed elements of study design, responded to scenarios, designed recruitment adverts, responded to questions, and shared their own expertise. As tasks were interactive, it was ensured that advisory members actively participated with co-design. Further details can be found in study chapters (4-5).

Alongside the involvement of the LGBTQ+ Advisory Group, methodology experts (Dr Hannah Heath, Dr Olivia Kirtley, Dr Daniel Powell) were approached before starting each empirical study. This was typically before the advisory groups' involvement such that I could approach engagement tasks with sense of research practicalities and priorities. Dr Heath has expertise in qualitative research, as such we discussed interview methodology, philosophical standing, and how to best address young people in interview settings. Both Dr Kirtley and Dr Powell have expertise with ESM research. With Dr Powell, I discussed practicalities of ESM platforms and different forms of assessment, such as wearable tech. Dr Kirtley and I discussed how the study design should suit the priorities of the research and population, such as the assessment period and number of survey assessments each day within an ESM study. Dr

Kirtley shared some of their experience within the field, their expertise as to what they had found useful with adolescent populations, and how I should consider missing data powers in relation to sample power. I was then able to approach the LGBTQ+ Advisory Group with a variety of study design options which would suit the needs of the research and gain their insights. This translated into co-designed studies with research expertise considered.

2.2.2. Rationale for exploratory, sequential, mixed-methods approach

Mixed-method approaches vary greatly within research (Johnson, Onwuegbuzie, & Turner 2007). However, the overall attitude of using mixed-methods is to achieve a broader or deeper understanding of the research topic (Johnson et al., 2007). This allows exploration of a subject using different methods to delve into the topic or concept and collaborate to form a stronger understanding. Furthermore, mixed-methods are thought to be particularly useful when investigating complex human behavioural phenomena (Greene & Caracelli, 1997), such as self-harm, with and without suicidal intention.

Traditional exploratory, sequential mixed-method approaches tend to have a quantitative element followed by qualitative work (Creswell, 2014). This project deviates from this approach by beginning with a review, then qualitative, then a quantitative structure (Figure 4). The rationale for this approach is that the review offers a general understanding of risk factors which impact LGBTQ+ young people who experience self-harm. This is then considered against LGBTQ+ young people's own accounts of what they feel is influential to their self-harmful experiences. Findings from the review and qualitative study direct the measures used within the quantitative study. Therefore, the overall premise is similar to previous quantitative followed by qualitative work, where the qualitative data expands and explains previous statistical findings by considering participants views (Creswell, 2014; Rossman & Wilson 1985; Tashakkori, Teddlie & Teddlie, 1998). Furthermore, this three-staged approach follows the premise that

sequential mixed-method projects should be adapted strategically and comprehensively to answer the overarching aim (Creswell, 2014).

An example of how exploratory, sequential, mixed-methods builds on each study is the decision to not explore protective factors within this thesis. During study 1, the systematic review and meta-analysis, a few studies were captured within the search which presented evidence for protective factors of self-harm. Given the low number of papers, I decided not to focus on this. However, if I had, this might have changed the qualitative study interview schedule. More attention might have been given to how processes which might typically lead to self-harm were stopped by protective factors. As it stands, I did explore how and what young people felt helped them to reduce or stop their self-harm (if they felt they were in recovery), and well as help-seeking behaviour. Participant responses did not translate in analysis to clear themes, and therefore were not considered when developing the ESM study. This example demonstrates that an early decision influences the line of questioning throughout the project, thus careful decision making, and documenting is needed.

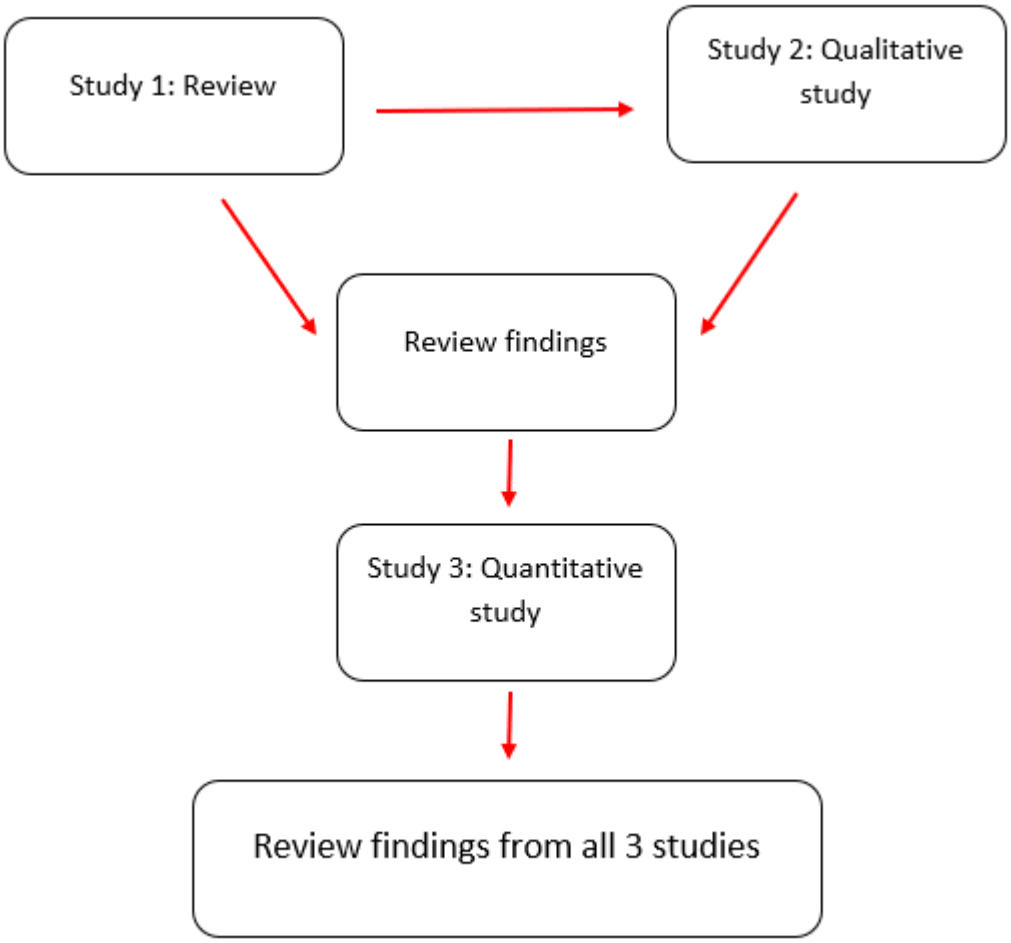

Figure 4.

Diagram of exploratory, sequential, mixed-method design

2.2.3. Philosophical standpoint

There is debate among research about the positionality of ontological and epistemological approaches and how this impacts the methodology of a study. It is suggested that by outlining these philosophical standpoints, the author offers a better understanding of the process of study design, data collection, biases, and analysis (Chamberlain, Stephens, & Lyons, 1997). Therefore, I will outline my

choices related to this body of work to ensure that the research produced is rigorous and robust, whilst also interpreting my own philosophical standpoint (Smith, 1983). For this mixed-method thesis, I take a relativist, pragmatic approach. Briefly, this allows for a real-world orientation of self-harm within LGBTQ+ young people, with a focus on finding answers to the thesis aim (Creswell, 2014).

Ontological approaches concern the understanding of reality and social beings within that reality (Hudson & Ozanne, 1988). Questions concerning ontology consider when an entity or phenomenon can be said to exist. For this project, I took a relativist approach. This considers the experiences of participants by acknowledging their points of reference, which influence their own understandings, perspectives and experiences related to their reality (Cartwright & Krausz, 2010). In this it is important to not consider self-harm in a vacuum or how someone discusses their experiences, without considering the context of their reality. In this sense, Cartwright and Krausz (2010) indicates that reality is made up of historical events, culture, morality, and cognitive processes, which all feed into creating someone's reality.

Epistemology is defined as how the reality set by the ontological approach is known by the researcher (Carson et al., 2001). Therefore, epistemology is about exploring the knowledge of a phenomenon and how this is presented or impactful to people (Alharahsheh & Pius, 2020). In this thesis, this means exploring the processes underlying self-harm specifically among LGBTQ+ young people. To do this, I took a pragmatic approach. Kelly and Cordeiro (2020) outline 3 key principles of pragmatic inquiry. The first of these is that research should produce useful, actionable knowledge. Therefore, the objective of pragmatic research should be to extend the understanding of a phenomena in a practical way. Given that self-harm is a dangerous behaviour which can result in death, this should be a key outcome for all self-harm research. A methodological advantage of this first principle is that researchers should evolve

their practice to suit the driving findings (Kelly & Cordeiro, 2020). This principle sits alongside sequential mixed-method designs well.

Secondly, pragmatic approaches should recognise the interconnection of experience, thoughts, and behaviour within participants (Kelly & Cordeiro, 2020). This allows for a holistic understanding of the young person's world and how elements of their lives are related to self-harm. Within this project, this pragmatic approach ensures that as the researcher, I need to consider findings not as individual aspects linked to self-harm but how they are interconnected. Finally, Kelly and Cordeiro (2020) highlight that responses to research may be altered due to engaging with the research process. They suggest that by involving stakeholders, researchers can gain a better understanding of the phenomena which can then be combined with studies (Kelly & Cordeiro, 2020). This furthers the rationale for the LGBTQ+ Advisory Group, as I was able to utilise their expertise to codesign studies.

An aspect of epistemology is the internal position of the researcher and how they may bring in their own biases to the research (Alharahsheh & Pius, 2020). I identify and present as a cisgender woman (she/her pronouns used). This means I naturally have cisnormative experiences and perspectives. I have aimed throughout this thesis to combat this by having a focus on TGD voices and aimed to not overshadow these by my own gender bias. I also have a history of self-harm, it is important to acknowledge this, specifically during study design, data collection, and analysis. These experiences helped guide the initial starting points for research questions and designing studies. By engaging with the LGBTQ+ Advisory Group, I aimed to account for my potential biases by including their lived experiences and prioritising their expertise. Through the philosophical standpoints I use for the project, I also acknowledge that my experiences are not those of the participants, and that no assumptions can be made. My aim was to not have my own biases or experiences influence the project, but by sharing this information to inform others that there may have been unintentional effects.

2.3. RATIONALE FOR STUDY DESIGNS AND ANALYTIC APPROACHES

This thesis contains three chapters relating to new research. These follow the exploratory, sequential, mixed-method structure. This section will provide an overview of the designs and analytic approaches for these studies, with justification for these choices. Further details are available in the specific chapter which corresponds to the study. See table 2 for a brief summary.

Table 2.

Overview of studies within the thesis

Chapter number	Study Design	Description	Primary analytic approach
3	Systematic review and meta-analysis	Synthesis of empirical literature which considers prevalent risk factors within LGBTQ+ young people who have self-harmful experiences.	PRISMA 2015 checklist followed and quality appraisal conducted using versions of the Newcastle-Ottawa Scale. Numerical data: meta-analysed using random effects models.
4	Qualitative semi-structured interviews	Exploring LGBTQ+ young people's perceptions of underlying processes to their self-harmful experiences.	Thematic analysis and member-checking.
5	Ecological momentary assessment	Investigating the feasibility and acceptability of ESM design with LGBTQ+ young people who have current experiences of self-harm.	Feasibility: enrolment, retention, study adherence. Acceptability: thematic analysis.

2.3.1. Study 1: Systematic review and meta-analysis

Previous reviews have considered the prevalence of self-harm among LGBTQ+ young people (Liu et al., 2019) and risk factors associated with one dimension of self-harm (Hatchel, Polanin, & Espelage, 2019c). While these are informative reviews, a comprehensive investigation of risk factors across LGBTQ+ identities which considers self-harm dimensionally has not been conducted. The intention of this systematic review and meta-analysis was firstly to investigate associated risk factors within the LGBTQ+

young people who experience self-harm. Secondly, I aimed to determine the prevalence of these risk factors. By including all LGBTQ+ identities, I then aimed to determine whether risk factor prevalence was different between identities (Chapter 3).

2.3.1.1. Rationale for systematic review and meta-analysis

The primary utility of systematic reviews is to pool and synthesise evidence from across research to answer a question. A core benefit of systematic reviews is the methodological rigour which is used (Shamseer et al., 2015). This is furthered by the ability to consider individual studies and results critically, while also producing an overall understanding of the current field of literature (Shamseer et al., 2015). Furthermore, systematic reviews can be used to identify areas where evidence is lacking or conflicting (Petticrew & Roberts, 2008). Therefore, systematic reviews offer comprehensive answers to research questions by examining previous research, producing new hypotheses.

Meta-analysis is a statistical technique used to combine effect sizes from included studies within a review, producing an overall effect size (Crombie & Davis, 2009). This method considers the influence of individual studies and offers insight into variations between- and within-studies. Therefore, meta-analysis is useful to inform an overall picture of a phenomenon. By calculating an overall effect size for risk factors, it would be possible to see the magnitude or importance that these may have to LGBTQ+ young people who self-harm. These pooled effect sizes could then be used to inform policy, clinical practice or focus self-harm research.

2.3.1.2. Methodological rigour

Several strategies were used to ensure the methodological rigour of this systematic review and meta-analysis. Firstly, this review followed the PRISMA guidelines (Shamseer et al., 2015). A set of principles which are used to enhance the rigour of systematic reviews and meta-analyses. An a-priori

protocol was published (PROSPERO: CRD42019130037), as well as a full peer-reviewed protocol (Williams et al., 2019).

A comprehensive search strategy was developed with the input from an academic skills specialist at the University of Birmingham library (Appendix C). This individual offered practical feedback as to how literature searches differentiated between databases, and how to ensure the same search was conducted for all databases used despite database differences. Multiple databases were searched to ensure that papers across multiple fields were captured. The reference lists of included articles were examined to determine whether there were any further relevant publications. Any key influential paper which had not been acknowledged in the search was considered as to why the search strategy may not have caught it. The paper was then assessed to determine whether it was relevant to the systematic review.

Paper screening took place over two steps; title and abstract, followed by full-paper screening. This process was conducted in full by myself and a co-author (AK) independently. Quality appraisal using versions of the Newcastle-Ottawa Scale (NOS) (Herzog et al., 2013; Knipe et al., 2019; Wells et al., 2014) was also conducted by both researchers for each included study. These NOS versions were adapted for the systematic review (Appendix D). Studies were rated using category distinctions seen in previous research (Polihronis et al., 2020). Discrepancies between researcher decisions at screening and quality appraisal were resolved through discussion, however if no agreement was reached a third researcher (MM) was approached to make an independent decision.

2.3.1.3. Analytic approach

There was large variation between risk factors captured by the systematic search. Therefore, the data was categorised to represent superordinate risk factors which individual factors fed into;

demographic, psychosocial, victimisation, mental health difficulties (MHD), and LGBTQ+ specific risks; a strategy used by Mars et al., (2019) in their study of self-harm predictors. The final category, LGBTQ+ specific risks, was qualitatively synthesised using the method outlined by Killick and Taylor (2009). This was informative as these risk factors are uniquely influential to this population, whereas other categories are associated across young people generally (Carballo et al., 2019, Clarke et al., 2019, Fliege et al., 2009; Mars et al., 2019; Plener et al., 2018). By synthesising these risk factors and their studies, I offer a better understanding of risk factors which specifically relate to LGBTQ+ young people who self-harm.

Meta-analysis was only possible for two superordinate risk factors associated with self-harm: victimisation and MHD. This was related to the amount of insufficient data available for aggregation, as well as the ability to meaningfully synthesise the data. For example, demographic risk factors were too diverse so it would have been futile to have one overall prevalence value for this category. Whereas, with victimisation, all the individual risk factors are related to other people behaving poorly towards the young person. Therefore, meta-analysis was only suitable for two superordinate risk factors.

For the meta-analyses I used the Generic Inverse Variance method. This uses effect sizes and associated standard errors or variance to calculate meta-analytic effect. Before conducting the meta-analyses, I log transformed all event rates of the primary studies and individual risks so that the data were the same unit of measure. By using this analytic approach, I was able to compare a greater number of effect sizes within the meta-analysis, producing a more robust pooled prevalence for these risk factors. To ensure relevant and useful results were developed, prevalence and odds ratios were calculated using random effects models. By using random effects, the model did not assume all studies were functionally equal. Therefore, a level of variation is initially accounted for. Further details regarding this analysis can be found in Chapter 3.

2.3.2. Study 2: Qualitative interviews

Study 1 (Chapter 3) established that there was a wealth of risk factors associated with self-harm among LGBTQ+ young people. However, it was clear that these were highly researcher-driven. Therefore, I aimed to understand what young people perceived to be the underlying processes leading to their self-harm. It was appropriate to use qualitative methods to answer this question as qualitative research relates itself to exploring the meaning and processes of a phenomenon (Alharahsheh & Pius, 2020). This reflected the mixed-method approach (Creswell, 2014), as the statistical information presented in Chapter 3 could be considered alongside young people's own understanding of self-harm and their perspectives, producing a deeper understanding (Creswell, 2002). Therefore, an exploratory investigation into the perceived underlying processes of self-harm, with and without suicidal intention, among LGBTQ+ young people was conducted (Chapter 4).

2.3.2.1. Rationale for semi-structured interviews

Two common data collection methods used in qualitative studies are focus groups and interviews. Each of these can be conducted differently to obtain unique data to answer the research question, therefore consideration was needed about which was best suited for this study.

Focus groups are useful for generating data regarding the collective views and norms between people (Gill et al., 2008). However, focus groups are not best suited to discussing topics which are potentially highly stigmatised and personal (self-harm, sexual orientation, gender identity). The questions are focused on the individual's personal experiences, and by having multiple people present, participants may be more anxious or uncomfortable sharing their accounts (Peters, 2010). Furthermore, given the broad definitions used in this study (self-harmful thoughts and behaviours, with and without suicidal intention; LGBTQ+ umbrella), some participants may have struggled to interact successfully with a focus group (Gill et al., 2008). For example, if the majority of the group had struggled with self-harmful

thoughts and identified as cisgender, bisexual women, a transgender man who had attempted suicide may have felt out of place and potentially stigmatised.

Considering the participant characteristics and needs, alongside the research question and analytical approach, I felt the best decision was to collect data through interviews (Frith & Gleeson, 2011). Firstly, interviews allow for one-to-one conversations, allowing for discussion of personal matters. Secondly, previous research has shown that participation in self-harm related interviews can lead to improved self-awareness and understanding (Biddle et al., 2013; Owen et al., 2016a). Thus, by collecting data by personal interviews, it was hoped that there would be minimal distress caused to participants, and perhaps there would be some positive outcomes. Thirdly, interviews are well suited to my philosophical standpoint (see section 2.2.3.). Additionally, I was able to further extend this standing by refining my pragmatic approach to include a subjective interpretive perspective. This allowed me to consider each participants' experiences and their understanding of self-harm. From this, the individuals' context, their own interpretations of self-harm, and their experiences remained central to the study.

Given that this study sought to explore perceived underlying processes which lead to self-harm, semi-structured interviews were best suited to collect in-depth, rich data about individual experiences. Semi-structured interviews offer flexibility to adapt the questions and allows the researcher to explore areas of interest which arise from the interview (Braun & Clarke, 2013). This allows participants to lead the interviews with their own experiences, while ensuring key questions are asked by the researcher. Whereas, in a structured interview, the researcher needs to follow a set interview schedule with no deviation (Mueller & Segal, 2014). This can mean that topics are not explored to their fullest and can impact the researcher-participant relationship, as the researcher may come across as dispassionate (Pitts & Miller-Day, 2007). It has also been suggested that unstructured interviews can lead the participant to over-disclosing as they see the researcher as a friend or counsellor (Mueller & Segal, 2014), this would

have caused a significant imbalance in the researcher-participant relationship. A secondary benefit of semi-structured interviews is that they allow for reflexivity and flexibility throughout the study (Mason, 2002). Therefore, after piloting the interview schedule, I was able to make adjustments before data collection began, as well as during data collection.

The LGBTQ+ Advisory Group codesigned this study. Their primary involvement was seen through the interview schedule (Appendix E), their expertise in language use and highlighting the importance of flexibility. They also guided the recruitment advert design. Advisory members offered insights as to what they felt should be asked during the interview, advised on the structure and flow of the interview, as well as presenting and adjusting the language of specific interview questions to suit the young person being interviewed. An example of this was having specific questions to ask about sexual orientation and gender identity. This was thought to reaffirm that the young person's identity was accepted. The LGBTQ+ Advisory Group also suggested that offering multiple forms of interview (phone, skype or in-person) would be useful. This was to combat the stigma or anxiety which a young person might feel when approaching a researcher. This expertise was also considered and used to determine that semi-structured interviews would be most suitable for this study.

2.3.2.2. Analytic approach

Two analytical approaches were considered: interpretative phenomenological analysis (IPA) and thematic analysis (TA). Additionally, member-checking was used (Harvey, 2015). Further specifics of the analysis can be found in Chapter 4.

Given the philosophical standpoint and methodological considerations, IPA was an appropriate option for analysis due to the flexibility and participant-central approach. IPA considers ideas of phenomenology, hermeneutics, and engagement with subjective accounts within the participants' own

worlds (Smith, 1996; Smith, Flowers & Larkin, 2009). It is suggested that researchers aim to understand the meanings described by participants by considering their social and personal worlds, with a degree of interpretation from the interaction with the participant (Shinebourne, 2011). This positions the researcher within the analysis to a degree, and how they may shape analysis, which would therefore account for any influence I would bring into the analysis. However, Creswell (2012) states that when designing an IPA study, researchers should aim to have a homogenous sample and focus on the different individual narratives. This was therefore unsuitable for this study. Firstly, because I aimed to explore self-harm across LGBTQ+ young people, who hold different sexual orientations and gender identities. Secondly, I was interested in experiences across the dimension of self-harm. This ranges between thoughts and behaviours, with and without suicidal intention. Therefore, specific inclusion criteria were put in place to recruit a relatively heterogenous sample with a range of self-harmful experiences. It was therefore determined that IPA would not answer the research question and was rejected.

Alternatively, TA is a very versatile analytic method which focuses on "identifying, analysing and reporting patterns within data" (Braun & Clarke, 2006, p.79). Broadly, TA is considered a "method" rather than a pre-established methodology which specifically cites theoretical and philosophical underpinnings (Braun & Clarke, 2013). The advantage of this is that it is particularly flexible. This approach allows researchers to consider their own philosophical viewpoint and therefore guide how they approach the analysis (Braun & Clarke, 2006; Braun & Clarke, 2013). It also allows that the analysis can be question-driven, which complements the pragmatic stance of the overarching mixed-method approach (Creswell, 2014). Analysis can also be inductive or deductive depending on the goal of the research (Braun & Clarke, 2006). These flexible advantages require that researchers are explicit in their approach prior to analysing the data which ensures rigour and aids understanding of the thematic outcomes. Therefore, TA was the most appropriate analysis to respond to the research question as I

aimed to thematically determine meaning from experiences from a range of participants (Braun & Clarke, 2006).

The final analytical approach used was member-checking of the thematic framework (Harvey, 2015). The aim of this analysis ensured accuracy and validity of the synthesised data by participants reflecting on the thematic framework. Member-checking allows participants to compare and consider whether the findings capture theirs' and their perceptions of others' experiences. Participants are invited to comment, change, or counter any aspect of the framework to better reflect their perceptions. This was an iterative process of reflecting on findings to offer more meaningful and valid interpretation of the framework. Furthermore, member-checking was used to ensure that findings were representative of the participants' experiences and ensure that researcher influences were minimised.

2.3.3. Study 3: Experience sampling methods

After reviewing the findings from chapters 3 and 4, several key issues were found to be associated with self-harm. To further understand the dynamic of these issues and self-harm, I decided to refine the quantitative study to use experience sampling methods (ESM; Chapter 5). This took forward specific processes that were shown to be influential to self-harm and assessed them in real-time. Through experience sampling I was able to offer insights as to whether these daily experiences could be temporally related to self-harm.

However, a key gap within the literature was that ESM had not previously been used with LGBTQ+ young people to assess self-harm. The primary goal of this study was to determine whether ESM was feasible and acceptable with this population. This was achieved through three experimental phases: i) baseline assessment (Phase 1); ii) ESM assessment period (Phase 2); and iii) a semi-structured interview (Phase 3). The first two phases assessed whether it was feasible to run two essential elements

of an ESM study. The third phase, the interviews, considered the acceptability of ESM by directly asking participants their views and opinions of the study and specific aspects. Full details of the study can be found in Chapter 5.

2.3.3.1. Rationale for ESM study design

ESM or ecological momentary assessment (ESM; Hektner, Schmidt, & Csikszentmihalyi, 2007; EMA; Stone & Shiffman, 1994) is a set of methods which use repeated assessments to collect data in real-time. Such methods are used to assess emotions, behaviours, cognitions, or experiences within the participants' own environments (Stone & Shiffman, 1994). In this study, ESM was used to measure self-harmful thoughts and behaviours across a 7-day period. Alongside this, influential experiences and moods which were highlighted as key during the preceding studies were assessed (Chapter 3-4).

ESM offers distinct advantages over traditional quantitative study designs. Firstly, ESM assesses the thoughts, feelings, and experiences of participants in real-time rather than the typically used retrospective questionnaires. This means that participants are less likely to be impacted by retrospective biases (Myin-Germey et al., 2018). It also allows for the investigation of temporal association between variables (Myin-Germey et al., 2018), for example self-harm and depressive symptoms. Secondly, ESM also enhances ecological validity (Csikszentmihalyi & Larson, 1987). Given that the study takes place in the participants' daily lives it is evident that the results can be generalised to real-life settings (Trull & Ebner-Priemer, 2014; Csikszentmihalyi & Larson, 1987).

Furthermore, self-harm has been shown to vary between and within person over time (Kleiman, Glenn & Liu, 2017; Nock, Prinstein, & Sterba, 2009) and is sensitive to contextual experiences (Davidson, Anestis & Gutierrez, 2017). Therefore, ESM offers the opportunity to determine how thoughts and behaviours may vary over a brief period, and what is impactful in a day-to-day basis. Davidson et al.,

(2017) extends the use of ESM by suggesting these methods could be used to pinpoint timeframes to target self-harm interventions.

The study design followed the recommendations and advice of Palmier-Claus et al., (2011). These focused on key elements of the study design; i) delivery of assessment; ii) sampling window; iii) sampling structure; iv) assessment period; and v) number of assessments per day. table 3 outlines the final decisions. These recommendations are based on the opinions and experiences of ESM mental health researchers (Palmier-Claus et al., 2011). Recommended study designs were put forward to the LGBTQ+ Advisory Group, who adjusted the designs to what they felt was suitable, made recommendations, and offered feedback as to the study elements. For example, advisors stated how often they felt participants should be assessed over a day. Their options were then listed in the context of a week experimental period, and advisors rated their best and worst choices. Alongside this, the guidance offered by Kirtley et al., (2021a) was considered. This article offers unique insights when planning an ESM study and therefore was used as a checklist prior to ethical submission.

Table 3.

Overview of ESM study elements

Study element	Final decision for study design
Delivery of assessment	mEMA phone app
Sampling window	8:00-22:00
Sampling structure	Quasi-random time-based sampling
Assessment period	7 days
Number of assessments per day	6 surveys

Firstly, Palmier-Claus et al., (2011) suggests that phone-based assessment has more advantages than paper, watches, and personal digital assistants, as participants are used to carrying a mobile phone with them. Using phones also helps participants to respond to survey notifications at the times scheduled by the study, therefore reducing rates of non-adherence (Palmier-Claus et al., 2011). This was the preferred option among the LGBTQ+ Advisory Group, who felt it was much more accessible and required less effort on the participants' behalf. Several strategies were considered from previous literature and ESM researcher recommendations: manual messaging of survey links, timed emails of survey links, or app-based assessment (e.g. LifeData, mEMA). As mEMA (https://ilumivu.com/) has been used in previous self-harm related research (Glenn et al., 2020; Kleiman et al., 2017), this was selected as a suitable approach. mEMA offered a user-friendly interface, allowed for me to design and create the study, and ensured confidential storage of personal data. Therefore, only I could access the study and related participant data. The company and software were assessed and approved by IT Security at the University of Birmingham (Appendix F). Their review ensured that the software met all data protection and anonymity criteria.

A second recommendation was the sampling window and sampling structure. Participants are typically requested to respond to survey notifications between 7:30-8:00 to 22:00-22:30 (Ben-Zeev, Young, & Depp, 2012; Palmier-Claus et al., 2011). This ensures a range of activities are captured, producing an accurate representation of the participants' lives. Agreed with the LGBTQ+ Advisory Group, assessment timeframes were between 8:00-22:00 each day. Having a set daily time frame is particularly suitable for time-based sampling rather than event-based. Time-based sampling is a random, quasi-random or fixed sampling structure for assessments to be administered throughout a day. By having a set daily timeframe, this offers parameters for the sampling structure. Alternatively, event-based sampling reflects when participants have experienced a particular event. In this case, this would be self-

harm. Event-based sampling was rejected as it was possible there would be no or minimal responses from participants who had not experienced self-harmful thoughts or behaviours during the study period. Additionally, participants may find event-based sampling triggering or difficult in a moment of distress. Quasi-random time-based sampling was selected. This would ensure that a wide range of timepoints were assessed over the course of the assessment period and that participants would be unlikely to predict assessment notifications, which may have caused participants to change their behaviours preceding assessment.

Alongside this, the assessment period was discussed. Typically, ESM assessment periods range from 6-28 days (Ben-Zeev et al., 2012; Hallensleben et al., 2019; Kleiman et al., 2017; Links et al., 2007; Littlewood et al., 2019; Nock et al., 2009). With the LGBTQ+ Advisory Group, a 7-day period with 6 survey notifications a day was selected. This is similar to previous research (Forkmann et al., 2018; Husky et al., 2014; Littlewood et al., 2019), indicating that this level of assessment is feasible in other self-harm samples. A 7-day assessment period ensured that a full week of data was collected, representing a week of the participants' daily lives. However, this also would not overburden participants, potentially causing them to lose interest in the study. Six survey notifications per day was selected. While previous research indicates that a higher number of survey notifications a day, over a shorter period is more effective for participant compliance (Eisele et al., 2020), more than 6 surveys was disliked by the advisory group. They were concerned about the burden for participants, given the area of interest was self-harm. Therefore, this decision was made to balance participant burden and sample power. As the primary study objective was to establish the feasibility and acceptability of the ESM with this population, it was not crucial to balance sample size and predicted rates of missing data into study design.

2.3.3.2. Rationale for measures and ESM items used

The findings from Chapter 3-4 were built into the baseline measures and ESM items. The systematic review and meta-analysis (Chapter 3) highlighted the importance of mental health and social interactions to self-harm. The qualitative study (Chapter 4) also contextually described experiences of mental health, primarily depression and anxiety. Given the prevalence of anxiety and depression in LGBTQ+ young people who self-harm (Hatchel et al., 2019c; Liu et al., 2019), these were selected to represent mental health difficulties within this ESM study. The interviews reinforced the influence of social interactions and indicated minority stressors (e.g. gender dysphoria, misgendering, discrimination, and self-perceptions of LGBTQ+ identity). Thus, validated, reliable measures were used to measure these influential experiences at baseline. Whereas previously used ESM items were taken from the ESM Item Repository (Kirtley et al., 2021b) to reflect these experiences. Further details in Chapter 5.

One key decision was to only query self-harm thoughts and behaviours once a day. This was discussed with the LGBTQ+ Advisory Group, supervisors, and research experts at multiple points. Given the COVID-19 pandemic and related stressors for LGBTQ+ young people (Fish et al., 2020), it was reasoned that ensuring the feasibility and acceptability of ESM with reduced assessment for self-harm would not overburden or harm participants. However, this does mean that there is less information available to capture specific patterns and repeated self-harm behaviours. This will be separately considered for follow-on research.

2.3.3.3. Analytic approach

The primary objective was to determine the feasibility and acceptability of ESM LGBTQ+ young people who have current experiences of self-harm. Therefore, the analytic approach highlights the feasibility of conducting ESM with this population and how acceptable participants felt the study was. Descriptive information was analysed to inform study feasibility; enrolment and retention rates,

feasibility of the mEMA app, study adherence and participant adherence. These statistics are similar to those produced by other ESM feasibility studies in mental health and self-harm research (Czyz, King, & Nahum-Shani, 2018; Glenn et al., 2020; Moitra et al., 2017). Descriptive results from feasibility studies allow for comparison with prior research and indicate the practicality of the current study design. This analytic approach informs whether a follow-up study following this design would be appropriate.

Acceptability was examined through short semi-structured interviews with participants. These interviews focused on exploring the barriers and facilitators to engagement with the study. Given that the aim for these interviews were to produce practical and applicable findings, I held the pragmatic philosophy applied throughout the thesis. The aim also was better suited to the flexible and pragmatic approach offered by thematic analysis; therefore, I followed the guidance of Braun & Clarke (2006; 2013) to analyse the interviews. These findings provide further information to support future research and inform how to conduct ESM within LGBTQ+ young people with self-harm experiences.

The secondary aim was to examine parameters of the ESM study using preliminary data. This was achieved through a sample size calculation; this indicates the number of participants needed for analysis of all affects and processes associated with self-harm. Secondly, descriptive patterns of the influential variables (social context, mental health difficulties, perceptions of LGBTQ+ identity, and minority stressors) in relation to self-harm were examined. This offered information as to the relevance of the underlying processes of self-harm in real-time, and whether further research would be worthwhile.

2.4. ETHICAL CONSIDERATIONS

In this section, I discuss the ethical considerations associated with the two empirical studies (studies 2-3; Chapters 4-5). As the systematic review and meta-analysis did not include any new

participants, ethical approval was not needed for study 1. I detail; i) ethical approval, ii) informed consent; iii) right to withdraw; iv) anonymity and confidentiality; v) debrief, and vi) participant safety.

2.4.1. Ethical approval

Ethical approval was obtained for individual studies (table 4) from the University of Birmingham, Science, Technology, Engineering and Mathematics Ethical Review Committee. This approval ensured that the research conducted would adhere to the British Psychological Society (BPS) code of ethics (Ethics Committee of the BPS, 2021). Specific university policies were to ensure that the data was stored according to the Data Protection Act 1998 and the General Data Protection Regulation. For this project, this meant that all consent forms, contact details and datasets were stored securely in password protected folders on the University of Birmingham server.

Table 4.

Ethical approval for individual studies

Study	Approval code	Appendix location
Study 2: Exploring the experiences and perspectives of self-harm, suicidal ideation and suicidal behaviours in LGBTQ+ young people.	*ERN_19-1032*	G
Study 3: Feasibility and Acceptability of Experience Sampling Method among LGBTQ+ Young People with Experiences of Self-Harm and Suicide	*ERN_201745*	H

As part of study 3's ethical approval, I needed to complete a Digital Health Assessment for the University of Birmingham, School of Psychology. This was a new process following COVID-19, wherein physical participant testing was limited. To ensure participant and staff safety, a General Health and Safety Assessment was created. To ensure similar rigour of digital studies was achieved, all studies needed to have an approved Digital Health Assessment, querying health, wellbeing, safety, and mental

health for participants. Approval was received from internal school staff (Appendix I). Once this was granted, I was able to submit my ethical application to the College Ethical Review Committee.

2.4.2. Informed consent

The employed recruitment strategies for study 2 and 3, both required community samples to respond to recruitment adverts. This was either by contacting me directly via my email address or leaving their contact information through the MQ Participate portal (https://participate.mqmentalhealth.org/). From this point, I sent potential participants emails which contained a summary of the study, an information sheet for that study (Appendices J-K) and a consent form (Appendices L-M). Given that the lower age bracket of participants was 16 years, it was acceptable that sole consent was obtained for participation (Ethics Committee of the BPS, 2021). Potentially, this aided recruitment as there were fewer barriers in place for young people to speak openly about their experiences. Digital consent forms were accepted as informed consent if participants had agreed to all the terms and conditions specified, provided their GP information, and had dated and signed this form.

A key consideration was to ensure that participants understood the nature of the study and what would be involved by consenting to take part (Ethics Committee of the BPS, 2021). If participants did consent, I would also verbally reiterate the information sheet and consent form prior to commencing the study. This was to remind participants of the purpose of the study, what the study would include, their participant rights, safety procedures and data storage, and offered them opportunities to ask questions.

2.4.3. Right to withdraw

Participants were informed from the onset that they could withdraw from either study at any time. This information was also present in both information sheets. Prior to collecting data, I also

verbally reminded them of study withdrawal and highlighted that if there were any questions or aspects of the study they did not wish to complete, this was acceptable (Ethics Committee of the BPS, 2021).

If participants at any time during the study appeared uncomfortable, indicated by language, verbal cues or the need for wellbeing checks, they were asked whether they wished to continue with the study. Consideration was given to the language used in these situations, e.g. “wish to continue” rather than if they “wanted to withdraw”. This was to ensure that participants understood that I valued their input to the research but that their wellbeing was more important. The option was also given to pause the study if they desired.

Participants were given 28 days to withdraw their data from studies. This was prior to transcription of qualitative data or the exploration of statistical data. However, participants were not allowed to revoke their data at any time, as this would impact recruitment for both studies and data saturation of qualitative datasets. For such data it is difficult to “unlearn the insights” which have been gained from discussions of participants’ experiences (Thorpe, 2014, p.258), and the initial analysis that begins from interview and transcription. If data had been revoked beyond these points, this would have impacted my understanding of how self-harmful experiences were shaped for these young people, which may have unintentionally influenced final data analysis.

2.4.4. Confidentiality and anonymity

Participants were assured that their confidentiality and anonymity were protected when taking part in studies, in accordance with the Data Protection Act (2018) and BPS guidelines (Ethics Committee of the BPS, 2021). Participants were assigned an identification code, which mapped to their data and was kept separately from their consent forms. Data collection such as recorded interviews or datasets accumulated on a platform (Qualtrics, illumivu) were downloaded and deleted from the site, once data

collection had been completed. All identifiable information (e.g., names, locations) was anonymised from qualitative data (Ethics Committee of the BPS, 2021). All contact information was deleted following the end of each study.

The Economic and Social Research Council (ESRC) which funded this project, discuss the importance of upholding confidentiality. However, it is specified that it is the researchers' duty of care to inform appropriate services if the safety of a participant or another person is in question (ESRC, 2012). Therefore, confidentiality and anonymity were ensured unless the participants were at imminent risk to themselves or someone else. This caveat to anonymity and confidentiality was highlighted before consent was obtained and is discussed in another section (2.4.6. Participant safety).

2.4.5. Debrief

Following completion or withdrawal from each study, participants were sent a debrief sheet (Appendix N-O) which thanked the participant for their time and input. The debriefs contained a summary of the study purpose and plan for the results. It included several helplines in case the participant became distressed following the study. These helplines were specialised to be globally available or UK-based depending on the recruitment strategy and origin of the participant. Participants were reminded to contact their GP if they felt they needed support for their self-harm or any other distress. My contact details and those of my primary supervisor (MM) were available in the event a participant needed to discuss the study.

2.4.6. Participant safety

Previous literature has evidenced that discussion or asking about self-harm does not negatively impact participants (Biddle et al., 2013; Blades et al., 2018; Dazzi et al., 2014). In fact, a recent meta-analysis suggested that taking part in such research could reduce harmful ideation and behaviours,

particularly when those taking part were young people (Blades et al., 2018). From their analysis, Blades et al., (2018) evidenced that between pre- to post-interview there was reduction in self-harm ideation. Whereas, after an experimental study, participants were significantly less likely to report a suicide attempt compared to before the experiment (Blades et al., 2018). That said, some individuals may find participating in self-harm research distressing and this needs to be considered when planning studies to minimise distress.

Given the different study designs, various safeguarding strategies were in place between studies 2 and 3. Study specific safeguarding details are provided in the corresponding Chapters (4-5). All safeguarding procedures were outlined to those who expressed interest in each study prior to consent being obtained. All procedures were brainstormed with LGBTQ+ advisory members, with selected strategies being reviewed and discussed with the group.

In both studies 2 and 3, contact information for the participants' local GP was needed to complete the consent form. Within each consent form, participants were made aware and consented to have their GP contacted if they were thought to be in imminent risk. This was discussed with participants before consenting to the study (studies 2-3; Chapters 4-5), before starting the interview (study 2; Chapter 4) or during a wellbeing check (study 3; Chapter 5). This follows the ethical advice offered by the ESRC (2012). It was made clear that GP contact would not be made without the participant being aware and having discussed this with me. Imminent risk in this context was taken as a specific plan to complete suicide within a timeframe; this is a similar definition which is adopted by helpline staff (Williams et al., in prep).

Furthermore, a safety planning activity (Stanley & Brown, 2012; Appendix P) was conducted with the participant. This was either before the interview started (study 2; Chapter 4) or during a wellbeing

check (study 3; Chapter 5). This highlighted what may trigger one's self-harm, internal coping mechanisms which could be utilised, social distractions or supports and professional services which could be accessed if the individual was feeling distressed. This brief intervention configures several evidenced-based strategies into one activity (Stanley & Brown, 2012) and is quick to complete. It is also effective at reducing self-harmful thoughts and behaviours (Stanley et al., 2016; Stanley et al., 2018). A recent meta-analysis of six studies in the U.S.A., Taiwan and Switzerland suggested that participants who had a safety plan were significantly less likely to self-harm than those who received treatment as usual (Nuij et al., 2021). The participants were sent a template of the safety planning activity and fill this in while we discussed their thoughts. This allowed them to have a personal copy of their individualised strategies to reflect on if they felt distressed at any point.

2.5. THE IMPACT OF COVID-19 TO THIS THESIS

In March 2020, the U.K. went into national lockdown due to the COVID-19 virus and global pandemic. Throughout 2020-2021, several lockdowns and social isolation strategies were put in place within the U.K. to reduce the spread of the virus. This led to some severe consequences for ongoing research. Worldwide, the LGBTQ+ community was recognised as vulnerable, with reports of LGBTQ+ individuals struggling with isolation (Gato et al., 2021; McGowan, Lowther, & Meads, 2021), being confined to family homes where family members might not be accepting of their sexual orientation or gender identity, and increased rates of depression, anxiety, and distress (Gato et al., 2021; Gonzales et al., 2020).

Due to concerns for LGBTQ+ young people's wellbeing, the final study of this project was delayed by 8-10 months (study 3; Chapter 5). Given the research phenomena of interest, as well as the fact that experience sampling methods are novel and have not been conducted with LGBTQ+ young people before, there were discussions about participant safety. This was particularly relevant if the participants

were not in environments where they felt able to express themselves openly. Through discussion with the LGBTQ+ Advisory Group, who stated that this final study was more relevant and important to conduct now than any other point, the study was adapted to a feasibility and acceptability study. Practically, this fills a literature gap of whether this method can be utilised successfully with the population. However, in essence, it also allowed for a longer development time, more input from the LGBTQ+ Advisory Group and reduced the pressure for high recruitment. While to a degree it is disappointing that a full experience sampling study could not be conducted, this feasibility and acceptability study offers practical findings for the field of research.

The research presented in Chapter 3 is published in:

Williams, A. J., Jones, C., Arcelus, J., Townsend, E., Lazaridou, A., & Michail, M. (2021). A systematic review and meta-analysis of victimisation and mental health prevalence among LGBTQ+ young people with experiences of self-harm and suicide. PloS one, 16(1), e0245268.

Williams, A. J., Arcelus, J., Townsend, E., & Michail, M. (2019). Examining risk factors for self-harm and suicide in LGBTQ+ young people: a systematic review protocol. BMJ open, 9(11), e031541.

CHAPTER THREE: A SYSTEMATIC REVIEW AND META-ANALYSIS OF VICTIMISATION AND MENTAL HEALTH PREVALENCE AMONG LGBTQ+ YOUNG PEOPLE WITH EXPERIENCES OF SELF-HARM

3.1. ABSTRACT

Objectives: LGBTQ+ youth have higher rates of self-harmful thoughts and behaviours than cisgender, heterosexual peers. Less is known about prevalence of risks within these populations. The first systematic review and meta-analysis to investigate the prevalence of risks among young people throughout the LGBTQ+ umbrella with experiences across the dimension of self-harm, suicidal ideation and suicide behaviour; and how they may differ between LGBTQ+ umbrella groups.

Methods: This review was preregistered with PROSPERO (PROSPERO registration number: CRD42019130037). MEDLINE, Scopus, EMBASE, PsycINFO, and Web of Science searches were run to identify quantitative research papers (database inception to 31st January, 2020). Articles included were empirical quantitative studies, which examined risks associated with self-harmful thoughts and behaviours, with and without suicidal intentions, in LGBTQ+ young people (12-25 years). 2457 articles were identified for screening which was completed by two independent reviewers. 104 studies met inclusion criteria of which 40 had data which could be meta-analysed in a meaningful way. This analysis represents victimisation and mental health difficulties as risks among LGBTQ+ youth with self-harm experiences. Random-effects modelling was used for the main analyses with planned subgroup analyses.

Results: Victimisation and mental health difficulties were key risk factors across the dimension self-harm identified through all analyses. A pooled prevalence of 0.36 was indicated for victimisation and 0.39 for mental health difficulties within LGBTQ+ young people with experiences of self-harm. Odds ratios were calculated which demonstrated particularly high levels of victimisation (3.74) and mental

health difficulties (2.67) when compared to cisgender, heterosexual counterparts who also had these experiences.

Conclusions: Victimisation and mental health difficulties are highly prevalent among LGBTQ+ youth with experiences of self-harm. Due to inconsistency of reporting, further risk synthesis is limited. Given the global inclusion of studies, these results can be considered across countries and inform policy and suicide prevention initiatives.

3.2. INTRODUCTION

Worldwide, suicide is one of the leading causes of death for young people (WHO, 2021), with adolescent suicide rates between 11.2-12.7 per 100,000 across low-, middle-, and high-income countries (WHO, 2014). Suicidal thoughts and attempt are thought to be around 3 times higher among sexual orientation minorities (Lesbian, gay, bisexual, questioning or queer, LGB) youth when compared to heterosexual, cisgender counterparts (Marshal et al., 2011). A recent meta-analysis found suicidal ideation prevalence was demonstrated to be around 28% among gender identity minority groups (transgender and gender diverse, TGD) and suicidal attempt prevalence was 14.8% (Surace et al., 2021). Self-harm (defined as self-injury or self-poisoning of self, irrespective of suicidal intent (NICE, 2011)) is known as the most influential risk factor for completed suicide among young people (Hawton & Harriss, 2007; Hawton et al., 2012). There is also strong evidence that demonstrates the high prevalence of self-harm among young people who identify as LGBTQ+ (Lesbian, Gay, Bisexual, Transgender, Queer or Questioning, and others) (Jourian, 2015). Within LGB youth self-harm was reported by 65% of the sample whilst around 46% of TGD samples have also reported this type of behaviour (Clark et al., 2014; Taylor et al., 2018).

Among young people generally, regardless of sexual orientation or gender identity, risks associated with experiences of self-harm, with and without suicidal intention, are numerous, ranging from childhood neglect to poor academic performance (Fliege et al., 2009, Nock et al, 2008). Given this, risk factors are often put into broad categories; demographic, psychosocial, mental health, or psychopathology etc. (Carballo et al., 2019; Clarke et al., 2019; Plener et al., 2018). Within a category such as demographic risks, the individual risk factor can also range widely e.g. age (Boyas et al., 2019), race (Bostwick et al., 2014; Consolacion, Russell & Sue, 2004) or education level (Wang et al., 2019).

Additionally, certain populations may also experience risks which are only influential to that specific group of individuals. LGBTQ+ young people are often exposed to additional stressors which are specifically related to their sexual orientation and gender identity when compared to cisgender heterosexual peers, such as institutionalised prejudice, social pressures, and victimisation (Brandelli Costa et al., 2017; Grossman, D'Augelli & Frank, 2011; Meyer, 1995). Among the LGBTQ+ umbrella there is also variation of how prevalent a risk may be to a subgroup. For example, someone who is outwardly gender nonconforming may receive more harassments than a cisgender member of the LGBTQ+ umbrella. Therefore, it is possible that there is another layer of risks which TGD young people face. Gender nonconformity, gender dysphoria, and frustrations due to the long waiting lists for gender affirming medical interventions are common among TGD populations and have previously been shown to influence self-harm behaviour (Remafedi, Farrow & Deisher, 1991). Although we know that negative experiences such as institutional prejudice, social pressures, victimisation are associated with self-harm among those who identify as LGBTQ+ young people (Brandelli Costa et al., 2017; Grossman et al., 2011; Meyer, 1995), less is known about how prevalent these experiences may be within this population. This systematic review seeks to comprehensively investigate the prevalence of all risks within LGBTQ+ young people who have a history of self-harm, with and without suicidal intention.

Previous reviews in this population specifically focus on a category of self-harm and suicide; either non-suicidal self-injury or suicide excluding self-harm (Hatchel et al., 2019c; Liu et al., 2019). However, I aim to investigate outcomes across the dimension of self-harm, irrespective of intent, suicidal ideation and attempt to consider differences and similarities within risk prevalence by outcome among LGBTQ+ young people. This will allow us to explore risks across the dimensional structure of self-destructive thoughts and behaviours (Orlando et al., 2015) and consider the comparison of risk across the continuum of suicidal intent. Furthermore, previous reviews have not looked at the prevalence of risk factors for self-harm and suicide across the full LGBTQ+ umbrella, therefore, losing comparability of risks within this broad population (King et al., 2008). In this study, I consider LGBTQ+ young people as a whole group, and then by sexual orientation minority (LGB) and gender identity minority (TGD) groups.

3.2.1. Objectives

1. To investigate, for the first time, the prevalence of risks associated with the full dimension of self-harm, suicidal ideation or attempts in LGBTQ+ young people who have these experiences.
2. To investigate whether there is a difference in the prevalence of risks between young people who identify as a sexual orientation minority (LGB) alongside those who identify as a gender identity minority (TGD).

3.3. METHODS

3.3.1. Protocol and registration

This review was conducted and reported in accordance with PRISMA guidelines, appendix Q (Shamseer et al., 2015). An a-priori protocol was registered on PROSPERO (CRD42019130037), and the full protocol was previously published (Williams et al., 2019). As this is a systematic review and meta-analysis of published literature, ethical approval was not sought.

3.3.2. Search strategy

During March 2019, a literature search strategy was developed with an academic skills specialist at the University of Birmingham. An electronic search was conducted on the 31st of March 2019 using MEDLINE, Scopus, EMBASE, PsycINFO, and Web of Science. This was updated on the 31st of January 2020. There was no date limit for identified articles, however only those in English language were considered. Search terms (and their derivatives) focused on the variables of interest; “self-harm”, “suic*”, “adolescent*”, “young person*”, “sexual orientation”, “gender identity” and “risk*”, see Figure 5. The reference list of included articles and key papers within the field were examined for further relevant publications.

Search strategy terms:

(self-harm OR self harm* OR self-injur* OR "self injur*" OR self-cut* OR self-destruct* OR “self destruct*” OR "nonsuicidal self-injur*" OR "non-suicidal self injur*" OR "deliberate self harm" OR “deliberate self-harm” OR DSH OR "self-mutil*" OR overdos* OR self-inflicted injur* OR "self inflicted injur*" OR suicid* OR “parasuicid*” OR para-suicid* OR parasuicid* OR suicidal behav* OR suicide* OR "life-threatening behavio*" OR “suicide ideat*” OR “suicide attempt*” OR “attempted suicide*” OR NSSI)

AND

(moderat* OR mediat* OR "risk facto*" OR mechan* OR predict* OR pathway OR interact* OR "protective facto*" OR facto* OR influence OR correlate* OR precurs* OR “causal facto*”)

AND

(transgender* OR transsexual* OR "gender nonconforming" OR "gender identity disorder" OR "gender dysphoria" OR "gender minority" OR lesbian*OR gay* OR bisexual* OR "sexual minority" OR "same-sex" OR homosexual* OR “homosexuality, male” OR “homosexuality, female” OR “gender identity” OR non-heterosexual* OR “non heterosexual*”OR homosexuality OR queer* OR questioning OR "non-binary" OR "non binary" OR “LGBT*” OR “sexual dissident*” OR “sexual and gender minorities” OR “gender variant” OR gender-variant OR genderqueer OR intersex OR “minority groups” OR “TGNC” OR “transgender and gender nonconforming”)

AND

(Child* OR adolesc* OR "young people" OR kid* OR pupils OR youth OR juvenile OR “young adult*” OR “young person” OR minor*)

Figure 5.

Systematic review search strategy terms

3.3.3. Inclusion criteria

Articles included in this systematic review were empirical quantitative studies, which examined risks across the dimension of self-harm in LGBTQ+ young people (12-25 years). This age range covers the period of adolescence and early adulthood (Arnett & Hughes, 2014). An associated risk is operationalised as "an exposure that is statistically related in some way to an outcome" (Burt, 2001; p1), such as significant effect sizes, correlations, mediators, moderators, beta statistics, or any prevalence available relating to an outcome of self-harm. Mixed-method study designs were included if the quantitative aspects were relevant and extractable. Papers were included if they provided a self-reported or verified group who identified as a sexual orientation or gender identity minority, and any outcome of across the dimension of self-harm. Studies, whose population were not focused on any sexual orientation or gender identity minorities, were included if they presented information for LGBTQ+ participants separately or if authors were able to offer this information when contacted. Full inclusion criteria are described in table 5.

Table 5.

Inclusion criteria used during systematic review screening process

Inclusion Criteria	Exclusion criteria
- Peer reviewed studies. - Any geographical location. - English language. - Empirical quantitative studies, following cross-sectional, prospective, longitudinal, cohort and case-control designs. - Participants that have had a measured outcome from the dimension of self-harm; self-harm (self-harm or injury to self-irrespective of suicidal intent; non-suicidal self-injury), suicidal ideation (thoughts, plan, death wish), or suicide attempt (individual took an attempt on their life, suicide death). - Studies must consider risks associated with or predictive of self-harm, suicidal ideation, suicidal attempt or death. - Participants must be young people (12-25 years). - Participants that are identified or self-identified as any sexual or gender minority or member of LGBTQ+.	- Non-peer reviewed literature. - Not English language. - Grey literature such as theses, dissertations or conference proceedings. - Articles such as commentaries, reviews, editorial or opinion pieces. - Empirical qualitative studies. - Participants who have no experience of self-harm, suicidal ideation or suicidal attempt. - Sample not aged between 12 and 25 years, e.g. adults 26 years and above or children 12 years and under. - Participants who are identified as heterosexual or not part of sexual or gender minority.

3.3.4. Study selection

The results of the systematic search are presented in Figure 6. Overall, the searches yielded 2457 results; 96 duplicates were removed. Studies were screened for eligibility at title, abstract and full-text by two independent researchers (AJW and AL) following the PRISMA guidelines (Shamseer et al., 2015). Following the removal of duplications, 2361 were title and abstract screened. If agreement regarding the eligibility of an article could not be met through discussion, a third researcher (MM) was invited to review. This process was repeated at full-text screening for 465 articles, which produced a very high inter-rater reliability (Prevalence- And Bias-Adjusted Kappa, PABAK = 0.948) (Byrt, Bishop & Carlin, 1993). This was used due to PABAK being a more stable indicator of inter-rater reliability than Cohen's Kappa (Chen et al., 2009).

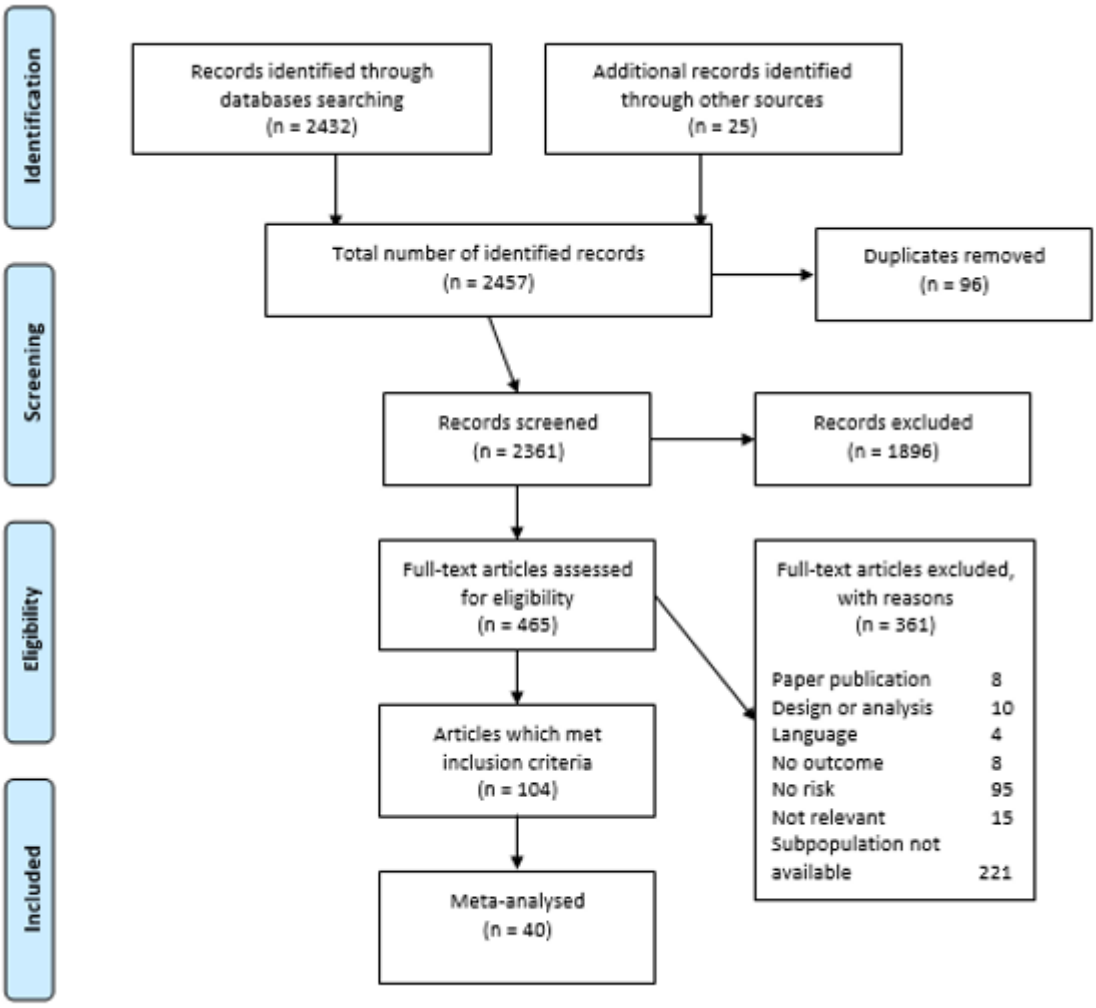

Figure 6.

PRISMA flow chart

3.3.5. Data extraction

A modified version of the data extraction tool used in a previous systematic review was utilised by two independent authors (AJW, AL) to extract data on study design, participants, outcome details, and associated risk (Knipe et al., 2019). After extraction was completed and checked, any disagreements were discussed and resolved by the research team. Risks were extracted based on a significant

relationship to a self-harm outcome. This has the potential to produce multiple reporting of the same study, as the risk may be reporting different outcomes for the same population, or the same risk reported for multiple subgroups. For example, within one study, victimisation may be significantly associated with self-harm and suicidal ideation, both of which have an effect size. This would then be extracted twice to yield both sets of information. Initially, outcomes were combined into a single quantitative outcome (Borenstein et al., 2009). Thereby, the overall prevalence of this risk for self-harm could be observed. Further analysis considered the risk to each outcome individually (e.g., self-harm; suicidal ideation). The inclusion of multiple reporting from a single study may have resulted in a reduction in confidence intervals for the random effects model as the sample sizes will be included numerous times.

3.3.6. Risk of bias assessment

To assess methodological quality within the literature, variations of the Newcastle-Ottawa Scale (NOS) were employed (Herzog et al., 2013; Knipe et al., 2019; Wells et al., 2014). This allowed several study designs to be considered and assessed. The forms assess risk of bias based on three core aspects of study design: participant selection, comparability of participants, and exposure ascertainment. These were adapted for this systematic review (Appendix D), and rated as either low, moderate or high quality using the same category distinctions as previous research (Polihronis et al., 2020). The two reviewers assessed the quality of studies independently, with intermediate agreement (PABAK = 0.43). Agreement was achieved through discussion.

3.3.7. Data synthesis

The search strategy yielded 104 primary articles, across 102 studies. Given the large number of individual risk factors, similar variables were categorised resembling the format used by previous literature (Mars et al., 2019); demographic, psychosocial, mental health difficulties (MHD). Rather than

use “psychiatric or mental health” however, mental health difficulties (MHD) was selected due to self-report measures commonly being used, the inclusion of symptomology, and limited information regarding diagnosis of mental health conditions. Additionally, two categories of risk were created, victimisation and LGBTQ+ specific risks. Victimisation includes individual measures which considered the process of the LGBTQ+ young person being treated poorly, harassed, abuse or discriminated against or subjected to bullying. LGBTQ+ specific risks included risks which were strongly related to the LGBTQ+ identity held by the young person, e.g., coming out stress (Baams et al., 2015), parent being unaware of sexual orientation (D’Augelli & Hersherger, 1993), or negative attitudes towards homosexual orientation (Mendoza-Pérez & Ortiz-Hernández, 2019). Risks were classed as victimisation if they suggested direct negative action against the individual, e.g., discrimination, bullying, harassment or threat. Victimisation was selected as representative title as it most often occurred within the studies. Risks which were both victimisation and LGBTQ+ specific, such as trans, bi, and homophobic bullying, were categorised as victimisation.

There was a large amount of inconsistency among individual risks for three categories: demographic, psychosocial and LGBTQ+ specific risks. This did not allow for meaningful clustering of variables into meta-analysis which would provide a prevalence of risk among LGBTQ+ young people who had experiences of self-harm or suicide. Furthermore, numerical evidence was not available for many individual risks; in these instances, either there was no statistically significant statistics available for associated risks, effect sizes, correlations, mediators, moderators, beta statistics, or any reporting of prevalence. Numerical data was predominantly available within victimisation and mental health difficulties; therefore, these risks were analysed. The 65 studies not included in meta-analysis are briefly described by risk category, and separated by population (e.g. sexual orientation minority, gender identity minority, LGBTQ+ umbrella) within table 6. Additionally, the category of LGBTQ+ specific risks are

qualitatively synthesised using the guidance of Killick & Taylor (2009) this can be found in Appendix R due to word limits. These risk factors are unique to the population of LGBTQ+ young people. Whereas other categories of risk factor (e.g. demographic, psychosocial) are recognised as influential across young people (Carballo et al., 2019, Clarke et al., 2019, Fliege et al., 2009; Mars et al., 2019; Plener et al., 2018).

3.3.8. Numerical analysis

A meta-analysis was conducted for two risks associated with self-harm among LGBTQ+ young people; victimisation and MHD, where sufficient data for aggregation were available. For these two risks, outcome data from forty primary studies were synthesised. The purpose of the meta-analysis was to 1) to investigate the prevalence of victimisation and MHD associated with self-harmful thoughts and behaviours, among LGBTQ+ young people with these experiences; 2) to investigate whether there is a difference in the prevalence of victimisation and MHD among those young people who identify as a sexual orientation minority (LGB) and those who identify as a gender identity minority (TGD); 3) to identify whether the prevalence of victimisation and MHD is different in LGBTQ+ young people who have experiences of self-harm compared with cisgender heterosexual young people with these experiences.

Event rates of primary studies were log transformed before numerical syntheses such that they were all the same unit of measure (but back-transformed for clear presentation in tables). Studies with an event rate of zero or one were excluded from analysis as studies with a small sample size do not permit accurate estimations of event rate. Where data was available for the target population subgroup and a control subgroup of cisgender and heterosexual individuals, odds ratios were calculated.

The random effects model was used as this assumes that not all studies have the same power to detect effects, therefore, a common effect size cannot be assumed. As the study effects were normally distributed, the DerSimonian and Laird method was selected to determine the variation between the

studies to fit the random effects model (DerSimonian & Lard, 1986). The random effects model was extended to include explicit consideration of the methodological quality of the primary studies. This "quality effects model" (QEM) used the NOS total score to characterise the overall methodological quality of the study. This QEM model can be interpreted as the meta-analytic synthesis that would have been obtained if all the studies had been of the same methodological quality as the highest rated study within the review, thereby providing a measure of attenuation to the methodological variation of included studies. This is presented sub-group analyses to offer insights to outcome prevalence in relation to low, moderate, and high-quality studies.

Higgins I^2 was used to determine the level of heterogeneity within the primary studies with a value of above 75% considered problematic. Sensitivity analysis was conducted to identify studies disproportionately influencing results. Such studies were excluded from subsequent analyses due to the high risk of bias. Subgroup analysis was also used to aid the identification of sources of problematic heterogeneity.

Publication bias and small study effects were also estimated by inspection of funnel plots. In absence of publication bias, high precision studies will be evidenced near the average, with lower precision studies spread evenly and symmetrically on both sides of the average, creating a funnel-shaped distribution. Publication bias is indicated by the absence of studies in the area of the final plot associated with small (i.e., non-significant) effect sizes in small studies.

If publication bias was evidenced then a trim and fill procedure was undertaken. This produced an adjusted effect size (controlling for publication bias), and the impact of publication bias was assessed by comparison with the uncorrected random effects model. The fail-safe N was also calculated using the Orwin algorithm (Orwin, 1983). This is the estimation of missing studies that was required to render the

effect non-significant. If the fail-safe N is large (in relation to the number of studies included in the synthesis), then the synthesis could be considered robust to the effects of publication bias.

Before searches were conducted, two a-priori hypotheses were established to consider heterogeneity which may occur within the data (Williams et al., 2019). The first suggested that heterogeneity may be explained by consideration of LGB and TGD as separate populations. This allows us to determine whether there are similar levels of risk within both groups. The second a-priori aim was to consider risk by age group; however, this was not possible given the final dataset. Additionally, a subgroup analysis was run based on the type of outcomes reported: self-harm, suicidal ideation, and suicidal attempt. Summary effects and associated heterogeneity measures were calculated for each subgroup, the significance of difference between these being evaluated by the comparison of their 95% confidence intervals.

3.4. RESULTS

One-hundred and four papers from 102 studies were included, which met all the inclusion criteria and contained extractable significant risks associated with self-harm. Twenty-six studies examined a form of self-harm (e.g., self-harm with suicidal intent, self-harm intent unspecified, non-suicidal-self-injury) whereas 77 considered suicidal ideation and 76 considered suicidal behaviour, studies often considered more than one outcome. None of the studies included information on participants who died by suicide. Two of the included papers (Hershberger, Pilkington & D'Augelli, 1997; Huang et al., 2018b) utilised the same dataset as a previously included study (D'Augelli & Hershberger, 1993; Huang et al., 2018a). These were included as separate papers, given that they highlight risk factors which the primary study did not. The majority of studies were cross-sectional (n = 91); with 10 longitudinal studies, and 3 cohort studies. A total of 1,146,395 participants were included, with 129,469 (11.3%) being LGB and 13,041 (1.1%) being TGD. Ages ranged from 12-25 (M = 17.7, SD = 1.9). Studies

were mainly based within the U.S.A (n = 77), followed by the U.K. (n = 7), and China (n = 4). For full individual study characteristics, see appendices S-T. Appendices U-Y show further figures regarding heterogeneity and influential studies.

From the 104 included papers, 64 were unable to be numerically synthesised. The individual characteristics of these studies can be seen in Appendix S. The population of these papers represented a total of 929,802 individuals, of whom 90,767 were LGBTQ+ identifying (9.76%). Therefore, these studies are considered 81.1% of the overall population. These studies did evidence multiple risks associated with experiences of self-harm among LGBTQ+ young people. The individual risk factors were varied and numerous to the extent that they could not be individually considered in relation to prevalence. However, by categorising these broadly, some information can be gained.

Most of the papers which were not numerically synthesised, focused on samples which only considered sexual orientation minorities, see table 6. With fewer studies examining TGD populations or across the LGBTQ+ umbrella. Across all populations, psychosocial risks were most commonly cited in associated with self-harm. Victimisation and MHD were evident, although without reinforcing numerical evidence.

Table 6.

Risks associated with experiences of self-harm among LGBTQ+ young people: Papers unable to be numerically synthesised

Categories of risk	LGB k=48 N (%)	TGD k=8 N (%)	LBGTQ+ k=8 N (%)
Demographic variables (*e.g. natal gender, age, race*)	15 (30.6)	4 (50)	3 (37.5)
Psychosocial variables	31 (63.3)	4 (50)	5 (62.5)

(*e.g. low self-esteem, dating violence, suicide of friend or family, abuse*)			
Victimisation variables	27 (55.1)	2 (25)	4 (50)
(*e.g. LGBTQ hate crime, homophobic bullying, school bullying, cyber bullying*)			
Mental health difficulties variables	10 (20.4)	4 (50)	2 (25)
(*e.g. depression, substance use, bipolar, anxiety*)			
LGBTQ+ specific variables	13 (26.5)	2 (25)	3 (37.5)
(*e.g. gender-role nonconformity, internalised homophobia, parental rejection, loss of friends due to sexual orientation*)			

3.4.1. Meta-analysis: Victimisation

A random effects model was calculated, using the generic inverse variance method, to examine the prevalence of victimisation as a risk associated with experiences of self-harm among LGBTQ+ young people. Sixty-three estimates from 31 individual samples were reported, representing 331,321 participants in total. The random effects models reported a pooled prevalence estimate of 0.33 and a 95% confidence interval of between 0.29-0.38 among LGBTQ+ young people with self-harmful experiences.

A high level of between study variation (heterogeneity) could not be attributed to differences in individual reaction to victimisation within the included studies (Higgin's I^2 = 99%). Therefore, the prevalence estimates of the primary studies may be influenced by the presence of uncontrolled or confounding factors. Given this substantial level of heterogeneity, the impact of disproportionately influential individual studies was assessed using a leave-one-out analysis. Following this, Taliaferro and Muehlenkamp (2017) was removed from the meta-analysis. This was due to a variable being extracted multiple times as numerical data was given per sexual orientation, this resulted in a large volume of included variables. Therefore, this study was overtly overrepresented within the sample.

The random effects model was recalculated with 55 measures of prevalence from 30 unique samples. The corrected random effects model reported a pooled prevalence estimate of 0.36 (95%CI: 0.31-0.40) (Figure 7). The corrected random effects model did not impact heterogeneity (Higgin's I^2 = 99%). Accordingly, the observed heterogeneity could not be considered to be the result of overly influential individual studies, and therefore other sources of heterogeneity require exploration.

The Quality Effects Model was calculated using the total score from the risk of bias ratings, (individual study ratings can found within study characteristics tables; appendices S-T). The QEM can be interpreted as the meta-analytic synthesis that would have been obtained had all the studies been of the same methodological quality as the best study within the review. This reported an estimate of 0.36 (95% CI: 0.31-0.41). Given the similarity between the random effects model and the synthesis derived from the quality effects model, it is possible to conclude that the ratings of methodological quality did not have a significant and substantial impact upon the estimates of prevalence.

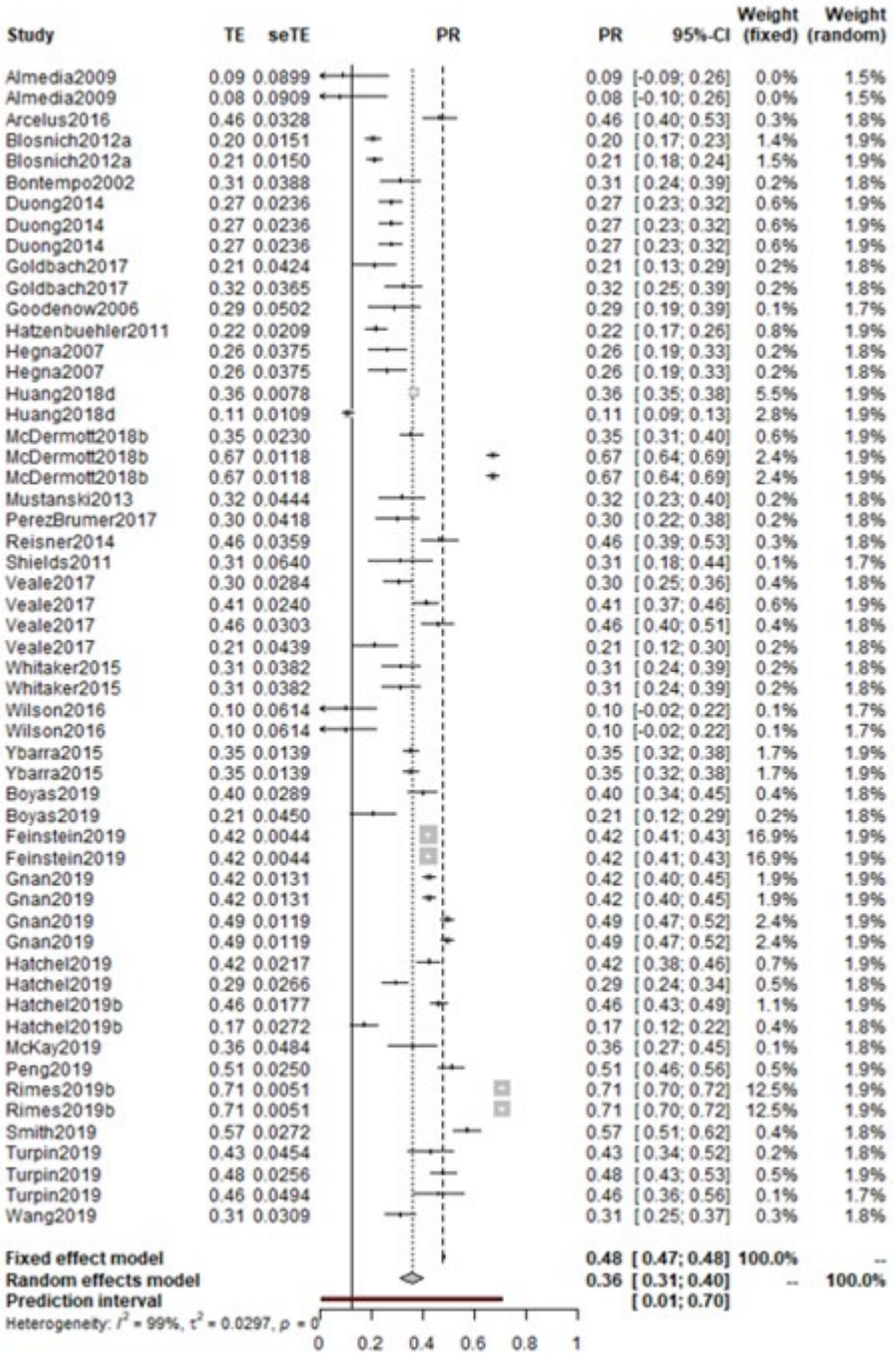

Figure 6.

Forest plot of victimisation prevalence among LGBTQ+ young people with experiences of self-harm

Visual inspection of the funnel plot of victimisation prevalence there is little evidence of publication bias. A fail-safe number of 107 suggested that an additional 101.9% of the existent literature would be required for unpublished null effects for the meta-analytic effect to become non-significant. Thus, the observed effect is considered robust to publication bias.

To further assess the impact of methodological variation upon heterogeneity, a series of subgroup analyses were conducted (table 7). The first considered risk of bias ratings; low, moderate, and high quality ($Q = 19.5$, $p < 0.01$). Both high-rated and low-rated studies evidenced higher prevalence than those rated as moderate quality.

Subgroup analysis was utilised to explore the impact of uncontrolled covariates upon victimisation (table 7). Initially, this evaluated differences in prevalence of victimisation between groups of sexual orientation (LGB) or gender identity groups (TGD) with these experiences of self-harm and suicide. This analysis was to explore whether a particular identity group experiences greater victimisation than others. Studies which combined the populations or looked at just one representation of LGB were excluded from this analysis. The subgroup analysis showed that prevalence rates of victimisation were relatively consistent across all gender identity and sexual orientation studies/groups ($Q = 0.11$, $p = 0.74$). However, heterogeneity was notably lower within the TGD studies. This may be related to a small number of studies being included, as analysis of LGB triples the study sample. Following this, subgroup analysis was conducted regarding outcome. Again, studies were excluded if they collapsed two distinct categories: suicidal ideation and suicidal attempt. Studies with self-harm as outcome demonstrated an overall victimisation prevalence rate of 39%. This suggests that higher rates of victimisation are associated with self-harm when compared to suicidal thoughts or attempts among LGBTQ+ participants.

Table 7.

Subgroup analyses of victimisation prevalence among LGBTQ+ young people with self-harm experiences

	Number of estimates (N)	Prevalence Rate	95% CI	Q	I^2 (%)	χ^2	Q, df , p
QUALITY RATING							Q = 19.50, df = 2, p = 0.01
Low	7	0.46	0.34-0.58	347.88	98.3	0.02	
Moderate	31	0.28	0.24-0.32	686.32	95.6	0.01	
High	17	0.45	0.37-0.52	4107.33	99.6	0.02	
POPULATION							Q = 0.11, df = 1, p = 0.74
LGB	27	0.34	0.27-0.42	6282.68	99.6	0.03	
TGD	9	0.33	0.24-0.41	108.99	92.7	0.01	
OUTCOME							Q = 12.18, df = 2, p = 0.01
Self-harm	10	0.39	0.31-0.48	353.09	97.5	0.02	
Suicidal ideation	21	0.35	0.33-0.38	212.38	93.4	0.00	
Suicidal attempt	15	0.26	0.20-0.31	212.38	93.4	0.01	

The prevalence of victimisation within LGBTQ+ young people with experiences of self-harm was compared to matched cisgender, heterosexual control counterparts. The odds ratios (19 estimates from 12 studies) were synthesised using the generic inverse variance. An odds ratio of 4.82 (CI: 3.67-6.32) was reported. Between studies heterogeneity was high (I^2 = 98%) suggesting uncontrolled methodological or conceptual factors contributing variations in reported risks. Therefore, a leave-one-out analysis was conducted to identify studies that might be exerting a disproportionate influence on the overall meta-analysis. One study was identified as both heterogeneous and influential, demonstrated by a change of effect of over 13%. Thus, Turpin, Boekeloo & Dyer (2019) study was removed to give a more conservative overall odds ratio.

The following meta-analysis was based on the remaining 16 odds ratios from 12 studies. This produced a synthesised odds ratio of 3.74 (95% CI: 2.90-4.84) (Figure 8). The corrected random effects model produced very little change to the heterogeneity level, (Higgin's I^2 = 98%). Given the small number of studies, further analyses including an assessment for publication bias were not feasible.

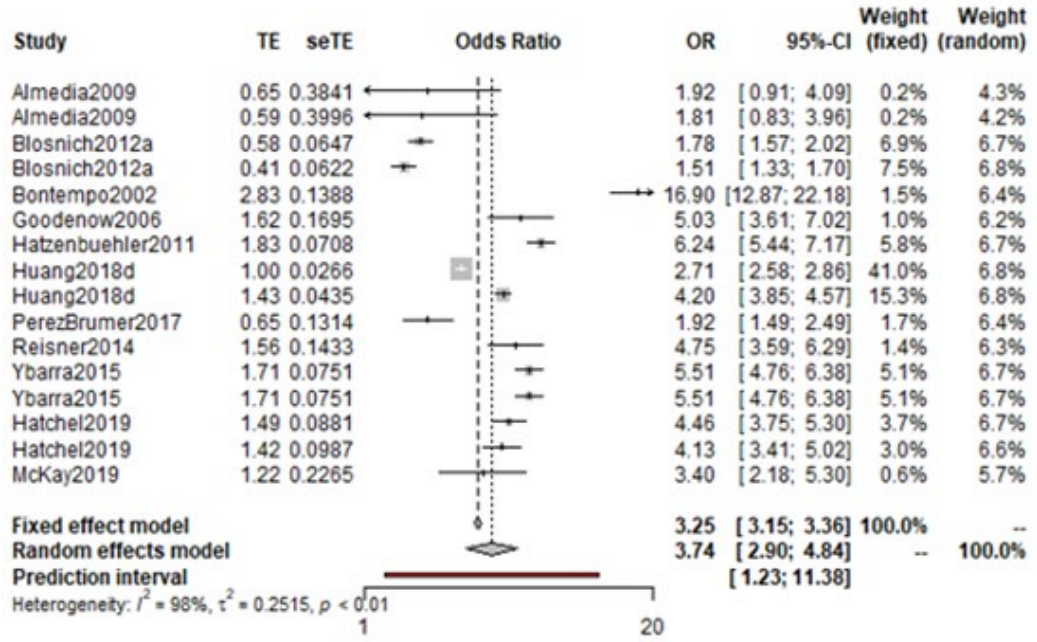

Figure 7.

Victimisation odds ratio among LGBTQ+ young people with experiences of self-harm compared to cisgender, heterosexual counterparts

3.2.2. Meta-analysis: Mental health difficulties

A second random effects model was calculated to consider the prevalence of previous mental health difficulties (MHD) within LGBTQ+ young people who have an experience of self-harm. A total of 166,810 participants were assessed over 22 studies which produced 51 estimates. The model calculated a prevalence of MHD of 0.36 (95% CI: 0.29-0.43). Again, a high level of heterogeneity was found (Higgin's I^2 = 99%). A leave-one-out analysis was therefore run, with the influential studies being evaluated for inclusion. Studies were omitted if they disproportionally influenced the overall result (Smith et al., 2020; Taliaferro & Muehlenkamp, 2017; Taliaferro, McMorris & Eisenberg, 2018b). The random effects models were then recalculated with the 19 studies and 32 variables. This resulted in the prevalence of mental health difficulties increasing to 0.39 (95% CI: 0.31-0.47) (Figure 9). While high heterogeneity remained (Higgin's I^2 = 98%).

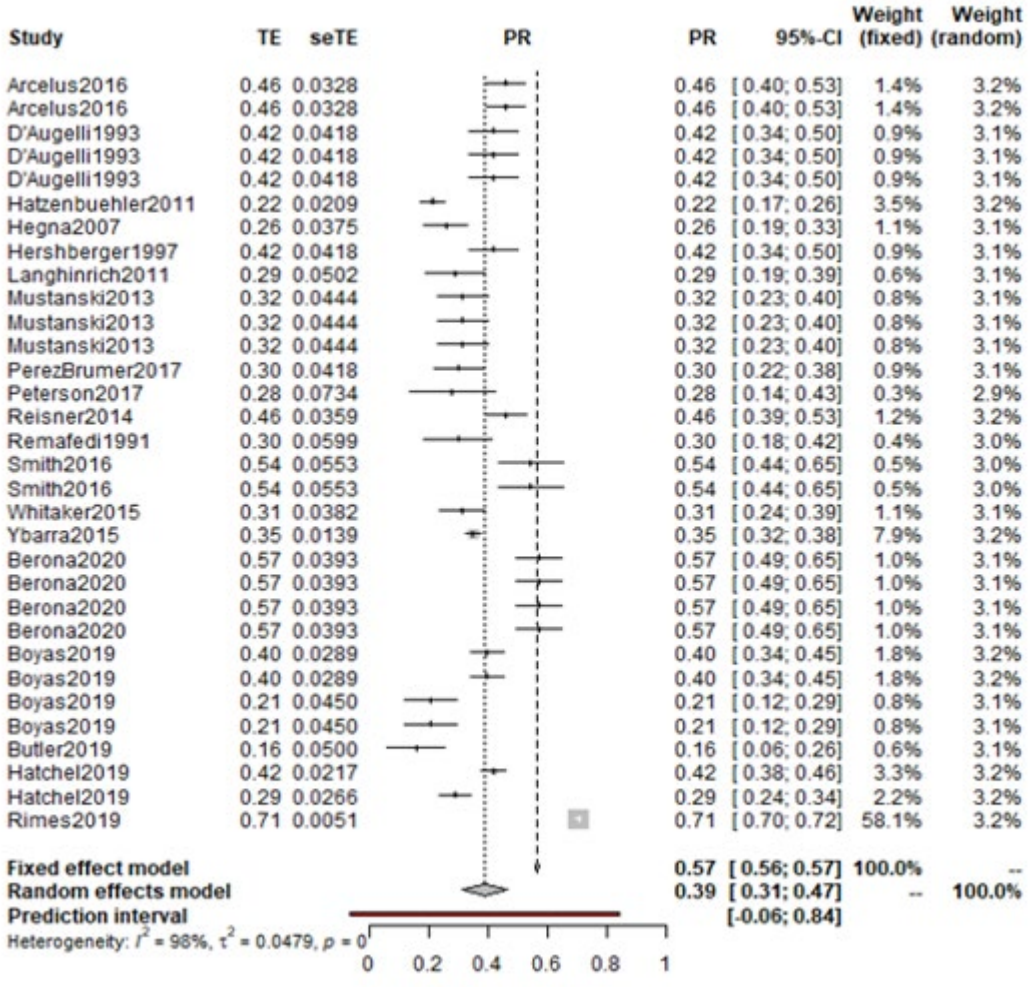

Figure 8.

Forest plot of MHD prevalence among LGBTQ+ young people with experiences of self-harm

Visual observation of a funnel plot and trim-and-fill procedure suggests the absence of publication bias. Following Orwin's algorithm, it was shown that 31 unpublished null studies would be needed to reduce the meta-analytic effect found within this sample. Again, subgroup analyses considering the risk of bias were conducted. The QEM model reported an estimate of 0.39 (95% CI: 0.31-0.47), suggesting that there were not enough differences regarding the risk of bias ratings to substantially influence the overall effects. Subgroup analysis of this sample demonstrated that 4 studies

were considered high quality, 14 were of moderate quality and 3 of low quality. However, little could be concluded from between groups differences (Q = 1.54, P = 0.46).

Further subgroup analyses were conducted to investigate the impact of uncontrolled covariates relating to MHD prevalence (table 8). The first of these again considered the prevalence differences which may occur between LGB and TGD samples. This analysis evidenced that LGB young people were shown to have a higher prevalence of MHD than TGD individuals (42% vs 34%). The difference in effect size is likely related to the large difference of included studies. The Higgins I^2 value for both groups were still high, suggesting that these studies do contribute to heterogeneity, although to lesser extent within TGD populations. A similar subgroup analysis regarding outcome was conducted, this demonstrated that the rates of mental health difficulties were slightly more prevalent among those with suicidal ideation.

Table 8.

Subgroup analyses of MHD prevalence among LGBTQ+ populations who have experiences of self-harm

	Number of estimates (N)	**Prevalence Rate**	**95% CI**	**Q**	**I^2 (%)**	**χ^2**	**Q, df , p**
QUALITY RATING							Q = 1.54, df = 2, p = 0.46
Low	11	0.41	0.33-0.49	122.06	91.8	0.01	
Moderate	17	0.36	0.31-0.41	125.83	87.3	0.00	
High	4	0.47	0.25-0.69	417.38	99.3	0.05	
POPULATION							Q = 2.43, df = 1, p = 0.30
LGB	20	0.42	0.32-0.53	1227.71	98.5	0.05	
TGD	5	0.34	0.22-0.45	37.56	89.4	0.01	
OUTCOME							Q = 0.41, df = 2, p = 0.82
Self-harm	3	0.38	0.20-0.53	30.19	93.4	0.02	

Suicidal ideation	8	0.40	0.35-0.44	32.70	78.6	0.00
Suicidal attempt	19	0.38	0.31-0.44	222.21	91.9	0.02

Following this, a meta-analysis of odds ratios was conducted; considering prevalence of MHD among LGBTQ+ young people and cisgender, heterosexual young people both with experiences of self-harm. Only 7 studies had available data. The random effects model calculated an odds ratio of 2.67 (95% CI: 1.93-3.71), with a high level of heterogeneity (I^2 = 95%) (Figure 10). However, due to the limited number of studies, further analysis was not conducted.

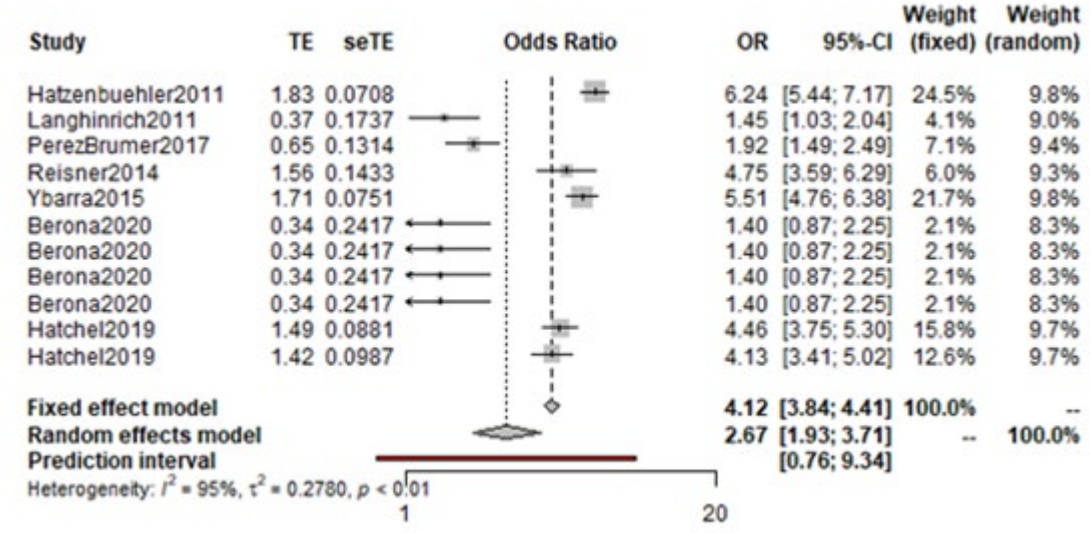

Figure 9.

MHD odds ratio of LGBTQ+ young people with experiences of self-harm compared to cisgender, heterosexual counterparts

3.5. DISCUSSION

This is the first systematic review and meta-analysis which evidences prevalence of victimisation and MHD within young people aged 12-25 who identify as LGBTQ+ with experiences of self-harmful

thoughts and behaviours, with and without suicidal intention. The review consisted of 142,510 participants who were a sexual orientation or gender identity minority. Due to limited information reported within the studies, it was not possible to consistently consider TGD participants by their sexual orientation as well. Evidence demonstrated high prevalence of victimisation (36%) and MHD (39%) within these populations. This review shows that these experiences were respectively 3.74 times and 2.67 times higher among young LGBTQ+ people than their cisgender, heterosexual counterparts. There were only 10 studies which were considered high-quality, with most studies (81%) being rated as moderate quality. Substantial heterogeneity was observed between study estimates within both meta-analyses.

The key findings of this meta-analysis strongly support previous research (Bailey et al., 2014; Brandelli Costa et al., 2017; Hatchel et al., 2019c; Liu et al., 2019; Meyer, 1995; Remafedi et al., 1991; Taylor et al., 2018). Within this study, a broad view of victimisation was arrogated, including a range of bullying behaviours such as cyber victimisation, homophobic bullying, peer bullying and so forth. Preceding meta-analyses have previously demonstrated established links between peer victimisation and suicide and LGBT victimisation and non-suicidal self-injury (NSSI) (Liu et al., 2019). This review demonstrates that there is a high prevalence between LGBTQ+ young people experiencing various forms of victimisation and self-harm. Indeed, this link between victimisation and self-harm appears to be more common than that among cisgender, heterosexual peers.

MHD were also shown to be highly prevalent with self-harm among LGBTQ+ young people. Liu and colleagues also evidenced MHD were linked to NSSI within this population (Liu et al., 2019). The current review extends findings from previous research by calculating risk prevalence and odds across the spectrum of self-harm to suicide and differentiating by gender identity and sexual orientation (Hatchel et al., 2019c; Liu et al., 2019). Thus, demonstrating that higher rates of victimisation and mental

health difficulties are found in LGBTQ+ young people who experience self-harm. However, evidence is not available from this review as the causal pathway causing self-harm or suicide or how predictive these risks associated with self-harm and suicide are.

By looking across the broad umbrella LGBTQ+ identities, this review has assessed the prevalence of risks associated with self-harm by gender identity compared to sexual orientation minorities groups. This allows for consideration of how influential these risks might be to particular groups among the LGBTQ+ label, and where differences of risk may lie. Both victimisation and MHD were evidenced to be more prevalent within LGB young people rather than TGD. However, it is likely that this finding is due to the higher number of studies focusing solely on LGB populations, as noted by the wider confidence intervals seen within the TGD subgroup analyses. Furthermore, those studies which considered both sexual orientation and gender identity, tend to have low numbers of TGD participants. Therefore, the TGD risks are potentially conflated or ignored, as there is a lack of statistical power to evidence risks which may apply to TGD participants and not LGB.

Further to this, we were unable to conduct meta-analysis by identity (e.g. transgender man, transgender woman, nonbinary etc.) within gender identity or sexual orientation (e.g. bisexual, homosexual, lesbian), thereby these are broadly categorised. This may overlook differences between identifying as a particular sexual orientation or gender identity; and how being a member of these subgroups may differ from each other (Mink, Lindley & Weinstein, 2014). Additionally, no papers considered sexualities outside of homosexual, bisexual, queer or questioning. This limits how far these risk conclusions might be drawn to other sexual orientation groups e.g. those who are asexual, pansexual, polysexual etc. Future research should support inclusion of diverse sexualities and gender identities within studies, offering individuals to self-report in their own words, and options for intersectional identities.

This review has important clinical and policy implications in relation to suicide prevention among LGBTQ young people. Primarily, discrimination against LGBTQ+ individuals has widely been recognised as a priority for governments and organisations globally (Government Equalities Office, 2018; The Equality Project, 2020). These results definitively highlight the harmful outcomes associated with acts of discrimination and victimisation. Given the variety of countries which are included in this study, the findings of this study could be used to inform national policies, such that there is a priority focus on reducing minority victimisation and discrimination. Furthermore, by understanding these complex experiences which surround LGBTQ+ youth, compounded by high rates of MHD, suicide prevention strategies are better informed to support LGBTQ+ youth. Thereby suicide prevention interventions and policies may be better tailored to the specific needs of LGBTQ+ young people and develop initiatives which build resilience and challenge societal acceptance of such discrimination. However, the studies in this meta-analysis mainly come from HIC, therefore the results might not be generalisable to LMIC where young people who identify as LGBTQ+ may face additional or different types of risks.

Secondly, health care professionals should be aware of the high prevalence of MHD and victimisation within the umbrella of LGBTQ+ young people. Acknowledging sexual orientation and gender identity in an accepting and supportive manner, would be beneficial to encouraging a constructive health care environment (Banerjee et al., 2020; Makadon, 2011), which could potentially aid disclosure of self-harm and suicide. Evidence also shows that health professionals encouraging LGBTQ+ youth to discuss their experiences of victimisation could further reduce negative health consequences (Earnshaw et al., 2017). From these insights, professionals might be able to suggest treatments or care understanding the sociodemographic environment which these individuals are living in.

Much of this research takes places within school settings, with the average age of participants being below 18 years old. Given that bullying among school-aged children is common (Swearer et al.,

2010), this would suggest that school-based interventions would be an appropriate setting to target victimisation for LGBTQ+ young people, potentially reducing self-harm. This is supported by a recent study suggesting that addressing the barriers and facilitators when reporting and responding to LGBTQ+ victimisation in schools would prevent adverse mental health (Reisner et al., 2020). In particular, LGBTQ+ youth felt that building trust with staff members, being given time to discuss problems and receiving responses from school were key (Reisner et al., 2020). Therefore, creating an environment which recognises the unique aspects and potential risks of being LGBTQ+, such as dealing with difficult disclosure (Gnan et al., 2019) or understanding gender nonconformity (Liu et al., 2019) would be beneficial. This could translate to older adolescents and young adults by having similar environments within colleges, universities, or social community spaces. These spaces might be able to consider risks, which differentiate by age (e.g. identity development, transition treatments available, housing situations) which due to limited reporting we were unable to meta-analysis within this review.

There is a wealth of literature readily available relating to risks for self-harm within LGBTQ+ young people. However importantly, even though many of these studies had explicit focus on LGBTQ+ individuals, only 12% of the total population held these identities and reporting is highly inconsistence between individual risks. Future research in the field of self-harm and suicide prevention requires a specific LGBTQ+ focus as this would allow for a holistic understanding of these populations' experiences.

3.5.1. Strengths and limitations

This is the first systematic review and meta-analysis which has comprehensively synthesised existing evidence from across the full spectrum of LGBTQ+ young people in order to identify the prevalence of key risks with self-harm. Firstly, this dimensional approach allowed for a holistic view and comparison of risk prevalence across self-harm and suicidal thoughts and behaviours. Secondly, broad search strategies were run, which ensured a large number of studies was identified across disciplines and

across the LGBTQ+ umbrella. This search was re-run prior to submission to ensure that the review was as up-to-date as possible. Thereby, TGD populations were able to be identified and specifically examined with reference to similar LGB samples. A final strength was the robust meta-analytic strategy, which was emplaced within this study, therefore allowing authors to determine points of bias and control for these.

There were, however, some limitations which need to be considered. Firstly, there were few high-quality studies and substantial heterogeneity within the findings. Sources of heterogeneity were explored using our pre-specified subgroup analysis but also to determine points of heterogeneity; this offered little. Potentially, this was related to the use of four variations of the NOS assessment (Appendix D). While inclusion of four versions allowed for a greater number of papers to be assessed, this also created another variable of ambiguity. However, heterogeneity may also be related to the variation in conceptualisation of phenomena, population, study design and fundamentally individual reporting of risk. In future, clear operationalisation within studies is necessary and use of standardised, validated measures to assess self-harm and suicide across the spectrum of thoughts and behaviours.

Secondly, self-harm with suicide intention and self-harm without suicide intention may have different associated risks which link to why someone might be more likely to consider suicide. However, given the measures used to assess self-harm within included studies this was not possible. Therefore, only risks associated with self-harm regardless of intention was able to be analysed. This does not allow us to offer explanation as to why someone might consider suicide with this behaviour. Finally, searches were limited to English language; thereby key studies within other languages may have been overlooked.

The research presented in Chapter 4 is published in:

Williams, A. J., Arcelus, J., Townsend, E., & Michail, M. (2021). Understanding the processes underlying self-harm ideation and behaviors within LGBTQ+ young people: a qualitative study. Archives of suicide research, 1-17.

CHAPTER FOUR: UNDERSTANDING THE PROCESSES UNDERLYING SELF-HARM WITHIN LGBTQ+ YOUNG PEOPLE: A QUALITATIVE STUDY

4.1. ABSTRACT

Objective: This study aims to understand the processes underlying self-harmful thoughts and behaviours, with and without suicidal intent, among LGBTQ+ young people.

Methods: Nineteen semi-structured interviews took place between October 2019-May 2020. Participants were aged between 16-25 years, had experiences of self-harm ideation and behaviours, and were part of the LGBTQ+ umbrella. A range of sexualities and gender identities were represented: eleven participants were cisgender, six were transgender and two were non-binary. Interviews were transcribed verbatim and anonymised. Thematic analysis and reflective member-checking were used to develop a thematic framework.

Results: Three themes were developed from the interviews and evaluated by four participants who engaged with reflective member-checking. Findings indicated that internal processes and external responses to being LGBTQ+ resulted in self-harmful thoughts and behaviours. Alongside these, additional stressors related to being a young person were led to difficulties with self-harm.

Conclusions: Findings from this study indicate that young people often struggle with accepting their LGBTQ+ identity for a number of reasons, whether this is due to access to a resource or their own feelings about their identity. These negative self-perceptions can be enhanced by poor responses from others and additional life stressors which impact their self-esteem or self-perception.

4.2. INTRODUCTION

Self-harm, the self-injury or poisoning irrespective of suicidal intent (NICE 2011), is a crucial issue impacting young people (Geulayov et al., 2018). LGBTQ+ (Lesbian, Gay, Bisexual, Transgender, Queer or Questioning) youth are particularly vulnerable (Liu et al., 2019). Given self-harm ideation and behaviours are the strongest predictor of suicide attempt and completion (Hawton et al., 2012; 2020), this is particularly worrying. Among LGBTQ+ youth, self-harm is around 30-50% more likely (particularly in TGD people, those who do not identify their gender with the sex assigned at birth) than among cisgender (individuals who identify as the sex they were assigned at birth), heterosexual peers (Liu et al., 2019; Marshal et al., 2011). Given these significant disparities between LGBTQ+ youth and cisgender, heterosexual youth in self-harm, it is crucial to explore processes that underlie these experiences.

Among LGBTQ+ youth, self-harm has been linked to high rates of mental health difficulties, victimisation (Williams et al., 2021a), interpersonal problems, lower self-esteem (Arcelus et al., 2016), difficulties with self-concept integration and social comparison (Taylor et al., 2018). The Minority Stress Model (MSM; Meyer 1995, 2003; Hendricks & Testa, 2012) suggests that mental health is affected by proximal (internally orientated processes) and distal (objective, external events) stressors based on one's minority status. These adverse experiences negatively impact self-harm (Arcelus et al., 2016; Shilo & Mor, 2014; Taylor et al., 2018; Williams et al., 2021a; Wilson & Cariola, 2020) and explain some of the disparity seen between LGBTQ+ youth and cisgender, heterosexual peers.

Minority stressors within the LGBTQ+ umbrella can include internalised and external homo- and trans- phobia (Gibbs & Goldbach, 2015; McDermott et al., 2018b; McDermott, Hughes & Rawling, 2017; McDermott et al., 2008; Puckett et al., 2017), body and gender dysphoria (Bailey et al., 2014; Wilson & Cariola, 2020), or impact of transition (social or medical) among others (Beek et al., 2015; Coleman et al., 2012; Wylie et al., 2014). To reduce self-harm, it is key to understand what these shared stressors are

and how they relate to being part of a minority group. This is particularly important to be studied among young people as their identity develops when moving from childhood to adulthood.

While there is some consideration given to underlying processes which lead to self-harm across LGBTQ+ young people in qualitative research (McDermott et al., 2018; McDermott et al., 2013; McDermott et al., 2008), this is still a relatively small pool. Research is often split by identity, e.g., bisexual individuals (Dunlop et al., 2021), or by aspect of self-harm, e.g. non-suicidal self-injury (Jackman et al., 2018) or suicidal intention (Hunt, Morrow & McGuire, 2019; Rivers et al., 2018). This study aims to extend the literature in this area by looking across LGBTQ+ identities and the dimensions of self-harm. Sexual orientation has been grouped with gender identity in this study as both are part of a minority group at a time when their identity is developing. By having these broad categories for self-harm and LGBTQ+ identities, it is thought that this research will have utility across research, clinical and third-sector services and well help us to understand the interaction between self-harm and being part of a minority group. Furthermore, by adopting the NICE (2011) definition of self-harm, findings can give insight into how particular experiences can influence the transition from self-harm to suicide attempts in young people. Therefore, the aim of this study is to explore the views of young LGBTQ+ people's regarding the factors that influence their self-harm using a dimensional approach of self-harm to include experiences with and without suicidal intent.

4.3. METHODS

4.3.1. Design

This is a cross-sectional qualitative study using semi-structured interviews considering experiences of self-harm ideation and behaviour among young people who self-identified as part of the LGBTQ+ umbrella. This study was granted ethical approval by the Science, Technology, Engineering and Mathematics review committee at the University of Birmingham (ERN_19-1032).

4.3.2. Recruitment

Recruitment took place via physical (at the two associated universities), and social media advertising (Twitter, Facebook), as well as an advert hosted by the mental health charity MQ's research participation webpage (a mental health body's research platform: https://participate.mqmentalhealth.org/). These adverts explained the interview topic and participant inclusion criteria.

Snowballing sampling was also used. Following interviews, I would ask participants if they would be comfortable to tell any friends about the study and let them know to get in touch with me if they were intrigued. Participants were under no pressure to do this, and I highlighted that if they didn't wish to disclose that they had taken part they could also refer to seeing the online adverts.

International online TGD communities were approached as to explore any differences or similarities of health care services and current social changes. This had the added benefit of an alternative approach for a difficult to reach population, given that I am cisgender as is the supervisory team there was some resistance. I explained to these groups the work of the LGBTQ+ advisory group which includes transgender and gender diverse members. However, not having a paid full-time team member who was gender diverse may have impacted recruitment, as interested individuals may not have felt represented. An additional aim for approaching international groups was to explore help-seeking for self-harm among TGD young people between countries. However due to low response, it was decided not to consider these experiences separately at this point.

4.3.3. Participants

Nineteen participants were interviewed between October 2019 and May 2020. These participants were from the U.K. (n=16), U.S.A (n=2), and Israel (n=1). Participants held a range of gender identities; 11 being cisgender (1 male; 10 female), 6 transgender (4 trans male; 2 trans female) and 2

who were non-binary (people who identify outside of male or female). These individuals also held a variety of sexual orientations (Table 9). Ages ranged from 16-25 (M: 21.2, SD: 2.7).

Table 9.

Interview participants' descriptives

Gender	Sexual orientation	Age (years)	Interview method
Cis Female	Bisexual	21	Phone
Trans Male	Gay	16	Phone
Cis Male	Gay	22	Phone
Trans Male	Bisexual	23	Skype (video chat)
Trans Female	Polysexual	24	Skype (non-video chat)
Cis Female	Lesbian	19	Phone
Cis Female	Bisexual	21	Skype (video chat)
Non-Binary	Asexual	22	Phone
Cis Female	Lesbian	18	Phone
Cis Female	Lesbian	24	Phone
Non-Binary	Queer	19	Skype (video chat)
Cis Female	Lesbian	25	Phone
Cis Female	Bisexual	18	Phone
Cis Female	Bisexual	25	Phone
Cis Female	Bisexual	19	Phone
Trans Female	Pansexual	23	Skype (non-video chat)
Cis Female	Bisexual	22	Phone
Trans Male	Bisexual	18	Skype (video chat)
Trans Male	Queer	23	Skype (video chat)

4.3.4. Procedure

Before conducting interviews, participants completed a safety planning activity (Stanley & Brown, 2012; Appendix P). This was sent prior to the scheduled interview, along with a visual scale, and participants were asked to have a copy of each physically or digitally available for the interview. I would then ask them to fill in the safety plan by talking me through their triggers, internal coping strategies, social distraction, and people they could turn to for help (Stanley & Brown, 2012). If participants struggled to give three examples for each section, we would discuss their options or alternative supports. Once this was completed, I reminded participants to use this safety plan if they felt distressed during the interview or at any point in the future.

Additionally, before and after the interview, participants were asked to rate their mood between 1-10 (10 being extremely happy) using a visual scale. This was to determine whether the interview had significantly impacted participants mood at all. Offering the opportunity to talk through any concerns or distress. Prior to interview, participants' mood averaged as 5.9, whereas following, mood was 6.3, therefore indicating a slight mood improvement.

The interview schedule was developed with input from an advisory group of LGBTQ+ young individuals who had experience of self-harm and piloted with two individuals. The interviews broadly discussed self-harm, and how this may link with being LGBTQ+, finishing by asking about help-seeking and recovery (Appendix E). The semi-structured nature of the interview allowed reflexivity and flexibility (Mason, 2002).

I interviewed all participants. These were single interviews, with only the participant and myself present. Personal reflexivity and rapport building can be found in Appendix Z. Participants were encouraged to use the language which they felt was appropriate for them to describe their self-harm. Field notes were taken during the interviews, which acted as question prompts and highlighted points of

relevance within the interview. The interviews lasted a mean of 63 min (45' to 89') and were audio recorded and transcribed verbatim with identifying information removed for confidentiality. Most participants had experiences of self-harm thoughts and behaviours, with just under half discussing at least one suicidal attempt. One participant withdrew from the study as they had not realised that the main topic of the interview was self-harm instead of mental health generally.

4.3.5. Analysis

As I conducted and transcribed all the interviews using the philosophical standing found in Appendix AA, I was immersed in the data from collection. Initial coding of interviews began during data collection and was ongoing to ensure that data saturation was achieved before recruitment ceased (Guest, Namey & Chen., 2020). Following transcription, data was imported into NVIVO12, and inductively thematically analysed following steps by Braun and Clarke (2006; 2019). Extensive coding of topics, content and context was performed. Similarities and differences among the codes were identified to develop preliminary subthemes within the data.

These subthemes were continuously viewed in relation to the interviews, allowing for reflective consideration and critical discussion between all authors. JA and I refined subthemes to move forward the strongest identified. Notes and discrepancies were evaluated to enhance the accessibility of subthemes and regrouped to make major themes. This framework was then evaluated and discussed by all authors to create a full thematic framework.

While transcripts were not return to participants, to enhance the accuracy and validity of this framework, participants who had expressed interest in being involved in member checking were contacted. These participants engaged with member checking (Harvey, 2015). Member-checking supported the proposed framework with minor adjustments (language used in theme descriptor).

4.4. FINDINGS

Three major themes were identified; i) Struggling with processing and understanding one's own LGBTQ+ identity; ii) Negative responses to being LGBTQ+; and iii) Life stressors. Each theme is described in further detail and supported by participants' quotes. The thematic framework is presented in table 10, with theme and subtheme prevalence. Theme prevalence is offered for an insight into the generalisability of themes across participants. However, it is important to note that not every participants' experiences are the same and lower prevalence does not indicate the importance of a specific experience to an individual.

Table 10.

Thematic framework of LGBTQ+ young people's experiences of self-harm

Theme	N (%)	Subtheme	N (%)
Struggling with processing and understanding one's own LGBTQ+ identity	*16 (84%)*	Not having the words to describe feelings and thoughts associated with LGBTQ+ identity	*12 (63%)*
		Internalised hatred relating to LGBTQ+ identity	*7 (37%)*
		Coping with gender dysphoria	*8 (42%)*
		Difficulties of medical transition	*4 (21%)*
Negative responses to being LGBTQ+	*16 (84%)*	Peer abuse and bullying	*8 (42%)*
		Unaccepted and unsupported by family	*13 (68%)*
Life stressors	*14 (74%)*	Abusive experiences	*6 (32%)*
		Stress of feeling responsible for others	*7 (37%)*
		Difficulties relating to physical injuries and illnesses	*6 (32%)*
		Academic pressures	*5 (26%)*

4.4.1. Struggling with processing and understanding one's own LGBTQ+ identity

Participants discussed at length their internal self-evaluation in relation to their LGBTQ+ identity and how this led to self-harm with and without suicide intent. Multiple aspects fed into this process; not having the appropriate language to explain their thoughts and feelings even to themselves, hating their LGBTQ+ identity, coping with gender dysphoric feelings and the difficulties of medical transition. These aspects negatively influenced participants' self-acceptance, which led to self-harmful thoughts, behaviours and occasionally suicide attempts. During member checking one participant described how "*self-acceptance is an ongoing process and can fluctuate for some folks*" (Trans man, Bisexual, P4), which indicated that understanding and accepting one's LGBTQ+ identity is often not a linear process.

4.4.1.1. Not having the words to describe feelings and thoughts associated with LGBTQ+ identity

During early adolescence, self-harm was often related to working out one's sexual orientation and gender identity. Initially, participants typically felt that their sexual attractions or gender identity were somehow different from their peers but did not have the words to describe what was going on for them;

"I think that was very much there but I probably I didn't have the terminology to understand erm, myself or that you could have a life anything other [than heteronormative relationship]" (Cis woman, Lesbian; P12).

However, for other participants this confusion was extended. Here, participants discussed how they knew of being homosexual but were still unable to identify their own sexual orientation or gender identity. This caused distress as they didn't have terminology to explain what they were experiencing. But knew that they were neither hetero- or homo- sexual, or their assigned gender, something which was unheard of in their worlds at this point.

"…it's only recently that it's more talked about, erm, that there's different sexualities and it branches off in many different ways like a tree. But that point I just knew it as you're either gay or you're straight…" (Cis woman, Bisexual, P13)

"The word trans was not something I heard until I was like 20 so, erm I didn't think it was a possibility and I didn't really connect me not liking my male body to me wanting to be a girl." (Trans woman, Polysexual, P5)

By lacking this terminology, participants described how they were confused by their feelings and thoughts of being LGBTQ+, and often tried to suppress these which ultimately caused anxiety, distress and self-harm.

4.4.1.2. Internalised hatred relating to LGBTQ+ identity

Young people often struggled with accepting that they were LGBTQ+, leading to feelings of stigma and internalised hatred. Participants described feeling as though they were unable to think about being LGBTQ+ or imagine a future where this was the case, therefore believed that they deserved to be in pain due to their sexual orientation and/or gender identity which could make them engage with self-harm; for some resulting in a suicide attempt; *"I didn't allow myself to accept or think about at that time that I was gay"* (Cis woman, Lesbian, P12).

"I think it was a lot of me feeling like I deserved it [self-harm]. Erm and that it was again a form of punishment for me because I genuinely thought that what I was feeling was sinful and that I needed to get it out for me." (Trans man, Queer, P19)

"…you kind of think "oh you know maybe I shouldn't be gay or you know, if I'm gay maybe I should act like this or based on whatever" and it ended up in me like hating myself for my sexual orientation." (Trans man, Gay, P2)

While for some internalised hatred was part of the journey towards accepting themselves, other participants still felt very negatively about their LGBTQ+ identity and were unable to accept this aspect of themselves, this was a key factor leading to their self-harm. In particular, one participant spoke at several points about not wanting to stand out or be considered different in anyway which transcended into their early adult life.

"I still would choose not to be gay now if I could. I-, I, I, it's not something I would choose or wish on anybody but it's just who I am." (Cis man, Gay, P3)

4.4.1.3. Coping with gender dysphoria

Among TGD participants, an important cause for self-harm was experiencing difficulties with their bodies and others using the wrong pronouns; this was described under the umbrella of gender dysphoria. Young people explained how the mental distress caused by gender dysphoria led them to feel that they should hurt themselves and was an ongoing issue, as their bodies did not represent their true gender and were triggering their pain.

"I'd say the gender dysphoria aspect of it has definitely influenced [suicidal thoughts] because there was just sometimes where I couldn't stop thinking about my body and how it just wasn't how I wanted it to be." (Trans man, Bisexual, P4)

"…if I was already in a bad place you know something just as small as one pronoun would just sort of send me into a spiral…. Yeah I'd say especially like dealing with like gender dysphoria, you know, it feels you know kind of natural to take those feelings out on your body when it feels like it shouldn't even be yours." (Trans man, Gay, P2)

For some, this resulted in very specific, localised self-harm.

"Hurt myself in my biceps or where I'm muscular. And when I was younger, so I would hurt, I would disproportionally get hurt in my testicles a lot. Erm like I tried to, I tried to castrate myself sort of…"

(Trans woman, Polysexual, P5)

Gender dysphoria was most often discussed in relation to self-harm behaviours. The majority of TGD participants associated gender dysphoria with a suicide attempt. This was related to feelings of entrapment within one's own body and perpetuating feelings of depression. Among LGBTQ+ young people, this offers distinctive experiences facing TGD or questioning youth which are perceived to cause particularly dangerous behaviours.

4.4.1.4. Difficulties of medical transition

Participants discussed the financial costs of medical transitioning to some degree, and the stress due to waiting time for NHS trans health services, which occasionally forced young people to buying gender affirming hormone therapy online. Interestingly, participants from the U.S.A and Israel had been able to begin transition legally prior to the interviews and so much of their discussions were retrospective. UK-based transgender participants were all still on waiting lists and dealing with these issues at the time of interview.

"They (Gender Clinic) sent me back a letter a couple of months later saying "18 months, see you a year and a half from now". And then when that year and a half came they'd delayed it another year or so, and at that point I've just spent 2 years of my life waiting to get care so I can make the decision and when it got pushed back that's when I got suicidal because I just needed the help there and then." (Trans woman, Pansexual, P16)

"…it's going to be ages until I can medically transition you know I'm either going to have to go it, wait for adult services, or private and stuff like that. It's really stressful and you know again sometimes if I'm already in a bad place just thinking about that would just push me over the edge." (Trans man, Gay, P2)

The long waiting times for transitional appointments caused distress and self-harm as participants felt as though they would never be seen by professionals resulting in thoughts of hopelessness about their futures. Further concerns shared among participants included that they would age out of a particular service before receiving treatment or that they might need to take on private services, which would increase the financial burden. One participant discussed how this pushed back further life experiences, such as attending university, as young people were trying to deal with medical transition first.

4.4.2. Negative responses to being LGBTQ+

A common theme which dominated the interviews was how others had and might respond to young people disclosing their LGBTQ+ status or outwardly presenting as LGBTQ+. The fear and experience of rejection was frequently stated as a perceived cause of self-harm. This often furthered any negative perceptions the young person held of themselves and intertwined deeply with their self-esteem.

4.4.2.1. Peer abuse and bullying

Some participants spoke about how peers at school who knew or suspected their LGBTQ+ identity would react, and that this made them a target for insults, bullying and abuse.

"I kind of started self-harm in high school, beginning of high school. So 10, 11, 12 after being bullied quite a lot […] it was just constant bullying with, just because I was different really, different to the stereotypical, like normal, girl or boy things to do." (Non-Binary, Asexual, P8)

"I had probably about at least half, 150 people being "oh [name] dirty lesbian" coming into my classrooms, I had people throwing balls of yarn covered in piss, piss, urine, didn't ever hit me." (Non-Binary, Queer, P11)

Once their peers knew about their non-heterosexual orientation, changing rooms were a place for discrimination and bullying. Several young people spoke about how they were accused of looking at others while changing or otherwise invading others' privacy. This caused violence for some, while others isolated themselves to avoid confrontation.

"…everyone would be like "ew she's going to be looking at us" like "aw I bet she fancies us kind of thing", like I felt better being away from everyone else which it didn't feel great that I had to kind of go somewhere else from other people […] I think definitely the discrimination I got when I was younger from other girls, that definitely impacted it [self-harm and suicidal thoughts] because it added to that low mood and just not feeling accepted." (Cis woman, Bisexual, P15)

Subsequently, young people were anxious about sharing their LGBTQ+ identity and would keep it hidden. This, however, resulted in participants feeling they were not being their "true selves" causing emotional turmoil and depression, ultimately leading to self-harm and sometimes suicide attempts.

"I felt like anger for like how other people had treated me but I didn't know how to express that anger in a healthy way towards the actual reasons I was feeling angry and so it became self-directed anger and kind of felt like I should punish myself." (Cis woman, Bisexual, P1)

4.4.2.2. Unaccepted and unsupported by family

Commonly, these negative responses to LGBTQ+ status came from family members. For TGD youth this could be that their family invalidated their gender identity and desire to transition. This had a

detrimental impact on the relationship between the young person and their family. Participants describe the experiences as isolating and caused a huge amount of distress which resulted in self-harm.

"…my mum basically used to send me loads of like articles to read and she was all for "oh you know you need to look at the other side and stuff" but they were all really like blatantly transphobic articles and one of them was so bad I had a panic attack really bad." (Trans man, Gay, P3)

"…my mum has just refused to call me [name] or use my pronouns. Despite coming to the clinic, sitting down with professionals being told "your daughter needs to hear this from you." And she just wouldn't…" (Trans woman, Pansexual, P16)

Unacceptance from family members was also perceived by LGB participants; *"…my dad doesn't believe in lesbians and erm gays and bisexuals, […] my dad's attitude angers me quite a lot. And when I get angry that leads to self-harm."* (Cis woman, Bisexual, P17). While negative attitudes were not directed at this individual, the participant felt unable to disclose her sexual orientation to family members due to her father's disbelief around LGBTQ+ people. Another participant noted that their parents not accepting that they were a lesbian caused them to feel "*like I needed to change myself or be someone that I wasn't to make my parents happy and then I just ended up disliking myself*" (Cis woman, Lesbian, P12). Ultimately, these experiences also caused participants to suppress their identity and limit disclosure. For this participant 12, this ended with them attempting suicide several times.

Even if a parent or family did accept their child as being LGBTQ+, this did not always result in the young person feeling as though their identity was supported, which could influence their own self-acceptance journey. This was often described as family members ignoring that aspect of the young person or avoiding topics of relationships.

"Sometimes still with my family, especially with my mum, even though I feel that she accepts that I'm gay she still tries to get me to be someone that I'm not […] And I struggle with that, that she doesn't just, that there's not this acceptance of this is who I am, don't try and change me." (Cis woman, Lesbian, P12)

"I think she still kind of takes that stance but she's kind of, she's accepted it, well [pause] she knows it's there but is choosing to ignore it." (Trans man, Bisexual, P18)

4.4.3. Life stressors

This was the final theme which was developed to convey young LGBTQ+ people's narratives of difficult experiences that they had faced. These experiences, while not always explicitly related to the individual's LGBTQ+ identity, often shaped other elements of their coping mechanisms or self-perception which impacted self-harm.

4.4.3.1. Abusive experiences

Several young people experienced some form of abuse. For most, this abuse was emotional, however one participant experienced multiple types of abuse from her parents and brother.

"My dad physically, emotionally and sexually abused me throughout my life. [pause] Erm and my mother physically and emotionally abused me. I was on child protection when I was a child. And then my brother, I was his punching bag from around the age of 2 onwards…" (Cis woman, Lesbian, P17).

For participant 17, she began self-harming at a young age and was sectioned several times following suicide attempt. Primarily she associated self-harm with her abusive experiences and bullying from peers related to her abusers. Another participant spoke in depth about their experience of being sexually assaulted while hitchhiking which caused them to completely shut down their internal dialogue and progress regarding their sexual orientation and gender identity. She discussed how self-harm was a tool for communication and coping with their experience.

"…then one of those times when I was hitchhiking I was assaulted and kind of regressed everything. I went into a depression afterwards and kind of didn't leave my house a lot […] My problem was trauma. But it wasn't self-harm, self-harm was the way I dealt with it. But I did have, in some ways self-harming was a way to get people to notice that there was a problem." (Trans woman, Polysexual, P5)

4.4.3.2. Stress of feelings responsibility for others

Stress was often related to feeling responsibility for others' either physical or emotional health. Several participants had caring duties for people within their families or foster family and felt it was their responsibility to look after the person who was disabled or ill. This led to them feeling overwhelmed, anxious, and engaging with self-harm.

"I was doing sort of like night shifts just learning how to be a proper carer, like you know he [foster brother] had seizures, epilepsy, and you probably don't know what it is but chronic seizures. They're erm. And I was only doing it for a little while but it was really a lot to process, you know, like obviously his [foster father] daughter had been brought up with it because he was, he was about 24 now I think but you know. It's terrifying seeing that you know. And he was really ill, really ill…" (Non-Binary, Queer, P11)

Other participants spoke about how they were emotionally supportive for friends. Often, the case was that the participant was the person that many people came to discuss their own problems with, including mental health. Because of this, the young person felt they were unable to disclose their own struggles without burdening their friends, and that it was their priority to care for their friends over their own wellbeing. As young people were looking after others, this meant their own self-harm was pushed aside and caused them not to seek help, as they felt their own feelings were not a priority.

"…the problems with my friends, my friends were going through depression and stuff. And having stuff going on in their lives, and I was always the one who was like helping them out. And it got to a point where it was just too much for me, I just started cutting and stuff..." (Cis woman, Lesbian, P9)

4.4.3.3. Difficulties relating to physical injuries and illnesses

A number of participants also dealt with ongoing physical injuries or illnesses which caused them great stress; "*I have chronic back and neck pain after fracturing my spine […] I would say [pause] it affects my mood a lot and it can affect the self-harming aspect as well*." (Cis woman, Lesbian, P6). These participants often felt isolated by their injury or illness, being left to deal with it alone. Being unwell was also discussed in relation to age, as participants felt they should not be so ill at young ages, this led to feelings of being overwhelmed. Self-harm was used to deal with this sense of being overwhelmed.

"I'm in chronic pain I think having constant pain at a young age you don't know how to deal with it. No one really educated me or advised me on how to deal with it […] And then the pain obviously it gets too much sometimes…" (Cis woman, Bisexual, P13)

"I've had 4 cancer scares or is it 3 I can't really remember, as well, so that's a nightmare. And I've also had sepsis when I was 18, and then I had a scare of a blood clot in my lung and I've also had pericarditis which is an infection of the heart, the sack of your heart sorry. So for someone my age it's a bit much you know." (Cis woman, Bisexual, P17)

Another participant discussed at length how their physical illness, caused them to isolate themselves from others, question their sexual orientation due to a fear of being intimate with others and described how it left her feeling hopeless; "…*it (self-harm) was to do with a physical health thing that I had going on that I felt really embarrassed about and didn't tell anyone about and yeah. I didn't really have any hope for the future…*" (Cis woman, Bisexual, P14).

4.4.3.4. Academic pressures

Finally, participants discussed how they were concerned about their academic performance, that they were perfectionists, and that they could not live up to their own expectations. For some, pressure also came from their parents to succeed but mainly the young people discussed the pressures which they put on themselves. These pressures led to feelings of anxiety particularly in relation to exam periods, such as A-levels, or in the first year of university.

"So with the end of first year just before like probably 2 months before first year exams things just got really, really bad. Erm, and I'd yeah, it was, it was like a daily every minute just thinking I'd be better off dead." (Cis man, Gay, P3)

One of the participants stated how academic pressures tend to *"…affect everyone a lot more directly, and I feel it is something which contributes, is affected by and is at the centre of a person's life at this age."* (Trans man, Bisexual, P18). This highlights the key position of school, college or university plays within many young people's lives.

To a degree, this subtheme can be related to the preceding section (*4.4.3.3)* discussing illness and injuries. As those with injuries or illness in early years appeared to disengage from education systems, despite being concerned about their academic progress. For some, this causes stress to catch up with schooling and therefore led their self-harm, while others became apathetic about school.

4.5. DISCUSSION

These findings offer new insights into the complex processes associated with self-harm among LGBTQ+ young people. Understanding and processing one's sexual orientation and or gender identity is an ongoing journey, which, when young people feel as though they cannot accept it, causes significant distress. This is often compounded by the experiences of rejection or discrimination from peers, friends,

and family members. The self-exploration process acts as a proximal stressor while distal stressors are represented by others' attitudes and responses. These findings are consistent with prior research, which indicates that minority stressors are influential to self-harmful thoughts and behaviours, with and without suicide intent among LGBTQ+ young people (Meyer, 1993; McDermott et al., 2017; McDermott et al., 2008; Rivers et al., 2018; Wilson & Cariola, 2020); and extends our knowledge of how these experiences are understood by those affected.

The final theme "Life stressors" is somewhat complex. While these experiences were not explicitly connected to participants' LGBTQ+ identity here, they may be interlinked with other aspects of participants' self-views. Abuse and maltreatment (Cederbaum, Negriff & Molina, 2020; Celik & Odaci, 2012), the perception of ill health (Goodwin & Olfson, 2002), and perfectionism (Smith et al., 2017) have all been linked to negatively impacting self-perception and self-esteem. Given that LGBTQ+ youth often struggle with their self-esteem (Gnan et al., 2019; Arcelus et al., 2016), these life stressors may enhance already tumultuous self-perceptions, and relate to the behaviours of prioritising others first. This, in turn, led to our participants struggling more with self-harm. Therefore, these findings highlight the importance of understanding how self-perceptions relate to self-harmful thoughts and behaviours.

Based on these findings, supporting young people who are LGBTQ+ through their self-exploration is key to reducing self-harm. Part of our participants' experiences was that a lack of terminology to describe their developing understanding of their sexual or gender identity, and limited awareness of LGBTQ+ identities during early adolescence (Thorne et al., 2019a). This might reflect a failing to include LGBTQ+ education or information within education systems; and therefore, highlights the importance of inclusive education regarding LGBTQ+ experiences, history and terminology consistently throughout year groups. Such approaches enhances young people's ability to engage with LGBTQ+ history and culture to promote acceptance among students broadly (Wagaman, Shelton, &

Carter, 2018). Additionally endorsing accepting behaviours in students from younger ages and reduce the level of discrimination or bullying directed towards LGBTQ+ peers (Gower et al., 2018).

Findings also suggest that the responses from others are highly influential to personal acceptance and self-harm. Supporting young people to better understand their own identity and enhance their self-perception can be enhanced by positive approaches and acceptance from family members, friends, peers and society on a wider scale. Family acceptance is crucial (McDermott et al., 2021), acting as the strongest influence to positive self-esteem and feeling comfort as LGBTQ+ in young people (Snapp et al., 2015). These findings emphasize the need for families to approach LGBTQ+ disclosure in an accepting and reassuring manner to ensure good mental health (McDermott et al., 2021), this would therefore help mitigate and perhaps even reduce self-harm.

Professionals working closely with LGBTQ+ youth, (educators, social workers, CAMHS workers, counsellors), require a broad understanding of the young person's family environment and context around the individual (Roe, 2017; Wagaman et al., 2016). For social workers or counsellors engaging with the family, having an awareness that such internal dynamics around the young person's LGBTQ+ identity is important, as well as considering how the family have or might respond. It has been widely acknowledged that family support is important for health and well-being in LGBTQ+ youth (McConnell, Birkett & Mustanki, 2016; Westwater, Riley & Peterson, 2019) however, having alternative adult support may also act protectively for self-harm and suicide (Roe, 2017). Professionals should be expected to understand that a young person may require further support and potentially work with the family to explore underlying concerns around being LGBTQ+ (Roe 2017; Wagaman, 2016). Furthermore, professionals also need to explore how the young person perceives themselves and how this influences their mental wellbeing.

4.5.1. Limitations

Several interview methods were offered; in-person, by phone or through Skype, which removed geographical and financial barriers for participants. However, there are limitations such as difficulties with rapport building (Opdenakker, 2006) and possible bias surrounding nonverbal cues being observed (Cohen, Manion & Morrison, 2007; Novick, 2008) in non-visual interviews. Given the lack of nonverbal cues in voice-only interviews (either by phone or Skype without video), it is possible that probing or interpretation of responses were limited. This would indicate that there was potential for greater exploration within interviews which had a face-to-face dynamic. However, the majority of participants selected methods which enhanced their privacy and anonymity (selecting not to use Skype, preferring phone calls) which may have actually increased information that was shared as participants were more comfortable or relaxed (Ybarra, Alexander & Mitchell, 2005).

Two interviews were with participants in the U.K. during the COVID-19 lockdown period (March-April 2020). No changes were made to their interview process. However, both mentioned COVID-19 during the rapport building section of the interview.

Data on ethnicity of participants was not captured. Therefore, there is inadequate information present to determine whether any of these experiences were related to multi-minority status. Given that black and minority ethnicity (BAME) members of the LGBTQ+ umbrella are underrepresented (Kneale et al., 2019), future research should ensure inclusion and diversity of populations.

4.6. CONCLUSION

Minority stress experiences appear to interact and influence those processes underlying self-harm among LGBTQ+ young people. Often these experiences are related to thoughts and feelings relating to being LGBTQ+ but experiences of abuse and discrimination enhance this negative self-perception. Alongside this, LGBTQ+ young people also face stressors relating to how they perceive

themselves, which could compound already complicated emotions surrounding their identity. Consideration needs to be given to LGBTQ+ acceptance within families, by peers, and society more widely as this could help protect LGBTQ+ young people against self-harm. This could be achieved through LGBTQ+ education within schools and colleges. Professionals working with LGBTQ+ youth should be aware of how these young people may perceive themselves and what family environment they may be dealing with.

The research presented in Chapter 5 is currently under review in:

Williams, A. J., Arcelus, J., Townsend, E., & Michail, M. (2021). Feasibility and acceptability of experience sampling among LGBTQ+ young people with self-harmful thoughts and behaviours.

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CHAPTER FIVE: FEASIBILITY AND ACCEPTABILITY OF EXPERIENCE SAMPLING AMONG LGBTQ+ YOUNG PEOPLE WITH SELF-HARMFUL THOUGHTS AND BEHAVIOURS

5.1. ABSTRACT

Objective: This study was the first to determine whether it was feasible and acceptable to use experience sampling methods (ESM) among LGBTQ+ young people, who had current experiences of self-harm. A secondary aim was to examine the study parameters.

Methods: Sixteen LGBTQ+ young people, 16-25 years old, were recruited and consented to take part in the study. This included a baseline assessment, a 7-day ESM assessment (participants were sampled 6 times a day using a phone app), and the option of an interview at the end of the 7-day ESM assessment. ESM variables assessed social context, symptoms of depression and anxiety, perceptions of LGBTQ+ identity, minority stressors, and once a day queried self-harm ideation and behaviour. Quantitative data was descriptively analysed. Qualitative data was thematically analysed to determine the barriers and facilitators of taking part in this study.

Results: Study feasibility was assessed by consent rate (55.2%), retention rate (100%), ESM app feasibility (87.5%), and adherence to total number of ESM surveys (67.6%). Individual study adherence ranged between 43.0-95.2%. Study acceptability was assessed by participant interviews. Thematic analysis indicated 4 superordinate themes; i) Self-reflection and awareness; ii) Practicalities of ESM surveys; iii) Daily timeframes; and iv) Suggestions for future studies. Examination of the ESM data highlighted fluctuation of all variables of interest throughout the week. Participants who self-harmed during the 7-day ESM assessment, typically had higher scores for depression and lower scores for anxiety than those who did not self-harm.

Conclusions: This study demonstrated that ESM surveys are feasible and acceptable among LGBTQ+ young people with current experiences of self-harm. There is utility and promise in conducting future research using ESM. To determine temporal influences on self-harm behaviour or ideation, a follow-on study is suggested.

5.2. INTRODUCTION

Preceding chapters have focused on identifying risk factors for LGBTQ+ young people who self-harm (Chapter 3; Williams et al., 2021a) and perceived underlying processes (Chapter 4; Williams et al., 2021b). The previous chapters have indicated experiences such as internalised self-hatred, negative responses from family, and bullying or victimisation as leading to self-harm (Chapters 3-4; Williams et al., 2021a; Williams et al., 2021b). Such studies are useful to understand experiences or events which are likely to be influential to self-harm within this population. However, less is known about how such experiences may be time-variant (Glenn & Nock, 2014). This being how underlying processes may influence self-harm across hours or days, rather than weeks and years (Glenn & Nock, 2014). For example, in their study, Lockwood and colleagues (2020) found that young people tended to act on self-harm thoughts within ten minutes. This evidence shows that impulsivity is a predictor of self-harm (Lockwood et al., 2020) but also that experiences may have a time-variant influence on self-harm thoughts or behaviour. To explore real-time influences, experience sampling methods (ESM; Hektner, Schmidt & Csikszentmihalyi, 2007; also known as Ecological Momentary Assessment, EMA; Stone & Shiffman, 1994; Shiffman, Stone, & Hufford, 2008) can be used.

ESM uses repeated real-time assessments throughout the day to assess emotions, behaviours, cognitions, and experiences in the participant's natural environment (Stone & Shiffman, 1994). This allows for prospective examination of in-time influencers to a phenomenon, in this case self-harm. For the past 20 years, experience sampling has been gaining traction within self-harm research (Rodriquez-

Blanco, Carballo, & Baca-Garcia, 2018; Sedano-Capdevila et al., 2021). Previous studies have indicated that ESM are feasible and acceptable within self-harming populations (Czyz et al., 2018; Forkmann et al., 2018; Glenn et al., 2020; Husky et al., 2014; Kleiman et al., 2017; Littlewood et al., 2019). A recent review indicated that across studies retention of participants was relatively high (64-100%), as well as compliance with total responses to ESM questions (52-98.7%) (Sedano-Capdevila et al., 2021). These rates indicated a high degree of variation between studies but that ESM studies are well engaged with by participants, further suggesting that they are a practical way to assess self-harm.

ESM has effectively been used to investigate self-harm fluctuation and related stressors across various populations (Ben-Zeev et al., 2017; Fehling, 2019; Forkmann et al., 2018; Hallensleben et al., 2019; Husky et al., 2017; Kleiman et al., 2017; Littlewood et al., 2018; Link et al., 2007; Nock et al., 2009). For example, Littlewood et al., (2018) demonstrated that sleep disturbances predicted higher levels of self-harm ideation the following day within adults. However, there is still limited ESM research regarding mental health with LGBTQ+ individuals.

Fehling (2019) assessed twenty-one LGB adults using the LifeData app-system over a period of two weeks, to examine the fluctuations of minority stress, NSSI and mental health. They found that greater experiences of minority stress were related to high predictions of distress and engagement with NSSI. Increased rates of NSSI took place at the same timepoints as minority stress events, which indicates that there is a strong temporal relationship between these two types of experiences (Fehling, 2019). In their papers, Livingston et al., (2017; 2020) also evaluated the impact of minority stress, in the form of microaggressions, to determine their contribution to psychological distress and substance use within 50 LGBTQ+ adults. These experiences were assessed over two weeks using Basic for Android, which was installed onto Samsung Galaxy phones. This study indicated that high psychological distress and maladaptive coping behaviours (e.g., substance use) were predicted 2-3 hours following microaggression

experiences. While this pool of literature is small, it evidences that minority stressors can have real-time impact on mood, distress, and self-harm. However, Livingston et al., (2017; 2020) did not explore self-harm at all, and Fehling (2019) only considered NSSI in LGB adults within their sample. There is a clear gap in the ESM literature considering the experiences of LGBTQ+ young people with current experiences of self-harm. This would be the first study to use experience sampling methods across the umbrella of LGBTQ+, within young people (16-25 years), and considering the dimension of self-harm (thoughts and behaviours, with and without suicidal intention). Thus, it is first important to determine whether such a study is feasible and acceptable to conduct. This could then directly extend how processes relate to self-harm in real-time, providing useful clinical implications.

5.2.1. Research aims

The primary aim of this study is to determine whether it is feasible and acceptable to conduct an experience sampling study with LGBTQ+ young people with experiences of self-harm, with and without suicidal intentions. This would be the first study which uses ESM to examine daily fluctuations of self-harm experiences with this population and therefore would fill a gap within the literature as to whether these can be utilised effectively in this population. To do this, specific objectives are listed:

1. To determine feasibility, I will examine recruitment and consent rates, retention, app usability, and adherence.
2. To assess the acceptability of the study, I will explore LGBTQ+ young people's views of the barriers and facilitators to engaging with the ESM study.
3. Finally, I will examine parameters of the study using preliminary data. This will be achieved by firstly calculating the sample size needed for a follow-up study, and secondly by examining patterns of influential variables (social context, mental health difficulties, perceptions of LGBTQ+ identity, and minority stressors) in relation to self-harm, from the preliminary data.

These objectives will indicate whether a future, larger study is practical and whether there is value in further investigating these underlying processes' temporal relationship with self-harm.

5.3. MATERIALS & METHODS

5.3.1. Study design

This is a mixed-method experimental study which uses ESM over a 7-day period (6 prompts/day between 8:00-22:00) with LGBTQ+ young people who have experiences of self-harm, with and without suicidal intention. This was co-designed with the LGBTQ+ Advisory Group.

The study includes briefing and debriefing, while data collection took place over three testing phases: i) baseline assessment (Phase 1); ii) 7-day ESM assessment (Phase 2); and iii) post-ESM semi-structured interview (Phase 3). Rationale for the structure of the study design has been discussed within Chapter 2 (section 2.3.3.1.). Phases one and two were designed to test the feasibility of conducting an ESM study with this population, and therefore follow the traditional structure of ESM studies (Glenn et al., 2020; Littlewood et al., 2018). Phase three engaged participants to give their own perceptions and experiences to determine how acceptable the study was, as well as discuss facilitators or barriers to engagement with ESM. Ethical approval was received from the Science, Technology, Engineering and Mathematic Ethical Review Committee on the 8th of June 2021 (ERN_201745, Appendix H). The study was pre-registered on the Open Science Framework following the ESM template developed by Kirtley et al., (2021a), study pre-registration: DOI 10.17605/OSF.IO/DPWTV.

5.3.1.1. Involvement of the LGBTQ+ Advisory Group

The LGBTQ+ Advisory Group were consulted regarding the study design several times between July-November 2020. Firstly, they were asked whether an ESM study considering self-harmful thoughts, with and without suicidal intention, and about self-harm behaviour once a day would be suitable to

conduct during the COVID-19 pandemic. Their response was that the discussion of mental health and self-harm, and how this varies daily for young LGBTQ+ people, was now even more important. Following this, the advisory group members gave input on: i) the inclusion of the following ESM variables and the acceptability of assessing these six times per day: anxiety, depression, social context and perceived social support, perceptions of LGBTQ+ identity and minority stressors; ii) how often they felt the ESM survey should be conducted per day; iii) what impact responding to an ESM survey might have on the participant; iv) how to safeguard participants; v) thoughts about the structure and wording of ESM variables; vi) additional comments, thoughts, and expertise regarding the study design.

5.3.1.2. Safeguarding procedures

To ensure the safety of participants, several measures were taken. These were explained to participants prior to providing consent for the study and during the study briefing. On enrolment to the study, letters were sent to the participants' GP practice (Appendix BA). This would explain that the individual was involved in a mental health study at the University of Birmingham and provide my contact information. No information was presented that this was a self-harm or LGBTQ+ study to avoid unwanted disclosure for the participant. However, GPs were informed that if the participant was experiencing high distress, I would inform their practice by letter and phone call.

During the 7-day ESM assessment, if a participant scored suicide ideation highly or that they had self-harmed, they would receive a pop-up note that acknowledged their distress and advised contacting their GP service or helplines such as Samaritans. Alongside this, data was monitored once a day to assess for self-harm risk (Glenn et al., 2020). A cut-off score for high-risk responses was established as seen in previous research (Glenn et al., 2020; Kleiman et al., 2017). This was scoring highly for suicidal thoughts and having self-harmed which would result in a wellbeing call. Data was not checked in real-time due to researcher burden; it was established that this would be conducted each morning between 10:00-12:00.

Any wellbeing calls would take place before 15:00; this was to ensure that contact with supervisors was conducted during academia hours and GP practices would be open in the event that the call needed to be escalated.

This wellbeing call included encouraging help-seeking to the participant's GP, assessing the imminent risk of a suicide attempt (plans, timeline, access to means), and conducting a safety planning activity with the participant (Stanley & Brown, 2012; Appendix P). A basic transcript can be found in the Appendix CA. If the participant was at imminent risk of attempting suicide, they would be informed that I would need to notify my supervisors, their GP, and potentially emergency services. This would be an immediate phone call to the GP service, and a formal letter (Appendices DA-EA). If it was a weekend and the GP service was closed, I would automatically need to revert to emergency services. However, if they were not at-risk, I would not escalate their wellbeing check. At this point, participants would be asked if they wished to continue with the study and reminded that it is their right to withdraw if they so wished. All participants were aware of these procedures and agreed to them when signing the consent form.

5.3.2. Participants

Participants were recruited using online social media platforms such as Twitter, shared in specific private Facebook groups by moderators (a TGD group; self-harm group) and on MQ's mental health research website; Participate (https://participate.mqmentalhealth.org) between 14th June 2021-24th August 2021. Firstly, the TGD Facebook group was selected due to the lower representation of gender diverse participants within study 2. The aim of directly approaching this group was to enhance the number of TGD participants within this study. Secondly, the self-harm group was approached as this study sought participants with current experiences of self-harm. Through this group, it was hoped that young people who were open to discussing their experiences would be reached, as well as those who may "lurk" within such groups but currently be dealing with self-harm.

To take part, participants had to meet five inclusion criteria: i) identify as any part of the LGBTQ+ umbrella; ii) currently experience self-harmful thoughts and/or behaviours, with or without suicidal intentions; iii) be aged between 16-25 years old; iv) be registered with a U.K. based GP practice; and v) have personal access to a smartphone. Participants received a £10 voucher as compensation for completing the full-study (Phase 2 + Phase 3) or £5 if they completed either the full ESM period (Phase 2-only) or withdrew during the ESM period but took part in semi-structured interview (Phase 3-only).

5.3.3. Measures and procedures

To take part in the study, participants responded to online adverts using my email address or submitted their information through the MQ website. Following initial contact, I would outline the study and safeguarding procedures, as well as attaching the full study information sheet and consent form to the email. By offering a study outline in the email and including safeguarding procedures, I aimed to ensure that participants were fully aware of the study before signing the consent form. Once a complete and signed consent form was received, the young person was eligible to start the study. An overview of data collection procedures and measures can be seen in Figure 11.

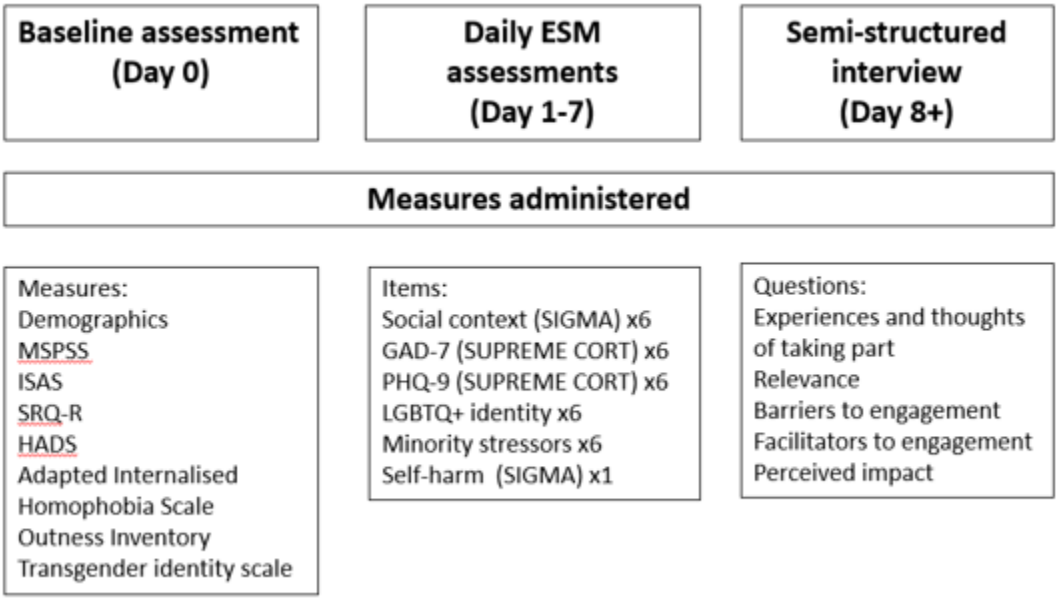

Figure 10.

Overview of data collection and measures

5.3.3.1. Baseline assessment and briefing

Phase one of the study was to complete an online baseline assessment. This was hosted by Qualtrics. The link was sent to participants once their completed, signed consent form had been received and checked. The baseline assessment took between 20-30 minutes to complete. Demographics which confirmed the study inclusion criteria were collected: age, country, sexual orientation, and gender identity, as well as ethnicity and occupation. Following this, participants completed several validated measures to assess areas of interest; perceived social support, self-harm, suicidal thoughts and behaviours, anxiety, depression, and minority stressors. An overview of baseline measures and rationale is presented in Table 11. Completion of baseline assessment data was checked to ensure that participants fit the inclusion criteria before conducting briefing.

Table 11.

Questionnaire measures of ESM baseline assessment (Phase 1)

Topic	Questionnaire measure	Comparable population previously used in	Cronbach's alpha
Perceived social support	Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988)	LGBTQ+ young people (Arcelus et al., 2016; McConnell et al., 2015; Watson & Tatnell, 2019)	0.89-0.94 (Arcelus et al., 2016; McConnell et al., 2015; Watson & Tatnell, 2019)
Self-harm	Inventory of Statements about Self-Injury (ISAS; Klonsky & Glenn, 2009; Klonsky & Olino, 2008)	LGBTQ+ young people (Hamza & Willoughby, 2013; Watson & Tatnell, 2019)	0.80-0.88 (Glenn & Klonsky, 2011; Klonsky & Glenn, 2009)
Suicide	Suicidal Behaviours Questionnaire-Revised (SRQ-R; Osman et al., 2001)	LGBTQ+ populations (Kaniuka et al., 2019; Kuper et al., 2018; Rhoades et al., 2018)	0.82 (Kaniuka et al., 2019)
Anxiety and depression	Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983)	Adolescents (White et al., 1999) LGBTQ+ populations (Marziali et al., 2020; Witcomb et al., 2019)	0.74-0.84 (Marziali et al., 2020; Witcomb et al., 2019)
Minority stressors			
Internalised homophobia	Adapted internalised Homophobia Scale (Herek, Gillis, & Cogan, 2009; Livingston, 2017)	LGBTQ+ populations (Livingston, 2017; 2020)	0.82-0.85 (Herek, et al., 2009; Livingston, 2017)
Outness	Outness Inventory (Mohr & Fassinger 2000; Livingston et al., 2020)	LGBTQ+ populations (Livingston et al., 2020)	0.91(Livingston et al., 2020)
TGD self-perceptions (including gender dysphoria)	Transgender Identity Survey (Bockting et al., 2020); Congruence and Life Satisfaction Scale (GCLS; Jones et al., 2019a)	TGD populations (Bockting et al., 2020; Jones et al., 2019a; Jones et al., 2019b).	0.90 (Bockting et al., 2020); 0.95 (Jones et al., 2019a)

The Zoom ESM briefing was arranged for participant convenience. It was mandatory for participants to attend this briefing, however having their camera on was optional. During the briefing, I would introduce myself formally to the participant and offer an overview of the study. Participants were asked to download the mEMA app which hosted the 7-day ESM assessment. I would ensure that they

were able to log into the app using the confidential mEMA code and access their ESM surveys. A dummy run of a "prompt" was conducted (push notification on a smartphone). During this dummy run, participants were led through the different types of questions and explained the rating scales. Participants were asked if they had any questions about the study overall or the practical aspects of the app. Following this, I would discuss the participants' rights (withdrawal, confidentiality), explain the safeguarding procedures, and compensation. I also informed participants that I would be in touch on day 2 of the ESM study period, this was to encourage study adherence and troubleshoot issues. Participants were asked to confirm they understood, were happy with all procedures, and invited to ask any questions. The 7-day ESM assessment would begin the day following the briefing.

5.3.3.2. Seven-day ESM assessment

Phase two of the study was the 7-day ESM assessment. This would run for the next consecutive week following the briefing. Participants would be randomly prompted to complete six daily surveys between 8:00-22:00 using their mEMA app on their smartphones. The duration and number of survey notifications followed similar designs to previous research (Husky et al., 2014; Littlewood et al., 2018; Wrzus & Neubauer, 2022). Participants were given a 30-minute window to respond to each survey notification, this was to ensure that participants gave in-the-moment responses.

The ESM surveys were administered using the mEMA app from ilumivu (memea.ilumivu.com), software which was designed specifically for ESM research using smartphones. Participants were assigned a confidential code which gave them access to the app, so that no identifying information was shared with the software platform. Survey data was collected and stored on the participants' smartphones, once an internet connection was established this data would sync with the online platform. This software was designed for multi-platform compatibility, which allows for automated

notifications for participants using a quasi-random temporal sampling structure; the app was piloted using an Android and an iOS device to ensure its compatibility.

5.3.3.2.1. ESM items

The ESM items were selected to represent previously identified underlying processes leading to self-harm in LGBTQ+ young people (Chapters 3-4; Williams et al., 2021a; Williams et al., 2021b). These were grouped by ESM topic; i) social context and environment (items asking who the participant was with at that time and perceived support); ii) anxiety and depression, and iii) perception of LGBTQ+ identity and minority stressors. Items were asked 6 times a day. The last assessment of each day would also include three items about self-harm and suicidal thoughts, and self-harm behaviour. An overview of all ESM items is presented in table 12, a full list of included items in Appendix FA. As suggested by Palmier-Claus et al., (2011) visual analogues were used for all ESM items; these were 1-7 Likert scales. Having consistent scales aids in reducing errors when completing the ESM surveys (Palmier-Claus et al., 2011).

Table 12.

Overview of ESM items and connected preceding findings (Phase 2)

Chapter Number	Key finding: risk factor or experience	ESM topic	Origin of item	Number of items	Times asked per day
Chapter 3-4 Williams et al., 2021a; 2021b	Victimisation. Negative responses to being LGBTQ+. Feeling responsible for others.	Social context and environment	SIGMA (Kirtley et al., al, 2021c) 2 additional items developed and were face validated by LGBTQ+ Advisory Group.	Branching item = 4 or additional branching question. Second item = 7, or 9 further questions.	6
Chapter 3 Williams et al., 2021a	Mental health difficulties	Depression (PHQ-9) Anxiety (GAD-7)	SUPEREME CORT study (Werumeus Buning, 2017)	16	6

Chapter 4 Williams et al., 2021b	Struggling with processing and understanding one's own LGBTQ+ identity	Perception of LGBTQ+ identity	Items developed and were face validated by LGBTQ+ Advisory Group.	6	6
Minority stressors					
Chapter 3-4 Williams et al., 2021a; 2021b	Victimisation. Negative responses to being LGBTQ+.	Discrimination	Items developed and were face validated by LGBTQ+ Advisory Group.	2 items, both which branch to 2 additional items if response is yes.	6
Chapter 4 Williams et al., 2021b	Coping with gender dysphoria.	Gender dysphoria	Items developed and were face validated by LGBTQ+ Advisory Group.	1	6
Chapter 4 Williams et al., 2021b	Negative responses to being LGBTQ+.	Misgendering	Items developed and were face validated by LGBTQ+ Advisory Group.	1	6
Outcome of interest					
		Self-harm thoughts	SIGMA (Kirtley et al., al, 2021c)	1	1
		Suicidal thoughts	SIGMA (Kirtley et al., al, 2021c)	1	1
		Self-harm behaviour	SIGMA (Kirtley et al., al, 2021c)	1	1

ESM items which had been used in previous research were obtained from The ESM Item Repository; www.esmitemrepository.com (Kirtley et al., 2021b). This repository is an open science tool, where researchers share their ESM measures from ongoing and published research. The overall aim of the repository is to ensure better reproducibility, validity, and transparency between ESM studies. These items came from two primary sources; SIGMA study (Kirtley et al., 2021c) and SUPREME CORT (Werumeus Buning, 2017).

The SIGMA study provided thirteen items which considered social context and experiences, including who the participants were with at the specified timepoint, if anyone, and how they felt about being with those individuals (Kirtley et al., 2021c). The Likert scale for these ranged from “not at all” (1) to “very much” (7). During the study, the initial question of “who is with me?” would produce three branches: with people (in person), with people (online), and alone. The same following questions were asked irrespective of whether the participant was with someone in person or online. Two questions were developed to sit on the end of these items. These asked whether the participant felt supported by who they were with, and whether these people accepted that the participant was LGBTQ+. Face validity of these items was conducted by the LGBTQ+ Advisory Group, who also considered the language and formatting of the items.

The SIGMA study also offered three questions regarding self-harm (Kirtley et al., 2021c). These asked about self-harmful thoughts, suicidal thoughts, and whether the participant had engaged with self-harm behaviour. The same Likert scale was used. In addition to this, I offered a free-text option so that if participants wished to give context to their self-harm they could.

From the SUPREME CORT study, I obtained sixteen items (Werumeus Buning, 2017). These items were ESM adapted versions of the generalised anxiety disorder assessment (GAD-7; Spitzer, Kroenke, & Williams, 2006) and the patient health questionnaire-9 (PHQ-9; Kroenke & Spitzer, 2002). These assessed symptoms of anxiety (GAD-7) and depression (PHQ-9). The Likert scale remained between 1-7 for these items but graded from “no burden at all” (1) to “a lot of burden” (7). These were selected as they are commonly used measures of mental health difficulties in clinical settings with high internal consistency (Cleare et al., 2018; Subica et al., 2016) and therefore likely to be recognised by participants. These ESM adaptions however use different scales to the original measures. This meant that severity thresholds were not able to be determined.

The final group of items was developed to represent perceptions of LGBTQ+ identity and related stressors (Williams et al., 2021a; Williams et al., 2021b). Ten items were developed using the same Likert scale used by the SIGMA items: “not at all” (1) to “very much” (7). These questions asked about positive and negative feelings relating to one’s LGBTQ+ identity, whether the participant had witnessed or experienced discriminatory behaviour, whether they had been misgendered, and whether they had experienced gender dysphoria. Open-text responses were offered if the participant had witnessed or experienced discrimination. Questions concerning misgendering and gender dysphoria had secondary items which if endorsed would ask the participant how much this experience had distressed them (1-7 Likert scale). The items were developed by considering retrospective questionnaires included in the baseline assessments and examining how measures were phrased. As discussed by Palmier-Claus et al., (2011) by taking into consideration previous cross-sectional measures, new ESM items can be developed with some validity in mind. These items were then given to the LGBTQ+ Advisory Group to discuss and evaluate face validity. One advisor suggested that asking whether gender dysphoria was distressing was not necessary, as gender dysphoria was always distressing. However, they agreed that it should be included if it was to consider the extent of dysphoria across a time-period.

Previous ESM research has suggested that assessing self-harm multiple times a day, across a 7-day period, is feasible and acceptable (Eisele et al., 2020; Glenn et al., 2020; Husky et al., 2014). However, this research was conducted with either; adult participants (Husky et al., 2014), participants under acute psychiatric care (Glenn et al., 2020), or before the COVID-19 pandemic (Eisele et al., 2020; Glenn et al., 2020; Husky et al., 2014). LGBTQ+ young people have been detrimentally affected by the pandemic (Fish et al., 2020; Salerno et al., 2020). Therefore, this study was designed to minimise the potential impact to their lives, so items concerning self-harmful thoughts, suicidal thoughts, and self-harm behaviours were limited to being asked once a day. This was agreed with the LGBTQ+ Advisory

Group, who were very supportive of this study being conducted. However, they did acknowledge that it may be difficult for some young people given the current global environment.

5.3.3.3. Post-ESM interview and debriefing

On the final day of the 7-day ESM assessment, participants were sent an email thanking them for taking part in the study, reminding them that this was the last day, and inviting them to phase 3 of the study. Phase 3 was a semi-structured interview to discuss participants' perceptions and experiences of the study. A secondary consent form was needed for this phase. Participants were also reminded that having completed the 7-day ESM assessment had earned them a £5 voucher, but if they wished to receive £10 they could take part in the interview. If participants did not respond to this email within two days, they were sent a reminder. If participants did not send through a consent form after a week or did not wish to take part, they were debriefed, and sent their voucher and debrief sheet for their records (Appendix O).

Interviews were arranged at the participants' convenience following the receipt of a completed, signed consent form. These took place over Zoom and were audio-recorded using a Dictaphone. Participants were encouraged to speak openly about their opinions, perceptions, and experiences of the study (schedule found in Appendix GA). Notes were taken by hand. The interviews lasted a mean of 19 minutes (12' to 41'). Following the interview, participants were thanked, debriefed, and compensated for their time.

5.3.4. Analysis

5.3.4.1. Objective one: Feasibility

Study feasibility was assessed by examining recruitment and consent rates, retention, app usability, and adherence. Firstly, the number of respondents over the recruitment period and final study

enrolment rate are described. Reasons for non-consent were recorded. Secondly, retention was examined across the baseline assessment and 7-day ESM assessment, this was to determine whether a particular phase of the study was less desirable. If participants withdrew during any aspect of the study, they were asked for reasons and invited to the post-ESM interview to discuss their opinions of the study and elaborate on exercising their choice to withdraw. Thirdly, the mEMA app usability was determined by the number of days in which participants were able to log in and give responses. Finally, adherence was examined in the following ways; total number of responses to surveys; descriptives of total survey completion; average completion of ESM topic items. Participant adherence was assessed through total study adherence and ESM topic surveys completed. Analysis consists of descriptive statistics.

5.3.4.2. Objective two: Acceptability

Study acceptability was assessed using the data from LGBTQ+ young people's semi-structured interviews. I conducted all the interviews and transcribed the data verbatim, so I was immersed within the data. Following transcription, all transcripts were imported into NVIVO12 and deductively thematically analysed (Braun & Clarke, 2006; 2013; 2019) to determine barriers and facilitators of taking part within the study. Line-by-line coding of opinions, perceptions and experiences took place. These were then considered in relation to the research aim, and similarities and differences between codes were collated to develop preliminary subthemes. These were reviewed and discussed between the research team to create the final thematic framework.

5.3.4.3. Objective three: Examining study parameters

The final objective was to examine parameters of the study using preliminary data. This was achieved by firstly calculating the sample size needed for a follow-up study, and secondly by examining patterns of influential variables (social context, anxiety, depression, perceptions of LGBTQ+ identity, and minority stressors) from the preliminary data. A sample size calculation was run to determine the sample

needed to achieve a power of 0.8 to detect an effect between ESM items of 0.3, when using an alpha of 0.05 (Pirla, Taquet & Quoidbach, 2021). This indicates the number of participants needed for full multi-level modelling. This would allow for full analysis of the temporal relationship of ESM items and self-harm.

Following this, I calculated total scores for the ESM topic surveys (e.g., all PHQ-9 scores were calculated to create a total depression score). I then ran descriptive analysis on key features of the data within SPSS27. Minority stressor items (witness and direct discrimination, misgendering and gender dysphoria) are descriptively described. Basic fluctuations of mood (anxiety, depression), and perceptions of LGBTQ+ identity, were independently examined in relation to self-harm experiences using total scores. Perceptions of LGBTQ+ identity was calculated by reverse-scoring the two negatively phrased ESM items, to create a total score of positively perceiving LGBTQ+ identity.

When calculating total scores, if items had missing data, these were excluded from further analysis. This was determined by total scores being outside the parameters of their scales, (e.g., GAD-7 total score range: 7-49). As the GAD-7 and PHQ-9 had previously been adapted for ESM studies, these items no longer have the same scales which determine severity thresholds of anxiety or depression. For social experiences and context, there was an issue within the ESM app. This meant that data was missing when some participants were asked about “who they were currently with?”. Due to this and an associated app malfunction for half of the participants, further analysis was not possible at this point for social context ESM items.

Finally, qualitative responses from open-text responses were considered. These open-text responses followed items querying self-harm behaviour and witnessing or experiencing LGBTQ+ related discrimination.

5.4. RESULTS

5.4.1. The sample

The final sample consisted of 16 LGBTQ+ young people, with the average age of 19.2 (SD: 2.7). For full participant details, see table 13. Twelve participants were cisgender and 4 were TGD. 37.6% identified as bisexual, whilst other sexualities were represented by other participants. One participant distinguished their bisexual orientation to include demisexual, such that they only feel sexual attraction to someone they have an emotional bond with. Another identified as neptunic, this is the attraction to female genders and non-binary individuals. Most participants described themselves as white or white British, and nearly half of the sample were sixth form or college students (43.8%).

Table 13.

ESM sample characteristics

Participant	Age (years)	Ethnicity	Occupation	Sexual orientation	Gender
1	19	White British	University student	Bisexual/demisexual	Cisgender woman
2	24	White	Flexible working hours	Gay	Cisgender man
3	25	White	Currently unemployed	Pansexual	Non-binary
4	22	Asian Malaysian	University student	Bisexual	Cisgender woman
5	18	White	Volunteering	Neptunic	Non-binary
6	19	White	Sixth form or college student	Bisexual	Cisgender woman
7	17	White British	Sixth form or college student	Bisexual	Cisgender woman
8	16	White British	Sixth form or college student	Bisexual	Cisgender woman

9	16	White British	Sixth form or college student	Gay	Cisgender man
10	19	White British	Sixth form or college student	Gay	Transgender man
11	20	Asian Vietnamese	University student	Bisexual	Cisgender woman
12	16	White	Sixth form or college student	Queer	Questioning
13	19	White	University student	Asexual	Cisgender woman
14	20	Mixed (White and Asian)	University student	Lesbian	Cisgender woman
15	22	White	Full-time employment	Lesbian	Cisgender woman
16	18	White British	Sixth form or college student	Pansexual	Cisgender woman

5.4.2. Objective one: Feasibility

5.4.2.1. Recruitment, consent, and retention rates

Across the 2.5-month recruitment period, 29 individuals responded to the study call. Most of these were through MQ Participate (75%). From the 29 respondents, 16 provided valid consent forms, therefore the enrolment rate was 55.2%. Seven people did not respond following the initial email contact and follow-up emails. Two chose not to take part as they were too busy; one person was not currently experiencing self-harm; and one declined as they felt the compensation was not enough for the study. Two people were excluded as they did not meet the inclusion criteria (over 25-years-old, invalid GP details).

Of the final sample, all the participants completed both the baseline assessment and 7-day ESM assessment. Therefore, throughout the experimental phases of this study, the retention rate was 100%. Twelve participants (75%) went on to take part in the post-ESM interview. Reasons for not taking part in

the interview were: not being able to fit the interview around medical appointments, multiple instances of forgetting to attend, and not returning the completed consent form despite reminders and interest.

5.4.2.2. App usability

Over the 7-day ESM assessment period, 14 participants were able to log into the mEMA app at least once a day (87.5%). Two of the participants missed all surveys for the final day of the study, while one logged in multiple times on the last day but did not complete the full survey each time. Neither participant flagged why they did not respond on the final day within the post-ESM interview. Despite this, participants generally felt that the 7 days was an appropriate test period.

From observation of the data, an issue in the software was observed. For eight participants the first question of social experiences and context would stop following their responses to whether they were with others physically or online. If they responded that they were online, the following branching questions were not presented. This indicated that there was a logic break within the design platform and the app, as the remaining participants did not encounter this software issue. Potentially, this is a barrier to usability was related to phone type. While this wasn't recorded within the study, the limitation was mentioned by a participant who owned a Microsoft phone, and previous studies have found technical issues of the mEMA app relating to phone type (Glenn et al., 2020).

5.4.2.3. Adherence

Adherence to the ESM protocol was operationalised in three ways; i) total responses to surveys; ii) adherence to ESM topic surveys; and iii) participant adherence. Firstly, I examined the total number of responses to surveys. For each participant, 42 surveys were sent over the course of the 7-day assessment period, resulting in 672 possible surveys to complete across the whole sample. The total number of responses to these surveys was 454 (67.6%). The fluctuation of survey completion can be

seen in figure 12, with information presented in table 14. This is broken down into overall survey adherence per day and survey completion within each day. The highest response rates were on day 2, while the lowest responses were on days 4 and 7. On average, participants completed 4.05 (SD: 1.06) surveys per day.

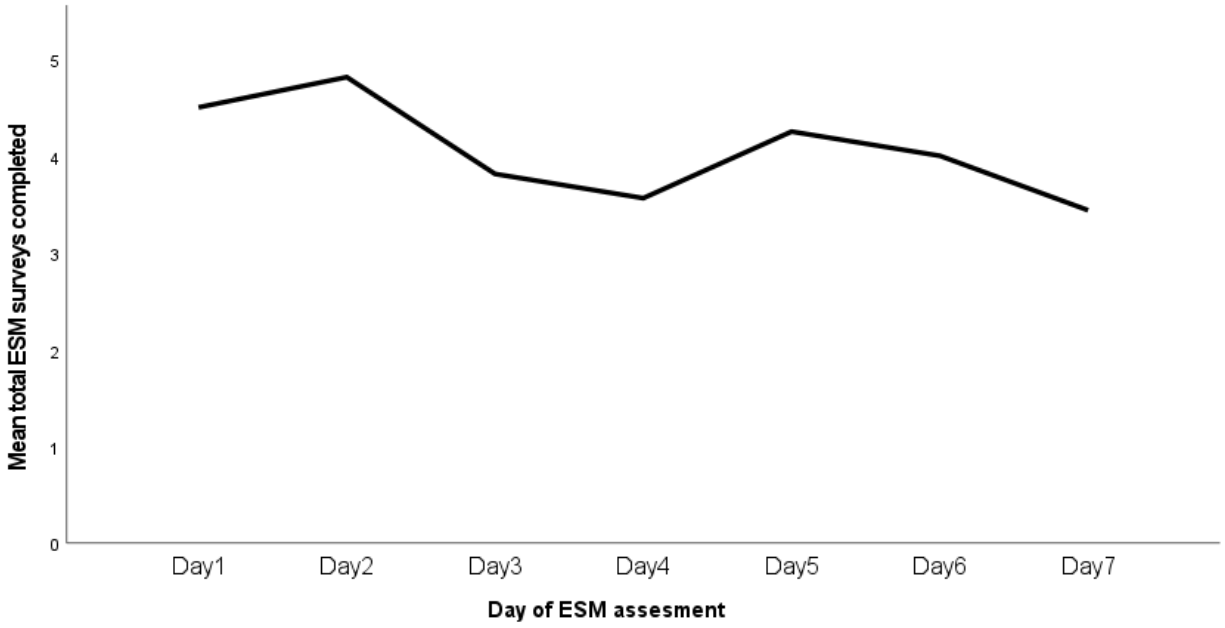

Figure 11.

Changes in study adherence over the 7-day ESM assessment period; mean survey response per day

Table 14.

ESM survey completion (range, mean, standard deviation & percentage) per day across 7-day ESM assessment

Day number	Range of survey responses	Overall survey adherence per day N (%)	Survey adherence M (SD)	Day#Survey#	Total survey completion per day N (%)
Day 1	2-6	72 (75.1)	4.5 (1.4)	D1S1	10 (62.5)
				D1S2	13 (81.3)
				D1S3	12 (75.0)
				D1S4	13 (81.3)
				D1S5	13 (81.3)
				D1S6	10 (62.5)
Day 2	2-6	77 (80.2)	4.8 (1.4)	D2S1	13 (81.3)
				D2S2	11 (68.8)
				D2S3	12 (75.0)
				D2S4	14 (87.5)
				D2S5	13 (81.3)
				D2S6	14 (56.3)
Day 3	2-6	61 (63.5)	3.8 (1.5)	D3S1	12 (75.0)
				D3S2	12 (75.0)
				D3S3	9 (56.3)
				D3S4	9 (56.3)
				D3S5	10 (62.5)
				D3S6	9 (56.3)
Day 4	2-6	57 (59.4)	3.6 (1.4)	D4S1	10 (62.5)
				D4S2	9 (56.3)

				D4S3	7 (43.8)
				D4S4	13 (81.3)
				D4S5	10 (62.5)
				D4S6	10 (62.5)
Day 5	1-6	68 (70.8)	4.3 (1.6)	D5S1	10 (62.5)
				D5S2	10 (62.5)
				D5S3	10 (62.5)
				D5S4	13 (81.3)
				D5S5	12 (75.0)
				D5S6	13 (81.3)
Day 6	2-6	64 (66.7)	4.0 (1.3)	D6S1	6 (37.5)
				D6S2	9 (56.3)
				D6S3	8 (50.0)
				D6S4	13 (81.3)
				D6S5	14 (87.5)
				D6S6	14 (87.5)
Day 7	0-6	55 (57.3)	3.4 (1.9)	D7S1	6 (37.5)
				D7S2	9 (56.3)
				D7S3	9 (56.3)
				D7S4	10 (62.5)
				D7S5	12 (75.0)
				D7S6	9 (56.3)

Secondly, I examined adherence with ESM topic surveys. This breaks down the ESM survey into specific topic items (social context, mental health difficulties (MHD), identity and minority stressors, and self-harm). Participants were asked about self-harm 7 times (once a day), on average participants

responded to 70.6% of these surveys (M: 4.94; SD: 1.24). All other ESM topic surveys were asked 42 times (6x day) as they occurred in each survey. Similar adherence rates were seen across social context (63.1%; M: 26.3; SD: 6.5), MHD (65.0%; M: 27.3; SD: 7.4), and identity and minority stressor items (65.5%; M; 27.5; SD: 7.5).

Thirdly, full adherence to the ESM protocol was demonstrated if the LGBTQ+ young people, completed all six surveys per day. Therefore, participant adherence was assessed by considering study adherence and adherence to ESM item group. An overview of this can be seen in the Appendix HA. Participant adherence ranged from 13-40 survey responses. The highest rate of completion was 95.2%, with another four participants being able to respond to over 80% of the total surveys. The lowest overall adherence was by two participants, who responded to less than 43% of the survey prompts.

5.4.3. Objective two: Acceptability

To determine the acceptability of the ESM study, LGBTQ+ young people were invited to take part in a post-ESM semi-structured interview. This would explore their perceptions of the ESM study, with a focus on the specific challenges and facilitators to taking part in this type of research, and opinions of how they felt the study could be improved. Four themes were developed; thematic framework can be seen in table 15. Below I discuss the "Self-reflection & awareness" as this was most significant to all participant narratives. Appendix IA contains the further three themes and subthemes identified with example quotes.

Table 15.

Thematic framework considering barriers, facilitators, and study suggestions

Theme	Descriptors	Subtheme	Descriptor

Self-reflection & awareness	Participants tracking their own mood, reflecting on this and increased awareness of their personal influencers. This helped them to engage with the study.	**Improved understanding of mood** (facilitator)	Majority of participants found that the ESM study helped them to track and reflect on their mood. Specifically, this aided awareness of influences to their self-perceptions of LGBTQ+ identity.
		"But with awareness kind of comes some intense lows and intense highs" (facilitator/barrier)	As awareness grew, participants were more aware of their self-harm. Mainly participants didn't feel there was a change in the frequency of these thoughts, and some actually used the study as a barrier to self-harm. However, one participant found that this triggered more self-harmful thoughts.
		Future uses (suggestion)	Potential therapeutic uses for mood tracking and integration with clinical services.
Practicalities of the ESM surveys	Participants opinions on the survey and app were mainly positive. However some experienced notification errors.	**Quick, easy, and minimal impact** (facilitator)	Participants did not feel as those taking part in the ESM study had a large impact to their day because it was so quick.
		Notification system error (barrier)	Some participants faced notification errors. Either notifications failed to present, or the notification would not be dismissed once the survey had been completed.
Daily timeframe	Participants thoughts on the ESM assessment timeframes (8:00-22:00).	**Missing morning notifications** (barrier)	Several participants missed morning notification due to sleeping patterns.
		"negative thoughts more come at night" (barrier)	Participants felt that 10pm was too early to capture their self-harm behaviour
		Personalised timeframe (suggestion)	Participants wanted to adjust the timeframes to better suit their lifestyles. It was suggested this would be beneficial during work or education hours.
Suggestions for a future study	Participants reflected on the relevance of questions and how to improve the study.	**Streamlining ESM items** (suggestion)	Participants offered two suggestions to improve ESM surveys. These changes were related to the ESM items. These suggestions were separating cisgender and gender diverse items, and including additional self-harm items.

System changes and additional context (suggestion)	Participants suggested a system which would allow for their experiences to be captured if they missed several surveys. They also wanted an option to write context for themselves or others to understand why their mood, thoughts or behaviours had changed.

5.4.3.1. Self-reflection and awareness

A key facilitator to engagement was the ability for participants to track their mood over time. This resulted in participants feeling that they had an increased awareness of their experiences, mood, thoughts, and feelings about self-harm. This allowed participants to reflect on their potential triggers and influences on their mood. Many participants found that this was helpful for them. Participants also suggested that aspects of ESM could be used in clinical services.

5.4.3.1.1. Improved understanding of mood

Most participants found that the ESM study helped them to track and reflect on their mood. This was beneficial to their own wellbeing, as well as, helping them to engage with the study; *"It might have affected my mood for the better really because being able to check in and reflect is, was helpful for me."* (P10, gay, transgender man). This enhanced understanding dominated most of the interviews. Some participants even made efforts to change their behaviours when noticing that they were scoring highly for depression or anxiety;

"And I think, I don't know, it was kind of like someone just checking in and being like "hello! You okay?" and being able to be like "actually no I'm not" like you know it was very useful to motivate me to be like right let's change my mood, let's improve how I'm feeling because that reflection wasn't you know, I feel like shit a bit. [laugh]" (P2, gay, cisgender man).

From this improved understanding of their mood, a number of participants became aware of how experiences which related to their LGBTQ+ identity could influence their mood and thoughts; *"Actually helped me understand a lot about myself, and how, how actually that could be effecting my mental health. Because I realised for some of the questions that I've been answering, they reflected on, that it actually, there was some correlation to it."* (P3, pansexual, non-binary).

"But like it was interesting to see how my views towards that [being bisexual] changed when my mood changed, like when I was in a worse mood I felt like worser towards it [being bisexual], I don't know how to phrase it." (P8, bisexual, cisgender woman).

The ability to self-reflect widely encouraged participants to engage with the ESM study. By completing surveys, they were able to obtain a better reflection of their wellbeing and make their own evaluations of what influenced their mood and self-harm.

5.4.3.1.2. "But with awareness kind of comes some intense lows and intense highs"

As self-awareness and reflection grew, participants also commented how they were more aware of their self-harmful thoughts and behaviours. For most this caused no impact. Participants did not feel that they experienced more frequent or intensive self-harm than usual despite being asked daily; *"Erm, no I don't think so. It didn't make them worse or better [thoughts], in a way it was the same."* (P6, bisexual, cisgender woman). Some found that they were able to use their engagement with the study as a barrier to self-harm behaviour. One participant mentioned how they were able to reflect on whether acting on their self-harmful thoughts was necessary, while another specified that she actively did not self-harm due to being in the study.

"I feel like it made me more aware of them [thoughts], especially when it came to erm like self-harm [behaviour]. When I would be looking back on it, I'd be like well "I have thought about it but have I actually…? But I didn't do it and now looking at it did I need to?" (P3, pansexual, non-binary).

"I don't know about self-harm or suicidal thoughts. [pause] I guess a bit, it kind of acted like [pause] what's the opposite of incentive? […] kind of a barrier for self-harming. Like oh I've got to report this." (P15, lesbian, cisgender woman).

However, with greater self-awareness of self-harm, a few participants did mention that they could, in certain circumstances, see that responding to questions about self-harm daily could be difficult. One participant discussed that if they were having a bad week (frequent self-harm ideation) they would have been less likely to engage with the study, while another disclosed they had more impulses to self-harm during the study. However, their greater self-awareness also acted as a barrier to engaging with this self-harm.

"So I started to overanalyse my, essentially my emotions and everything […] Yeah well it was triggering in that I felt like I had a bit of an impulse to do like, you know, bad things [self-harm]. But I say I managed to control it, because I was more well aware of how I was feeling and I knew what to do now." (P4, bisexual, cisgender woman).

5.4.3.1.3. Future uses

Several participants mentioned that they found the ESM study so useful to track mood and their self-harm that they felt aspects of experience sampling could be used within therapeutic or clinical services. The benefit of this would be that instead of being asked about their thoughts and feelings over the last two weeks, clinicians would be able to see within-day and week changes. One participant, who

was a medical student, discussed how the questions regarding mood and self-harm could be useful within in-patient settings or in the community to gain real-time reflections of risk.

"I think that would be really useful, definitely in an in-patient setting and maybe even like if someone you feel is in a community setting and they're really at risk, then getting them to answer these questions once a day, or 3 times or even 6 times a day, just to sort of check in and see what their risk is instead of waiting until someone is at crisis, and then saying "oh well we can't help you now because you're too ill" or whatever." (P1, bisexual/demisexual, cisgender woman).

5.4.4. Objective three: Exploring descriptive statistical information

The final objective was to examine parameters of the study using preliminary data. Firstly, I present a sample size calculation. This informs the number of participants needed to achieve study power to complete complex analysis in a future, follow-up study. Secondly, I present an overview of the participants descriptive results (raw values, means). Thirdly, I consider the data by participants who self-harmed during the 7-day ESM assessment compared to those who did not. Finally, I consider the open-text responses which followed ESM items regarding self-harm and experiences of discrimination.

5.4.4.1. Sample size calculation

Based on the sample size calculator developed by Pirla et al., (2021) an estimate of between 190-210 participants are required to obtain a strong power to determine effect size of 0.3, alpha of 0.05. This is based on an assessment period of 7 days, in which participants are sampled 6 times a day. Studies using a similar ESM design (7 days, 6 assessments a day) have greatly lower sample sizes (N=96, Huskey et al., 2014; N=54, Littlewood et al., 2018). During their ESM assessments however, both studies examined fewer ESM items and topics. This may therefore explain why a greater sample is needed for this study to be fully powered.

5.4.4.2. Overview of ESM descriptive results

The overview of participants' ESM descriptive results can be found in Appendix LA. The raw data for self-harmful behaviour, self-harm ideation, suicidal intention is presented, alongside the mean total scores for ESM topic surveys; depression, anxiety, perception of LGBTQ+ identity, misgendering and gender dysphoria items. These mean scores were calculated from all ESM topic surveys each day (e.g., depression total score from all PHQ-9 items).

Across participants, higher depression (PHQ-9; range: 9-63) and anxiety (GAD-7; range: 7-49) scores were associated with greater severity of symptoms. However, high scores for perception of LGBTQ+ identity (range: 5-35) indicated more positive thoughts about one's LGBTQ+ identity. Binary presence of witnessing or experiencing LGBTQ+ related discrimination is also indicated within Appendix LA. Higher scores are related to more burdensome experiences within misgendering and gender dysphoria items. Overall, misgendering and gender dysphoria items were scored more highly among TGD participants. However, some cisgender participants also experienced some level of burden relating to misgendering and gender dysphoria. These descriptive results demonstrate that all variables fluctuated over the course of the 7-day assessment period between and within participants. Further power is needed to complete analysis which would highlight fluctuation patterns.

5.4.4.3. Participants who self-harmed during the 7-day ESM assessment

Of the 16 LGBTQ+ young people who took part in the study, five endorsed self-harm behaviours at some point during their ESM assessment period. These participants are highlighted within Appendix LA. on the day they self-harmed. Each of these participants only reported self-harm on one day, with one also stating very high suicidal ideation triggering the safeguarding response. This did not need to be escalated to supports or services after the wellbeing check, as the participant no longer felt at-risk and wished to continue the study.

When participants were clustered by whether they had self-harmed (n=5) or not (n=11) over the week, depression scores (PHQ-9) were higher among those who had self-harmed, compared to those who had not self-harmed (Figure 13). Whereas anxiety scores (GAD-7) were higher among those participants who did not self-harm (Figure 14).

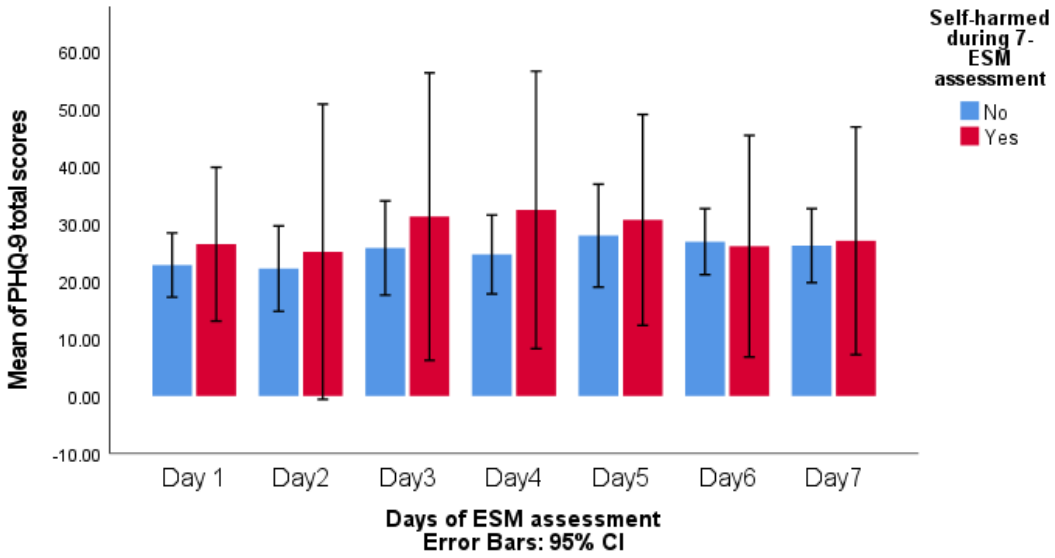

Figure 12.

Depression scores (PHQ-9) clustered by self-harm behaviour across seven-day ESM assessment period

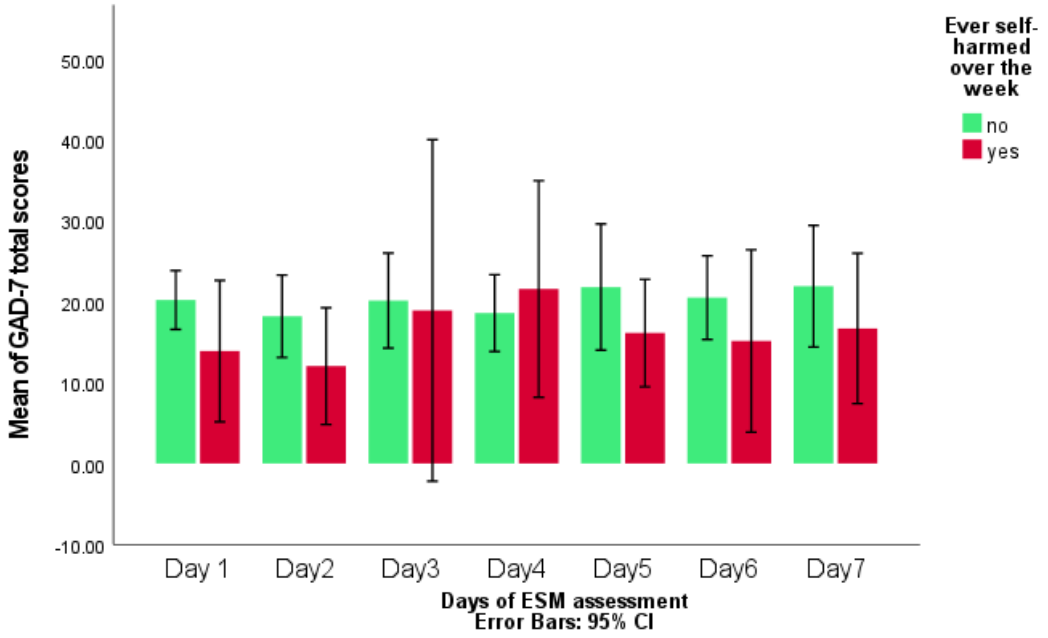

Figure 13.

Anxiety scores (GAD-7) clustered by self-harm behaviour across seven-day ESM assessment period

Across the week, participants who self-harmed appeared to have more positive associations with their LGBTQ+ identity than those who did not, however, there was only a slight difference each day (Figure 15). Only one of the participants witnessed and experienced LGBTQ+ related discrimination on the day that they had self-harmed. Their qualitative response indicated that this discrimination came from TikTok. However, these experiences were rated as not highly burdensome (witness = 1, not at all burdensome; experienced = 3, not very burdensome). Potentially, patterns could be determined with a larger sample.

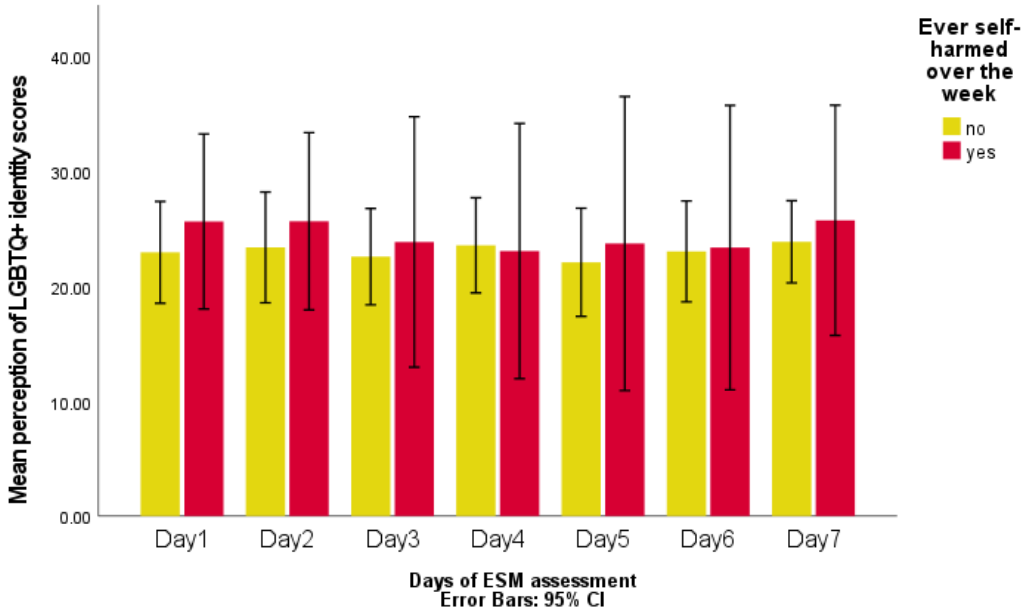

Figure 14.

Perception of LGBTQ+ identity scores clustered by self-harm behaviour

5.4.3.4. Open-text responses

Open-text responses followed three ESM items; whether the participant had self-harmed that day, and whether they had witnessed or experienced LGBTQ+ related discrimination. Here, I offer a brief summary and full details can be found in Appendix MA. Of the 5 participants who self-harmed, 4 left responses following self-harm items. These indicated that participants self-harmed following arguments with partners or friends. Alternatively, participants left me messages to explain that they were not at immediate risk despite self-harming.

There were 16 instances were participants witnessed LGBTQ+ related discrimination, which was indicated to be moderately distressing (M: 4.9; SD: 1.6). Most of these experiences came from online or

social media sources. There were 5 instances of direct discrimination reported by 2 TGD participants; these were rated as similarly distressing (M: 4.8; SD: 1.6). This discrimination was by people continually misgendering the participant and from family members.

5.5. DISCUSSION

This study is the first to examine experience sampling methods within LGBTQ+ young people who have current experiences of self-harm, with and without suicidal intentions. The overall findings support the feasibility and acceptability of ESM among this population. In terms of feasibility, the enrolment rate for the study was comparable to other small feasibility studies (Garey et al., 2021; Wenze, Armey, & Miller, 2014). Each of these studies included 14 participants (Garey et al., 2021; Wenze et al., 2014). However, compared to feasibility studies which considered high-risk adolescents and self-harm, the consent rate is much lower (n= 34, Czyz et al., 2018; n = 55, Glenn et al., 2020). Potentially these higher consent rates are related to the period of recruitment, as neither paper mentioned how long recruitment was open for these studies or recruitment rates (Czyz et al., 2018; Glenn et al., 2020). For this study, the software license of mEMA was only available for two and a half months following ethical approval, therefore, there was a limited recruitment period. Additionally, this study had strict inclusion criteria, potentially explaining the lower consent rates. A further difference between studies may be that the participants here were sampled from community rather than psychiatric hospitals (Czyz et al., 2018; Glenn et al., 2020). For this study, community members needed to either contact me directly or register their interest with MQ Participate, whereas Czyz et al., (2018) and Glenn et al., (2020) may have been able to directly approach potential participants. The retention rate of participants, however, was consistent with previous ESM research in samples who have self-harm experiences (Humber et al., 2013; Husky et al., 2014; Husky et al., 2017; Nock et al., 2009). Indeed, retention of all participants was a

particular strength of this study, on the higher end of retention rates comparably (Sedano-Capdevilla et al., 2021).

Overall, adherence to survey completion (68%) was similar to other ESM studies considering adolescents and young people who experience self-harm (69%, Czyz et al., 2018; 63% Glenn et al., 2020). As Czyz et al., (2018) and Glenn et al., (2020) both examined self-harm across longer study periods (around a month), it was evident that adherence decreased over time. In this study, the lowest rate of total survey adherence was the seventh day of the ESM-assessment period. On a smaller scale, this presents similar findings that towards the end of the study, participants may lose some interest in completing the ESM surveys. When asked, participants felt that the 7-day period was right for this study, and that if it had been longer, they might have responded less accurately or frequently. Within their study, Eisele et al., (2020) increased sampling frequency was not associated with negative consequences, such as participant burden. Thus, it might be useful to shorten ESM-assessment periods but counteract this with increased sampling frequency to ensure analytical power is achieved.

5.5.1. Future directions for ESM within LGBTQ+ young people

This study is highly exciting for two reasons; i) it demonstrates that it is feasible and acceptable to engage young LGBTQ+ people with ESM when they currently experience self-harm, ii) it was shown that there are daily changes within- and between- person of underlying processes associated with self-harm (Chapters 3-4; Williams et al., 2021a; Williams et al., 2021b). To conduct a larger ESM study which is fully powered, it has been calculated that 190-210 participants is necessary. This is related to the study design as it currently stands and was calculated to be sensitive of all fluctuations relating to affect dynamics (Pirla et al., 2021) as well as behaviours. This would provide evidence of temporal dynamics of influential variables within LGBTQ+ young people, to explain how these are related to self-harm.

Research implications from the study indicate some changes could be made to enhance the acceptability. However, the assessment period (7-days) and number of assessment surveys (6 per day) has been found to be the most effective over ESM fields (Wrzus & Neubauer, 2022). Extending the assessment period was related to a drop in compliance (Wrzus & Neubauer, 2022). Like Eisele et al., (2020), this meta-analysis indicated there were not negative impacts if researchers used more assessments per day over a shorter period (Wrzus & Neubauer, 2022). As participants and the LGBTQ+ Advisory Group both felt that 6 surveys a day was optimal, changing this study design would not be efficient. However, the delivery system of ESM surveys needed improvement. Given that some participants struggled with the notification system and there was a software issue effecting half the participants, alternatives to mEMA should be considered. Following technical issues in their study, Glenn et al., (2020) switched to Metricwire, which was used with over 90% of their participants. Further delivery concerns were not mentioned within the study (Glenn et al., 2020). Potentially, Metricwire would act as a suitable alternative for future studies. Additional changes to enhance the acceptability of the study would be to personalise timeframes. This would add an additional step to ESM briefing and set-up but would likely return a higher level of compliance across the study. Such a small change should be considered for future study designs.

Considering theoretical implications, it is possible to use ESM to assess the Minority Stress Model (MSM, Meyer, 1995; 2003) in real-time. Kleiman and colleagues (2019) postulate that all theories suggest that processes change over a short period of time. ESM could be used to assess the of the MSM in real-time. All the ESM surveys were built to reflect underlying processes which lead to self-harm in LGBTQ+ young people (Chapters 3-4; Williams et al., 2021a; Williams et al., 2021b). Across ESM topic surveys there were similar levels of topic compliance (62-66%) and were all considered to be relevant topics by the participants. Therefore, these surveys could be used to provide real-time evidence for the MSM

(Figure 3). Here, depression and anxiety would sit within general stressors, perceptions of LGBTQ+ identity and gender dysphoria would act as proximal stressors, and witnessing or experiencing discrimination and misgendering would be distal stressors. Examination of the data would determine whether social context added to stress for these young people or was a form of social support. It is likely that this would change between who the individual was with and their environments. Therefore, ESM could be used to test and modify current models, as well as generate new theories within LGBTQ+ young people and self-harm (Kleiman, Glenn & Liu, 2019).

A final consideration for future ESM research is the ability to focus on person-centred data as well as at group-level (Kleiman et al., 2019). As the individual is being repeatedly sampled to provide rich data, real-time monitoring allows consideration at the personal level as well as group (Kleiman et al., 2019). This allows for extraction of crucial information which may be utilised by tailored interventions (Kleiman et al., 2019), such as self-harm triggers. For LGBTQ+ young people in particular, a level above person-centred monitoring would be to use subgroup analysis, whereby young people are clustered by their sexual orientation or gender identity. This could be used to determine similarities or differences between sexualities and gender identities which relate to self-harm, which could be generalised by LGBTQ+ identity. But also used to distinguish how different identities within the LGBTQ+ umbrella may need alternative or differently tailored interventions. Such person-centred and identity-centred monitoring would offer valuable information for intervention research in self-harm.

5.5.2. Clinical implications

The long-term goal of this line of research is to understand how daily experiences prospectively influence self-harm among LGBTQ+ young people, which could then be used to inform future interventions or prevention strategies. One key theme of the ESM qualitative interviews highlighted the utility of ESM to enhance awareness and reflect on mood and self-harm. Some participants saw this as a

therapeutic tool, acting as a barrier to their self-harm. Firstly, research should be conducted to determine whether aspects of ESM can act as an intervention to self-harm. This would provide an individualised, easy to access, and relatively cheap way to reduce self-harm within LGBTQ+ young people. Participants also discussed the use of ESM to monitor self-harm risk in the community, as well as using ESM as a tool with therapists.

Through ESM strategies, clinical teams could use real-time data to determine the level of self-harm risk (e.g., how likely they are to engage with self-harm behaviour) for their patients or clients. Kleiman et al., (2019) have discussed how advances in machine learning with ESM data have indicated the ability to assess self-harm risk from known risk factors. Machine learning allows for the consideration of dangerous combinations of responses, which can be predictive of a self-harm event (Kleiman et al., 2019). Within clinical teams, such information would be useful to understand when a young person needed intervention. Within participant reflections, it was mentioned how ESM could be used as an assessment tool to help at-risk young people before a point of crisis. Whereby clinical teams were aware of vulnerable young people in the community and would monitor their daily data to assess trends in mood or behaviour. Clinical teams would then be aware of whether intervention was acutely needed in real-time.

Within the qualitative interviews, one participant discussed how they felt ESM had a place within 1-on-1 therapeutic settings. They stated how they would be incorporating their reflections of self-harm into their IAPT sessions. Using ESM, it is possible that therapists would be able to track self-harm within their clients and understand the context surrounding these thoughts and behaviours. This would offer additional information as to the participants overall mood and wellbeing prior to therapeutic sessions. By reviewing data, therapists would be able to tailor their clinical services to readily address the young person's needs. Instead of relying on the communication provided by the young person, which may be

limited in times of distress. Therefore, ESM data collection and review could act as additional pathways to tailored care.

5.5.3. Ethical implications

Despite LGBTQ+ young people who self-harm being considered a high-risk population (Hatchel et al., 2019c; Liu et al., 2019; Marshal et al., 2011), there was only one event in which the safeguarding procedure was flagged. This event did not need to be escalated when speaking with the participant during their wellbeing check. The procedure followed a similar strategy to Glenn et al., (2020), whereby participants would be contacted by the researcher within 24 hours for a wellbeing check. This information is useful, firstly, to demonstrate that ESM with a high-risk population is possible while providing a tested protocol for others to adopt. Secondly, it is ethical to conduct such research, as from the qualitative interviews, participants found the ESM design highly helpful to monitor their self-harm and mood, rather than feeling as though the survey assessments triggered their self-harm. Thirdly, to determine that this safeguarding procedure was acceptable to LGBTQ+ young people. All participants were told before taking part in the study that this safeguarding procedure would be in place to ensure safety; only one person did not give valid GP details and was therefore excluded. Considering this and previous research, it appears that ESM designs are appropriate to use with high-risk young people who experience self-harm (Andrewes et al., 2017; Czyz et al., 2018; Glenn et al., 2020; Husky et al., 2014; Nock et al., 2007).

Furthermore, ESM often can include GPS monitoring through the devices used to collect data, (e.g., mobile phone, wearable technology). While mEMA does offer this feature, it was unnecessary for this study. However, if there are concerns of suicide attempts within ESM studies, it is possible that GPS could be used as a safeguarding tool (Kleiman et al., 2019). This would be able to track the participant following reports of highly suicidal thoughts and self-harm behaviour. From this information, researchers

would be able to have locations for emergency services if needed or be aware if there were additional risks (e.g., location of the participant). However, real-time assessment does not necessarily mean real-time monitoring (Kleiman et al., 2019). Therefore, a GPS safeguarding system places a great deal of burden on the researcher. If a participant did complete suicide, this would naturally cause a high degree of guilt. Even with such technology it is necessary to balance several factors, i) researching vulnerable populations, ii) expectations of the participants, such that they know when their data will be checked, iii) safeguarding of participants, and iv) protecting researchers' wellbeing. When designing ESM studies, ethical considerations need to be central and realistic.

5.5.4. Strengths and limitations

This study is highly useful as a learning tool. An initial strength is that this study demonstrates ESM is feasible and acceptable with LGBTQ+ young people who experience self-harm. Furthermore, this strength is extended by the reflections of barriers and facilitators for study engagement. These demonstrate how to improve the study for participants and can be considered with development strategies in mind (e.g. research costs, ethical submissions and approvals).

A second strength of the study is that it provides the first step towards understanding how experiences highlighted by previous research (Chapters 3-4; Williams et al., 2021a; Williams et al., 2021b) can be influential in real-time. Descriptive data demonstrated that there were changes within social context, mood, perceptions of LGBTQ+ identity, and minority stressors, within and between participants over a short-time period. Of note, depression rates were generally higher among those who self-harmed during the ESM assessment. While there was not enough statistical power for complex analysis, this study indicates that the topics are relevant for LGBTQ+ young people in their daily lives. Thereby providing the initial indications that further research in this area would be valid and extend the understanding of temporal relationships between these factors and self-harm.

However, there were some limitations. The first being the generalisability of the current sample. While a range of LGBTQ+ identities were included, there were only 4 TGD participants, and a large portion of the sample was bisexual. Furthermore, the majority of participants were as white or White British. This was left as a free-text response for participants to report their ethnicity, however, this left some ambiguity around who was captured in this sample. Inclusion of ethnically diverse participants is important to fully understand the experiences of LGBTQ+ people and how their experiences may be different from white British individuals. Future research requires more diverse samples to understand self-harm among ethnically diverse minorities (Lindsey et al., 2019).

The second limitation relates to the recruitment period. Due to COVID-19, the start of this study was delayed. This followed in-depth team discussions and codesign with the LGBTQ+ Advisory Group. This meant there was only 2.5 months for recruitment to be conducted before the mEMA software license expired. This resulted in a small sample. Furthermore, given that participants were only assessed 6 times a day over 7 days, expected missing data was not strongly accounted for. This pushes the need for higher sample numbers to achieve statistical power. Other studies have used shorter study periods with around 10 survey assessments per day (Eisele et al., 2020; Forkmann et al., 2018; Hallenslben et al., 2019) to account for this. However, as this is a feasibility study and I did not expect to reach statistical power for full analysis of daily fluctuation relationships, it was decided to only administer the surveys 6 times a day. This was to ensure participants were not overburdened and followed the recommendations made by the LGBTQ+ Advisory Group. For future studies, if this study design is followed, strategies need to be considered to enhance recruitment, an example of which would be a longer recruitment period. This should aim to recruit between 190-210 participants to achieve a power of 0.81 over a 7-day period, with 6 assessments a day (Pirla et al., 2021).

5.6. CONCLUSIONS

The current study is the first to monitor LGBTQ+ young people with experiences of self-harmful thoughts and experiences, in real-time. This is the first to use an ESM design to examine the feasibility and acceptability of these methods with this population. Findings support the use of ESM research among these young people and indicate that future research is necessary to determine how influential factors may fluctuate within-person over the day and week. Further ESM research with this population would help to identify any other mechanisms which could be influential to self-harm, such as risk or protective impact. These results could then be used to develop or adapt interventions to reduce self-harm in daily life.

CHAPTER SIX: GENERAL DISCUSSION

6.1. OVERVIEW OF KEY AIMS, FINDINGS AND CONTRIBUTION TO LITERATURE

The purpose of this thesis was to conduct an in-depth exploration of the processes underlying self-harm among LGBTQ+ young people. A mixed-method approach was most appropriate to address this aim using a range of methodologies (Figure 4). This thesis offers a comprehensive understanding of self-harm risk factors (Chapter 3) and processes which this population perceives to lead to their self-harm (Chapter 4). Findings from these studies were reviewed and built into the third study as baseline assessment and experience sampling items. The experience sampling study was conducted to determine whether it was feasible to assess processes which are likely to be related to self-harm in real-time (Chapter 5). Table 16 provides an overview of the key findings and novel contributions to the literature which are reported in the empirical chapters of this thesis.

Table 16.

Summary of empirical findings associated with each chapter and study design

Chapter number	Study design	Novel findings and contributions
3	Systematic review and meta-analysis	● This was the first systematic review and meta-analysis to examine associated risk factors across the dimension of self-harmful thoughts and behaviours, with and without suicidal intention, throughout the umbrella of LGBTQ+ identities within young people. ● While many associated risk factors were found amongst the published literature, only two overarching risks could be meta-analysed: victimisation and mental health difficulties (MHD). ● The pooled prevalence of victimisation (36%) and MHD (39%) was determined through meta-analyses. ● The odds of these risk factors were calculated. A higher rate of each risk factor was found among LGBTQ+ young people who self-harmed, when compared to cisgender, heterosexual counterparts (victimisation OR: 3.74; mental health difficulties OR: 2.67).

4	Qualitative semi-structured interview	● Growing up, LGBTQ+ young people often turned to self-harm as they did not have the terminology to understand or communicate their sexual orientation and/or gender identity. ● Internal perceptions of one's LGBTQ+ identity change and develop, which can influence self-harm both positively and negatively. ● TGD young people were unique in their experiences of gender dysphoria and medical transition, which related greatly to their self-harm. ● Discrimination from two groups was particularly influential to self-harm: peers and the family unit.
5	Experience sampling assessment	● This was the first experience sampling study which has been conducted with LGBTQ+ young people, currently experiencing self-harm. It is feasible and acceptable to use ESM with this population. ● From consent to completion of the 7-day ESM assessment, retention was 100%. Total survey completion was 67.6%, with participant adherence ranging from 43-95% of surveys completed. ● All ESM topics (social context, mood, perception of LGBTQ+ identity, and minority stressors) were considered as relevant to self-harm in daily life. ● Without prompting, participants naturally used the ESM study to track their own mood and self-harm. This resulted in some reducing their self-harmful behaviour. ● TGD individuals more frequently experienced daily direct discrimination than cisgender LGB young people. However, witnessing discrimination was frequently highlighted by participants. ● It was recommended that a follow-on study would be worthwhile in the future, given that fluctuations were observed within the ESM data between and within- participants. ● A sample power analysis was conducted, which suggested that if participants were sampled 6 times a day for 7 days, 190-210 participants would be needed to fully explore all aspects of variable fluctuation.

Together, this thesis adds value to the field of self-harm research among LGBTQ+ young people. This is by offering a range of important outcomes which can inform practical implications for evidence-based intervention and presentations for self-harm among LGBTQ+ young people and enhances theoretical models, such as the IMV and the Minority Stress model. These are discussed in more detail within this chapter.

6.2. REVISITING STUDY AIMS AND PRIMARY FINDINGS

6.2.1. Investigating associated risk factors of self-harm across LGBTQ+ young people, (i) determining the prevalence of these risk factors, and (ii) differentiating risk prevalence between TGD and LGB youth. (Chapter 3)

To date, this was the first systematic review and meta-analysis which examined self-harm risk factors among all LGBTQ+ identities in young people (Chapter 3; Williams et al., 2021a). Previous research had limited their analysis to a dimension of self-harm, either suicide or self-harm only (Hatchel et al., 2019c; Liu et al., 2019), or focused on one group of LGBTQ+ identities, e.g., TGD (Marshal et al., 2011). This was the first review which offered both identity and self-harm phenomena such a broad inclusion criterion, allowing for comparison of risk prevalence between LGB and TGD groups, as well as aspects of self-harm (self-harm, suicidal ideation, suicide attempt).

Findings from these meta-analyses demonstrated that victimisation (36%) and mental health difficulties (MHD, 39%) were highly prevalent among the target population. Victimisation was found to be more often associated with suicidal ideation (n=21); however higher prevalence was found for self-harm (39%). Whereas, suicide attempt was most frequently associated with MHD (n=19), suicidal ideation had the highest prevalence (40%). From the data, it appears that MHD is more closely associated with suicide than victimisation. The evidence also indicated that compared to heterosexual, cisgender counterparts, these risk factors were much more likely to occur for LGBTQ+ young people.

Previous literature suggests that victimisation and MHD are higher among TGD young people (Bradlow et al., 2017; Su et al., 2016). However, these meta-analyses demonstrated higher prevalence among LGB samples than TGD. This is possibly related to the low number of studies which include solely TGD young people. Additionally, those studies which did include TGD young people, often had low TGD samples. Therefore, within these meta-analyses, it is likely that TGD young people are underrepresented.

6.2.2. What are the perceived underlying processes which lead to self-harm? (Chapter 4)

LGBTQ+ young people were interviewed to determine what they felt led to their self-harmful thoughts and behaviours (Chapter 4; Williams et al., 2021b). This was to extend the understanding of risk factors discussed in the systematic review and meta-analysis. By qualitatively examining what LGBTQ+ young people perceived to be related to their self-harm, a richer understanding of self-harm within the population is achieved.

Firstly, these interviews illustrated the internal journey towards understanding and accepting one's LGBTQ+ identity, and how this was associated with self-harm. Transitional periods between developing and understanding one's own sexual orientation or gender identity has been recognised as a difficult period for LGBTQ+ young people (McDermott et al., 2008; Robinson et al., 2013). In these instances, participants felt like this internalised struggle led to their self-harm.

Secondly, participants experienced lack of support and acceptance from peers and family members. These were described as either discriminatory actions, such as abuse, bullying, or microaggressions (e.g., parents not using a participant's preferred pronouns). These experiences created a pathway to self-harm. This furthers the understanding of discrimination and self-harm, as victimisation prevalence was highly associated with self-harm in the preceding study (Chapter 3; Williams et al., 2021a).

Third, several causes which were not distinctly related to being LGBTQ+ were discussed. These highlighted the pressures of being a vulnerable young person, struggling to cope with illnesses, academic or social pressures, and the impact of abuse. These experiences are acknowledged to influence how people perceive themselves (Cederbaum et al., 2020; Celik & Odaci, 2012; Goodwin & Olfson, 2002; Smith et al., 2017) and were seen by the participants to cause their self-harm, potentially as an emotional release or as self-punishment.

6.2.3. Is it feasible and acceptable to conduct an experience sampling study with LGBTQ+ young people with current self-harm experiences? (Chapter 5)

Findings from the previous studies (Chapters 3-4) offer insights as to what experiences are likely to relate to self-harm in this population. However, all evidence is based on retrospective accounts. Therefore, the next line of enquiry is to determine how these underlying processes interact with self-harm in real-time. To do this, it is important to ensure that such methods work within this population, in a manner which is feasible, acceptable and safe. Therefore, this study tested ESM with LGBTQ+ young people currently experiencing self-harm, with and without suicidal intention.

During the 2.5-month recruitment period, 16 interested individuals provided consent for the study. From consent onwards, there was a 100% retention rate. This is among the highest within self-harm research (Humber et al., 2013; Husky et al., 2017; Husky et al., 2014; Nock et al., 2009). One measure of study adherence was the total number of surveys completed during the 7-day ESM assessment; 67.6% of surveys were completed across participants. Again, this is consistent with previous research (Czyz et al., 2018; Glenn et al., 2020). Participants offered insights into the acceptability of the study. For example, ESM surveys were quick, easy, and made minimal impact to their days. However, it was frustrating if the notification system was not working. All participants tracked their own mood and self-harm using the mEMA app; some actively avoided self-harm because of this self-awareness.

Parameters of the study were explored, which indicated that variables of interest were likely to fluctuate across the ESM period. These patterns were compared between participants who self-harmed and those that did not across the assessment period. Those who self-harmed generally had higher rates of depression, lower rates of anxiety, and more positive associations with LGBTQ+ identity. All participants felt that the topics asked within the ESM surveys were relevant to their self-harm. These

findings indicate that there would be value in conducting future ESM studies, considering how these variables influence self-harm in real-time.

6.3. WHAT ARE THE KEY ISSUES INFLUENCING SELF-HARM IN LGBTQ+ YOUNG PEOPLE?

By using a mixed-method design, the aim of this thesis was an in-depth exploration of underlying processes which lead to self-harm among LGBTQ+ young people. Something that simply quantitative or qualitative work alone would not be able to offer. From the findings, key issues which influence self-harm have been collated and reflected on. Given the quantitative approaches used, these issues can be considered to impact a wider population than through qualitative research alone (Creswell, 2014). However, the qualitative aspects offer a deeper understanding of self-harm presented by those with lived experiences. This explores the perceived meaning behind these experiences (Creswell, 2014) and how they relate to self-harm for a young person who is LGBTQ+. Figure 16 demonstrates the process through which exploratory, sequential, mixed-methods were used within this thesis.

The thesis studies indicate that there are several common processes which lead to self-harm; i) mental health difficulties; ii) bullying, stigma, and discrimination; and iii) internal perception of one's LGBTQ+ identity. One or more of these issues are discussed in either the systematic review and meta-analysis (Chapter 3) or the interviews (Chapter 4). These were then taken as key variables for the ESM study (Chapter 5), tested as baseline assessment and ESM items. This study demonstrated that these methods are feasible, acceptable, and a better understanding of temporal dynamics surrounding self-harm could be investigated in future. This offered some further information regarding their impact to self-harm.

The following sections will discuss each issue within the context of related research. These issues do not exist within a vacuum. Therefore, they are likely to relate with each other and how they may influence self-harm is considered.

6.3.1. Mental health difficulties

LGBTQ+ young people are disproportionately likely to experience negative mental health (Marshal et al., 2011; Russell & Fish, 2016; Shearer et al., 2016). Therefore, the importance of MHD to self-harm is not surprising. However, this thesis extends the understanding of MHD as an underlying process leading to self-harm. Firstly, by offering a prevalence of MHD (39%) among those LGBTQ+ young people who self-harm, which was beyond the occurrence for comparable cisgender, heterosexual young people (OR=2.67) (Chapter 3; Williams et al., 2021a). Thus, this is a key issue facing this demographic. These statistics also offer insight into how prevalent MHD co-occurs with self-harm.

While the meta-analysis does not indicate those with a diagnosed mental health condition, it offers an overview of those who self-report, experience symptoms of MHD, and those who have received clinical diagnosis; the other studies within the thesis further this understanding of MHD and self-harm. The interviews discuss MHD as a contextual factor. Participants discussed how MHD did not directly cause self-harm, but recognised they were more likely to have low mood or be anxious when they self-harmed. This suggests that LGBTQ+ young people were more vulnerable to triggers or adverse events when they were experiencing MHD. Similarly, through the ESM study, it was shown that MHD varied over the week. It is telling that participants felt the need to track their MHD (as well as their self-harm) within the study. It is possible that participants recognised that their MHD are more influential to their self-harm, than as described within the interviews. However, further evidence would be needed to examine this suggestion.

Specifically, anxiety and depression were discussed in relation to MHD by participants (Chapter 4, Section 4.4). This maps to prior research which indicates higher symptoms of depression and anxiety associated with self-harm among LGBTQ+ young people than non-minority peers (Marshal et al., 2011; Reisner et al., 2016; Taliaferro & Muehlenkamp, 2017). Given this relationship, these specific conditions were built into the ESM study (Chapter 5), which indicated that depression was higher among those who self-harmed, while anxiety was lower. A potential explanation for this, is that depression is closely related to hopelessness (Beck et al., 1974; Hawton et al., 2013) which according to the Cry of Pain model is key to developing self-harm (Williams & Pollock, 2000). Depression and anxiety are commonly comorbid, and relationships are likely (Kessler et al., 2015). This was demonstrated by participants scoring for both difficulty symptoms during the ESM study (Chapter 5). Thus, further investigation is needed to explore how these interact and relate to self-harm in real-time. This would highlight which difficulties or symptoms may be particularly relevant and important to target for self-harm prevention.

From the meta-analysis, MHD was not associated with self-harm among 61% of LGBTQ+ young people (Chapter 3; Williams et al., 2021a). Therefore, while this is useful to understand why a high number of young people are likely to experience both self-harm and MHD, it does not explain why some people self-harm and others do not. Potentially, this suggests that self-harm may be more closely related to other influential experiences, such as interpersonal or intrapersonal difficulties, or other aspects, such as impulsivity, may be more important for these young people.

6.3.2. Bullying, stigma, and discrimination

LGBTQ+ populations have consistently been faced with stigma, discrimination, and abuse (Brandelli Costa et al., 2017; Grossman et al., 2011; Meyer, 1995). The strongest and most evident core issue running through the studies of this thesis are the impacts of bullying, stigma, and discrimination as underlying processes which lead to self-harm (Chapters 3-5; Williams et al., 2021a; 2021b).

Bullying is a well-established self-harm risk factor among LGBTQ+ young people (Myers et al., 2020; Toomey & Russell, 2016). Through meta-analysis, it was evidenced that 36% of LGBTQ+ young people who self-harmed were likely to have experienced victimisation (Chapter 3; Williams et al., 2021a). A broad definition was used to capture victimisation data (Chapter 3), so this prevalence is not limited to LGBTQ+ related bullying or discrimination. As previously discussed, in Chapter 3, ambiguous measures have previously been used, therefore the nature of victimisation is not always clear. On an individual level, the cause of bullying may also not be known to the victim; potentially assumptions are made that this bullying occurs because the victim has a minority identity.

Through interviews (Chapter 4; Williams et al., 2021b), victimisation was elaborated on by participants discussing what is perceived to have led to their self-harm. Victimisation experiences were extended to stigmatised or discriminatory incidents. For example, being teased for being non-heterosexual, peers assuming that LGBTQ+ youths would be using changing rooms to invade privacy, and even being attacked while the perpetrator uses phobic slurs. Consequently, some LGBTQ+ young people disliked attending school, which could impact their education, or cause isolation from their peers. Both school non-attendance (Epstein et al., 2020) and isolation (WHO, 2014) are individually recognised as self-harm risk factors. Arguably, these consequences may have exacerbated young people's difficulties with self-harm.

It has been suggested that some LGBTQ+ youth face high rates of abuse due to phobia within the household (Schnarrs et al., 2019). This suggests that family members are directly being abusive or neglectful to a young person due to their LGBTQ+ identity. While abuse was discussed by some participants (Chapter 4; Williams et al., 2021b), the focus of abuse was not overtly related to being LGBTQ+. However, this may have been an underlying factor which was not mentioned or known to the participant. Family members were predominantly discussed as holding stigmatised views of LGBTQ+

people, namely being unaccepting or unsupportive. This meant that participants often masked their LGBTQ+ identity, a strategy widely used by LGBTQ+ youth (Scmitz & Tyler, 2018). In turn, this delayed them coming out to family members. It was shown that this caused difficulties with self-harm and influenced their feelings in relation to their own identity. Therefore, the importance of coming out and the associated response from families is highlighted. Within international and UK-based research, negative perceptions of coming out, whether expected or experienced, have been associated with self-harm (Diamond et al., 2011; Hunt et al., 2020; Rivers et al., 2018), which was confirmed within these findings. It is important therefore to understand that if family members are perceived to hold stigmatised views of LGBTQ+ individuals, these views can hinder the young person's ability to come out with their sexual orientation or/and gender identity in their home environment. This is then influential to self-harm.

Preliminary data on the feasibility of exploring the frequency of witnessing or experiencing direct discrimination was examined (Chapter 5). In these accounts, participants reported 16 instances of witnessing LGBTQ+ related discrimination. This suggests that LGBTQ+ discrimination or stigma is likely to occur on a regular basis. Five instances of direct discrimination were also reported, by 2 TGD participants. From this data, TGD young people were more likely to be directly discriminated against. However, not enough data is available to test this assumption. This is consistent with previous literature that TGD individuals are likely to be discriminated against by peers (Grossman & D'Augelli, 2012) and by their own family (Austin, Craig & McInroy, 2016; Nadal, Skolnik, & Wong, 2012). It has long been recognised that gender-based victimisation and discrimination is associated with self-harm among TGD young people (Clements-Nolle, Marx, & Katz, 2006). To support those TGD young people who face discrimination, strategies should be in place to support their mental wellbeing and reduce the impact of self-harm if necessary.

Given these negative social experiences, a young person may develop feelings of thwarted belongingness, a key construct within the Interpersonal Theory of Suicide (Joiner, 2005) and the Integrated Motivational-Volitional model (O'Connor, 2012; O'Connor & Kirtley, 2018). This can then lead to perceived burdensomeness, as the young person doesn't feel that they belong with those around them, resulting in self-harm. Potentially, thwarted belonging due to experiences of stigma and discrimination explains some of the self-harm disparity between this population and heterosexual, cisgender peers.

While acceptance of LGBTQ+ is growing (GALLUP, 2021), it is disheartening that LGBTQ+ young people still face many experiences of stigma, victimisation, and discrimination. Due to the importance of education and family factors associated with self-harm among adolescents generally (Carballo et al., 2020; Fortune et al., 2016), the added strain of stigma or discrimination within these contexts are important areas to target for future self-harm prevention.

6.3.3. Internal perception of one's LGBTQ+ identity

During adolescence and emerging adulthood, young people develop and form their identity (Briggs, 2008; Cass, 1984; Erikson 1950). The struggle to determine a synthesis with one's identity can be a difficult process (Briggs, 2008; Cass, 1984). This can relate to feelings of not belonging (Briggs, 2008), disconnection or isolation (WHO, 2014), as the young person perceives themselves as different from a societal norm (Goffman, 1963). The final key issue presented by this thesis was how an individual perceives their LGBTQ+ identity during this timeframe (16-25-years), how this varies, and how this may be linked to identity formation through to consolidation. This was demonstrated through risk factors associated to identity (Chapter 3; Williams et al., 2021a), retrospective reflections within interviews (Chapter 4; Williams et al., 2021b) and the feasibility of capturing perception variations over the course of a week (Chapter 5).

Using a model of identity, Cass (1984) suggests that forming one's identity starts with confusion and social comparison. It is suggested that internalised hatred comes at these stages, as young people feel a sense of shame and difference to their peers (Parmenter et al., 2020). Within interviews (Chapter 4; Williams et al., 2021b), participants discussed how negative self-perceptions of their LGBTQ+ identity led to their self-harm. This was extended for those TGD participants who experienced gender dysphoria and discussed how this was related to their identity. These reflections suggest that participant had internalised negative societal messages relating to their sexual orientation and/or gender identity (Berg et al., 2016). As previously discussed, these experiences are likely to lead to a young person feeling as though they do not belong, which can precipitate self-harm (Joiner, 2005; O'Connor, 2012; O'Connor & Kirtley, 2018). It is also likely that this led to negative social comparisons (Cass, 1984), resulting in internalised hatred. Within the systematic review, internalised hatred was identified as a risk factor within 10 studies (Chapter 3; Section 3.4.1.3.).

Identity confusion, and related self-hatred, can be explained by young people not having access to resources which enable them to explore their identity. Parmenter et al., (2020) suggested that identity conflict could be associated with religious upbringings (which hold stigmatised views of LGBTQ+ people) or lack of access to LGBTQ-affirmative communities, which they label as resources. This caused the young people to feel ashamed about their identity and hindered their consolidation to this identity. From this thesis, lack of resources may be extended to limited terminology, as from the interviews, participants described their early understanding of being LGBTQ+ as restricted as they did not have the words to describe or label their feelings (Chapter 4; Williams et al., 201b). Furthermore, these findings portray that confusion or limited understanding of identity can result in self-harm. This highlights the influence of environmental factors when developing an understanding of identity.

The ESM study demonstrated that it was possible to examine identity perceptions over time and that these are likely to fluctuate within-person (Chapter 5). Over the course of the 7-day ESM assessment, participants scored differently on their perceptions of their LGBTQ+ identity. This is reinforced by the statement made during member checking of the thematic framework, that self-acceptance and perception of identity was an ongoing journey (Chapter 4; Williams et al., 2021b). From these findings, it appears that perception of identity is not static within this population. This would reflect how during adolescence and emerging adulthood, identity is still being synthesised and consolidated (Cass, 1984; Briggs, 2008; Erikson 1950). Potentially, those who hold perceptions which are aligned with pride and positive identity affirmation are closer to achieving identity synthesis (Cass, 1984). Here, this would be young people feeling able to comfortably identify and consolidate their sexual orientation and/or gender identity. Pride has also been connected with in-group identification among LGBTQ+ populations (Hendricks & Testa, 2012). This suggests that allowing LGBTQ+ terminology and resources (e.g., LGBTQ+ affirming communities) could enhance positive associations with identity, enabling quicker self-acceptance (Parmenter et al., 2020). From the findings of this thesis, such a strategy may aid self-harm prevention within LGBTQ+ young people.

However, Cass's model (1984) has been criticised as being one dimensional, not considering intersectionality or variations from the linear process of identity (Kenneady & Oswalt, 2014). The linear structure of this model misses how perceptions of a person's own identity can change over the course of a shorter period, as suggested within the ESM study (Chapter 5), arguably simplifying the process of identity consolidation. It was explicitly stated that acceptance, and pride of one's LGBTQ+ identity was viewed as an ongoing journey (Chapter 4; Williams et al., 2021b). Therefore, identity's relationship with self-harm is complex and likely to change as the young person feels differently towards their sexual orientation and/or gender identity.

6.4. HOW DO THE THESIS FINDINGS RELATE TO SELF-STIGMA AND SHAME?

The original remit of this thesis was to explore the impact of self-stigma and shame on self-harm within LGBTQ+ young people. It was unclear how self-stigma and shame were related to self-harm initially (Chapter 2; section 2.1.1.). Therefore, if self-stigma and shame were associated with self-harm, it was likely that this would be identified within the systematic review (Chapter 3; Williams et al., 2021a). Given that, these concepts were not detected as risk factors from the existing literature, self-stigma and shame were not explicitly asked about during the interviews (Chapter 4; Williams et al., 2021b). Therefore, if these were discussed during interviews, they would have organically developed from the individual themselves rather than been primed. This leaves the questions of; i) how do these findings relate to self-stigma and shame? ii) how has this thesis furthered this understanding?

6.4.1. Self-stigma

Corrigan and Watson (2002) stated that self-stigma includes 3 constructs which are all discussed in relation to perceptions of oneself: stereotype, prejudice, and discrimination. The findings from this thesis can be argued to fit with this model. Firstly, "stereotype" is the negative belief about self. Secondly, "prejudice" is the agreement with a negative belief (Corrigan & Watson, 2002). From the systematic review and meta-analysis (Chapter 3, Williams et al., 2021a), "stereotype" and "prejudice" have been widely explored concepts, as they hold similar definitions of internalised phobia and hatred within LGBTQ+ literature (Berg et al., 2016). Firstly, internalised homo-, queer-, or trans- phobia were identified as risk factors across 10 studies (Chapter 3; Section 3.4.1.3.). Following this, participants discussed deeply negative self-beliefs, resulting in their self-harm (Chapter 4; Williams et al., 2021b). These studies indicate very high levels of negative self-perceptions which would fulfil the criteria of self-stereotype and self-prejudice (Corrigan & Watson, 2002).

The final aspect of Corrigan and Watson's (2002) self-stigma model is discrimination. They define this as a behaviour response to one's self-prejudice, offering examples of failure to succeed within the workplace or housing market. Given that this thesis and previous research has demonstrated that internalised phobia leads to self-harm (Gibbs & Goldbach, 2015; Hendricks & Testa, 2012; Rehman, Lopes, & Jaspal, 2020; Staples et al., 2018; Williams et al., 2021b), it seems clear that self-harm is a self-discriminatory response. This demonstrates that self-stigma is linked to self-harm among LGBTQ+ young people who believe and act on their negative self-beliefs.

There is little research which seems to directly assess "self-stigma" with self-harm in LGBTQ+ youth (Reyes et al., 2017a; Reyes et al., 2017b). This may be a language distinction between research areas. The model proposed by Corrigan and Watson (2002) originates from mental health disciplines. Whereas internalised phobia is commonly used within LGBTQ+ fields (Berg et al., 2016; Gibbs & Goldbach, 2015; Hendricks & Testa, 2012; Rehman et al., 2020; Staples et al., 2018). Therefore, it is suggested that this thesis has consolidated that self-stigma is related to self-harm, by encompassing several experiences which may be individually assessed within LGBTQ+ research. However, self-stigma was not operationalised and specified measured within the studies, only limited conclusions can be drawn from these findings. Specific assessment of "self-stigma" within this population may be interesting. There may be further utility in examining whether the forementioned concepts "internalised hatred" and "self-stigma" are valid proxies for each other.

6.4.2. Shame

Shame has been discussed as an emotional response to difficult or stigmatising experiences (Luoma & Platt, 2015; Tangney et al., 2007). Lewis (2003) recognises shame as i) feelings of inadequacy; ii) the desire to hide; iii) pain or discomfort around the aspect of difference; and iv) feeling of a focus on themselves. These feelings of shame are internal to the individual (Lewis, 2003), as they are related to

perceptions of oneself and the world around them. Through this pathway, shame can cause internalised stigma (Luoma & Platt, 2015; Tangney et al., 2007). Therefore, as with self-stigma (Section 6.4.1), shame may be represented in this thesis through internalised hatred. This is reinforced by the single study within the meta-analysis assessed shame (Puckett et al., 2017). This study discussed shame as a proximal factor associated with internalised hatred. It is possible that within LGBTQ+ research, shame is incorporated into internalised hatred. This could explain why so little exploration is being conducted on the concept of shame in isolation.

Extending this, Lewis (2003) proposes shame is related to the concerns of other's views about oneself. This can then influence identity formation, as people desire social approval (Czub, 2013). This suggests that people can select to identify with an identity, which is positively reinforced, and can strengthen their associations with a social group (Czub, 2013). When this is not achieved, shame and a desire to disassociate from the identity are felt (Czub, 2013). For young people, shame may be used as a tool to dismiss an identity during identity formation (Erikson, 1950). As LGBTQ+ young people already go through additional stages of identity formation according to Cass (pre-stage, conflict, confusion), shame may be represented by young people feeling that they are different but not being able to communicate why this is or lacking terminology (Chapter 4; Williams et al., 2021b).

It has also been suggested that shame is the emotional response after losing or loss of social acceptance (Gilbert, 2007; Luoma & Platt, 2015). Extending this, if one experiences stigma or discrimination, shame is a natural response. Among young people who self-harm, concealment of a wound is common (Gardner et al., 2020). Concealment is often used to avoid stigma or disapproval from others (Chandler, 2018). This may reflect that young people are ashamed of their wounds or that they aim to avoid confrontation. Similar strategies may be employed by LGBTQ+ young people. Those who felt their families were unsupportive or unaccepting tended to delay coming out (Chapter 4; Williams et al.,

2021b). They used strategies such as “masking” or “concealing” their sexual orientation or gender identity (Schmitz & Tyler, 2018). This was evidenced as a risk factor by one included study of the systematic review (McDermott et al., 2018b). Some participants did recognise that they also held negative self-perceptions, while some did not want to have to explain their LGBTQ+ identity to their families. Potentially, this indicates shame defined by a desire to hide (Lewis, 2003) or the fear of social disapproval (Gilbert, 2007; Luoma & Platt, 2015). However, participants did not associate or overtly discuss LGBTQ+ concealment as a form of shame. Thus, there is not a conclusive answer to whether masking was associated with shame among these participants.

While some of the thesis findings could be interpreted as shame, this is not a definite or clear result. This thesis has not directly assessed shame, it was not uncovered as a potentially important risk factor among previous literature and the concept of “shame” was not discussed by participants (Chapters 3-4; Williams et al., 2021a; 2021b). Therefore, this thesis has not furthered the understanding of shame. However, considering shame in relation to confrontation avoidance within LGBTQ+ young people could be an interesting extension of this work.

6.5. THEORETICAL CONSIDERATIONS

In this section, the key findings will be discussed in relation to theory. Firstly, these are considered alongside the Minority Stress Model (Meyer et al., 2015; Meyer, 1995; 2003), a leading theory in LGBTQ+ research. This model offers insights as to how negative wellbeing and psychological distress is caused among LGBTQ+ people. Therefore, providing a perspective from LGBTQ+ experiences and how these translate to self-harm. Findings are then discussed in relation to the Integrated Motivational-Volitional model (O’Connor, 2011; O’Connor & Kirtley, 2018). This model was selected as it

takes into consideration risk factors and processes leading to self-harm. This model offers an alternative perspective with a focus on self-harm progression from ideation to behaviour.

6.5.1. How does this thesis fit with the Minority Stress Model (MSM)?

Firstly, Meyer et al., (2015) has encompassed suicidal ideation within mental health. This is distinctive from suicide behaviour, which includes additional influences from suicide diathesis. These include genetic and neurobiological factors, such as lower serotonergic activity. Considering the results from this thesis, self-harm naturally fits with mental health in the minority stress model (MSM). This could explain why mental health difficulties (MHD) are so high among LGBTQ+ young people who self-harm. It could also shed light on why depression and anxiety were discussed as contextual factors for self-harm, rather than specific perceived causes (Chapter 4; Williams et al., 2021b). Suicide ideation is not always comorbid with poor mental health. In this thesis, a pooled prevalence of 36% for associated MHD among those who experience self-harm was presented (Chapter 3; Williams et al., 2021a). This model would ignore the 61% who have not reported MHD. Self-harmful thoughts may overlap with MHD but not sit directly within this section of the model. Furthermore, self-harm ideation does not have to precede self-harm behaviour (O'Connor & Kirtley, 2018) and these can occur separately or together.

Secondly, health inequalities have been linked to minority stressors (Meyer, 1995; 2003; Meyer et al., 2015). Therefore, poor mental health is associated with distal stressors, such as bullying, stigma, and discrimination. This can be seen in the centre of the model (Figure 3). As suggested by these findings of this thesis, discriminatory experiences are recognised to influence self-harm ideation and behaviour.

The MSM presents general, distal, and proximal stressors side-by-side, indicating interaction between these stressors (Meyer et al., 2015; Meyer 1995; 2003). These stressors then go on to influence mental health and self-harm behaviour, either through direct or mediating pathways (Meyer et al.,

2015). This is shown by the central cluster of arrows immediately following the general, distal, and proximal stressors (Figure 3). The findings of this thesis could be an example of the interactions between proximal and distal stressors. Exposure to prejudiced views from family members relate to how a young person experiences proximal stressors. This can cause a young person to conceal their identity from others due to expected rejection and internalising self-hatred. These stressors then go on to cause self-harm. General stressors may also account for the variation of victimisation and abuse which were either not recognised or specified as being distinctly related to LGBTQ+ identity.

Considering minority identity, recent research indicates that adolescents are recognising and understanding their LGBTQ+ identity at younger ages (Fish, 2020). Younger adolescents are more vulnerable to peer attitudes and influences (Robinson et al., 2013; Russell & Fish, 2016). These attitudes can impact their self-concept (Brechwal & Prinstein, 2011). Therefore, younger adolescents who are developing an understanding of their LGBTQ+ identity may be more vulnerable to distal stressors than older individuals and enhancing proximal stressors. This may explain why self-harm is so prevalent within LGBTQ+ young people (Berona et al., 2020; Hatchel et al., 2019a; Taliaferro et al., 2019). Potentially, within younger individuals distal and proximal stressors have more influence on how one reflects on their own identity. This could explain the variation within internal perceptions of LGBTQ+ identity presented from this thesis.

The MSM (Meyer et al., 2015; Meyer, 2003) also suggested that coping and social support could interact with identity, and this mediated the relationship between stressors and mental health. Feeling connected to others has been shown to aid a sense of identity and self-worth (Romijnders et al., 2017). This is particularly important when young people feel that their family and friends accept them, enhancing their own levels of self-acceptance, wellbeing, and reducing the impact of mental distress (McConnell et al., 2016; Shilo & Savaya, 2011). Given the negative influence of family members and

peers when they hold prejudiced views or act in discriminatory ways, social support could have a protective relationship when considering self-harm.

Overall, the key self-harm related issues fit neatly into the MSM (Meyer et al., 2015). However, given the critics discussed, Meyer's latest version of the MSM has been adjusted below (Figure 16). To clarify, this adjusted model has not been tested statistically, and is based on the findings of this thesis. This figure provides a visual indication of how the results from this thesis could theoretically offer a clearer understanding of the MSM in relation to self-harm. All changes or additions are shown in red.

Firstly, self-harm is presented adjacent to mental health, rather than within. This is to distinguish that not all those people who self-harm experience MHD. Secondly, participants within this thesis discussed both self-harm ideation and behaviour but indicated that they could cycle between these states of self-harm. Therefore, I do not distinguish between ideation and behaviour. This represents self-harm thoughts and behaviours, with and without suicidal intention (De Leo et al., 2021; NICE, 2011). Thirdly, I have highlighted that proximal and distal stressors may influence how one relates to their minority identity and the characteristics of this. This is shown by a double ended arrow between stressors and identity, and an additional arrow from stressors to characteristics. This accounts for how distal and proximal stressors can influence the process of identity formation and consolation within LGBTQ+ young people. The adjusted model here extends the MSM (Meyer et al., 2015) with enhanced understanding of LGBTQ+ young people's pathways to self-harm. This specifically includes those experiences of TGD youth which has not previously been included in the MSM. From the findings of this thesis and the surrounding literature, this provides a clearer representation of minority stress and self-harm in LGBTQ+ young people.

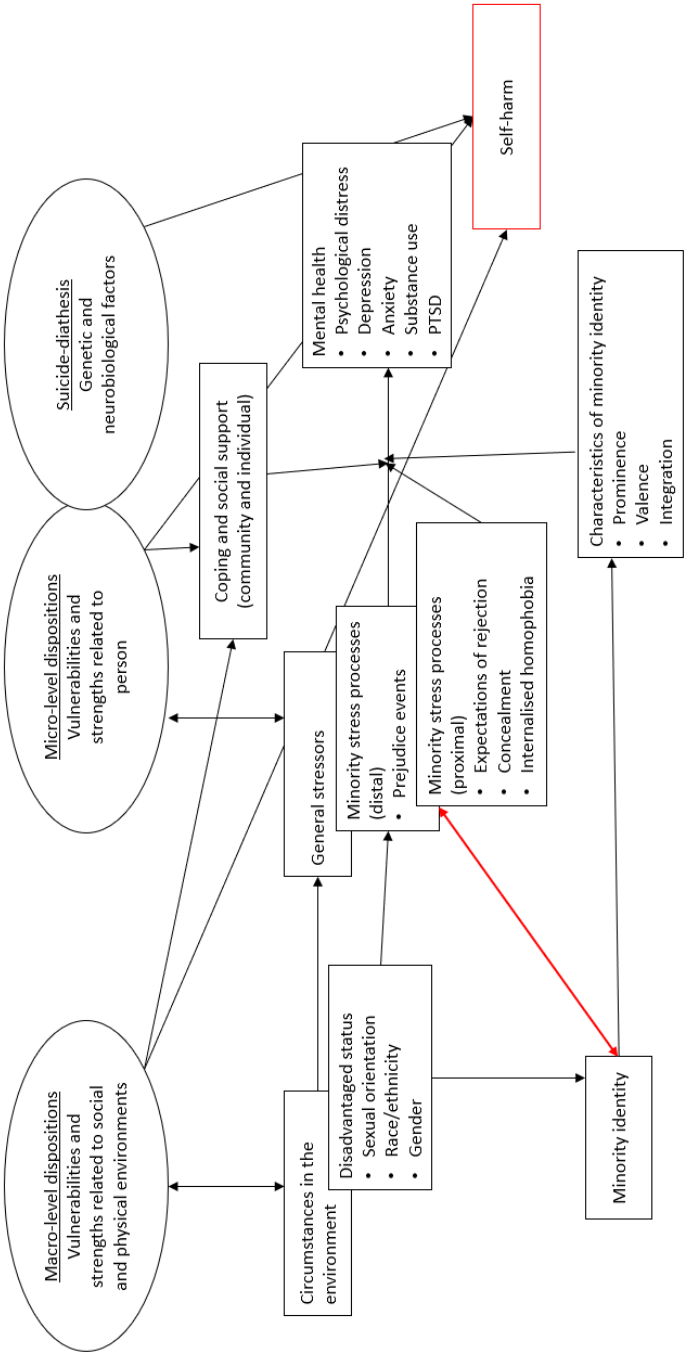

Figure 15.

Adjusted Minority Stress Model based on thesis findings

6.5.2. How do these findings relate to the Integrated Motivational-Volitional (IMV) model of suicidal behaviour?

Using a self-harm lens, the thesis findings are positioned within the IMV model. This offers an interpretation of how LGBTQ+ young people may be at-risk of transitioning between self-harmful thoughts to behaviours. Firstly, the IMV considers the individual's background and how this relates to the development of self-harm through the pre-motivation stage (O'Connor, 2011; O'Connor & Kirtley, 2018). Among this population, it may be likely that a young LGBTQ+ person could be living within a prejudiced household or experiencing adversity, such as abuse. This would be considered their environment. Additionally, the pre-motivational stage considers life events. This can represent experiences which participants perceived as leading to their self-harm. For example, important academic milestones or forming self-concept of one's LGBTQ+ identity.

The IMV model cites defeat, humiliation, and entrapment as predictors of suicide (O'Connor, 2011; O'Connor & Kirtley, 2018). These are the bases for self-harm ideation and intention. Defeat and humiliation may be related to stigmatised views, bullying, and discrimination from the thesis findings. Having frequent reminders of stigma, for example through bullying, a LGBTQ+ young person could feel trapped and unable to escape their situation. This may transition into internal entrapment, as they internalise the negative beliefs about their LGBTQ+ identity, resulting in self-hatred. A specific motivational moderator may be the perception of their minority identity as a variation from a social norm. This would map with Goffman's theory of stigma (1963), whereby "outsider" identities are shunned for differing from a societal norm. Through these cognitions and emotions, it is relatively easy to understand how a LGBTQ+ young person would have thoughts of self-harm, that could move towards behaviours.

The IMV has been examined in relation to LGB young people in the U.K. (Rasmussen et al., 2019). Across the IMV constructs, LGB individuals presented with worst levels of defeat, entrapment, and suicide ideation when compared to heterosexual counterparts (Rasmussen et al., 2019). This suggests that LGB populations are at greater risk of transitioning through the IMV model. Rasmussen et al., (2019) considered that experiences of discrimination and internalised stigma may explain these high rates of defeat, entrapment, and ideation. The findings from this thesis would reinforce these suggestions.

However, neither this study nor my findings present specific volitional motivators. This could be that volitional motivations are generalisable. For example, impulsivity is a general risk factor for self-harm among young people (Lockwood et al., 2017). In their study, Lockwood et al., (2020) found that impulsivity was a predictor to act on self-harm ideation within 10 minutes, among adolescents. Such a predictor would be relevant to LGBTQ+ young people, but not limited to those with minority sexual orientations or gender identities. Furthermore, access to means is not population specific, although access may be hindered or eased by environment. Therefore, focusing on motivational factors are more important for a populational understanding of self-harm transition.

The thesis findings conceptually support the IMV model. These offer enhanced insights into how specifically LGBTQ+ youth travel through the IMV, offering precise processes or experiences which relate to their self-harm. One example of this would be academic pressures such as important exams presenting as a life event. From there, self-perception and external experiences of discrimination and bullying feed into the motivational stage and streamline self-harm behaviour within this population. The cyclical behaviour of being rejected, and then internalising these feelings relating to a characteristic which is unchangeable, may build into greater motivation causing the heightened prevalence seen in LGBTQ+ young people. This reinforces the findings from Marzetti (2020). However, these are not tested

constructs with the model and therefore cannot be confirmed. Further research would be needed to test whether these findings truly supported LGBTQ+ specific evidence for the IMV model. This would also extend the work conducted by Rasmussen et al., (2019), to include TGD young people.

6.6. PRACTICAL IMPLICATIONS

In this section, practical implications of the thesis findings will be discussed. These will be presented in clinical practice, educational settings, and family implications, including where tailored interventions may be most suitable.

6.6.1. Clinical implications

This thesis has highlighted underlying processes which can lead to self-harm among LGBTQ+ young people. A clear way to support this population is by enhancing and easing presentation and help-seeking within clinical services. As GPs are often the first stop for those seeking help for self-harm (Michail, Mughal & Robinson, 2020), with the ability to offer access to specialist services (Mughal et al., 2020), GPs are uniquely placed to support self-harm prevention. To do this, GPs need specific, tailored training to ensure awareness of experiences which LGBTQ+ young people are likely to face and enable them to understand the unique needs of this population. From this thesis, I emphasise the prevalence of mental health difficulties and victimisation as risks for LGBTQ+ young people who self-harm (Chapter 3), the issue of internalised hatred and difficulties relating to family members (Chapter 4). By being aware of these risk factors and experiences, GPs would be better placed to offer tailored advice based on the needs of the LGBTQ+ young person. For example, parents of an LGBTQ+ young person may not accept or support their identity, therefore having consultations without a parent present may be necessary to aid disclosure. This specialist training needs to be clearly advertised to encourage help-seeking and self-harm presentation. Thereby indicating an accepting and supportive clinical environment which is receptive to LGBTQ+ unique needs. From a GP's viewpoint, such specialist training would also increase

the practitioner's confidence and knowledge when working with self-harming young people (Mughal et al., 2020).

Using the findings from the ESM study (Chapter 5); it appears that ESM could reliably aid the tracking, assessment and management of self-harm within in-situ real-time contexts. Therefore, it is possible that ESM could be used to inform clinical professionals about self-harm in real-time rather than using retrospective measures. One such implication would be that young people presenting to medical services could be tracked in an ethical manner and with consent, this would provide in-situ warnings if a suicidal individual was approaching or presenting in a dangerous environment. Similar methods have been adopted with substance and gambling abuse in recent years (Coral et al., 2020; Gustafson et al., 2014). In these situations, participants are sent a notification reminding them that they are in a difficult or triggering environment, such as a liquor shop or casino, and that they are capable of moving away from a triggering. As their movements are shared with their medical team, intervention is possible if needed. This could translate to those struggling with suicide intended self-harm, in the respect of being in areas where common methods or personally triggering environments are likely to be. The concern with this method of using ESM as an in-situ prevention is that intention is difficult to measure, with regard that someone may not wish to report that they are planning to act on their self-harm if they know that this will cause intervention by professionals.

Another example is that ESM could be incorporated into an interpersonal psychotherapy (IPT) intervention. Briefly, IPT is based around forming a relationship with an empathic therapist, who guides the patient to understand their emotions or behaviours, how and why these occur, and structure a treatment to reduce negative or harmful impact (Markowitz & Weismann, 2004). This typically takes place over a short period, such as 12 weeks, and is built of 3 stages. The initial stage of IPT is to identify problematic thoughts or behaviours, and what leads to these (Markowitz & Weismann, 2004). Following

this, the second stage focuses on the therapist and patient working together to formulate a treatment plan and trial this (Markowitz & Weismann, 2004). The final stage indicates the end of treatment and aims to ensure that the patient can continue their progression with reduced support from the therapist (Markowitz & Weismann, 2004). This has been shown to be effective across MHD and self-harm (Bellino et al., 2014; Cox & Hetrick, 2017; Cuijpers et al., 2016; Tang et al., 2009). Including the element of ESM would allow for in-depth temporal understanding of mood and events which lead to self-harm in the initial stage of IPT, from which the therapist and young person could work together to tailor an individualised treatment plan in stage 2. During this stage the ESM element would continue to collect data regarding mood and events surrounding self-harm. This would be a real-time indicator of whether the intervention was reducing self-harm. Throughout stage 2, the therapist and young person could review and reflect on the ESM data to pinpoint what benefited the individual and what was not effective. Towards the end of the intervention, the young person would have an effective treatment plan which they were confident to continue with reduced levels of support

Specifically, among young people who self-harm, dialectical behaviour therapy (DBT) may benefit from inclusion of ESM. Among young people, DBT is thought to be one of the more effective treatments for self-harm (Ougrin et al., 2015; Witt et al., 2021). In summary, DBT is a talking therapy which aims to help one understand and accept their emotions, learn how to manage these feelings and teach strategies to make positive changes. DBT is usually build of four treatment modes; individual therapy, skills training, crisis consultation with the therapist and therapist consultation meetings (Rizvi et al., 2013). ESM could be used between the patient and therapist for the first three of these types of treatments. Firstly, a common feature of DBT individual therapy is for therapists to initially request a daily diary of behaviours and thoughts to explore patterns or triggers for self-harm, which could be collected through ESM. Following this, ESM could be used to establish the fluctuations in behaviour, mood, and self-harm across

the course of therapy. From this data, the therapist would have a greater understanding of personal triggers and how the young person responses to certain environments. Secondly, ESM could be used to deliver skills training. This would provide in-situ support to develop greater skills development (Fulford et al., 2020), within DBT this relates to emotional regulation, mindfulness, distress tolerance and interpersonal effectiveness skills (Herbet & Forman, 2011), which could then be evaluated through ESM responses. Recently Webb and colleagues (2021) assessed whether ESM could be used to predict patient-specific skills outcomes. Following behaviour therapy and DBT skills training, participants received four ESM surveys a day for two weeks, measuring skill usage and emotional response (Webb et al., 2021). This found that greater use of DBT was associated with positive affect, among adults who struggled with self-harm. Through this, it is clear that a DBT therapist would be able to track how a young person engages with the skills therapy and whether this is having any impact to their mood. Finally, ESM would be able to provide information as to whether the young person was likely to require a crisis consultation based on self-harm and mood tracking.

Throughout clinical settings, there are several clear ways that ESM could be used to better enhance presentation and interventions for young people struggling with self-harm. Through this engagement, there is potential to reduce self-harm, and opportunities for clinical professionals to intervene within difficulty settings.

6.6.2. Education implications

Given the age range of participants included in this thesis, it is unsurprising that many young people were in some form of education (school, college, or university). Bullying and discrimination is common among school-aged adolescents (Swearer et al., 2010) and recognised as a risk factor for LGBTQ+ young people (Chapter 3; Williams et al., 2021a). Due to this, interventions to tackle discrimination would be a practical way to reduce LGBTQ+ related bullying and aid acceptance within

this age range. For LGBTQ+ young people, this may also reduce their likelihood of experiencing self-harm. As highlighted by participants, peer bullying and abuse was a perceived cause of self-harm, with specific school settings such as changing rooms and classrooms being mentioned (Chapter 4; Williams et al., 2021b).

Addressing bullying and discrimination in schools has been linked to preventing mental health difficulties in this population (Reisner et al., 2020). Practical strategies include building trust between staff members and the young people, by having time to discuss issues the young person is facing and demonstrating that the school would respond constructively (Reisner et al., 2020). For adolescents and young people, being taught about different sexualities, gender identities, and relationships has been recognised as a way to promote acceptance (Gower et al., 2018). This would reduce the levels of bullying which LGBTQ+ young people face within education settings.

Furthermore, victimisation and bullying have been established as risk factors for self-harm, alongside educational difficulties (Hawton et al, 2012; Rodway et al., 2016). It is possible that these risk factors interrelate, as being bullied at school is likely to make attendance unpleasant or distressing. This could explain why participants felt that academic pressures were crucial to them, and fear of poor performance was associated with their self-harm (Chapter 4; Williams et al., 2021b). By supporting anti-discrimination within education settings, it is possible LGBTQ+ related bullying may be reduced and encourage a safer, healthier environment for these young people.

In education settings, teaching young people about LGBTQ+ history and culture has been suggested to aid acceptance within student populations (Wagaman et al., 2018). This can be used to provide a space in which young people can discuss their thoughts and self-expressions. By this, young people would be able to challenge their own conflicts around identities and recognise external

acceptance of LGBTQ+ identities. This may then allow them to more readily accept their sexual orientation and/or gender identity, reducing the impact of identity confusion or internalised hatred. It would also aid peer acceptance of LGBTQ+ identities. In higher education, this may also be beneficial. An ongoing output of this thesis is to aid Allyship training at the University of Birmingham. It is thought that by discussing how self-harm is relevant to self- and social acceptance, that a better understanding can be achieved within student and staff populations. This is a clear implication of how this thesis could be used in higher education.

6.6.3. Supporting self-discovery and acceptance within the family

Supporting self-discovery and acceptance is complex. It requires spaces for the young person to determine their own thoughts about identity. These internal evaluations are helped or hindered by those around the young person, particularly during adolescence when others' opinions are highly important to self-esteem (Brechwal & Prinstein, 2011; Robinson et al., 2013; Russell & Fish, 2016). However, good self-esteem and resilience are recognised as protective factors for wellbeing among LGBTQ+ populations (Hendricks & Testa, 2012; Kosciw, Palmer, & Kull, 2015; Testa et al., 2015). Therefore, these are promising concepts to support the reduction of self-harm.

The first step to aiding self-discovery and acceptance is to tackle limited awareness of LGBTQ+ identities in early adolescence (Fish, 2020). This would have prevented several participants in this thesis from initially engaging with self-harm. So, to prevent future self-harm, this is a clear starting point. Among LGB emerging adults (20-25 years) in the U.S., Parmenter et al., (2020) found that identity conflict was related to lack of resources. Through LGBTQ+ related resources, these emerging adults felt that they could manage and facilitate their identity coherently, allowing for acceptance and affirmation (Parmenter et al., 2020). This thesis extends the understanding of resources offered by Parmenter et al., (2020). Here, resources highlight the importance of terminology and that these are necessary at younger

ages than 20-25 years. Therefore, a practical implication of this thesis would be to offer resources of LGBTQ+ terminology and identities. These resources could encourage open discussions with family members to explore potential sexual orientations or gender identities during childhood. This would negate distressing identity conflict seen in early adolescents (Cass, 1984) and prevent self-harm.

Furthering this, family acceptance is crucial for LGBTQ+ young people to feel confident with their identity (McDermott et al., 2021; Snapp et al., 2015). In this thesis, families were often discussed as being unsupportive or unaccepting (Chapter 4; Williams et al., 2021b) or actively discriminating against the LGBTQ+ young person (Chapter 5). This can influence how the participant sees themselves and lead to self-harm. It is, therefore, necessary that families approach LGBTQ+ disclosure with acceptance and reassurance, as this has been associated with good mental health (McDermott et al., 2021).

To do this, resources educating family members on different LGBTQ+ identities and how to approach these topics would be beneficial. The most efficient way to do this would be digitally, such that educational resources are easily accessible and can be used at any point. The clearest avenue for a parent is likely to be a resource which is associated with the school or college their child attends, or through primary care services (GP website). Ideally, additional support (e.g., bookable workshops) would be available through the education or health service. In these, families would be able to discuss what changes their child is going through and how to best support their LGBTQ+ identity. This would ensure a two-pronged approach, such that young people are being educated themselves and adults have similar resources which they can access in their own time. Considering the point that self-acceptance is an ongoing journey, it is also important that families continue to respect the young person's LGBTQ+ identity and be aware that their identity may adapt in the future. Support for these changes would be presented within digital resources and bookable workshops.

In their study, Parmenter et al., (2020) discussed how family religion can lead to identity conflict, such that the young person feels their LGBTQ+ identity is wrong. In such cases, a broader approach may be necessary to ensure LGBTQ+ acceptance. This would be through building community relationships and working with religious groups to educate them in LGBTQ+ history, culture, and health. Care is needed in such interactions as to not alienate or invalidate religious beliefs, while also ensuring that communities are aware of stigmatised beliefs and how these impact LGBTQ+ young people. From this, it appears that supporting a young person's self-discovery and acceptance should be addressed in three phases. By educating the young person themselves, by guiding families to understanding and accepting LGBTQ+ identities, and finally by having community acceptance.

6.7. FUTURE DIRECTIONS FOR RESEARCH

Within this section, future directions for research are outlined. The work of this thesis answers key gaps within the literature, but also points towards new areas to explore. This section is broken into three categories: i) engaging participants more diversely; ii) designing future experience sampling studies; and branching research lines of inquiry. While ideas for future research are presented, however, potential studies should involve an advisory group of lived experience, like the one consulted for this thesis. This would ensure the relevance of future research.

6.7.1 Engaging participants more diversely

An ongoing limitation of this work is that participants were predominantly cisgender female and white. This is clearly a group that can struggle with self-harm, however, the over-representation within study samples is possibly related to recruitment strategy. For example, MQ Participate was used for both interview and ESM studies. Most participants from these studies were in contact through this service. Therefore, these samples may have greater awareness of mental health research or services than others.

To sample a less homogenous group of participants, strategies need to be in place to ensure diverse communities are recruited and engaged. To capture a wider remit of gender, considering the education-based research may be useful, which would ensure that genders were approached equally. A more specific strategy is youth participatory action research (YPAR). This involves constructing new knowledge by implementing a youth-adult partnership (Cammarota & Fine, 2010). Using this method, the researcher puts themselves into the young person's spaces (Cammarota & Fine, 2010), such as a school or youth club rather than asking young people to come to an office space. This is used to reduce power-dynamic imbalances. The environmental change is to emphasise that the young person's perspectives and values are crucial and that as the researcher these are respected during the research process (Cammarota & Fine, 2010). Through YPAR young people are also able to develop their own abilities, such as leadership, career skills or social skills (Anyon et al., 2018). Therefore, YPAR provides a reciprocal experience for both the researcher and young person. By following this methodology, it would be necessary to enhance community relationships specifically with ethnic minorities and ensure diversity in public engagement. This is particularly important with LGBTQ+ ethnic minorities, as they are frequently underrepresented in research (Kneale et al., 2019). This underrepresentation can mean that risks or experiences which are unique to these young people are missed.

A challenge when recruiting TGD participants was that the research team were all cisgender. To enter TGD spaces online, often moderators asked whether the research was conducted by someone who was gender diverse. For my thesis work, this was not the case, however, there was representation within the advisory group. In some cases, communities either refused to engage due to lack of representation in a paid position or were less forthcoming in their aid. In future, it would be wise to promote TGD researchers, ensure equal opportunities within academic spaces and offer paid positions for marginalised groups in research. It has been acknowledged that some work environments have barriers for TGD

people (Leland & Stockwell, 2019). Examples of this include prejudice from hiring committees, discrimination among colleagues, but also delayed education due to transition which may leave a TGD person feeling less able to apply for a position. From a purely research-based perspective, offering a TGD-affirming environment would aid access to communities which were more difficult to reach. But from a TGD-focused perspective, this would be demonstrating that their insights, wisdom, and experience is recognised and valued in these spaces.

6.7.2. Designing future experience sampling studies

A prime extension of this research would be to design a fully powered ESM study. A key finding of this thesis was determining if ESM works within LGBTQ+ young people who experience self-harm. This thesis provides an acceptable study design which could be utilised. A fully sampled study would be able to demonstrate whether minority stressors, perception of LGBTQ+ identity, mood, and social contexts influenced self-harm. This would offer understanding of temporal dynamics between these variables.

Extending the ESM study could also mean that theoretical variables are examined in real-ti9me (Kleiman et al., 2019). For example, testing the constructs of the IMV (O'Connor, 2011; O'Connor & Kirtley, 2018). Here, models would be able to assess the relationship between triggering events and known risk factors with self-harm. These would be specific to LGBTQ+ young people as discussed within this thesis. The impact of threat to self (e.g. rumination, coping) and motivational moderators (e.g. thwarted belongingness, perceived burdensomeness) could be modelled to determine the influence of these between self-harm ideation and behaviour. Through this, associations provided by this thesis could be tested in combination with theoretical underpinnings of self-harm. Consideration would need to be given to avoid further participant burden by additional ESM items asked (Eisele et al., 2020). Potentially, this would mean a shorter testing period but with more sampling points (Eisele et al., 2020).

Alternatively, ESM could be used in conjunction with the CaTS card sort task (Townsend et al., 2016) as a mixed-method study. This method allows for temporal consideration of patterns leading to self-harm, using thoughts, feelings, experiences, moods, behaviours, and help-seeking around an event of self-harm (Townsend et al., 2016). In this proposed mixed-method study, ESM could show how prospective variables fluctuated and potentially have an influence on self-harm, while CaTS would offer insight as to what the LGBTQ+ young person felt had impacted their self-harm. These could be compared and discussed with the participant within a semi-structured interview. From this type of study, a broader understanding of pathways to self-harm may be understood with LBGTQ+ young people. This would allow for tailored interventions to be designed.

6.7.2.1. Can ESM be used to reduce self-harmful thoughts and behaviours?

Following on from this, once ESM has been used to statistically test variables in real-time with self-harm, ESM could be used to assess and manage self-harm. Particularly whether ESM could reduce self-harmful thoughts and behaviours within LGBTQ+ young people; this could be done in conjunction with the practical implications previously discussed. From this thesis, the ESM study demonstrated that most of the participants used the ESM to track their own moods and self-harm (Chapter 5). For some, this provided an additional level of accountability which they felt reduced their self-harm behaviour.

A basic extension would be to run the ESM study but include an additional question each day. This question would examine how the participant appropriates the ESM, thereby, providing information as to whether the ESM has additional uses for that individual beyond data collection, e.g., self-reflection and accountability. Participants would be asked whether they wish to keep using ESM (without data collection, safeguarding procedures, or any involvement of the research team) to continue to track their own mood and self-harm following the end of the study. Essentially ESM would be a personal tracking mechanism. This would provide a baseline of participants who felt the ESM had additional uses for them.

Following this, participants would be invited to co-design an ESM intervention, discussing what specific aspects of the design they would adjust further to reduce their self-harm.

The first step of extending the ESM study is to determine whether LGBTQ+ young people are temporally impacted by the suggested variables which relate to their self-harm. From this thesis, it appears that the sample selected to monitor themselves and their own thoughts and behaviours. Therefore, it is possible that ESM could be used as a promising in-situ intervention. By adding additional features designed for this purpose, ESM could help to reduce or prevent further self-harm.

6.7.3. Branching research questions from this thesis

While research aims to address unanswered questions, often it leads to more areas of interest or topics being asked. In this section, some additional questions are presented which could build from the findings of this thesis.

6.7.3.1. Understanding concealment: stigma or confrontation avoidance?

When discussing the reaction to identity formation, the concept of "masking" is presented (hiding of sexual orientation or gender identity) to follow social norms. Meyer (1995; 2003; Meyer et al., 2015) offers concealment as a proximal process. Suggesting that concealment of identity is an internal stressor. However, in self-harm research, concealment is used as a strategy to avoid stigma or disapproval for a wound (Chandler, 2018).

Further research could consider how concealment by LGBTQ+ young people who self-harm is used. This maybe like "masking", which is used when one feels less cohesion with their identity and therefore wishes to hide this aspect of themselves. Therefore, concealment may be related to self-stigma. However, some LGBTQ+ young people may hide their identity or self-harm to avoid confrontation from those who may be discriminatory. This would present concealment as a mechanism

of confrontation avoidance. A secondary question of concealment would be to explore whether this relates to shame. This could be an interesting branching question from this thesis.

6.7.3.2. Early adolescent identity development: how does this relate to self-harm?

The findings of this thesis demonstrate that identity has a connection with self-harm. When most participants were recruited, they were able to reflect on at least part of their identity journey and how this may be related to their self-harm. However, identity development starts at earlier ages than 16-years. It has also been clearly shown that LGB adolescents are 4 times more likely to self-harm than heterosexual peers before the age of 16-years (Irish et al., 2019). Thus, an opportunity to learn more about self-harm and its relationship with identity would be to specifically ask those who are currently learning about their sexual orientation and gender identity, for the first time. This would aid understanding of self-harm for LGBTQ+ adolescents. Given the lower age bracket however, such a study could be complex when approaching ethics. For example, considering parental consent or the need for more stringent safeguarding measures.

6.7.3.3. What do friends and families believe led to an LGBTQ+ young person's self-harm? How do these individuals place themselves within the narrative of an LGBTQ+ young person's self-harm?

The thesis findings place importance on those close to the LGBTQ+ young person. Namely that negative responses can cause them to engage with self-harm (Chapters 4-5; Williams et al., 2021b). These are the perspectives of the LGBTQ+ young people. However, extending the research lens outwards; how is LGBTQ+ self-harm perceived by those closest to them? What do friends and family members perceive to cause the LGBTQ+ young person's self-harm? Do these people fit themselves into the narrative of the LGBTQ+ young person's self-harm?

By asking these questions, a broader understanding of self-harm among LGBTQ+ young people from an outsider perspective would be achieved. These results could then be compared to the young person's perceived causes. This may highlight how to target a deeper understanding of self-harm between groups and therefore forge strategies to aid self-harm prevention. It would also present how the LGBTQ+ young person's self-harm could impact others, thereby furthering the social understanding of self-harm with this specific group.

6.8. REFLECTIONS: STRENGTHS, LIMITATIONS, AND CONSIDERATIONS OF RESEARCH PRACTICE

While completing the research for this thesis, I have considered the strengths and limitations of my research practice. Within this section, I reflect on these practices alongside some additional considerations. Through this reflectivity, I aim to demonstrate my growth as a researcher and highlight areas where this research could be enhanced.

6.8.1. Methodology

6.8.1.1. Mixed-method research

This thesis followed an exploratory, sequential, mixed-method design. By approaching the overall aim of the thesis through a mixed-method design, this enabled appropriate research questions to be linked to methodologies which were best placed to fully investigate the issue (Creswall, 2014). The benefit of using an exploratory, sequential design ensured that findings were reviewed following quantitative and qualitative studies. These findings were embedded into the final study, which firstly demonstrated that ESM was feasible and acceptable with this population. Descriptive data suggested that there is potential to examine whether these various experiences are temporally associated with self-

harm among LGBTQ+ young people. Therefore, this methodology was appropriate to gain a clearer understanding of self-harm within LGBTQ+ young people.

However, to extend this thesis, one consideration would be to add an additional cross-sectional quantitative element prior to the ESM study. This would assess the relationship between LGBTQ+ identity and self-harm, within a large sample. By using a cross-sectional survey, it would be possible to pinpoint LGBTQ+ identity at different ages and their perceptions, furthering the understanding of one's journey with their LGBTQ+ identity. This would offer a more precise understanding of the dynamic between identity, self-harm, and age. This would then be incorporated into the ESM study.

6.8.1.2. Retrospective and prospective assessments

This thesis consists of a review which was primarily made of retrospective assessments, an interview considering experiences of self-harm, and a prospective study. There are several issues with retrospective accounts. Recall bias can be caused by participants struggling to remember experiences, their current mood, or their interpretation of memories (Hassan, 2005). However, retrospective assessments can be very useful. For example, within the interview study, participants discussed long periods of time, often from childhood to their current age. This covered their discovery of their LGTBQ+ identity and journey with this identity, as well as the formation of self-harmful thoughts and behaviours. This allowed participants to give various perspectives and opinions about their self-harm and potentially linking factors. Furthermore, accounts are less likely to be emotionally driven or draining on the participant.

By including prospective assessments, I aimed to challenge the understanding of what risk factors or experiences were associated with self-harm. Prospective assessments would be able to distinguish whether a given experience was influential at that moment to a participant's self-harm. Given

the sample size, at this point I can only determine that these are potentially influential and there may be a temporal relationship to explore. This would indicate that retrospective accounts can have utility to accurately convey important prospective variables to self-harm. Combining these assessments between studies strengthens the understanding of self-harm among this population.

6.8.1.3. Recruitment & sample sizes

Early career researchers (ECRs) have previously indicated that recruiting for self-harm studies is difficult, particularly when the study needs a specific population who self-harm (Wadman et al., 2019). One aspect of this is that often these studies discuss stigmatised (self-harm) or delicate topics which young people may not want to publicly share. This means that recruitment strategies where potential participants are directly recruited are not suitable. Therefore, other methods need to be employed.

Throughout this thesis, I used a range of recruitment strategies. Primarily, I used traditional methods, such as putting up posters around the university or in LGBTQ+ positive environments and posting online advertisements, mainly through Twitter and MQ Participate. Most participants came from these sources for the two latter studies (Chapters 4-5).

For each study, I also included a staged, targeted approach. Lists of self-harm or LGBTQ+ related organisations were created (Battle Scars, TransActual UK, LGBT Youth Scotland), which I approached at different time points. This was to ensure that studies were not overwhelmed with participants from various organisations all at once. A standardised email was sent to organisations I had no professional contact with. This email introduced me as a researcher, my background, the aim of the study and asked the organisation if they would like to be involved to contact me at my email address. For those organisations where I did have professional communications, I contacted them asking if they'd like to be involved in my latest study and offered an overview of the project. All organisations were encouraged to

have a discussion before making any choices and were asked if I could offer anything in return for their help. Few organisations were able to help, and only a small number of participants came from these sources. All these strategies meant that interested individuals had to contact me to obtain more details regarding a study.

Participant sample sizes were appropriate for the interview (reaching saturation) and ESM. A key aspect of the ESM feasibility study was the recruitment rate. However, overall sample sizes were relatively small. Several limitations were highlighted: i) lack of TGD representation within research team, ii) participants needing to seek out more information actively, and iii) timeframe of the ESM software licence. I have previously discussed how TGD representation would enhance study engagement (Chapter 6; section 6.7.1.). While the recruitment window for the ESM study is an influential factor, which could not be helped, a few additional months would have aided better recruitment. This would have added greater value to the overall study.

To counteract the limitation of participants seeking research, and enhance the recruitment strategy employed, I suggest a better structured advertising approach may be necessary. Firstly, ECRs have highlighted the use of pre-established connections with societies and charities when recruiting (Wadman et al., 2019). Therefore, before starting recruitment, establishing strong, reciprocal relationships with societies and charities within the UK would be useful. This would set the premise that the organisations would receive investment back for their help. Examples of this would be volunteering with an LGBTQ+ youth group. Secondly, establishing recruitment approaches with the aid of the LGBTQ+ Advisory Group's connections with external organisations and social platforms. This would promote the involvement of the LGBTQ+ Advisory Group, potentially enabling them to feel more ownership of the studies, as well as further recruitment. Finally, I was successful in my use of online strategies and therefore would continue this use.

6.8.2. Ethical considerations

Previous work has indicated that engaging with self-harm research does not increase risk or induce harm (Biddle et al., 2013; Dazzi et al., 2014; Polihornis et al., 2020). One meta-analysis has demonstrated that there can be small benefits to taking part in such research, such as a reduction in self-harm with suicide intentions (Blades et al., 2018). However, self-harm is an emotive topic which is highly likely to be related to distress, therefore it is key to recognise the importance of ethical considerations.

6.8.2.1. Participant safety

As part of this thesis, a primary focus was participant safety. This had several steps to ensure that participants were not adversely impacted by the research and were fully aware of their rights as participants. As standard practice, participants were sent study-specific information sheets (Appendices J-K). These acted as accessible reminders that participants could withdraw from the study at any point, that their engagement was voluntary, and that withdrawing would not negatively impact them in any way. These also explained the aim and outcome of the study. All this information was also explained during emails preceding participant consent. By doing this, I aimed for participants to feel in control by knowing their rights, and safe in the knowledge of how their data would be used. Debriefs, which were received on completion or withdrawal of each study, reminded participants of these rights (Appendices N-O), as well as signposted additional supports, such as helplines or use of primary care services. These were recommended if the participant had felt distressed by anything discussed within the study in which they took part.

Additional steps were taken which were unique to each study, while each strategy offered its own strength for participant safety. Further considerations are discussed as to how to optimise these in the future. Within the interview study (Chapter 4; Williams et al., 2021b), participant mood was measured before and after participation using a visual scale. This was to examine whether the interview

process had an impact, positively or negatively, on the participant. Such assessment has been successfully used in prior research (Townsend et al., 2016). For this study, this was useful to determine that the interview made very little difference to participants' wellbeing, with only a very slight increase in mood. This is a positive result in the fact that discussing their experiences of self-harm did not distress them. However, if the interview had negatively impacted the participant, I was prepared to discuss this with them. This measurement of mood could have an additional use, however. By rating mood before and after assessment, researchers would be able to gauge whether an objectionable number of participants were negatively affected (Townsend et al., 2020). If this was the case, the researcher would be able to cease the study due to participant impact. While this could seem like a self-sabotaging procedure, it is the responsibility of the researcher to ensure participant safety.

Before taking part in the interview (Chapter 4; Williams et al., 2021b), participants completed a safety planning activity (Appendix P). This was based on the template presented by Stanley and Brown (2012). This was to encourage participants to recognise particular triggers which might precede self-harm, as well as strategies and supports to deter self-harm. Reductions in self-harm behaviour with suicidal intentions has been evidenced to reduce when safety plans were in place (Nuij et al., 2021). This pattern does not hold for suicidal thoughts however (Nuij et al., 2021). It is plausible that this could be related to successful engagement with a safety plan. Potentially, participants may not use a safety plan as effectively for self-harmful thoughts as it is difficult to determine when a thought starts or ends. Therefore, it could be useful to encourage safety plan engagement through a follow-up email. This could be several days after the interview or study procedure has taken place. The email would contain the individualised safety plan and recommend the participant refer to it if they felt distressed, had low mood, or were upset. By facilitating engagement prior to a trigger this could aid the safety plan use for self-harm thoughts.

As part of the ESM study (Chapter 5), participant data was checked once a day following the safeguarding process used by Glenn et al., (2020). This was to determine whether a participant had engaged with self-harm, and if so, was this associated with severe suicidal thoughts. If this was the case, I would contact the participant for a wellbeing check and risk assessment. Only one participant triggered this procedure. However, during the wellbeing check they felt that they were not in imminent risk (they were not planning on self-harming with suicidal intent, had no plans to self-harm or end their life, and did not have a timeline for such actions). The safety plan activity (Stanley & Brown, 2012) discussed above was used with the participant. Had they been at imminent risk, I would have needed to call emergency services. This was known to the participant.

Reviewing this strategy, I wonder whether participants could (or would) underreport their level of risk to avoid emergency services. Owens et al., (2016) discussed the fears of young people presenting with self-harm at A&E. The authors stated that their analysis of online forum data indicated that young people felt shame when they were forced into emergency care (Owens et al., 2016). Despite this, there are limited options when dealing with young people in crisis. This strategy was also approved by the LGBTQ+ Advisory Group. A potential consideration could be asking individuals what their preferred emergency strategy would be. This would have emergency services as the default option, if participants did not specify a preference. By offering participants this option, it may enable them to feel in control of their safeguarding procedures and result in participants truthfully complying with the strategy used in the event of crisis.

For both the interview and ESM studies (Chapters 4-5), I required GP information to include the participant in the study. In the event of imminent risk, I would contact the participant's GP to inform them of the situation. This strategy has benefits, such as the GP being aware that their patient is struggling with self-harm and is at risk, therefore can make an informed decision about their health care.

However, the strategy does pose some limitations. Primarily that the onus is on the GP to react or find time to see a distressed young person. As researchers, we are not aware of GP's work schedules, time limitations, or their relationship with patients. This could have meant that some participants would not have received the aid they needed at a crisis point. After reflecting on the interview study, this safeguarding procedure was enhanced to include a letter to the participants' GP practices prior to starting the ESM study. This explained that the participant in question was taking part in a mental health study (Appendix BA). The letter stated that although we did not expect the participant to become distressed, I would be in contact in the event of risk. By prewarning GPs that they may receive a call about a distressed young person who is registered with them, this at least offers some time to prepare themselves. Luckily, no participants needed these safeguarding measures within either study.

However, not all participants were comfortable in sharing their GP information initially within the interview study. Those who refused were unable to take part in the study. Whereas in the ESM study, one participant provided falsified GP information (this was checked by inputting the postcode into Google Maps and checking the address related to the phone number provided). Due to this, the participant was asked to provide real GP contact information, or they would not be able to take part in the study. This resulted in their exclusion from the study. As a researcher, it is difficult to know that potential participants are uncomfortable with a procedure. But such safeguarding is paramount to keeping young people who may be at risk safe. An alternative or additional procedure could be to have the contact information of a trusted person (≥18 years). This individual would be aware of the young person's engagement with the study and that they would be notified if the young person was distressed. As young people often seek help from their friends or those close to them (Rowe et al., 2014), this may be a preferable strategy for some participants. If this was used as an additional safeguarding procedure, potentially this trusted person could be the "first contact" in the event of distress. If necessary, GP

services could be engaged if the participant was highly distressed and in imminent risk. This would not leave the trusted person as the only source of support, particularly in the event of crisis.

6.8.2.2. Researcher wellbeing

When reflecting on ethical procedures, I am in the distinct position of having lived experience of self-harm, as well as being a researcher. This allows me to consider research practices through two lenses. Some aspects can be beneficial, such as sharing an identity with participants. This could encourage participants to feel more comfortable or that I recognise their concerns in relation to safeguarding procedures. However, I recognise that having a shared experience may have been more impactful on my wellbeing than someone who has not had similar experiences of self-harm.

Specific strategies to bolster researcher welfare is often overlooked in emotive research (Orr et al., 2021). While I was well placed to access clinical supervision from one of my supervisors, this can be a difficult space to discuss the impact of a study or participant given the working relationship. This is not a limitation of the research team, but a consideration for future research. It may be useful for ECRs to have access to clinical supervision outside the research team. This would offer a place to discuss potentially distressing experiences, or vent about an aspect of a study, without concerns that this may change the view of a respected supervisor or impacting the project. With this reflection, it would be necessary to budget clinical supervision for research on sensitive topics.

A cheaper and potentially less formal strategy would be to debrief with other PhD students or ECRs working in similar fields. This could also be used to encourage a sense of community with those dealing with similar strategies, as well as sharing key skills. For example, how a more experienced researcher may have handled a similar safeguarding strategy of a young person who is distressed. This strategy could be structured as a mentoring programme.

6.8.3. Public involvement

Public involvement has various names within research (Hayes et al., 2012). However, it has been recognised that working with members of the public or members from a target population has many benefits (Ghisoni et al., 2017; Tarpety & Bite, 2014). Primarily, that working with these people can aid and prioritise research to increase the relevance of studies, promote the impact of research, and can enhance participant engagement (Gomez & Ryan, 2016; Hayes et al., 2012). This results in meaningful research of better quality.

Throughout this PhD, the LGBTQ+ Advisory Group has been involved to codesign two studies and review various elements of the thesis. They have practically completed tasks such as reviewing study materials, offering insights to study designs, and their thoughts about safeguarding policies. But also, they have aided the thesis by their mere presence, for example, helping the project be promoted on moderated, transgender social media groups, as well as being a sounding board to discuss the appropriate timings of studies during a global pandemic. Their inputs have been invaluable and a key strength for this thesis.

Similarly, to the early career researchers sampled within Wadman et al., (2019) mixed-method study, I was not able to obtain funding for most of the public involvement work. This is a challenge faced by many who wish to engage with public involvement. Nonetheless, it is important to demonstrate that the involvement of advisory group members is valued and therefore should be paid. Future research should incorporate an involvement fund, from which an advisory group could be paid for their time and input. This is also likely to encourage engagement from members of the public.

A limitation of the involvement within this work is that advisory group members preferred asynchronistic communication. Given the target population, some advisory group members wished to remain anonymous. They all selected individual communication when offered group or individualised

contact. This meant, for the most part, I approached each member individually, discussed the studies and their opinions with them, then drew together key points. Wadman et al., (2019) presents lack of time as a challenge to conducting public involvement. This was notable on short-term contracts or PhD projects, which are often time limited. However, I argue that this activity is not time wasted. Although I do acknowledge that the strategy used in this thesis could be optimised. For future work, I would promote meeting with an advisory group in-person or through synchronistic online meetings, through platforms such as GatherTown (https://www.gather.town/). GatherTown as a platform allows for anonymous participation, if the members are known and invited by the moderator (the researcher). Therefore, limiting personal exposure of group members. This would facilitate conversation between advisory group members, much like a focus group, but without sharing personal details. Hopefully this would promote idea discussions and invoke in-depth commentary.

6.8.4. The impact of COVID-19

In March 2020, COVID-19 emerged as a global pandemic. This had a clear impact on the progression of my research, but also on young people themselves. One strategy to combat the spread of COVID-19, was to close education environments (e.g., schools, colleges, universities) and suspend face-to-face teaching (Crawley et al., 2020). Given these drastic changes occurred during important exam periods, alongside the increase of social isolation due to closures, it is not surprising that young people were suggested to be vulnerable to the psychosocial aspects of the pandemic (Crawley et al., 2020). Young Minds (2020) demonstrated that 81% of young people felt their mental health had worsened due to the COVID-19 pandemic. This was related to loneliness, social isolation, loss of motivation or purpose, general anxiety, and a loss of coping mechanisms (Young Minds, 2020). A rapid review indicated that loneliness was associated with greater levels of depression and anxiety among young people during the pandemic (Loades et al., 2020).

However, LGBTQ+ young people were quickly recognised to be a particularly vulnerable group among young people (Fish et al., 2020; Salerno et al., 2020). From the evidence of this thesis, pre-pandemic, mental health was recognised as a key issue. Since the start of the pandemic, studies have demonstrated that LGBTQ+ young people have reported high rates of depression and stress (Kneale & Becares, 2020). Therefore, the pandemic is likely to have exacerbated an ongoing issue for those who struggle with self-harm.

Furthermore, due to the social distancing measures in place during the UK lockdowns, many LGBTQ+ young people were confined within their homes (Crawley et al., 2020). Again, my work demonstrates that stigma or discrimination is influential to self-harm within this population, particularly when it's directed from family members. Unfortunately, one in six LGBTQ+ young people stated they had experienced some form of discrimination since the start of the pandemic (Kneale & Becares, 2020). This had been associated with the young people's enhanced stress and depression (Kneale & Becares, 2020). Social distancing measures also meant that LGBTQ+ young people had less access to identity-based alliances and mental health services (Fish et al., 2020; Salerno et al., 2020). Such services can act as protective factors against poor mental health and self-harm (Fish et al., 2020; Salerno et al., 2020). Therefore, LGBTQ+ young people were left in difficult situations with limited supports during this pandemic.

During the U.K. national lockdowns, none of my studies were actively running recruitment. Two pre-booked interviews took place following the first lockdown in March 2020 (Chapter 4; Williams et al., 2021b). Participants were asked whether they still felt comfortable and able to take part in these interviews. Both agreed and were happy to engage with the study. While not the focus of the interviews, each participant mentioned COVID-19 and the national lockdown. These were discussed as strange experiences in a rapport building manner but not linked to self-harm. Given the recency of the UK

lockdowns at the point of these interviews, it is likely the full impact of the pandemic had not yet been felt by these young people. Therefore, I am relatively confident that COVID-19 had no impact on the qualitative outcomes from this study.

My final study (ESM; Chapter 5), was delayed due to concerns of LGBTQ+ young people's wellbeing given the experiences discussed above. The mEMA software was bought after the end of the first lockdown. However, given the unpredictable state of government policies regarding lockdowns and social distancing, I was unsure about proceeding with a relatively intensive study focusing on self-harm. A primary concern was to avoid causing further stress for these young people or promote rumination. Therefore, the study was revised and was discussed with the LGBTQ+ Advisory Group at length. The advisory group members promoted the study, suggesting it was relevant and meaningful, particularly given the pandemic. The study was submitted to ethical review towards the end of the third UK lockdown (March 2021). However, once ethics was granted, the mEMA software license was coming to an end. The company did agree to an additional three-month extension, for which I am very grateful. This meant my recruitment and data collection was significantly reduced (2.5 months).

While the ESM study took place after lockdown ended, it is unclear how long the impact of the COVID-19 pandemic and associated mandated restrictions will last. Given that young people have had great disruptions during their emerging adulthood, it is quite possible that responses to risk factors and experiences derived from the preceding studies may have varying impact to young people following COVID-19. For example, academic pressures were highlighted as an underlying process to self-harm pre-COVID-19. As schools, colleges and universities were closed during the UK lockdowns, it was demonstrated that young people were highly concerned about their education (Young Minds, 2020). Thus, this underlying process may be particularly relevant to the latter population. Furthermore, among LGBTQ+ young people specifically, the networks created between LGBTQ+ communities are highly

important to developing and accepting one's own identity (Meyer et al., 2015). Due to social distancing, young people may have missed some of this identity development, which could impact their self-perception. Therefore, when considering the rates of anxiety and depression within this study (Chapter 5), they may be higher than pre-pandemic rates, which I did not examine before the pandemic. Given the lack of social support (Fish et al., 2020), difficult home environments (Fish et al., 2020) and high levels of mental health difficulties (Fish et al., 2020; Salerno et al., 2020) it is likely that COVID-19 and related experiences have had impact on the findings of the ESM study. Further research is now needed to understand whether and how far reaching the impact of the COVID-19 pandemic has been to these issues.

For my PhD, I was in the fortunate position where much of my research takes place online. The COVID-19 pandemic highlights the need to be prepared to pivot toward digital methodology and procedures. This requires a level of preparation which was fundamentally not recognised prior to the pandemic. Moving forward, similar studies should now have clear offline and online strategies to managing the project, such as offering in-person and online interviews. A poignant lesson within my research career has been learning the timing of a study. During COVID-19, it was important to pause my research of the ESM study and flexibly redesign the study, as I needed to recognise the current burden facing young people during a pandemic, despite the timing for me being crucial as I entered the final year of my PhD. This has prepared me to ensure the protection of participants despite personal needs or research timelines and take into consideration national policies for public health.

6.9. CONCLUSIONS

Through a mixed-method design, this thesis has been an in-depth exploration of the processes underlying self-harm among LGBTQ+ young people. The findings have demonstrated that mental health difficulties and victimisation are high within this population, and more prevalent than within cisgender,

heterosexual peers (Chapter 3, Williams et al., 2021a). Interviews with LGBTQ+ young people presented internalised difficulties relating to their LGBTQ+ identity and interpersonal experiences, such as abuse, bullying, and difficulties with family members, which were associated with their development and maintenance of self-harm (Chapter 4, Williams t al., 2021b). By taking the results from these two studies, the thesis also provides an ESM template which is feasible and acceptable to conduct with this population and offer insights to how these experiences (mental health difficulties, social context, perceptions of LGBTQ+ identity and minority stressors) may be relevant for future studies. I emphasise that LGBTQ+ young people face many unique stressors relating to their age and sexual orientation or gender identity which can lead to self-harm.

This thesis extends the current field of LGBTQ+ self-harm literature by closing several gaps in our collective understanding. Mainly, which are the key self-harm risk factors facing this population and how prevalent are these; what do LGBTQ+ young people perceive to lead to their self-harm and whether it is feasible to conduct experience sampling with these young people. From the thesis findings, more needs to be done within society broadly to ensure LGBTQ+ young people feel that they belong and are accepted. This is particularly important within education and family contexts. Through these means, LGBTQ+ young people should feel more able to consolidate their sexual orientation and/or gender identity and be proud of all aspects that make them who they are. Through practical implications suggested within this chapter, self-harm could be reduced or prevented by diminishing the impact of processes which underlie these thoughts and behaviours.

From this thesis, we have a better understanding of what leads to self-harm within LGBTQ+ young people. With this information, future research can pinpoint how to prevent young people from developing these thoughts and behaviours. My next step is to determine how I can use these findings to inform digital interventions tailored for LGBTQ+ young people at-risk of self-harm.

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Appendices

Appendix A. Rationale for terminology

The cornerstones of this thesis focus on i) self-harm; ii) young people; and iii) LGBTQ+ populations. Therefore, I will briefly present rationale for the terms I use throughout the thesis.

A.1. Self-harm definition

Across suicide and self-harm research, there has been a lack of consensus regarding terminologies (De Leo et al., 2021). This has limited how research can be generalised, as interpretations between studies may be different and ill-reported. Recently, a large-scale international consensus survey has been conducted to determine definitions of suicide from a sample of experts (De Leo et al., 2021). These authors have offered recommended definitions of suicide (fatal act carried out by the individual), as well as across the dimensions of suicide outcome (De Leo et al., 2021). These agreed terms are useful for future research to hold a shared understanding of these outcomes across countries.

Self-harm is defined as an intentional act, which can include a desire to die (De Leo et al., 2021). This is aligned to the conceptualisation of self-harm by NICE (2011); "the self-injury or poisoning of self, irrespective of suicidal intention". Both definitions permit a wider depiction of self-harm. This allows a broad range of thoughts and behaviours to be captured through a dimensional approach, considering self-harmful thoughts and behaviours, with and without suicidal intention. For this thesis, I use the term "self-harm" throughout. "Suicide" is only use when an individual has died through their self-harmful behaviours, such as statistics of completed suicides per year within the UK. Notably, "suicide attempt" is also used to refer to an act where the individual self-harmed with the intention to die (De Leo et al., 2021). Within this thesis I use "suicide attempt" when previous authors present evidence which indicates there was suicidal intention present alongside self-harm, or when participants explicitly states that their self-harm was fuelling by their desire to die. Finally, I use "self-harmful thoughts" broadly across the

thesis, this is because it is unclear how one can determine whether a single thought may or may not carry intention. This is particularly important when considering retrospective accounts. However, if previous authors previous authors specifically state they captured evidence of suicidal ideation within their research, I do use this term.

A.2. Young people definition

Young people are defined here by the age range (16-25 years). This represents later teen years through to mid-twenties, a period which has been dubbed emerging adulthood by Arnett (2000). This term is useful as it covers several transitional periods and timing in one's lifetime (Arnett, 2007). For example, developing and exploring one's identity (Briggs, 2008), ending compulsory education, making decisions for the future, leaving home, and starting in the workplace or higher education. Therefore, during this period, young people are likely to encounter many stressors which may lead to self-harm.

A.3. LGBTQ+ definition

Within LGBTQ+ (lesbian, gay, bisexual, transgender, queer or questioning) communities, terminology has changed, developed, and diversified over time. In recent years, young people have expanded commonly used terminology. Moving from highly recognised sexual orientations, such as "lesbian" or "gay", to very specific or reclaimed terms, e.g., "pansexual" (someone who is attracted to multiple/all genders or to people regardless of gender) or "queer" (Easpaig & Fox, 2017). Previously, "queer" was an ambiguous slur when referring to someone's identity, however, "queer" is now considered to be a reclaimed term by the LGBTQ+ community and is more widely used (Barker & Scheele 2016; Holleb, 2019).

Language is also complex within transgender and gender diverse populations. Transgender broadly refers to individuals who self-identify with a gender other than the sex which was assigned to

them at birth (APA, 2015; Kaufman, 2008). Some argue that this distinction is still too binary (Fian & Han, 2019), and does not convey the magnitude of gender identity within the one term. Within a recent systematic review, the authors discuss terminology around those who identify as "non-binary" (Thorne et al., 2019a). This study highlights that "genderqueer" and "non-binary" are widely used among those who identify with gender outside of; "male" or "female", however there are many other terms used (Thorne et al., 2019a). It is important to understand that there are numerous identities and terms which refer to this group of sexual orientations and gender identities, and it is key for researchers to respect these (Bergman & Barker, 2017).

The umbrella term for sexual orientation and gender identity minorities is subject to variation, (e.g., LGBT, LGBTQIA, LGBTQIAP). This can create challenges within research, when comparing findings and ensuring that studies refer to the same population (Eliason, 2014). This thesis uses the abbreviation LGBTQ+ to stand for lesbian, gay, bisexual, transgender, queer or questioning, and any further identities which are captured among participants. When presenting evidence which is only related to sexual orientation participants, I will use the abbreviation "LGB". When specifically discussing gender identity minorities, I will use the abbreviation "TGD" which aims to broadly capture all those who identify as non-cisgender. However, I emphasise that sexual orientation and gender identity are not limited to those letters which are represented in the abbreviations. This research aimed to include all whose sexual or romantic orientation or gender identity were outside of heterosexual or cisgender.

Appendix B. Advert for LGBTQ+ Advisory Group

Appendix C. Study 1: Systematic review search strategy

Search strategy terms:

(self-harm OR self harm* OR self-injur* OR "self injur*" OR self-cut* OR self-destruct* OR "self destruct*" OR "nonsuicidal self-injur*" OR "non-suicidal self injur*" OR "deliberate self harm" OR "deliberate self-harm" OR DSH OR "self-mutil*" OR overdos* OR self-inflicted injur* OR "self inflicted injur*" OR suicid* OR "parasuicid*" OR para-suicid* OR parasuicid* OR suicidal behav* OR suicide* OR "life-threatening behavio*" OR "suicide ideat*" OR "suicide attempt*" OR "attempted suicide*" OR NSSI)

AND

(moderat* OR mediat* OR "risk facto*" OR mechan* OR predict* OR pathway OR interact* OR "protective facto*" OR facto* OR influence OR correlate* OR precurs* OR "causal facto*")

AND

(transgender* OR transsexual* OR "gender nonconforming" OR "gender identity disorder" OR "gender dysphoria" OR "gender minority" OR lesbian*OR gay* OR bisexual* OR "sexual minority" OR "same-sex" OR homosexual* OR "homosexuality, male" OR "homosexuality, female" OR "gender identity" OR non-heterosexual* OR "non heterosexual*"OR homosexuality OR queer* OR questioning OR "non-binary" OR "non binary" OR "LGBT*" OR "sexual dissident*" OR "sexual and gender minorities" OR "gender variant" OR gender-variant OR genderqueer OR intersex OR "minority groups" OR "TGNC" OR "transgender and gender nonconforming")

AND

(Child* OR adolesc* OR "young people" OR kid* OR pupils OR youth OR juvenile OR "young adult*" OR "young person" OR minor*)

Example of highly sensitive search strategy used in EMBASE

*Search terms (AND, OR, NOT) and truncation (wildcard characters like *)*	1. exp automutilation/ 2. exp suicide/ 3. exp suicide attempt/ 4. exp suicidal ideation/ 5. 1 or 2 or 3 or 4 6. exp risk factor/ 7. exp "sexual and gender minority"/ 8. exp homosexuality/ 9. exp bisexuality/ 10. exp transgender/ 11. exp LGBT people/ 12. exp gender identity/ 13. 7 or 8 or 9 or 10 or 11 or 12 14. exp adolescent/ 15. exp child/ 16. young people.mp. 17. exp young adult/ 18. exp juvenile/ 19. 14 or 15 or 16 or 17 or 18 20. 5 and 6 and 13 and 19

Appendix D. Study 1: NOS versions

NOS Case Control

Selection

1) Is the case definition adequate:
   a) Yes, with independent validation. *
   b) Yes, e.g. self-reports.
   c) No description.

2) Representativeness of the cases:
   a) Consecutive or obviously representative series of cases. *
   b) Potential for selection biases or not stated.

3) Selection of Controls:
   a) Community controls. *
   b) Hospital controls.
   c) No description.

4) Definition of Controls:
   a) No history of suicide/self-harm. *
   b) No description of source.

Comparability

1) Comparability of cases and controls on the basis of the design or analysis:
   a) Study controls for LGBTQ status. *
   b) Study controls for LGBTQ and self-harm/suicide. **

Exposure

1) Ascertainment of exposure:
   a) Secure record (e.g. surgical records). *
   b) Structured interview where blind to case/control status. *
   c) Self-report.
   d) No description.

2) Same method of ascertainment for cases and controls:
   a) Yes. *
   b) No.

3) Non-Response rate:
   a) Same rate for both groups. *
   b) Non respondents described.
   c) Rate different and no designation.

NOS Cohort

Selection

1) Representativeness of the exposed cohort:
   a) Truly representative of the average in target population (all subjects or random sampling). *
   b) Somewhat representative of the average in the target population (non-random sampling). *
   c) Selected group of users.
   d) No description.

2) Selection of the non-exposed cohort:
   a) Drawn from the same community as the exposed cohort. *
   b) Drawn from a different source.
   c) No description.

3) Ascertainment of exposure:
   a) Secure record (e.g. surgical records). *
   b) Structured interview. *
   c) Written self-report.
   d) No description.

4) Demonstration that outcome of interest was not present at start of study:
   a) Yes. *
   b) No.

Comparability

1) Comparability of cohorts on the basis of the design or analysis:
   a) Study controls for LGBTQ status. *
   b) Study controls for LGBTQ and self-harm/suicide. **

Outcome

1) Assessment of outcome:
   a) Independent blind assessment. *
   b) Record linkage. *
   c) Self-report.
   d) No description.

2) Was follow-up long enough for outcomes to occur:
   a) Yes e.g. 6 months. *
   b) No.

3) Adequacy of follow up of cohorts:
   a) Complete follow up - all subjects accounted for. *
   b) Subjects lost to follow up but rate given (description given). *
   c) Subjects lost to follow up (no description given).
   d) No description at all.

NOS Cross Sectional

1) Representativeness of the sample:
   a) Truly representative of the average in the target population. (all subjects or random sampling) *
   b) Somewhat representative of the average in the target population. (non-random sampling) *
   c) Selected group of users.
   d) No description of the sampling strategy.

2) Sample size:
   a) Justified and satisfactory. *
   b) Not justified.

3) Non-respondents:
   a) Comparability between respondents and non-respondents characteristics is established, and the response rate is satisfactory. *
   b) The response rate is unsatisfactory, or the comparability between respondents and non-respondents is unsatisfactory.
   c) No description of the response rate or the characteristics of the responders and the non-responders.

4) Ascertainment of the exposure:
   a) Validated measurement tool. **
   b) Non-validated measurement tool, but the tool is available or described. *
   c) No description of the measurement tool.

Comparability:

1) The subjects in different outcome groups are comparable, based on the study design or analysis. Confounding factors are controlled.
   a) study controls for LGBTQ status *
   b) study controls for LGBTQ and self-harm/suicide **

Outcome:

1) Assessment of the outcome:
   a) Independent blind assessment. **
   b) Record linkage. **
   c) Self report. *
   d) No description.

2) Statistical test:
   a) The statistical test used to analyze the data is clearly described and appropriate, and the measurement of the association is presented, including confidence intervals and the probability level (p value). *
   b) The statistical test is not appropriate, not described or incomplete.

Appendix E. Study 2: Interview schedule

Introduction

- Introduce self, pronouns: she/her
- Thank you for taking part in the interview, estimate it will take around an hour
- We will be recording this interview -> transcribed -> any names, places or other identifying information will be removed
- You are free to withdraw at any point during interview
- Can withdraw data 28 days after finishing the interview
- Interview will involve discussing sensitive topics such as self-harm/suicide, if you don't want to answer a question don't worry we can move on. If you're upset or if I'm concerned about you, we may stop the interview and discuss how you will be able to take care of yourself after the interview.
- If I'm seriously concerned about your wellbeing, I do need to let my supervisors know and contact your GP – however I will not do this without you knowing.
- Sometimes people worry about rambling – please don't worry. I'll direct you if you go wildly off topic but it's most productive to let you talk freely so I will be saying as little as possible!

Do you have any questions before we start?

Before we begin I'd just like to run through a quick safety planning exercise with you; if you could fill in this sheet (safeguarding activity) and then if you feel distressed at any point we can think about which strategies might be best to help you in this moment.

Participant ID:

Date:

Repoire/demographics

1. How shall I address you? What name, what pronoun?
2. What is your date of birth please?
3. What is your assigned gender?
4. How do you identify in relation to gender?
5. How do you identify in relation to sexual orientation?
6. Do you currently work or study?
7. What do you currently do for work/study?
8. What do you enjoy doing outside of work/study?
9. What's your current living situation? [e.g. with guardians, friends, partner]

1. Could you tell me a bit about your experiences of self-harm, suicidal thoughts or behaviours?
    a. [Prompt] *If participant unsure:*
        i. How old were you when these feelings/thoughts/behaviours started?
        ii. What sort of thing tends to be happening when you have these feelings/thoughts/behaviours?
    b. Could you describe what you tend to do?
    c. How often do you have these thoughts, feelings or experiences?

2. How has your self-harm, suicidal thoughts or behaviours changed over the years?

3. How do you think being [sexual orientation] has influence your self-harm, suicidal thoughts or behaviour?
    a. [Prompt] This could be both positive or negative.
    b. Who, if anyone, knows about your self-harm, suicidal thoughts or behaviours?
    c. Why did you feel able to share this with them?
       [Alt] Why do you not feel able to share this with people close to you?
    d. Do you feel like your self-harm, suicidal thoughts or behaviours have or would influence how they see you?

OR

How do you think being transgender has influence your self-harm, suicidal thoughts or behaviour?

    e. [Prompt] This could be both positive or negative.
    f. What impact has the process of transitioning had to these thoughts/behaviours?
    g. Who, if anyone, knows about your self-harm, suicidal thoughts or behaviours?
    h. Why did you feel able to share this with them?
       [Alt] Why do you not feel able to share this with people close to you?
    i. Do you feel like your self-harm, suicidal thoughts or behaviours have or would influence how they see you?

4. Have you ever sought self-harm, suicidal thoughts or behaviours?
    a. Where?
    b. Who from?
    c. What happened when you sought help?
        i. [Prompt] What did you find most helpful about any support/services/help you received?
        ii. [Prompt] What did you find least helpful about any support/services/help you received?

5. What do you think would help reduce your self-harm, suicidal thoughts or behaviours?

OR

What has helped you reduce or stop?

6. How do you think self-harm, suicidal thoughts or behaviours could be reduced in [sexual orientation/gender identity] young people in general?

7. What would you like to see for young LGBTQ+ people who have experiences of self-harm, suicidal thoughts or behaviours in the future?
    a. [Prompt] What would you have found helpful or supportive?

Is there anything else you think is important to mention which I haven't asked you?

Do you have anything you'd like to ask me?

Appendix F. Study 3: IT Security approval for mEMA software

Ilumivu Mema security clearance

Dear Amy Williams (PhD Psychology Lab FT),

Thank you for contacting the IT Service Desk at the University of Birmingham. A solution has been proposed for incident reference number INC[redacted]

Close Notes:

Hi

On the basis of the security documentation we have now seen, we are happy that this service meets necessary security requirements so it is fine to use it.

Thanks

Chris

Chris Bayliss
IT Security Manager
IT Services

If this has fixed the issue reported, you don't need to do anything further as the incident will automatically close in 7 days.

If this has not fixed the issue reported, please access the incident INC[redacted] and add a comment in the User Notes field. Alternatively, call us on [redacted] or reply to this email within the next 7 days.

Regards,
IT Service Desk

Ref:MSG22970103

Appendix G. Study 2: Ethical approval

Dear Dr Maria Michail,

Re: "Exploring the experiences and perspectives of self-harm, suicidal ideation and suicidal behaviours in LGBTQ+ young people"
Application for Ethical Review ERN_19-1032

Thank you for your application for ethical review for the above project, which was reviewed by the Science, Technology, Engineering and Mathematics Ethical Review Committee.

On behalf of the Committee, I confirm that this study now has full ethical approval.

I would like to remind you that any substantive changes to the nature of the study as described in the Application for Ethical Review, and/or any adverse events occurring during the study should be promptly brought to the Committee's attention by the Principal Investigator and may necessitate further ethical review.

Appendix H. Study 3: Ethical approval

Samantha Waldron (Research Support Services)
Tue 08/06, 13:31
Maria Michail (Psychology); Amy Williams (PhD Psychology Lab FT)

Reply all

Dear Dr Michail,

Re: "Feasibility and Acceptability of Experience Sampling Method among LGBTQ+ Young People with Experiences of Self-Harm and Suicide"
Application for Ethical Review ERN_20-1745

Thank you for your application for ethical review for the above project, which was reviewed by the Science, Technology, Engineering and Mathematics Ethical Review Committee.

On behalf of the Committee, I confirm that this study now has full ethical approval.

I would like to remind you that any substantive changes to the nature of the study as described in the Application for Ethical Review, and/or any adverse events occurring during the study should be promptly brought to the Committee's attention by the Principal Investigator and may necessitate further ethical review.

Appendix I: Study 3: Digital Health Assessment approval

From: Sophie Watson (Psychology) <S.Watson.2@bham.ac.uk>
Sent: 22 March 2021 14:52
To: [redacted]
Cc: [redacted]
Subject: Re: SOPHS_21_14_MM

Hi Jess and Maria,

We are happy to confirm your RA SOPHS_21_14_MM has been approved. Thanks for your work on this.

Kind regards,
Sophie

Appendix J: Study 2: Information sheet

Participant Information Sheet

Study Title: *Exploring the experiences and perspectives of self-harm, suicidal ideation and suicidal behaviours in LGBTQ+ young people*

Researchers: A. Jess Williams, PhD Researcher. Supervised by Dr Maria Michail, Professor Jon Arcelus and Professor Ellen Townsend

You are being invited to take part in a PhD study being completed at the Institute for Mental Health, School of Psychology, University of Birmingham, which explores LGBTQ+ young people's experiences and perspectives of self-harm suicidal ideation and suicidal behaviours. Before you decide whether or not to take part, it is important for you to understand why the research is being conducted and what will be involved.

Please take your time to read the following information, and ask any questions you may have about the information or process. Feel free to take your time deciding whether you wish to take part or not, and you are able to withdraw at any point.

Thank you for taking the time to read this.

What is the purpose of the study?

This research aims to interview young LGBTQ+ young people (aged 16-25) who have experiences of self-harm, suicidal thoughts or suicidal behaviour. This is to help us understand what might influence LGBTQ+ young people's self-harm and suicide, and how this might be different or similar to other individuals under the LGBTQ+ umbrella.

What would taking part involve?

If you wish to take part, you will be given a consent form to sign and date. Once we have received your consent, we will arrange an interview to be conducted either in person, by phone or via skype. The choice of which is completely up to you. You will be asked to arrange the interview for a time that is convenient for you. We estimate that this will take around 60 minutes.

In this interview, we are interested in hearing about your experiences regarding self-harm, suicidal ideation and suicidal behaviours and what you think influences this. This interview will be audio-recorded, with your permission. Following the interview you will be given a debrief sheet which will have information to contact the researcher if you have any further questions or concerns, and contact information for local services.

As a thank you for your time, you will receive a £10 voucher.

What are the possible benefits of taking part?

By taking part in this research you will be helping to inform our understanding of what influences self-harm and suicide specifically in LGBTQ+ young people, and help to guide future research and potentially interventions. This is specifically important given how prevalent these thoughts and behaviours are in the population, and that there may be unique experiences which LGBTQ+ young people encounter which may have previously been overlooked. We hope that this experience may give you an opportunity to reflect on your experiences, and that this is a positive experience for you.

What are the possible disadvantages or risks of taking part?

The topics discussed within the interview can be understandably upsetting for people. Beforehand we will run through a brief safety planning exercise, which will highlight some personal sources of support and coping strategies you could use in the event of distress. If you wish to stop the interview at any point – you are of course welcome to do this. If I am concerned that you're becoming distressed, I may also stop the interview. These stops may be as a break, to skip certain questions or to end the interview; we can discuss these options between us to work out which would be best. You can also choose to withdraw from the interview at any time without giving a reason.

Following the interview if you wish to discuss any concerns or thoughts with myself or my supervisor that is completely fine. I will also give you a debrief sheet which will signpost you to helplines such as Samaritans (116 123) and MindOut (01273234839), and other third section services.

We will need to take the information for your local GP, this is a standard precaution. In the event that I am seriously concerned for your safety or that of any others, I will stop the interview, explain why I am doing this and that I will need to inform my supervisors and your GP.

What happens if I do not wish to take part?

If you don't want to take part in the study, that is completely fine. If you could please just let me know, that would be very helpful, thank you.

If you choose to participate but withdraw at a later date, you have 28 days to inform us that you would like to retract your interview data. If you withdraw during or following the interview, you will still receive a voucher for the taking part.

What will happen to my data?

Your consent form will be kept separately from any interview data to protect your anonymity. Only I and my primary supervisor will have access to the data. All information and data will be kept confidential. This will be locked in a secure cabinet at the researcher's office at the University of Birmingham and kept in accordance with university data protection policy and the General Data Protection Regulation (2018).

The interview will be recorded on an encrypted Dictaphone and once the file has been transferred to a protected file, it will be deleted from the Dictaphone. The interview will be transcribed verbatim and anonymised. You can

choose to withdraw your data up to 28 days after your interview, however after this point your data will not be able to be removed due to the data analysis taking place.

Confidentiality

In line with confidentiality policies at the University of Birmingham, everything discussed will be kept confidential unless I become seriously concerned about your current safety or the safety of anyone else. At this point, I will share this information with the supervisory team and your local GP.

What happens to the results?

This study is part of a PhD project looking at self-harm and suicide in LGBTQ+ young people, it will be built into the final thesis. The anonymised results will be published in a peer-reviewed journal, which you can request a copy of if you wish. They will also be shared with the LGBTQ+ Advisory Group.

Thank you very much for taking the time to read this information, and I hope that you will consider taking part in this study. If you have any further questions, please contact:

Researcher: A. Jess Williams

Email: [redacted]

Telephone: [redacted]

Postal Address: Office 304

Institute for Mental Health

School of Psychology,

University of Birmingham,

52 Pritchatts Road,

B15 2SA

Supervisor: Dr Maria Michail

Email: [redacted]

Telephone: [redacted]

Postal Address: Institute for Mental Health

School of Psychology,

University of Birmingham,

52 Pritchatts Road,

B15 2SA

Appendix K: Study 3: Information sheet

Participant Information Sheet

Study Title: Feasibility and Acceptability of Experience Sampling Method among LGBTQ+ Young People with Experiences of Self-Harm and Suicide

Researchers: A. Jess Williams, PhD Researcher. Supervised by Dr Maria Michail, Professor Jon Arcelus and Professor Ellen Townsend

You are being invited to take part in a PhD study being completed at the Institute for Mental Health, School of Psychology, University of Birmingham, which explores the feasibility and acceptability of using a method called experience sampling with LGBTQ+ young people. Before you decide whether or not to take part, it is important for you to understand why the research is being conducted and what this will involved.

Please take your time to read the following information and ask any questions you may have about the information or process. Feel free to take your time deciding whether you wish to take part or not.

Thank you for taking the time to read this.

What is the purpose of the study?

This is the first study which uses experience sampling methods (ESM) within LGBTQ+ young people (aged 16-25), who have experiences of self-harm and suicide. Experience sampling method or daily diary is a research method, which asks participants to stop at certain times and make note of their experiences, feelings, thoughts and behaviours in real time. You can do this using a mobile app such as the one we will be using in this study, mEMA app hosted by Illumivu (https://ilumivu.com/).

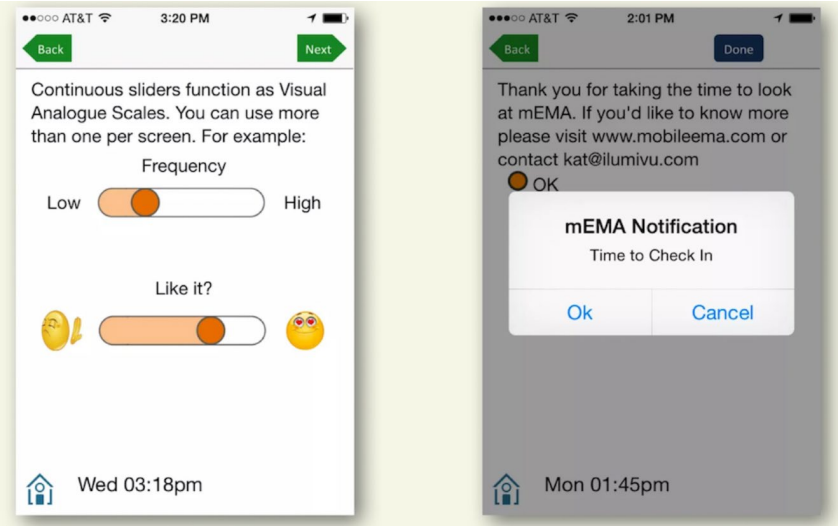


Figure 16: This is a sample of the mEMA app interface

We want to know whether ESM is acceptable and effective as a research method within the LGBTQ+ youth population. ESM have previously been used with other populations of young people and to explore mental health broadly. But there has been limited research considering LGBTQ+ adults, and none with LGBTQ+ young people. This study would be the first of its kind. We hope that findings from this study would be able to suggest whether ESM could be used within a future, larger study with LGBTQ+ young people.

What would taking part involve?

If you want to take part, Jess (PhD student) will email you a consent form to sign and date (throughout this study, the PhD student (Jess) will be your point of contact). As part of the consent form, we will ask you for your GP's contact information. This is so that we can inform them by letter that you are part of a mental health study and that if there is imminent threat to you, that we will be in touch by phone call and letter to let them know. This inclusion letter does not give details that this study is looking at self-harm and suicide, as to not disclose potentially private information. It also does not say that the study is with LGBTQ+ individuals, as to not "out" anyone to their GP.

Once we have received your completed consent form, we will arrange a brief meeting at your convenience. This will be through Zoom. During this meeting, Jess will talk through downloading the mEMA app to your smartphone and how to use this. (The mEMA app is how we collect our ESM data, it will send you push notifications or "prompts" throughout the day which link to quick 2-3 minute surveys.) This meeting would most likely take about 15-30 minutes and we would discuss the confidentiality of the study, your right to withdraw at any point, and if you were to engage with self-harm and had suicide thoughts what we would need to do as researchers to keep you safe. You will also be given a link to a survey that would need to complete before the ESM study. Once this survey is complete, Jess will send you your unique code to access the mEMA app.

You will need to use your unique code to login to the mEMA app, this is an automatically generated ID to login. From here you will randomly receive 6 alerts a day for 7 days, these will be push notifications. At each of these prompts you will be asked to fill in a short survey (about 2-3 minutes long). At each prompt the survey will only be

available for 30 minutes. This is so we get an idea of your thoughts, feelings and experiences in real time rather than later. Please try to respond to as many as possible of the push notifications. All of your data will be anonymously synced to our database which only the PhD student (Jess) can access.

Once your 7-day study period is over, you will be asked if you would take part in a short interview, which will ask about your experience of the ESM study and if you have any feedback. This will take about 20-30 minutes, and it will be an opportunity for you to discuss what did and did not work within the study. Following this, you will be offered a debrief meeting with Jess. Jess will email you a debrief sheet regardless of whether you decide to have a debrief meeting or not. This contains information about the study, signposting information and contact information for LGBT and suicide prevention services.

What are the possible benefits of taking part?

By taking part in this research you will be helping us to find out whether ESM can be used effectively with LGBTQ+ young people who have experiences of self-harm and suicide to monitor feelings, thoughts and behaviours in real time; and what helps and hinders engagement with this method. This will inform future research as how to engage LGBTQ+ young people with ESM research more effectively. Through understanding this, we hope to be able to consider how self-harm and suicide can change across short time periods, and experiences or moods which impact these. We hope that this study will help inform future research, policy and clinical practice.

As a thank you for taking completing the study you will receive a £10 Amazon voucher. If you complete some of the ESM-study period and take part in the interview, you will receive a £5 Amazon voucher.

What are the possible disadvantages or risks of taking part?

The final alert of each day will ask about your experiences of suicidal thoughts and self-harm throughout the day. You will be offered a space to explain these thoughts and experiences if you want to elaborate, although you don't have to. If you respond that you are having suicidal thoughts or have engaged with self-harm the app will offer you information about helplines, which are LGBTQ+ friendly.

If you respond that you are experience very burdensome suicidal thoughts and have self-harmed, Jess will be in touch within 24 hours for a wellbeing check. This phone call will present as a private number (e.g. Unknown Caller). You will be asked at this point whether you have plans to end your life; and if so Jess will need to breach confidentiality and inform her supervisor (Dr Maria Michail), your GP and potentially emergency services. This will be done with your knowledge and your GP will know that this is mental health study but not LGBTQ+ specific. This is so as to not "out" anyone who is not happy for their sexuality or gender identity to be shared. If you do not have imminent plans, you will discuss how you are feeling and run through a brief safety planning activity.

If you don't answer the phone for this wellbeing check; Jess will sent you an email with a read receipt. This will explain that we understand you may not want to speak to a researcher right now but we need to know you are okay. You will need to respond to this email. If you don't respond, Jess will call you the following day for another wellbeing check.

Following the 7-day ESM study period, if you wish to discuss any concerns or thoughts with Jess or her supervisor that is completely fine. We will also be offering an opportunity to discuss the pros and cons of taking part in this study so that we can better learn what would be useful and acceptable to LGBTQ+ youth who have these

experiences of self-harm and suicide. We are happy to offer a debrief meeting at your convenience. All participants will receive a debrief sheet which will signpost you to national helplines.

What happens if I do not wish to take part?

If you do not want to take part in the study, that is completely fine. If you could please just let us know, that would be very helpful, thank you.

If you choose to participate but miss 2-days' worth of alerts and do not respond to a reminder email, we will consider you to have dropped out of the study. If you feel like you can no longer continue with the study, you can also email Jess, and your study will be stopped. You will no longer receive alerts.

You will be asked if you'd like to take part in the feedback interview to discuss your experience of taking part in the study. This would be really useful to understand why you didn't want to continue the study and what we could do to help this in the future. You do not have to take part in the interview if you do not want to.

What will happen to my data?

Your consent form will be kept separately from the dataset. The randomly generated ID you receive to log into the mEMA app will also be your ID number for your dataset, this ensures your anonymity within the study. Only Jess and her supervisor will have access to the data and be able to link your ID with your contact information provided by the consent form.

All information and data will be kept confidential, securely online in password protected folder hosted by BEAR and kept in accordance with university data protection policy and the General Data Protection Regulation (2018).

The interview will be recorded on an encrypted Dictaphone and once the file has been transferred to a protected file, it will be deleted from the Dictaphone. The interview will be transcribed word for word and anonymised. You can choose to withdraw your data up to 28 days after your interview, however after this point your data will not be able to be removed due to the data analysis taking place.

Will my data be kept confidential?

In line with confidentiality policies at the University of Birmingham, everything discussed will be kept confidential and you data will be anonymised. Confidentiality will only ever be breached with your knowledge, following a wellbeing check where you have shared that you have an imminent plan to end your life. Your GP will be informed about your involvement with a mental health study being conducted by the University of Birmingham, and that you are expressing serious suicide plans. Emergency services will also be called if you are at serious risk of ending your life. The supervisor will also be informed.

What happens to the results?

This study is part of a PhD project exploring self-harm and suicide in LGBTQ+ young people and will be built into the final thesis. The results will be disseminated to the academic community via conference presentations and journal articles. We also hope to share the findings more widely with the LGBTQ+ population through social media and

blog posts. If you have any thoughts of how these findings could be shared with LGBTQ+ youth more widely, we would appreciate suggestions. Thank you.

Thank you very much for taking the time to read this information, and I hope that you will consider taking part in this study. If you have any further questions, please contact:

Researcher: A. Jess Williams

Email:

Telephone:

Postal Address: Office 304

Institute for Mental Health

School of Psychology,

University of Birmingham,

52 Pritchatts Road,

B15 2SA

Supervisor: Dr Maria Michail

Email:

Telephone

Postal Address: Institute for Mental Health

School of Psychology,

University of Birmingham,

52 Pritchatts Road,

B15 2SA

Appendix L. Study 2: Consent form

Participant Consent Form

Study Title: *Exploring the experiences and perspectives of self-harm, suicidal ideation and suicidal behaviours in LGBTQ+ young people*

Researchers: A. Jess Williams, PhD Researcher. Supervised by Dr Maria Michail, Professor Jon Arcelus and Professor Ellen Townsend

ID code:

Please read and confirm your consent to being interviewed for this project by initialling the appropriate boxes, and signing below:

1. I confirm that the purpose of the project has been explained to me and that I have been given the opportunity to ask any questions. ☐
2. I understand my participation is voluntary, and I am free to withdraw at any point without having to give a reason, and without any implications for any legal rights. ☐
3. I understand that if I disclose that I am a serious risk to myself or others that the researcher will need to contact her supervisors and my local GP to ensure my safety. ☐
4. I understand that I can withdraw my interview data up to 28 days after participating in the study. ☐
5. I confirm my permission to be audio recorded during this interview. ☐
6. I understand any data which is published will be in an anonymous format. ☐
7. I know that anonymised results will be disseminated and published in academic works such as peer-reviewed journals and conferences. ☐
8. I agree to take part in this project. ☐

In case of emergency, please provide the details of your local GP. They will only be contacted if you are thought to be a serious risk to yourself, others or in danger.

GP (or surgery name):

Phone number:

Name of Participant	Date	Signature
Name of Researcher	Date	Signature

If you have any questions or require further information, please contact

Researcher: A. Jess Williams

Email: [redacted]

Telephone: [redacted]

Postal Address: Office 304

Institute for Mental Health

School of Psychology,

University of Birmingham,

52 Pritchatts Road,

B15 2SA

Supervisor: Dr Maria Michail

Email: [redacted]

Telephone: [redacted]

Postal Address: Institute for Mental Health

School of Psychology,

University of Birmingham,

52 Pritchatts Road,

B15 2SA

Appendix M. Study 3: Consent form

Participant Consent Form

Study Title: Feasibility and Acceptability of Experience Sampling Method among LGBTQ+ Young People with Experiences of Self-Harm and Suicide

Researchers: A. Jess Williams, PhD Researcher. Supervised by Dr Maria Michail, Professor Jon Arcelus and Professor Ellen Townsend

Please read and confirm your consent to taking part in this project by initialling all boxes, and signing (by typing your name) below:

1. I confirm that the purpose of the project has been explained to me and that I have been given the opportunity to ask any questions.	
2. I understand my participation is voluntary, and I am free to withdraw at any point without having to give a reason, and without any implications for any legal rights.	
3. I confirm that I am between 16-25 years old.	
4. I confirm that I identify as part of the LGBTQ+ umbrella.	
5. I confirm that I have experiences of self-harm, suicidal thoughts or behaviours.	
6. I understand that if I respond that I am experiencing very burdensome suicidal thoughts and have self-harmed, I will receive a wellbeing check as a phone call within 24 hours.	
7. I confirm that I have supports I can contact if I feel distressed (e.g. friends, family, GP, support group).	
8. I confirm that I will use the supports I have if I feel distressed during this study.	
9. I understand that if I disclose that I am a serious risk to myself that the researcher will need to contact her supervisor, my local GP and if necessary emergency services to ensure my safety.	
10. I understand that my data will be kept confidential and only be accessed by the researcher team.	
11. I understand any data which is published will be in an anonymous format.	
12. I understand that anonymised results will be disseminated and published in academic works such as peer-reviewed journals and conferences.	
13. I agree to take part in this project.	

In case of emergency, please provide the details of your local GP. They will only be contacted if you are thought to be a serious risk to yourself, others or in danger.

GP (or surgery name) and address:

Phone number:

Please provide the number for your smartphone which will host the mEMA app. Please be aware this may be used for a wellbeing check if you respond to having self-harmed and have been experiencing very burdensome thoughts of suicide.

Your phone number:

Name of Participant	Date	Signature
Name of Researcher	Date	Signature

If you have any questions or require further information, please contact

Researcher: A. Jess Williams

Email

Telephone:

Postal Address: Office 304

Institute for Mental Health

School of Psychology,

University of Birmingham,

52 Pritchatts Road,

B15 2SA

Supervisor: Dr Maria Michail

Email:

Telephone:

Postal Address: Institute for Mental Health

School of Psychology,

University of Birmingham,

52 Pritchatts Road,

B15 2SA

Appendix N: Study 2: Debrief

Participant Debrief

Study Title: *Exploring the experiences and perspectives of self-harm, suicidal ideation and suicidal behaviours in LGBTQ+ young people*

Researchers: A. Jess Williams, PhD Researcher. Supervised by Dr Maria Michail, Professor Jon Arcelus and Professor Ellen Townsend

Thank you for participating in our study.

This project aims to explore how LGBTQ+ young people experience self-harm, suicidal ideation and suicidal behaviours. We hope that by discussing how you've experiences self-harm and/or suicide we can understand why so many LGBTQ+ young people self-harm, have suicidal thoughts or attempt suicide.

If you're interested in reading the anonymised findings of these interviews, please let Jess know and she will be happy to forward a copy onto you. Please be aware analysis and write up of these results may take several months.

You can withdraw your data up to 28 days after your interview. To do this, please email Jess directly. Your data will be treated anonymously and confidentially at all time, and will only be used for the purpose of this research.

If you are feeling distressed or upset after participating, please feel free to contact the research team or consider one of the services listed below:

Birmingham Mind Helpline: 01216088001 Email: info@birminghammind.org	**LGBT Foundation** Helpline: 03453303030 Email: info@lgbt.foundation	**Forward Thinking Birmingham** Helpline: 03003000099
Samaritans Helpline (UK & ROI): 116 123 Helpline in Welsh language: 08081640123 Email: jo@samaritans.org	**MindOut** Helpline: 01273234839 Email: info@mindout.org.uk	**Harmless** Helpline: 01158800280 Email: support@harmless.org.uk

If you are experiencing very low mood or suicidal thoughts, behaviour or self-harm, we urge you to seek help from your local GP.

If you have any questions or require further information, please contact

Researcher: A. Jess Williams

Email:

Telephone:

Postal Address: Office 304

Institute for Mental Health

School of Psychology,

University of Birmingham,

52 Pritchatts Road,

B15 2SA

Supervisor: Dr Maria Michail

Email:

Telephone:

Postal Address: Institute for Mental Health

School of Psychology,

University of Birmingham,

52 Pritchatts Road,

B15 2SA

Appendix O: Study 3: Debrief

Participant Debrief

Study Title: Feasibility and Acceptability of Experience Sampling Method among LGBTQ+ Young People with Experiences of Self-Harm and Suicide

Researchers: A. Jess Williams, PhD Researcher. Supervised by Dr Maria Michail, Professor Jon Arcelus and Professor Ellen Townsend

Thank you for participating in our study. Your data will be treated anonymously and confidentially at all times (unless during the study you disclosed that you were at serious risk during a wellbeing check; in such a case as discussed your information was past to your GP and emergency services) and will only be used for the purpose of this research.

This study explores whether using experience sampling methods (ESM) is a suitable and effective method to use with LGBTQ+ young people who have experiences of self-harm and suicide. We are exploring whether this method is effective and appropriate in monitoring daily experiences, feelings, behaviours in real time. This is done through examining how often you have responded to the notification prompts, whether you completed the whole study period, how you've responded during the ESM study period and your feedback from the short interview. We appreciate the time and effort that you gave to this study and are truly grateful.

If you are feeling distressed or upset after participating, please feel free to contact the research team or consider one of the services listed below:

Kooth Online counselling: https://www.kooth.com/	**LGBT Foundation** Helpline: 03453303030 Email: info@lgbt.foundation	**Switchboard** Helpline: 03003300630 Webchat: https://switchboard.lgbt/ Email: chris@switchboard.lgbt
Samaritans Helpline (UK & ROI): 116 123	**Mermaids** Helpline: 08088010400	**Allsorts** Helpline: 01273721211

Helpline in Welsh language: 08081640123 Email: jo@samaritans.org	Webchat: https://mermaidsuk.org.uk/young-people/	Website: https://www.allsortsyouth.org.uk/contact

If you are experiencing very low mood or persistent suicidal thoughts, behaviour or self-harm, we urge you to seek help from your local GP or health care provider.

If you have any questions or require further information, please contact

Researcher: A. Jess Williams

Email: [redacted]

Telephone: [redacted]

Postal Address: Office 304
Institute for Mental Health
School of Psychology,
University of Birmingham,
52 Pritchatts Road,
B15 2SA

Supervisor: Dr Maria Michail

Email: [redacted]

Telephone: [redacted]

Postal Address: Institute for Mental Health
School of Psychology,
University of Birmingham,
52 Pritchatts Road,
B15 2SA

Appendix P: Studies 2-3: Safety Planning Activity (Stanley & Brown, 2012)

Safety Plan Exercise Template (adapted from Brown & Stanley, 2012)

Warning signs (thoughts, images, mood, situation, behaviour) that a crisis may be developing: 1. 2. 3.	Internal coping strategies – Things I can do to take my mind off my problems without contacting another person (relaxation techniques, physical activity): 1. 2. 3.
People and social settings that I can go to for support and distraction: 1. 2. 3.	Professionals or organisations I can contact during a crisis: 1. Professional/organisation: Number: 2. Professional/organisation: Number: 3. Professional/organisation: Number:

Appendix Q: Study 1: PRISMA guidelines

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	98
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	98-99
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	Section: introduction 99-101
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	Section: introduction 101
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	Section: method 101
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	Section: method 102-103
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	Section: method 102
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	Section: method 102
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	Section: method 103-104
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	Section: method 105-106

Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	Section: method 105-106
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	Section: method 106
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	Section: method 106-110
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	Section: method 106-110

Appendix R: Study 1: Narrative Review of LGBTQ+ specific risk factors

In this review, 31 papers described LGBTQ+ specific risks (overview table R.1). This section includes those papers which were incorporated in the meta-analyses, unlike Table 4. As a category "LGBTQ+ specific risk factors", meaningful meta-analysis was not possible due to the broad variation of risks. However, given that these risk factors are uniquely experienced by LGBTQ+ young people, they are narratively described here. Broadly, these risk factors were broken down into six groups; i) specific sexual orientation or gender identity; ii) identity development and presentation; iii) internalised self-hatred; iv) coming out and direct responses from others; v) family awareness and responses; and vi) interpersonal interactions relating to being LGBTQ+.

Table R.1.

Overview of LGBTQ+ specific risk factors across all papers included in the review (n = 31)

Author (date) country	LGBTQ+ specific risk factor
Specific sexual orientation or gender identity (n=8)	
Cenat et al., (2015)[56] Canada	Sexual orientation: Bisexuality
Fraser et al., (2018)[67] New Zealand	Sexual orientation: Bisexuality
Gnan et al., (2019)[117] U.K.	Gender identity: Transgender
	Sexual orientation: Bisexuality
Rimes et al., (2019)[132] U.K.	Sexual orientation: Bisexuality
Taliaferro et al., (2016)[136] U.S.A	Sexual orientation: Bisexuality
Walls et al., (2010)[106] U.S.A.	Gender identity: Transgender
	Sexual orientation: Bisexuality
	Sexual orientation: Lesbian
Whitaker et al., (2015)[141] U.S.A	Gender identity: Transgender
Ybarra et al., (2015)[142]	Sexual orientation: Bisexuality
Identity development and presentation (n=12)	
D'Augelli et al.,(1993)[41] U.S.A	Awareness of own orientation at earlier age
	Self-labelled at later age
Fraser et al., (2018)[67] New Zealand	Sexuality concerns
Friedman et al., (2006)[68] U.S.A	Highly femininity during middle school
	Masculinity during elementary school
	Gender-role nonconformity
Gnan et al., (2019)[117] U.K.	Identified early as LGBTQ
Grossman et al., (2007)[72] U.S.A	Body esteem: weight
	Body esteem: attribution

Liu & Mustanski (2012)[83] U.S.A	Gender nonconformity
Mustanski et al., (2013)[127] U.S.A	Younger age of same-sex attraction
Remafedi et al., (1991)[22] U.S.A	Feminine gender role
Rimes et al., (2019)[132] U.K.	Identified as LGB before 10 years
Savin-Williams & Ream (2003)[97] Multiple countries	Mastery orientation lower
Taliaferro et al., (2018a)[100] U.S.A	Same-sex sexual experience
Walls et al., (2010)[106] U.S.A.	Level of outness
Internalised self-hatred (n=10)	
D'Augelli et al., (2001)[58] U.S.A	Personal homonegativity
D'Augelli et al., (2005)[59] U.S.A	Personal homonegativity
Gibbs & Goldbach (2015)[70] U.S.A	Internalised homophobia
Grossman et al., (2007)[72] U.S.A	Transgender-related suicide negativity
Mendoza-Pérez et al., (2019)[42] Mexico	Negative attitudes towards homosexuality
McDermott et al., (2018)[125] U.K.	Felt negatively about their sexual orientation
	Distressed by hiding their sexual orientation
	Keeping their sexual orientation or gender identity hidden
Peng et al., (2019)[128] China	Disliked assigned sex
	Felt pain/depressed at onset of puberty
Puckett et al., (2017)[91] U.S.A	Internalised homophobia
	Guilt/shame due to sexual orientation
Remafedi et al., (1991)[22] U.S.A	Personal homonegativity
	Interpersonal homonegativity
Savin-Williams & Ream (2003)[97] Multiple countries	Less acceptance of their sexual orientation
Coming-out and direct responses (n=11)	
Baams et al., (2015)[40] U.S.A	Coming out stress
D'Augelli et al.,(1993)[41] U.S.A	Loss of friends due to sexual orientation
Gnan et al., (2019)[117] U.K.	Coming out as LGBTQ under 16
	Bad reaction from friend
Goldbach et al., (2017)[118] U.S.A	Negative disclosure experiences
Hegna &Wichstrøm (2007)[123] Norway	Early age of coming out (under 15 years)
Hershberger et al., (1997)[45] U.S.A	Loss of friends due to sexual orientation
Puckett et al., (2017)[91] U.S.A	Loss of friends due to sexual orientation
Rimes et al., (2019)[132] U.K.	Disclosure before 16 years
	Bad parental reaction to coming out
	Bad sibling reaction to coming out
	Bad friend reaction to coming out
Rotheram-Borus et al., (1994)[94] U.S.A	Came out to parents
	Came out to siblings
Savin-Williams & Ream (2003)[97] Multiple countries	Earlier age at first disclosure
	Higher rate of disclosure
Wang et al., (2019)[140] Taiwan	Early coming out
Family awareness and responses (n=7)	
D'Augelli et al.,(1993)[41] U.S.A	Lack of awareness of orientation by mother
	Lack of awareness of orientation by father

D'Augelli et al., (2001)[58] U.S.A	Parental rejection
D'Augelli et al., (2005)[59] U.S.A	Parental discouragement of childhood gender atypical behaviour
	Parental labelling of sexual orientation
Gibbs & Goldbach (2015)[70] U.S.A	Parental anti-homosexual religious beliefs
	Leaving religion of origin due to conflict
Hershberger et al., (1997)[45] U.S.A	Sibling knowledge of sexual orientation
Rotheram-Borus et al., (1994)[94] U.S.A	Parental discovery of sexuality
Yadegarfard et al., (2014)[108] Thailand	Family rejection
Interpersonal interactions relating to being LGBTQ+ (n=7)	
D'Augelli et al., (2001)[58] U.S.A	LGB-friends suicide attempts
Eisenberg et al., (2016)[63] U.S.A	Low level of LGBQ peers
Gnan et al., (2019)[117] U.K.	Half or more friends who are LGBTQ
	Not feeling accepted where young person lives
	Having no out staff at school
Goldbach et al., (2017)[118] U.S.A	Experiences of homonegative communication
Grossman et al., (2007)[72] U.S.A	Other's evaluation of body and appearance
Hegna &Wichstrøm (2007)[123] Norway	Infrequent contact with heterosexual friends
	Early heterosexual debut (under 16 years)
Rimes et al., (2019)[132] U.K.	School staff not speaking up against prejudice
	Students not speaking up against prejudice
	Lessons referred to LGBTQ issues or people negatively

R.1. Specific sexual orientation or gender identity

Eight studies specified a minority sexual orientation or gender identity as a risk factor associated with self-harm (Cénat et al., 2015; Fraser et al., 2018; Gnan et al., 2019; Rimes et al., 2018; Taliaferro et al., 2018a; Walls et al., 2010; Whitaker, Shapiro & Shields, 2015; Ybarra et al., 2015). Bisexual orientation was most often associated with self-harm among these samples (Cénat et al., 2015; Fraser et al., 2018; Gnan et al., 2019; Rimes et al., 2018; Taliaferro et al., 2018a; Walls et al., 2010; Ybarra et al., 2015). However, Walls et al., (2010) also identified that being lesbian was a risk factor. Their study demonstrated that sexual minority females were more likely to deal with self-harm, than males. The authors only assessed cutting behaviour as a form of self-harm, which they acknowledge as being more prevalent among adolescent females (Madge et al., 2008). Therefore, it appears that their study actually demonstrates that being a sexual minority female is associated to self-harm behaviour, rather than a specific sexual orientation.

Three studies linked transgender identity with self-harm (Gnan et al., 2019; Walls et al., 2010; Whitaker et al., 2015). None of these studies focused solely on TGD populations. TGD participants were a subsample of all studies' populations. Often highly underrepresented. For example, Whitaker et al., (2015) study analysed data from a state-wide questionnaire conducted in 2010-2011, focusing on respondents who were sexual minorities. Of their total sample only 16.9% were transgender (Whitaker et al., 2015). Despite being underrepresented, TGD identities still demonstrated an association with self-harm. Similar patterns are seen within both Gnan et al., (2019) and Walls et al., (2010) studies. Thereby indicating that gender identity is likely to be an important risk factor among LGBTQ+ young people.

R.2. Identity development and presentation

Thirteen studies associated self-harm with LGBTQ+ identity development and presentation (D'Augelli & Hershberger, 1993; Fraser et al., 2018; Friedman et al., 2006; Gnan et al., 2019; Grossman & D'Augelli, 2007; Liu & Mustanski, 2012; Mendoza-Pérez & Ortiz-Hernández, 2019; Mustanski & Liu, 2013; Remafedi et al., 1991; Rimes et al., 2018; Savin-Williams & Ream, 2003; Taliaferro et al., 2018a; Walls et al., 2010). These risks varied greatly between studies. Firstly, awareness or identifying as LGBTQ+ at earlier ages was considered a risk factor (D'Augelli & Hershberger, 1993; Gnan et al., 2019; Mustanski & Liu, 2013; Remafedi et al., 1991; Rimes et al., 2018). Only two studies offered a threshold for "early age" (Gnan et al., 2019; Rimes et al., 2018), considering this as identifying as LGB before age of 10. Both studies use data from the Youth Chances survey, explaining the similarity of their measures. Rimes et al., (2018) appears to use the full sample, whereas a subsample of university and higher education students are analysed by Gnan et al., (2019). Therefore, these studies represent this risk factor with the same data, this limits the conclusions which can be drawn. A limitation of the other studies is the lack of associated age of identifying as LGBTQ+. Therefore, it is unclear what "early awareness" or "identification" actually means and how this can then be associated with self-harm.

Secondly, 3 studies presented risk factors which were related to gender nonconformity among sexual minority samples (Friedman et al., 2006; Liu & Mustanski, 2012; Remafedi et al., 1991). As one of the earliest papers in the review, Remafedi et al., (1991) is an important initial study to include. This considered sexual minority males recruited in 1998 to understand suicide attempts. However, this does mean that the evidence is relatively old. More recent studies have reinforced this association between self-harm and gender nonconformity. Friedman et al., (2006) again looked at gay or bisexual males and found a link between gender role nonconformity and self-harm. This broke down to presenting with a "lack of masculinity" during elementary school and presenting highly feminine at middle school. An issue with this study, is the lack of information within the paper. There are few details which means little can be inferred. Secondly, the study collected retrospective responses from participants aged 18-25 years, asking about their experiences at primary and middle school. Given the gap between events of interest and age of participants, it is likely that this study includes a high degree of recall bias. The latest of these studies, offered evidence across a longitudinal framework with a sample which included TGD participants (Liu & Mustanki, 2012). This presents the benefit that gender nonconformity is a consistent risk factor across a 2.5-year period. Given that only 20 TGD participants were included, Liu and Mustanki (2012) were unable to conduct subgroup analyses. Therefore, from these papers it is unclear how gender nonconformity may vary between identities within the LBGTQ+ umbrella and whether this has an influence on self-harm. However, consistently gender nonconformity among LGB samples is associated with self-harm.

Leading on from this, internal evaluations of identity development and presentation were associated with self-harm. These were concerns about sexual orientation (Fraser et al., 2018), lower levels of "mastery orientation" (Savin-Williams & Ream, 2003), self-labelling (D'Augelli & Hershberger, 1993), and self-esteem related to appearance among TGD participants (Grossman & D'Augelli, 2007).

Fraser et al., (2018) developed the single measure of sexual orientation concerns by adapting questions from the Sexual Identity Distress Scale (Wright & Perry, 2006). No alpha coefficient was presented within the paper; therefore, it was unclear how valid the original scale was during full-text review. Furthermore, the new measure simply asked respondents if they were worried about their sexual orientation. This could be interpreted in many ways and is therefore less reliable. Similarly, Savin-Williams and Ream (2003) used a measure which is potentially unsuitable when assessing "mastery orientation". For example, the measure would ask how much control does the participant feel they have over their life choices. This appears to have been used in one of two datasets combined by Savin-Williams and Ream (2003), the measure was originally used to assess mental health. Given that this measure was not intended as an assessment for sexual orientation, it is a less valid tool. Furthermore, given the use of two datasets which employ different questions, the authors ran analyses using examined variables which best represented similar topics (Savin-Williams & Ream 2003). This adds degrees of uncertainty into the study and causes concerns about the results. From these two papers (Fraser et al., 2018; Savin-Williams & Ream, 2003), there is a clear issue with measures used. Firstly, this adds to the heterogeneity of risk factors. As authors label concepts and experiences differently. Secondly, with single or newly developed measures being used without indication of validity, these risk factors are weak at best. Consideration is needed to understand how relevant these risk factors truly are to self-harm among LGBTQ+ young people and whether under further investigation they would still present as associated.

Within their study, D'Augelli and Hershberger (1993) highlighted that awareness of LGBTQ+ identity at an earlier age was a risk factor. They also present self-labelling as a risk. From their study of 194 LGB young people, self-labelling at an older age was important to self-harm, rather than younger age as seen with awareness. This could be that the young person does not feel safe to present their sexual orientation until they are older and self-harm may be related to the distress of hiding such information.

It is unclear from the analysis presented how this is related to self-harm, further examination was not followed up in D'Augelli's later studies which are included in this review (2001; 2006; Grossman & D'Augelli, 2007).

Alternatively, Grossman & D'Augelli (2007) use a validated and tested measure when considering self-esteem related to appearance in their study. This was the Body-Esteem Scale for Adolescents and Adults (Mendelson, Mendelson, & White, 2004), which broke down to questions about weight, attribution, and appearance. These were found to be associated with self-harm in TGD participants. This offers valuable understanding of the importance of how a TGD young person feels about their body, and how others perceive them can be associated with great distress. The authors suggest that this is because TGD young people want their gender identity to be represented by their bodies (Grossman & D'Augelli, 2007). However, this was found in a small sample of TGD participants, therefore may be less generalisable to LGBTQ+ young people broadly.

R.3. Internalised self-hatred

Ten studies presented information relating to internalised self-hatred under various names (D'Augelli, Hershberger, & Pilkington, 2001; D'Augelli, Grossman & Starks, 2006; Gibbs & Goldbach, 2015; Grossman & D'Augelli, 2007; McDermott, Hughes & Rawling, 2018b; Mendoza-Pérez & Ortiz-Hernández, 2019; Peng et al., 2019; Puckett et al., 2017; Remafedi et al., 1991; Savin-Williams & Ream, 2003). Among studies which sampled LGB, self-harm was associated with guilt or shame related to sexual orientation (Puckett et al., 2017), less acceptance of their identity (Savin-Williams et al., 2003) and internalised homophobia or -negativity (D'Augelli et al., 2001; D'Augelli et al., 2006; Remafedi et al., 1991; Puckett et al., 2017). Mendoza-Perez and Ortiz-Hernandez (2019) employed a different strategy. They explored attitudes towards homosexual orientation as a proxy for internalised homophobia. Negative attitudes were identified as a self-harm risk factor. The authors do not discuss why they

collected and analysed data in this way. Potentially this was to offer participants a positive option and therefore not infer any results.

In their study, Puckett et al., (2017) found that internalised heterosexism and guilt or shame relating to sexual orientation were predictors of self-harm. However, only internalised heterosexism was a validated measure, whereas guilt or shame was dummy coded. This offers a less reliable form of measure of these emotions. A further limitation of the paper is that authors state the survey was administered in three parts. It is unclear what questions were asked at which timepoint, the timing of administering the survey and how this influenced analysis. This causes concerns about the strength of these predictors. In comparison, D'Augelli et al., (2006) build on their previous cross-sectional research (D'Augelli et al., 2001) which indicated that personal homonegativism was associated with self-harm. By first demonstrating this association, authors then tested personal homonegativism (among other variables) as predictors for self-harm across a 2-year period. This shows that personal homonegativism is a consistent predictor across research for self-harm among LGB young people.

Within TGD participants, self-harm was associated with dislike of assigned sex, pain or depression relating to onset of puberty (Peng et al., 2019) and transgender-related negativity (Grossman & D'Augelli, 2007). Given that this review consists of mainly western countries, Peng et al., (2019) offer unique insights as to TGD young people in China. This demonstrates that distress related to puberty is a risk factor among this population. This paper uses a subsample of a national study which included TGD adults. From this there is a wide representation of Chinese young people included. However, their study recruited and was completed online, therefore only those with access to the internet were able to take part. Potentially missing a large portion of rural inhabitants. Despite these limitations, both studies indicate that negative self-evaluations are associated with self-harm among TGD young people.

Across LGBTQ+ identities, this association of negative feelings or internalised phobia and self-harm was maintained (Gibbs & Goldbach, 2015; McDermott et al., 2018b). Within their mixed-method study, McDermott et al., (2018b) found that feeling negative about sexual orientation, keeping LGBTQ+ identity hidden and feeling distress by hiding their LGBTQ+ identity was all associated with self-harm. This was demonstrated from the quantitative element of their study. While unable to give the details of the association between these risk factors and self-harm, they all do seem related. For example, internal negative perception of identity could be linked to wanting to hide this information, which then causes distress to hide their identity. This potentially could worsen self-harm itself. Exploration of such risk factors would be interesting to examine.

R.4. Coming out and direct responses from others

Experiences related to coming out and others' responses to this were identified as risk factors. Two studies demonstrated that stress related to coming out was associated with self-harm (Baams et al., 2015; Rotheram-Borus, Hunter & Rosario, 1994). The earlier study found that coming out to parents or siblings was a self-harm risk factor among LGB male youths (Rotheram-Borus, et al., 1994). This sample was predominantly made up of ethnic minority adolescents and was relatively small (N=131). Potentially, additional factors are related to this stress, e.g., religion or culture, which were not captured by the study. Recently, Baams et al., (2016) indicated that coming out stress was a relevant risk factor across 876 LGB young people. Thereby suggesting that coming out stress is generalisable to a wider inclusion of LGBTQ+ identities. However, this was found to be higher among male youth, whereas females had greater levels of self-harm ideation. Authors suggested that thwarted belonging and perceived burdensomeness mediated this relationship within the female participants (Baams et al., 2016). Between the studies, coming out stress is a consistent risk factor for males, whereas this association may be weaker within female young people.

Only one paper explored the timing of coming out (Wang et al., 2019). In their study of Taiwanese men, coming out during junior high school or before was associated with self-harm experiences. This offers insights to risk factors in Asian sexual minority males. However, as participants were between 20-25-years and were being asked to recall events from their adolescents or childhood, there is potential bias. Further research would be needed to determine the association of age and other LGBTQ+ identities across different populations.

Disclosure of LGBTQ+ identity was associated as a risk factor relating to the age of the young person (Gnan et al., 2019; Hegna & Wichstrøm, 2007; Rimes et al., 2018; Savin-Williams & Ream, 2003; Wang et al., 2019). Studies suggests that disclosure at younger ages was more likely to be associated with self-harm (Gnan et al., 2019; Rimes et al., 2018; Hegna & Wichstrøm, 2007). The studies using the Youth Chance survey specified that this age was below 16 years (Gnan et al., 2019; Rimes et al., 2018) while Hegna and Wichstrøm (2007) suggested that disclosure was a risk before 15 years. These studies indicate that disclosure of sexual orientation around mid-adolescence is important when considering self-harm. However, the data used by Hegna and Wichstrøm (2007) is outdated, coming from 1999 and only 2% of their sample was not ethically Norwegian. Therefore, this may be a particular risk for LGB youth in Norway over 20 years ago. Greater levels of disclosure or outness were also recognised as risk factors (Savin-Williams & Ream, 2003; Walls et al., 2010). Both studies use secondary analysis of voluntary sector datasets. Walls et al., (2010) specify that surveys were primarily used to explore data trends for a voluntary organisation's program development. This highlights that these surveys were not designed specifically to answer the studies' research questions. Despite this, neither paper discusses data checks or criteria to ensure reliable and relevant data is being used (Tripathy, 2013).

Several papers demonstrated that negative responses or loss of close relationships due to disclosure were important risk factors (D'Augelli et al., 1993; Goldbach, Schrager & Mamey, 2017; Gnan

et al., 2019; Hershberger et al., 1997; Puckett et al., 2017; Rimes et al., 2018). These poor reactions were centred around parents, siblings, and close friends (D'Augelli et al., 1993; Hershberger et al., 1997; Puckett et al., 2017, Gnan et al., 2019; Rimes et al., 2018). It is important to note that D'Augelli et al., (1993) and Hershberger et al., (1997) are reflecting risk factors from the same dataset, as the later paper is a secondary analysis. In their study, Goldbach et al., (2017) use a 64-item measure which had not been validated at the time of publication. When reviewing the paper, the label "blinded for review" was still in place with no further communications. It has not been possible to assess the validity of the measures used to consider negative disclosures or what this item may include. As previously discussed, all of these studies have limitations. However, it is consistently presented that responses to disclosure are self-harm risk factors across LGBQ young people. None of these studies included TGD participants. Therefore, this review does not present evidence that this risk factor is generalised to these young people.

R.5. Family awareness and responses

Seven papers identified self-harm risk factors relating to family awareness and response to the young person's LGBTQ+ identity (D'Augelli & Hershberger, 1993; D'Augelli et al., 2001; D'Augelli et al., 2006; Gibbs & Goldbach, 2015; Hershberger et al., 1997; Rotheram-Borus et al., 1994; Yadegarfard, Meinhold-Bergmann & Ho 2014). These risk factors ranged from lack of awareness (D'Augelli & Hershberger, 1993), to family awareness or discovery (Hershberger et al., 1997; Rotheram-Borus et al., 1994) to family rejection due to being LGBTQ+ (D'Augelli et al., 2001; Yadegarfard et al., 2014). Most of these studies are relatively old. This suggests that these are long-established risk factors which researchers are aware of. Despite Gibbs & Goldbach's (2015) study being published more recently, the data used was actually collected during 2000. Therefore, offering little novel evidence for these risk factors. From their study, Yadegarfard et al., (2014) compared transgender and cisgender individuals from Thailand. This offers new insights to how family rejection is a risk factor among TGD young people

and in Thai participants. However, both sets of participants completed the same survey which particularly asked about anti-transgender mistreatment. It is unlikely that a cisgender individual is likely to receive anti-transgender mistreatment, therefore it is questionable how valid this comparison is. Potentially, presenting misleading results.

D'Augelli et al., (2006) also presented parental discouragement of childhood atypical gender behaviour and parental labelling of sexual orientation as self-harm risk factors. Results were based on self-reported surveys from a 2-year longitudinal study, using single item questions. These questions seemed to be asked within a section focused on verbal discrimination from parents, this may have primed the participants to negatively recall parental experiences. Alternatively, these risk factors had a lasting impression on the young person, considering they were being assessed on childhood experiences. It is quite possible that these risk factors are therefore very influential.

Religion was influential to family dynamics for LGBTQ+ young people within one study. Gibbs and Goldbach (2015) evidenced that religious beliefs within the family and religious conflicts was associated with self-harm. From their OutProud survey, anti-homosexual religious beliefs were recognised as being more closely related to suicide attempt, with many participants leaving their religion due to conflict. The sample were mainly affiliated with Christianity in the U.S.A., thus it is unclear whether these risk factors would be replicated among different religions and family cultures. Authors stated that by leaving the religion this was considered a "resolved conflict". However, it is likely that these actions also came with their own additional risks which were not explored.

R.6. Interpersonal interactions relating to being LGBTQ+

The final section of LGBTQ+ specific risks concern the interpersonal interactions which surround the LGBTQ+ young person. Firstly, some studies considered variations of interpersonal homonegativity

(Goldbach et al., 2017; Remafedi et al., 1991) or people not challenging LGBTQ+ prejudice within schools (Rimes et al., 2019b). It is unclear what exactly is meant by interpersonal homonegativity within papers. For example, Remafedi et al., (1991) do not describe their measurement of this and simply report interpersonal turmoil relating to the participants' sexual orientation. This offers little information of the risk factor. Whereas Goldbach et al., (2017) relate this to homonegative communication around the young person rather than directed at them. It is possible that these are two different risk factors; direct and indirect homonegativity, however due to study reporting this is unclear.

Alternatively, Rimes et al., (2018) present interpersonal risk factors which occur within schools. These are referred to as school stigma; risk factors include prejudice occurring without staff or students speaking against it, and LGBTQ issues or people being presented negatively within classes. These were presented as predictors for self-harm. While Gnan et al., (2019) uses the same survey, only having no staff who represented the LGBTQ+ community at university was evidenced as a risk factor. The risks highlighted by Rimes et al., (2018) were measured but non-significant to self-harm risk within the subsample of university students (Gnan et al., 2019). Together these studies highlight the importance of the education environment when considering self-harm risks. Particularly, representation and speaking up against prejudice viewpoints.

Both studies also suggested that having a high number of LGBTQ+ friends was a self-harm risk factor (Gnan et al., 2019; Rimes et al., 2018). Contrastingly, another study stated that lower levels of LGBTQ+ peers was a risk factor (Eisenberg et al., 2016). This distinction could represent the level of relationship between friends and peers, or the environmental differences between U.K. (Gnan et al., 2019; Rimes et al., 2018) and American participants (Eisenberg et al., 2016). In comparison, Eisenberg et al., (2016) use a much larger sample surveying students across the state of Minnesota. However, from the paper it is unclear whether the students are aware of other students' sexual orientations, there is no

indication of how many "out" students are in their schools. This could have therefore influenced analysis, as researchers may be assuming knowledge of LGBTQ+ peers within participants. Alternatively, potentially the contact with friends is more important than the number of friends. Hegna and Wichstrom (2007) presented infrequent contact with heterosexual friends as a self-harm risk factor. This was determined as monthly contact. The same risk was not found for contact with homosexual friends. Often, homosexual friends were in contact daily more frequently than heterosexual friends. Possibly this denotes closer friendships with those that share similar sexual orientations. This may also explain why LGB-friend's suicide attempt was also highlighted as a risk factor (D'Augelli et al., 2001). As LGB friends may be closer to the young person generally. But D'Augelli and colleagues (2001) did not explore the impact of heterosexual-friend suicide attempt, and therefore a comparison of risks cannot be made.

Within their study, Hegna and Wichstrom (2007) also suggested that heterosexual sex before the age of 16-years was associated with self-harm. Their sample mainly contained homosexual adolescents (80%); therefore, it is unlikely that this represents participants who are bisexual. Alternatively, among a population of bisexual adolescents, self-harm was associated with those who had experiences with same-sex intercourse (Taliaferro et al., 2018a). It is unclear how gender of partner is associated with self-harm between these populations. Possibly LGBTQ+ identity of the young person engaging in sex is more relevant. Taliaferro and colleagues (2018a) also highlight that within their study same-sex experience may not capture all sexual activities. They mentioned "experiences" and "intercourse" but did not label these, therefore participants may have under or overreported. More detailed examination is needed to determine the relevance of this risk factor.

Appendix S. Study 1: Characteristics of non-meta-analysed studies

Author (date) country	No. total participants	No. LGBQ (%) No. TGNC (%)	Participant age range (years)	Setting	Outcome	Identified Risks	Quality
Antonio & Moleiro (2015)[49] Portugal	211	LGBQ: 148 (70.1) TGNC: -	12-20	Community	Suicidal ideation	Low social support Victimisation	Moderate
Baams et al., (2015)[40] U.S.A	876	LGBQ: 876 (100) TGNC: -	15-21	Community	Suicidal ideation	Coming-out stress Perceived burdensome Thwarted belongingness Victimisation	Low
Baiden et al., (2019)[50] U.S.A	9,693	LGBQ: 722 (7.5) TGNC: -	14-18	School	Suicidal ideation; Suicidal attempt	Teen dating violence	Moderate
Ballard et al., (2017)[51] U.S.A	1,550	LGBQ: 155 (10) TGNC: -	14-18	School	Suicidal ideation; Suicidal attempt	Victimisation	Moderate
Birkett et al., (2009)[52] U.S.A	7,376	LGBQ: 1,118 (15.1) TGNC: -	12-14	School	Suicidal ideation	Negative perception of education Victimisation	High/Moderate
Bostwick et al., (2014)[17] U.S.A	72,691	LGBQ: 6,245 (8.6) TGNC: -	13-18	Community	Self-harm; Suicidal ideation; Suicidal attempt	Gender (female) Ethnic minority	Low
Burton et al., (2013)[53] U.S.A	192	LGBQ: 55 (29) TGNC: -	14-19	Hospital/Clinic	Suicidal ideation; Suicidal attempt	Victimisation	Low
Button (2016)[54] U.S.A	484	LGBQ: 484 (100) TGNC: -	12-18	School	Suicidal ideation; Suicidal attempt	Age (below 14) Victimisation	High/Moderate

Cenat et al., (2015)[56] Canada	8,194	LGBQ: 1,426 (17.4) TGNC: -	14-20	School	Suicidal ideation	Sexuality (bisexual) Victimisation	Moderate
Consolacion et al., (2004)[16] U.S.A	13,205	LGBQ: 1,189 (9) TGNC: -	12-18	Community	Suicidal ideation	Gender (female) Race (white)	Low
Coulter et al., (2015)[56] U.S.A	75,192	LGBQ: 6,558 (8.7) TGNC: 175 (0.2)	18-25	School	Self-harm; Suicidal ideation	Alcohol-related problems	Moderate
Cutuli et al., (2020)[57] U.S.A	77,559	LGBQ: 6,903 (8.9) TGNC: -	14-18	School	Suicidal ideation; Suicidal attempt	Homelessness	Moderate
D'Augelli et al., (2001)[58] U.S.A	350	LGBQ: 350 (100) TGNC: -	14-21	Community	Suicidal attempt	Age (below 16) Personal homonegativity Parental rejection LGB-friends suicide attempts	High/Moderate
D'Augelli et al., (2005)[59] U.S.A	361	LGBQ: 361 (100) TGNC: -	15-19	Community	Suicidal attempt	Personal homonegativity Parental discourage of childhood gender atypical behaviour Parental labelling of sexual orientation Parental psychological abuse Family history of suicide Victimisation	Moderate
De Assis et al., (2014)[60] Brazil	3,205	LGBQ: 122 (3.8) TGNC: -	15-19	School	Suicidal ideation	Problems with romantic relationship	Low
Duncan & Hatzenbuehler (2014)[61] U.S.A	1,173	LGBQ: 102 (8.7) TGNC: -	14-18	School	Suicidal ideation; Suicidal attempt	LGBT hate crime – threat LGBT hate crime – harassment LGBT hate crime – assault or battery LGBT hate crime – assault or battery with weapon	Moderate

DuRant et al., (1998)[62] U.S.A	3,886	LGBQ: 338 (8.7) TGNC: -	12-18	School	Suicidal attempt	Higher number of male sexual partners	Moderate
Eisenberg et al., (2016)[63] U.S.A	122,180	LGBQ: 6,223 (5.1) TGNC: -	13-17	School	Suicidal attempt	Gender (female) Low levels of LGBQ peers Victimisation	Moderate
Eisenberg et al., (2019)[64] U.S.A	2,168	LGBQ: - TGNC: 2168 (100)	14-17	School	Self-harm; Suicidal ideation; Suicidal attempt	Location (rural areas)	Moderate
Espelage et al., (2008)[65] U.S.A	13,921	LGBQ: 1,997 (1.6) TGNC: -	14-18	School	Suicidal ideation	Victimisation	High/Moderate
Espelage et al., (2018)[66] U.S.A	11,794	LGBQ: 767 (6.5) TGNC: 212 (1.8)	14-18	School	Suicidal ideation; Suicidal attempt	Teen dating violence Negative perception of school violence and crime Victimisation	High/Moderate
Fraser et al., (2018)[67] New Zealand	1,799	LGBQ: 198 (11) TGNC: 5 (0.3)	13-18	School	Self-harm	Sexuality (bisexual) Sexuality concerns Emotional regulation	Moderate
Friedman et al., (2006)[68] U.S.A	96	LGBQ: 96 (100) TGNC: -	18-25	Community	Suicidal ideation; Suicidal attempt	High femininity during middle school Masculinity during elementary school Gender-role nonconformity Victimisation	Moderate
Garofalo et al., (1999)[69] U.S.A	3,365	LGBQ: 129 (3.8) TGNC: -	14-18	School	Suicidal attempt	Gender (male) Drug and alcohol use Sexual activity risk (against will) Violence and victimisation risk	Moderate
Gibbs & Goldbach (2015)[70] U.S.A	2,949	LGBQ: 2944 (99.8) TGNC: 75 (2.5)	18-24	Community	Suicidal ideation	Parental anti-homosexual religious beliefs Leaving religion of origin due to conflict Internalised homophobia	Moderate

						Religious upbringing with unresolved conflict	
Grossman & Kerner (1998)[71] U.S.A	90	LGBQ: 90 (100) TGNC: -	14-21	Community	Suicidal ideation	Low self-esteem Emotional distress	Moderate
Grossman et al., (2007)[72] U.S.A	55	LGBQ: - TGNC: 55 (100)	15-21	Community	Suicidal attempt	Transgender-related suicide negativity Body esteem – weight Body esteem – attribution Other's evaluation of body and appearance Parental verbal abuse Parental physical abuse	Moderate
Grossman et al., (2016)[73] U.S.A	129	LGBQ: - TGNC: 129 (100)	15-21	Community	Suicidal ideation; Suicidal attempt	Gender (natal female) Race (white) High thwarted belongingness High perceived burdensomeness Previous experiences of painful and provocative events	Low
Halkitis et al., (2018)[74] U.S.A	665	LGBQ: 665 (100) TGNC: -	18-23	Community	Suicidal ideation; Suicidal attempt	Loneliness Low self-esteem	Moderate
Hee-Kim et al., (2016)[75] South Korea	146,621	LGBQ: 1,270 (0.9) TGNC: -	12-17	School	Suicidal ideation; Suicidal attempt	STDs experience Violence	Moderate
Higgins-Tejera et al., (2019)[76] U.S.A	10,386	LGBQ: 926 (8.9) TGNC:	16-17	School	Suicidal ideation	Victimisation	Moderate
Hightow-Weidman et al., (2011)[77] U.S.A	351	LGBQ: 351 (100) TGNC: 16 (4.6)	13-24	Community	Suicidal attempt	Sexual minority and disability status	Moderate
Huang et al., (2018a)[48]	123,459	LGBQ: 6685 (5)	12-18	School	Suicidal attempt	Poor sleep quality	Moderate

China		TGNC: -					
Huang et al., (2018b) [78] China	72,409	LGBQ: 15,066 (19.9) TGNC: -	12-20	School	Suicidal ideation; Suicidal attempt	Obesity	Moderate
King et al., (2018)[79] U.S.A	11,364	LGBQ: 730 (6.4) TGNC: -	14-18	School	Suicidal ideation	Low school connectedness Victimisation	Moderate
Lardier et al., (2017)[80] U.S.A	538	LGBQ: 70 (13) TGNC: -	14-18	Community	Suicidal ideation	Depressive symptoms Victimisation	Moderate
LeVasseur et al., (2013)[81] U.S.A	11,887	LGBQ: 939 (7.9) TGNC: -	14-18	School	Suicidal attempt	Victimisation	Moderate
Li et al., (2019)[82] China	1,810	LGBQ: 310 (17.1)	15-18	School	Self-harm	Adverse childhood experiences	Moderate
Liu & Mustanski (2012)[83] U.S.A	246	LGBQ: 244 (99.2) TGNC: 20 (8.1)	16-20	Community	Self-harm; Suicidal ideation	Gender (female) Gender nonconformity History of attempted suicide Depressive symptoms Impulsivity Low social support Sensation-seeking Hopelessness Victimisation	High
Lytle et al., (2018)[84] U.S.A	203	LGBQ: 73 (36) TGNC: 18 (8.9)	18-24	Community	Suicidal ideation; Suicidal attempt	Sex assigned at birth Depression/anxiety Friend suicide attempt or complete Family suicide attempt or complete Less perceived family support	High/Moderate
Marx et al., (2019)[85] U.S.A	16,292	LGBQ: 2,786 (17.1) TGNC: 610 (3.7)	14-18	School	Suicidal ideation	Problematic drug use Victimisation	Moderate

Mendoza-Pérez et al., (2019)[42] Mexico	23,496	LGBQ: 2,350 (10) TGNC: -	14-19	School	Suicidal ideation; Suicidal attempt	Negative attitudes towards homosexuality Violent experience	Moderate
Mustanski et al., (2010)[86] U.S.A	246	LGBQ: 241 (98) TGNC: 20 (8.1)	16-20	Community	Suicidal attempt	Gender (female)	Moderate
Mustanski et al., (2014)[87] U.S.A	16,977	LGBQ: 1,185 (7) TGNC: -	13-18	Community	Suicidal attempt	Cocaine use Feelings of sadness Intimate partner violence Victimisation	Moderate
Palm et al., (2016)[88] Sweden	1,051	LGBQ: 105 (10) TGNC: -	15-22	Community	Suicidal ideation; Suicidal attempt	Multiple victimisations	Moderate
Poteat et al., (2009)[89] Unclear	14,439	LGBQ: 3,321 (23) TGNC: -	14-19	Community	Suicidal ideation	Victimisation	Moderate
Proctor & Groze (1994)[90] Multiple countries	221	LGBQ: 221 (100) TGNC: -	-	Community	Suicidal attempt	Depressive symptoms Poor parental relations Poor school performance Low self-esteem	Moderate
Puckett et al., (2017)[91] U.S.A	61	LGBQ: 61 (100) TGNC: -	14-23	Community	Suicidal attempt	Gender (female) Loss of friends due to sexual orientation Guilt/shame due to sexual orientation Internalised homophobia Psychological maltreatment from caregivers	Moderate
Remafedi (2002)[92] U.S.A	255	LGBQ: 255 (100) TGNC: -	15-25	Community	Suicidal attempt	Race (black/African-American) Location (urban areas) Fewer years in education Lower enrolment in school	Moderate
Rimes et al., (2017)[93]	677	LGBQ: 622 (91.9)	16-25	Community	Self-harm	Gender (natal female)	Moderate

U.K		TGNC: 677 (100)					
Rotheram-Borus et al., (1994)[94] U.S.A	131	LGBQ: 127 (96.9) TGNC: -	14-19	Community	Suicidal attempt	Dropped out of school Lived outside of family home Came out to parents Came out to siblings Parental discovery of sexuality Friend or family suicide attempt	High/Moderate
Russell & Joyner (2001)[95] U.S.A	11,940	LGBQ: 836 (7) TGNC: -	12-15	School	Suicidal ideation; Suicidal attempt	Alcohol abuse Depression Friend or family suicide attempt Hopelessness Victimisation	Moderate
Ryan et al., (2009)[96] U.S.A	224	LGBQ: 224 (100) TGNC: -	21-25	Community	Suicidal attempt	Family rejection	Moderate
Savin-Williams & Ream (2003)[97] Multiple countries	732	LGBQ: 727 (99.3) TGNC: -	13-25	Community	Suicidal attempt	Younger age of first sexual experience with male More male partners Mastery orientation Earlier age at first disclosure Higher rate of disclosure Less acceptance of their sexual orientation Alcohol use Hard drug use Depressive symptoms Low self-esteem Greater willingness to engage in risky sex Victimisation	Moderate
Scheer et al., (2019)[98] U.S.A	7,532	LGBQ: 1089 (14.5) TGNC: -	14-18	School	Suicidal ideation; Suicidal attempt	Sexual violence	Moderate

Shearer et al., (2018)[99] U.S.A	129	LGBQ: 41 (31.9) TGNC: -	12-18	Community	Suicidal attempt	Religiosity More religious parents	High/Moderate
Taliaferro et al., (2018a)[100] U.S.A	922	LGBQ: 922 (100) TGNC: -	14-18	School	Suicidal attempt	Same-sex sexual experience Binge drinking Marijuana use Substance use Relationship violence Multiple sexual partners Victimisation	Moderate
Taliaferro et al., (2019)[101] U.S.A	1,635	LGBQ: - TGNC: 1,635 (100)	14-17	School	Self-harm; Suicidal attempt	Gender (natal female) Mental health problem Positive screen for depression Alcohol use Marijuana use Physical or sexual abuse Relationship violence Run away from home Bullying perpetrator Victimisation	Moderate
Teasdale & Bradley-Engen (2010)[102] U.S.A	11,911	LGBQ: 787 (7) TGNC: -	12-18	School	Suicidal ideation; Suicidal attempt	Gender (female) Location (suburban) Suicide of close friend Suicide of family member Run away from home Victimisation	Moderate
Thoma & Huebner (2013)[103] U.S.A	276	LGBQ: 276 (100) TGNC: 22 (8)	14-19	Community	Suicidal ideation	Antigay discrimination Greater levels of perceived discrimination Racial discrimination	Moderate
Waldo et al., (1998)[104] U.S.A	248	LGBQ: 248 (100) TGNC: -	15-21	Community	Suicidal ideation; Suicidal attempt	Low self-esteem Psychological distress Victimisation	Moderate/Low
Walls et al., (2008)[105]	142	LGBQ: 142 (100)	14-21	Community	Suicidal ideation; Suicidal attempt	Gender (female) Methamphetamine use	High/Moderate

U.S.A		TGNC: -				Hopelessness Homelessness Victimisation	
Walls et al., (2010)[106] U.S.A	265	LGBQ: 265 (100) TGNC: 13 (4.9)	13-22	Community	Self-harm	Younger age Sexuality (lesbian) Sexuality (bisexual) Gender identity (transgender) Level of outness Depression History of attempted suicide Daily smoking Inhalant use Homelessness Friend suicide attempt or complete	High/Moderate
Yadegarfard et al., (2013)[107] Thailand	190	LGBQ: - TGNC: 190 (100)	15-25	Community	Suicidal ideation	Number of sexual partners	Moderate
Yadegarfard et al., (2014)[108] Thailand	260	LGBQ: - TGNC: 129 (49.6)	15-25	Community	Suicidal ideation; Suicidal attempt	Family rejection Depression PANSI-negative Low social support Loneliness	Moderate

Appendix T. Study 1: Characteristics of meta-analysed studies

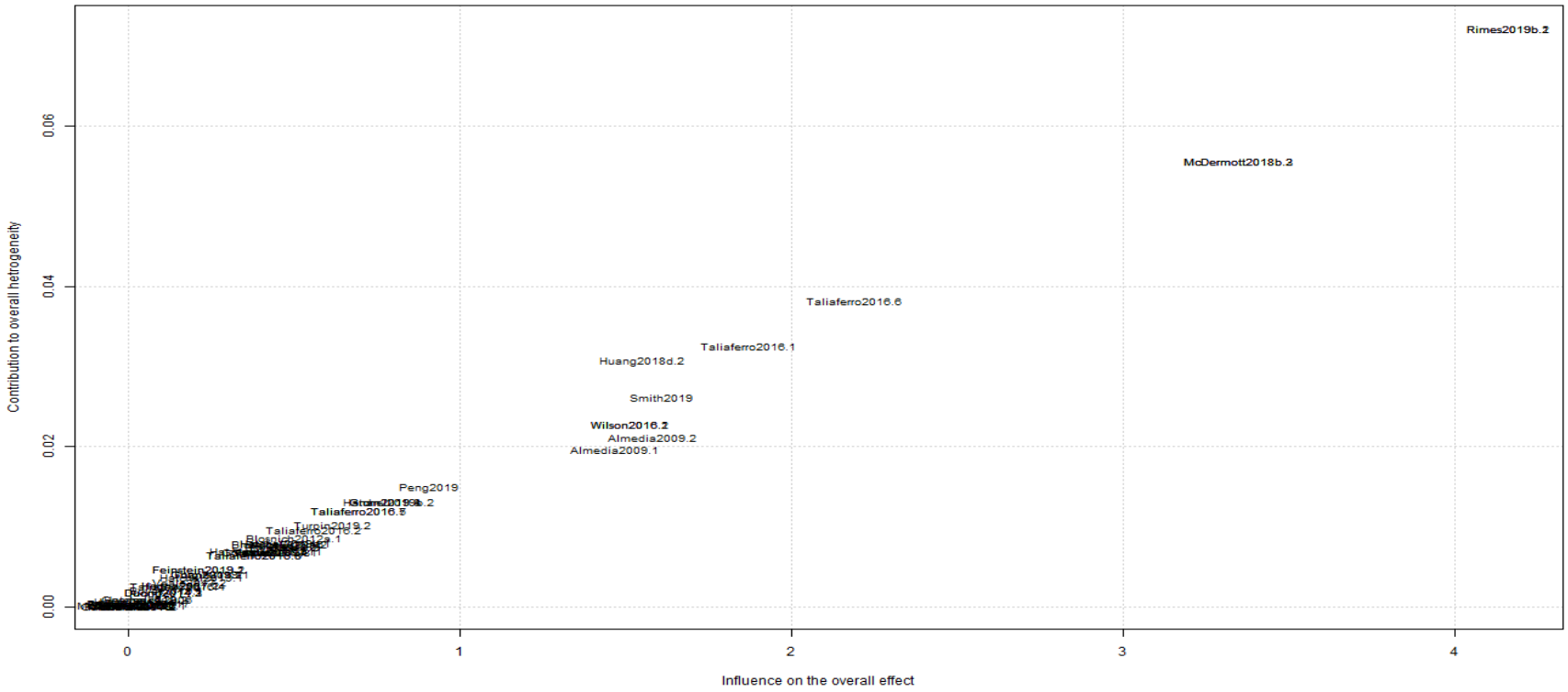
Author (date) country	No. total participants	No. LGBQ (%) No. TGNC (%)	Participant age range (years)	Setting	Outcome	Quality	Multiple Reports
Almedia el al., (2009)[109] U.S.A	1,032	LGBQ: 93 (9) TGNC: 17 (1.7)	13-19	School	Self-harm; Suicidal ideation	High/Moderate	
Arcelus et al., (2016)[110] U.K.	268	LGBQ: - TGNC: 268 (100)	-	Hospital/Clinic	Self-harm	Moderate	
Berona et al., (2020)[111] U.S.A	285	LGBQ: 119 (41.8) TGNC: 7 (2.5)	13-25	Hospital/Clinic	Self-harm; Suicidal ideation; Suicidal attempt	Low/Moderate	
Blosnich et al., (2012)[112] U.S.A	11,046	LGBQ: 773 (7) TGNC: -	18-24	Community	Self-harm; Suicidal ideation; Suicidal attempt	High/Moderate	
Bontempo et al., (2002)[113] U.S.A	9,188	LGBQ: 315 (3.4) TGNC: -	14-18	School	Suicidal attempt	Moderate	
Boyas et al., (2019)[15] U.S.A	451	LGBQ: 451 (100) TGNC: -	12-18	School	Suicidal ideation; Suicidal attempt	Low/Moderate	
Butler et al., (2019)[114] U.K.	8,440	LGBQ: - TGNC: 282 (3.3)	13-17	School	Self-harm	Moderate	
D'Augelli et al.,(1993)[41] U.S.A	194	LGBQ: 194 (100) TGNC: -	15-21	Community	Suicidal attempt	Moderate	Hershberger et al., (1997)[45]
Duong & Bradshaw (2014)[115] U.S.A	951	LGBQ: 951 (100) TGNC: -	14-18	School	Suicidal attempt	Moderate	
Feinstein et al., (2019)[116] U.S.A	18,515	LGBQ: 18,515 (100) TGNC: -	14-18	School	Suicidal attempt	High/Moderate	

Gnan et al., (2019)[117] U.K.	1,948	LGBQ: 1927 (98.9) TGNC: 214 (10.9)	16-25	Community	Self-harm; Suicidal ideation; Suicidal attempt	High/Moderate	
Goldbach et al., (2017)[118] U.S.A	346	LGBQ: 346 (100) TGNC: -	14-17	Community	Self-harm; Suicidal ideation	Moderate	
Goodenow et al., (2006)[119] U.S.A	3,637	LGBQ: 202 (5.6) TGNC: -	14-18	School	Suicidal attempt	Low	
Hatchel et al., (2019)[120] U.S.A	4,867	LGBQ: 713 (14.6) TGNC: 129 (1.5)	12-18	School	Suicidal ideation; Suicidal attempt	High/Moderate	
Hatchel et al., (2019b)[121] U.S.A	934	LGBQ: 769 (82.3) TGNC: 60 (6.4)	14-18	School	Suicidal ideation; Suicidal attempt	High/Moderate	
Hatzenbuehler (2011)[122] U.S.A	31,852	LGBQ: 1,413 (4.4) TGNC: -	16-17	School	Suicidal attempt	Moderate	
Hegna &Wichstrøm (2007)[123] Norway	407	LGBQ: 407 (100) TGNC: -	16-25	Community	Suicidal attempt	Moderate	
Huang et al., (2018a)[46] China	123,459	LGBQ: 6685 (5) TGNC: -	12-18	School	Suicidal attempt	Moderate	Huang et al., 2018d[48]
Langhinrichsen-Rohling et al., (2011)[124] U.S.A	1,533	LGBQ: 200 (13) TGNC: -	13-18	Community	Suicidal ideation; Suicidal attempt	Moderate	
McDermott et al., (2018)[125] U.K.	789	LGBQ: 789 (100) TGNC: 178 (22.6)	13-25	Community	Self-harm; Suicidal ideation; Suicidal attempt	Low	
McKay et al., (2019)[126] U.S.A	485	LGBTQ: 175 (36.1)	14-21	Community	Suicidal ideation; Suicidal attempt	Moderate	
Mustanski et al., (2013)[127]	237	LGBQ: 237 (100)	16-20	Community	Suicidal attempt	Low	

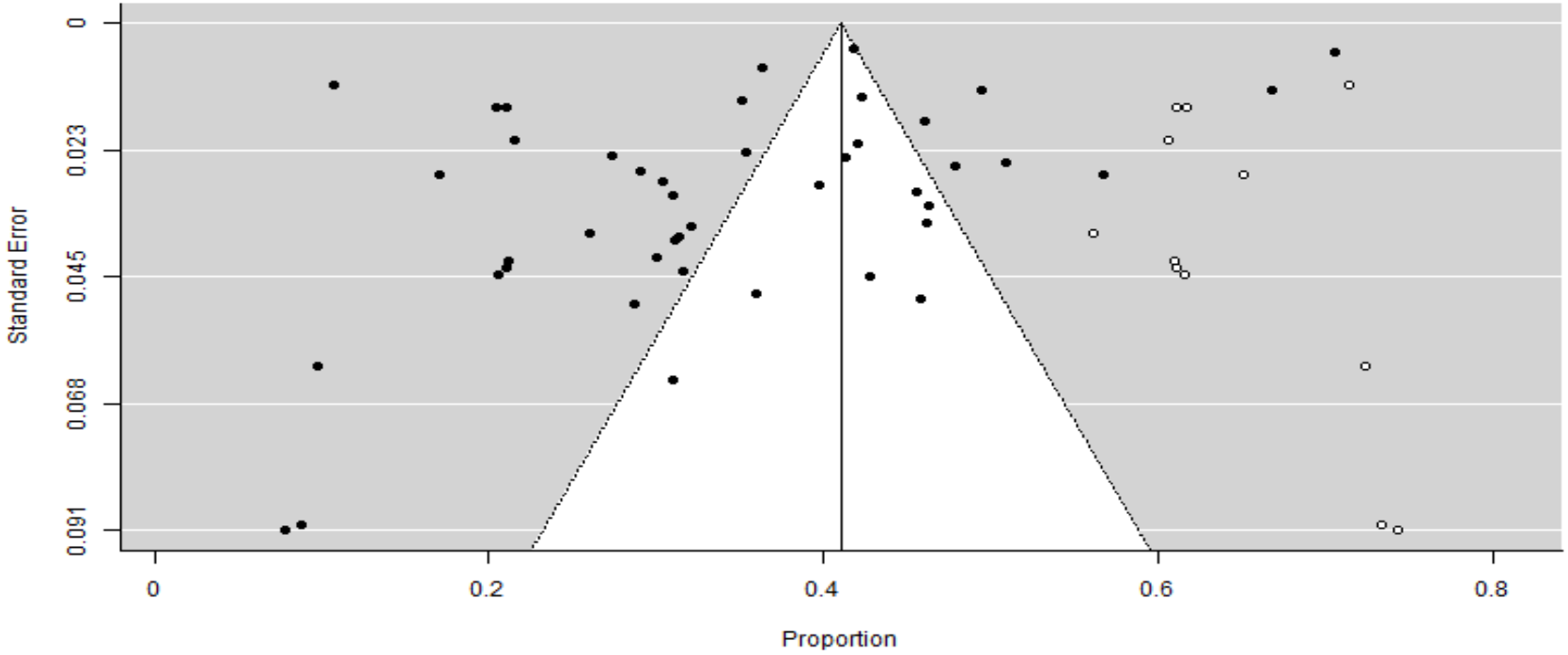
U.S.A		TGNC: 21 (8.9)				
Peng et al., (2019)[128] China	385	LGBQ: - TGNC: 385 (100)	12-18	Community	Suicidal ideation	High/Moderate
Perez-Brumer et al., (2017)[129] U.S.A	25,493	LGBQ: 2,440 (9.6) TGNC: 280 (1.1)	14-18	School	Suicidal ideation	High/Moderate
Peterson et al., (2017)[130] U.S.A	96	LGBQ: 96 (100) TGNC: 96 (100)	12-22	Hospital/Clinic	Suicidal attempt	Moderate
Reisner et al., (2014)[131] U.S.A	3,131	LGBQ: 225 (7.2) TGNC: -	14-18	School	Self-harm; Suicidal attempt	High
Remafedi et al., (1991)[22] U.S.A	137	LGBQ: 137 (100) TGNC: -	14-21	Community	Suicidal attempt	Moderate
Rimes et al., (2019)[132] U.K.	3,275	LGBQ: 3275 (100) TGNC: -	16-25	Community	Suicidal ideation; Suicidal attempt	High/Moderate
Shields et al., (2011)[133] U.S.A	2,154	LGBQ: 2,154 (100) TGNC: -	14-18	School	Suicidal ideation	Moderate
Smith et al., (2016)[134] U.S.A	68	LGBQ: 68 (100) TGNC: -	16-24	Community	Suicidal ideation	Moderate
Smith et al., (2019)[135] U.S.A	252	LGBQ: 179 (71) TGNC: 73 (29)	14-15	Community	Self-harm; Suicidal ideation; Suicidal attempt	Low/Moderate
Taliaferro et al., (2016)[136] U.S.A	77,758	LGBQ: 4,960 (6.5) TGNC: -	14-18	School	Self-harm; Suicidal ideation; Suicidal attempt	Moderate
Taliaferro et al., (2018b)[137] U.S.A	2,168	LGBQ: - TGNC: 2,168 (100)	14-17	School	Self-harm	Moderate
Turpin et al., (2019)[138] U.S.A	924	LGBQ: 691 (74.8) TGNC: -	14-18	School	Suicidal ideation	High/Moderate

Veale et al., (2017)[139] Canada	923	LGBQ: - TGNC: 923 (100)	14-25	Community	Self-harm; Suicidal attempt	Moderate
Wang et al., (2019)[140] Taiwan	500	LGBQ: 500 (100) TGNC: -	20-25	Community	Suicidal ideation; Suicidal attempt	High
Whitaker et al., (2015)[141] U.S.A	356	LGBQ: 356 (100) TGNC: 64 (16.9)	14-18	School	Suicidal ideation	High/Moderate
Wilson et al., (2016)[142] U.S.A	216	LGBQ: 147 (68.1) TGNC: 105 (48.6)	16-24	Community	Suicidal ideation	Moderate
Ybarra et al., (2015)[142] U.S.A	5,542	LGBQ: 2,162 (39) TGNC: 442 (7.8)	13-18	Community	Suicidal ideation	Moderate

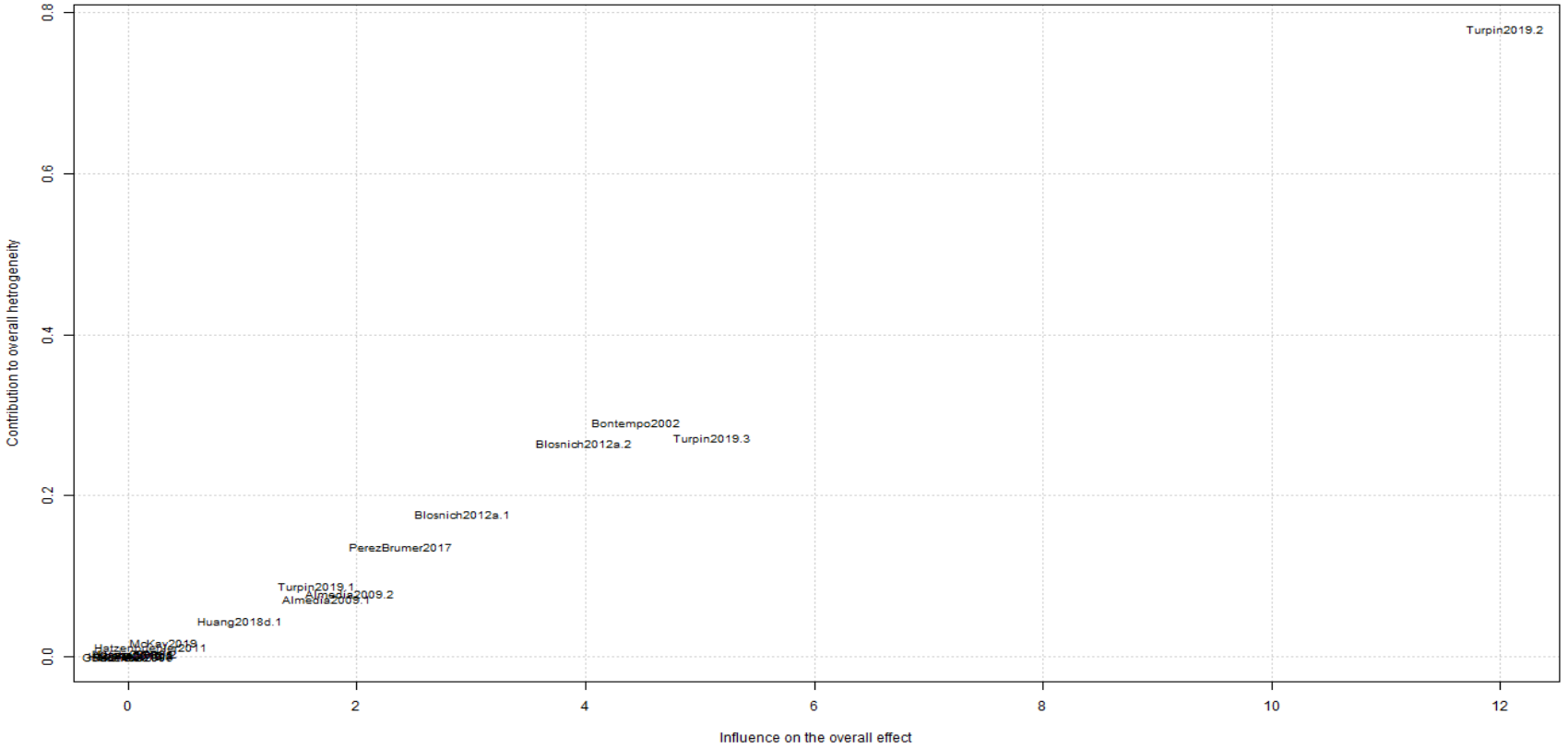
Appendix U. Study 1: Baujat chart of overall victimisation prevalence



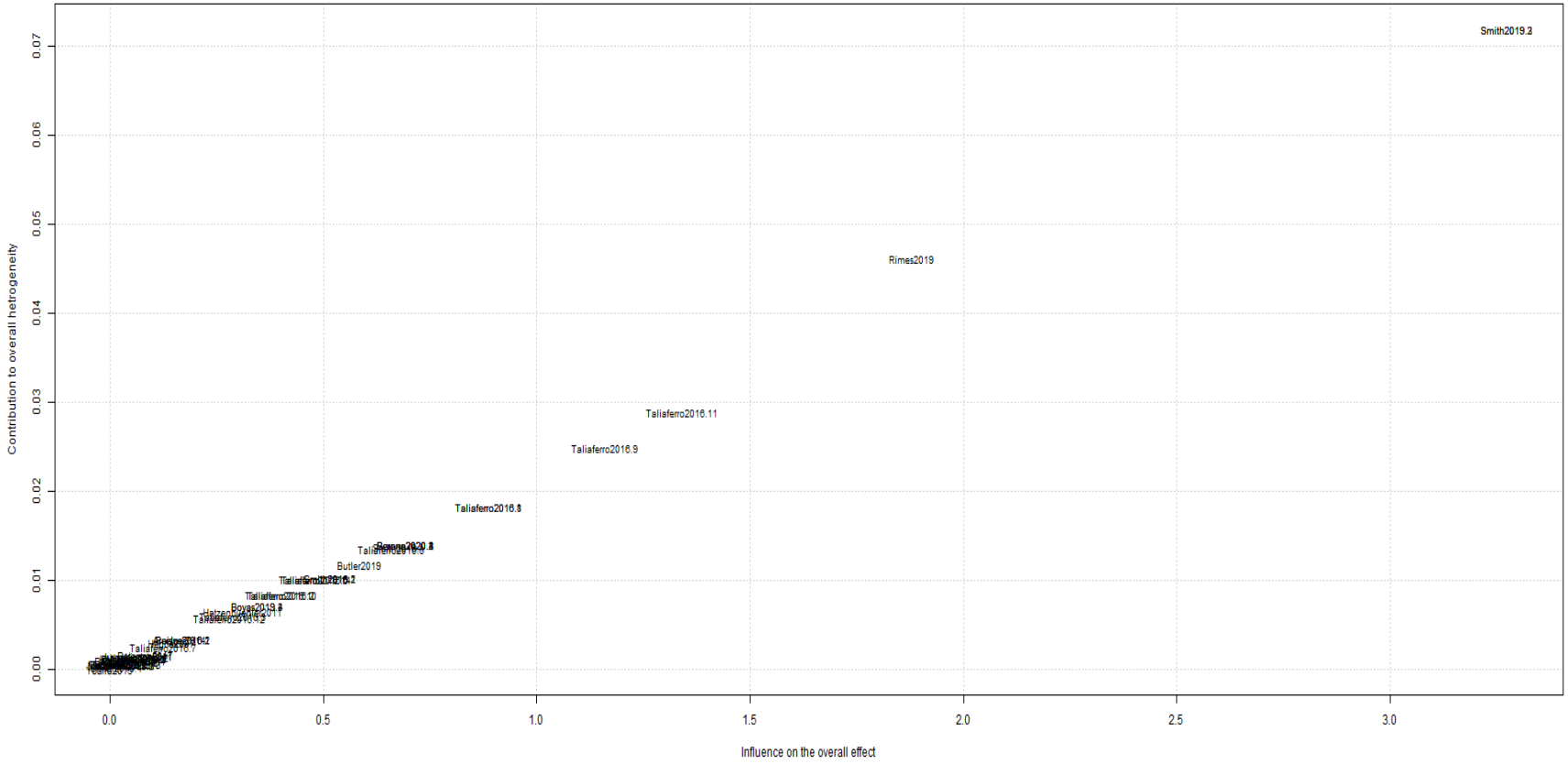
Appendix V. Study 1: Victimisation prevalence funnel plot



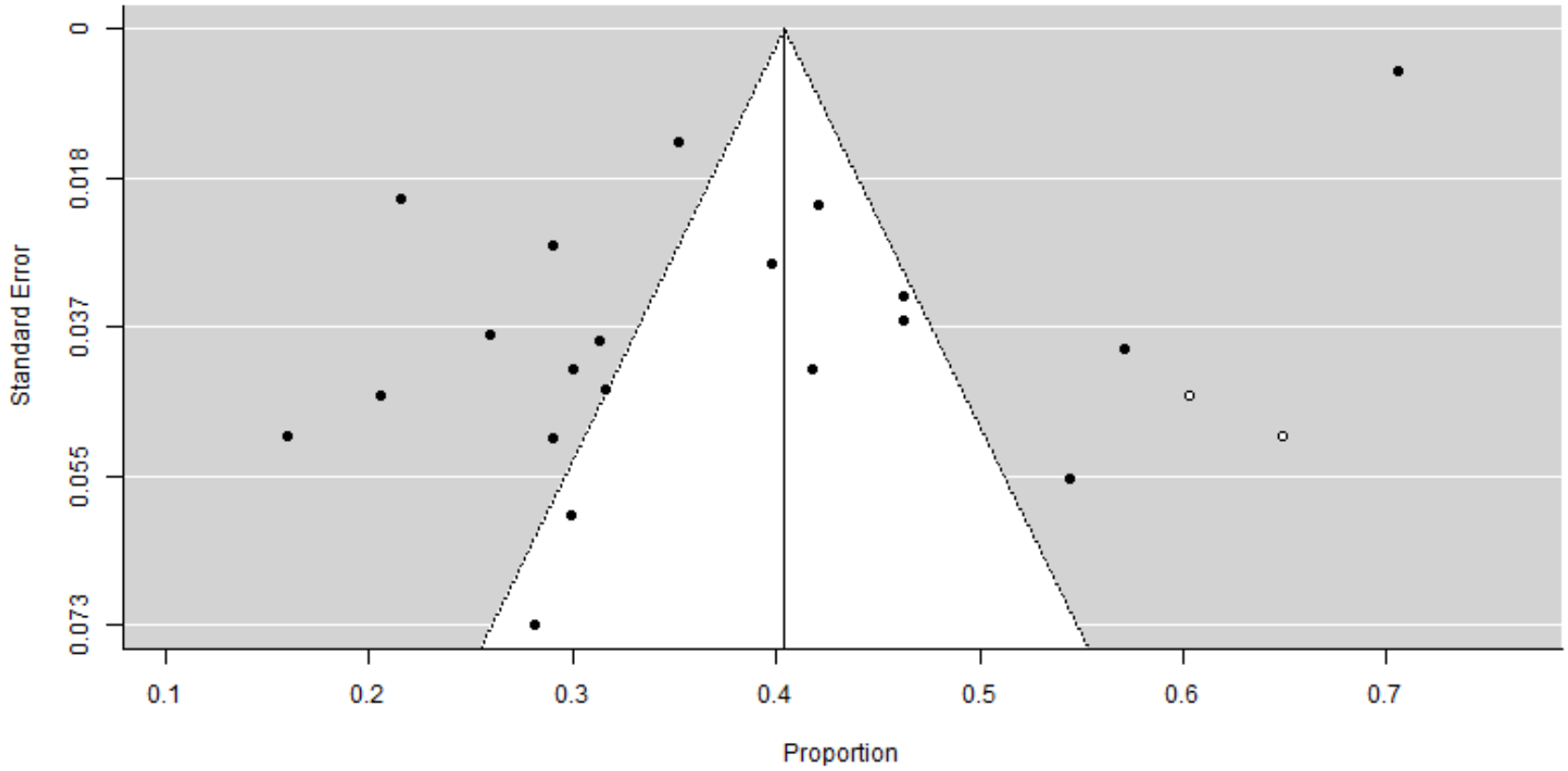
Appendix W. Study 1: Baujat chart of victimisation odds ratio



Appendix X. Study 1: Baujat chart of mental health difficulties prevalence



Appendix Y: Mental health difficulties prevalence funnel plot



Appendix Z: Study 2: Personal reflexivity and rapport building

During recruitment, I was in contact with all participants and interested individuals. At this point, it was explained that this research was part of a programme of PhD research to understand self-harmful thoughts and behaviours among LGBTQ+ young people. I aimed to ensure that participants were comfortable speaking to me prior to the interviews by speaking in layman language, emphasising my flexibility around their schedules, and highlighting how I appreciated their input to this study.

Discussing sexual orientation and gender identity can be highly sensitive topics, particularly when these topics are considered alongside experiences of self-harm. In this regard, it was important to reflect on the use of language within the interviews, which was discussed with the LGBTQ+ advisory group. It was evident that avoiding language which could be offensive was crucial; for example, when asking demographically about gender, clarity was required about pronouns, assigned gender at birth and gender identity. The participant's preferred pronouns were always used to help individuals feel that their identity was acknowledged and accepted. Participants were encouraged to use their own terminology around sexual orientation and gender, as well as the language used to describe their self-harm and/or suicide experiences. With regards to self-harm, this was important to ensure that participants did not feel invalidated.

I positioned myself firmly as an LGBTQ+ ally, without disclosing my own sexual orientation or gender identity. This was to ensure that participants felt comfortable to share their experiences with me while also not alienating them by evidencing that we may have had different sexualities. However, I am a cisgender woman, and we did have more cisgender LGBTQ+ woman in this study. Potentially this is related to these participants identifying with me to an extent and may have influenced recruitment. In

conversations, participants would occasionally mention LGBTQ+ societies, Pride events, clubs or pop culture which I am aware of and have often attended or viewed. I found this often enhanced our dynamic as participants were keen to discuss aspects which were considered a shared experience. One such conversation was a brief interlude between in-depth descriptions of a suicide attempt, where a participant and I discussed the current season of Drag Race UK. This enabled me to continue building rapport with participants throughout our interview.

I have personal experience of self-harm. This has had some influence on my interviewing style, as it is easier to understand when a participant is comfortable talking about their experiences and when they would rather not share something. While my history was not disclosed directly to participants, some verbal invitations by participants elicited responses of acknowledgement. Potentially, this may have led to further disclosure by these participants due to a shared identity.

Appendix AA: Study 2: Interview philosophical standing

Following the philosophical standing of this thesis, I used a relativist approach. Specifically for this study, when collecting and analysing data I also held a subjective interpretive perspective. This allowed me to consider participants' experiences and their understanding of the meaning behind their self-harmful thoughts and behaviours in a flexible manner. This considers these experiences of self-harm within the individuals' context and their interpretation of what was influential to their own self-harmful thoughts and experiences. It also allows consideration to potential biases or influences which I as the researcher and interviewer may have had.

Appendix BA: Study 3: Introductory letter to participant GP

Institute for Mental Health

School of Psychology

University of Birmingham

Birmingham, B15 2TT

DATE

Dear Dr. [surgery name]

I am writing to inform you that one of your patients, [participant name], is taking part in a prospective mental health study with the Institute of Mental Health, University of Birmingham. This study tracks an individual's mental health and wellbeing over a period of 7-days. We just wanted to let you know that in the case of an emergency, where the individual is in crisis, we will inform you by phone call.

If you have any questions, please feel free to call me at [phone number] or email me at a.williams.10@pgr.bham.ac.uk.

Many thanks

Yours sincerely,

A. Jess Williams

Researcher: A. Jess Williams

Email: [redacted]

Telephone: [redacted]

Postal Address: Office 304

Institute for Mental Health

School of Psychology,

University of Birmingham,

52 Pritchatts Road,

B15 2SA

Supervisor: Dr Maria Michail

Email: [redacted]

Telephone: [redacted]

Postal Address: Institute for Mental Health

School of Psychology,

University of Birmingham,

52 Pritchatts Road,

B15 2SA

Appendix CA: Study 3: Basic transcript of wellbeing check - risk assessment phone call

Hello [participant name], it's Jess calling from the University of Birmingham as part of the LGBTQ+ ESM study.

I'm calling regarding your latest response to the ESM survey which asked about suicidal thoughts and self-harm.

As we discussed at the start of the study, I check everyone's data once a day to check for risk and compliance.

I noticed you said you were having very burdensome thoughts about suicide and had self-harmed. I'm really sorry you were feeling that way.

- How are you feeling currently?
- Do you feel like you might hurt yourself today?
- Can I ask if you've made any specific plans to act on these suicidal thoughts? (e.g. how, where, when)
    - If yes: inform that will need to contact their GP, supervisor (and emergency services, if appropriate).
    - If no: continue without breaching confidentiality

Could we go through a brief safety planning tool together please? This can be used as a reminder of warning signs for distress and supports which could be used during a crisis. (Safety Plan Template – Brown & Stanley, 2012; Appendix P).

I'm really sorry you were having a tough time last night. Please remember that if you feel distressed you can call the Samaritans at anytime (116 123) or get in touch with your GP to discuss your mental health. Remind here that they can withdraw at any point and without giving a reason.

Thank you for talking to me. I'll only be in touch again during the ESM-period if you have responded that you are having a particularly difficult time with suicidal thoughts and self-harm. Otherwise, I will talk to you soon! Thank you again for taking part, I really appreciate it.

In the event a participant does not answer the phone; email

Dear [participant name]

This is Jess, PhD researcher from University of Birmingham. I've been in contact with you regarding the ESM LGBTQ+ study which you're currently undertaking.

From your responses, I can see you're having a really difficult time right now. As per our process, which is in the information sheet I provided at the start of the study and we discussed in our chat, I tried to ring you for a wellbeing check earlier. This will have appeared as "Unknown Caller". I understand you may not want or be able to talk to me at the moment, but I just want to check that you're okay.

Would you be able to let me know that you are okay please by emailing back? This is really important.

If I don't hear from you, I'll give you a ring tomorrow to check on your wellbeing.

Thank you for your time, hope you're okay.

Cheers

Jess

Appendix DA: Study 3: Immediate risk: Call to GP Service

Dear [name of GP]

My name is Jess Williams and I ama PhD researcher from the Institute of Mental Health, University of Birmingham.

I am calling you today regarding a patient registered with your practice, [participant name]. This person is currently participating in a mental health study at the University of Birmingham funded by Economic and Social Research Council.

We sent you a letter recently to inform you of their participation. However, it has come to our attention that they are struggling with suicidal thoughts and at risk of hurting themselves. I have talked with [participant name] and they are aware that I am contacting you with this information. Would you be able to reach out to them or potentially arrange an appointment with them to discuss how they are feeling? I have also signposted them to the Samaritans helpline as well.

We just wanted to ensure that you are aware of [participant name]'s situation. I will also be sending a letter with the details of this phone call in.

Many thanks for all your help.

Appendix EA: Study 3: Immediate risk: Letter to GP Service

Institute for Mental Health

School of Psychology

University of Birmingham

Birmingham, B15 2TT

DATE

Dear Dr. [name], [surgery name]

I have previous written to you regarding patients, [participant name], who is taking part in a prospective mental health study with the Institute of Mental Health, University of Birmingham.

I have called you to let you know that your patient is currently struggling with very burdensome suicidal thoughts and are at risk of seriously hurting themselves. As mentioned in the phone call we have shared helplines with them, asked them to seek medical and mental health support, and if appropriate been in touch with the emergency services. We would also really appreciate it if you could arrange an appointment with them as well.

This letter is to reconfirm this information with you and for your records.

If you have any questions, please feel free to call me at [phone number] or email me at [redacted]

Many thanks

Yours sincerely,

A. Jess Williams

Researcher: A. Jess Williams

Email: [redacted]

Telephone: [redacted]

Postal Address: Office 304

Institute for Mental Health

School of Psychology,

University of Birmingham,

52 Pritchatts Road,

B15 2SA

Appendix FA: Study 3: ESM items

Newly developed items indicated by red lettering.

Social context & experiences – measures from SIGMA (apart from red)
Branching question asked 6 times a day
Frequency of following questions related to participant choice through out day

1. Who is with me? **(Branching question – nobody or contact with others)**
   List: family, extended family, friends, other peers, teachers, unknown people or nobody

1.1 If nobody:

1. I find being alone pleasant: 1 (not at all) - 7 (very much)
2. I want to be alone: 1 (not at all) - 7 (very much)
3. I feel like an outsider: 1 (not at all) - 7 (very much)
4. I would prefer to have company: 1 (not at all) - 7 (very much)

1.2 If in contact with others: (Branching question – online or physically with others)

1. I am in contact with others online (e.g. gamechat, game play, instragam, discord, Facebook messenger)
   yes - no

If yes e.g. online:

1. We are doing something together: 1 (not at all) - 7 (very much)
2. I feel comfortable in this company: 1 (not at all) - 7 (very much)
3. I feel valued in this company: 1 (not at all) - 7 (very much)
4. I belong with the people I am interacting with : 1 (not at all) - 7 (very much)
5. I would like to be in virtual contact with different people: 1 (not at all) - 7 (very much)
6. This is my choice to be with these people: 1 (not at all) - 7 (very much)
7. I feel like an outsider: 1 (not at all) - 7 (very much)
8. **I feel as though the people I am with support me: 1 (not at all) - 7 (very much)**
9. **I feel as though the people I am with accept that I am LGBTQ+: 1 (not at all) - 7 (very much)**

If no e.g. physically with others:

1. We are doing something together (talking, studying, playing, etc): 1 (not at all) - 7 (very much)
2. I feel comfortable in this company: 1 (not at all) - 7 (very much)
3. I feel valued in this company: 1 (not at all) - 7 (very much)
4. I belong: 1 (not at all) - 7 (very much)
5. I would rather be alone: 1 (not at all) - 7 (very much)
6. **I feel as though the people I am with support me: 1 (not at all) - 7 (very much)**
7. **I feel as though the people I am with accept that I am LGBTQ+: 1 (not at all) - 7 (very much)**

Mental health – measures from SUPREME CORT (gad-7 + phq-9)

All questions asked 6 times a day

1. feeling nervous, anxious or on the edge: 1 (no burden at all) – 7 (a lot of burden)
2. not being able to stop or control worrying: 1 (no burden at all) – 7 (a lot of burden)
3. worrying too much about different things: 1 (no burden at all) – 7 (a lot of burden)
4. trouble relaxing: 1 (no burden at all) – 7 (a lot of burden)
5. being so restless that it is hard to sit still: 1 (no burden at all) – 7 (a lot of burden)
6. becoming easily annoyed or irritable: 1 (no burden at all) – 7 (a lot of burden)
7. feeling afraid as if something awful might happen: 1 (no burden at all) – 7 (a lot of burden)

8. Since the last beep, I have had little interest or pleasure in doing things: 1 (no burden at all) – 7 (a lot of burden)
9. feeling down, depressed, or hopeless: 1 (no burden at all) – 7 (a lot of burden)
10. trouble falling or staying asleep, or sleeping too much: 1 (no burden at all) – 7 (a lot of burden)
11. feeling tired or having little energy: 1 (no burden at all) – 7 (a lot of burden)
12. poor appetite or overeating: 1 (no burden at all) – 7 (a lot of burden)
13. feeling bad about yourself — or that you are a failure or have let yourself or your family down: 1 (no burden at all) – 7 (a lot of burden)
14. trouble concentrating on things, such as reading the newspaper or watching television: 1 (no burden at all) – 7 (a lot of burden)
15. moving or speaking so slowly that other people could have noticed? or the opposite — being so fidgety or restless that you have been moving around a lot more than usual: 1 (no burden at all) – 7 (a lot of burden)
16. thoughts that you would be better off dead or of hurting yourself in some way: 1 (no burden at all) – 7 (a lot of burden)

Minority stress experiences & identity
All questions asked 6 times a day

1. **I feel confident as my LGBTQ+ identity: 1 (not at all) - 7 (very much)**
2. **I can be my authentic self: 1 (not at all) - 7 (very much)**
3. **I am happy with my LGBTQ+ identity: 1 (not at all) - 7 (very much)**

4. **I resent being LGBTQ+: 1 (not at all) - 7 (very much)**
   1 (not at all) - 7 (very much)
5. **I need to hide that I'm LGBTQ+: 1 (not at all) - 7 (very much)**
   1 (not at all) - 7 (very much)
6. **I wish I wasn't LGBTQ+: 1 (not at all) - 7 (very much)**

7. **Since the last beep, I have experienced someone being mean or behaving negatively directly towards me because I am LGBTQ+ (e.g. bullying, harassment, discrimination)**
   Yes – no

- **This has distressed me: 1 (not at all) - 7 (very much)**
- **If you would like to explain further, please use the space below to describe the experience [open text]**

8. **Since the last beep, I have witnessed or experienced someone being mean or behaving negatively towards LGBTQ+ people in general (e.g. use of slurs, expressing anti-LGBTQ+ beliefs)**
   Yes – no

   - **This has distressed me: 1 (not at all) - 7 (very much)**
   - **If you would like to explain further, please use the space below to describe the experience [open text]**

9. **I feel like people have misgendered me: 1 (not at all) - 7 (very much)**

   - **Being misgendered has distressed me**
     1 (not at all) - 7 (very much)

10. **Since the last beep, I have been experiencing gender dysphoria: 1 (not at all) - 7 (very much)**

    - **Gender dysphoria has been distressing me**
      1 (not at all) - 7 (very much)

Self-harm and suicide (once a day/last beep of the day) -measures from SIGMA

Questions asked once a day (last prompt of day)

1. Have you considered harming yourself today?
   1 (not at all) - 7 (very much)

2. During these self-harm thoughts, how much did you wish to end your life?
   1 (not at all) - 7 (very much)

3. Have you actually harmed yourself on purpose by injuring yourself, hurting yourself, or poisoning yourself?
   yes – no

   - **If yes: signposting text**
   - If you would like to explain further, please use the space below to describe how you were feeling, what may have caused you to self-harm, how you're feeling now
     [open text]

Appendix GA: Study 3: Interview schedule

Introduction

Thank you for taking part in the LGBTQ+ ESM study. I really appreciate your contribution to the project and time taken to engage with the study.

I just wanted to have a brief discussion with you about how you felt about the ESM-study, this will probably take 20-30 minutes.

You are free to withdraw at any point during this interview and can withdraw your data for 14 days following – just send me an email and let me know.

Please feel free to answer as truthfully as possible. It's important we get your real thoughts and feelings about how the study was designed and conducted.

Questions

1. How do you feel having taken part in this study?
   Prompt: would you take part in another ESM study? Why?
   Alternative if drop out: Why did you want to leave the study?

2. What were your thoughts on the mEMA app?
   Prompt: How easy or difficult did you find it using the app?

3. What are your thoughts on questions which asked about your social experiences, stressors relating to being LGBTQ+, and your mental health?
   Prompt: How important do you these topics were to you? What do you think would have been more relevant? How do you feel being asked 6 times a day?

4. What do you think helped you to engage with this study?

5. What things do you think acted as barrier to you engaging with this study?

6. Can you describe what aspects of the study (if any) that you found most useful and least useful?

7. Do you think this study impacted your mood, self-harm, or suicidal thoughts at all? Could you describe this please?

8. How has this study interacted or potentially interfered with your daily activities, routine, habits?
   Prompt: Was it easy to integrate with your life? What was easy? What was difficult?

9. Do you have any other thoughts that you'd like to share regarding the study?
   Prompt: how do you think we could improve it? What would you have done differently?

Thank you so much for taking part. It's been really useful to hear your thoughts and opinions on the study and thank you for taking part in the initial steps of this study.

Is there anything you would like to ask me before we finish?

Appendix HA: Study 3: Overview of participant adherence; Adherence to total ESM survey adherence and ESM group adherence; range, percentage, mean and standard deviations

P#	Range of survey responses per day	Total survey adherence completed N (%)	Average number of surveys responded to per day M (SD)	Completed *self-harm* items in surveys N (%)	Completed *social context* items in surveys N (%)	Completed *mental health* items in surveys N (%)	Completed *identity and minority stressor* items in surveys N (%)
P1	5-6	40 (95.2)	5.7 (0.5)	6 (85.7)	34 (81.0)	39 (92.9)	40 (95.2)
P2	2-6	33 (78.6)	4.7 (1.6)	5 (71.4)	33 (78.6)	33 (78.6)	33 (78.6)
P3	0-6	25 (59.5)	3.6 (2.1)	4 (57.1)	25 (59.5)	25 (59.5)	25 (59.5)
P4	2-6	33 (78.6)	4.7 (1.7)	4 (57.1)	29 (69.0)	31 (73.8)	31 (73.8)
P5	2-5	26 (61.9)	3.7 (1.1)	6 (85.7)	26 (61.9)	26 (61.9)	26 (61.9)
P6	4-6	35 (83.3)	5.0 (0.8)	5 (71.4)	33 (78.6)	35 (83.3)	35 (83.3)
P7	2-4	21 (50.0)	3.0 (0.6)	3 (42.9)	21 (50.0)	21 (50.0)	21 (50.0)
P8	5-6	36 (85.7)	5.1 (0.4)	7 (100.0)	34 (81.0)	34 (81.0)	34 (81.0)
P9	1-5	18 (42.9)	2.6 (1.3)	4 (57.1)	18 (42.9)	18 (42.9)	18 (42.9)
P10	2-5	24 (57.1)	3.4 (1.1)	6 (85.7)	23 (54.8)	23 (54.8)	23 (54.8)
P11	0-3	13 (31.0)	1.9 (1.1)	3 (42.9)	13 (31.0)	13 (31.0)	13 (31.0)
P12	2-5	25 (59.5)	3.6 (1.0)	6 (85.7)	25 (59.5)	25 (59.5)	25 (59.5)
P13	3-6	34 (81.0)	4.9 (0.9)	6 (85.7)	34 (81.0)	34 (81.0)	34 (81.0)
P14	2-5	23 (54.8)	3.3 (1.1)	4 (57.1)	22 (52.4)	21 (50.0)	21 (50.0)
P15	4-6	38 (90.5)	5.4 (1.0)	6 (85.7)	30 (71.4)	36 (85.7)	37 (88.1)
P16	3-6	30 (71.4)	4.3 (1.4)	4 (57.1)	20 (47.6)	23 (54.8)	25 (59.5)

Appendix IA: Study 3: Full write-up of themes 2-4

JA.1. Practicalities of the ESM surveys

The second theme presents the participants' opinions of the overall survey and app itself. For most participants aspects related to the ESM surveys facilitated their engagement with the study; specifically the speed and ease of the completing ESM surveys. Due to these facilitators, participants felt

that completing ESM surveys had very little impact on their daily lives. However, there was a one element which acted as barrier for some participants: the notification system.

JA.1.1. Quick, easy, and minimal impact

All participants mentioned that the ease of responding to the ESM surveys was a facilitator to their engagement with the study. A key aspect was that the surveys were short and therefore quick to complete, which had little impact to the participants' activities; *"… because it's just such a small snapshot and it takes so little time, you sort of do it and then you forget about it until you've got the next one to do, because it's so quick that it doesn't impact what you're doing…"* (P1, bisexual/demisexual, cisgender woman).

"…even like in the evening when I was doing stuff, it didn't really break it up and I was like oh I'll just quickly do that, because it was only 2 minutes. Like a song is what? 3 minutes on average, 4 minutes, maybe like half a song, that's really no time at all. Half a song is nothing. It didn't feel intrusive to me." (P2, gay, cisgender man).

ESM surveys were distributed through the mEMA app and accessed through personal phones; participants felt this made completing surveys easy. One participant reflected on how using an app rather than email, meant that there was less burden on the participant to remember to engage with the study; *"…using a phone app is definitely a good way to collect the data rather than just having something be like "please remember to fill in this form and email it to me X times per day", that's, it's a good method…"* (P9, gay, cisgender man).

Participants did not feel that completing the ESM surveys was invasive, and the surveys had little impact on their wellbeing; *"It was [pause] I don't know, fine to do? [laugh] That sounds really weird like, but it wasn't stressful or felt overly invasive or anything."* (P15, lesbian, cisgender woman). Due to the

minimal impact of the study, it was encouraging that many participants mentioned how they would be happy to engage in other ESM studies; *"I mean yeah, it fitted into my life quite easily. It wasn't really taking much time out of my day so I would be interested in doing other similar things."* (P8, bisexual, cisgender woman).

JA.1.2. Notification system error

A small number of participants experienced errors with the mEMA app's notification system. For some this was that the app failed to present survey notifications. This meant that the participant had to actively go onto the app, find their survey schedule for the day and make their own alert system; *"…so it wouldn't actually send me the notifications. So when I woke up I would literally have to check what the times were and set an alarm for each of them."* (P12, queer, questioning).

However, for others if they had completed the survey, the two additional notification reminders would continue. This was mentioned as annoying; *"The thing is because it keeps notifying me even when I've done it, like buzz. And I'm like I've already done! Buzz, I've already done it! [laugh] To the app!"* (P10, gay, transgender man). Another participant found that the notification not automatically being dismissed meant that he wasn't sure whether the current notification was new or a previous survey. This led to him missing survey notifications as he ignored further notifications.

"…the technical problem I told you about where it wouldn't automatically clear the notification after the window has expired. I remember, especially because it didn't clear automatically, I had to manually do that so I only ever got the erm, self-harm end of the day survey I think twice…" (P9, gay, cisgender man).

These notification errors, combined with the observational data which indicated a survey logic break for some participants (no branching questions), highlight a key barrier within this study. Aspects of the mEMA app appear to be unsuitable for study use.

JA.2. Daily timeframe

The third theme concerns the primary barrier to engagement. This was the daily timeframe of 8:00-22:00 during which all ESM surveys were sent. This was related to most of the participants taking part during their summer holidays, as often they did not have specific daily schedules and therefore, they had variable sleeping patterns. Many felt that the surveys would start too early in the morning and end too early in the evening. It was suggested that participants had a personalised timeframe in future studies.

JA.2.1. Missing morning notifications

Several participants highlighted within their interviews that they struggled to complete the surveys in the morning. This was related to participants waking up later on days when they did not have any scheduled plans such as work; *"I mean it was alright on the days I was in work because I get up early then but on the days I don't I missed them, because like I woke up at like 2. [laugh]"* (P12, queer, questioning).

"…I mean it was a bit hard to get all 6 erm, all 6 of the questionnaires in each day. Especially since my sleep schedule is absolute carnage, so I'll often sleep in until about 11 and see I've missed a erm, [pause] I've missed my morning surveys…" (P9, gay, cisgender man).

This acted as a barrier as 1-3 of the surveys could be presented before the participants were awake. Therefore, the number of responses was greatly reduced simply by the young person missing their notifications by being asleep.

JA.2.2. "Negative thoughts more come at night"

A further barrier of the timeframe was that participants felt that 22:00 was too early to capture their self-harm behaviour; *"…with me I go to bed fairly late so by the time it asked that [self-harm] if*

something happened it wouldn't have reflected anything." (P6, bisexual, cisgender woman). This indicates self-harm may not be captured by the final survey of the day which was distributed randomly between 20:00-22:00 each day.

"…so a lot of these intrusive thoughts aren't really into my head at that moment. It tends to come at night, so I feel if you had asked me during the nighttime, although I know that's not a normal procedure to ask during the night, but I felt like it would have triggered more of a response from me [filling in surveys]." (P4, bisexual, cisgender woman).

Therefore, this study may not have captured all self-harm, as participants may have gone on to engage with these behaviours but not recorded this in the next day's survey. This builds into the specifications of how participants categorise their day, either midnight to midnight or their waking to sleeping period.

JA.2.3. Personalised timeframe

To combat timeframe barriers, participants suggested having a personalised timeframe*; "…I think if there was more of a flexibility […] if you could choose which hours you'd be more likely to fill stuff in from."* (P9, gay, cisgender man). This would be adjusted around participants' lifestyles; *"…the 8am all the way through maybe having it so many someone could put in their own timings, so say they have their own wake up and sleep. Say if they work night shifts then being able to adjust it for their own erm cycle."* (P3, pansexual, non-binary).

One participant suggested that instead of just having a start and end time for each day, being able to block out specific time periods would be helpful when he was in college; *"That sort of thing, like having a timescale when it can asked but outside of that timescale don't ask because I'm busy."* (P10,

gay, transgender man). Given the population of this ESM survey, this is an interesting suggestion for future studies to work around school, college, or university hours.

JA.3. Suggestions for a future study

The final theme presents the participants' reflections on the relevance of ESM questions and their perceptions of how to improve the survey for future studies. These suggestions were related to tailoring the ESM survey for gender identity, a further line of questioning regarding self-harm, and a procedure in place for participants who miss survey notifications or wish to offer further context for their own mood and self-harm.

JA.3.1. Streamlining ESM items

Some participants discussed changes to the ESM items. These changes focused on; i) separating cisgender and gender diverse ESM questions; and ii) including in-depth self-harm questions. Firstly, several cisgender participants discussed how ESM items relating to misgendering and gender dysphoria were less relevant to them; *"I'd say the only thing that wasn't useful was asking about gender dysphoria. […] slightly tailor the questions to the individual. So if someone doesn't have gender dysphoria don't include those questions…"* (P1, bisexual/demisexual, cisgender woman). Some participants felt that removing these questions would save them time as they responded to each set of these questions the same. It was suggested that if at baseline assessment, someone stated that they are cisgender, they would not be presented with these questions.

However, a small number of cisgender participants found that these questions might be useful to capture any fluctuations in how they felt about their gender identity; *"…I feel like when gender dysphoria yeah sometimes I would answer like second to least one yeah, because like I'm not really struggling with it but I'd be like oh I'd have thoughts about it…"* (P7, bisexual, cisgender woman). It was suggested that

tailoring ESM surveys to recognise gender identity more closely would be useful. However, dismissing these items by someone identifying as cisgender would miss some nuances of gender identity.

Secondly, several participants suggested changes to ESM items concerning self-harm. Given the precautions around self-harm items and the consideration of how frequently these were presented, participants mentioned that having more in-depth self-harm items would have benefits. One suggestion was to consider impulsivity, as this was personally associated with engaging self-harm behaviour among some participants; *"….it might have been quite helpful to ask about compulsive behaviours, if there were any compulsive behaviours or any impulsive decisions or something like that…"* (P6, bisexual, cisgender woman). This was recognised by participants as influential for moving from ideation to behaviour.

Another suggestion was distinguishing between someone actively self-harming and passively being injured. This was considered as a form of self-harm but potentially less directive or intentional. One of the participants who had endorsed self-harm within the 7-day ESM assessment mentioned that they were more likely to passively hurt themselves than actively self-harm.

"…there was an option for have you deliberately hurt yourself. But there wasn't an option for have you deliberately not got out of the way of harm. Which is like, not protecting yourself but not quite hurting yourself sort of thing, which I feel like might apply to people more. Because I know like if I'm frustrated or upset with myself, I'm less likely to go out of the way to protect myself from something bad happening."

(P10, gay, transgender man).

Finally, one participant suggested that an ESM item considering the severity of self-harm should be included. This was suggested to distinguish between self-harm behaviours which might trigger the safeguarding procedure, rather than considering self-harm behaviour in conjunction with suicidal

intention scores. This participant reasoned that by including this topic, researchers would be notified if someone had severely injured themselves, despite having low suicidal ideation.

"So when it comes to questions like that like it needs to be more a severity thing because when it comes to it, I mean, like for instance snapping a band that is a form of self-harm. Well cut for me, cutting my leg. […] Because I mean sometimes we get stuck in our own head that we don't actually realise how badly we numb ourselves out and then cut and then it's like oh that's a bit deeper than I wanted it." (P3, pansexual, non-binary).

JA.3.2. System changes and additional context

The final suggestion was including a system which would allow participants to report their experiences, mood, thoughts and feelings if they missed several surveys in one day. This would act as a reference for a chunk of time so that they had some data for the day; *"…like maybe if you miss a couple [surveys] it would be good to be like "hey this one [survey] is kind of going to be open until you do it" to kind of compensate for the ones you've missed maybe."* (P2, gay, cisgender man). While this would not offer the same specific real-time data, it may aid engagement with the study. However, this could also cause participants to be less motivated to respond to each survey as they knew there was a back-up system in place.

Similarly, some participants discussed having a system in which they could provide context for their overall day. They indicated that this would be helpful for their own self-reflection to understand what had happened to cause low mood or self-harmful thoughts and behaviours that day but could also be useful for research. This system could also potentially capture experiences which were influential outside of the ESM items asked.

"And I think the only other thing is sometimes I wanted at the end, at the end of any of the questionnaires for there to be like any other further context – so it's like being able to put in a star erm if I've put really bad, oh I feel awful. Being able to put a little comment box at the end, oh I had a really bad argument. Just for myself looking back or anyone who wanted to look at it. It's got some context for why I suddenly went like dipped really badly or you know if someone had said something misgendering or whatever, being able to put that in. "Oh so and so said this, and it made me upset" sort of thing would have been nice. Just to add an extra comment, just for myself even." (P10, gay, transgender man).

Appendix LA. Study 3: Overview of participants' ESM descriptive results

Table LA.1.

Descriptive of daily changes within and between participants; self-harm thoughts and behaviours, depression, anxiety, LGBTQ+ perceptions, microaggressions and related distress.

P#	Self-harm behaviour (Y/N)	Self-harm ideation	Suicidal ideation	Depression (PHQ-9) (M)	Anxiety (GAD-7) (M)	Identity perception (M)	Witnessed discrimination (Y/N)	Distress score relating to witnessing (M)	Experienced discrimination (Y/N)	Distress score relating to experience (M)	Misgender (M)	Distress relating to misgendering (M)	Gender dysphoria (M)	Distress relating to gender dysphoria (M)
Day 1														
P1				22.60	17.60	23.20	N		N		1.00	1.00	1.00	0.00
P2	N	2	1	20.50	20.83	31.00	N		N		1.00	1.00	1.00	0.00
P3	N	1	1	48.17	41.00	35.00	N		N		4.67	4.17	1.33	0.44
P4				23.40	19.20	16.20	N		N		1.00	1.00	1.00	0.00
P5				28.00	17.50	18.00	Y	5	N		4.00	2.50	4.00	1.00
P6	N	3	1	22.00	13.67	24.17	Y	4	N		1.00	1.00	1.00	0.00
P7	N	2	2	36.67	25.33	18.33	Y(2)	6	N		1.00	1.00	1.33	0.00
P8	N	3	2	17.50	28.00	27.75	N		N		0.80	0.80	0.80	0.32
P9				23.00	8.00	28.20	N		N		1.00	1.00	1.00	0.00
P10	N	2	2	21.67	12.67	34.00	N		N		0.75	0.75	3.00	1.50
P11	N	2	1	22.50	20.50	33.00	N		N		1.00	1.00	1.00	0.00
P12	N	5	4	39.00	21.25	17.25	N		N		3.00	4.00	6.00	0.38
P13	N	1	1	13.40	14.00	22.00	N		N		1.00	1.00	1.00	0.00
P14				15.33	15.33	27.00	N		N		0.75	0.75	0.75	0.38
P15	N	3	1	27.67	24.00	24.50	Y	5	N		1.00	1.00	1.00	0.00
P16				42.33	28.33	18.33	Y	4	N		1.00	1.00	1.00	0.00
Day 2														
P1	N	2	2	25.83	21.17	22.50	N		N		1.00	1.00	1.00	0.00
P2	N	4	1	17.67	21.00	31.33	N		N		1.00	1.00	1.00	0.00
P3				27.80	25.60	35.00	N		N		1.00	1.00	1.00	0.00
P4	N	1	1	27.83	20.80	17.50	Y	5	N		1.17	1.00	1.00	0.00
P5	N	3	1	33.40	22.80	18.40	N		N		5.40	5.20	2.60	0.48
P6	N	2	1	18.17	14.50	25.17	Y	6	N		1.00	1.00	1.00	0.00
P7	N	1	2	27.50	24.75	16.75	N		Y	6	1.00	1.00	1.00	0.00
P8	N	1	1	15.17	16.00	31.20	N		N		0.83	0.83	0.83	0.28
P9	N	1	1	15.00	7.00	28.00	N		N		1.00	1.00	1.00	0.00

P10	N	1	1	18.00	9.67	33.33	N		N		1.00	1.00	4.67	0.44
P11	N	5	3	25.00	30.00	34.50	N		N		1.00	1.00	1.00	0.00
P12	N	7	5	49.20	17.00	16.20	N		N		2.80	4.60	6.40	0.64
P13				9.00	7.33	24.00	N		N		1.00	1.00	1.00	0.00
P14	N	1	1	9.25	7.25	25.25	N		N		0.80	0.80	0.80	0.32
P15	N	3	1	33.83	22.67	25.50	N		N		1.00	1.00	1.00	0.00
P16	N	5	4	40.50	34.67	19.67	N		N		1.00	1.00	1.00	0.00
						Day 3								
P1	N	3	3	27.00	22.80	22.00	N		N		1.00	1.00	1.00	0.00
P2				15.67	17.00	31.00	N		N		1.00	1.00	1.00	0.00
P3				33.33	24.67	31.67	Y	7	Y	7	3.00	3.00	3.67	0.44
P4	N	1	1	26.67	31.67	19.33	N		N		1.00	1.00	1.00	0.00
P5	N	4	1	37.00	23.33	17.67	N		N		4.67	5.00	2.33	0.67
P6				19.60	11.40	25.20	N		N		1.00	1.00	1.00	0.00
P7				35.50	27.00	15.50	N		Y	4	1.00	1.00	1.00	0.00
P8	N	1	1	15.25	13.00	24.00	N		N		1.00	1.00	1.00	0.00
P9				16.50	7.00	35.00	N		N		1.00	1.00	1.00	0.00
P10	Y	7	5	49.00	37.00	25.50	N		N		2.50	3.00	5.00	1.00
P11				13.33	15.67	34.00	N		N		1.00	1.00	1.00	0.00
P12				39.75	20.25	10.50	N		N		3.25	5.50	6.75	0.00
P13	N	1	1	12.80	10.20	25.00	N		N		1.00	1.00	1.00	0.00
P14	N	1	1	19.67	11.00	26.00	N		N		1.33	1.00	1.00	0.00
P15	N	4	1	42.20	25.20	23.00	N		N		1.00	1.00	1.00	0.00
P16	N	6	5	40.67	35.00	18.75	N		N		1.00	1.00	1.00	0.00
						Day 4								
P#	Self-harm behaviour (Y/N)	Self-harm ideation	Suicidal ideation	Depression (PHQ-9) (M)	Anxiety (GAD-7) (M)	Identity perception (M)	Witnessed discrimination (Y/N)	Distress score relating to witnessing	Experienced discrimination (Y/N)	Distress score relating to experience	Misgender (M)	Distress relating to misgendering (M)	Gender dysphoria (M)	Distress relating to gender dysphoria (M)
P1	N	4	3	26.00	23.25	23.80	N		N		1.00	1.00	1.00	0.00
P2	N	1	1	23.50	16.50	33.50	Y	7	N		1.00	1.00	1.00	0.00

P3	N	1	1	29.50	20.00	35.00	N		N		1.50	2.00	3.00	0.50
P4	N	1	1	29.00	25.80	19.17	N		N		1.00	1.00	1.00	0.00
P5	N	6	2	38.40	26.60	19.20	Y	6	Y	4	4.80	4.00	3.20	0.88
P6				19.50	17.75	25.50	N		N		1.00	1.00	1.00	0.00
P7				32.33	21.00	20.00	N		N		1.00	1.00	1.00	0.00
P8	N	1	1	13.80	14.80	20.60	N		N		1.00	1.00	1.00	0.00
P9	N	1	1	19.00	11.50	32.00	N		N		1.00	1.00	1.00	0.00
P10				45.00	28.50	24.50	N		N		1.00	1.00	4.00	0.00
P11				12.33	7.67	34.33	N		N		1.00	1.00	1.00	0.00
P12	Y	7	7	46.00	28.50	8.00	Y	1	Y	3	2.50	4.00	7.00	0.00
P13	N	1	1	17.40	10.60	26.40	N		N		1.00	1.00	1.00	0.00
P14	N	1	1	11.50	9.75	25.75	N		N		1.00	1.00	1.00	0.00
P15				29.75	19.00	25.25	N		N		1.00	1.00	1.00	0.00
P16				54.50	32.00	18.00	N		N		1.00	1.00	1.00	0.00
							Day 5							
P1	N	4	3	27.00	24.83	24.50	N		N		1.00	1.00	1.00	0.00
P2	N	1	1	38.80	18.80	32.60	N		N		1.00	1.00	1.00	0.00
P3	N	1	1	17.20	10.20	35.00	N		N		1.00	1.00	2.00	0.64
P4				39.33	34.33	13.25	Y	5	N		1.00	1.00	1.00	0.00
P5	N	2	1	36.75	26.00	21.75	N		N		4.25	3.75	3.50	1.00
P6	N	2	1	19.80	17.00	26.80	N		N		1.00	1.00	1.00	0.00
P7	N	2	2	38.00	20.67	19.67	Y(2)	4.5	N		1.00	1.00	1.00	0.00
P8	N	4	5	27.00	37.20	18.60	N		N		1.00	1.00	1.00	0.00
P9				26.00	10.00	30.00	N		N		1.00	1.00	1.00	0.00
P10	N	2	5	30.00	19.00	30.80	N		N		1.00	1.00	5.20	0.32
P11	N	1	1	24.00	21.00	34.00	N		N		1.00	1.00	1.00	0.00
P12	N	7	7	46.75	18.50	5.75	N		N		3.25	5.75	7.00	0.00
P13	N	1	1	10.40	9.20	21.20	N		N		1.00	1.00	1.00	0.32
P14				9.67	7.00	25.00	N		N		1.00	1.00	1.00	0.00
P15	N	3	1	24.17	18.17	25.17	N		N		1.00	1.00	1.00	0.00
P16	N	5	5	44.33	37.40	21.67	Y	3	N		1.00	1.00	1.00	0.00
							Day 6							

P1	N	3	3	28.33	24.67	34.50	N	N	1.00	1.00	1.00	0.00
P2	N	1	1	17.50	11.17	32.83	N	N	1.00	1.00	1.00	0.00
P3	N	1	1	13.50	7.00	35.00	N	N	3.75	2.50	1.00	0.38
P4	N	5	2	26.67	29.80	19.17	N	N	1.00	1.00	1.00	0.00
P5	N	3	2	36.75	30.00	18.00	N	N	3.75	3.50	3.75	1.00
P6	Y	7	2	20.75	20.50	25.00	N	N	1.00	1.00	1.00	0.00
P7				36.67	22.33	18.33	N	N	1.00	1.00	1.00	0.00
P8	N	7	1	14.50	16.50	20.00	N	N	1.00	1.00	1.00	0.00
P9	Y	1	1	24.67	9.33	27.00	N	N	1.00	1.00	1.00	0.00
P10	N	2	3	15.50	8.75	34.00	N	N	1.00	1.00	4.00	1.00
P11				19.50	14.50	34.00	N	N	1.00	1.00	1.00	0.00
P12	N	7	7	43.33	22.00	7.00	N	N	2.00	3.00	7.00	0.00
P13	N	1	1	28.20	15.00	27.80	N	N	1.00	1.00	1.00	0.00
P14	N	4	2	24.50	15.00	23.50	N	N	2.50	1.00	1.00	0.00
P15	N	3	1	28.50	20.00	23.75	N	N	1.00	1.00	1.00	0.00
P16	N	6	5	47.50	34.50	22.00	N	N	1.00	1.00	1.00	0.00
						Day 7						
P1	N	4	3	27.50	24.50	25.00	N	N	1.00	1.00	1.00	0.00
P2				19.80	21.80	32.00	N	N	1.00	1.00	1.00	0.00
P3							N	N				
P4				28.50	41.00	20.00	N	N	1.00	1.00	1.00	0.00
P5	N	3	2	36.00	28.67	22.67	N	N	5.00	4.33	4.00	0.44
P6	N	4	2	20.50	18.50	27.20	N	N	1.00	1.00	1.00	0.00
P7				37.67	22.33	18.00	N	N	1.00	1.00	1.33	0.44
P8	N	1	1	12.20	9.80	25.60	N	N	1.00	1.00	1.00	0.00
P9	N	2	3	28.00	13.50	29.50	N	N	1.00	1.00	1.00	0.00
P10	N	1	1	15.50	10.75	34.25	N	N	1.00	1.00	4.25	1.00
P11							N	N				
P12	N	7	7	44.00	24.00	12.67	N	N	2.33	2.67	7.00	0.00
P13	N	1	1	24.00	9.80	25.60	N	N	1.00	1.00	1.00	0.00
P14				18.50	15.00	22.00	N	N	1.00	1.00	1.00	0.00
P15	Y	5	1	31.25	24.25	25.00	N	N	0.83	0.83	0.83	0.28

P16	N	N	0.00	0.00	0.00	0.00

Appendix MA: Study 3: Open-text responses

MA.1. Responses to self-harm items

Of the 5 participants who self-harmed, 4 offered insights into their self-harm using the open-text response function. One explained that they had self-harmed but that this was following the last beep of the day, so aimed to ensure clarity across their data; *"I self harmed late last night yesterday well after the last bleep. Haven't self harmed today I'm fine now"* (P15, lesbian, cisgender woman). Another participant explained that they had been feeling low lately and that had brought on their self-harm; *"I've just been feeling terrible lately, and I think I'm developing a slight eating disorder. I'm currently ok, and safe, and im not at immediate risk to myself."* (P9, gay, cisgender man). Both participants clarified their wellbeing within the open-text responses. This could indicate that they were hoping to avoid safeguarding procedures or inform the researcher of their safety.

Alternatively, two participants who self-harmed had done so as a response to difficult interactions with others. One of these individuals had argued with their partner. Whereas the other had been "outed" by their friends causing distress and feelings of isolation.

"after a particularly bad argument in which i was injured, i had a panic attack and that always brings suicidal/self harm thoughts with it. i caused myself a small amount of deliberate harm by eating food that i am allergic to (all be it mildly) to give myself an unpleasant sensation. i am not at risk, just feeling bad" (P10, gay, transgender man).

"Had issue with friends - close friends - found out they were the ones who told everyone at school that i was bi & had to cut off the friendship - i never thought it be them - was so upset as i dont have many friends anyway" (P6, bisexual, cisgender woman).

Given that participants didn't often engage with self-harm behaviour, limited conclusions can be drawn from these responses. However, it does seem apparent that the areas of influence (social context, anxiety, depression) are indeed related to self-harm behaviour for some participants.

MA.2. Responses to LGBTQ+ related discrimination items

There were 16 instances when participants stated they had witnessed LGBTQ+ related discrimination; these were rated on average as somewhat distressing (M: 4.9; SD: 1.6). Similar levels of distress were reported when participants experienced the LGBTQ+ related discrimination themselves (M: 4.8; SD: 1.6). Direct discrimination was less frequent with only 5 events.

Participants were offered an open text response if they had witnessed or experienced LGBTQ+ related discrimination during the day. Several participants noted occurrences of witnessing discrimination which they found distressing. Often, these events took place online; *"mostly online"* (P16, pansexual, cisgender woman) or on social media *"Tik tok"* (P12, queer, questioning). Sometimes, participants were more specific as to what had happened; *"Again online, mostly religious Christians who believe it's a sin, doesn't distress so much, but frustrates me."* (P16, pansexual, cisgender woman).

"One of my favourite video games show a same sex couple (game: Life is strange) it makes me happy and makes me feel confident about being LGBTQ+, however someone on their twitter was being horrible about it and it was difficult for me to read as this video game helps me a lot! It is called Life is Strange."

(P6, bisexual, cisgender woman)

Participant 6 wrote about their distress as someone had insulted a video game which featured an LGBTQ+ couple. This representation had helped them to feel more confident in themselves, whereas when someone aggressively disliked this game, they found it difficult. Other participants mentioned

passively hearing negative commentary around LGBTQ+ people; *"Hearing about certain hate crimes against the LGBTQ+ community that has taken place not to long ago."* (P7, bisexual, cisgender woman).

One participant witnessed discrimination directed at a friend when they were on a night out; *"Friend got called a slur last night by strangers"* (P2, gay, cisgender man). While the open-text response offered little information, the participant also brought this event up in their post-ESM interview. They discussed how through the study, they realised that this event had had an impact to their own self-confidence relating to their sexual orientation.

Direct discrimination was reported by two TGD participants. One of these was continually misgendered by a staff member of a moving company. They disclosed that they felt the staff member was not respecting their gender identity which lead to high levels of distress.

"I was on the phone to a company to sort out my moving van. They person on the phone was very rude and kept calling me Miss and Ma'am even when I asked not to be called that due to my identity. They said Ma'am every sentence until I started crying" (P3, pansexual, non-binary)

The other participant experienced discrimination towards them from a family member multiple times during the study. Following the initial discriminatory event during the study period, the participant would simply state; *"my sister"*, in the response box. This suggested that discrimination within the home was a common event for this young person; *"my sister is homo/transphobic and often comments on the community in general knowing I am a part of it and it hurts everytime"* (P5, neptunic, non-binary).

From these responses, minority stressors in the form of indirect or direct discrimination is common among LGBTQ+ young people and can be very distressing. Therefore, it is plausible that these events may influence self-harmful thoughts and behaviours within this population. Future research is needed to determine the impact of these experiences in real-time.