Can the Integrated Motivational-Volitional Model of Suicidal Behaviour retrospectively differentiate between non-suicidal medically serious self-harmers, following hospital attendance, and those who attempt or die by suicide?

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Thesis Portfolio Abstract

Background

Self-harm and suicide are major public health issues, which are typically separated dichotomously, based on the presence or absence of suicidal intent, the frequency of self-harm and the severity of injuries sustained (American Psychiatric Association, 2013). However, literature suggests there are more discrete subgroups of self-harm that require further investigation. This has implications for theory and clinical practice. One such group is medically serious self-harm (MSSH), which has been defined as intentional self-harm, that is serious enough to require medical care within a general hospital (Breet & Bantjes, 2017).

Methods

The portfolio consisted of a systematic review and empirical paper. The systematic review explored the literature examining whether all instances of medically serious self-harm are attempts to end life, and the reasons for non-suicidal MSSH. The empirical paper explored whether motivational and volitional moderators from the Integrated-Volitional Model of Suicidal Behaviour (IMV, O'Connor & Kirkley, 2018), can retrospectively differentiate between those who enact hospital treated MSSH and those who attempt or die by suicide

Results

Eleven papers were identified and included in the systematic review. The systematic review found 49% of MSSH was enacted with suicidal intent, whilst 51% was not. Non-suicidal reasons fit within the dominant theory of non-suicidal self-injury, including coping with and regulating difficult internal emotional states, to stop or cope with intrapersonal conflict and to communicate to others to elicit a desired response. The empirical paper found The IMV model of suicidal behaviour differentiates between suicidal and non-suicidal hospital treated MSSH.

Conclusions

This thesis tentatively concludes that those who enact MSSH are not one homogenous group in that MSSH is underpinned by both suicidal and non-suicidal

reasoning. Also, MSSH ought to be considered a separate subgroup of self-harm, given there are nuanced differences in the demographical profile of MSSH and the different psychological and social factors that contribute to non-suicidal MSSH, compared to suicidal behaviour. The findings align with overarching literature that cites there may be alternate, non-suicidal functions of MSSH and lends tentative support for the idea that contextualising MSSH purely within a suicidal framework is too simplistic.

Table of Contents

List of Tables

Appendix B – Extended Methodology

List of Figures

List of Appendices

Glossary of terms

Term	Definition
Ambivalence	A state of co-occurring, conflicting feelings and/or uncertainty about how an individual is feeling.
Acquired Capacity	The ability to engage in behaviour dangerous enough to bring about death
Frequency	The feeling that you are a burden to other people
Hopelessness	The feeling that one will not experience positive emotions or an improvement in one's condition
Impulsivity	Behaviour characterised by little or no forethought, reflection, or consideration of the consequences of an action, particularly one that involves taking risks
Life threatening self-harm	An act of self-harm that has the potential to be lethal, which was enacted without suicidal intent including any behaviour that restricts breathing, blood-letting and vein-popping, cutting near main arteries, and any behaviour that makes a pre-existing vulnerability more likely to be lethal.
Medically serious self-harm	Intentional self-harm, that is serious enough to require medical care within a general hospital (Breet & Bantjes, 2017)
Near-lethal self-harm	Acts of self-harm using a method that would usually lead to death **OR** Acts which require fast medical response, which without emergency, or medical intervention, could prove fatal **AND** Self-harm to a vital body area (e.g., throat, chest or abdomen, not wrists, legs or arms)
Non-suicidal self-injury	The intentional destruction of one's own body tissue without suicidal intent and for purposes not socially sanctioned.

	Behaviours that cause unintentional harm (such as smoking) and culturally sanctioned body modifications including tattoos and piercings are excluded from this definition (Nock & Prinstein, 2009).
Non-suicidal medically serious self-harm	Intentional self-harm, that is serious enough to require medical care within a general hospital (Breet & Bantjes, 2017), enacted without suicidal intent.
Planning	Evidence of an individual taking steps to prepare for their suicidal behaviour, including making clear plans (date, time, location), leaving suicide notes or preparing personal affairs, planning to avoid be found, disclosing plans or thoughts regarding methods with another person (both verbally and written) and evidence of researching how to enact harm.
Risk Factor	Any attribute, characteristic, vulnerability or exposure of an individual that increases the likelihood of an event, disease or injury.
Self-Harm	'Self-poisoning or self-injury, carried out by a person, irrespective of their motivation" (National Institute for Clinical Excellence Self-Harm Quality Standard QS34, 2013). Behaviours which may be considered self-harm as a result of physical or psychological damage, such as smoking, recreational drug use, excessive alcohol consumption, over-eating or dieting, and excess exercising, and self-harm which occurs as part of religious practise, political or social protest or as an act of 'body enhancement' are also excluded.
Self-inflicted death	Deaths arising from non-natural causes that appeared to be directly caused by the actions of the individual concerned.
Severity	The seriousness of self-harm incidents
Suicidal Medically Serious Self-Harm	Intentional self-harm, that is serious enough to require medical care within a general hospital (Breet & Bantjes, 2017), enacted with suicidal intent.

Suicide attempt	Engagement in potentially self-injurious behaviour in which there is at least some intent to die (British Psychological Society, 2016).
Thwarted belongingness	An extreme disconnection to other people and society

Abbreviated Terminology

Abbreviation	Non-Abbreviated Term
IMV	The Integrated Motivational-Volitional Model of Suicidal Behaviour
IPMS	The Interpersonal-Psychological Model of Suicide
LTSH	Life-threatening self-harm
NSSI	Non-suicidal self-harm
NLSH	Near-lethal self-harm
MSSH	Medically serious self-harm
SA	Suicide Attempt
SI	Suicidal Intent

Thesis Definitions

For the purposes of this thesis, the following key definitions will be used to describe the behaviours studied in both the systematic review and the empirical paper. To aid clarification and to try to mitigate the use of interchangeable terminology (Andover, 2012; Silverman, 2006), the definitions were selected after reviewing the literature and international policy for the most neutral and widely used terminology. When reference is made to literature describing alternative behaviours, definitions can be found in the thesis glossary.

1) Medically Serious Self-Harm
    a) Used to describe self-harm that is serious enough to require medical care within a general hospital (Breet & Bantjes, 2017).
2) Suicidal Behaviour (including a suicide attempt)
    a. Engagement in potentially self-injurious behaviour in which there is at least some intent to die (British Psychological Society, 2016), and non-injurious acts of planning a suicide including researching methods of suicide, writing a suicide note and preparing ones financial or personal affairs.
3) Suicide
    a. A death where the underlying cause was intentional self-harm, for those aged 10 years and over (International Classification of Diseases, 10th Revision).

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Chapter One: Introduction to Thesis Portfolio

Self-harm and suicide are major international health issues. It is estimated that approximately 7% of the British public self-harm at least once across the lifespan (McManus et al., 2019), whilst globally, more than 700,000 people die each year by suicide (WHO, 2021). Shockingly, the most recent figures indicate that one person dies from suicide every 40 seconds, making it a leading cause of death worldwide (WHO, 2021). Despite self-harm and suicide being named as key targets across research, national and international prevention strategies such as Preventing Suicide, A Global Imperative, (WHO, 2014) and the Suicide Prevention Strategy for England (2012; 2015; 2017; 2021), the rates of both behaviour's remain stubbornly high (Office of National Statistics, 2021). Clinically, identifying those likely to be at risk and introducing effective treatment to reduce risk is complex (Smith et al., 2015; Schqartz-Lifshitz et al., 2012; Carter et al., 2005). Both tasks are fundamentally important to undertake, as asides from the important personal and social costs of self-harm and suicidal behaviour, in the UK alone, the cost of related hospital attendance to NHS clinical care and public spending is thought to be around £162 million per year (Tsiachristas et al., 2017).

Adding to the complexities, for decades there has been ongoing debates regarding the use of inconsistent terminology, and until recently there has been a distinct lack of consensus as to what conceptual definitions best describe self-harm and suicidal behaviours (Silverman, 2007). At the core of the argument is the concern that using terms interchangeably can create problems for accurate assessment, formulation and intervention, as it conflates the meanings and functions behind the behaviours (Andover et al., 2012). Consequentially, to aid understanding and diagnosis, the DSM-5 (2013), called for the separation of self-harm and suicidal behaviours, based on the presence or absence of suicidal intent, frequency and severity of self-harm, and the methods involved (DSM-5, 2013; American Psychiatric Association, 2013; Whitlock et al, 2010; Klonsky & Muehlenkamp, 2007; Nock et al, 2006). Underpinning a dichotomous approach is the fundamental assumption that self-harm that occurs without suicidal intent, is inherently different to self-harm enacted with some level of suicidality (Poon et al., 2019; May & Victor, 2018; Andover et al., 2012; Nock et al., 2008). From this approach, the reasons for

the behaviour, the associated risk factors and indeed treatment pathways are different, and ought to be considered as two individual behavioural constructs.

Non-suicidal self-injury (NSSI) has been defined as the "deliberate destruction of one's own bodily tissue in the absence of suicidal intent and for reasons not socially sanctioned" (Nock & Favazza, 2009). NSSI is known to occur frequently and involves methods that pose low risk to life and results in injuries that require little or no medical attention. The most common forms of NSSI are skin cutting, (Hawton et al., 2012; Klonsky, 2007) banging or hitting and burning (Bentley et al., 2014; Haw et al., 2015). Amongst children and young people, lifetime prevalence of NSSI is around 13% (Bentley et al., 2014; Muehlenkamp, et al., 2012; Plener, et al., 2009; Ross & Heath, 2002), with those aged between 18 and 25 accounting for the greatest proportion of self-harm (Nock, 2010; Lloyd-Richardson et al., 2007). Comparably, adults are understood to be at lower risk of NSSI, with lifetime prevalence rates falling somewhere between 4% and 28% (Shaffer & Jacbonson, 2009). Amongst clinical populations, the figures are far greater for young people and adults (Bentey et al., 2014). The impacts of NSSI can, in some instances, be life-long and it is known to contribute to many adverse outcomes, including heightened emotional distress, poorer academic achievement, and physical health complications such as increased risk of infection, and scarring (Geulayov et al., 2016; Bergen et al., 2014; NICE, 2013; Hawton et al., 2012; Klonsky, 2009).

Literature has examined in depth the risk factors associated with NSSI. Typically, those who engage in NSSI are young and female, (Beauchaine et al., 2019). Amongst adolescents, a recent systematic review by Wang et al. (2022) concluded that mental disorders, lower health literacy, adverse childhood experiences (including physical, sexual and emotional abuse, low social support, parental substance abuse and forensic history, exposure to suicide and lower economic status), bullying, problem behaviours (including substance misuse, gaming disorder, internet/mobile abuse, and having run away from home) being female, and physical health symptoms (including disability and sleep problems) were risk factors for NSSI. Furthermore, a systematic review by Cipriano et al. (2017) also highlighted an increased risk of NSSI amongst those with a diagnosis of Borderline Personality Disorder (BPD) (although not all people who enact NSSI have BPD, and not all people with BPD self-harm), and eating disorders. Compared to adolescents, the risk factors

for NSSI in adults appear different (Wang et al., 2022), and the strongest predictor of NSSI is historical self-harm and hopelessness (Fox et al., 2015).

According to the most widely evidenced theory, there are four key functions of NSSI. The Four Functional Model of NSSI (FFM) (Nock, 2009), contextualises NSSI as a functional, non-suicidal behavioural attempt at coping with stressful and unmanageable situations, amongst individuals with pre-existing vulnerabilities that limit their ability to cope in ways considered more effective. The functions of NSSI are understood to be an attempt to decrease or distract from aversive thoughts or feelings (intrapersonal negative reinforcement), an attempt to generate desired feelings (intrapersonal positive reinforcement), help seeking (interpersonal positive reinforcement) or an attempt to escape an undesired social situation (interpersonal negative reinforcement). The FFM has been validated and tested amongst adolescents (Hepp et al., 2020; Izadi-Mazidi et al., 2019), adults (Hepp et al., 2020; Turner et al., 2015), and prison populations (Power et al., 2016), however some argue that the theory maybe skewed towards the experiences of adolescents, given much of literature relates to studies conducted with young people. Arguably, there may be additional, less understood differences between NSSI in adult populations, or NSSI becomes more entwined with the presentation of suicidal behaviour over time. Evidence from a large systematic review suggests the risk factors for both behaviours run more in parallel amongst adults (Fox et al., 2015).

Comparably, suicidal behaviour (SB) is a term used to describe thoughts and behaviours related to an individual's efforts to take their own life. Typically, the term suicidal behaviour refers to suicidal ideation (thinking about suicide), suicide planning, and attempted suicide, which has been idefined as 'engagement in a potentially self-injurious behaviour in which there is at least some intention of dying' (O'Connor, 2014). Suicide is the term used when someone intentionally ends their own life (O'Connor, 2014). Nock et al. (2008) reported that the lifetime prevalence of suicidal ideation is around 9.2%, whilst 3.1% of people are thought to make suicidal plans, and 2.7% will enact a non-lethal suicide attempt.

Table 1

Adaptation of Muehlenkamp (2005) 'differentiation between self-harm and suicidal behaviour's and taken from Oakes-Rogers (2020).

Feature	**NSSI**	Attempted Suicide (with fatal or non-fatal consequences)
Intent	Non-suicidal	Suicidal – a desire to end life
Lethality / Severity	Low, rarely requires medical attention	High, often required medical attention
Chronicity	Repetitive, frequent	Infrequent
Methods	Will not pose high risk to life – scratching, burning, cutting	Will post high risk to life – hanging, jumping from height, overdose

As with NSSI, it is generally accepted that for some, there are a set of dynamic and static risk factors that increase the likelihood of suicide. A systematic review exploring risk factors for suicide across the lifespan (Steele et al., 2017) found that insomnia, burdensomeness and recent conflicts with family or a romantic partner were predictive of suicide amongst young people. In adults, being male, abusing substances, and experiencing marital or job loss was predictive of increased risk. Finally, amongst elderly individuals, having multiple physical health conditions, hopelessness and isolation predicted higher risk. More broadly, across the lifespan, having a mental health diagnosis is associated with high risk of suicide (Gili et al., 2019). Depression, mood disorders, anxiety disorders and PTSD have been widely shown to increase the risk of someone dying by suicide (McClatchey et al, 2017; Hawton et al; 2013; Kanwar et al, 2013; Palmier-Claus et al., 2012).

Whilst accepting of the differences in terms of the intent, frequency, severity and outcome of self-harm and suicidal behaviours, there is a clear relationship between the two (Steel et al., 2017; Hawton et al., 2014; Bergen et al., 2010). Having a history of NSSI (particularly when it is frequent or occurs over a longer period of time; (Hawton et al., 2012) it is understood to the most robust predictor for future suicide (O'Connor & Nock, 2014; Hawton et al., 2012; Bergen et al., 2010; NICE, 2010; Nock et al., 2009; Cooper et al., 2005), and many people who self-harm also experience suicidal thoughts at some point in their lives (Wang et al., 2022). In fact, evidence suggests that 50% of those who die by suicide

have a history of self-harm (NICE, 2013; Cooper et al., 2005; Hawton et al., 2003). The relationship between suicidal thoughts and suicidal behaviour is also complex, and consistently, research reports that around a third of people who think about suicide, attempt suicide, with more than 60% of attempted suicides occurring within the first year of experiencing suicidal ideation (O'Connor, 2014; Nock et al., 2008). This suggests that self-harm and suicidal behaviour exist upon a continuum of behaviours, given it highlights a potential transitional period from one behaviour to another (Cleare et al., 2021; Klonsky & May, 2016; Nock et al., 2012).

Understanding what causes the transition between suicidal thoughts and suicidal behaviour is however complex and is a challenge academics and clinical psychologists have tried to make sense of since suicide was first recognised in the 19th century. Early theories claimed suicide was a result of social and structural factors including not feeling meaningfully tied to other members of society (which can lead to feelings of meaninglessness and depression) (Durkeim, 1879), whilst more recent theories aim to consider how cognitive, biological and social factors may lead to suicidal behaviour (Schotte & Clum, 1987; Baumeister, 1990; Williams & Pollock, 2001; Joiner 2005). Despite this, currently even the most comprehensive and evidenced theories are unable to explain with confidence how and why some people who harm themselves go on to think about suicide, and why some people who think about suicide eventually act on their suicidal thoughts (O'Connor, 2012).

Similarly, whilst a credible evidence base exists to support all of the aforementioned theories, O'Connor (2011) argued that none adequately explain how suicidal ideation develops and translates to suicidal behaviour. Instead, O'Connor (2011) and Klonsky and May (2016) argued theories of suicide should adopt an ideation-to-action framework, whereby the development of suicidal intent and the progression of suicidal intent to suicidal behaviour, are conceptualised as two distinct processes, which exist upon a continuum of behaviours. In part this is because most individuals who think about suicide do not go onto attempt suicide (Have et al., 2009; Nock et al., 2009) and because literature has shown well evidenced risk factors of suicidal ideation do not predict suicide attempts (May & Klonsky, 2016; Klonsky & May, 2014; Kessler et al., 1999).

Therefore, despite gaps, which require further investigation, the Integrated Volitional Model of Suicidal Behaviour (IMV), (O'Connor & Kartley, 2012; 2018) is an

ideation-to-action framework, that outlines the development of suicidal thoughts and transition to suicidal behaviour. Whilst discussed at lengths in the extended introduction chapter, the IMV is a tripartite, linear model consisting of three distinct phases. The pre-motivational phase describes the things that make people vulnerable to developing suicidal thoughts, including adverse life events and biopsychosocial factors. The motivational phase outlines the core constructs needed for one to experience suicidal thoughts (including a sense of defeat and humiliation and entrapment) and several threat-to-self moderators that impact the strength that one feels the constructs. The final phase details the factors that govern the transition from suicidal thoughts to suicidal acts. Volitional factors are thought to be a range of environmental, psychological, social or physiological processes including; historical NSSI or suicide attempts, exposure to another's suicidal behaviour, impulsivity, planning suicidal behaviour, access to means, and mental images of death or dying.

The IMV underpinned the thinking and research within this thesis, as arguably, it is the most validated theory of suicide. Studies have proven the utility of the IMV to differentiate between NSSI and suicidal behaviour in adolescents (O'Connor et al., 2012), college students (Dhingra et al., 2015), and adults (O'Connor et al., 2013). Additionally, various individual facets of the model have been tested to try and determine which, if any, play a more significant role in the transition from suicidal thoughts to action. Results suggest previous suicidal behaviour and entrapment may play the strongest roles (Owen et al., 2018; Li et al., 2018; Whetherall & O'Connor, 2018; O'Connor et al., 2013; Park et al., 2010). Although a respectable evidence base is growing, O'Connor and Kirtley (2018) welcome further exploration, as there remain issues with differentiating between those who think about suicide and those who act on their thoughts. A more nuanced understanding could only prove beneficial to prevention, identification of those at risk and clinical intervention.

Whilst generating a body of literature in support of the IMV model of suicidal behaviour, recent literature has indicated there are additional subgroups of self-harm, which require further investigation. Such studies include Cleare et al. (2021) who found the IMV differentiates between suicidal and non-suicidal individuals who enact medically serious self-harm. Larkin et al. (2014) who highlighted another subgroup of people attending A&E following incidents of cutting, who they suggest are at increased risk of medically serious repetitions and fatal self-harm compared to other self-harm patients (Bergen et al., 2012; Bilen et al., 2010; Lilley et al., 2008). Furthermore, a doctoral thesis

(Oakes-Rogers, 2020), provided details of seven different subtypes to describe the pathways to and functions of medically serious, non-suicidal self-harm amongst female forensic mental health patients.

Medically serious self-harm has been defined as intentional self-harm, that is serious enough to require medical care within a general hospital (Breet & Bantjes, 2017). MSSH presents a somewhat unique challenge for clinicians in that according to the DSM-5 dichotomous classification of behaviours, MSSH appears akin to suicidal behaviour (in that it utilises methods that pose high risk to life and result in injuries that could result in death without medical intervention). However, consensus has not yet been reached as to whether all instances of MSSH are suicidal in nature, despite literature typically making sense of the behaviour within suicidal frameworks. Consequentially, the function of medically serious self-harm is unclear; therefore, arguably any prevention or interventions used to target the behaviour may well be misinformed. Furthermore, there is yet to be a theory that specifically explains the pathways to, and functions of medically serious self-harm, or whether variables cited within the IMV play a role in other types of self-harm. Understanding this better may assist in improving our understanding of particular risk profiles or sub-types of behaviour, which would offer a unique opportunity to tailor individual interventions for different groups (O'Connor & Kirtley, 2018).

This thesis therefore aimed to investigate what is currently known about medically serious self-harm (MSSH) (a previously identified subgroup of self-harmers, Cleare et al., 2021), and to retrospectively explore whether the IMV model of suicidal behaviour could differentiate between those who attempt or die by suicide and those who receive hospital treatment following an incident of MSSH. In doing so, it hoped to offer tentative findings and suggest future research areas, which could develop this early work. Within this thesis, chapter two is a systematic review investigating the literature to determine whether all incidents of hospital treated MSSH are attempts to end life and provide an overview of what the literature tells us about non-suicidal reasons for MSSH. Chapter three provides an account of the theoretical and contextual links between chapters two and the retrospective empirical study reported in chapter four. Chapter five presents an integration of the findings from both studies, alongside a discussion of implications and directions for future research and the strengths and limitations of this thesis portfolio. Chapter six provides a short

reflective account of designing, conducting and reporting of the thesis portfolio. Extended introduction and methodology chapters are included within the appendices.

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Chapter Two: Systematic Review

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Are incidents of hospital treated medically serious self-harm always attempts to end life across the life span? A Systematic Review.

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Abstract

Background

Between 2001-2018 in the UK alone there were approximately 55,000 incidents of self-poisoning per year (NHS Digital, 2020). Medically serious self-harm - intentional self-harm that is serious enough to require medical care within a general hospital (Bree & Bantjes, 2017) is thought to cost the NHS an estimated £162 million per year (Tsiachristat et al., 2017). However, this cohort is under researched, meaning further study into MSSH is warranted.

Methods

11 of 1338 unique records searched were included with an aim to determine whether all instances of medically serious self-harm were attempts to end life, and if not, explore alternative reasoning. Participant ages ranged from 13-88 and were conducted in eight different countries. Studies were appraised using the Joanna Briggs Institute quality assessment tools. Data was narratively synthesised.

Results

49% of medically serious self-harm incidents were attempts to end life. For those who did not cite suicidal intentions, the function of MSSH was most commonly to cope with

distressing intrapersonal difficulties, manage or stop interpersonal conflict or communicate with another person to elicit a desired response. The findings from this review appear applicable across the life span, and cross-culturally, with some minor differences noted.

Limitations

Given the methodological rigor of most studies was assessed as fair or poor, the findings are offered tentatively. Seven studies, and by extension the findings in this review, are cross-sectional and have limited ability to infer causality. As heterogeneity prevented meta-analysis, reviewer bias cannot be ruled out. It is possible some reasons for MSSH were underreported, and that additional reasons for MSSH were not captured.

Conclusion and implications of key findings

Not all incidents of medically serious self-harm are an attempt to end life. In the absence of suicidal intent numerous non-suicidal reasons are provided for engaging in medically serious self-harm that align with non-suicidal self-injury models. Medically serious self-harmers may be a distinct subgroup of self-harm.

Keywords

Medically serious self-harm, NSSI, near-fatal self-harm, suicide, hospital

Introduction

Each year, more than 700,000 people die by suicide (World Health Organisation; WHO, 2021). Between 2001-2018, suicide was the leading cause of death in the UK amongst people aged 20-34, accounting for 27.1% of male and 16.7% of female deaths (Office of National Statistics, 2020). A further 1.2 million people attempted suicide (Centre of Disease Control and Prevention, 2021), and between 2010-2020 over 620,000 people were admitted to general hospital following an incident of self-harm (NHS Digital, 2020). However, these figures are undoubtedly underestimated as not all people disclose their actions (Polling et al., 2019; Clements et al., 2016).

Why people self-harm is complex and individualised (NICE, 2013; Nock, 2009). Yet it is generally accepted that there are a set of risk factors that make some people more likely to enact self-harm and/or suicidal behaviour than others (Wang et al., 2020; Steel et al., 2017). Such risk factors for self-harm include being young and female, childhood trauma and adverse life events, lack of social support, low self-esteem, and physical health difficulties (O'Connor et al., 2008; Haw et al., 2005; Hawton et al., 2002; Mannion, 2009; Jacobson et al., 2008). Similar risks are understood to make people vulnerable to suicide, with the addition of hopelessness, entrapment, defeat and humiliation, thwarted belongingness, burdensomeness, access to means, exposure to suicide, and historical self-harm (O'Connor & Kirky, 2018; O'Connor, 2012; Joiner, 2005). The most robust risk factor for suicide is historical self-harm and prior suicidal behaviour (Probet-Linstrom, Berge, Westrin, et al., 2020; O'Connor & Kirky, 2018).

Despite advancement in our knowledge of what makes some people vulnerable to self-harm and suicide, conceptual difficulties with defining and separating self-harm and suicidal behaviours exist (Andover, 2012; Silverman; 2006; 2007). Some argue for a distinction between self-harm that is enacted without suicidal intent (SI) (i.e., non-suicidal self-injury, (NSSI)) and that which is enacted with some level of SI (i.e., suicidal behaviour) as they are different in terms of severity, frequency and the function of the behaviours (American Psychiatric Association, 2013, Nock, 2009). Comparably, others call for such behaviours to be understood upon a continuum, whereby there are several subtypes of self-harm and suicidal behaviour, which vary in terms of severity, frequency and the functions of the behaviour (Barker et al., 2022; Cleare et al., 2021; Oakes-Rogers & Slade, 2020;

Naherniak et al., 2019; Kapur et al., 2013). Whilst a body of literature is emerging regarding discrete subgroups of self-harm, currently, there is uncertainty as to whether they fit within current theoretical frameworks (Mitchell & Li, 2021; Cleare et al., 2012; Klonsky & Mae, 2016).

The two dominant theories for self-harm and suicide are Nock's (2009) Four Functional Model of NSSI (FFM) and The Integrated Volitional Model of Suicidal Behaviour (IMV) (O'Connor & Kirtley, 2018). The FFM proposes that NSSI is motivated and maintained by an attempt to decrease or distract from aversive thoughts or feelings, an attempt to generate desired feelings, help seeking, or an attempt to escape an undesired social situation. Comparably, the IMV is a linear tripartite model consisting of three distinct phases that attempt to explain what makes people vulnerable to suicide, how suicidal ideation develops, and what governs the transition from suicidal thoughts to behaviour.

Despite well-evidenced support for the aforementioned theories, it is unclear whether they adequately explain less understood subgroups of self-harm. One such subgroup is medically serious self-harm (MSSH) - intentional self-harm that is serious enough to require medical care within a general hospital (Bree & Bantjes, 2017). Between 2001-2018 in the UK alone there were approximately 55,000 incidents of self-poisoning per year (NHS Digital, 2020). They are however a group less understood, meaning further study into MSSH is warranted considering the cost of hospital attendance for MSSH is high, at an estimated NHS £162 million per year (Tsiachristat et al., 2017).

According to McMannus et al. (2019), those who enact MSSH differ to the wider self-harm population in that they are more likely to self-poison and overdose, but less likely to enact harm by cutting (Geualyov et al., 2017; Hawton et al., 2015; Haw et al., 2005). Consequentially, literature often contextualises MSSH as a failed suicide attempt (SA), given the use of more lethal methods and severity of injuries. Furthermore, survivors often report SI (Geualyov et al., 2017). However, situating MSSH purely as failed SA may not be the most appropriate approach, as literature has also consistently identified non-suicidal reasons for MSSH (Kumar et al., 2006; Douglas et al., 2004; Hjelmeland et al., 2002; Groholt et al., 2000).

The terms 'near-fatal self-harm' (NFSH) (Marzarno et al., 2009; 2010; 2011; 2012; 2016) and non-suicidal 'life-threatening self-harm' (LTSH) (Oakes-Rogers & Slade, 2020) have also been coined within the prison and forensic mental health populations. They

reported a myriad of reasons people provide for engaging in NFSH and LTSH, however due to the high prevalence of forensic specific factors (such as the environment, sentencing decisions, being on remand, and wanting to move cells), it is difficult to generalise their findings to the general population.

To our knowledge, currently, literature exploring MSSH is limited in that to date, it is has not been synthesised. A review of this nature has potentially important implications given it may shed light on the functions of behaviour and inform function specific treatment (NICE Draft Guidelines for Self-Harm, 2022). Clinically, this may help to improve assessment and formulation, and encourage a wider consideration to the reasons people provide for MSSH. A clearer understanding of the motivations behind MSSH may also serve to confirm the existence of self-harm subgroups and inform more specific treatment pathways.

Therefore, this review aimed to examine and synthesise the literature exploring the functions of MSSH and answer the following questions:

1) How many incidents of MSSH are attempts to end life?
2) If incidents exist where MSSH is not suicidal in nature, what are the alternative reasons people provide for medically serious self-harm?

Method

This systematic review adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Guidelines (Moher et al., 2009) and was pre-registered on PROSPERO: the international prospective register for systematic reviews (National Institute for Health Research & University of York, 2016) registration 332438.

Search Strategy

The databases PsycINFO, PubMed (MEDLINE), Science Direct, and CINAHL were searched using the search terms outlined in table 1. MeSH terms were consulted and where a record existed, additional terms were used. Concepts were combined with the Boolean operator AND. The reference lists and authors of studies included within the full text review stage were searched by hand. Final searches were conducted in May 2022. As the literature

indicates 'medically serious' was first used as a term to describe self-harm in 1982 (Isherwood et al., 1982) records were searched from 1982 until May 2022.

Table 1

Key concepts and search terms

Concept	Search Terms	Location
Medically Serious Self-Harm	Medically serious self-harm* OR non-suicidal self injur* OR life-threatening self-harm* OR near-lethal self-harm* OR serious self-harm* OR severe self-harm* OR near-fatal self-harm* OR deliberate self-harm *OR non-fatal self-harm* OR severe self-harm or non-suicidal self-harm	Any
Functions	Function* OR reason* OR factor* OR motives OR motivation* OR predictor* OR risk factor* OR volition* factors OR intent	Any
Hospital	Hospital OR urgent care OR emergency room OR emergency department OR ward OR accident and emergency OR A&E or emergency medical care	Any

Study Selection

The first (SOR) and second (AR) authors screened titles and abstracts and excluded studies that clearly did not meet inclusion criteria. The same authors completed full text screening, according to the outlined eligibility criteria, with 85% agreement. Discrepancies were resolved by discussion with the third author (JB).

Each identified study was evaluated against the following pre-determined selection criteria.

a) Population: Participants from across the life span (with no age restriction)

b) Exposure: Participants had enacted MSSH, defined as 'intentional self-harm, that is serious enough to require medical care within a general hospital' (Bree & Bantjes, 2017), regardless of intent
c) Comparison and Outcomes: The study methodology facilitated quantitative or qualitative exploration of the reasons for MSSH with and without SI
d) Study setting: participants had received hospital-based medical treatment

Unpublished studies, case studies, studies absent of peer review and works that were not original or available in English were excluded. As described in the introduction, given the strong influence of environmental factors on MSSH (Marzano et al., 2011), studies on forensic populations were excluded as they would introduce high levels of heterogeneity into the study given this review focused on the general population.

Data Extraction

The second author (AR) independently completed data extraction, and 100% was evaluated for completion, accuracy and consistency by the first author (SOR). Disagreements were resolved through discussion. Data extracted included study characteristics (e.g. country and research site, population, design, and definitions), population characteristics (e.g. mean age, age range, gender, ethnicity and mental health diagnosis) and self-harm characteristics (e.g. methods, percentage of MSSH enacted with SI and motivations for non-suicidal MSSH. Extracted data was put into a pre-designed data extraction form.

Table 2

Included Study Characteristics

Study Country Population	***County***	***Population***	***Design***	***Participants (N)***	***Age Range Gender Ratio Ethnicity***	***Gender Ratio***	***Ethnicity***	***Quality Rating***
Barnes et al. 2016	United Kingdom	Adults	Qualitative	(N) = 19	Mean age: not reported Age range – 19-56	F: 52% M: 48%	Not reported	Good
Blenkiron et al. 2000	United Kingdom	Adolescents and Adults	Cross-sectional	(N) = 158	16+	F: 55.1% M: 44.9%	Ethnicity not reported	Fair
Breet et al. 2018	South Africa	Adolescent and adults	Cross-sectional		(N) = 238	Mean age: Substance users - 32.9 (SD 11.8) F: 52.1% M: 47.9% Nonsubstance users – 31.2 (SD, 14.3) F: 37.5% M: 62.6%	Substance users Black: 37.5% Asian/Moslem: 2.1% Mixed race: 31.3% White: 25% Not known: 4.2% Nonsubstance users Black: 33.7% Asian/Moslem: 3.7% Mixed race: 46.4% White: 11.1% Not known: 5.3%	Fair
Cleare et al. 2021	Scotland	Adults	Cross-sectional	(N) = 500	Mean age 37 Age Range 18-88	F: 60.6% Male: 39.4%	White British: 92.7% Other: 7.3%	Good
Desalew et al. (2011)	Ethiopia	Adolescents and Adults	Cross-sectional	(N) = 116	Mean age 21 Age range 13-50	F: 64.4% M: 35.4%	Ethnicity not reported	Poor

Groholt & Haldorsen (2000)	Norway	Adolescents	Qualitative	(N) = 91	Mean age 16.9 Age Range 11-19	F: 90% M: 10%	Ethnicity not reported	Fair
John et al., (2022)	Wales	Adolescents	Qualitative	(N) = 8	Mean age: 21.5 Age range 23-49	F: 25% M: 75%	Ethnicity not reported	Good
McAuliffe et al. 2007	Ireland	Adolescents and Adults	Retrospective cross-sectional design	(N) = 146	Mean age 29 Age Range 14-70	F: 53% M: 47%	Ethnicity not reported	Fair
Mitchell et al. (2021)	Canada	Adolescents	Cross-sectional	(N) = 93	Mean age 15.2 Age range 11.2-17.9	F: 78.5% M: 21.5%	Caucasian: 69.9% First Nations, Inuit, Metis: 8.6%	Fair
Naz et al. (2021)	Pakistan	Adolescents	Qualitative-Semi-structured interviews	(N) = 16	Mean age 16.4 Age range 13-18	F: 56% M: 44%	Ethnicity not reported	Fair
Park et al. (2020)	Republic of Korea	Adolescents and Adults	Cross-sectional	(N) = 300	Mean Age 37.4 Age Range 17-80	F: 61.3% M: 38.7%	Ethnicity not reported	Fair

Appraisal of Selected Studies

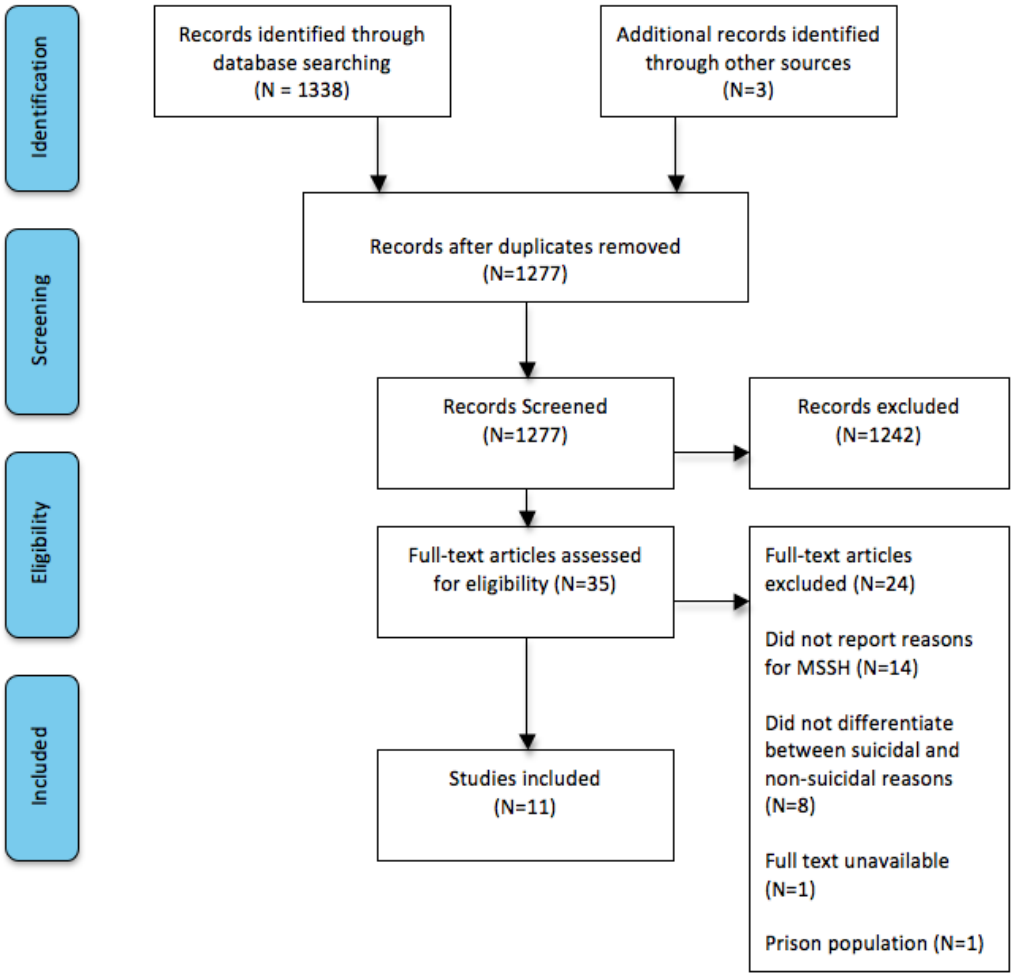
In accordance with Cochrane Guidance (Higgins et al., 2019), the methodological quality of each included study was independently assessed by the first (SOR) and second authors (AR). Whilst there are no gold standard tools for quality rating or bias risk assessment (Moskaleqicz & Oremus, 2020), a systematic review of quality assessment tools for quantitative and qualitative studies suggest the Joanna Briggs Institute (JBI) tools are recommended for cross-sectional studies (Ma et al., 2020) and qualitative research (Zeng et al., 2015). Excellent inter-rater agreement was noted as Cohen's Kappa was above .80 (Cohen, 1988).

Data Analysis

A meta-analysis of the alternative reasons given for MSSH was planned but could not be performed due to inherent heterogeneity in terms of the populations studied, focus of the study and the findings reported. In all instances, (n) numbers and percentages were reported, offering the most consistent way of reporting the findings. In line with guidance from Popay et al. (2006), a descriptive analysis of the quantitative data and a thematic analysis of the qualitative data was performed by the first author (SOR) and narratively synthesized together.

Figure 1

PRISMA diagram



Results

Study Characteristics

A total of 1338 citations were identified, with three further studies identified through reference checking. A total of 33 full-text articles published between 2000 and 2022 were assessed for inclusion. Eleven studies (seven cross-sectional designs and four qualitative) met the eligibility criteria and were included. Figure 2 outlines the flow of studies and the reasons for exclusion.

The majority of studies (seven) were conducted in western countries including the United Kingdom, Canada, Norway and the United States. The remaining four were

conducted in: The Republic of Korea, Ethiopia, Uganda and South Africa. Six studies were multi-site projects, whilst the remaining five were single-site studies. Four studies included children and adolescents, two included adults, and five included both adolescents and adults. All studies used questionnaires, health records, clinician reports or semi-structured interviews to obtain information.

Assessment of bias and quality

Seven papers were assessed using the JBI Critical Appraisal Checklist for Analytical Cross Sectional Studies. One study was assessed as good quality, five as fair and one as poor. Weaknesses in observational studies were attributed to cross-sectional design. The remaining four qualitative studies were assessed using the JBI Critical Appraisal Checklist for Qualitative Research. Three were rated as good quality and one as fair. Weaknesses in qualitative studies included omission of researcher influence on the research, or details on mitigating such risk, and not providing a statement locating the research culturally or theoretically. Inter-rater agreement between the first and second author was 85%.

When drawing conclusions, greater weight was afforded to the higher quality studies, given their data was subject to a lower risk of bias and greater methodological rigor.

Demographic Characteristics

1685 people with an age range of 13-88 years were included in the studies**.** Nine studies reported a mean age, with an aggregated mean of 25.3 years, however this ranged between 13 and 37.4 years. Overall, 54% of participants were female**.**

MSSH Characteristics

When combing findings from all included studies, 822 (49%) of all participants enacted MSSH with SI. The proportion of people citing suicidal reasons for MSSH ranged between 32% and 76%. Two studies failed to report the proportion of SMSSH, therefore this figure may be inaccurate.

Methods of MSSH

Nine studies reported methods of MSSH. Self-poisoning was the dominant method across all MSSH, with rates ranging from 74.2% - 96% (John et al., 2022; Mitchell et al., 2021; Naz et al., 2021; Cleare et al., 2021; Breet et al., 2018; McAuliffe et al., 2007; Desalew, 2011; Gorholt and Haldorsen, 2000).

Mental Health Diagnosis

Seven studies provided information on mental health diagnosis. In studies that did not differentiate between suicidal and non-suicidal MSSH mental health diagnosis, depression was reported most frequently. Rates of depression ranged between 6.3% (Desalew et al., 2011), and 75.2% (Mitchell et al., 2021). A broader range of mental health diagnosis was provided in studies of western populations (Mitchell et al., 2021; McAullife et al., 2007; Gorholt and Haldorson, 2000; Blenkiron et al., 2000). A greater number of different diagnoses were reported amongst adolescents (Mitchell et al., 2021; Desalew et al., 2011; McAuliffe et al., 2007; Groholt and Haldorsen, 2000).

Only two studies differentiated between mental health diagnosis for suicidal and non-suicidal MSSH. The same mental health conditions were reported amongst non-suicidal MSSH, however the prevalence rates of each disorder differed. The rate of depression was far lower amongst non-suicidal participants compared to suicidal MSSH (SMSSH) (Park et al., 2021; Groholt and Haldorsen, 2000), whilst the prevalence of disruptive disorder and Personality Disorder was common. Substance abuse was only diagnosed amongst the non-suicidal MSSH group.

Motivations for Non-Suicidal MSSH

Given most people included within the synthesised studies provided non-suicidal reasoning for MSSH, in the absence of any validated theory outlining the pathways to or functions of MSSH, the synthesised findings regarding non-suicidal reasons for MSSH have been grouped and presented below in line with Nock's Four Functional Model (FFM) of NSSI (Nock, 2009). The FFM was selected as it is widely considered the dominant theory explaining non-suicidal self-harm and has been validated amongst adolescents (Hepp et al., 2020; Izadi-Mazidi et al., 2019) and adults (Hepp et al., 2020; Turner et al., 2015).

Table 3

Summary of findings presented in alignment with The Functions of NSSI (Nock, 2009)

Non-suicidal Function Type	**Function Description**	**Adolescent Studies**	**Adult Studies**	**Mixed Age Studies**
Intrapersonal-negative reinforcement	To alleviate negative internal emotional or cognitive states	Groholt & Haldorsen (2000) Mitchell et al., (2021)	Barnes et al., (2016) Cleare et al., (2021) John et al., (2022)	Blenkiron et al., (2000) Breet et al., (2018) Desalew et al., (2011) McAuliffe et al., (2007) Park et al., (2022)
Intrapersonal positive-reinforcement	The generation of positive or desirable internal emotional or cognitive states	No evidence found	No evidence found	No evidence found
Interpersonal-social negative reinforcement	Escape from or cessation of social situations and interpersonal demands	Mitchell et al., (2021) Naz et al., (2021)	No evidence found	Blenkiron et al., (2000) Breet et al., (2018) Desalew et al., (2012) McAuliffe et al., (2007) Park et al., (2022)
Interpersonal-social positive reinforcement	To elicit care or obtain a positive response from others	Groholt & Haldorsen (2000)	Barnes et al., (2016)	Breet et al., (2018) McAuliffe et al., (2007)

Intrapersonal Negative Reinforcement

Nine studies of mixed methodological rigor identified a myriad of factors that align with the function of negative intrapersonal reinforcement. Unlike all other intrapersonal difficulties, MSSH used to cope with mental health difficulties was the only factor to be consistently cited across the life span, suggesting it may be an important factor. A high-quality study conducted by Cleare et al. (2021) with Scottish Adults, concluded that those who enact MSSH with suicidal intent scored significantly higher for psychological risk factors compared to people who enact non-suicidal MSSH. Whilst the best quality evidence suggest mental health difficulties are more prevalent amongst people who enact MSSH to end their lives, coping with mental health difficulties and emotional dysregulation was cited as a reason for non-suicidal MSSH in five studies (Mitchell et al., 2021; Cleare et al., 2020; Breet et al., 2018; Barnes et al., 2016; Blenkiron et al., 2000).

In studies conducted in non-western countries, the prevalence of citing mental health difficulties as a reason for non-suicidal MSSH was lower. Rates ranged from 10-20% of total samples (Park et al., 2020; Desalew et al., 2011). Other similar descriptors included emotional disturbance, (Desalew et al. 2011), which may highlight methodological heterogeneity in terms of the definitions used for presenting interpersonal difficulties. Despite citing mental health difficulties as a reason for their MSSH, compared to suicidal MSSH, Park et al. (2020) found that non-suicidal participants were significantly less likely to have a history of psychiatric treatment (26.1% vs 45.7%, p= <0.01), and significantly more likely to refuse counselling (30.4% vs 9.9%, p= <0.01). Both studies were limited by a high proportion of people not disclosing reasons for their MSSH (45.6% in Desalew et al. 2011 and 25% in Park et al., 2020), meaning these findings could also be underrepresenting the MSSH population. Furthermore, these findings likely highlight some cultural heterogeneity between the western and non-western studies.

Across mixed adolescent and adult studies, papers assessed as good or fair quality reported that other non-suicidal MSSH reasons were to cope with financial concerns, including job loss and debt (Park et al., 2021; Blenkrion et al., 2000), distress around exam or academic failure (Breet et al., 2018; Desalew et al., 2011; Park et al., 2022), physical health conditions (Park et al., 2021; Breet et al., 2018; Blenkiron et al., 2002) to get a temporary break from one's problems (McAuliffe et al., 2007), concerns about work, having

no close friends, difficulties with housing, alcohol or drugs, and bereavement (Blenkiron et al., 2000).

The clearest evidence from studies involving adolescents corroborated the findings from mixed adult and adolescent samples where MSSH was used to cope with unbearable thoughts and losing control of emotions (Groholt & Haldorsen, 2000), and distress about exam failure and school pressure (Mitchell et al., 2021). Mitchell et al., (2021) also noted additional reasons not reported in the mixed age, or adult only samples including sexuality and/or gender identity concerns, coping with memories and distress of abuse and/or neglect, death in the family and legal problems. However, caution ought to be given when generalising the findings from the study given their methodology involved clinician-based reporting, which may not accurately represent the participant voices.

Similar reasons for MSSH appear to transcend to adult populations in good and fair quality papers. A good rated qualitative study by Barnes et al. (2016) reported themes of concerns around employment difficulties, housing difficulties, and co-existing or historical vulnerabilities as reasons for non-suicidal MSSH. The findings from this study are likely to be skewed towards financial concerns, given the study specifically explored the impact of financial austerity on self-harm. Additional intrapersonal reasons provided in a good quality study were concerns about alcohol and drug use and bereavement and distress related to historical abuse (John et al., 2022). Caution is given to applying conclusions from the John et al. (2022) study as it was conducted with people who enacted MSSH during a cluster of deaths by suicide. In doing so, their findings may not generalisable to those without similar experiences, as the reasons for MSSH may well have been impacted by multiple exposures to other people's suicide.

Intrapersonal Positive Reinforcement

None of the studies detailed people reporting reasons for MSSH that would explicitly fall within the intrapersonal positive reinforcement function of the FFM of NSSI.

Interpersonal-Social Negative Reinforcement

Seven studies investigated suggest that MSSH is used as a way of managing interpersonal difficulties or demands, across both adolescents and adults. Across fair quality

studies, common interpersonal difficulties included familial, romantic, relational or parental conflict, (Park et al., 2022; Mitchell et al., 2021; Breet et al., 2018; Desalew et al., 2012; Blenkiron et al., 2000) or to get away for a while or get a temporary break from an unacceptable situation (Breet et al., 2018; McAuliffe et al., 2007).

In an adolescent study by Mitchell et al. (2021), the rates of interpersonal difficulties preceding MSSH was notably high being reported by 83 out of 93 respondents. In particular, family conflict was cited most frequently. However, methodological issues limit the strength of confidence in these findings, as the use of clinician-based reporting results in a lack of lived-experience and may have limited the accuracy of reports regarding the reasons for MSSH. Nevertheless, the findings were echoed by Blenkiron et al. (2000), in an adult and adolescent sample from the United Kingdom.

Comparable findings were reported cross-culturally in adolescents and adults (Park et al., 2022; Naz et al., 2021; Breet et al., 2018; Desalew et al., 2012). Whilst the prevalence rate of interpersonal conflict appears to be lower in non-western studies, interpersonal conflict was still cited as a reason for MSSH. Again, family appears particularly relevant (Park et al., 2021; Breet et al., 2018; Dewalew et al., 2012). Prevalence rates do vary, however best quality evidence indicates between 33-57% cite it as the reasons for their MSSH (Naz et al., 2021; Breet et al., 2018; Dewalew et al., 2012). There are however methodological issues with the aforementioned quantitative literature as data was collected retrospectively from medical records, some of which the authors said lacked completeness and uniformity. Furthermore, issues with missing data meant the reasons for MSSH were reported for a smaller proportion of people. This may in part explain the lower rate of conflict related MSSH compared to western studies.

Despite an acknowledgment of issues with social heterogeneity (in terms of cultural and socio-demographic variability) and the prevalence of interpersonal conflict between the Ethiopian, North Korean and Western studies, these findings indicate that cross-culturally, people report interpersonal conflict as a reason for MSSH.

Interpersonal-Social Positive Reinforcement

Fair quality evidence suggests for some, MSSH is utilised as a form of communication to others (Breet et al., 2018; Barnes et al., 2016). A study assessed as fair quality compared the relationship between SI and patient characteristics amongst adults and adolescents in Ireland (McAuliffe et al., 2007). The most commonly cited reason for non-suicidal MSSH was a desire to communicate something to others in the hope of eliciting a desired response. McAuliffe et al. (2007) concluded that people who enact MSSH without suicidal intentare significantly more motivated to appeal to others ($M = 1.61$, $p < .001$), compared to those who enacted SMSSH, who were significantly more motivated to escape from their intrapersonal difficulties ($M = 3.15$, $p < .001$). Caution is issued when generalising these findings, as the authors note there is the potential for findings to be skewed towards people with depression as the proportion of depression cited within the study was significantly larger compared to the prevalence rate within the general population.

Similarly, a multi-site qualitative project conducted across six hospitals on adolescents in Norway (Groholt & Haldorsen, 2000) aligns with quantitative findings, concluding that non-suicidal MSSH is significantly more often influenced by interpersonal motives compared to SMSSH. Groholt and Haldorson (2000) found similar reports of MSSH being used to elicit care or to obtain a positive response from another person (Interpersonal-social positive reinforcement). Across both the suicidal and non-suicidal MSSH groups, adolescents attributed their behaviour to five or more problems. This highlights a likely sample bias towards young people with more documented difficulties.

Summary of findings

Overall, based on eleven studies of mixed methodological rigor, amongst people aged 13 to 88 years old, 49% of medically serious self-harm incidents were found to be attempts to end life. For those who did not cite suicidal intentions, the function of MSSH was most commonly to cope with distressing intrapersonal difficulties, manage or stop interpersonal conflict or communicate with another person to elicit some form of response. The findings from this review appear applicable across the life span, and cross-culturally, with some minor differences noted. Given the methodological rigor of most studies was assessed as fair or poor, the findings are offered tentatively.

Discussion

This review aimed to ascertain whether all instances of MSSH are attempts to end life across the lifespan, and if they are not, provide an overview of alternative reasons for MSSH. To our knowledge, this was the first study to synthesise existing MSSH literature into a review. Study quality was generally fair, however there were several studies rated good. The synthesis of existing literature suggests that MSSH ought not to be viewed as is one homogenous group. The different factors highlighted across the studies suggest MSSH is a complex issue with potentially numerous causations, which for some are non-suicidal.

In line with what is known about NSSI (Wang et al., 2022; McMannus et al., 2019), within the included studies more females enacted MSSH than their male counterparts. Similarly, the mean age of those treated for MSSH was 25.3 years old, suggesting the demographic profile of MSSH is akin to those who enact NSSI (Muehlenkamp et al., 2018; Fox et al., 2015), yet different to those who die by suicide. Males are at greater risk of dying by suicide, however attempted suicide is more common amongst females (Choo et al., 2019). The survival rate amongst women is greater as they are more likely to use less lethal methods and disclose their behaviour to another person (Jordan & McNiel, 2019). However, as MSSH looks similar to attempted suicide, yet more than 50% of incidents in this review were enacted without SI, it is plausible that some females who attempt suicide are in fact enacting MSSH. If true, current suicide prevention strategies are unlikely to help and may in part explain increasing trends in female MSSH (McMannus et al., 2012). Future research must do more to clarify gender specific differences for women, as currently the majority of preventative strategies and national policy is based on what is currently known about males (Oakes-Rogers & Slade, 2015).

In line with widely reported literature on hospital treated self-harm (ONS, 2021; Hawton et al., 2012;), amongst the included studies, self-poisoning was the most common form of MSSH across the lifespan. Methods typically associated with suicide (such as hanging or jumping from heights) were less common, conflicting with what theoretical models expect from suicidal individuals (O'Connor & Kirkley, 2018; Joiner, 2005). Whilst further research must explore the decision-making process around method selection before conclusions can be drawn, in conjunction with the non-suicidal reasons cited within the studies, this may separate some MSSH from suicidal behaviour.

A mental health diagnosis was common amongst people who enacted MSSH. Depression appeared to be the dominant diagnosis, however consensus was not reached regarding prevalence, as the rate of depression ranged widely between included studies. Compared to suicidal MSSH, depressive disorder wassignificantly lower amongst those who were not suicidal, whilst the prevalence of disruptive and personality disorders was significantly higher. This was particularly true in studies that included adolescents. These findings align with literature evidencing a relationship between certain mental health disorders and NSSI (Milone & Sesso, 2022; Stead et al., 2019), and that, which situates those with depression at increased risk of suicide (O'Connor et al., 2019). However, as studies that utilises mixed-age samples often did not differentiate between younger and older participants, caution is given when using the findings to inform a risk profile of young people. Nevertheless, the findings may indicate a clinical need to consider risk for future MSSH and death by misadventure amongst young people who enact MSSH with the aforementioned mental health diagnoses, as they are conditions closely linked to repetitive self-harm (Prada et al., 2018). This could identify a key group which future preventative work should target.

Regulating intrapersonal states has long been cited as a key function of self-harm and suicidal behaviours (Brausch & Muehlenkamp, 2018) and using best available evidence, our findings concurred with the wider literature. Whilst it was by no means the only intrapersonal factor cited for MSSH, coping with intrapersonal distress caused by one's mental health difficulties was the only factor to transcend across the lifespan, indicating it is likely a key factor for non-suicidal and SMSSH (Cleare et al., 2021; Mitchell et al., 2021; Breet et al., 2018; Barnes et al., 2016; Blenkiron et al., 2000). Not surprisingly, a high-quality study indicated that people enacting MSSH with SI reported significantly higher levels of psychological risk factors compared to non-suicidal MSSH, namely those included within the IMV model of suicidal behaviour (Cleare et al., 2021). The findings highlighted how the current dominant model of suicidal behaviour (The IMV) differentiated between MSSH with and without SI, suggesting that whilst the IMV could distinguish those enacting suicidal behaviour, given the lower prevalence of motivational and volitional factors amongst incidents of non-suicidal MSSH, it may not fully capture alternative factors that explain the pathways to or functions of MSSH. Cleare et al. (2021) findings also provide evidence that is supportive of MSSH not being one homogenous group.

In addition to the aforementioned reasons, non-suicidal reasoning appeared age specific, in that adolescent cited distress around exam and academic pressures and coping with sexuality and/or gender identity concerns as reasons for MSSH. This highlights a potential increased risk for young people experiencing intrapersonal distress and aligns with literature that concluded that the proportion of young people reporting NSSI to relieve difficult feelings is increasing (McMannus et al., 2019). In particular, young women who enact NSSI were cited as more likely to experience psychological distress, compared to their young male counterparts (Lutz et al., 2021; McMannus et al., 2019). Given our findings that more women engage in MSSH than males, it seems likely that increased psychological distress could explain the high prevalence of intrapersonal negative reinforcement reasons given for non-suicidal MSSH. Interventions that focus on teaching distress tolerance, emotion regulation skills and alternative coping strategies have been called for (Lutz et al., 2021).

This review did not find evidence that people enact MSSH for functions that would align with intrapersonal positive reinforcement. Given the respectable evidence base supporting the FFM, it is unlikely that our findings refute the model's accuracy. Instead, our findings could suggest the functions of MSSH differ to NSSI, or our search did not facilitate the finding of studies that captured self-harm to generate positive emotional or cognitive states. Our findings also indicate that for many, there are multiple reasons why they enact MSSH at any given time. Therefore, it is also likely that the reasons for non-suicidal MSSH overlap across the functions of FFM, yet the methodological designs of the literature included within this review may not capture intrapersonal positive reinforcement functions, or they prioritise reasons, which fall into other functional domains. Whilst conclusions cannot be drawn on either suggestion, further research is warranted given intrapersonal positive reinforcement reasons has been well evidenced in non-suicidal self-harm and cited in other explorative studies seeking to understand the functions of medically serious forms of self-harm in other populations (Oakes-Rogers & Slade, 2020).

Comparably, in line with wider literature exploring the interpersonal social positive reinforcement function of the FFM, adolescent studies in this review reported some people enact MSSH to communicate distress to others, and to elicit a caring response. Furthermore, McAuliffe et al. (2007) and Groholt and Haldorson (2000) found significant differences between suicidal and non-suicidal MSSH and alluded to intrapersonal social positive

reinforcement being a characteristic function for non-suicidal MSSH. Our findings may indicate that focusing on communication difficulties and conveying one's need to others may be a potentially useful area for treatment amongst young MSSH'ers.

The findings from our review also demonstrate how some adults and adolescents enact non-suicidal MSSH to manage interpersonal difficulties or demands and achieve a desire to change, escape or get a break from an interpersonal situation. Situating our findings with wider literature, familial, parental and romantic conflict was cited most frequently, across the age span and cross-culturally (McMannus et al., 2019; Oakes-Rogers, 2020' O'Connor et al., 2012; Nock, 2009). The findings from our own review are however limited in that several of the studies reported findings in relation to interpersonal negative reinforcement using clinician completed data retrospectively and was critiqued for missing data and potentially not capturing the voices of their participants. This could indicate our findings do not report a comprehensive account of the potentially complicated relationship between conflict and non-suicidal MSSH. However, given a review of population level NSSI shows an increasing trend in the proportion of participants reporting NSSI to escape or change their situation, (McMannus et al., 2019), further research is warranted to see if the same is applicable to those who enact MSSH in a larger sample size. Our findings indicate a clinical focus on problem solving may prove beneficial to facilitate alternate strategies to manage or change unwanted or challenging intrapersonal situations.

Finally, our review highlights cultural differences are likely to exist between MSSH'ers. Compared to western cultures, non-western studies reported lower rates of mental illness amongst their participants and higher levels of non-disclosure of reasons for MSSH. Han and Ollife (2015) describe the close interlink between self-harm and suicidal behaviours and culture. They explained how cultural attitudes; stigma about mental health, concerns around traversing cultural norms, and perceptions of healthcare can impact help seeking and self-management (Han & Ollife, 2015). This raises an important clinical consideration and highlights the need for cultural sensitivity and knowledge when treating a culturally diverse population. Future research ought to investigate further how cultural differences impact disclosure rates of reasons for MSSH and help seeking, which could in turn inform clinical practice. Such literature is pressing given recent healthcare studies indicate the large health disparities between white and Black and Minority Ethnic groups (Salas et al., 2021).

Strengths and limitations

This review explored the prevalence of SMSSH and non-suicidal reasons for MSSH. A relative strength was all studies included in the review were co-rated for bias and quality. However, the majority of studies were fair and low-quality studies meaning findings have to be viewed through this lens. Furthermore, the studies, and by extension the findings in this review, are cross-sectional and have limited ability to infer causality.

As heterogeneity prevented meta-analysis, reviewer bias cannot be ruled out, although, attempts were made to mitigate this through second and third reviewers. As many studies did not exclusively report SMSSH as attempted suicides, caution should be taken when generalising or comparing the findings to SA's. Furthermore, as several studies reported a relatively high non-disclosure rate of reasons for MSSH, it is possible some reasons for MSSH were underreported, and that additional reasons for MSSH were not captured within the reviewed studies.

Clinical Implications

Clinicians and future research should hold in mind that those who enact MSSH are not a homogenous group. In this review, whilst many people cite SI, the majority enacts MSSH for a range of non-suicidal reasons. Therefore, suicide prevention strategies may not be clinically helpful for those whose behaviour is driven by non-suicidal functions more akin to NSSI. A focus on managing intrapersonal difficulties, problem solving and improving communication ought to feature in any clinical intervention for non-suicidal MSSH. Caution is raised in terms of the prevalence of non-disclosure of the reasons for MSSH, which may or may not be impacted by a range of cultural and social factors including concerns around stigma. A more sensitive understanding of these factors is needed. If non-disclosed intensions are to end life, non-disclosure could lead to missing risk markers for future suicide.

It is also recognised that some people are unsure of the reasons behind their behaviour and/or present in a state of ambivalence about their desire to live or die. It is well documented in literature that such individuals are a less well-known group (Reference) and as such as typically neglected in research. This presents clinical difficulty as often treatment

pathways are determined based on the intent behind, and functions of one's behaviour. Similarly, our review did not capture studies which reported that people enacted MSSH with ambivalence, or ambiguous about their reasoning for MSSH. This is however unlikely to be truly representative of the MSSH, therefore caution is issued when considering these findings in a clinical setting.

Future research

Whilst it is generally accepted that NSSI is typically a behaviour seen amongst young females, the inclusion of adolescents and young adults outweighs that of other age ranges. To increase generalisability, it would be prudent for future research to focus on older people and establish whether MSSH follows similar trends as NSSI across the general population. Furthermore, given there are suggestions that cultural norms impact disclosure rates and help seeking for self-harm and suicidal behaviour's, exploration of MSSH in non-western countries would be helpful.

Future research would also benefit from using a more homogenous outcome measure to assess the reasons for MSSH. Research of this type would allow for a meta-analysis, which would provide a more objective appraisal of the evidence and allow stronger conclusions to be drawn. This has important clinical implications, given meta-analysis is considered a more robust and reliable methodology, and is therefore given more weight when informing changes to clinical practice (McKenzie and Brennan, 2014).

Whilst outside the scope of this review, it is also unclear why some people enact MSSH over less potentially lethal forms of self-harm, particularly when the behaviour is non-suicidal. Understanding how and why self-harm progresses from lesser to more lethal forms would be prove beneficial. Research of this type may aid the development of a MSSH specific theory, highlight key time points for intervention and prevention, and may add to the body of literature that posits self-harm and suicidal behaviour ought to be considered upon a continuum of changeable behaviours.

Conclusions

Although the methodological limitations are accepted for this review, it would appear that for some, MSSH aligns more appropriately with models of NSSI as it shares similar functions. It is however clear that for others, MSSH is enacted with some level of desire to die, meaning the picture is more complex. Given that multiple reasons for MSSH exist, there is a clear need for future research to focus on this relatively unknown group to allow for more effective, function specific interventions to develop. A better understanding will impact both the assessment process of those who attend emergency medical care services and indeed any ongoing treatment pathways they are offered. Failure to do so will continue to feed into the dichotomous culture of defining, understanding and treating NSSI and suicidal behaviour, ignoring emerging literature that consistently identifies subgroups of self-harm that are not currently well explained by theoretical frameworks, or targeted by treatment approaches.

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Chapter Three: Bridging Chapter

The systematic review in chapter two investigated whether medically serious self-harm (MSSH) was always an attempt to end life across the life span, and if it was not, explore the alternate reasons people provide for enacting MSSH. The results indicated that within the included studies, MSSH was enacted with suicidal intent in many instances, however more than half of the people included gave alternate, non-suicidal reasons for their actions. When not suicidal in nature, for the most part, the reasons people provided appeared to align with the Four Functional Model of Non-Suicidal Self-Injury (Nock, 2009).

Our review found people frequently cite interpersonal distress, particularly distress related to their mental health, as a reason for MSSH. Additionally, conflict with family, and wanting to communicate distress to another person in the hope of eliciting a desired response were reasons for non-suicidal MSSH. This places our findings in line with what is known about the functions of NSSI, as each cited reason aligned with one of the four functional reinforcement processes. Our review did not however find evidence of an interpersonal positive reinforcement function of MSSH. This finding is unlikely to refute the FFM of NSSI and instead is likely to highlight either a difference between NSSI and non-suicidal MSSH, or a limitation in our review in that our search did not capture studies that report MSSH to elicit positive emotional or cognitive states.

Our findings offer tentative evidence to suggest that MSSH is not one homogenous group and that further research into MSSH is warranted. Namely, research is important given our results indicate that the FFM does not fully explain MSSH (although we of course did not test the model directly), and it is unclear whether MSSH fits into other theoretical models of suicidal behaviour. This is important given many people cited suicidal reasons for their MSSH. Consequentially, in the absence of a seemingly appropriate theory, one could argue that any intervention designed on current theoretical frameworks may prove ineffective. Despite finding some preliminary evidence to suggest there may well be similarities between the underlying functions of low-lethality NSSI, our study was limited in that the majority of studies were fair and low quality studies. Furthermore, as heterogeneity prevented meta-analysis, reviewer bias cannot be ruled out. The findings must therefore be viewed through this lens.

Our review therefore presents MSSH in a different light to how it is contextualised in much of the wider literature. Although there is continued mention of non-suicidal reasoning, typically MSSH is contextualised as a failed suicide attempt and is therefore

situated within the suicide prevention literature. This is of course understandable given the two behaviours share a range of common risk factors (Huang et al., 2020), and appear similar in terms of the lethality of methods, the level of injuries sustained, and the high risk to life regardless of intent. However, despite appearing epidemiologically similar to what is understood about suicidal behaviour, our findings found that for the majority, MSSH has alternate non-suicidal functions. Our findings therefore align with more recent literature that highlights that there are complex differences between people who enact suicidal and non-suicidal behaviour (Huang et al., 2020).

Although The World Health Organisation (2021) and The British Government (2021) recognise self-harm and suicidal behaviour as major public health concerns, the review highlighted a dearth of research exploring MSSH. This was surprising given hospital attendance following MSSH and suicide attempts is estimated to cost the NHS around £162 million per year (Tsiachristas et al., 2017). In the same vein, there have also been calls for the current dichotomous approach between NSSI and suicidal behaviour's to be reevaluated, given emerging literature over the last decade has consistently found subgroups of self-harm (including MSSH), which arguably we do not yet fully understand. However, in comparison to NSSI or suicidal behaviour, subgroups of self-harm that do not appear to fit seamlessly into either category are relatively neglected within literature. A lack of knowledge creates a problem, as understanding the factors associated with, and the functions of suicidal and non-suicidal behaviour, is required to respond to self-harm effectively (Hawton et al., 2012). To this end, further research is needed.

A picture is also forming which highlights differences in psychopathological profiles for suicidal and non-suicidal self-harmer's (Chartrand et al., 2015; Mars et al., 2014). This includes a range of symptoms, such as depression and anxiety. However, very little research has explored whether the same differences exist amongst people who self-harm and require emergency medical treatment – medically serious self-harmers. To address this gap, as our systematic review identified, a recent study by Cleare et al. (2021) examined whether variables from throughout the IMV model could differentiate between individuals treated in hospital following non-suicidal self-injury and those who attempted suicide. They concluded that people who attempt suicide scored higher on a range of psychological risk factors compared to non-suicidal self-harmers, including suicidal ideation, defeat, internal entrapment and perceived burdensomeness. Their findings are akin with our own and

suggest MSSH may well be a subgroup of self-harming and suicidal behaviours, or even a standalone group, and thus further research is needed to understand this better.

To this end, the empirical paper reported in chapter four investigated whether variables included within the Integrated Motivational-Volitional Model of Suicidal Behaviour were able to retrospectively differentiate between non-suicidal medically serious self-harmers, following hospital attendance, and those who attempt or die by suicide. In light of the COVID-19 pandemic, secondary data was sourced. Whilst this meant individuals enacting MSSH were not directly consulted, there were merits in that unlike Cleare et al. (2021), we were able to compare MSSH to those who had attempted and died by suicide. This is helpful given the IMV is a model ultimately designed to explain psychological process of suicide occurring, and many of the people included in the studies within the systematic review cited suicidal intentions. Arguably, this strategy may assist with providing a clearer understanding of whether MSSH is in fact a self-harming or suicidal behaviour.

Chapter Four: Empirical Study

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Can the Integrated Motivational-Volitional Model of Suicidal Behaviour retrospectively differentiate between non-suicidal medically serious self-harmers, following hospital attendance, and those who attempt of die by suicide?

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Abstract

Medically serious self-harm (MSSH) – self-harm that is serious enough to require medical care within a general hospital, costs the NHS around £162 million per year. However, less is known about MSSH compared to other types of self-harming and suicidal behaviours (SB). A better understanding of the factors associated with suicidal and non-suicidal MSSH is needed to respond effectively. To explore such factors, our study aimed to retrospectively examine whether the factors specified within the IMV model of suicide would differentiate between adults who enacted SB, and those who received medical treatment following an incident of non-suicidal MSSH. The SB group (n= 151) statistically differed on all demographic variables to non-suicidal MSSH (n= 85). They were more likely to be older, male, utilise methods that restricted breathing and experience more recent significant life events. Chi squares tests revealed that SB statistically differed from non-suicidal MSSH on 11 moderator variables from the IMV; historical suicide attempts, historical self-harm, hopelessness, impulsivity, significant life events, suicidal planning, rumination, lack of social support, poor coping skills, poor problem solving skills, and lack of future goals. Binary logistic regression revealed, six of the variables made a statistically significant contribution to the model (historical suicide attempt, planning, a significant life event within six months, impulsivity, historical self-harm and alerting someone) and independently differentiated between SB and NSMMSH. Our findings suggest that there are nuanced differences in the demographical and psychological profiles of NSMMHer's and those who attempt or die by suicide. Further research ought to focus on developing MSSH specific theory, which by extension may improve targeted psychological interventions to reduce risk.

Keywords

Medically serious self-harm, NSSI, suicide, hospital, IMV

Introduction

Suicide is a major international health issue. According to the World Health Organisation (WHO) (2021), more than 700,000 people die per year by suicide, equating to one person dying from suicide every 40 seconds. Despite an on-going global effort to prevent suicides (Preventing Suicide a Global Imperative, WHO, 2014) sadly, suicide remains one of the leading causes of death worldwide (WHO, 2019). Similarly, self-harm is a pressing health concern and estimates suggest that approximately 7% of the UK population self-harm (McManus et al., 2019). In terms of clinical care and public spending, the costs of self-harm are high, and previous findings suggest related hospital attendances cost the NHS approximately £162 million per year (Tsiachristas et al., 2017). Furthermore, the high prevalence of self-harm is of concern, given that historical self-harm is understood to be the most reliable risk factor for future suicide (O'Connor & Nock, 2014; Hawton et al., 2012; Bergen et al., 2010; NICE, 2010; Cooper et al., 2005).

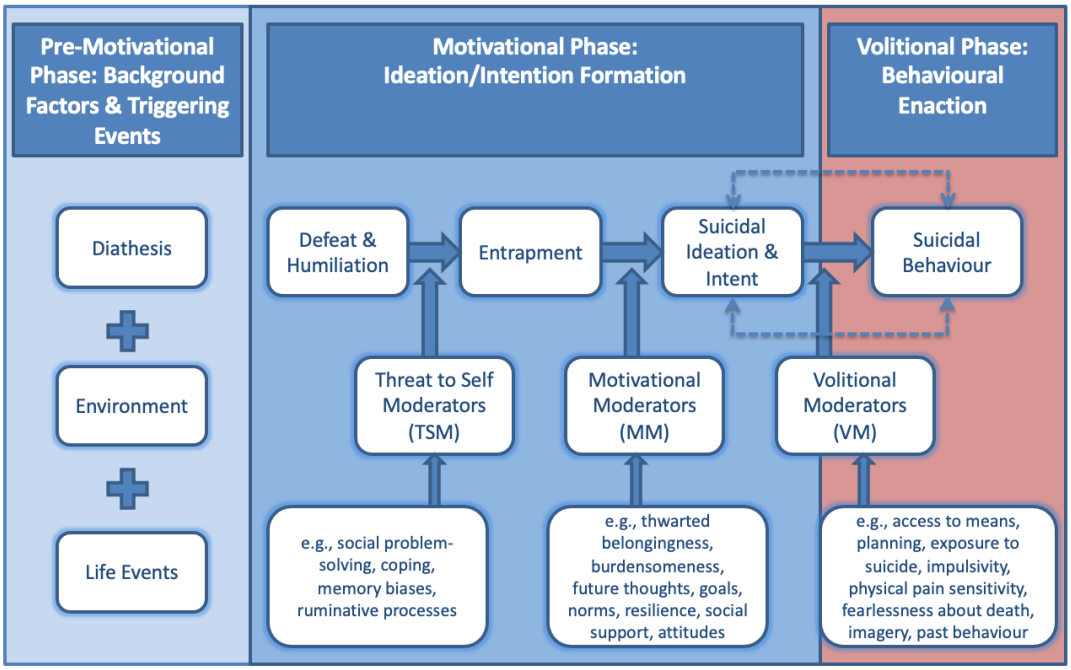
Despite the clear relationship between self-harm and suicide, the general consensus, particularly within the medical disciplines, is they are separate behavioural constructs, as they are underpinned by different motivations (American Psychiatric Association (APA), 2013). Non-suicidal self-injury (NSSI) is the "direct, deliberate destruction of one's own body tissue in the absence of intent to die" (Nock, 2009). The reasons for self-harm are complex and highly individual, but typically the functions of self-harm are understood to relate to regulating emotions, to cope with increased mental and physical distress and to communicate or articulate needs to others (Nock, 2009). NSSI occurs frequently, uses methods that pose low risk to life, and results in injuries not lethal enough to bring about death (APA, 2013; Nock, 2009). Conversely, a suicide attempt and a death by suicide are thought to be rare events (on an individual level), which occur using methods that pose high risk to life with the intention of ending one's life (WHO, 2021). Whilst some support a dichotomous separation of behaviours, there is growing consensus that self-harm and suicidal behaviours exist upon a continuum, as evidence suggests there are more discrete categories of self-harming and suicidal behaviours (Barker, Oakes-Rogers & Leddy, 2022; Cleare et al., 2021; Oakes-Rogers & Slade, 2020; Naherniak et al., 2019; Klonsky & May, 2016; Kapur et al., 2013). This includes self-harm and/or suicide attempts enacted with ambivalence (having a mixed or contradictory beliefs about wanting to live or die), varying levels of lethality (Barker, Oakes-Rogers & Leddy, 2022); and non-suicidal self-harm that is

intentionally serious enough to bring about death, (Mitchell et al., 2021; Oakes-Rogers & Slade, 2020; Marzano et al., 2012; 2011). Consequentially, determining treatment pathways based on a bipartite separation of behaviours presents a challenge for clinicians, as the functions of self-harm and suicidal behaviour often overlap, and rarely fit into two dichotomous groups (Kapur et al., 2013).

Whilst it is generally accepted that a wide range of risk factors exist, which for some increase the risk of enacting self-harm and/or suicidal behaviour, there is less clarity around how these factors translate to clinical practice. This means accurately identifying who thinks about harming themselves, and who will go on to act on their thoughts remains a complex task (Wetherall et al., 2018; Chan et al., 2018; Klonsky & May, 2016). This is partly because even the most evidenced predictors of suicide are common amongst clinical populations and only 50% of people who die by suicide have a self-harm history (Geulayov et al., 2019; Hawton et al., 2015). Given the potential for clinical intervention and prevention, developing a better understanding of the factors that mediate the transition from thoughts to actions, and improving our ability to identify those who will go on to enact suicidal behaviour is of critical importance (Kessler et al., 2005).

Whilst no model exists to explain non-suicidal medically serious self-harm (MSSH), more recent theoretical models of suicide present an ideation-to-action framework. This views the development of suicidal intent and the transition from suicidal ideation to action as two distinct processes (O'Connor & Kirtley 2018; Klonsky et al., 2017). The most widely supported theories of this nature include the Interpersonal-Psychological Theory of Suicide (IPT; Joiner, 2005) and the Integrated Motivational-Volitional Model of Suicidal Behaviour (IMV; O'Connor, 2011; 2018). The Integrated Motivational-Volitional Model of Suicidal Behaviour (IMV) (O'Connor, 2011; 2018) is a tri-partite model, consisting of the pre-motivational phase (the things that make people vulnerable to suicide), the motivation phase (the factors required for suicidal ideation to develop), and the volitional phase (the factors that facilitate the transition of suicidal thoughts to suicidal behaviours). The IMV posits that the pathway to suicide is linear, meaning individuals who do not possess factors from the pre-motivational phase are unlikely to think about or die by suicide (O'Connor, 2018).

Figure 1: The Integrated Motivational-Volitional Model of Suicidal Behaviour (O'Connor, 2012)



Despite growing evidence to support the ability of factors detailed within the volitional phase of the IMV to differentiate between those with and without suicidal intent (Cleare et al., 2021; Branley-Bell et al., 2019; Wetherall et al., 2018), a gap remains regarding the utility of the IMV to explain why people engage in other types of potentially lethal self-harm (Cleare et al., 2021). This presents an issue in terms of treatment, as currently, psychological interventions for medically serious, non-suicidal self-harm are lacking (Cleare et al., 2021). MSSH is intentional self-harm, that is serious enough to require medical care within a general hospital (Breet & Bantjes, 2017). Although in comparison to non-suicidal self-injury (NSSI) and suicidal behaviour, MSSH is largely under researched, it has been reported as a subtype of self-harm amongst adults (Cheon et al., 2020; Fox et al., 2016; Douglas et al., 2004; Hjelmeland et al., 2002), adolescents (Groholt et al., 2000), psychiatric inpatients (Sankaranarayananet al., 2020), and the prison population (Marzano & Colleagues, 2016; 2009; 2011a; 2011b; 2012; 2013; MacKenzie et al., 2013; Rivlin et al, 2013). Literature often reports that MSSH is enacted with suicidal intent, however within the same studies, non-suicidal reasons are consistently cited (Rivin et al., 2013; Horesh et

al., 2012; Marzano et al., 2011; Kumar et al., 2006; Douglas et al., 2004; Hjelmeland et al., 2002; Groholt et al., 2000). Such reasons include to gain relief from an unbearable state of mind, to articulate distress, to seek help from others, to influence someone or achieve a goal, to gain relief from physical pain and to punish the self (Rivlin et al., 2011; Madge et al., 2008; Jelic et al., 2005; Deer et al., 2005; Schnyder et al., 1999; Stephens, 1995; Bancroft et al., 1976; Casey, 1989). Interestingly, the aforementioned reasons are also cited within literature pertaining to non-suicidal self-injury (Nock et al., 2009). This may indicate that whilst the aforementioned reasons co-occur with suicidal intent, for others, MSSH can occur without suicidal intent. Therefore, given the evidence, considering MSSH only through the suicidal lens may be too simplistic.

Further exploration of how well current models of suicidal behaviour can explain MSSH, could provide clarity on whether the same transitional (or volitional) factors exist for those who enact MSSH without suicidal intent and those who engage attempt or die by suicide (O'Connor, 2011; Klonsky & May, 2016). Closer investigation could provide a better understanding of how to conceptualise different types of self-harm (Kapur et al., 2013) and offer a new clinical perspective relating to those who enact MSSH but do so without suicidal intent. This invariably could have positive clinical implications, given the need to understand the differential factors associated with MSSH and suicidal behaviour for clinicians to support subgroups of self-harmers more optimally (Cleare et al., 2021; Hawton et al., 2012).

To address these gaps, the current study aimed to retrospectively examine whether the pre-motivational, motivational and volitional factors specified within the IMV model of suicide would differentiate between adults who either attempted or died by suicide, and those who received medical treatment following an incident of non-suicidal MSSH. We hypothesised that individuals who cited suicidal intent would have a greater number of risk factors cited in the IMV, compared to those who enacted MSSH without suicidal intent. We predicted the IMV variables would differentiate between MSSH and those who attempt or die by suicide. Given the clinical and financial costs associated with self-harm hospital attendances and ongoing care, (Tsiachristas et al., 2017), we aimed to add to, and refine current theory, and provide a more clinically insightful understanding of the transitional factors for those who enact MSSH (Cleare et al., 2021). To our knowledge, this is the first study to use clinician completed serious incident reports and Datix incident reports to retrospectively test whether the IMV can differentiate between suicidal behaviour

(attempts and deaths by suicide attempts), and incidents of MSSH as its own behavioural construct.

Method

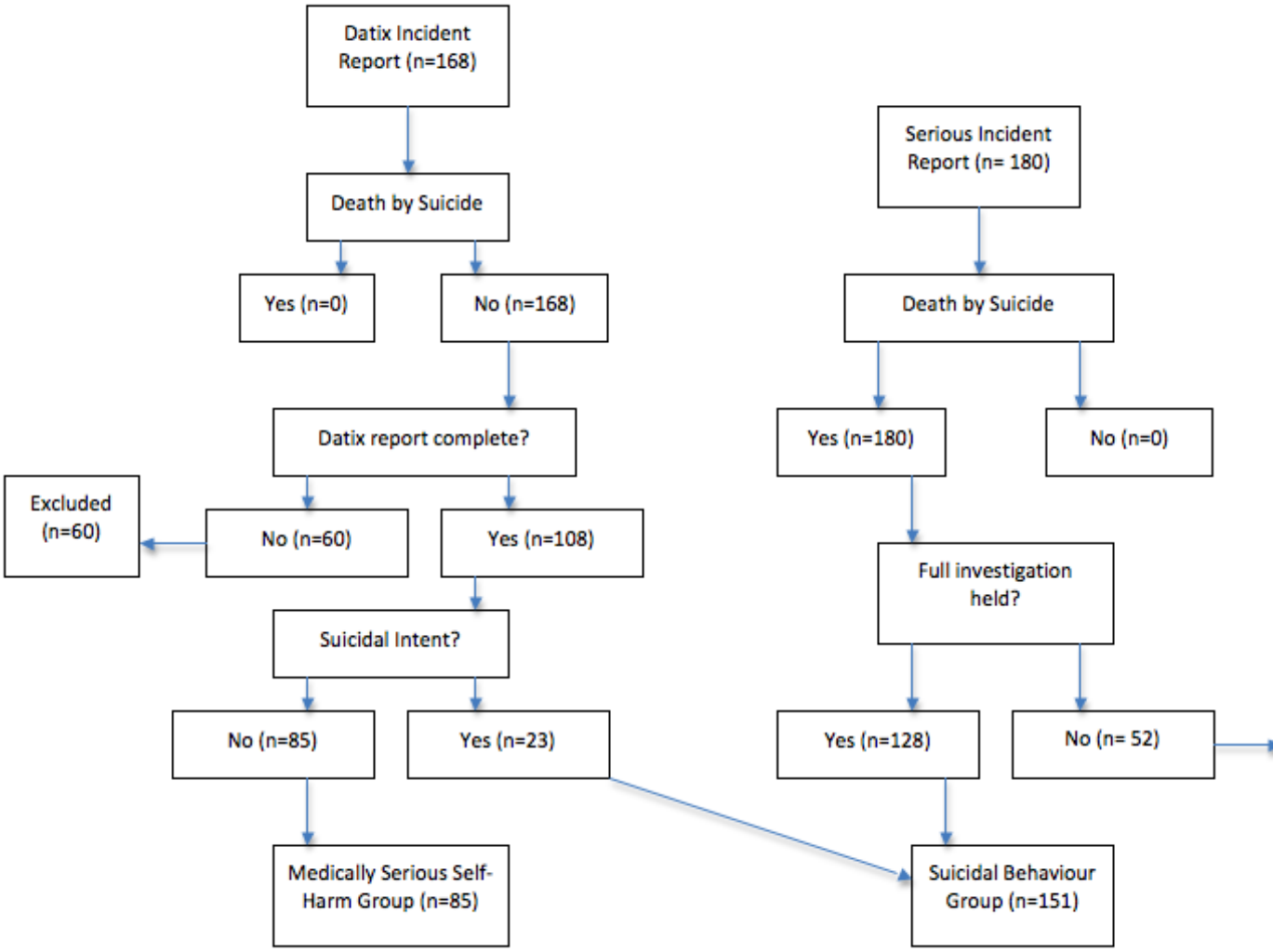
Participants

Adopting a similar approach to Bowers et al. (2011), participants were obtained from a pre-existing database, consisting of Patient Safety (Datix) Incident Reports (DIR) and Serious Incident Reports (SIR). SIRs are NHS documents, produced retrospectively by a patient safety investigation team. They aim to draw on information from clinical records and conversations with patients, families and care teams and identify learning points from serious incidents. DIRs are used to report harmful incidents that occur in NHS services and are completed by clinicians shortly after an incident of self-harm or suicidal behaviour.

A request was made to one NHS Patient Safety and Patient Mortality department for all SIR's pertaining to deaths by suicide between March 2011 and March 2019, with 180 incidents identified. 52 incidents were excluded. SIR's were excluded if death occurred more than three months after discharge from the trust (as any information or assessment of risk might be out of date) and when the deceased was unknown to the trust at the time of death, meaning a full investigation into the circumstances around the suicide was not possible. All deaths had been ruled as a suicide following a Coroners inquest.

A second request was made for DIR's relating to incidents of MSSH between March 2011 and March 2019, with 168 incidents identified. DIR's related to an adult who had received medical treatment following an incident of MSSH at an acute Accident and Emergency department across the East of England. All incidents had been coded by NHS staff as either; resulting in moderate-short term harm, in which a patient required further treatment or a medical procedure and impacted them for longer than seven days, or severe – permanent or long-term harm, which impacted them for more than 15 days. 60 incidents of MSSH were excluded from analysis. Excluded DIR's included; threats of self-harm with no action, drug overdoses that were not taken with the intention of harm to self (for example recreational drug use), DIR's that corresponded to the same person, and reports that did not provide sufficient information to allow meaningful coding of the personal circumstances around the event (e.g. those that only detailed the managerial response to an incident).

Figure 2 – Decision making flow chart for incident report group categorisation



Procedure

SIR's and DIR's were coded by the first author and categorised as either suicidal behaviour or non-suicidal MSSH (NSMMH), the process of which is outlined in figure 2. Incidents categorised as suicidal behaviour included deaths where a Coroner ruled the cause of death as a suicide and incidents of MSSH where the DIR recorded that the individual had stated the intended aim of their behaviour was to end their life, either verbally or within a suicide note. Incidents were categorised as non-suicidal MSSH when the SIR or DIR did not report suicidal intent, or where the function or aim of the self-harm was documented as anything other than to die (Oakes-Rogers, 2020).

In order to code for the presence of absence of motivational and volitional factors from the IMV model of suicidal behaviour, a simple binary coding framework was developed. For each variable, the definition used within the coding framework came from either the IMV model of suicidal behaviour, or where one was not available in the IMV literature, the American Psychiatric Association Dictionary of Psychology. Each variable was coded as 'present' (1), if the SIR or DIR explicitly documented the presence of the variable in question, or 'absent' (0) if the SIR or DIR explicitly stated the variable was not present, or the variable was not mentioned within the report. Table 1 illustrates the definitions and criteria used for the coding scheme for the variables extracted from the SIR's and DIR's.

Ethical Approval

The study obtained ethical approval from the Health Research Authority (reference: 298025) and the University of East Anglia Faculty of Medicine (reference: 2020/21-095). Given the sensitive nature of the study, a Clinical Psychologist provided regular supervision and authors had access to university wellbeing services.

Statistical Analysis

All analysis was conducted using the Statistical Package for the Social Sciences 25.0 (SPSS, Chicago, Illinois, USA). Two groups (suicidal behaviour and non-suicidal MSSH) were compared on demographic and clinical variables. Categorical variables were analysed with Chi-square tests. A binary logistic regression additionally explored the ability of variables included in the IMV model of suicide that were cited within SIR's and DIRs to differentiate between those who attempt or die by suicide and those who enact non-suicidal MSSH. According to Cohen (1988), a value of 0.10 indicates a small effect size; a value of 0.30 indicates a medium effect size and a value of 0.50 indicates a large effect size.

Table 1 Variable Coding Scheme

Variable	Coding
History of self-harm	Coded as present if the SIR or DIR reported that the individual had self-harmed on one (or more) other occasion(s).
History of suicidal behaviour	Coded as present if the SIR or DIR reported that the individual had attempted suicide, or enacted self-harming behaviours with "at least some intent to die" (Nock, 2009) on one (or more) other occasion(s).
Significant life event (SLE)	Coded as present if the SIR or DIR reported that the individual had experienced a life event within the last six months. Additionally, SLE's were categorised into one of five groups (health and personal wellbeing, relationships, financial / home stressors, multiple life events and change).
Impulsivity[2]	Coded as present if the SIR or DIR reported that the patient was known to act impulsivity, or the patient had self-reported current or historical impulsive risk behaviours.
Rumination[3]	Coded as present if the SIR or DIR reported that the patient had been ruminating.
Hopelessness[4]	Coded as present if the SIRs or DIRs detailed self-reported hopelessness, or if the author of the SIR or DIR noted a clinical impression of hopelessness.
Planning	Planning was coded as present if the SIR or DIR reported evidence of an individual taking steps to prepare for their suicidal behaviour or LTSH.
Lack of social support	Coded as present if the SIR or DIR reported that the individual had, or perceived that they had no support network.
Lack of future plans or goals	Coded as present if the SIR or DIR reported the individual had described not being able to see a future, not having any plans or goals for the future, or there were reports of nihilism in clinical notes.
Poor coping skills	Coded as present if the SIR or DIR stated that the patient had a lack of, or poor coping skills, utilised unhelpful patterns of behaviour or avoidance, or if the individual had reported that they did feel able, or know how to cope.
Poor problems solving skills	Coded as present if the SIR or DIR stated that the patient lacked, or had poor problem solving skills, or if the individual struggled to solve life problems or come up with alternative solutions.
Alerted someone	Coded as present if the SIR or DIR reported that the individual notified someone shortly after the act of self-harm or suicidal behaviour, or enacted self-harm or suicidal behaviour in front of another person, or in a place that would alert members of their family, friends or the public to their behaviour.
Consumed alcohol	Coded as present if the SIR or DIR cited toxicology reports which evidenced alcohol consumption at the time of death or hospital treatment, or if the patient had self-reported consuming alcohol at the time of incident.

2 'Describing or displaying behaviour characterized by little or no forethought, reflection, or consideration of the consequences of an action, particularly one that involves taking risks' (APA)

3 "Obsession thinking involving excessive, repetitive thoughts or themes that interfere with other forms of mental activity." (APA)

4 "The feeling that one will not experience positive emotions or an improvement in one's condition" (APA)

Results

Suicidal behaviour statistically differed on all demographic variables to non-suicidal MSSH (see table 2). Within the serious incident reports (SIRs), those who attempted or died by suicide were more likely to be older, (X^2(2, N = 236) = 28.62, p < .001, ϕ[5] = .348 and male (X^2(1, N = 236) = 20.72, p < .001, Φ[6] = .305). Comparably, within Datix incident reports (DIR's), those who enacted non-suicidal MSSH were more commonly young (52.9%) and female (64.7%). Within the SIR's, people who attempted or died by suicide were also more likely to utilise methods that restricted breathing (including hanging, ligaturing and suffocation), (X^2(4, N = 236) = 67.56, p < .001, ϕ = .535) whereas the DIR's identified that people who enacted non-suicidal MSSH were more likely to self-poison. Furthermore, the SIR'S revealed those who attempted or died by suicide were more likely to be under community mental health teams (X^2(3, N = 236) = 77.44, p < .001, ϕ = .573) whereas non-suicidal MSSH DIR's most commonly corresponded with receiving inpatient treatment.

Suicidal behaviour reported within SIR's also statistically differed from incidents of non-suicidal MSSH for significant life events (SLE) within six months of a suicide attempt or death by suicide, (X^2(5, N = 236) = 47.39, p < .001, ϕ = .448). As detailed in table 3, within the SIR's where people attempted or died by suicide, more experiences of SLE's were reported than for those who enacted MSSH. The greatest proportion of people were reported to have experienced multiple life events (n=41), events that impacted their relationships (n=29) or those that impacted their physical or mental health (n=26). Comparably, in the DIR's, there were no reported SLE for 61.2% (n=52) of those who enacted MSSH. When life events were reported in incidents of non-suicidal MSSH, those that impacted their relationships were most commonly reported (n=15).

[5] ϕ denotes the reporting of Cramer's V, (effect size), for tables larger than 2x2 (variables with more than two categories), which takes into account degrees of freedom.
[6] Φ denotes the reporting of the phi coefficient, which is a correlation coefficient used to represent an effect size for a 2x2 table (a binary variable with two categories).

Table 2

Number and percentage coded as present for descriptive characteristics

		Suicidal Behaviour *n* = 151	Non-suicidal MSSH *n* = 85	*P* value
Gender	Male	66.9% (n=101)	35.3% (n=30)	< .001
	Female	33.1% (n=50)	64.7% (n=55)	
Age	<= 32	23.2% (n=35)	52.9% (n=45)	< .001*
	33-49	33.1% (n=50)	32.9% (n=28)	
	50+	43.7% (n=66)	14.1% (n=12)	
Method	Lacerations/Stabbing	7.3% (n=11)	38.8% (n=29)	< .001*
	Restricting Breathing	52.3% (n=79)	3.5% (n=3)	
	Self-poisoning	24.5% (n=37)	34.1% (n=33)	
	Poly Trauma	7.9% (n=12)	8.2% (n=7)	
	Other	7.3% (n=11)	15.3% (n=13)	
Mental Health	None	15.2% (n=23)	1.2% (n=1)	< .001*
Service	Community Mental Health Teams	57% (n=86)	31.8% (n=27)	
	Crisis Teams	17.2% (26)	3.5% (n=3)	
	Inpatient	10.6% (n=16)	63.5% (n=54)	

Whilst further demographic information was unavailable within the non-suicidal MSSH DIR's, details of mental health diagnosis and marital status were collected from the SIR's. As illustrated in table 4, amongst those who attempted or died by suicide, 40% did not have a recorded mental health diagnosis at the time of incident. 25.2% had a diagnosis of a mood disorder and 15.2% had a diagnosed anxiety disorder. 49.7% (n=75) of people were single, 45.7% (n=69) had a partner and 4.6% (n=7) were widowed.

Table 3
Number and percentage coded as present for significant life events

		Suicidal Behaviour *n* = 151	Non-suicidal MSSH *n* = 85	*P* value
Significant life event	None	25.2% (n=38)	61.2% (n=52)	< .001*
	Health	17.2% (n=26)	9.4% (n=8)	
	Relationships	19.2% (n=29)	17.6% (n=15)	
	Finances/ Home	6.6% (n=10)	1.2% (n=1)	
	Multiple life events	27.2% (n=41)	1.2% (n=1)	
	Notable Change	4.6% (n=7)	9.4% (n=8)	

To explore which variables from the IMV model of suicide were described in SIR's or DIR's, where possible, data was collected for each of the 33 pre-motivational, motivational and volitional moderators. 12 variables were excluded from the analysis as they were rarely described within either the SIR's or DIR's, meaning they would have an overfitting impact if included within further analysis (Harrell et al., 1984). These were: burdensomeness, defeat and humiliation, entrapment, exposure to suicide, fearlessness about death, high pain threshold, imagery of death, no future thoughts, perfectionism, poor resilience, having positive attitudes towards suicide, and thwarted belongingness. Two additional variables were coded for, including alerting someone or telling others about an incident, and alcohol consumption at the time of the incident.

As illustrated in table 5, Chi squared tests revealed that those who attempted or died by suicide statistically differed from those who enacted non-suicidal MSSH on 11 moderator variables from the IMV model of suicide. Compared to DIR's for non-suicidal MSSH, SIR's reported that a greater proportion of those who attempted or died by suicide had attempted suicide before ($X^2(1, N = 236) = 88.09$, $p < .001$, $\Phi = .620$), had a history of self-harm ($X^2(1, N = 236) = 18.16$, $p < .001$, $\Phi = .287$), reported feeling hopeless ($X^2(1, N = 236) = 25.26$, $p < .001$, $\Phi = .339$), were clinically reported or self-reported as being impulsive, ($X^2(1, N = 236) = 29.06$, $p < .001$, $\Phi = .361$), experienced a significant life event within six months of the incident ($X^2(1, N = 236) = 28.39$, $p < .001$, $\Phi = .356$) and had planned their suicidal

behaviour (X^2(1, N = 236) = 44.60, p < .001, Φ = .444). Amongst those who attempted or died by suicide, the SIR's also documented greater levels of rumination, (X^2(1, N = 236) = 32.89, p < .001, Φ = .384), lack of social support, (X^2(1, N = 236) = 12.78, p < .001, Φ = .246), poor coping skills, (X^2(1, N = 236) = 24.46, p < .001, Φ = .334), poor problem solving skills, (X^2(1, N = 236) = 8.06 p < .001, Φ = .202), and lack of future goals (X^2(1, N = 236) = 10.65, p < .001, Φ = .228). The SIRs of DIRs were also more likely to report alcohol consumption at the time of incident (X^2(1, N = 236) = 10.94, p < .001, Φ = .215) when people enacted suicidal behaviour, however given more people who enact LTSH were receiving inpatient care, this was expected. For those who enacted suicidal behaviour, the SIRs or DIR's were less likely to report that they alerted someone or let another person know about their behaviour (X^2(1, N = 236) = 77.53, p < .001, Φ = -.582).

Table 4

Mental Health Diagnosis amongst those who attempted or died by suicide

	Frequency of diagnosis
No Mental Health Diagnosis	40.4% (n=61)
Mood Disorders	25.2% (n=38)
Anxiety Disorders	15.2% (n=23)
Personality Disorders	9.9% (n=15)
Schizophrenia	7.3% (n=11)
Harmful Substance Use	0.7% (n=1)
Eating Disorders	0.7% (n=1)
Autism Spectrum Disorder	0.7% (n=1)

Table 5

Number and percentage coded as present for pre-motivational, motivational and volitional factors from the IMV model of suicide

	Suicidal Behaviour *n* = 151	Non-suicidal MSSH *n* = 85	*P* value	*Phi* (φ)*
History of Self-Harm	35.5% (N=54)	39.3% (N=33)	.666	.287
History of Suicidal Behaviour	64.9% (n=98)	1.2% (n=1)	< .000*	.620
Hopelessness	26.5% (n=40)	0% (n=0)	< .001*	.339
Significant Life Event				.356
Impulsivity	33.8% (n-51)	2.4% (n=2)	< .001*	.361
Planning	49.7% (n=75)	5.9% (n=5)	< .001	.444
Lack of Social Support	19.9% (n=30)	2.4% (n=2)	< .001*	.246
No Future Goals	13.3% (n=20)	0% (n=0)	< .001*	.228
Poor Coping Skills	25.8% (n=39)	0% (n=0)	< .001*	.334
Poor Problem-Solving Skills	10.6% (n=16)	0% (n=0)	.002*	.202
Rumination	32.5% (n=49)	0% (n=0)	< .001*	.384
Alerted Someone	16.6% (n=25)	76.5% (n=65)	< .001*	-.592
Consumed Alcohol	29.8% (n=45)	10.6% (n=9)	.001*	.220

* ϕ denotes effect size for binary 2x2 tables. According to Cohen (1988), a value of 0.10 indicates a small effect size; a value of 0.30 indicates a medium effect size and a value of 0.50 indicates a large effect size.

A binary logistic regression was performed to examine the ability of pre-motivational, motivational and volitional factors from the IMV model of suicide (as reported in either SIR's or DIR's) to predict membership of the suicidal behaviour or non-suicidal MSSH group. Multicollinearity was tested and no violations were recorded. In line with recommendations from Harrell et al. (1984), five variables were omitted to maintain acceptable power and risk of overfitting. As such, the variables that were reported on the

least within the SIR's or DIR's were removed, including rumination (n=49), hopelessness (n=40), no future goals (n=20), poor coping (n=39) and poor problem solving (n=16).

The overall model was significant $X^2(8) = 212.98$, $p = < .001$, indicating that the model was able to distinguish between people who had an SIR for an attempt or death by suicide, and those who had a DIR, following an incident of LTSH. The model as a whole correctly classified 88.6% of cases. As shown in table 5, six of the variables made a statistically significant contribution to the model (historical suicide attempt, planning, a significant life event within six months, impulsivity, historical self-harm and alerting someone). As illustrated in table 6, the strongest predictor of suicidal behaviour was historical suicidal behaviour, recording an odds ratio of 48.19. This indicated that the odds are 48.19 times greater that individuals with a history of suicidal behaviour would have attempted or died by suicide, than those who enacted MSSH, controlling for all other factors in the model. Notable odd ratios were also reported for impulsivity (18.55) and planning suicidal behaviour (23.67). The odds ratio for historical self-harm, was less than one, indicating that for those who have a history of self-harm, the odds were .163 lower that they would enact suicidal behaviour, controlling for all other factors in the model. Similarly, the odds ratio for alerting someone to their behaviour was less than one, indicating that for those who tell others about their behaviour, the odds were .065 lower that they would enact suicidal behaviour, controlling for all other factors in the model. The only predictor variable that did not significantly contribute to the model was lack of social support.

Table 6

Binary Logistic regression predicting likelihood of enacting suicidal behaviour

	B	*SE*	Wald	*df*	*P*	Odds Ratio	95% CI for Odds Ratio	
							Lower	Upper
Historical Suicidal Behaviour	3.875	1.063	13.06	1	< .001*	48.19	5.997	387.26
Historical Self-Harm	-1.813	.738	6.04	1	.014*	.163	.038	.693
Lack of Social Support	1.502	1.264	1.41	1	.235	4.489	.377	53.42
Planning	3.164	.722	19.21	1	< .001*	23.672	5.750	97.47
Significant Life Event	.996	.507	3.87	1	.049*	2.708	1.003	7.311
Impulsivity	2.920	1.180	6.12	1	.013*	18.546	1.836	187.37
Alerted someone	-2.750	.433	24.78	1	< .001*	.064	.022	.189

Discussion

To our knowledge, this is the first study to retrospectively test whether components of the IMV model of Suicidal Behaviour (O'Connor & Kirtley, 2018b; O'Connor, 2011) differentiate between incidents of suicidal behaviour (attempted or death by suicides with suicidal intent) and medically serious self-harm (without suicidal intent), as reported within serious incident and Datix incident reports.

The demographic profiles of those who enact suicidal behaviour and MSSH are different. Those who enacted suicidal behaviour were significantly more likely to be male and of older age, whereas MSSH's were significantly younger and female. The groups also differed in terms of the type of mental health service they received care from. Those who enact suicidal behaviour were most commonly under community mental health teams, whereas being an inpatient was associated with MSSH. Clinically, this finding may seem at odds to the expectation that those at greatest risk would be more likely to receive inpatient care and not within the community. Sadly, our findings are akin to the caution issued by The Royal Collage of Psychiatrists (2020), which state community care provisions such as Crisis health teams have "*become a default for acute mental health services because of the*

pressure on in-patient beds". This raises questions regarding how people receive support in the community and whether inpatient stays are in fact a more effective suicide prevention strategy, despite the knowledge that people can and do still die by suicide within inpatient provisions (The Royal College of Psychiatrist, 2020). Consequentially, emphasis ought to be placed upon understanding the factors that influence why people may receive community over inpatient care and longer-term studies on whether in-patient treatment prevents suicide more effectively.

Differences were also noticed in terms of methods and compared to MSSH; methods that restrict breathing were the most common methods of suicidal behaviour. These findings are in keeping recent data from the Office of National Statistics (ONS, 2020) regarding suicide and incidents of attempted suicide that received hospital treatment. Conversely, the largest proportion of the MSSH group inflicted lacerations. This finding differs from previous literature, which cites self-poisoning as the most common form of self-harm requiring hospital attendance (Haw et al., 2005; 2015). Arguably, as young women are known to attempt suicide more frequently than men, but often survive due to the use of less lethal methods, (Clarke et al., 2020; Cibis et al., 2012), some may argue that MSSH should be understood as suicidal behaviour (APA, 2013). This is on the basis that the DSM-5 diagnostic (APA, 2013) criteria for suicidal behaviour posits that in addition to suicidal intent, it will involve methods that pose a high risk to life and result in moderate to severe injuries.

However, the findings from the current study offer preliminary evidence to reject the hypothesis that all potentially lethal forms of self-harm are best understood as suicidal behaviour, given none of the people who enacted non-suicidal MSSH cited suicidal intent. Clinically this may offer a helpful indication that MSSH hospital presentations of lacerations (when reported to have occurred without suicidal intent) may benefit from being referred for ongoing self-harm interventions and not those designed to target suicidal behaviour. However, the findings relating to MSSH ought to be interpreted with caution, as previous literature has indicated that some people do not fully understand the potential seriousness of their MSSH (Craig & Fox, 2014; Oakes-Rogers & Slade, 2022, in press). Furthermore, literature has shown that people who inflict lacerations during an index incident of serious self-harm commonly switch to more lethal methods should they repeat their MSSH (Witt et al., 2019; Chan et al., 2016; Miller et al., 2013). Arguably, this highlights the cohort of MSSH

as a vulnerable group for future suicide, or death by misadventure (Miller et al., 2013). Therefore, further research into the process of selecting and understanding the potential lethality of method selection is warranted. Whilst it was beyond the scope of the current study, research of this nature could help to clarify whether high lethality methods, or indeed life-threatening injuries are indicative of suicidal intent, or driven by other currently less understood functions.

Whilst the limitations relating to retrospective research are accepted, including whether individuals disclosed their true intentions to the treating clinician, an issue highlighted in suicidality research and suicide prevention initiatives, (Sheenan et al., 2019; Fulginiti & Frey, 2019), our findings appear to align with literature that consistently cites there may be alternative, non-suicidal functions of MSSH (Fox et al., 2016; Rivin et al., 2013; Horesh et al., 2012; Mazarno, et al., 2011; Kumar et al., 2006; Douglas et al., 2004; Hjelmeland et al., 2002; Groholt et al., 2000). This lends tentative support for the idea that contextualising MSSH purely within a suicidal framework may be too simplistic (Oakes-Rogers and Slade, in press; Cleare et al., 2021), as there are likely to be more discrete categories of potentially lethal self-harm (Cleare et al., 2021). Further research is needed to better understand this.

Consistent with other research, (Cleare et al., 2021; Branly-Bell et al., 2019) historical suicidal behaviour differentiated suicidal behaviour and MSSH and was the strongest predictor of suicidal behaviour. Clinically, this finding reaffirms the importance of obtaining a comprehensive risk history when assessing individuals thought to be at risk of suicide and gives weight to historical suicide being a key risk marker for future attempted or death by suicide. However, the need to consult multiple sources of information is important given our findings showed those who attempted or died by suicide were significantly less likely to alert someone to their behaviour, and literature that highlights around 50% of people do not share their suicidal thoughts or intensions (Love & Morgan, 2021; Hoyen et al., 2021). It may also be helpful to focus on building therapeutic relationships with those known to be at risk, to encourage transparency around suicidal thoughts and plans.

Additional group differences were noted for impulsivity, significant life events and planning harmful behaviour. Given previous literature highlights the relationship between impulsivity and suicidal behaviour (Liu et al., 2017; Klonsky & Mae, 2010), and that which suggests the time between thinking of suicide and acting on suicidal thoughts can be as

short at 10-minutes (Deisenhammer et al., 2009), impulsivity may offer a potential area for intervention. Furthermore, an awareness of individuals who have experienced significant life events may also offer a potential opportunity to increase support, as literature has shown recent significant life events are associated with suicidal behaviour (No et al., 2020; Howarth & O'Connor, 2020; Oquendo, Perez-Rodriguez et al., 2014). In this instance, clinical teams are most likely to capture those in need given they ought to become aware of significant life events amongst those already under their care. Lastly, as planning significantly differentiated between suicidal behaivour and MSSH, our findings suggest that questions around suicidal planning ought to be routinely asked, and any disclosure of suicidal plans (both in terms of thoughts around method selection, location or timing of an event) must be taken seriously. Interestingly, a lack of social support did not differentiate between suicidal behaviour and MSSH, but with it being cited in almost a quarter of all SIR's and DIR's, it is likely to still play a role in MSSH and suicidal behaviours in a way that we have not quite understood

Our findings therefore align with the IMV model, which predicts impulsivity, planning and past behaviour are key volitional factors in the transitional period of suicidal thoughts to action. Unlike other studies, which use survivors of suicide attempts as proxies those who die by suicide (Levi-Belz et al., 2020; 2018; Rivlin et al., 2012), our findings indicate a key strength of the study and suggest that the retrospective method of data collection used for the current study offers a viable way of learning more about suicide. Testing the IMV model retrospectively on SIR's at a nationwide level could reveal further insight on a significantly large scale. Arguably this could provide population level data, which may help to further clarify factors responsible for people acting on suicidal thoughts (O'Connor & Kirkely, 2018b). Furthermore, conducting research on larger sample sizes may refine the current understanding regarding the existence of other subgroups of self-harmers.

Despite an alignment to the IMV model of Suicidal Behaviour, our findings suggest those who attempted or died by suicide were less likely to have had a documented history of self-harm. This finding was unexpected as previous literature suggests historical self-harm is the most robust predictor of future suicidal behaviour (Knipe et al., 2019; Mars et al., 2019; Hawton et al., 2015). Arguably, in the absence of historical self-harm, our findings may highlight the importance of recent significant life events and impulsivity as a separate pathway to suicidal behaviour. A pathway of this nature would align with current literature,

as a large systematic review reported impulsivity played a particularly important role in suicidal behaviour when distress levels caused by a significant life event was high (Gvion & Levi-Belz, 2018; Bagge et al., 2013; Zouk et al., 2006). The same literature suggests the relationship between significant life events, impulsivity and suicidal behaviour is moderated by suicidal planning (Bagge et al., 2013), meaning that for those not actively planning suicide, experiencing a significant life event can trigger increased mental pain, impulsivity and suicidal behaviour (Bagge et al., 2013; Zouk et al., 2006).

Such a suggestion is in keeping with the IMV model of suicide, given its linear nature and standpoint that people are unlikely to experience suicidal thoughts and even less likely to enact suicidal behaviour if they have do not have risk factors from the pre-motivational phase (i.e. significant life events). Arguably our findings may offer a novel insight into a different cohort to those cited in previous literature, which frequently includes people already known to services as people who engage in self-harming behaviours. As a quarter of the SIR's for the suicidal behaviour group did not report a mental health diagnosis, and only 35% had a history of self-harm, our findings may be helpful in considering why people enact suicidal behaviour without seemingly presenting with other well-known risk factors. This is important, as it highlights a group of people not fully understood theoretically or clinically and raises questions at a societal level as to how we adequately identify and support people without obvious risk. Continued research into refining pathways to suicide is warranted and important given the need to develop clinical and theoretical understanding, social awareness, treatment, and future prevention.

In terms of clinical reporting, the number of variables excluded from the analysis was surprising. Variables were excluded when they were not represented frequently enough in the data, meaning they were not reported within SIR' or DIR's. Given many of the variables have a known relationship with suicide, (for example, exposure to suicide of a close friend or family member, burdensomeness, defeat and humiliation and entrapment), the low prevalence rates across incident reports was unusual. Arguably, this suggests the excluded variables may not have been considered when completing incident reports, which could prevent important lessons being learnt amongst clinical services. Given rumination, hopelessness and alcohol consumption, all featured in around 30% of SIR's, it is likely they would reveal a role in suicidal behaviour and confirm findings from other studies. These findings highlight the need to encourage professional curiosity and consideration to a wider

range of factors that may play a role in self-harm and suicidal behaviours, which is a recommendation that has been highlighted frequently in Coroner's investigations (Thacker et al., 2019; Mantell & Jennings, 2016).

Given the underreporting of variables consistently cited within literature, we have to consider the possibility that these could have been present in the incident reports but have not been identified. This needs to be considered when interpreting this part of our findings as they limited ability to explore in-depth which factors from the IMV were present in Datix Reports for MSSH. Comparably, it is also possible that clinicians reporting the data were not aware of the relationship between the variables excluded from the analysis and suicide, meaning they were not reported. The limitations of poorly completed incident reports places upon research and future learning have been well documented within literature (James et al., 2012; Bowers et al., 2011). It is therefore encouraged that this part of our findings are viewed as exploratory, and as a preliminary examination of the factors that could contribute to other types of medically serious self-harm. A possible solution includes training more clinicians to conduct serious incident reviews, and in doing so, introducing more specialties and clinical perspectives. It may also be helpful to modify the investigation template to include known risk factors for suicide from the IMV Model of Suicidal Behaviour, to prompt clinicians to consider a wider set of possible reasons suicidal behaviour. Clinicians with specialist knowledge of self-harm and suicide are likely to be best placed to implement such change.

Strengths and limitations

A primary strength of the study is the use of data collected from SIR's that had undergone a stringent and standardised investigation process and drew on information provided by the Coroners office and physical and mental healthcare records. In doing so, it gives weight to the assumption that the information held within the SIR's was the most accurate representation of the information available at that time and ensures good inter-related reliability. However, whilst many of the variables detailed within the IMV were rarely discussed within the SIR's and DIR's, higher power would have allowed us to

investigate these factors known to play a role in suicidal behaviour more thoroughly in the analysis.

Given the exploratory nature of both medically serious self-harm and by extension the analysis, it is recognised with adjustment for multiple comparisons, some of the findings may no longer be significant. Readers are therefore encouraged to consider the findings tentative and future research would be welcomed.

Unlike much of research into the IMV model of Suicidal Behaviour, a second strength of the study was the lack of exclusion criteria for particular mental health disorders, age or gender. This ensures good external validity and the findings offer an accurate representation of adults in the clinical mental health population, however it is recognised that it introduces heterogeneity to the sample. A final limitation relates to the sample only including people from the East of England, meaning the results may not be generalisable to people in other geographical locations. Namely, this is because the East of England is known to largely consist of people of white ethnicity, and due to its farming connections, differences may exist in relation to access to means of self-harm and/or suicide less common to urban areas.

Conclusion

Whilst medically serious self-harm and suicidal behaviour may appear similar, there are nuanced differences in the demographical profile. Arguably, these findings contribute to the growing body of evidence, which posits additional subgroups of self-harm are likely to exist (Cleare et al., 2021). Caution is however recommended when considering some of the clinical and theoretical implications, given there are concerns that variables from the IMV model of Suicidal Behaviour were excluded from the analysis. However, this limitation does not exist across the entire database as a number of variables are consistently reported accurately with little or no missing data.

Despite its limitations, clinically, our findings could suggest that for individuals without a history of self-harm, particular attention ought to be paid towards the experience of recent significant life events, whereas for those with a history of self-harm, reports of planning may be indicative of increased risk. It is however accepted that the pathway suggestions are unlikely to be complete and future research is needed. Additionally, some

tentative differentiations were noted between MSSH and suicidal behaviour. This may help to formulate the beginnings of a separate profile for MSSH'ers, including being younger than 32 years of age, female, an inpatient and enacting MSSH via lacerations. Further research is necessary to continue to identify the myriad of different pathways to suicidal behaviour (Oakes-Rogers & Slade, 2015), and to establish pathways to alternative forms of medically serious self-harm.

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Chapter Five: Discussion and Critical Evaluation

This chapter provides an overall discussion and critical evaluation of the two papers outlined within this thesis.

Overall Discussion

The overarching aim of this thesis was to explore whether medically serious self-harm (MSSH) ought to be understood as suicidal or non-suicidal in nature, amongst people across the lifespan. To achieve this aim, two papers were presented. Chapter two, a systematic review, was to our knowledge, the first paper to synthesise the literature pertaining to MSSH with the aim of determining whether all instances of MSSH were attempts to end life. In the event that non-suicidal reasoning was found, it also aimed to provide an overview of the alternate reasons people cite. Being the first study to do so, despite limitations related to the quality of literature reviewed and heterogeneity of papers the findings make a unique contribution to literature. Chapter four presented an empirical paper examining the ability of variables detailed within the Integrative-Volitional Model of Suicidal Behaviour (IMV) to distinguish those who received emergency medical treatment following an incident of non-suicidal MSSH and those who attempt or die by suicide. Whilst previous studies have utilised similar aims (Cleare et al., 2021), or used a similar methodology in terms of retrospectively exploring data from Datix incident reports (Bowers et al., 2011), to our knowledge our empirical study was the first to compare both Datix and Serious Incident reports pertaining to hospital treated MSSH and suicides, meaning a comparison can be made between MSSH and those who have died by suicide.

In line with what is known about NSSI (Wang et al., 2022; McMannus et al., 2019), our systematic review found that more females enacted MSSH than their male counterparts. Similarly, the mean age of those enacting MSSH was 25.3 years old, suggesting the demographic profile of non-suicidal MSSH is akin to those who enact NSSI (Muehlenkamp et al., 2018; Fox et al., 2015), yet different to those who die by suicide, who are more likely to be male (Choo et al., 2019). Furthermore, our findings mirror trends in hospital treated self-harm (ONS, 2021), whereby self-poisoning was the most common form of self-harm across the lifespan. Methods typically associated with suicide (such as hanging or jumping from heights) were however less common, conflicting with what theoretical models expect from suicidal individuals (O'Connor & Kirkley, 2018; Joiner, 2005). Notable differences also existed in terms of mental health diagnoses, and compared to suicidal MSSH, depressive disorder was significantly lower amongst people enacting MSSH without

suicidal intent, whilst the prevalence of disruptive and personality disorders was significantly higher. This was particularly true in studies that included adolescents. The same pattern emerged for well-known psychological risk factors and people were found to score significantly higher on most factors if they were suicidal, compared to those who were non-suicidal.

A key conclusion of the systematic review was that medically serious self-harmers are not one homogenous group, and that for many; there are multiple reasons why they enact MSSH at any given time. The biggest difference between those enacting MSSH was the presence or absence of suicidal intent. Importantly, some individuals enact MSSH with suicidal intent, however when combined across the studies, for the majority of those captured within the review literature, MSSH was underpinned by alternative non-suicidal reasons. This was an interesting and important reason, given individually; most studies report that the majority of MSSH is enacted with suicidal intent. Whilst firm conclusions cannot be drawn due to the inconsistencies in how suicidal intent was measured and reported, it does highlight a need for literature to revisit how MSSH is contextualised, to approach MSSH from this standpoint and carry out more research to corroborate our findings.

On average, 51% of people did not cite suicidal intent; alternate non-suicidal reasoning was explored. Such reasoning included coping with intrapersonal distress, which seemingly caused various factors such as mental health difficulties (the only factor which transcended the lifespan), financial or employment worries, physical health concerns and bereavement. Regulating intrapersonal states has long been cited as a key function of self-harm and suicidal behaviours (Brausch & Muehlenkamp, 2018) and our findings alligned with the wider literature. Additional non-suicidal intrapersonal reasoning appeared age specific. Adolescents cited more distress inducing worries including exam and academic pressures and coping with sexuality and/or gender identity concerns as reasons for MSSH, and a wider range of mental health disorders were diagnosed amongst younger participants. This highlights a potential increased risk for young people experiencing intrapersonal distress and aligns with literature that concluded that the proportion of young people reporting NSSI to relieve difficult feelings is increasing (McMannus et al., 2019). Wider psychological theories, namely those relating to psychological development across the life span, may offer some explanation for our findings. Erikson's eight stages of

development (1968), posits that between the ages of 12 and 24, adolescents can experience 'identity confusion'. Identity confusion relates to an imbalance of identity, which results in increased distress, a lack of purpose and direction in life and an inability to commit to life's tasks (Erikson, 1968). This is the opposite of 'identity synthesis', which is the ideal state for young adults and refers to a subjective feeling of sameness and consistency over time, and the extent to which someone's pieces of their identity fit together (Claes et al., 2014). Literature has suggested that NSSI may be symptomatic of identity confusion and has cited it as a coping strategy for managing challenges of developing and maturity, and the difficult circumstance that aging and maturing brings (Law et al., 2106; Claes et al., 2014). According to Stanikle et al., (2020), psychological challenges during the development from childhood to adulthood is likely to act as a key pathway into NSSI. Whilst beyond the scope of this thesis, these suggestions ring true to the reasons provided by adolescents enacting MSSH for non-suicidal reasons and indeed the increased prevalence of MSSH across younger people, highlighting an interesting area for future research. This could also prove beneficial from a clinical standpoint, given an understanding of the pathways into and out of self-harming and suicidal behaviours are crucial for effective treatment planning (Stanikle et al., 2020).

Difference in reasoning appears to differentiate MSSH from suicidal behaviour in terms of suicidal intent, age and culture. In terms of cultural differences, compared to western cultures, non-western studies reported lower rates of mental illness amongst their participants and higher levels of non-disclosure of reasons for MSSH. Han and Ollife (2015) describe the close interlink between self-harm and suicidal behaviours and culture, warning that cultural attitudes; stigma about mental health, concerns around traversing cultural norms, and perceptions of healthcare can impact help seeking and self-management (Han & Ollife, 2015).

Interestingly, our review did not find evidence that people enact MSSH for functions that would align with intrapersonal positive reinforcement. However, given the respectable evidence base supporting the FFM, it is unlikely that our findings refute the model's accuracy. It is instead more likely that our search strategy did not allow for the finding of studies that included people who enacted MSSH for intrapersonal positive reasons.

Reasons that aligned with both intrapersonal processes from the FFM (to stop or change a situation involving other people, or to communicate something to someone in

order to achieve a desired outcome) were also found within the reviewed literature. Enacting MSSH to communicate distress to others, and to elicit a caring response was particularly prevalent amongst younger people and was significantly more common amongst non-suicidal MSSH compared to suicidal MSSH (McAuliffe et al., 2007; Groholt & Haldorson, 2000). Similarly, our review also demonstrated how some adults and adolescents enact non-suicidal MSSH to manage interpersonal difficulties or demands, achieve a desired change and escape or get a break from an interpersonal situation. Situating our findings with the wider self-harm literature, familial, parental and romantic conflict was cited most frequently, across the age span and cross-culturally (McMannus et al., 2019; Oakes-Rogers, 2020; O'Connor et al., 2012; Nock, 2009).

The empirical paper followed the systematic review was to our knowledge, the first study to test whether components of the IMV model of Suicidal Behaviour (O'Connor & Kirtley, 2018b; O'Connor, 2011) can retrospectively differentiate between incidents of suicidal behaviour (attempted or death by suicide with suicidal intent) and MSSH (without suicidal intent), as reported within serious incident and Datix incident reports. The study therefore makes a unique contribution to the current MSSH literature but offers a slightly different perspective in that it compares psychological factors between those who enact non-suicidal MSSH and those who die by suicide. Arguably, this allows a clear comparison between the two behaviours and contributes to the wider academic positioning of self-harm and suicidal behaviours existing upon on a continuum of interlinked, yet different behaviours.

As the systematic review eluded, findings from the empirical paper also found evidence to suggest that the demographic profiles of those who enact suicidal behaviour and MSSH are different. Concurring with the review, people who enacted MSSH were significantly younger and more likely to be female, compared to their suicidal counterparts, who were significantly more likely to be older and male. Those who enact suicidal behaviour were most commonly under community mental health teams, whereas being an inpatient was associated with MSSH. Clinically, this finding may seem at odds to the expectation that those at greatest risk would be more likely to receive inpatient care and not within the community. Differences were also noted in terms of methods of MSSH, and compared to MSSH, methods that restrict breathing were the most common methods of suicidal behaviour. These findings are in keeping recent data from the Office of National Statistics

(ONS, 2020) regarding suicide and incidents of attempted suicide that received hospital treatment. Conversely, the largest proportion of the MSSH group inflicted lacerations. These findings were unexpected given the systematic review had revealed an overwhelming propensity of MSSHincidents to involve self-poisoning. Caution is therefore issued when generalising the findings of our empirical study to the wider population and it is acknowledged that our inconsistent findings may reflect some level of heterogeneity amongst the sample, in that young females were more likely to be receiving inpatient care at the time of their MSSH. Whilst outside the scope of this thesis, one hypothesised theory for our findings may be attributable to restriction (or removal) of means – a suicide prevention policy that has been indicated as responsible for influencing methods of self-harm amongst female mental health inpatients (Oakes-Rogers & Slade, 2020; Klein et al., 2012), which restricts peoples access to more lethal forms of self-harm. Consequentially, it would be reasonable to assume that within inpatient settings, accessing medication would prove more challenging compared to an object that could inflict medically serious lacerations. Further research is needed to understand this finding.

The findings from our empirical paper supported the work of Cleare et al. (2021), in that we also found significant differences between variables cited within the IMV model of suicidal behaviour. The IMV differentiated those who attempted or died by suicide from non-suicidal MSSH in terms of historical suicidal behaviour, which was the strongest predictor of suicidal behaviour, and those who attempted or died by suicide were significantly less likely to alert someone to their behaviour. This finding is consistent with previous literature (Love & Morgan, 2021; Hoyen et al., 2021; Branly-Bell et al., 2019; Hawton et al., 2012). Additional significant group differences were noted for impulsivity, significant life events and planning harmful behaviour. Again, our findings were consistent with wider literature evidencing the relationship between impulsivity and suicidal behaviour (Liu et al., 2017; Klonsky & Mae, 2010), that which shows recent significant life events are associated with suicidal behaviour (No et al., 2020; Howarth & O'Connor, 2020; Oquendo, Perez-Rodriguez et al., 2014), and that which puts people who plan their suicidal behaviour at greater risk of death (King et al., 2019; Carleton et al., 2018; Joiner et al., 2003). Interestingly, a lack of social support did not differentiate between suicidal behaviour and MSSH, but with it being cited in almost a quarter of all SIR's and DIR's, it is likely to still play a role in MSSH and suicidal behaviours in a way that we have not quite understood. Our

findings therefore align with the IMV model, which predicts impulsivity, planning and past behaviours are key volitional factors in the transitional period of suicidal thoughts to action.

Despite an alignment to the IMV model of Suicidal Behaviour, our findings suggest those who attempted or died by suicide were less likely to have had a documented history of self-harm. This finding was unexpected as previous literature suggests historical self-harm is the most robust predictor of future suicidal behaviour (Knipe et al., 2019; Mars et al., 2019; Hawton et al., 2015). Arguably, in the absence of historical self-harm, our findings may highlight the importance of recent significant life events and impulsivity as a separate pathway to suicidal behaviour. A pathway of this nature would align with current literature, as a large systematic review reported impulsivity played a particularly important role in suicidal behaviour when distress levels caused by a significant life event was high (Gvion & Levi-Belz, 2018; Bagge et al., 2013; Zouk et al., 2006). The same literature suggests the relationship between significant life events, impulsivity and suicidal behaviour is moderated by suicidal planning (Bagge et al., 2013), meaning that for those not actively planning suicide, experiencing a significant life event can trigger increased mental pain, impulsivity and suicidal behaviour (Bagge et al., 2013; Zouk et al., 2006).

Such a suggestion is in keeping with the IMV model of suicide, given its linear nature and standpoint that people are unlikely to experience suicidal thoughts and even less likely to enact suicidal behaviour if they have do not have risk factors from the pre-motivational phase (i.e. significant life events). Arguably our findings may offer a novel insight into a different cohort to those cited in previous literature, which frequently includes people already known to services as people who engage in self-harming behaviours. As a quarter of the SIR's for the suicidal behaviour group did not report a mental health diagnosis, and only 35% had a history of self-harm, our findings may be helpful in considering why people enact suicidal behaviour without seemingly presenting with other well-known risk factors. This is important, as it highlights a group of people not fully understood theoretically or clinically and raises questions at a societal level as to how we adequately identify and support people without obvious risk.

Considering the findings from both the systematic review and the empirical paper, this thesis tentatively concludes that firstly, MSSH is not one homogenous group in that MSSH is underpinned by both suicidal and non-suicidal reasoning. Secondly, MSSH ought to be considered a separate subgroup of self-harm, given there are nuanced differences in the

demographical profile of MSSH (a profile that seems similar to the well-known profile of NSSIer's), and there are different psychological and social factors that contribute to non-suicidal MSSH, compared to suicidal behaviour. Our findings therefore appear to align with overarching literature that consistently cites there may be alternate, non-suicidal functions of MSSH (Rivin et al., 2013; Horesh et al., 2012; Mazarno, et al., 2011; Kumar et al., 2006; Douglas et al., 2004; Hjelmeland et al., 2002; Groholt et al., 2000) and lends tentative support for the idea that contextualising MSSH purely within a suicidal framework is too simplistic (Oakes-Rogers & Slade, in press; Cleare et al., 2021).

Strengths and Limitations

The systematic review offered a comprehensive synthesis of existing research. It was to our knowledge the first review of MSSH literature, therefore expanding the current evidence base relating to a relatively under researched behavioural phenomenon. Our findings were in line with much of the wider literature pertaining to non-suicidal self-harm yet considered it from a new perspective and made tentative findings about the utility of current theories to explain MSSH.

A particular strength of the review relates to its methodological rigor in study selection. The first strengths lies with the definition chosen for MSSH, in that a definition was employed that did not include any inference of the intent behind an individual's actions (Breet & Bantjes, 2017). Our decision to utilise a neutral-intent based definition stems from the comprehensive body of literature that explores and discusses key conceptual difficulties regarding how self-harm and suicidal behaviours ought to be defined (Andover, 2012; Silverman, 2006; 2007). Andover (2012) and Silverman (2006; 2007) both highlight how different terms are used interchangeably to describe the same behaviours, which then create problems for accurate assessment, formulation and intervention, as it conflates the meanings and functions behind the behaviours. Therefore, a neutral-intent approach was chosen to remove any bias from the searches and is a stance adopted in the definitions used by The World Health Organisation, The NHS, NICE, and HM Prison Service. Our decision-making transpired to align with the majority of definitions used within the included studies, and whilst differences existed in terms of the exact wording, no studies used definitions that referred to the intent behind one's actions.

A second methodological strength is the utilisation of a minimum of two authors at each stage of the study screening and selection. The first (SOR) and second (AR) authors screened 100% of titles and abstracts and excluded studies that clearly did not meet inclusion criteria. The same authors completed full text screening, according to the outlined eligibility criteria, with 85% agreement, both independently assessed each study included within the review, as recommended as best practice within Cochrane Guidance (Higgins et al., 2019), and 100% of the extracted data was evaluated for completion, accuracy and consistency by the first author (SOR). The third author contributed to the study by acting as a final independent vote, and any discrepancies were resolved by discussion. Consequentially, the findings were reported with confidence. However, as heterogeneity prevented meta-analysis, reviewer bias of the narrative synthesis cannot be ruled out, despite attempts that were made to mitigate this through second and third reviewers.

In a similar vein, the quality of the studies included within the systematic review was generally assessed as fair, meaning caution is issued when interpreting the findings and generalising them to the wider MSSH population. A key issue is the lack of consistency in measuring suicidal intent and disclosure of alternative reasons for MSSH, which future studies ought to address. Similarly, there were methodological flaws amongst the included studies including retrospectively using clinician reported data, which arguably can fail to capture the lived experience of those under study. Furthermore, as several studies reported a relatively high non-disclosure rate of reasons for MSSH, it is possible some reasons for MSSH were underreported, and that additional reasons for MSSH were not captured within the reviewed studies. Finally, many of the studies, and by extension the findings in this review, are cross-sectional and have limited ability to infer causality.

In terms of the empirical paper, unlike other studies, which use survivors of suicide attempts as proxies for those who die by suicide (Levi-Belz et al., 2020; 2018; Rivlin et al., 2012), a key strength of the study was the use of serious incident reports pertaining to individuals who had died by suicide, which suggests that the retrospective method of data collection used for the current study offers a viable way of learning more about suicide. Such a method of data collection not only offers a plausible way of accessing large amounts of population level data which undergone a stringent and standardized investigation and review process. This bolsters the assumption that the information held within the SIR's was the most accurate representation of the information available at that time and ensures

good inter-related reliability. Unlike much of the research into the IMV model of Suicidal Behaviour, a second strength of the study was the lack of exclusion criteria for particular mental health disorders, age or gender. This ensures good external validity, and the findings offer an accurate representation of adults in the clinical mental health population, however it is recognised that it introduces heterogeneity to the sample.

There where however limitations to the empirical paper, namely that many of the variables detailed within the IMV were rarely discussed within the SIR's and DIR's, meaning they were excluded from the analysis. The number of variables excluded from the analysis was surprising, given many of the variables have a known relationship with suicide, (for example, exposure to suicide of a close friend or family member, burdensomeness, defeat and humiliation and entrapment), and the low prevalence rates across incident reports was unusual. Arguably, this suggests the excluded variables may not have been considered when completing incident reports, which could prevent important lessons being learnt amongst clinical services. Given rumination, hopelessness and alcohol consumption, all featured in around 30% of SIR's, it is likely they would reveal a role in suicidal behaviour and confirm findings from other studies. Given the underreporting of variables consistently cited within the literature, we have to consider the possibility that these could have been present in the incident reports but have not been identified. This needs to be considered when interpreting this part of our findings as they limit ability to explore in-depth which factors from the IMV were present in Datix Reports for MSSH. It is therefore encouraged that this part of our findings are viewed as exploratory, and as a preliminary examination of the factors that could contribute to other types of medically serious self-harm.

A final limitation of the empirical paper relates to the sample only including people from the East of England, meaning the results may not be generalisable to people in other geographical locations. Namely, this is because the East of England is known to largely consist of people of white ethnicity, and due to its farming connections, differences may exist in relation to access to means of self-harm and/or suicide less common to urban areas.

Directions for Future Research

The findings from the two studies presented in this thesis indicated that MSSH is not one homogenous group. Such a position was supported by differences that were noted in

terms of the demographic profile of those who enact MSSH, the reasons provided for non-suicidal MSSH, and the fact that the IMV model of suicidal behaviour differentiated between those who attempted or died by suicide and those who enacted non-suicidal MSSH. It is however acknowledged that research into MSSH is relatively in its infancy, meaning any findings ought to be corroborated by future studies. Furthermore, several limitations exist, meaning until such a time, the findings ought to be reviewed tentatively.

Our systematic review found the reasons people provide for non-suicidal MSSH may align with three functions outlined in the FFM of NSSI. It did not however find evidence that people enact MSSH for functions that would align with intrapersonal positive reinforcement, which was surprising given enacting self-harm to elicit positive emotional and cognitive states has been reported in wider self-harm literature (Stanicke et al., 2018; Morris et al., 2014) and other explorative studies seeking to understand the functions of medically serious forms of self-harm in other populations (Oakes-Rogers & Slade, 2020). Given to our knowledge, this is one of the first studies to relate the functions of MSSH to the FFM of NSSI; further research testing the validity of our suggestions would be welcome.

Our review also found that there are likely to be cultural differences in non-suicidal MSSH. Namely, the prevalence of mental health disorders was lower amongst non-western countries. Literature has indicated previously that concerns about the stigma attached to mental health difficulties and concerns around traversing cultural norms prevent people from disclosing their behaviour (Han & Ollife, 2015). Future research ought to investigate further how cultural differences impact disclosure rates of reasons for MSSH and help seeking, which could in turn inform clinical practice. Such literature is pressing given recent healthcare studies indicate the large health disparities between white and Black and Minority Ethnic groups (Salas et al., 2021).

Given our findings from the empirical paper indicate a valid method using serious incident and datix reports, testing the IMV model retrospectively on SIR's at a nationwide level could reveal further insight on a significantly large scale. Arguably this could provide population level data, which may help to further clarify factors responsible for people acting on suicidal thoughts (O'Connor & Kirkely, 2018b) and a larger sample size may refine the current understanding regarding the existence of other subgroups of self-harmers. Furthermore, as many of the known variables for suicide were excluded from analysis, higher power would allow future studies to investigate these other factors known to play a

role in suicidal behaviour more thoroughly in the analysis and may serve to facilitate a meta-analysis of future works.

As our research indicated, continued research into refining pathways to suicide is warranted and important given the need to develop clinical and theoretical understanding, social awareness, treatment, and future prevention. Further research may also help to formulate the beginnings of a separate profile for MSSH. Further research is necessary to continue to identify the myriad of different pathways to suicidal behaviour (Oakes-Rogers & Slade, 2015), and to establish pathways to alternative forms of medically serious self-harm. This in turn ought to help refine current theoretical frameworks (if they appear to adequately explain MSSH), or indeed inform the development of a new, specific theory of medically serious self-harm.

Implications for Clinical Practice

The findings from the systematic review indicate that in addition to some suicidal reasoning, MSSH appears to be driven by a range of alternative factors. These factors included: regulating and coping with difficult intrapersonal states, stopping or changing a difficult intrapersonal situation, and communicating distress to another person, with an aim of achieving a desired outcome. Akin to call forms Lutz et al. (2021), the review indicates a clinical focus on distress tolerance and a practical approach to teaching emotion regulation skills and alternative coping strategies is paramount. As the review also highlighted an intrapersonal and communicative function of MSSH amongst adolescents, focusing on communication difficulties, conveying one's need to others and problem solving may also be a potentially useful area for treatment amongst young people who enact MSSH. Collectively, these suggestions are similar to the treatment targets of Dialectical Behavioural Therapy, which may be an interesting area to explore its utility with MSSH.

In the reviewed papers, young people appeared to experience a broader range of mental health difficulties, cite more reasons for intrapersonal distress (for example exam and academic failure and gender or sexuality concerns) and use MSSH to communicate their distress more so than adults. Additionally, a diagnosis of disruptive or personality disorders (conditions with a proven relationship with repetitive self-harm, Prada et al., 2018)) were significantly higher amongst adolescents. The findings may therefore indicate a clinical need

to consider risk for future MSSH and death by misadventure amongst young people with the aforementioned mental health diagnoses, as they are conditions closely linked to repetitive self-harm (Prada et al., 2018). This could identify a key group which future preventative work should target.

The review also highlighted an ongoing need for cultural sensitivity, to ensure a culturally diverse population is accurately assessed and treated. An understanding of what might prevent people from disclosing their difficulties and MSSH is important, given engaging in MSSH puts people at greater risk of dying by misadventure, intentionally or not (Logan & Taylor, 2019; Vassilas et al, 2007; Owens et al., 2005). Therefore, training around non-western understanding of such behaviours and mental illness is important and needed and clinicians ought to be aware when assessing risk that people from different cultural backgrounds may be inclined to withhold information, that may mask their true level of risk.

Consistent with other research, (Cleare et al., 2021; Branly-Bell et al., 2019) findings from our empirical paper indicate historical suicidal behaviour differentiated suicidal behaviour from MSSH and was the strongest predictor of suicidal behaviour. Clinically, this finding reaffirms the importance of obtaining a comprehensive risk history when assessing individuals thought to be at risk of suicide and gives weight to historical suicide being a key risk marker for future attempted or death by suicide. However, the need to consult multiple sources of information is important given our findings showed those who attempted or died by suicide were significantly less likely to alert someone to their behaviour, and literature that highlights around 50% of people do not share their suicidal thoughts or intensions (Love & Morgan, 2021; Hoyen et al., 2021).

Despite an alignment to the IMV model of Suicidal Behaviour, our findings from the empirical paper highlighted a likely gap in the current clinical reporting process for serious incidents and incidents of MSSH. Whilst it was accepted that potential variables were not found within the reports, the lack of, or low prevalence of variables consistently identified within literature to have a relationship with suicidal behaviour highlighted a potential gap in the way risk factors are captured in incident reporting and investigation. This is important given excluded variables could prevent important lessons being learnt amongst clinical services. These findings may highlight a need to encourage professional curiosity and consideration to a wider range of factors that may play a role in self-harm and suicidal behaviours, which is a recommendation that has been highlighted frequently in Coroner's

investigations (Thacker et al., 2019; Mantell & Jennings, 2016). However, asking people to be curios also highlights a need to train people to understand what factors may contribute to an increased risk of self-harm and suicidal behaviours – a skill and knowledge that clinical psychologists are likely more equipped to do. A possible solution includes training more clinicians around the risk factors associated with the behaviours, and more clinicians to conduct serious incident reviews, and in doing so, introducing more specialties and clinical perspectives. It may also be helpful to modify the investigation template to include known risk factors for suicide from the IMV Model of Suicidal Behaviour, to prompt clinicians to routinely consider a wider set of possible reasons suicidal behaviour. Clinicians with specialist knowledge of self-harm and suicide are likely to be best placed to implement such change.

The aforementioned clinical recommendations and the ability to implement effective and individualised treatment plans, reply heavily on accurate assessment and formulation of the functions and reasons for people's MSSH. However, clinician accuracy in terms of risk assessment is often criticised when people sadly die from suicide, and there have been calls for increased levels of professional and clinical curiosity when working with people who self-harm (Thacker et al., 2019; Mantell & Jennings, 2016). This again links to the ability of clinicians to form trusting relationships with those they assess to facilitate a greater rate of disclosure around the reasons why people enact harm and any future plans for harmful behaviour. This is however fraught with difficulty, given many clinicians are expected to make an informed assessment of risk with an individual they may have met only moments before. Perhaps more needs to be done to evaluate our current assessment process, however this is a challenge that will not be achieved in any small-time frame.

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Chapter Six: Reflections

This chapter contains my own personal reflections of conducting a doctoral research project during COVID-19. The reflections will discuss how the pandemic impacted my research original project and the planning and design of the new thesis. It also provides my reflections on conducting a project on a sensitive and emotive topic.

Planning and design during COVID-19

After the COVID-19 pandemic hit, like many others, my original thesis project was impacted. Given my original project, which involved interviewing survivors of medically serious suicide attempts under the care of Liaison Psychiatry, was no longer viable, I needed to come up with an alternative plan.

I felt lucky that I had previous research experience in that I knew how to design a project from the beginning. In fact, I was enthused by this idea and felt ready for the challenge. I can remember thinking to myself that in light of the time pressures of completing the research in time for ending training and the reality that real-life research had become much harder in the new COVID world, I needed to go back to basics and review what had already worked. I was reminded of the journal article I had published from my Forensic Psychology MSc. Whilst slightly different in that it used secondary data from death in custody reports, I began to consider who might hold large amounts of secondary data and settled upon trying to contact the Coroner's office. I quickly found myself in a maze of different people passing on contact details for others who they felt would be helpful and ended up talking to the local Coroner. What an experience! It was genuinely motivating to hear how open they were to research ideas and understood the benefits of learning from those who had sadly died or been impacted by suicide. However, as with many good ideas in 2020, I soon learnt that all Coroners reports were held in paper format in the basement of the Coroner's office and with lockdown, I was unable to go and read them.

When faced with the issue of not being able to access the Coroner's reports, I remembered the audit process I used to identify potential participants for my PhD, through the national database of self-harm incident reports. I went back to the Coroner's officer to enquire if they knew who managed patient safety and was pointed in the direction of a Data Analyst who worked in conjunction with the general hospital trust. I attended some of the team meetings and after many meetings and discussions later, I had finally found the data source I needed. Luckily, the team that managed data relating to patient safety and mortality are so committed to patient safety and improving the lives of those impacted by suicide that they welcomed my research and were happy to host and facilitate it.

Whilst I was really thankful to be able to design a new project and genuinely enjoyed

the process of building new contacts and 'solving the puzzle' as it were, with this came the pressure of having a 'good enough' project and one that would meet the requirements for the thesis. I know there have been times where I have found this research a struggle and questioned its usefulness. I noticed that I was carrying a sense of pressure to be a 'good researcher' given I competed a PhD before training and at times, this meant my critical self-talk about not being good enough at research distracted my focus. In response to this like most human beings I avoided the work a little, meaning of course I felt even more incompetent!

Reflecting on this, I think this is another example of how COVID-19 impacted my research, as in reality, it meant calling upon quantitative methods when my confidence lies with qualitative research. I also had to override the thoughts of my research being one-sided (in that it was based on staff reports) and not informed by the very people who I seek to research. Luckily as we complete thesis projects alongside our clinical training, as time has gone on, I have become a real advocate of Acceptance and Commitment Therapy. I was able to apply the idea that the difficult thoughts and feelings I was having about not being good enough or the project not being where I felt my strengths lie, were all just part of the experience of training. Once I accepted they were part of the ride, I was able to be more compassionate towards myself, which was helpful given the sensitivity of the data I was about to read.

Researching with sensitive data

Working with sensitive data, particularly when this relates to times of human suffering is challenging. Having done a PhD in the same field, I think I had a sense of preparation, knowing the types of things I might read. With preparation also came a sense of responsibility, and I wanted to approach each report with care and read them with compassion. There were of course times where I noticed I had perhaps drifted off or lost concentration, and moments where I felt quite numb to some of the most graphic and distressing content. In part, I think this was to do with the sheer volume of reports (some of which were 30 or 40 pages), and the pressure of trying to get through data extraction within the time frames I had set myself. Without realising, this probably left me having to choose between efficiency and processing the emotional response I had to what I was reading.

Whilst initially, noticing I had switched off or become numb to the content brought up feelings that I was not doing the person, or their family justice and I can recall wondering if I was strange being able to read content of this nature without feeling consciously impacted. However, I suspect switching off was a welcome defense mechanism to shield me from some of the more distressing information within the reports. It also challenged me to accept that timelines in research can change, and I made peace with the need to make a deliberate point of having lots of breaks, returning to the report when I felt more focused, even if it did mean that data extraction took longer than I had anticipated.

Looking after my own wellbeing and being accepting of delays turned out to be important as towards the end of data extraction, I was also reminded of how our own human experiences impact the research we do, particularly if we have been impacted by the topic we study. For me, without realising until later, one particular serious incident report triggered a difficult emotional response in me, as it reminded me of the desperately sad circumstances around my best friend's death. Whilst I know my brain protects me from remembering aspects of her and her partner's death, ultimately, I forget that I have myself been impacted and affected by suicide. Although Bec died long after I embarked on a research interest in self-harm and suicide, it is a reminder to me of how human we are and how no matter how often we read reports or data relating to suicide, it is and always will be an incredibly emotive topic and one what requires a focus on researcher wellbeing and self-compassion.

Summary

In short, it has been a privilege to be trusted with data relating to such sensitive and life changing human experience. Putting this thesis together, I found myself feeling very emotional reflecting on the stories of each person included. I hope I have done the data justice and that I have contributed to literature and furthered understanding around self-harm and suicide. Research of this nature is not however without personal cost, and it is important that this is remembered and recognised.

Chapter 7 Extended Introduction

Theoretical understanding of self-harm and suicide

This chapter contains information that is supplementary to the introduction section of the empirical paper

Overview

Self-harming and suicidal behaviours are important national and international topics, and prevention of such behaviours remains a key focus of many world health and government strategies (Preventing Suicide, A Global Imperative, WHO, 2014; Preventing Suicide in England, 2012 and the Five Year Forward View for Mental Health, 2014). Over the last decade, British suicide prevention strategies have been outlined within two key initiatives – Preventing Suicide in England (2012) and The Five year Forward View of Mental Health (2014). The fifth report issued in 2021 outlined how suicides continued to rise (despite a small reduction between 2014 and 2017), particularly amongst people aged 10-24 years and men ages 45-60 years. Whilst individual nations were working from their own suicidal prevention agendas, in 2014, The World Health Organisation issued 'Preventing Suicide, A Global Imperative'. The aim of the document was to raise awareness of the public health significance of suicide and suicide attempts and to insist on suicide prevention being a higher priority on the global health agenda. The report compiles evidence from global research and detailed accountable steps for countries to adopt to try and improve suicide prevention. Despite a global platform and advances in theoretical and academic advances, which continue to bolster our understanding of suicide; clearly gaps exist in terms of effective interventions and suicide prevention.

In 2020, for the first time in more than a decade, the rates of suicide were significantly lower compared to the previous year (ONS, 2021). Whilst 2020 was of course a year of great national change, and one that perhaps has to be cautiously compared to other years, the ONS statistics were warmly welcomed. Despite the emphasis on prevention, gaps remain in our understanding of both why people enact self-harm and how suicidal behaviours manifest (Nock, 2009) and the cost of self-harm and suicide to the NHS remains almost £1.7 million (Tsiachristas et al., 2017). There are however several key theories, which attempt to explain why people engage in non-suicidal self-harm (NSSI), and/ attempt, or die

by suicide. This extended introduction section of the thesis portfolio reviews the research evaluating the validity of said theories. It is these theories that form the theoretical underpinnings of the thesis portfolio.

Non-Suicidal Self-Injury

According to the Diagnostic and Statistical Manual of Mental Disorders 5th Addition (DSM-5) (American Psychiatric Association, 2013), non-suicidal self-injury (NSSI) (see glossary) is characterised by frequent self-harm (which occurs on 5 or more occasions), methods that post low risk to life, and injuries that require little or no medical attention. This definition indicates people enact NSSI for reasons other than to die, will select methods they are unlikely to die from, and will inflict injuries that are unable to cause death. The Four Function Model of NSSI (FFM) argues that NSSI is motivated and maintained by one of four reinforcement processes (see table 1). These are classified as: a mechanism to manage emotional distress, to get a response from another person, to elicit feelings during times of numbness, self-punishment, or anger, or to achieve a desired goal (Nock, 2009).

The FFM suggests several intrapersonal and/or interpersonal vulnerabilities can predispose an individual to NSSI, many of which are likely to develop via exposure to early stressors and adverse live events (Nock, 2009). Such experiences include childhood maltreatment (including physical, sexual abuse, emotional abuse and neglect) and genetic predispositions, physical hyper-arousal, and parental hostility or criticism (Bentley et al., 2014; Klonsky & Moyer, 2008; Weierich & Nock, 2008; Nock et al., 2008c). Arguably, predisposing factors can limit an individual's ability to cope with stressful events in an adaptive way, meaning that for some, NSSI offers a viable way to manage difficult intrapersonal experiences and meet their interpersonal needs (Nock, 2009). Nock (2009) and Najmi et al. (2007) illustrate this and found individuals who report using NSSI to reduce negative internal emotions (intrapersonal-negative reinforcement) are likely to also demonstrate high levels of stress and decreased ability to effectively manage distress. Likewise, an individual who reports to engage in NSSI to elicit care (interpersonal-social positive reinforcement) may have also experienced parental neglect and as a result demonstrate poor communication and problem-solving skills (Nock, 2009; Hilt et al., 2008a; Nock & Mendes, 2008). This process is illustrated in figure 1, and the hypothesised processes related to the development of maintenance of NSSI is summarised in table 1.

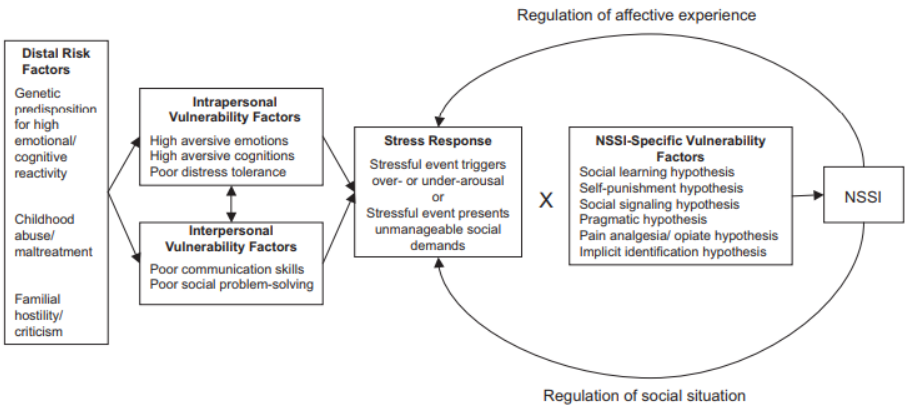
Table 1

The Functions of NSSI (Informed by Nock, 2009 and adapted from Oakes-Rogers, 2020)

Type	Description
Intrapersonal-negative reinforcement	To alleviate negative internal emotional or cognitive states
Intrapersonal positive-reinforcement	The generation of positive or desirable internal emotional or cognitive states
Interpersonal-social negative reinforcement	Escape from or cessation of social situations and interpersonal demands
Interpersonal-social positive reinforcement	To elicit care or obtain a positive response from others

Figure 1

Integrated theoretical model of the development and maintenance of NSSI (Nock, 2009b)



There is a significant evidence base to support and confirm the four functions of NSSI across adult, adolescent, prison and community populations (Bentley et al., 2014; Klonsky et al., 2014; Muehlenkamp et al., 2012; Turner et al., 2012; Nock 2008). It also highlights helpful clinical differences in the functions of NSSI between populations, particularly those with a high prevalence of individuals with a diagnosis of Personality Disorders, where NSSI is cited more commonly as occurring with the intention of eliciting a social response (Siebery, 2012; Klonsky, 2007; Power et al., 2005; Whittle, 1997) or influencing their environment (Holmqvist, 2008; Klonsky, 2007). It is however important to be mindful when generalising the FFM to other populations as to date, the majority of literature has been conducted

within adolescent samples (Zetterqvist et al., 2013; You et al., 2013; Nock et al., 2009; Heilbron & Prinstein, 2008). This is likely due to the increased prevalence of NSSI found amongst young people (Nock et al., 2009). Furthermore, from a clinical perspective, whilst the FFM helps to guide understanding in terms of the functions of NSSI, and who may be more vulnerable to NSSI, it is limited in its ability to explain why some people with similar developmental experiences begin to harm themselves whilst others do not. This limits its ability to predict and identify those at risk with certainty, which in turn hinders the potential for early intervention and prevention.

There have also been criticisms regarding the lack of research in clinically severe populations as literature is disproportionately weighted towards those without enduring or complex mental health presentations (Pollak et al., 2020). Given advances in literature directly informs clinical practice and NSSI interventions (NICE, 2022 update pending), arguably, current treatment programmes have been designed on the experiences of those without mental health difficulties, which may or may not address the needs of those who come into contact with mental health services. This highlights an important clinical need given the prevalence rates of NSSI across mental health populations is known to be far higher than in general population samples (Horvath et al., 2020).

Pollak et al., (2020) also identified a gap in the utility of the FFM when applied to repetitive NSSI'ers in terms of how their risk changes over time. Given the strong predictive relationship between NSSI and suicide, and literature, which evidences an increased risk of death by suicide amongst those who enact NSSH five or more times within a year period, (Hawton et al., 2012) this highlighted an important area for research to focus on. Their preliminary findings from their study do however indicate the functions of NSSI can predict who is at risk of continued risk of NSSI. Interestingly, those who cited social functions for the NSSI had a reduced likelihood of engaging in NSSI either during their hospital stay. Authors suggested hospital might have provided the 'removal' from a difficult social situation and/or elicited care from those around them. The findings align with those from Muehlenkamp et al. (2012) who suggest social reasons may trigger onset of NSSI, but not maintenance of the behaviour over time. Conversely, those who endorsed NSSI to regulate internal experiences were more likely to engage in NSSI during their hospital stay. This is consistent with findings from Yen et al. (2016) and Taylor et al., (2012) who found those citing NSSI to regulate affect were more likely to continue using NSSI long-term, compared to those who endorsed

automatic and social functions. This research has helpful clinical implications, given it provides an indication of who is more likely to continue to use NSSI and evidences that NSSI can and does desist, if the functions of someone's behaviour are met in another way. Arguably, this evidence strong advocates for a focus on emotion regulation and communication skills within any clinical intervention.

Table 2

Hypothesised development and maintenance of NSSI (adapted from Nock, 2009b)

Social Learning Hypothesis	Individuals learn from other people that NSSI offers a viable way to overcome emotional or cognitive distress and is an effective way to elicit a response and care from others.
Self-punishment hypothesis	Individuals engage in NSSI as a way of punishing the self. This is particularly true for those who have experienced physical, emotional or sexual abuse and is closely linked to self-hatred, and self-deprecation.
Implicit attitude/identification hypothesis	People who enact NSSI have developed positive beliefs about NSSI and identify positively with the behaviour. These beliefs strongly influence behaviour.
Social signalling hypothesis	Individuals learn that engaging in NSSI is an effective form of social communication and eliciting help from others, more so than other methods of communication such as talking, shouting, or crying.
Pain analgesia/opiate hypothesis	People who engage in NSSI may have increased tolerance to the pain associated with self-injury. Although Nock (2006) states this area is particularly under researched, it is suggested that individuals who engage in NSSI are either born with, or develop an increased threshold to pain, meaning they can withstand self-injury more easily than others. Additionally, it has been suggested that an increased level of endogenous opiates (endorphins) are found within those who self-injure, which can lead to feelings of euphoria (Van Ree et al., 2000). This may explain why people engage in NSSI find it is effective for escaping negative feelings and inducing positive ones.
Pragmatic hypothesis	This hypothesis suggests people engage in NSSI as it provides an effective, and rapid option to assist in the regulation of cognitive and emotional distress, which is easily accessible. Arguably, this is most applicable to adolescent samples however Nock (2009) suggests it is also suitable for individuals with less access to alternative methods of regulation such as alcohol, drugs, or communicating their problems.

Theories of Suicide

Suicide is a complex issue, which has always had far reaching individual and societal implications. According to Thomas, (2010), the first suicide in England was recorded in 1861. Since its recognition in the 19th century, clinical psychologists have tried to make sense of

why and how people die by suicide, highlighting how suicide has been, and remains a chronic societal challenge. Notably and Durkheim (1897) published one of the first theories of suicide, claiming suicide was a result of social and structural factors. According to Durkheim, individuals who are not meaningfully tied to other members of society experience depression and feelings of meaninglessness, which can ultimately lead to suicide (Stanley et al., 2016). Durkheim's theory of suicide (1897) was praised for its ability to conceptualise suicide as a societal issue and explain phenomena such as seasonal variation in suicide (Christodolou et al., 2012), decreases in the number of suicide during crisis or 'times of coming together' (Jenkinson et al, 2020**,** Joiner et al., 2006; Joiner, 1999), and cross-cultural differences in suicidal behaviour (Shah et al., 2007). Despite this, Durkheim's theory was criticised for failing to appreciate the highly individualised nature of suicide (Stanley et al., 2016). Since then, several cognitive, biological and social theories of suicide have emerged, outlining the etiology and development of suicidal behaviour (O'Connor & Kirtley, 2018).

Table 3

Durkheim's Types of Suicide (adapted from Stanley et al, 2016).

Type	Description
Altruistic	When an individual believes their suicide would contribute to the society they are highly integrated in.
Egoistic	When an individual is lacking social bonds and integration and ties with other people.
Anomic	Suicide occurs during times of hardship when there is not adequate social regulation (e.g. during financial crisis).
Fatalistic	Suicide is the result of excessive social regulation and oppressive discipline

Considering individual factors that impact suicide, other theories emerged that emphasised the role of cognitive vulnerabilities and stress (Diathesis-stress-hopelessness model of suicidal behaviour, (Schotte & Clum, 1987) and psychological pain (Schneidman, 1998). Between them, these theories encompass a plethora of risk factors, cognitive processes, personality traits and trigger events, known to increase the risk of suicidal behaviour. Such theories are however critiqued as they overemphasise the individualised

nature of suicide and simplify the role of society and relationships (Stanley et al., 2016). Therefore, whilst seminal theories were helpful, more recently theories of suicide aim to combine the idea of societal influence and individual risk factors and consider the impact of both on suicidal behaviour. Such theories include Baumeister's escape from self model (1990), William's Arrested Flight Model (2001), The Cry of Pain Model (Williams & Pollock, 2001) and Joiner's Interpersonal-Psychological Model (Joiner, 2005).

Whilst a credible evidence base exists to support all of the aforementioned theories, O'Connor (2011) argued that none adequately explain how suicidal ideation develops and translates to suicidal behaviour. Instead, O'Connor (2011) and Klonsky and May (2016) argued theories of suicide should adopt an ideation-to-action framework, whereby the development of suicidal intent and the progression of suicidal intent to suicidal behaviour, are conceptualised as two distinct processes, which exist upon a continuum of behaviours. In part this is because most individuals who think about suicide do not go onto attempt suicide (Have et al., 2009; Nock et al., 2009) and because literature has shown well evidenced risk factors of suicidal ideation do not predict suicide attempts (May & Klonsky, 2016; Klonsky & May, 2014; Kessler et al., 1999).

One such theory is the Integrated Motivational-Volitional Model of Suicidal Behaviour (IMV) (O'Connor, 2011), which draws influence from the Diathesis-Stress Model, (Schotte & Clum, 1987), the Arrested Flight Model, (Williams, 2001), the Theory of Planned Behaviour (Ajzen, 1991), and The Interpersonal-Psychological Model of Suicide (Joiner, 2005). In short, the IMV posits a range of social norms, attitudes and behavioural control which influence one's intention, and these factors are likely to inform the distinction between suicide ideation and enacting suicidal behaviour. However, as the IMV integrates aspects of the Interpersonal-Psychological Model of Suicide (Joiner, 2005) (IPMS), to be able to fully understand the IMV, it is important to review the literature that supports or refutes the IPMS

Table 4 Predominant models of suicidal behaviour, adapted from The International Handbook of Suicide Prevention, (2016).

Author	Model	Summary
Beck and Colleagues (1985)	Hopelessness Theory	Core reason for suicide is hopelessness (negative and fatalistic views about the future and an inability to see a way to improve the future).
Schotte and Clum (1987)	Diathesis-stress-hopelessness model of suicidal behaviour	Cognitive vulnerability (e.g. poor social problem solving) accounts for the relationship between stress and suicide risk
Baumeister (1990)	Suicide as escape from self	Fundamental reason for suicide is to escape painful self-awareness
Schneidman (1993)	Suicide as Psychache	Suicide is caused by 'psychache' or intense psychological pain, guish and hurt, caused by unfulfilled, frustrated or thwarted psychological needs.
Williams (2001)	Arrested Flight Model	Suicide risk is greatest when defeat and entrapment are high, and the potential for rescue is low
Williams and Pollock (2001)	The Cry of Pain Model	Suicide should be seen as a 'cry of pain', resultant from a strong perception of entrapment, and a desire to escape ones situation.
Joiner (2005)	Interpersonal-Psychological Model	Suicide ideation is the result of high levels of thwarted belongingness, and burdensomeness. Translates to suicidal behaviour only when the individual has the capacity (facilitated by overcoming fear of death through habituation to pain)
Wanzel and Beck (2008)	Differential Activation Theory of Suicide	Diathesis-stress model with 3 main constructs: dispositional vulnerability factors, cognitive processes associated with psychiatric disturbance, and cognitive processes associated with suicidal acts
O'Connor (2011)	Integrated Motivational-Volitional Model of Suicidal Behaviour	Diathesis-stress model, which posits specific pre-motivational, motivational and volitional phases of suicidality.
Klonsky and May (2015)	The Three Step Theory (3ST) of Suicide	Suicidal ideation can translate to suicidal behaviour in the presence of pain, hopelessness, and disconnectedness

The Interpersonal-Psychological Model of Suicide (IPMS)

According to the IPMS, for suicide to occur, an individual must simultaneously experience three key facets. Thwarted belongingness (an extreme disconnection to others), a high sense of burdensomeness (feeling you are a burden to others), and the capacity to enact suicidal behaviour (the ability to attempt suicide). The theory suggests that thwarted belongingness, paired with high burdensomeness can cause suicidal ideation to develop, and having the capacity to enact suicide, facilitates the translation of suicidal ideation into suicidal behaviour. This theory suggests as a result, very few people who think about suicidal develop suicidal ideation, and even fewer people who want to die by suicide actually have the capacity to do so (Van Orden et al., 2010).

According to the Interpersonal-Psychological Model of Suicide (IPMS) (Joiner, 2005), the separation from others, and the genuine belief that there is no one to offer support during times of distress or difficulty, can result in extreme feelings of isolation and loneliness (Van Orden et al., 2010; Joiner, 2005). Literature suggests those most vulnerable to developing thwarted belongingness include those with few social connections, are likely to have experienced domestic, childhood abuse, or familial discord, and may have spent time in custody (Klonsy & May, 2016; Cukrowicz et al., 2013; Szanto et al., 2012; You et al., 2011; Van Orden et al., 2010; 2008; Hill, 2009; Joiner, 2005). Thwarted belongingness is thought to be a dynamic cognitive state, due to its dependence on both interpersonal and external influencers, meaning it can change in intensity over time (Cacioppo et al., 2006).

Burdensomeness, particularly the feeling of being a burden to one's family, has been shown to be fundamental in the etiology of suicide across adult, adolescent, undergraduate and incarcerated populations (Hagen et al., 2017; Mandracchia & Smith, 2015; Buchman-Schmitt et al., 2014; Cukrowicz et al., 2013; Bryan et al., 2012; Kanzler et al., 2012; Van Orden el al., 2010; Van Orden et al., 2008; Conner et al., 2007; Van Orden et al., 2006; Joiner et al., 2002). The IPMS posits individuals who experience unemployment, homelessness, physical illness, and have spent time within custody, are most likely to develop feelings of burdensomeness because the costs of such worrying times are felt most amongst

ones social network as each experience places a unique pressure upon close family and friends (Mandracchia & Smith, 2015).

The IPMS states the intensity of thwarted belongingness is no greater than when experienced simultaneously with high levels of perceived burdensomeness as concurrently both can contribute to as sense of hopelessness about ones ability to overcome and manage their external situation (Hagen et al., 2016; Christensen et al., 2014; Leopoulos & Vincent, 2013; Van Orden et al., 2008). Therefore for some, suicide can become the only viable option for resolving their interpersonal and external problems and many believe their death will be beneficial for others (Brown et al., 2002; Joiner et al., 2002; Filiberti et al., 2001). Therefore, according to the IPMS, thwarted belongingness and high levels of burdensomeness is responsible for the development of suicidal ideation. Clinically, the emphasis on the role of burdensomeness and thwarted belongingness is helpful as it highlights key factors to assess for. In particular it draws attention to the importance of social relationships, exploring the quality of said relationships and an individual's perceived level of connection and support. It also indicates a need to determine how well someone believes they are able to function and cope with everyday life (including managing financial tasks and commitments and tasks of everyday living), to ascertain whether they feel reliant on other people and as such, a burden to their close relationships.

Whilst the concurrent occurrence of thwarted belongingness and burdensomeness are sufficient to facilitate suicidal ideation, according to the IPMS, these factors alone are not enough to cause movement between intent and suicidal behaviour. For this to happen, an individual must acquire the capacity to enact suicidal behaviour through repeated exposure to painful or fearful experiences, which diminishes the fear associated with death and increases one's pain threshold (Joiner, 2005; Hagen et al., 2016). Literature has identified a pathway to acquired capability for suicide via frequent NSSI and suicide attempts (Glenn et al., 2014; Joiner et al., 2012; Van Orden et al., 2008). It is also thought to occur through exposure to events whereby there was the potential for serious injury or death, military combat, and physical and sexual and domestic violence (Bryan et al., 2013; Van Orden et al., 2010; Riberio & Joiner, 2009). Only when an individual experiences suicidal intent (facilitated by thwarted belongingness and perceived

burdensomeness) and has overcome the fear and pain associated with suicide can a suicide attempt occur (Joiner, 2005). Clinically, this again highlights and important need for risk assessments to obtain a thorough history regarding previous self-harm or suicidal behaviour (including thinking about suicide, planning or researching methods), violent and/or sexually traumatic experiences, and behaviours that are risky and involve some level of pain including for example, intravenous drug use or repetitive fighting (Joiner, 2005; Stellrecht et al., 2006).

Despite the emphasis placed on capacity to enact lethal self-harm as the key factor facilitating the transition between suicidal ideation and behaviour, literature suggests it is the least evidenced part of the model (May & Klonsky, 2016). When capability has been explored, the findings have been mixed and a recent literature review found that only 40% of cross-sectional studies examining acquired capability report significant associations with suicide (Chu et al., 2017). Such findings may however be explained by the overrepresentation of military veterans (Silva et al., 2017; Monteith et al., 2013; Bryan et al., 2010; Selby et al., 2010), meaning findings are skewed towards a population who are known to be at greater risk of suicide (Chu et al., 2016). Furthermore, the IPMS has also been criticised within two large systematic reviews, claiming there is insufficient evidence supporting the relationship between the theory's main constructs (May & Klonsky, 2016). Instead, Klonsky and Ma, (2016) argue there is more evidence to support the independent relationship between thwarted belongingness, perceived burdensomeness and acquired capability with suicidal behaviour than there is for the theory as a whole.

Importantly, the IPMS is also limited in that it does not explain why some people who possess all of the components for suicide do not go on to attempt, or indeed die by suicide. Arguably, this is because the IPMS cannot fully explain the pathway from suicidal ideation and suicidal behaviour. A number of researchers (Chu et al,. (2017); Klonsky & May (2016); O'Connor, (2011)) suggest this may be because the IPMS does not consider the likelihood that other factors mediate this transitional period, including anger, major depression, PTSD, adverse childhood experiences and abuse, maladaptive perfectionism and negative coping style (May & Klonsky, 2016). This is an important oversight as arguably understanding moderating factors between suicidal intent and behaviour is an essential part of being able to not only

distinguish between individuals who will experience suicidal intent and those who will go on to attempt suicide, but better identify when such behaviour will occur (Chu et al., 2017; Klonsky & May 2016).

The Integrated Motivational-Volitional Model of Suicidal Behaviour (IMV)

The Integrated Motivational-Volitional Model of Suicidal Behaviour (IMV) (O'Connor, 2011) is a three-phase model, which hypothesises the development of suicidal ideation, (the motivational phases), and the transition of suicidal ideation to suicidal behaviour (volitional phase). The IMV advocates that suicidal ideation and suicidal behaviour develop separately, meaning both elements are distinctly differently (O'Connor et al., 2016). The IMV also conceptualises suicidal behaviour as something that develops over time and occurs as a result of a complex interplay between predisposing vulnerabilities, and social, environmental and individual factors.

Like with many theories of suicide, the IMV posits that several background factors and trigger events can predispose an individual to developing suicidal intent. This is known as the pre-motivational phase and relates to many of the proximal and distal risk factors outlined in the introduction to the thesis portfolio. These can include poor mental health, deprivation, relationship breakdowns, bereavements, loss of employment, and detention within custodial or inpatient settings. Combined, the pre-motivational vulnerabilities form the basis from which suicidal ideation can develop. Importantly, the IMV model of suicidal behaviour is a linear model; meaning individuals without vulnerabilities outlined within the pre-motivational phase are unlikely to move through to other phases of the model and they are very unlikely to enact suicidal behaviour. As a result, the factors detailed within the pre-motivational phase can provide a useful predictive grounding to identify those who may be at risk of suicide (O'Connor, 2011).

The motivational phase, (or the 'thinking' about suicide phase), incorporates key aspects of the Cry of Pain Theory (Williams & Pollock, 2001) and The Interpersonal-Psychological Theory of Suicide (Joiner, 2005), to outline three factors required for the development of suicidal ideation. The first necessary factor is the

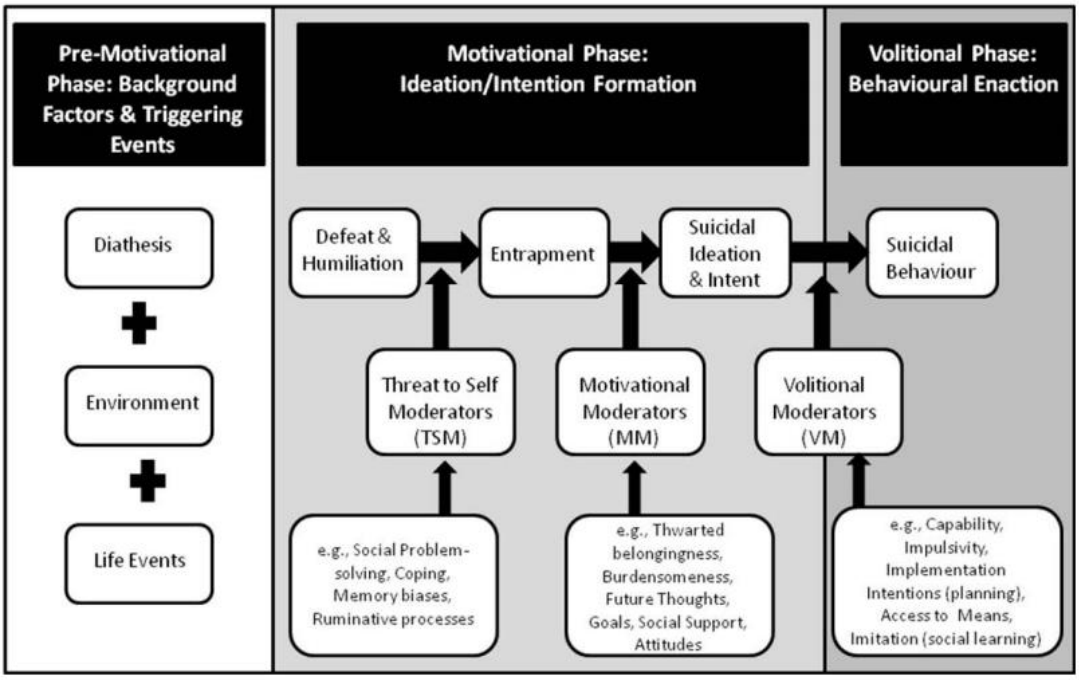
feeling of defeat and humiliation. According to the IMV this develops because of acute external stressors (loss of employment, incarceration, relationship breakdowns etc.). When defeat and humiliation is felt in the presence of 'threat to self-moderators', (poor coping strategies, lack of problem-solving abilities, and ruminative processes), for some, the feelings of defeat and humiliation can trigger feelings of entrapment. Entrapment relates to the perception that an individual is trapped by their circumstances, and they have no way to resolve life issues.

Several motivational moderators can exacerbate the perception of entrapment. Motivational moderators include being unable to conceive the possibility of a positive future and not being able to set future goals (O'Connor, 2011). It can include thwarted belongingness (extreme disconnection to others, loneliness, and not feeling supported by others). It can also include burdensomeness (feeling that you are a burden to your family, and your social network). When entrapment co-occurs with motivational moderators, some people begin to view suicidal behaviour as a valid solution to resolve their personal and external circumstances, which by definition is the onset of suicidal ideation (American Psychiatric Association, 2013).

Unlike most other theories of suicide, within the volitional phase of the IMV, an account of how suicidal ideation can translate to suicidal behaviour is offered. O'Connor (2011) defined a volitional motivator as "any factor that bridges the suicidal intention-behaviour gap, i.e., any factor that renders it more or less likely that an individual will act on their suicidal intent". In the Volitional Phase, capacity to enact suicide (as explained by the Interpersonal Theory of Suicide, Joiner, 2005), impulsivity, fearlessness about death, exposure to self-harm by family and friends, access to means, and planning all play important roles. As with threat to self-moderators and motivational moderators, each factor facilitates, or obstructs the likelihood of the movement from the motivational stage to the volitional phase.

Figure 2

The Integrated Motivational-Volitional Model of Suicidal Behaviour (O'Connor, 2011)



Importantly, large-scale studies have found the factors associated with the volitional phase are independent from those in the earlier phases of the model (O'Connor et al., 2012; Dhingra et al., 2015). In other words, only the factors present in the volitional phase are able to distinguish between those who desire suicide and those who will attempt suicide. Specifically, impulsivity has been shown to distinguish between adolescents (Madge et al., 2011; O'Connor et al, 2012) and adults, as does exposure to self-harm by friends and family, and fearlessness about death (Dhingra et al., 2015). However, further testing is required to validate the IMV across a range of alternative populations, specifically in terms of identifying which other volitional moderators have predictive power for distinguishing which individuals that think about suicide will enact it (Kirtley et al., 2016). Clinically, advancements in our understand is key as they serve to improve ability to identify those at risk of progressing from suicidal thoughts to suicidal acts, which ultimately provides more opportunities to implement effective treatment plans. Risk factors are however known to have limited utility for predicting risk alone, as ultimately, amongst clinical populations, many patients present with co-morbid difficulties

including some or all of the cited pre-motivational factors. Consequentially, even in the presence of well evidenced theory, some have argued our ability to predict who is at greater risk remains no better than chance (Belsher et al., 2019; Lindh et al., 2020).

Whilst the IMV clearly has helpful clinical utility, in that it highlights key psychological factors and early vulnerabilities to assess for, accurately predicting risk relies heavily on service user disclosure. Key factors of the IMV model, such as defeat and humiliation, are difficult to assess for in the early stages of building a therapeutic relationship, as people are often reluctant to disclose information that humiliates them (Chu et al., 2015). Furthermore, literature has suggested that people can refrain from disclosing the true nature of their difficulties in an attempt not to be a burden to healthcare services or clinicians, if they already feel a sense of burdensomeness within their close relationships (Fulginiti, & Frey, 2019). Reluctance around disclosing aspects of suicide risk have been well documented within the literature (Blanchard & Farber, 2020; Hom et al., 2017) and consequentially, understanding the true extent of an individual's suicide risk may not happen until well-established relationship have been formed. Clearly, this can for some, mean suicide risk is missed. Clinician understanding and curiosity are also key to assessing risk (Fowler, 2012; Walsh, 2007). Whilst psychological professions emphasise a scientific practitioner and evidenced based approach, clinical psychologists or psychiatrists are rarely the first professionals to meet someone at risk of self-harm or suicide. Literature indicates those at risk will usually be seen first by general practitioners or other healthcare professionals not trained specifically in mental health or risk assessment (Ng et al., 2017). Consequentially, despite decades of literature to support the validity and application of self-harm and suicide theories, more needs to be done to inform and up skill clinicians and lay people who risky people are most likely to first present to (Dabkowski & Porter, 2021; Uribe Guajardo et al., 2019).

Summary and comparison of models

To date, many models have attempted to explain why some people are vulnerable to self-harm and suicidal behaviours and why some people go on to enact these complex behaviours. Whilst none are perfect, both of the key models described in this chapter agree that certain social, psychological and biological factors increase the likelihood that someone will engage in self-harm and/ or suicidal behaviours, typically in the absence of alternative ways of coping. They also both agree that self-harm and suicidal behaviours develop during some form of process, in that people experience increased distress and because of static and dynamic risk factors, and that in any given moment, a range of psychological factors can combine to create a state of distress people feel compelled to resolve. Unfortunately, what both fail to explain with confidence is why some people who seemingly have the same vulnerabilities and increased distress do not go on to harm themselves. This impacts our ability to predict who will and who will not self-harm, attempt suicide or indeed die by suicide. Additionally, neither theory currently accounts for self-harming behaviours that neither aligns fully with NSSI or suicidal behaviour and appear to sit more appropriately upon a continuum of behaviours. Given literature continues to emerge highlighting the existence of alternative forms of self-harm, research needs to explore these further.

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Chapter 8 Extended Methodology

This extended methodology contains information that is supplementary to the methodology section of the empirical paper

Ethical Considerations

Consent

Under section 251 of the National Health Service Act 2006 and the Health Service (Control of Patient Information) Regulations 2002, the study described within the empirical paper was exempt from processing consent to participate. This is such as the proposed secondary data was collected and stored by the data controllers under the lawful basis of vital interests and public task (Data Protection Act, 2018), within the public interest and in the interest of improving patient care, relates to an activity which had a medical purpose (as defined in s251 (12) of the NHS Act 2006), and relates to information which was generated in circumstances leading to an obligation of confidence. Therefore, it would not have been necessary to obtain consent to process or transfer personal information when the data controllers originally collected it.

Confidentiality

According to GDPR laws, the data required for the empirical paper did not constitute 'personal information'. This was such as the Patient Safety Officer and NPSA acted as the controller of processing personal information. To ensure patient and service confidentiality, the senior manager of the Patient Mortality team confirmed that it was standard practise to anonymise and redact any identifiable information within all Datix forms and SIR's once Datix forms and Serious Incident Reports investigations are complete. The redacted versions are stored on a central database and are available for request. Consequentially, the author had means of identifying the individuals or services included within the transferred dataset.

Transparency

According to the GDPR laws, as the data held for the empirical paper did not constitute personal data at the point of transfer, the GDPR transparency requirements do not apply.

Data protection and storage

Whilst the data did not constitute personal data, the author followed good GDPR practice in handling data and all data was sorted in a password-protected document, which only the author and research supervisors had access to. It was not necessary to have any printed versions of the data set or associated documents. Following completion of the study, the study and its data will come under the governance of UEA, and the primary supervisor will become the data custodian and retain responsibility for data storage once the author has left the university. The UEA data storage policy indicates that data is archived for a period not less than 10 years after the end of the study.

Personal wellbeing

It was accepted that the content of the patient safety and serious incident reports would be of a sensitive and potentially distressing nature. Therefore, the author had appropriate support should upset occur, including regular supervision with a qualified Clinical Psychologist, and access to both the NHS staff support service and the University of East Anglia student wellbeing service.

Recognition of Participants

The risk of recognition of a participant was considered highly unlikely. This was such as only anonymised SIR's and DIR's were passed to the author, the author was from outside of the data inclusion area (meaning they were unlikely to have heard local news regarding incidents), and the author had only ever worked within child services in the trust in question for the final year included within the data search.

Procedure

Only pre-existing, secondary data was used for the empirical study. Data extraction occurred over two phases, which are outlined below:

Phase 1: Clinician search of existing Patient Safety and Patient Mortality Database

Phase 2: Coding of Serious Incident Reports and Datix Incident Reports

Phase 1: Clinician Search of Existing Database

Adopting a similar approach to Bowers et al., (2011), data was extracted from Datix Incident Reports (DIR's) held by the National Patient Safety Agency NPSA (NSPA) and Serious Incident Reports (SIR's), held by the Patient Mortality Officer for one NHS Trust. The NPSA is commissioned by the Department of Health to collect anonymised reports of patient safety incidents across healthcare providers in England and Wales. The aim of the NPSA is to identify and reduce risks to patients through periodically reviewing incident reports and making action recommendations for organisations. To report a patient safety incident, NHS staff are required to complete a pre-population Datix form. Datix forms collate information including time date, and location of an incident, the level of injury caused by an incident, the outcome, and qualitative information including how an incident occurred (i.e., methods of self-harm), who was involved in an incident, the reasons why an incident occurred, and any further details reported by the patient. All Datix reports are anonymised once they have been reviewed by the NPSA and are stored on a central database, known as The Reporting and Learning System, and are available on request under the NHS Patient Safety Strategy to support learning and improvement.

SIR's are produced to ensure serious incidents are identified, investigated and learned from, and to reduce the likelihood of the same incident happening again. According to the NHS Serious Incident Framework (revised 2015), a serious incident is defined as a "serious incident in health care where the potential for learning is so great, or the consequences to patients, families and carers, staff or organisations are so significant, that they warrant using additional resources to mount a

comprehensive review". Whilst there is no specific inclusion or exclusion criteria as to what constitutes a serious incident, reports must be declared for circumstances whereby "acts and/or omissions occurring as part of NHS-funded healthcare result in unexpected or avoidable death (including all suicides/ self-inflicted death), unexpected or unavoidable injury that has resulted in serious harm and some near-miss events where the outcome did not reflect the potential severity of harm that could be caused should the incident occur again". As with patient safety reports, Serious Incident Reports are completed using a pre-defined report template. Once the investigation has been closed, redacted versions of SIR's are stored on a central database and are available on request from the Patient Mortality Safety Officer.

A request was made to the Patient Mortality officer to complete a search to identify suitable to reports to include in the analysis. The following inclusion criteria was applied:

- Deaths of adults (over 18 years of age) that occurred between March 2011 and March 2019, which had been ruled as a 'suicide' by a Coroner.
- Incidents of medically serious self-harm that
    - Occurred between March 2011 and March 2019
    - Related to an adult (over 18 years of age) who had received medical treatment at an acute Accident and Emergency department across the East of England
    - Had been coded by NHS staff as either; resulting in moderate-short term harm, in which a patient required further treatment or a medical procedure and impacted them for longer than seven days OR severe – permanent or long-term harm, which impacted them for more than 15 days.

DIR's or SIR's were excluded if they met any of the following criteria;

- Threats of self-harm or suicide where no action was taken
- Accidental drug overdoses that were not taking with the intention of harm to the self (for example, recreational drug use)

- Reports that did not allow meaningful coding of the personal circumstances of the event (e.g., DIR's that detail only the managerial response to an incident but did not include patient reported reasons).

Phase 2: Coding of Serious Incident Reports and Datix Incident Reports

Coding

SIR's and DIR's were coded by the first author and categorised as either suicidal behaviour or non-suicidal MSSH. Incidents categorised as suicidal behaviour included deaths where a Coroner ruled the cause of death as a suicide. In line with ICD-11 (WHO, 2019) criteria, 23 of the MSSH incidents were categorised as a suicide attempt, (and therefore coded as suicidal behaviour), as the SIR or DIR recorded that the participant has stated the intended aim of their behaviour was to end their life (either verbally or within a suicide note). Incidents were categorised as non-suicidal MSSH when the SIR or DIR did not report suicidal intent, or where the function or aim of the self-harm was documented as anything other than to die (Oakes-Rogers, 2020).

Demographic Variables

For each incident, demographic information was extracted including gender, age, relationship status, method of self-harm, and whether they were receiving care from a mental health service.

Table 1

Demographic variables coding scheme

Variable	Coding
Gender	• Male (0) • Female (1)
Age	• </= 32 (1) • 33-49(2) • 50+(3)
Relationship Status	• In a relationship (0) • Single (1)
Methods of self-harm	• Cutting, stabbing, lacerations (1) • Restricting breathing (2) • Self-poisoning (3) • Poly-trauma (4) • Other (5)
Metal Health Service	1 None (0) 2 Community Mental Health Teams (1) 3 Crisis Teams (2) 4 Inpatient Services (3)

Variables of Interest from the IMV Model of Suicidal Behaviour

The following definitions were used to construct the coding scheme for variables cited within the IMV model of suicidal behaviour. Variables with two categories were coded as 'present' (1) or 'not present' (0), and details of how those with more than two categories were coded can be found below.

History of self-harm

A history of self-harm was coded as 'present' if the SIR or DIR reported that the individual had self-harmed on one (or more) other occasion(s).

History of suicidal behaviour

A history of suicidal behaviour was coded as present if the SIR or DIR reported that the individual had attempted suicide or enacted self-harming behaviours with "at least some intent to die" (Nock, 2009) on one (or more) other

occasion(s).

Impulsivity

Impulsivity was coded in line with the American Psychiatric Association Dictionary of Psychology definition, 'describing or displaying behaviour characterised by little or no forethought, reflection, or consideration of the consequences of an action, particularly one that involves taking risks. Impulsivity was coded as present if the SIR or DIR reported that the patient was known to act impulsivity, or the patient had self-reported current or historical impulsive risk behaviours.

Significant life event (SLE)

In line with Mo, Ma, Wang, et al. (2020), Howarth & O'Connor (2020) and Oquendo et al. (2014), SLE's were coded as present if the SIR or DIR reported that the individual had experienced a life event within the last six months. To allow for further investigation, in addition to coding for the presence or absence of SLE, like Mo et al (2020), each SLE was categorised into one of five groups (health and personal wellbeing, relationships, financial / home stressors, multiple life events and change, and is illustrated in table 2.

Rumination

Rumination was coded in line with the American Psychiatric Association Dictionary of Psychology definition, "Obsessional thinking involving excessive, repetitive thoughts or themes that interfere with other forms of mental activity." Rumination was coded as present if the SIR or DIR reported that the patient had been ruminating.

Table 2

Significant Life Event Coding Scheme

Significant Life Event	Included Events
Health and personal wellbeing (1)	• Physical health diagnosis (including terminal and non-terminal) • Increase/ onset in mental health symptoms (patient report of increase or worsening of symptoms shortly before suicide). • Psychotic episode • Struggles with sexuality • Struggles with Gender • *Detox from alcohol/drugs*
Relationships (2)	• Familial discord • Marital breakdown • Birth of a child • Family taken into care / alternative care arrangements made • Ill health of family member • *Bereavement / anniversary of bereavement*
Financial / Home Stressors (3)	• Homelessness • Financial difficulties (including bankruptcy) • University / exam pressure • New work-related stress • Changes / removal of benefits
Multiple Life Events (4)	
Change (5)	• Loss of employment • Loss of education • Loss of independence • Discharge from services / transfer to new placement/ward/ leave ended • Release from prison • Arrest / contact with criminal justice system (or parent, partner or close family member) • Admission to inpatient services

Hopelessness

Hopelessness was coded according to the APA Dictionary of Psychology definition "the feeling that one will not experience positive emotions or an improvement in one's condition". Hopelessness was coded as present if the SIR's or DIR's reported the patient had cited hopelessness, or if the author of the SIR or DIR noted a clinical impression of hopelessness.

Planning

Planning was coded as present if the SIR or DIR reported evidence of an individual taking steps to prepare for their suicidal behaviour or LTSH. This included making clear plans (date, time, location), leaving suicide notes or preparing personal affairs, planning to avoid be found, disclosing plans or thoughts regarding methods with another person (both verbally and written) and evidence of researching how to enact harm.

Lack of social support

Lack of social support was coded as present if the SIR or DIR reported that the individual had or perceived that they had no support network.

Lack of future plans or goals

Lack of future plans or goals was coded as present if the SIR or DIR reported the individual had described not being able to see a future, not having any plans or goals for the future, or there were reports of nihilism in clinical notes.

Poor coping skills

Poor coping skills was coded as present if the SIR or DIR stated that the patient had a lack of, or poor coping skills, utilised unhelpful patterns of behaviour or avoidance, or if the individual had reported that they did feel able or know how to cope.

Poor problems solving skills

Poor problem-solving skills was coded as present if the SIR or DIR stated that the patient lacked, or had poor problemsolving skills, or if the individual had reported finding it difficult to solve life problems or come up with alternative solutions.

Alerted someone

Alerting someone was coded as present if the SIR or DIR reported that the individual notified someone shortly after the act of self-harm or suicidal behaviour or enacted self-harm or suicidal behaviour in front of another person, or in a place that would alert members of their family, friends or the public to their behaviour.

Consumed alcohol

Coded as present if the SIR or DIR cited toxicology reports which evidenced alcohol consumption at the time of death or hospital treatment, or if the patient had self-reported consuming alcohol at the time of incident.

Analysis

Using SPPS version 25, a series of binary logistic regressions were performed to explore the strength of the relationship between the pre-motivational, motivational and volitional factors cited in the IMV model of suicide on distinguishing those with presence or absence of non-suicidal MSSH and suicidal behaviour. Logistic regression was selected to provide an indication of how well the factors in the IMV model are applicable to suicidal behaviour as well as medically serious self-harm in the general population and highlights particular variables that have strong explanatory power (Pallant, 2020). Furthermore, logistic regression provides information on the accuracy of the classification of cases on a model, which is helpful when trying to see how well the model correctly identifies individuals who enact suicidal behaviour, and if it is able to identify individuals who enact non-suicidal MSSH (Pallant, 2020).

Appendices

Appendix A
Health Research Authority Approval

Ymchwil Iechyd a Gofal Cymru
Health and Care Research Wales

NHS
Health Research Authority

Dr Adrian Leddy
Norwich Medical School
University of East Anglia
Norwich Research Park
NR4 7TJ

Email: approvals@hra.nhs.uk
HCRW.approvals@wales.nhs.uk

29 June 2021

Dear Dr Leddy

HRA and Health and Care Research Wales (HCRW) Approval Letter

Study title:	**What motivational and volitional factors predict life-threatening self-harm (LTSH) and suicidal behaviour amongst adults in the general population who either received emergency medical care at a UK general hospital following an incident of medically serious self-harm, or died by suicide?**
IRAS project ID:	**298025**
Protocol number:	**2020/21-095**
Sponsor	**University of East Anglia**

I am pleased to confirm that **HRA and Health and Care Research Wales (HCRW) Approval** has been given for the above referenced study, on the basis described in the application form, protocol, supporting documentation and any clarifications received. You should not expect to receive anything further relating to this application.

Please now work with participating NHS organisations to confirm capacity and capability, in line with the instructions provided in the "Information to support study set up" section towards the end of this letter.

How should I work with participating NHS/HSC organisations in Northern Ireland and Scotland?
HRA and HCRW Approval does not apply to NHS/HSC organisations within Northern Ireland and Scotland.

If you indicated in your IRAS form that you do have participating organisations in either of these devolved administrations, the final document set and the study wide governance report

Appendix B
Faculty of Medicine and Health Sciences Research Ethics Committee Approval

Faculty of Medicine and Health Sciences Research Ethics Committee

University of East Anglia

NORWICH MEDICAL SCHOOL
Bob Champion Research & Educational Building
Rosalind Franklin Road
University of East Anglia
Norwich Research Park
Norwich NR4 7UQ

Email: fmh.ethics@uea.ac.uk
www.med.uea.ac.uk

Sophie Oakes-Rogers
Norwich Medical School
University of East Anglia
Norwich Research Park
Norwich
NR4

16th March 2021

Dear Sophie

Project Title: What motivational and volitional moderators predict life-threatening self-harm and suicidal behaviour amongst adults in the general population who either received emergency medical care at a UK general hospital following an incident of medically serious self-harm, or died by suicide?

Reference: 2020/21-095

Thank you for your email of 15th March 2021 notifying us of the amendments you would like to make to your above proposal. These have been considered and I can confirm that your amendments have been approved.

Please can you ensure that any further amendments to either the protocol or documents submitted are notified to us in advance, and that any adverse events which occur during your project are reported to the Committee.

Approval by the FMH Research Ethics Committee should not be taken as evidence that your study is compliant with GDPR and the Data Protection Act 2018. If you need guidance on how to make your study GDPR compliant, please contact your institution's Data Protection Officer.

Please can you arrange to send us a report once your project is completed.

Yours sincerely

Dr Jackie Buck
Chair
FMH Research Ethics Committee

COVID-19: The FMH Research Ethics Committee procedures remain as normal. Please note that our decisions as to the ethics of your application take no account of changes in Government measures and UEA guidelines relating to the coronavirus pandemic and all approvals granted are, of course, subject to these.

Appendix C
The Joanna Briggs Institute Critical Appraisal Checklist for Analytical Cross Sectional rating tools and results

JBI Critical Appraisal Checklist for Analytical Cross Sectional Studies

Reviewer_____Date_____

Author _____Year_____Record Number_____

	Yes	No	Unclear	Not applicable
1. Were the criteria for inclusion in the sample clearly defined?	☐	☐	☐	☐
2. Were the study subjects and the setting described in detail?	☐	☐	☐	☐
3. Was the exposure measured in a valid and reliable way?	☐	☐	☐	☐
4. Were objective, standard criteria used for measurement of the condition?	☐	☐	☐	☐
5. Were confounding factors identified?	☐	☐	☐	☐
6. Were strategies to deal with confounding factors stated?	☐	☐	☐	☐
7. Were the outcomes measured in a valid and reliable way?	☐	☐	☐	☐
8. Was appropriate statistical analysis used?	☐	☐	☐	☐

Appendix D

The Joanna Briggs Institute Critical Appraisal Checklist for Qualitative Research

JBI Critical Appraisal Checklist for Qualitative Research

Reviewer_____Date_____

Author _____Year_____Record Number_____.

		Yes	No	Unclear	Not applicable
1.	Is there congruity between the stated philosophical perspective and the research methodology?	☐	☐	☐	☐
2.	Is there congruity between the research methodology and the research question or objectives?	☐	☐	☐	☐
3.	Is there congruity between the research methodology and the methods used to collect data?	☐	☐	☐	☐
4.	Is there congruity between the research methodology and the representation and analysis of data?	☐	☐	☐	☐
5.	Is there congruity between the research methodology and the interpretation of results?	☐	☐	☐	☐
6.	Is there a statement locating the researcher culturally or theoretically?	☐	☐	☐	☐
7.	Is the influence of the researcher on the research, and vice- versa, addressed?	☐	☐	☐	☐
8.	Are participants, and their voices, adequately represented?	☐	☐	☐	☐
9.	Is the research ethical according to current criteria or, for recent studies, and is there evidence of ethical approval by an appropriate body?	☐	☐	☐	☐
10.	Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?	☐	☐	☐	☐

Overall appraisal: Include ☐ Exclude ☐ Seek further info ☐

Comments (Including reason for exclusion)

_____

_____

_____

Appendix E
Author Guidelines for Submission of Systematic Review to
The Journal of Affective Disorders

ELSEVIER

JOURNAL OF AFFECTIVE DISORDERS

Official Journal of the International Society for Affective Disorders

AUTHOR INFORMATION PACK

TABLE OF CONTENTS

ISSN: 0165-0327

DESCRIPTION

The Journal of Affective Disorders publishes papers concerned with affective disorders in the widest sense: depression, mania, mood spectrum, emotions and personality, anxiety and stress. It is interdisciplinary and aims to bring together different approaches for a diverse readership. Top quality papers will be accepted dealing with any aspect of affective disorders, including neuroimaging, cognitive neurosciences, genetics, molecular biology, experimental and clinical neurosciences, pharmacology, neuroimmunoendocrinology, intervention and treatment trials.

Journal of Affective Disorders is the companion title to the open access Journal of Affective Disorders Reports.

AUDIENCE

Journal of Affective Disorders is interdisciplinary and aims to bring together different approaches and fields including biochemistry, pharmacology, endocrinology, genetics, statistics, epidemiology, psychodynamics, classification, clinical studies and studies of all types of treatment for a diverse readership.

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ABSTRACTING AND INDEXING

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GUIDE FOR AUTHORS

Description

The Journal of Affective Disorders publishes papers concerned with **affective disorders** in the widest sense: **depression, mania, anxiety and panic**. It is interdisciplinary and aims to bring together different approaches for a diverse readership. High quality papers will be accepted dealing with any aspect of affective disorders, including biochemistry, pharmacology, endocrinology, genetics, statistics, epidemiology, psychodynamics, classification, clinical studies and studies of all types of treatment.

Submission checklist

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Highlights are mandatory for this journal as they help increase the discoverability of your article via search engines. They consist of a short collection of bullet points that capture the novel results of your research as well as new methods that were used during the study (if any). Please have a look at the examples here: example Highlights.

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Abstract

A concise and factual abstract is required. The abstract should state briefly the purpose of the research, the principal results and major conclusions. An abstract is often presented separately from the article, so it must be able to stand alone. For this reason, References should be avoided, but if essential, then cite the author(s) and year(s). Also, non-standard or uncommon abbreviations should be avoided, but if essential they must be defined at their first mention in the abstract itself.

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Immediately after the abstract, provide a maximum of 6 keywords, using American spelling and avoiding general and plural terms and multiple concepts (avoid, for example, 'and', 'of'). Be sparing with abbreviations: only abbreviations firmly established in the field may be eligible. These keywords will be used for indexing purposes.

Abbreviations

Define abbreviations that are not standard in this field in a footnote to be placed on the first page of the article. Such abbreviations that are unavoidable in the abstract must be defined at their first mention there, as well as in the footnote. Ensure consistency of abbreviations throughout the article.

Acknowledgements

Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).

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Appendix G
Supplementary Material for Studies Included within Systematic Review

Study	*% Enacted with suicidal intent and methods of MSSH*	*Mental Health Diagnosis*	*Alternative Reasons for MSSH*
Barnes et al. 2016	36% Methods not reported	Not reported People who were identified as have overt psychiatric symptoms at the time of hospital admission were excluded	Employment difficulties (N) = 5, 26% Debt (N) = 16, 84% Historic abuse (N) = 2, 11% Anxiety about social benefits system (N) = 3, 16% Housing difficulties (N) = 2 11%
Blenkiron et al. 2000	31% Methods not reported	Adjustment Disorder (N= not reported) Depressive Disorder (N= not reported) Other (N= not reported)	Relationship with partner or family Early - (N) = 19, 90.5% Late – (N) = 81, 80.2%(p=0.26) Money Early - (N) = 9, 42,9% Late – (N), 67, 66.3% (p=0.04)*[7] Mental health Early - (N) = 15, 71.4%, Late – (N), 43, 43.6% (p=0.0016)* Physical health Early - (N) = 8, 38.1%%, Late – (N), 35, 34.7% (p=0.76) Work Early - (N) = 11, 52.4%, Late – (N), 46, 45.5% (p=0.57) Housing Early - (N) = 9, 42.9%, Late – (N), 39, 38.6% (p=0.72) Alcohol or drugs Early - (N) = 11, 52.4%, Late – (N), 34, 33.7% (p=0.11) Death of some one close Early - (N) = 9, 42.9%, Late – (N), 25, 24.8% (p=0.048)
Breet et al. 2018	35% Substance users	Not reported	To regulate the behaviour of someone else (N) = 6, 12.5%

7

	43.8% (N) = 21 Non substance users 31.6% (N) = 60 Self-poison Substance users (N) = 37, 77.1% Non substance users (N) = 154, 81.1% Damage Body Tissue Substance users *(N) = 8, 16.7%* Non substance users (N) = 18, 9.47% **Mixed method** Substance users *(N) = 3, 6.25%* Non substance users (N) = 8, 4.2%,		To regulate emotional state (N) = 3, 6.3% To escape a situation (N) = 11, 22.9% To communicate something (e.g. distress) (N) = 13, 27.1% Mistake (N) = 5, 10.4% Chronic physical pain/ illness (N) = 1, 2.1% Not known (N) = 5, 10.4% Financial Concerns (N) = 13, 271% Friendship/marital/romantic relationship issues (N) = 16, 33.3% Family Conflict (N) = 11, 22.9% Social issue (isolation, friendship problems, legal issues)(N) = 2, 4.2% Medical Illness (N) = 6, 12.5% Psychiatric Illness (N) = 8, 16.7% Bereavement (N) = 3, 6.3% Academic Concerns (N) = 2, 4.2%
Cleare et al. 2021	67% F: (N) =186 (55.7%) M: (N)=149 (44.3%) Overdose: (N) = 453, 90.6% Cutting (N) = 27, 5.4%	Not reported	Depressive symptoms: NSSH: 30.83, SA: 38.07 Suicidal ideation: NSSH: 10.77, SA: 24.52 Perfectionism: NSSH (N) =57.22, SA (N)=62.62 Defeat: NSSH (N) = 37.63, SA (N) = 48.59 Internal entrapment: NSSH (N) = 15.1, SA (N) = 18.94 External entrapment: NSSH (N) = 19.27, SA (N) = 24.75 Burdensomeness: NSSH (N) = 26.36, SA (N) = 34.25 Belongingness: NSSH (N) = 17.1, SA (N) = 21.35 Impulsivity: NSSH (N) = 74.6, SA (N) = 80.14 Acquired capability: NSSH (N) = 10.21, SA (N) = 11.91

	Mixed methods %(N) = 20, 4%		Social support: NSSH (N) = 21.19, SA (N) = 18.40
Desalew et al. (2011)	% of SI not reported Poisoning (N) = 112/112 (100%)	Psychotic Disorders (N) = 6/112 (5.4%) Major Depressional Disorders (N) = 7/112 (6.25%	Quarrel with another person (n=32) Emotional disturbance (n=17) Underlying mental illness (n=12) Exam failure (n=1)
Groholt & Haldorsen (2000)	63% Non-suicidal Medication overdose (N) = 34/34 (100%) Suicidal Medication overdose (N) = 53/57 (93%) Other method (N) = 4/57 (7%)	Affective Disorder Non-suicidal (N) = 11/34 (32%) Suicidal (N) = 35/57 (61%) Disruptive Disorder Non-suicidal (N) = 11/34 (32%) Suicidal (N) = 6/57 (11%) Anxiety Disorder Non-suicidal (N) = 6/34 (18%) Suicidal (N) = 8/57 (14%) Adjustment Disorder Non-suicidal (N) = 6/34 (18%) Suicidal (N) = 14/57 (25%) Eating Disorder Non-suicidal (N) = 4/34 (12%)	Motives for MSSH measured with MPQ Thoughts unbearable: Non-suicidal (mean 2.29, SD 0.76), Suicidal (mean, 2.34, SD, 0.79) Show love to someone: Non suicidal (mean 1.44, SD 0.82), Suicidal (mean 1.27, SD 0.65) Lost control of self: Non suicidal (mean 2.32, SD 0.84, Suicidal (mean 1.89, 0.85) Unbearable situation: Non suicidal (mean 2.18, SD 0.85), Suicidal (2.48, SD 0.66) Escape for a while: Non suicidal (mean 2.29, SD 0.84), Suicidal (mean 1.77, 0.79) Show desperation: Non suicidal (mean 2.00, SD 0.88), Suicidal (mean 1.66, SD 0.79) I wanted help: Non suicidal (mean 1.91, SD 0.79), Suicidal (1.52, SD 0.71) Make anybody care: Non suicidal (mean 1.91, SD 0.79), Suicidal (mean 1.36, SD 0.59) Wanted someone to pay: Non suicidal (mean 1.47, SD 0.79),

		Suicidal (N) = 8/57 (14%) Substance Abuse Non-suicidal (N) = 4/34 (12%) Suicidal (N) = 0 Personality Disorder Non-suicidal (N) = 24/24 (71%) Suicidal (N) = 11/57 (19%)	Suicidal (mean 1.18, SD 0.47) To make someone feel guilty: Non suicidal (mean 1.44, SD 0.79), Suicidal (mean 1.77, 0.56) Change someone's mind: Non suicidal (mean 1.59, SD 0,74), Suicidal (mean 1.14, SD 0.40) Give someone relief: Non suicidal (mean 1.53, SD 0.75), Suicidal (1.63, SD 0.77) Sleep for a while: Non suicidal (mean 1.74, SD 0.79), Suicidal (mean 1.25, 0.55) Interpersonal problems: Non suicidal (mean 1.62, SD 0.47), Suicidal (mean 1.37, 0.32) Intrapersonal problems: Non suicidal (mean 2.06, SD 0.36), Suicidal (mean 2.09, SD 0.32)
John et al., (2022)	62.5% Self-poisoning (N) = 7/8 (87.5%) Self-injury (N) = 2/8 (25%)	Not reported	Alcohol abuse and relationship breakdown (n=2) Historical Abuse (n=1) Sexual assault in recent days prior to incident (n=1) Loss of friends during cluster suicide (n=1)
McAuliffe et al. 2007	56% Self-poisoning: (N) = 1,270/1,561 (81.3%)	Depression (N) = 436/1,561 (27.9%) Substance abuse (N) = 404/1,561 (25.8%) Adjustment disorder (N) = 293/1,561 (18.7%)	To get away for a while from an unacceptable situation, to make others know how desperate they felt, to sleep for a while (interruption) M: mean 1.87, SD, 1.36 F: mean 2.13, SD 1.38 To make others pay for the way they treated me, to make someone feel guilty (revenge)

			M: mean 0.46, SD 0.77 F: mean 0,47 SD 0.82, To make an appeal to others (to show someone how much they loved them, to get help from someone, to know if someone really cared, to persuade someone to change their mind) – (appeal) M: mean 1.21, SD 1.33 F: mean 1.31, SD 1.34 Seek a temporary break from their problem (to get away for a while from an unacceptable situation, to sleep for a while, to let others know how desperate they felt, lost control of themselves) – (escape) M: mean 2.72, SD 1.23 F: 2.76, SD 1.1
Mitchell et al. (2021)	47.3% Overdose (N) = 49/93 (74.2%) Hanging: (N) 18/93 (19.4%) Other: (N) 6/93 (6.5%	Depression: (N) = 63/85 (74.15) Anxiety: (N)= 34/85 (41.9%) Bipolar: (N) = 26/85 (32.5%) Personality Disorder: (N)= 19/85 (23.4%) Substance use disorder: (N)= 27/85 (33.8%) ADHD: (N)= 14/85 (17.3%) Behavioural Disorders: (N)= 8/85 (9.9%) Trauma-related Disorder: (N)= 6/85 (7.4%) Eating Disorders: (N)= 6 (7.4%) Other: (N) = 33/85 (40.2%)	Interpersonal conflict (N) = 64/93, (68.8%) Family conflict (N) = 40/93, (43%) Peer conflict (N) = 22/93, (23.7%) Romantic conflict (N) = 21/93, (22.6%) Academic difficulty (N) = 9/93, (6.5%) Sexuality/ gender identity concerns (N) = 7/93, (7.5%) Abuse/neglect (N) = 8/93, (8.6%) Other including death in the family and legal problems (N) = 31/93, (33.3%)

Naz et al. (2021)	% of SI not reported Self-poisoning (N) = 16, 100%	Not reported	Themes: Interpersonal conflicts with family Emotional Crisis Finding self-harm as an only option to cope
Park et al. (2020)	54% Cutting Non suicidal (N) = 138/138 (100%) Suicidal (N) = 162/162 (100%)	Depressive Disorders Non-suicidal: (N) = 31/82 (37.8%) Suicidal: (N) = 100/139 (71.9%) Trauma-Stessor Related Disorders Non-suicidal: (N) = 29/82 (35.4%) Suicidal: (N)= 21/139 (15.1%)	Couple confiict:Non-suicidal (37.7%), Suicidal (24.1%) Family conflict: Non-suicidal (12.3%) Suicidal (13%) Psychiatric illness: Non-suicidal (18.8%) Suicidal (35.8%) Other (academic stress, financial stress, job loss, medical condition, military service) Non-suicidal (7.2%) Suicidal (19.8%) Did not confide reasons Non-suicidal (23.9%), Suicidal 7.4%