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Aftercare and self-harm repetition following high-risk self-harm: a mixed methods study

A thesis submitted to the National University of Ireland, Cork for the degree of Doctor of Philosophy in the School of Public Health

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List of abbreviations

CUH	Cork University Hospital
CSO	Central Statistics Office
CBT	Cognitive Behavioural Therapy
CNS	Clinical Nurse Specialist
DASS-21	Depression Anxiety and Stress Scales
DBT	Dialectical Behavioral Therapy
DRO	Data Registration Officer
ED	Emergency department
GDPR	General Data Protection Regulation
GMS	General Medical Services
GP	General Practitioner
HCP	Healthcare professional
HR	Hazard ratio
HRB	Health Research Board
HRSH	High risk self-harm
HSE	Health Service Executive
ICD-10	International Statistical Classification of Diseases and Related Health Problems 10th Revision
IDO	Intentional drug overdose
IMV	Integrated Motivational Volitional Model of Suicidal Behaviour
IPW	Inverse probability weighting
IMPRESS	Improving Prediction and Risk Assessment of Self-harm and Suicide Study
NCP-SH	National Clinical Programme for the Assessment and Management of Patients Presenting to Emergency Department following Self-harm in Ireland
NCHD	Non-Consultant Hospital Doctor
NOSP	National Office for Suicide Prevention
NSHRI	National Self-harm Registry Ireland
NSSI	Non-suicidal self-injury
OR	Odds ratio
PS	Propensity score
RR	Risk ratio
SCL-CD6	Symptom Checklist-Core Depression
SDG	Sustainable Development Goal
SIS	Suicide Intent Scale
SPSS	Statistical Package for Social Sciences
UHL	University Hospital Limerick
UK	United Kingdom
WHO	World Health Organization

Declaration

This is to certify that the work I am submitting is my own and has not been submitted for another degree, either at University College Cork or elsewhere. All external references and sources are clearly acknowledged and identified within the contents. I have read and understood the regulations of University College Cork concerning plagiarism.

Digital signature of the candidate: 

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Abstract

Background: Existing research on individuals presenting to hospital with self-harm of high lethality or high suicidal intent indicates that they are a population with enduring mental health conditions (1-4) and a high risk of subsequent suicide (4-11). Despite this, there are gaps in the research relating to this subgroup of high-risk self-harm (HRSH) patients. Specifically, there is a paucity of prospective research examining rates and predictors of self-harm repetition following HRSH. Furthermore, knowledge of current approaches to aftercare following HRSH and the impact of these approaches on patient outcomes is limited.

Aim: The aims of this research were to describe demographic, clinical and psychosocial factors associated with HRSH, to investigate the allocation and impact of aftercare for HRSH patients, and to examine predictors of self-harm repetition.

Methods: The thesis used a mixed methods approach and is comprised of three quantitative studies (Studies 1-3) and one mixed-methods study (Study 4). Primary data collection was conducted as part of the Improving Prediction and Risk Assessment of Self-harm and Suicide (IMPRESS) study. This included: quantitative data collected from hospital records; qualitative and quantitative data collected via semi-structured interviews; and data linkage with the National Self-Harm Registry Ireland (NSHRI). The quantitative studies employed a prospective cohort design, and the mixed methods study used a sequential qualitatively led design.

Results: Study 1 included hospital presented self-harm and found that intentional drug overdoses (IDOs) involving psychotropic drugs and multiple drug IDOs were associated with increased repetition risk. Study 2 demonstrated that one in nine self-harm patients attending the EDs during the study period presented with HRSH and factors associated with this were age (45-64 years), a history of recent self-harm presentations and alcohol involvement in the self-harm act. Individuals presenting with HRSH had a significantly lower risk of not receiving a biopsychosocial assessment, compared with

individuals presenting with lower severity self-harm. Risk of non-assessment was highest among patients with a history of multiple recent self-harm presentations. HRSH patients showed the same risk of prospective non-fatal self-harm repetition as lower severity self-harm patients. Study 3 found that four out of five HRSH patients had a history of treatment for mental health issues. A high level of psychotropic drug prescribing was observed and most IDOs among HRSH patients involved multiple drugs, including drug(s) prescribed for the person. In a multivariable analysis using propensity score methods, HRSH patients admitted to a psychiatric inpatient setting following their self-harm act had similar risk of repeated self-harm as those who were not admitted. Factors that conferred greater risk of repeated self-harm following HRSH were recent self-harm history, particularly multiple recent presentations, young age (18-24 years) and a history of previous psychiatric admission. Study 4 identified considerable variation in satisfaction with aftercare following HRSH. Timely and comprehensive care involving supportive and compassionate relationships with healthcare professionals was considered essential following a HRSH episode by most participants. Individuals with a history of self-harm and mental health service engagement were more likely to report dissatisfaction with care provided. Those who described unsupportive relationships more frequently reported repeated self-harm, alcohol misuse and hopelessness at follow-up.

Conclusions: HRSH patients are a vulnerable group with psychiatric conditions and psychosocial difficulties, many of whom feel unsupported in the current healthcare system. Throughout this research, the vulnerability of self-harm repeaters was highlighted; those with a history of self-harm were more likely to present with HRSH acts, receive substandard care, and engage in further repeated acts of self-harm. Conducting a biopsychosocial assessment needs to be prioritised among individuals with a history of self-harm and/or mental health treatment each time they present to the emergency department. The overall findings arising from this thesis underline the importance of ongoing skills training for healthcare professionals in optimising assessment and management of HRSH patients, and in safe prescribing practices.

Preface

This thesis uses a mixed methods approach to examine high-risk self-harm (HRSH) presentations to hospital, defined as self-harm involving highly lethal methods, medical severity, or high suicidal intent, with a focus on aftercare and self-harm repetition. The thesis begins with an introductory chapter which provides an overview of terminology and epidemiology of suicidal behaviour, evidence on assessment and aftercare for self-harm patients and existing research on HRSH. This chapter provides the research context for the four empirical studies of this doctoral thesis. The subsequent chapter provides an overview of the variety of methodologies used in these studies which involved primary data collection, use of an existing data source and data linkage. Chapter 2 provides a description of the methodology of the research, including a detailed description of primary data collection, existing sources of data used, and an overview of the analytical approaches applied throughout the thesis. Chapters 3-6 present the four original interrelated research studies as follows:

- Study 1: Method of self-harm and risk of self-harm repetition: findings from a National Registry (Chapter 3)
- Study 2: Assessment and self-harm repetition following high risk self-harm presentations to hospital: a cohort study (Chapter 4)
- Study 3: Factors associated with psychiatric admission and subsequent self-harm repetition: a cohort study of high-risk hospital-presenting self-harm (Chapter 5)
- Study 4: Patients' experiences of engagement with healthcare services following an episode of high-risk self-harm: a mixed methods study (Chapter 6)

At the time of submission of this thesis, the studies outlined in Chapters 3 and 6 (studies 1 and 4) have been published. Study 2 is under review with Psychiatry Research and Study 3 is under review with Journal of Mental Health. The final chapter (Chapter 7) is a discussion of the main findings of this thesis and the theoretical, clinical and policy implications arising from the research. The strengths and limitations of the research are outlined, and the thesis concludes with a reflection on possible avenues for future research.

Chapter 1. Introduction

1.1. Chapter overview

This chapter will describe the context of the research undertaken in the thesis, beginning with an overview of nomenclature and definitions, and the epidemiology of suicidal behaviour. The existing evidence on high-risk self-harm (HRSH) and the assessment and aftercare care for self-harm patients will be discussed, followed by the theoretical underpinnings of the research and an overview of the aims and objectives.

1.2. Nomenclature and definitions of suicidal behaviour

Suicidal behaviour includes a range of behaviours with varying motives and levels of intent, ranging from low lethality acts of self-harm to acts with a fatal outcome. Suicide is defined by the WHO as '*an act of deliberately killing oneself' (12).* There is no uniform definition or nomenclature for non-fatal suicidal behaviour with numerous terms used in current literature including self-harm, suicide attempt, suicidal self-injury, non-suicidal self-injury (NSSI) and self-directed violence, among others (12-14). Due to the dynamic nature of suicidal intent and the varying motives underlying acts of self-harm, issues have been raised with the appropriateness and utility of definitions that dichotomise acts as into those with suicidal intent (e.g. suicide attempt) or without suicidal intent (e.g. NSSI) (15). This is reinforced by prospective findings demonstrating that NSSI is associated with future suicidal thoughts and behaviours (16). Thus, in the present research, suicidal behaviour is considered to be on a continuum with an overall definition of self-harm that includes all acts of self-harm, irrespective of level of suicidal intent or motivation (15). The term self-harm is used throughout the thesis to describe non-fatal suicidal behaviour, defined as *'an act with non-fatal outcome in which an individual deliberately initiates a non-habitual behaviour, that without intervention from others will cause self-harm, or deliberately ingests a substance in excess of the prescribed or generally recognised therapeutic dosage, and which is aimed at realising changes that the person desires via the actual or expected physical consequences'* (17). While this definition of self-harm includes episodes that do not

come to the attention of health services, the research in this thesis focuses primarily on self-harm that results in a presentation to hospital.

1.2.1. Definition of high-risk self-harm (HRSH)

In line with the definition of non-fatal suicidal behaviour overall, a uniform term or definition does not exist for the most serious cases of self-harm. The assessment of the seriousness of a self-harm act focuses on two main factors: the lethality of the act and the degree of suicidal intent associated with it (18-20). Lethality can refer to the potential lethality associated with the methods used or the actual medical consequences experienced as a result of the act (18, 21). Suicidal intent can be defined as the "seriousness or intensity of the subject's wish to terminate his or her own life" (Beck et al., 1974a). Suicidal intent has two components: an objective component which reflects the circumstances surrounding the act (for example, level of precautions taken against discovery), and a subjective component, which is related to the individual's statements about their intentions (for example, their wish to die or ambivalence about living) (Beck, 1990; Beck et al., 1974a). The level of suicidal intent is related to the lethality of an act (18, 22), but is considered an independent dimension (9, 23, 24). Expectations of lethality by individuals engaging in self-harm are frequently inaccurate (19) and this lack of comprehension of the lethality of certain methods, or of a substance's toxicity, may result in those without a strong wish to die losing their lives and those with high suicidal intent experiencing minor medical consequences (25, 26). Accordingly, a recent review of the research on HRSH concluded that it is necessary to include high suicidal intent in any definition of the most serious cases of self-harm (20). In this thesis, HRSH is defined as self-harm acts that involve a highly lethal method and/or medical severity and/or high suicidal intent. More detail on the operationalisation of HRSH in this thesis is outlined in Chapter 2.

Most previous studies have defined high risk self-harm according to the actual or potential lethality of the act, irrespective of suicidal intent. In these studies, high lethality acts are broadly defined as those which would have been lethal if it were not for medical intervention or chance and/or involved

methods associated with a high chance of death (3, 27-29). One notable exception is a historical study conducted by Rosen in 1976 (30) which included cases that were considered psychiatrically serious based on the level of preparation for the attempt in its definition of serious self-harm. Due to the emphasis on lethality, most existing research on the topic uses terms such as near-fatal self-harm, medically serious suicide attempts or nearly lethal suicide attempts to describe HRSH. For clarity, in the description of the literature in this chapter, the varying terms attributed to the most serious cases of self-harm will be referred to as HRSH.

1.3. Prevalence of self-harm and suicide

Suicidal behaviour has been conceptualised as an iceberg with suicide being a relatively rare, visible phenomenon at the top of the iceberg, hospital presented self-harm beneath this (which is considerably more common), and self-harm occurring in the community that does not come to the attention of hospital services (which occurs at a much greater frequency again) and is often hidden (31). Annually, almost 800,000 people die from suicide each year (12, 32). This represents a global suicide rate of 10.5 individuals per 100,000 (32). In 2016 in Ireland, the age-standardised suicide rate was 9.5 (12, 33). Internationally and in Ireland, males consistently have a higher suicide rate compared to females (15.4 vs 3.7 in Ireland in 2016) (12, 33). Age patterns in suicide rates vary globally, but on the whole, middle-aged and older persons are more likely to die by suicide (12). Approximately 12,000 self-harm presentations are made to EDs in the Republic of Ireland each year, involving 9,000-10,000 individuals (34-36). This represents an annual incidence rate of approximately 200 individuals per 100,000. In Ireland (36) and internationally (37), rates of hospital presented self-harm are consistently higher among females and generally peak among young people (38-44). Determining the prevalence of self-harm in the community is challenging but a previous international review estimated that approximately one in 40 adults had self-harmed previously (45). A more recent large scale UK study, based on self-report survey data, reported a lifetime prevalence of self-harm of 6.4% (46). As mentioned previously, this thesis focuses on hospital presented self-harm.

Individuals who present to hospital with an episode of self-harm commonly have subsequent repeated self-harm episodes (38, 47, 48). Data from the National Self-Harm Registry Ireland (NSHRI) indicates that approximately one in five self-harm presentations to hospitals are a result of repetition (34, 36). Data from the National Clinical Programme for the Assessment and Management of Patients Presenting to Emergency Department following Self-harm in Ireland (NCP-SH) in Ireland indicates that in 2016, almost 30% of persons presenting to hospital following self-harm made at least one repeat presentation in the same year (49). Internationally, the one-year rate of hospital presented self-harm repetition is approximately 16% (47). Self-harm repetition described in these studies and reports is based on repeated self-harm acts that result in a presentation to hospital, excluding those which do not result in a presentation to clinical services. This is in line with how self-harm repetition is defined in the empirical studies in this thesis.

1.4. Methods of self-harm

This section described methods commonly used in hospital presented self-harm. The thesis uses the method categorisation of the Tenth Revision of the World Health Organization's (WHO) International Classification of Diseases (ICD-10) codes for intentional injury (50).

1.4.1. Intentional drug overdose (IDO)

IDO can be defined as the intentional ingestion of more than the prescribed or recommended dose of any drug, as well as IDO of illegal drugs (ICD-10 codes X60-X64) (50). It is the most common method of hospital presented self-harm, involved in more than two thirds of presentations (37, 38, 51). IDO is frequently considered a lower lethality method of self-harm, particulalrly when compared with self-injury (38, 52-54). However, as with self-harm overall, episodes of IDO are not homogeneous in terms of clinical characteristics and medical severity. Increased number of tablets and multiple drugs taken in IDO are associated with higher levels of suicidal intent (22, 55), more extensive medical intervention and greater risk of fatality (56-58). The most common drugs taken in overdose are analgesics and

psychotropic drugs, particularly antidepressant and sedative drugs (37, 43, 59). Tricyclic antidepressants and opioid drugs are those associated with highest risk of fatality (58).

1.4.2. Self-cutting

Self-cutting (ICD-10 code X78) is involved in approximately 20% of self-harm presentations to hospital (38, 53, 60). Hospital presentations resulting from self-cutting can vary widely in terms of injury severity (61) but the majority of self-cutting is low lethality (61). In Ireland, more males present to the ED with self-cutting (34-36, 62). Internationally, some studies have found that self-cutting presentations are more common among women (52, 63) but others have reported a male predominance in self-cutting (9, 64, 65). Males are also more likely to present with higher severity self-cutting (61). Repeated self-cutting is associated with borderline personality disorder, also known as emotionally unstable personality disorder (66).

1.4.3. Other methods / highly lethal methods

Other methods, such as attempted hanging (ICD-10 code X70), attempted drowning (X71), self-poisoning with substances other than drugs (ICD-10 codes X66-X69), jumping from a height (X80), jumping in front of a moving object (X81) and crashing a motor vehicle (X82) are somewhat less common and thus have received less focus in epidemiological studies of hospital presented self-harm. Self-poisoning includes the ingestion of organic solvents, pesticides, gases and other noxious substances, with non-ingestible chemical substances (50). Often, self-poisoning with substances other than drugs is combined with IDO to make a large self-poisoning / IDO category (52-54). Where this combination occurs, due to the small proportion of patients presenting with self-poisoning with substances other than drugs, the majority of presentations will involve the ingestion of drugs rather than other substances.

Most of the uncommon self-harm methods, such as attempted hanging and self-poisoning with substances other than drugs, are associated with high case fatality rates (67). Accordingly, this group of methods are often referred to as highly lethal methods. Use of high lethality methods is significantly

more common among males (67, 68). While these self-harm methods are involved in a minority of self-harm episodes, recent research indicates that the involvement of some high lethality methods has been increasing in recent years (37, 43, 69). A study by Vancayseele (43) examined the trends in prevalence of self-harm methods in Ghent and reported that there was a significant increase in the involvement of attempted hanging (2.6% to 5.1%), jumping from a height (1.1% to 3.3%), and use of other "violent" methods, including firearms jumping before a moving object or other traffic related injury (1.1% to 3.2%). Geulayov et al (37) looked at trends over time using data from Multicentre Study of Self-harm in England and reported that there were increases in attempted hanging and jumping from heights between 2003 and 2012. Griffin et al. (69) reported similar trends among the use of highly lethal methods among young people in Ireland.

1.5. Risk factors for suicide and repeated self-harm

1.5.1. Risk factors for suicide following self-harm

People with a history of self-harm are at significantly greater risk of suicide compared to the general population (11, 47). Previous findings from a large meta-analysis indicate that 1.6% self-harm patients will take their life within 12 months of their self-harm act and one in 25 will die by suicide in the following 5 years (47). Risk factors for suicide following self-harm include: previous episodes of self-harm, suicidal intent, highly lethal methods, physical health problems and male gender (10, 11, 70-72).

1.5.2. Risk factors for repeated self-harm

A large body of research has examined risk factors for repeated self-harm following a self-harm presentation to hospital. A systematic review of 129 studies on this topic found the following factors associated with hospital presented self-harm repetition across studies: previous self-harm, self-cutting, personality disorder, hopelessness, history of psychiatric treatment, schizophrenia, alcohol misuse, drug misuse, and living alone (73). Previous self-harm is consistently the strongest predictor

of repetition and there is evidence of a dose response relationship with risk of repetition increasing with additional self-harm presentations (38, 47, 73).

Method of self-harm has been widely investigated as a risk factor for repetition and self-cutting is the only method consistently associated with repeated self-harm (73). The utility of the evidence emerging from research examining self-harm method as a risk factor for repetition is limited because methods are classified into large heterogeneous groups, most commonly IDO and self-poisoning combined and self-cutting (52-54). Specific characteristics of IDOs have been largely overlooked in large scale prospective studies of self-harm. One study, conducted over 20 years ago, found that ingestion of more than one drug was associated with increased risk of IDO repetition (74). In addition, use of benzodiazepines in IDO has been found to be a significant predictor of short-term risk of repetition (75). To date, one study has examined the severity of self-cutting and repetition of self-harm, indicating that increased severity was associated with a reduction in self-harm repetition (61). The relationship between repetition risk and self-cutting severity has not been examined in comparison with any other self-harm methods. Other methods of self-harm have received little individual consideration in relation to risk of non-fatal repetition. One previous study found that low lethality methods were associated with increased risk of repeat self-harm compared with high lethality methods (10).

1.6. Routine aftercare following hospital presented self-harm

Routine assessment and aftercare recommendations for individuals presenting to the ED following self-harm include: biopsychosocial assessment; referral to psychiatric outpatient care, specialist services and primary care; medical admission; and admission to a psychiatric inpatient setting.

1.6.1. Biopsychosocial assessment

One of the core aspects of care provided to persons presenting to the ED with self-harm is a biopsychosocial assessment, involving the assessment and initial management of both risk and need following self-harm (76, 77). Biopsychosocial assessment is considered central to the clinical

management of self-harm and represents a starting point for intervention to prevent further suicidal behaviour (76, 77). A key element of the assessment is to enable the clinician to make informed and tailored aftercare recommendations. Indeed, evidence indicates that those who receive an assessment are more likely to receive psychiatric treatment following their self-harm presentation (78). In addition, the experience of the assessment may be therapeutic for the self-harm patient in its own right, particularly when a collaborative and therapeutic relationship is developed with the patient (77). Clinical guidelines in Ireland and internationally, recommend that all self-harm patients should receive an assessment which should be conducted by a specially trained mental health professional prior to discharge from the hospital (76, 77, 79, 80). However, in practice, considerable variation in assessment rates have been reported (54, 81).

In Ireland two monitoring systems record data on receipt of biopsychosocial assessment, the NCP-SH and the NSHRI. The NCP-SH published a report in 2017 providing an overview of hospital presenting self-harm and receipt of assessment in 16 acute EDs in the Republic of Ireland (49). Data are collected by clinical nurse specialists (CNSs) who are responsible for conducting biopsychosocial assessments with self-harm patients. In line with the standard operation procedures of the NCP-SH, CNSs appointed through the NCP-SH submit data on each patient presenting to the ED. They aim to ensure that all presentations are included in this data, but it is possible that presentations made out-of-hours may be under-recorded. The NSHRI collects data from all acute EDs in the Republic of Ireland and has annual information on the receipt of assessment for 94%-96% of all hospital presented self-harm (34-36). This data is collected by Data Registration Officers who are independent of the hospital.

In the years 2017-2019, data from the NSHRI indicated that approximately 82% of all self-harm patients discharged directly from the ED received a biopsychosocial assessment (34-36). Patients leaving the ED before being seen accounts for a substantial proportion of the observed non-assessment with rates of assessment as low as 10% among this group. In addition, the assessment rate varies greatly across hospitals and the rate in the majority of hospitals differs significantly from

the national average (36). A higher rate of assessment is documented in the 16 hospitals included in the NCP report (49), with a rate of 91% of those presenting to the ED with self-harm or suicidal ideation reported as receiving an assessment. More than 50% of these patients were assessed by a CNS appointed via the NCP-SH or a Liaison Psychiatry Nurse, while 42% were assessed by a Non-Consultant Hospital Doctor (NCHD). The discrepancy between the rates of assessment reported by the NCP-SH and the NSHRI may reflect the aforementioned variation between hospitals, given that the NCP-SH data reports on a subset of the hospitals reported on by the NSRHI. The rates may also be impacted by differing procedures for data collection and differences in case identification as the NSHRI collects data on self-harm cases only, while the NCP-SH rate reported also includes individuals presenting with suicidal ideation. It is also possible that the definition and operationalisation of a biopsychosocial assessment may differ between NSHRI and the NCP-SH.

Internationally, it has been hypothesised that some of the variation in assessment rates may be reflective of the selection of patients for assessment based on their clinical severity or perceived risk (82, 83) but this has yet to be directly examined. Specific subgroups have also been identified who may be less likely to receive an assessment including people in receipt of mental health treatment in the year prior to their self-harm presentation (84), those with a history of self-harm (78), unemployed people (83, 84), those presenting with symptoms of depression (84) and those who planned the self-harm act (84).

1.6.2. Psychiatric admission

Psychiatric admission is an intensive form of treatment that would not be an indicated intervention for all self-harm patients (51, 84, 85). Accordingly, rates of psychiatric admission are low across the general self-harm population, ranging from 3-11% in studies in the UK and Ireland (51, 84-87). Psychiatric admission is likely to be allocated to those at higher risk of adverse outcomes. In line with this, higher psychiatric admission rates following self-harm involving high lethality methods have been

reported, for example, 30% of those presenting with attempted hanging were admitted and 26% following attempted drowning (51).

1.6.3. Medical admission

The primary reasons for medical admission following a self-harm presentation is treatment for physical consequences relating to a self-harm episode. Rates of medical admission vary significantly between regions and countries. For example, in Ireland approximately 30% of self-harm patients are medically admitted, ranging from 11%-61% across administrative health regions (51). In England, medical admission rates are higher, occurring in approximately 50-60% of cases (82, 87, 88), ranging from 22% to 85% across hospitals (82). Factors associated with admission to a medical bed include being male (51), older age (51) and presenting with IDO (87).

1.6.4. Referral and follow-up among those discharged from the ED

Clinical guidelines recommend that where appropriate, discharged patients should be referred to for outpatient appointments with local mental health services and / or referred to specialist services, including addiction treatment services and individual or relationship counselling (76, 77, 80). Assertive follow-up is advocated, involving the continued engagement with discharged patients, usually over the phone, to facilitate their engagement with the relevant services or bridge to their follow-up appointment (76, 77). Guidelines further recommend that clear communication of their care plan should be given to patients upon discharge along with phone numbers to contact in crisis situations (76, 77).

1.6.5. Primary care

Primary care plays a significant role in the aftercare of persons who present to hospital as a result of self-harm (89, 90), with one study reporting that approximately 50% of self-harm patients attended their General Practitioner (GP) in the four weeks following their presentation. In line with this, clinical guidelines recommend that communication with a patient's GP should happen immediately following a self-harm presentation to the ED (76, 77, 80). A study by Cooper et al (91) examined this and found

that of 93 consecutive cases of self-harm, almost two thirds were communicated with primary care. Of these communications 58% occurred within 24 hours and the majority within 3 days. Similar rates of communication were reported in an evaluation of assessment and management of self-harm in Irish hospitals, with 61% of cases being communicated to the GP within 24 hours (77).

1.7. Evaluation of the efficacy of routine aftercare following hospital presented self-harm

Observational studies are the most common approach to examining efficacy of routine hospital management of self-harm on subsequent patient outcomes. Randomised controlled trials are often used with specific patient groups to examine psychological and other therapeutic interventions following self-harm (92) but are not commonly used to evaluate self-harm management in the ED due to ethical issues in withholding routine aspects from a population at high risk of repeated self-harm and suicide. Observational studies using cohort data from surveillance systems that record self-harm presentations to hospitals are frequently used to investigate the relationship between aspects of assessment and aftercare and patient outcomes. However, the observational nature of these studies mean that it is not possible to determine causation from associations between treatment and outcome. The standard approach to address the lack of randomisation in these observational studies is to statistically adjust for potential confounding factors in the analyses of patient outcomes (82, 88). In recent years, a number of studies have utilised more advanced statistical approaches to balance the differences between treatment groups, including propensity score methods (84, 87) and instrumental variable analysis (93). Repetition of self-harm is the adverse outcome that is most frequently examined in these studies as it is indicative of ongoing distress and is routinely collected as part of these monitoring systems. Qualitative research of patient experiences is also an important method of understanding the impact of routine assessment and aftercare following hospital presented self-harm (94-97).

1.7.1. Efficacy of biopsychosocial assessment

Mixed findings have been reported from observational studies examining the relationship between biopsychosocial assessment and risk of repeated self-harm and suicide (84, 87, 93, 98). A meta-analysis of 64 observational studies published in 2014 reported no association between receipt of biopsychosocial assessment and risk of repeated self-harm or suicide (98). The authors of this review acknowledge the complexities of examining the relationship between assessment and patient outcomes. For example, in a large UK study conducted across multiple centres, no overall association was found between assessment and self-harm repetition (83). However, when the centres were examined independently, the findings indicated that assessment was associated with increased repetition risk in some centres and with reduced risk in others. Further findings from the analysis of the data from these centres indicated that receipt of assessment was associated with reduced repetition risk among individuals without a history of psychiatric treatment (54).

In order to account for the potential differences in patient characteristics between those who are and are not assessed, recent studies that have used analytic approaches beyond traditional regression analyses to examine the relationship between assessment and self-harm repetition (84, 87, 93). Carroll et al (93) used instrumental variable analysis to balance confounders between those who were and were not assessed reporting a possible reduction in risk of self-harm repetition among those who received an assessment. However, this type of analysis relies on a valid instrument to balance the differences between groups. The instrument used in this study did not balance all confounders. Therefore, the authors recommend being cautious when interpreting the results. A more recent study by Steeg et al (84) used propensity score methods adjusted for observed differences between those who were and were not assessed. In traditional analysis, no association between assessment and repetition was found. However, following application of propensity score methods, biopsychosocial assessment was associated with a significant reduction in self-harm repetition. Their findings further indicated that assessment was more effective in reducing repetition among certain patient groups including those presenting: for the first time, with less common methods (asphyxiation, jumping from

a height and self-immolation) and those with lower probability of receiving an assessment (84). A related study examined psychosocial assessment and risk of suicide using the same approach (87). In that study, assessment was significantly associated with increased risk of suicide in crude analysis. However, following adjustment with propensity score methods, although the increased risk of repetition was still evident, it was no longer statistically significant.

1.7.2. Efficacy of psychiatric admission

The rate of suicide and other causes of premature mortality following psychiatric admission among self-harm populations is high (99). Accordingly, understanding whether psychiatric admission has beneficial or harmful effects is of great importance. Studies have indicated that psychiatric admission increases risk of repeated self-harm and suicide (85, 86, 100, 101). However, the relationship between clinical severity and treatment allocation introduces bias to observational studies evaluating the effect of psychiatric admission (84, 85). Consequently, findings that indicate a harmful effect of treatment in psychiatric inpatient settings (101) may be a reflection of confounding by indication. Propensity score (PS) methods have been used to address confounding by indication in previous studies of outcomes following treatment among self-harm patients (84, 87, 102). Using this approach, a large cohort study found that the increase in risk of repetition following psychiatric admission that was observed using traditional covariate adjustment was no longer evident when PS methods were used to more accurately account for observed confounding (84).

While it is likely that the previous findings indicating a harmful effect of psychiatric admission can largely be explained by the selection effect described above, some have suggested that factors related to psychiatric admission play a causal role in subsequent fatal and non-fatal suicidal behaviour (101, 103). Methodological challenges make it difficult to examine this directly (103). However, Large and Kapur (103) posits that the high risk of suicide in the immediate aftermath of hospital discharge (104, 105) is indicative of a protective effect of the inpatient setting and that this protection is removed at

the point of discharge. This hypothesis is supported by a qualitative study with previously admitted individuals (106).

1.7.3. Efficacy of medical admission

While patients are not admitted to a medical bed for therapeutic reasons, medical admission may have beneficial effects in some cases due to extended time in hospital allowing for additional time for assessments to be carried out and follow-up care arrangements to be made (52, 87). The relationship between medical admission and subsequent repetition has been examined previously with mixed results. One observational study reported an increased risk in self-harm repetition associated with medical admission in one centre, and a decreased risk in another centre (88). Other studies have used PS methods to account for differences between those admitted and not admitted (84, 87), with findings indicating that medical admission was not associated with risk of subsequent repetition but was associated with an increased risk of suicide. Subgroup differences were observed in these studies. The increased risk of suicide associated with medical admission observed among the full cohort was not seen for admitted patients with a history of self-harm and psychiatric treatment (87). Patients with a history of self-harm who were admitted to a medical bed also had lower risk of non-fatal repetition (84).

1.7.4. Efficacy of outpatient services

Relatively few studies have examined patient outcomes following referral to outpatient services. Based on limited data, a previous meta-analysis reported no association between referral to outpatient services and self-harm repetition. This has been supported by more recent studies, including one using propensity score methods (82, 84). However, an increased risk of subsequent mortality associated with outpatient referral has been reported (87). A challenge with examining outpatient treatment is that it is a broad category that can include a multitude of interventions (87). In addition, it reflects a referral to treatment rather than receipt of treatment. Levels of engagement with outpatient referrals is difficult to ascertain and thus information on it is limited.

1.7.5. Patient experiences of services

Substantial variation in patient experiences of aftercare following self-harm in general have been reported in previous studies (94-97). A recent systematic review of qualitative studies reported that patients' experience of emergency hospital care following self-harm ranged from "gentle to hostile", highlighting the periods of admission and discharge as especially disorienting for patients (107). MacDonald et al (107) further reported that negative experiences of care may increase the likelihood of further episodes of self-harm. Divergent experiences of care may be a reflection of the actual care received or due to differences in needs and expectations between individuals (97, 108-110). Service level factors, such as inconsistencies in aftercare and staff attitudes, contribute to the observed discrepancy in satisfaction with care (94, 96, 110). Differences in perception of routine aftercare according to patient characteristics or expectations has not been explored to date. Preferences for different forms of therapeutic care among patients with psychological disorders have been found to differ according to certain patient characteristics such as sex, age, marital status and previous experiences of therapy (111, 112).

1.7.6. Family / carer involvement in aftercare

Clinical guidelines in Ireland (77) and internationally (76, 79) advocate the involvement of family, carers, or significant others, in the development of care plans, safety planning and harm reduction strategies. Ideally, this should involve a collaborative approach to aftercare planning involving the family member or carer and the provision of a copy of the written emergency care plan to this person(s), in addition to the patient. It is further advised that the family member or carer should be given specific advice on suicide prevention prior to discharge (77). Studies examining the efficacy of involving families or carers of self-harm patients in routine assessment and aftercare planning in the ED are limited. However, support from family members and others has been highlighted as protective factor against suicide risk (113). Furthermore, evidence indicates that involvement of family / carers in targeted interventions for people presenting with self-harm or suicidal ideation is associated with more positive outcomes compared with interventions delivered without family involvement (114,

115). Specifically, family-based interventions have the potential to promote engagement with and acceptance of treatment and to reduce self-harm-related hospitalisations and suicidality (114, 116, 117).

1.8. Review of research on HRSH

1.8.1. Prevalence of HRSH

It is generally accepted that most cases of hospital presented self-harm are of low lethality and low suicidal intent. The extent of hospital presented self-harm cases that involve HRSH is difficult to determine from the existing literature due to varying definitions of HRSH and differences in the composition of samples and control groups. In a study of HRSH cases presenting to three urban hospitals in the UK, Douglas et al (29) reported a prevalence of 8% of all presentations made to hospital for self-harm. Other studies have indicated higher prevalence rates ranging from 15% in Houston in the United States (118), to 34% in an Israeli study (18). However, the definitions of HRSH in each of these studies did not include suicidal intent. In a historical study of cases presenting to a poisoning treatment centre in Edinburgh, Rosen (30), reported that 21% of cases were HRSH, representing episodes of medically serious self-harm (16%) and self-harm with high suicidal intent (5%).

1.8.2. Profile of persons presenting with HRSH

In contrast to hospital presented self-harm as a whole, previous studies have identified that a greater proportion of males engage in HRSH (29, 119) and that older age is associated with HRSH (30, 119, 120). HRSH cases are also more likely to be unmarried (29). IDO generally remains the most common method of self-harm in line with the overall hospital presented self-harm population (27, 29, 118, 120). However, when compared with lower severity self-harm cases, one study found that the proportion of cases involving IDO was significantly lower in HRSH acts and the proportion involving hanging and CO2 poisoning were significantly higher (120). One study reported on the drugs taken in HRSH acts; Rosen (30) found that IDOs involving HRSH were more likely to have used barbiturates or salicylates.

1.8.2.1. Psychopathology

A number of studies have examined cases of HRSH in comparison to samples of community controls, indicating that HRSH cases are characterised by high rates of previous and current psychiatric disorders (2, 21, 27, 121-123). Rates of recent diagnosis of a mental disorder as high as 90% have been reported among a sample of HRSH patients presenting to a general hospital (124) and as high as 100% in a population of prisoners who had engaged in a HRSH (2, 3). Rates of comorbid disorders are high among HRSH patients (2, 3, 122, 125) and the most common types of disorders reported are mood disorders with rates ranging from 70%-90% (122, 126, 127). Other disorders identified among HRSH cases include anxiety disorders, substance use disorders, psychosis, antisocial personality disorder (2, 3, 124, 128, 129). Fewer studies have examined psychiatric diagnoses in HRSH patients compared with other self-harm patients. Two studies from over 20 years ago found that HRSH patients have significantly higher rates of psychiatric disorder compared with lower severity cases, particularly depression, psychotic disorders and borderline personality disorder (130, 131). In contrast, a recent study of 248 HRSH cases in comparison with 734 lower severity cases found no difference in prevalence of depressive disorder, alcohol and substance use, bipolar depressive disorder and anxiety disorders (120). However, a significant difference in the rate of psychotic disorders between the groups was reported in this study and HRSH patients scored significantly higher on measures of depressive symptoms (120). One other study reported that HRSH was associated with a diagnosis of PTSD (132).

1.8.2.2. Psychiatric treatment and self-harm history

Those who have engaged in a HRSH act are more likely to have a history of psychiatric treatment, including previous inpatient and outpatient treatment, compared with control groups (2, 3, 27, 125) and with lower severity self-harm (29, 30). Two studies based on prison populations reported that HRSH cases were more likely to be on medication for psychiatric concerns, most commonly antidepressants (2, 3). HRSH patients frequently have a history of previous episodes of self-harm (2,

3, 27, 125) but findings on whether self-harm history is more or less prevalent among HRSH patients compared to less severe self-harm are inconsistent. Douglas et al (29) found that previous self-harm predicted HRSH cases while Kim et al (120) reported fewer previous self-harm episodes among those presenting with HRSH.

1.8.2.3. Psychological risk factors

Several studies examining the psychological states of HRSH cases have reported high levels of mental pain, particularly hopelessness, but also depressive symptoms, neuroticism and low self-esteem in comparison with community control groups (21) as well as lower severity self-harm patients (120, 132, 133). However, other studies do not support these findings, observing similar levels of depressive symptoms, mental pain, anxiety and hopelessness between HRSH and lower risk self-harm (21, 134-136). A number of studies have examined the relationship between interpersonal and communication difficulties and HRSH, reporting that difficulties in self-disclosure, loneliness and social problems were strong independent predictors of the medical severity of a self-harm act and mediated the relationship between mental pain and episode severity (29, 121, 135, 137-139). Research comparing HRSH with community controls has also found that deficits in social interaction and limited help-seeking were associated with HRSH (121, 140). These findings suggest that severity of an act of self-harm may be partly dependent on the individual's ability to communicate their distress or mental pain they are experiencing to others (21).

Other studies indicate that HRSH cases have specific deficits in decision making ability, distinct from suicidal behaviour in general (21). The relationship between aggression and impulsivity and the severity of a self-harm act has been studied also. While both factors are predictors of self-harm in general, overall the evidence does not indicate that they are predictors of HRSH specifically (138, 141). However, a recent study reported that factors related to impulsivity and aggressiveness were associated with the medical severity of repeated self-harm acts (133). This was the case for all self-harm patients in the study, but particularly among those whose index acts were HRSH.

1.8.2.4. Negative life events

HRSH cases have been found to have higher numbers of stressful or traumatic life events compared with community controls (3, 121) and lower severity self-harm (132). Higher rates of emotional, sexual and physical abuse in childhood have also been reported among those presenting with high risk rather than lower risk self-harm (130, 132).

1.8.2.5. Socioeconomic risk factors

Evidence on socioecominic risk factors for HRSH is limited. A study by Douglas and colleagues (29) reported that HRSH patients were more likely to be unemployed compare to lower severity self-harm patients. In contrast, a historic study found that those presenting with HRSH had a more stable job history compared to those who presented with less serious episodes of self-harm (131). A case-control study reported that current financial concerns were a significantly more common problem among HRSH patients in comparison to both community controls and suicide cases (126). The same study found no difference between all three groups in the proportion of individuals with no formal education.

1.8.3. Comparison between HRSH and suicide cases

Prior studies have indicated that those who present with HRSH may share a similar profile of risk factors to persons who die by suicide (27, 29, 142). Beautrais (27) conducted a psychological autopsy study including information on 202 suicide cases and 275 HRSH cases and 984 controls. This study found a number of risk factors that were common to suicide and serious suicide attempters compared to controls including: the presence of a current mental disorder, history of self-harm, previous engagement with mental health services, lack of education and low income and exposure to stressful life events. However, there were some differences: those who died by suicide were more likely to have been male and have been diagnosed with non-affective psychosis, while those who made serious suicide attempts were more likely to be female, socially isolated and be diagnosed with an anxiety disorder. The authors concluded that those who die by suicide and make serious suicide attempts are

overlapping populations with more similarities than differences and that the risk factors and lived experiences that lead to their suicidal act are similar for the two groups. Douglas et al. (29) reported that the age and gender profile of HRSH cases was midway between the profile of suicide cases and lower severity self-harm cases.

A more recent psychological autopsy study was conducted in a sample of young adults in rural China (142). The results were broadly similar to those reported by Beautrais et al. (27) with risk factors common to suicide and HRSH cases: less educated, lower economic status, physical disease diagnosis, family history of suicide, negative life events, hopelessness, social support, anxiety, coping and presence of a mental disorder. However, the associations between all these factors were stronger for suicide than HRSH. Also, a number of additional risk factors were associated with suicide but not HRSH including: male sex, living alone, occupation status, religious beliefs, availability of lethal method, and impulsivity. The strongest predictor of both suicide and HRSH compared to population controls was mental disorder. The authors conclude that HRSH and suicide access are of the same population with similar demographic characteristics but with a different magnitude of risk factors (142).

1.8.4. Prospective studies of HRSH

There is a paucity of prospective studies examining fatal and non-fatal repetition following HRSH. A notable body of work was conducted by Beautrais and colleagues in New Zealand which followed up a sample of 302 HRSH cases for two decades examining self-harm repetition and suicide (4-6, 10). Mortality was examined 5, 10 and 20 years following an index HRSH act. Within 5 years, 5.3% of the HRSH patients had died by suicide (5). The majority (75%) of those who died by suicide changed their method from the index act to their suicide act, mostly changing from IDO to a method of higher lethality. While suicide deaths occurred throughout the 5-year period, the majority (62.5%) occurred within 18 months. Rates of suicide over the period were 48 times higher than expected compared with a general population sample comparable on age and gender. In contrast to the gender breakdown usually observed in samples of suicide decedents, the rate of suicide was similar for men and women

in this study (5). Ten years following their index HRSH act, 14.2% had died and one in four HRSH patients had died 20 years after their HRSH act (6). In line with these findings, a historical prospective study of HRSH cases in comparison with non-serious hospital presented self-harm found that those presenting with HRSH were twice as likely to die by suicide in the five years following their index act (30, 131).

Beautrais (4) also examined self-reported non-fatal repetition 5 years following the HRSH act, reporting that 37% made at least one non-fatal repeated attempt. A substantial proportion of the repetition happened by 6 months (18.6% had repeated) with the majority of individuals repeating within 5 years doing so by 18 months (27.9%). No comparison group of lower risk self-harm cases was included in the study. At a univariable level, numerous factors were associated with an increased risk of subsequent repetition including: female sex, parental separation, childhood sexual or emotional abuse, problems at school during childhood, poor family economic circumstances, family history of suicidal behaviour, diagnosis of an eating disorder or antisocial disorder, history of self-harm, history of inpatient psychiatric admission, hopelessness, neuroticism, impulsivity, and low self-esteem. In multivariable analysis, factors identified by Beautrais (4) as predictors for non-fatal repetition within 5 years of a HRSH act were: hopelessness, previous self-harm and at least one psychiatric admission in the year prior to the index act. A more recent study by Trakhtenbrot et al (133) followed up a group of individuals who had previously been admitted to a psychiatric unit, including individuals who had presented with HRSH (53), those who had presented with lower severity self-harm (64) and those who were admitted for other reasons (35). During the 1-9-year follow-up period, 45.3% of the HRSH cases had repeated, with 17% repeating with a further HRSH act. There was no difference in repetition risk between HRSH and lower severity self-harm patients. However, individuals whose index act involved HRSH were significantly more likely for their repeated acts to be HRSH also (133).

1.8.5. Assessment and treatment following HRSH

There is a distinct lack of research on assessment and aftercare following HRSH presentations to hospital. One previous study provided descriptive findings of allocation of care following HRSH (29). In this study of 158 HRSH patients, 50% were admitted to a medical acute ward, 8% admitted to a psychiatric unit or ward, 15% were referred to outpatient mental health services, 13% discharged to GP and in 14% of cases no aftercare plan was recorded. Beautrais et al (1) described high rates of psychiatric admission in the 30 months following an index HRSH act but the authors did not specify the proportion of individuals admitted immediately following their index act. Also, a number of studies primarily recruited their samples from those who were admitted as psychiatric (133) or medical inpatients (30), making it difficult to gain an understanding of patterns of treatment allocation following HRSH presentations to hospitals.

1.8.6. Qualitative studies of HRSH

There is a dearth of qualitative studies with HRSH patients. In the Douglas et al (29) study, qualitative data was collected on a subset of 35 HRSH patients as part of a larger epidemiological study. The qualitative exploration focused on individuals' help-seeking and engagement with health services prior to their HRSH presentation. The majority of those who participated in the qualitative study had not disclosed suicidal thoughts or intent to engage with services prior to their episode. The reasons for non-disclosure included: believing that they would not get the help they needed, that they were too unwell to communicate their feelings and a reluctance to reach out due to previous experiences of hostile attitudes from healthcare professionals after seeking help. In a recent review of research on HRSH in the prison population, Marzano et al (123) summarised four qualitative studies that explored prisoners' personal accounts of their HRSH episode. Common factors described by prisoners as contributing to their act included past trauma, mental health issues, feelings of loss and rejection, bullying and prison-related difficulties. The co-occurrence of multiple factors frequently contributed to the decision to take their lives. Reflecting on factors that may have prevented their self-harm act, being able to talk to someone emerged most frequently as a suggestion for prevention.

1.9. Scope of the research in this thesis

The review of the research on persons presenting to hospital with HRSH revealed that they are a population with enduring issues and a high risk of subsequent suicide (1-3, 5, 6). Despite this there are major gaps in the research relating to the most serious episodes of self-harm presenting to the ED. Firstly, while previous studies have suggested that the most serious cases of self-harm share similar characteristics with individuals who have died by suicide (20, 27, 143, 144), few studies have examined HRSH patients in comparison with lower risk self-harm. Consequently, study two in this thesis will address this gap by describing the prevalence of HRSH and examining the profile of individuals presenting to hospital with HRSH in comparison with other self-harm patients.

The relationship between the severity of a self-harm act and non-fatal repetition has not been adequately examined in previous research, with no prior studies examining repetition risk following a HRSH presentation in comparison with other self-harm presentations. The characteristics of the methods involved in a self-harm act can be examined as indicators of medical severity and suicidal intent. Previous studies have indicated that repetition risk is highest among those presenting with low severity self-harm, particularly repeated episodes of minor self-cutting (10, 61). However, increased risk of repetition following highly lethal self-harm has also been reported (119). The utility of previous evidence on the relationship between self-harm method and repetition is limited by the large heterogeneous method categories studied, most commonly IDO and self-poisoning combined and self-cutting (52-54). A more detailed examination of self-harm methods was carried out in study one of this thesis in order to enhance our understanding of their relationship with non-fatal repetition. The relationship between severity of self-harm and repetition was further explored in study two by comparing the rate of repetition between those presenting with HRSH and other lower severity presentations.

The review of risk factors for self-harm repetition revealed a number of factors consistently associated with increased repetition risk following self-harm in general. However, just one study

comprehensively examined factors associated with repetition following HRSH (4). Accordingly, the relationship between socio-demographic and clinical factors and risk of repeated self-harm following HRSH will also be examined in study three.

A final lacuna in the research on HRSH patients relates to their assessment and treatment following their presentation to the ED. Presenting to an emergency department (ED) following a HRSH self-harm act provides a vital opportunity for suicide prevention among those presenting with HRSH. As mentioned, considerable variation in assessment rates have been reported previously, as low as 22% (54, 81). It has been hypothesised that persons are selected for assessment based on their clinical severity or perceived risk (82, 83) but this has yet to be directly examined. Therefore, it is unknown what proportion of HRSH patients are among those not being assessed. This is addressed in the current research in study two which examined whether HRSH patients were at increased or decreased risk of not receiving a biopsychosocial assessment.

In order to continually improve the care provided to individuals presenting with HRSH, an understanding of current approaches to the allocation of aftercare and their impact on patient outcomes is also needed (84, 86, 87). As discussed previously, psychiatric admission is an intensive form of treatment that is likely to be allocated to those at higher risk of adverse outcomes, such as those presenting with HRSH (51). While no previous studies have examined outcomes following psychiatric admission among HRSH patients specifically, studies have indicated that psychiatric admission increases risk of repeated self-harm and suicide (85, 86, 100, 101). However, the relationship between clinical severity and treatment allocation introduces bias to observational studies evaluating the effect of psychiatric admission (84, 85). Focusing in on a subgroup of self-harm patients that are more homogenous in terms of clinical severity, with higher rates of psychiatric admission, has the potential to add further clarity to the complex relationship between admission and repetition. In light of this, in Study 3 of this thesis, the relationship between psychiatric admission and

self-harm repetition using propensity score methods to adjust for observed differences between treatment groups was investigated.

An exploration of healthcare service provision from the patients' perspective is also essential in order to facilitate the design and implementation of enhanced self-harm management (94-97). As outlined previously, substantial variation in patient experiences of aftercare following self-harm in general has been reported in prior studies (107). Existing research has not documented the experiences of engaging with healthcare services following a self-harm presentation among those presenting with HRSH. Investigating factors underlying dissatisfaction with care is also necessary as it can negatively impact treatment adherence, service engagement and future help-seeking intentions (94-97). Thus, Study 4 of this body of research used a mixed methods approach to explore patients' experiences of care following a HRSH presentation and to examine the demographic, psychiatric and psychosocial factors associated with variations in perceptions of care received.

1.10. Theoretical framework

Self-harm and suicide are complex behaviours. Explanatory models have been developed to support a comprehensive understanding of the impact of risk and protective factors on the occurrence of suicidal behaviours (145). Such models aim to support a greater understanding of individuals who engage in suicidal behaviour in order to facilitate assessment of their needs and future risk (145). The research in this thesis is underpinned by and will be interpreted using the Stress Diathesis Model of Suicidal Behaviour (145-147) (Figure 1). Interpretation of the findings will also be aided by considering the integrated motivational-volitional (IMV) model of suicidal behaviour (148).

1.10.1. Stress-Diathesis Model

Risk factors for suicidal behaviour are numerous and include proximal and distal factors (146). Distal risk factors include genetic and neurobiological factors, childhood adversity and trait characteristics such as hopelessness, aggression and impulsivity (146). Proximal risk factors commonly include acute episodes of psychiatric disorder, psychosocial crises, experience of traumatic events, physical

disorder, availability of means and exposure to suicidal models (145, 146). Not all those who are exposed to a distal risk factor such as a negative experience in childhood, will engage in suicidal behaviour later in life. Similarly, not all individuals who experience an acute stressor will try to take their life. Therefore, a model that comprehensively describes potential pathways to suicidal behaviour must account for interactions between proximal and distal risk factors (145). As described in a review by van Heeringen (2012), evidence from studies across the fields of neurobiology, neuropsychology, cognitive psychology and clinical psychiatry supports a stress-diathesis model of suicidal behaviour (145). Stress diathesis models propose that a stressor or a predisposition does not result in suicidal behaviour but predisposes individuals to develop suicidal behaviour when encountered with stress (145, 147). A person's diathesis is influenced by distal risk factors and can be defined as set of predispositional factors that reflect a vulnerability to the development of a disordered state (145). Stressors, which reflect proximal risk factors, can occur independently but more frequently co-occur, with cumulative stressors increasing the overall stress experienced by an individual (145). The prevalence of both distal risk factors and acute stressors among HRSH patients and the relationship between these factors and self-harm repetition will be examined within the framework of the stress diathesis model.

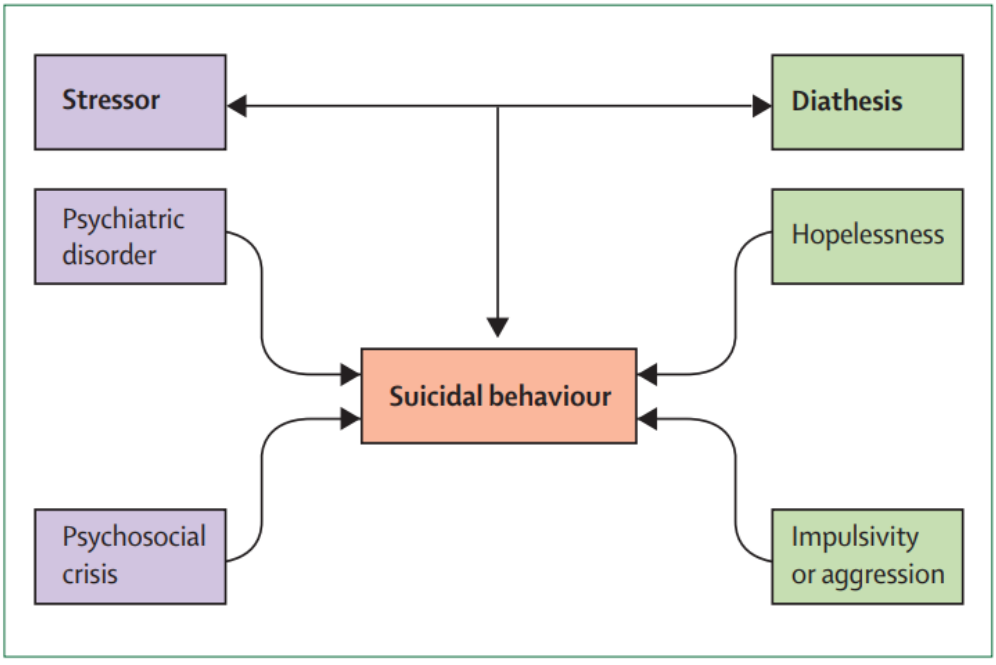


Figure 1. Stress-diathesis model of suicidal behaviour (Hawton and van Heeringen, 2009; Mann, 2003).

van Heeringen (145) postulates that the relationship between stress and diathesis is dynamic, with the level of diathesis on a continuum, rather than a dichotomy. The point at which suicidal behaviour occurs is dependent on the degree to which predispositional risk factors occur and the degree of stress that is experienced (145). It has been further hypothesised that a person's diathesis becomes more pronounced over the course of the suicidal process and each time an act of self-harm occurs, it becomes more easily accessible in a person's memory and less stimuli are required to activate it in the future (145). This has been conceptualised as a "kindling" effect, whereby stressors play a significant role in the initial self-harm act, but each additional episode of self-harm directly increases the risk of recurrence, with suicidal behaviours becoming more automatic and less related to environmental stressors. Moreover, repeated exposure to stressors may result in reduced resilience towards stress and consequently stressors of lower severity may result in suicidal behaviours of increasing severity (145). This "kindling" effect, also conceptualised in relation to depressive episodes (149), is also proposed within other models of suicidal behaviour such as the "suicidal process" model (150, 151) and is supported by empirical evidence of a dose response relationship between previous acts of self-harm and risk of further repetition (38, 48, 150). This is of particular relevance to the research in the current thesis which has a strong focus on self-harm repetition. Thus, framework of this model, particularly the kindling effect, will be useful for informing our examination of repeated self-harm across this body of work.

1.10.2. Integrated Motivational-Volitional (IMV) model of suicidal behaviour

The IMV model proposes that the development of suicidal behaviour occurs across three distinct stages: the pre-motivational phase which is comprised of background factors that create the context in which suicidal behaviour can occur; the motivational phase which involves factors that contribute to the development of suicidal thoughts; and the volitional phase including factors or moderators that facilitate the transition from ideation to behaviour (148). In line with the stress-diathesis model, the

IMV model highlights the cyclical nature of suicidal behaviour. The IMV model proposes the formation of suicidal ideation and intention in a repeated act of self-harm is unlikely to manifest in the same manner as the first self-harm act, noting that intention to self-harm is enacted with increasing speed with repeated acts. With the focus on repeated self-harm in the current research, it is anticipated that the volitional moderators, outlined in detail in Figure 2, will be of particular relevance for this thesis, particularly access to means and past suicidal behaviour.

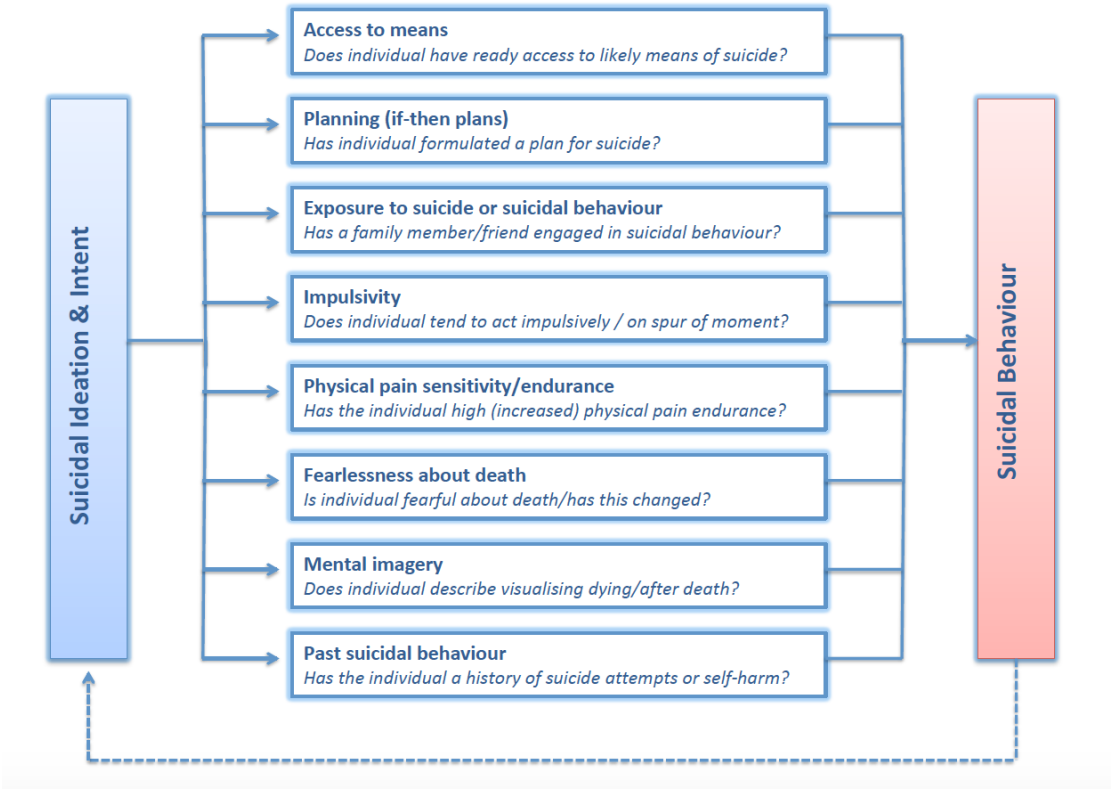


Figure 2. Integrated motivational-volitional model of suicidal behaviour (O'Connor and Kirtley, 2018).

1.11. This research in the context of national and international policy

The NCP-SH highlights the pivotal role that auditing and monitoring play in the successful implementation of the programme (49) (pages 54-55). This thesis will inform this evaluation by providing information on the patterns of biopsychosocial assessments and on service users' experiences of the care received in the ED and post discharge. This research also aligns with specific

goals of *Ireland's National Strategy to Reduce Suicide 2015-2020* (152). Specifically, findings from the thesis will inform Goal 1.1: to improve population-wide understanding of suicidal behaviour, mental health and wellbeing, and associated risk and protective factors and goal 5: to ensure safe and high-quality services for people vulnerable to suicide.

At a broader level, it is anticipated that this thesis will provide evidence reinforcing the vision of the *Sláintecare* programme to achieve a system within which all individuals have access to primary, acute and social care services based on need and not their ability to pay (153). The research also has the potential to inform the implementation of *Sharing the Vision: A Mental Health Policy for Everyone* which is closely aligned with the core elements of *Sláintecare,* particularly in the 'Service Access, Coordination and Continuity of Care Domain' (154).

This research is also in line with international policy, specifically: *Preventing Suicide: A Global Imperative*, a WHO report which highlights the importance of regular monitoring and evaluation of existing mental health services in order to improve ongoing care and the importance of continued training and education for healthcare workers (12) (page 68); and Target 3.4 of the *United Nations Sustainable Development Goals* which aims to reduce premature mortality from non-communicable diseases and to promote mental health and wellbeing (155).

1.12. Thesis aims and objectives

Aim

The aim of this research is to describe demographic, clinical and psychosocial factors associated with HRSH, to investigate the allocation and efficacy of aftercare for HRSH patients and to examine predictors of self-harm repetition.

Specific of objectives of the thesis are:

1. To examine the risk of self-harm repetition according to the characteristics of self-harm method(s) involved in an index self-harm presentation.

2. To estimate the prevalence of HRSH and identify associated factors, and to assess whether persons who engaged in HRSH acts were at increased or decreased risk of not receiving a biopsychosocial assessment and of subsequently presenting with further self-harm.
3. To examine factors associated with psychiatric admission and explore the relationship between psychiatric admission and self-harm repetition using propensity score methods.
4. To investigate factors associated repeated self-harm following HRSH.
5. To document patients' experiences of care following a HRSH presentation to hospital and examine the demographic, psychiatric and psychosocial factors associated with variations in perceptions of care received.

Chapter 2. Methods

2.1. Overview of research methods

This chapter will provide an overview of the methods used in this thesis. The overall aim of this thesis was to investigate aftercare and self-harm repetition following HRSH. To address this aim, a convergent mixed methods study design was used, with a predominantly quantitative focus. In line with the parallel-databases variant of the convergent mixed methods design (156), four parallel studies were conducted independently and brought together for interpretation in Chapter 7.

The main methodological approaches were:

- Cox proportional hazard models fitted to estimate time to self-harm repetition according to characteristics of self-harm methods *(Thesis objective 1, Study 1)*
- Poisson regression models estimated to examine risk of not receiving a biopsychosocial assessment and risk of hospital presented self-harm repetition in HRSH patients compared to other self-harm cases *(Thesis objective 2, Study 2)*
- Backwards stepwise logistic regression models used to examine factors associated with psychiatric admission and self-harm repetition *(Thesis objective 3, Study 3)*
- Propensity score methods applied to estimate the impact of psychiatric admission on self-harm repetition *(Thesis objective 4, Study 3)*
- Sequential qualitatively led mixed-methods approach used to examine HRSH patients' experiences of engagement with healthcare services following their index self-harm presentation *(Thesis objective 5, Study 4)*

Primary data collection was conducted for this thesis, including collection of quantitative data from hospital records and both qualitative and quantitative data via semi-structured interviews. An existing dataset from the NSHRI was also used. An overview of the data used in the four studies in the thesis is presented in Figure 3 and a detailed description of the data collection and data linkage procedures are provided in the remaining sections of this chapter.

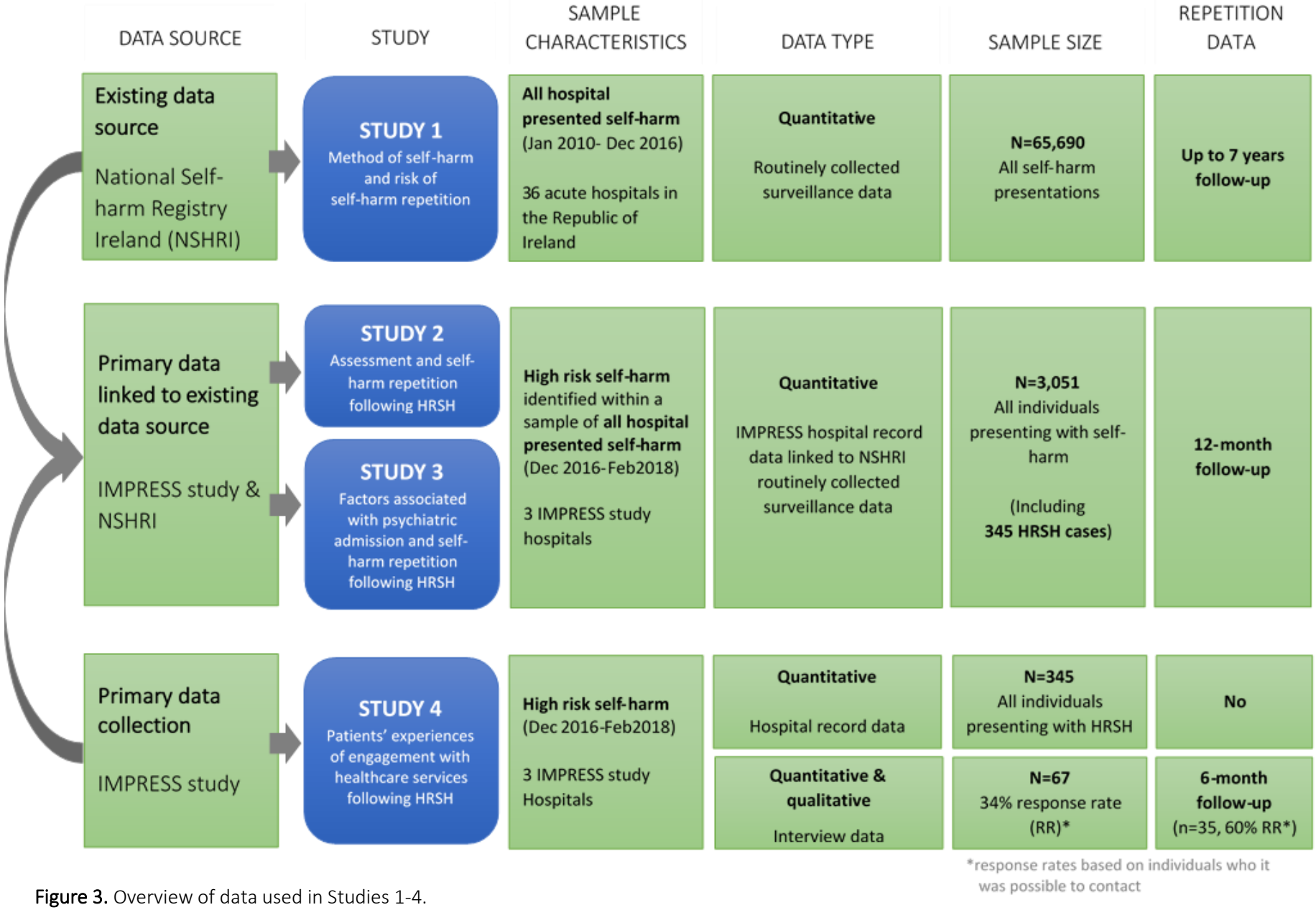


Figure 3. Overview of data used in Studies 1-4.

2.2. Data collection

Primary data collection was conducted by the PhD candidate (GC). GC collected data on a consecutive series of patients presenting with HRSH to three urban EDs in the Republic of Ireland from December 2015 to March 2018. This data collection was part of a study called the Improving the Prediction of Self-harm and Suicide (IMPRESS) study and is used in studies 2-4 of this thesis. Participating hospitals were Cork University Hospital and Mercy University Hospital in Cork, and University Hospital Limerick, Limerick. The IMPRESS study involved data collection on HRSH patients from ED records and psychiatric files and the recruitment of patients to participate in a prospective interview study. Data collected includes quantitative data on all cases collected from hospital files (n=345), and both quantitative and qualitative data collected from baseline (n=68) and follow-up interviews (n=35). Data collected from hospital files was used in Studies 2 and 3 and interview data was used in Study 4.

The IMPRESS study built on a previous HRB funded study called SSIS-ACE which was conducted from January 2014 until August 2016. SSIS-ACE was a retrospective case-control study that included the recruitment of consecutive cases of HRSH, as well as cases of suicide and controls (157). The IMPRESS study used the infrastructure which had been established as part of SSIS-ACE to approach consecutive HRSH patients. There was also an overlap in data collection period between the two studies between December 2016 and August 2017. A fourth hospital was also recruited to facilitate data collection during the study period. One full and one partial baseline interview were conducted by GC with participants recruited from this hospital. However, data collection was discontinued in this hospital due to issues in the application of the case identification procedures in a standardised manner and as a result data from this hospital is not included in the research in this thesis.

2.2.1. Data collection procedures

2.2.1.1. HRSH case definition and identification

The classification of HRSH used in this research is based on criteria used in previous studies of HRSH (2, 3, 20, 27, 29). HRSH was operationalised as a self-harm act that met at least one of the following criteria:

(i) Extensive medical treatment (including treatment in specialized units including intensive care unit, surgery under general anaesthesia, antidotes for drug overdoses, telemetry or repeated tests).

(ii) Self-harm involving method(s) with high risk of fatality if witnessed or any other physical evidence of use of high lethality method (see Table 1 for more detail).

(iii) Clinical impression of high suicidal intent.

Table 1. Assessment of method lethality

Method	**Considered highly lethal**
Attempted hanging, Ligature use, Self-strangulation	Unconscious after attempting to hang or use a ligature, or not unconscious but: (a) Witnessed in suspension or using a ligature and physical evidence of asphyxiation; or (b) Physical evidence of suspension or using a ligature
Self-asphyxiation, Suffocation	Witnessed self-asphyxiation, or any other physical evidence of self-asphyxiation
Cutting Stabbing Wound aggravation Or insertion	Sustained a puncture wound penetrating body cavity or major organ, or lacerations that damaged or severed tendons, arteries or large veins, or came very close to doing so. Treatment in specialised unit i.e. intensive care. Surgery under general anaesthesia
Ingesting, inhaling, injecting substances	(a) Objective evidence of altered level of consciousness, or unconscious at presentation or prior to medical facility (b) Admission to intensive care unit, hyperbaric unit. (c) Extensive medical treatment including antidotes for drug overdoses, telemetry, or repeated tests or investigations
Jumping	Witnessed jumping or any physical evidence of having jumped from a considerable height, likely to have led to serious injury
Other	Determined on a case-by-case basis

*Note: criteria based on Marzano et al., 2010, Rivilin et al., 2010, Beautrais et al., 2004, and Douglas et al., 2004.

Identification of HRSH acts based on the eligibility criteria was conducted by the psychiatric teams in the EDs. GC and another member of the study team (Dorothy Leahy, DL) collaborated with the hospital staff in the classification of HRSH cases and reviewed hospital records of all self-harm cases to assess the application of the eligibility criteria at regular intervals. GC and DL made daily phone calls to the relevant staff members in the study hospitals to receive information on new cases. Basic information on each case of HRSH was recorded on a paper form and subsequently entered into an excel database by GC.

2.2.1.2. Collection of hospital data

Collection of quantitative data on all identified cases from patient files in the liaison psychiatry departments of the study hospitals was conducted by GC and DL. Information was gathered from electronic hospital files and entered into an SPSS database with the assistance of a data codebook (Appendix 1). Crosschecks of the accuracy of the data collection procedure were conducted by GC and DL. Information was recorded on the same cases and then the corresponding records were reviewed. Instruction in the codebook were made clearer when necessary.

2.2.1.3. Recruitment of participants to interview study

GC was the primary researcher conducting the IMPRESS interview study with HRSH patients. DL, and a member of the SSIS-ACE study team, assisted and conducted a smaller proportion of interviews (n=25, 24.5%). The procedure for recruitment of patients to the interview study is outlined in Figure 4. When recommended by the treating clinicians, the IMPRESS study was introduced to HRSH patients prior to hospital discharge. Following agreement from the patient, the researcher gave a brief description of the research, provided an invitation letter, study information leaflet and leaflet of support services. If at this time there was a room available at the hospital and the patient was perceived as well enough to take part, the researcher invited the patient to take part in an interview then. If the situation did not allow

for this, the researcher asked the patients if it would be possible to take their contact details and telephone them in 7-10 days. The letter informed the patient to contact the researcher by telephone, email, or post should they choose not to participate. The treating nurse or clinician made the determination as to whether the patient was well enough based on their clinical judgement. Scenarios whereby the patient was considered not well enough included cases when the injuries from resulting from the self-harm act were severe and included brain damage or cognitive impairment, and cases where the patient was experiencing an ongoing psychotic episode.

If it was not possible to introduce the study to the patient in the hospital, the researcher obtained the patients contact details from the relevant hospital staff. The researcher phoned the patient, explained the study, outlined the collaborative nature between UCC and the relevant hospital, and asked if the patient was willing to receive information in the post explaining more about the project. If the patient agreed, the researcher sent out the study documents. The researcher contacted patients between 7-10 days after they received the information about the study. The reason for this period of 7-10 days before the phone call was to leave time for the delivery of the letter and for the individual to have the time to read through it to reduce the likelihood that they would feel pressurised into participation. During the telephone conversation, the researcher explained the purpose of the project and the procedure involved and invited the patient to take part in an interview. If the patient agreed to participate, the researcher considered the patient's preferred time and venue. Common interview locations included: university office or meeting room, hospital office or meeting room, the participants home and other neutral venues such as a meeting room in community or sports centres. The interviews lasted approximately 2.5 hours, with the flexibility to complete the interview over multiple sessions. During the interview, the researcher checked in with the participant to assess if they were comfortable to continue. On occasion, the interviewer suggested bringing a session to close prior to the completion of the interview schedule as they felt the participant was becoming fatigued. In such cases the researcher

would invite the participant to set up a subsequent session to complete the interview schedule, if they still wanted to participant.

Interviews were audio-recorded with consent from the participant. Of the 345 HRSH patients identified, it was not possible to approach 41 participants because the treating clinician deemed it inappropriate and it was not possible to make initial contact with 102 participants due to disconnected or unanswered phone-line after multiple attempts. Contact was made with the remaining 202 individuals, of whom 68 (33.7%) participated in a baseline interview. Of those who were contacted but did not take part, 74 (55.2%) said they did not want to take part at initial contact and 60 (44.8%) engaged initially but stopped responding or decided not to take part during a later phone-call. Those who completed a baseline interview were asked for their consent to be contacted for a 6-month follow-up interview. All participants that took part in the full baseline interview consented to be contacted for the follow-up interview.

Approximately 5.5 months after the index self-harm presentation, the researcher sent a letter reminding the participants of the opportunity to take part in the follow-up interview. The letter informed participants that the researcher would be in contact by telephone in 7-10 days and to contact the researcher by telephone, email, or post should they wish to withdraw from the study. If the participant indicated that he/she would like to take part in a follow-up interview but was not in the position to attend for an interview in person, the researcher invited the participant to take part in an interview conducted by telephone. The follow up interviews were conducted 6-9 months after the index act and lasted an average of 50 minutes (ranging from 15-94 minutes). Thirty-five follow-up interviews were conducted. Of the 68 baseline interviews conducted, it was not possible to recruit 10 participants for a follow-up interview for the following reasons: they did not fully complete the baseline interview and contact was lost (n=3), the baseline interview was completed 5.5 months after the index act (n=1), they were too unwell to be contacted according to family members (n=2), or their phone number disconnected (n=4). Removing these individuals from the sample results in a response rate of 60.3%.

At the completion of the interviews, the researcher asked the participants if they would like to discuss anything further before departing. In some cases, the participants expressed an interest in obtaining further information on available services and treatments. GC and EA discussed these requests, which sometimes resulted in EA facilitating an appointment with the participant. Following both baseline and follow-up interviews, with agreement of the patient, a phone-call was made approximately 10 days after the interview to ensure that any needs or potential effects from the interview were identified, monitored and counselled. This period of 10 days was allocated to allow the participant time to reflect on their experiences of the interview and to consider whether they required support in accessing services.

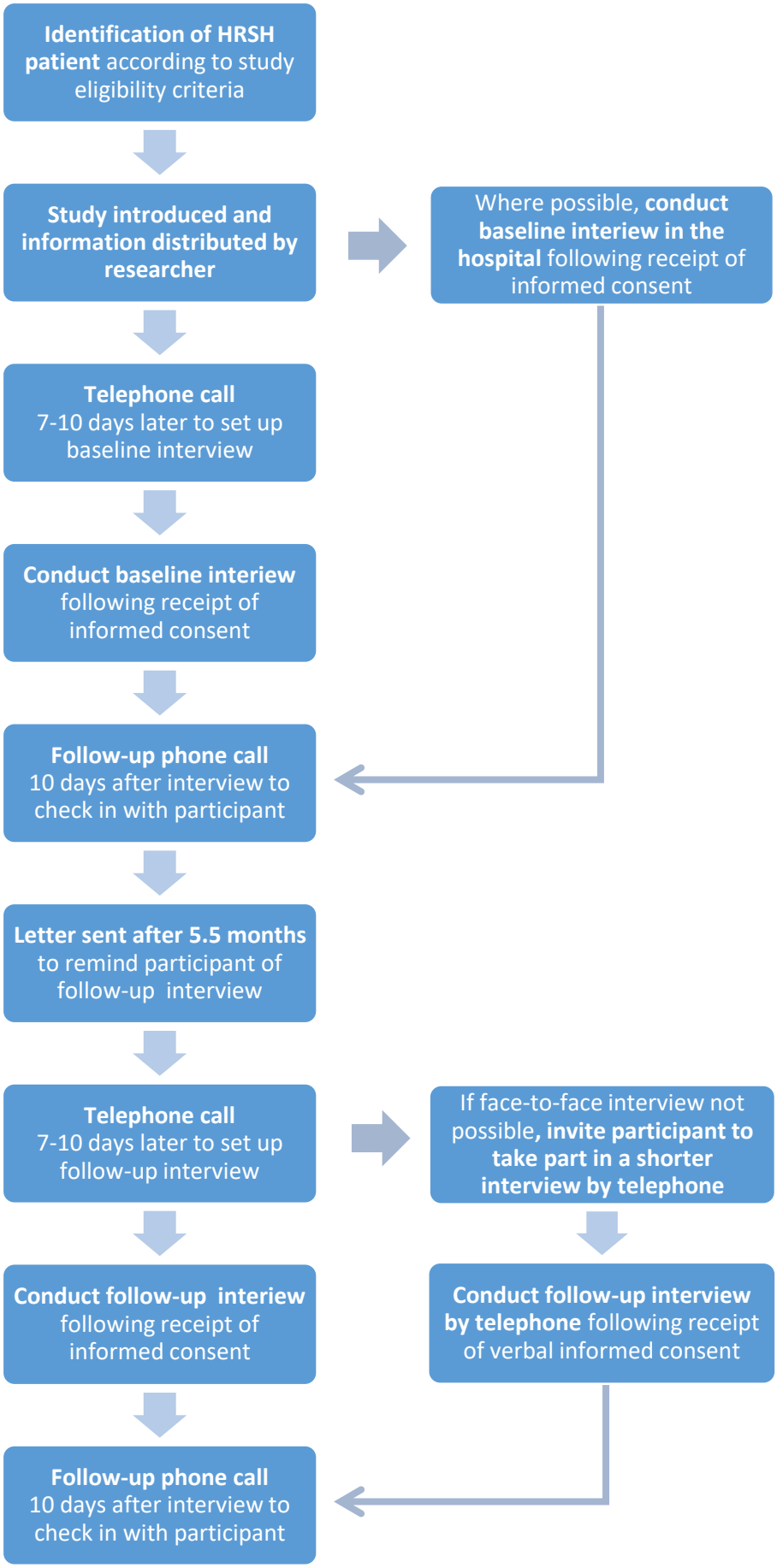


Figure 4. Procedure for recruitment of participants

2.2.1.4. Training and supervision

Training and regular supervision was provided to all team members of the IMPRESS and SSIS-ACE studies in recruitment and interviewing to ensure a standardised approach. This training involved 5 sessions led by the principal investigator (PI) on the IMPRESS study, Professor Ella Arensman (EA), with contributions from a practicing Cognitive Behavioural Therapist with a doctorate in the area of self-harm and suicide and a Senior Postdoctoral Researcher with extensive experience interviewing self-harm patients and individuals bereaved by suicide. These training sessions involved information sessions with background on topics such as risk and protective factors associated with suicide and self-harm, attitudes towards mental illness and suicidal behaviour, and the profile of HRSH patients. The training also involved interactive workshops on communicating via telephone, transcribing sensitive interviews and guidance for conducting interviews with vulnerable individuals. The interactive session including discussion points, case studies and role-plays.

The PhD candidate, GC, had regular supervision sessions with EA to debrief following phone calls and interviews. In preparation for recruitment, supervision sessions were conducted following GC listening to audio-recordings of previously conducted interviews with HRSH patients. Once recruitment started, brief sessions between GC and EA were arranged to debrief following phone calls with participants and a full supervision session was organised following each interview. During these sessions, portions of the audio-recordings of the interview were played to facilitate discussion around challenges faced by GC and to ensure her approach and style of interviewing was appropriate. As GC became more experienced, supervision sessions were held once weekly on weeks when at least one interview was scheduled. Following each interview, GC noted down personal reflections on her experience of the interview for discussion during supervision sessions.

A system of peer support was also established between GC and the Postdoctoral Researcher, DL, who was also conducting interviews. GC and DL developed a safety protocol for checking

in with one another via text prior to and following interviews that occurred off-site and frequently had brief sessions following interviews to debrief and provide support. Description of data collected

The selection of variables to collect from hospital records and via baseline and follow-up interviews were informed by the Stress-Diathesis Model of suicidal behaviour. Table 2 provides an overview of both distal and proximal risk and protective factors for suicidal behaviour examined within this doctoral work.

2.2.1.5. Data collected from hospital records

Data collected from hospital records was used in Studies 2 and 3. Variables in the hospital records dataset that are used in this thesis are described in Table 2. Suicide intent of the index self-harm presentation was measured using the objective section of the Beck Suicide Intent Scale (SIS) (158). The SIS was completed by members of either the study team or the hospital psychiatric teams. In two of the hospitals, members of the study team asked the psychiatry teams for the answers to the SIS items and filled it in accordingly. In the third hospital, members of the psychiatric team filled out the SIS directly. Proximal factors recorded from the hospital records included: alcohol misuse, drug misuse, conflict with current or previous romantic partner, conflict with person(s) other than romantic partner, financial concerns, legal troubles, marriage breakdown and bereavement of a loved one. Life events included history of being in foster care / an orphanage / adopted and history of emotional, physical or sexual abuse, where recorded. Psychiatric history data items included previous psychiatric admission and previous psychiatric diagnosis. Previous admission refers to a history of being admitted as a psychiatric inpatient at any time prior to the index HRSH presentation. Previous diagnoses were recorded based on documentation of a psychiatric disorder in a patient's file rather than based on details of formal diagnoses. Appendix 1 includes a full list of all data items collected.

Table 2. Quantitative data collected for IMPRESS study

	Categories / variables	Hospital records	Baseline interview	Follow-up interview
Socio-demographic information	Date of birth	✓	✓	
	Gender	✓	✓	
	Nationality	✓	✓	
	Marital status & children	✓	✓	✓
	Accommodation and living arrangements	✓	✓	✓
	Employment details	✓	✓	✓
	Level of education		✓	
	Religion		✓	
Self-harm act	Description of method of HRSH act	✓	✓	
	Suicidal intent related to HRSH act			
	Objective	✓	✓	
	Subjective	✓	✓	
	Proximal concerns prior to HRSH act	✓	✓	
	Details of self-harm repetition since index HRSH act		✓	✓
Personal History	Family / personal history	✓	✓	
	Life events	✓	✓	
	History of self-harm	✓	✓	
	Suicidal behaviour by persons known to the participant	✓	✓	
	Primary care history	✓	✓	✓
	Psychiatric treatment history	✓	✓	✓
	Psychiatric diagnoses	✓	✓	✓
	Experiences of engaging with mental health services		✓	✓
	Physical health	✓	✓	
	Alcohol and drug abuse	✓	✓	✓
Psychological state and trait variables	Recent symptoms of depression and mania		✓	✓
	Social support		✓	
	Self-efficacy		✓	✓
	Hopelessness		✓	✓

Note: Table provides an overview of variables collected. Specific data items collected from hospital records do not all correspond exactly with interview data items. More detailed data items were collected as part of the interviews.

2.2.1.6. Data collected from interviews

Data collected from the baseline and follow-up interviews was used in Study 4 (Chapter 6). The baseline and follow-up interviews were both semi-structured. The researchers used the interview schedules to guide the interviews but engaged with participants on topics they wished to discuss more deeply. At the end of both interviews, a number of psychological measures were administered. Table 2 provides an overview of the data collected in the interviews. Both interview schedules are listed in the Appendices (Appendix 2 and 3).

Both objective and subjective suicidal intent related to the HRSH episode and subsequent repeated self-harm acts was measured using the Beck Suicide Intent Scale (158). Social support was measured at baseline using the ten-item version of the Duke Social Support Inventory (159). Psychological distress was measured at baseline using the 21-item version of the Depression Anxiety and Stress Scales (DASS-21) (160). The Symptom Checklist-core depression (SCL-CD6) scale was used to assess depressive symptoms at baseline (161, 162). Self-efficacy was assessed using the 10-item General Self-Efficacy Scale (163) at baseline and follow-up. Hopelessness was also measured at baseline and follow-up using a four-item version of the Beck Hopelessness Scale (164, 165).

2.3. Use of the National Self-Harm Registry Ireland (NSHRI) for this thesis

2.3.1. Overview of the NSHRI

The NSHRI collects data on consecutive patients who present to EDs as a consequence of self-harm. The NSHRI was established by the NSRF in 2000 and since 2006 has full national coverage of all 36 acute hospitals in Ireland. The NSHRI uses the definition of self-harm used throughout the thesis (see Section 2.2.1). The NSHRI includes cases involving all methods of self-harm where it is clear that the self-harm was intentionally inflicted. All individuals who are alive on presentation to hospital following a self-harm act are included. Data Registration Officers (DROs) collect data on self-harm presentations according to standardised methods of case ascertainment and definition. More information on data collection procedures and

quality assurance has been reported elsewhere (38). The NSHRI collects data on all self-harm presentations, including multiple presentations made by the same individuals. The NSHRI data is pseudonymised with a unique code for every individual based on encrypted initials, sex and date of birth.

2.3.2. Use of NSHRI dataset for Study 1

Study 1 used the NSHRI data on all presentations to hospital as a result of self-harm from 1 January 2010 and 31 December 2016. This dataset included 65,690 presentations by 46,661 individuals. The aim of Study 1 was to examine risk of self-harm repetition according to the characteristics of self-harm method(s) involved in an index self-harm presentation. The NSHRI dataset was used to address this objective due to the large sample size, which facilitated a detailed examination of self-harm method that would not be possible with a small sample. The following NSHRI data items were used for Study 1: demographic characteristics (age and sex), method(s) of self-harm, characteristics of IDO and self-cutting, alcohol involvement, self-harm history and self-harm repetition.

2.3.3. Data linkage (Studies 2 & 3)

HRSH cases identified by the IMPRESS study represent a subgroup of all self-harm cases presenting to the three study hospitals. This subgroup of HRSH patients within the NSHRI dataset was identified by linking it with the IMPRESS dataset. This data linkage was conducted with the following objectives:

1. To establish whether persons presenting with HRSH made a repeated presentation following their index HRSH act (Studies 2 and 3).
2. To establish whether persons presenting with HRSH had made self-harm presentations to hospital prior to their index HRSH act (Studies 2 and 3).
3. To compare HRSH cases with lower risk cases in terms of their profile, receipt of psychosocial assessment and risk of self-harm repetition (Study 2).

As mentioned, the NSHRI data is pseudonymised with a unique code generated for every individual. For each HRSH patient in the IMPRESS dataset, a code was generated using the same encryption method used by the NSHRI. HRSH patients were matched to patients in the NSHRI dataset who had the same unique code. Where there was no corresponding unique code in the NSHRI dataset, HRSH patients were matched to patients in the NSHRI dataset based on age, sex, date, method of self-harm and presenting hospital. It was not possible to find a match in the NSHRI dataset for 36 (10%) NSHRI patients identified by the IMPRESS study, indicating that there was no record of their self-harm presentation in the NSHRI. The likelihood of multiple presentations by the same individual being missed by the NSHRI data collection was considered small. Therefore, these 36 cases were included in the NSHRI dataset and it was assumed that they had made no other self-harm presentations to hospital during the study period. This linked dataset is used in Study 2 and Study 3. In both studies, all analyses were repeated that excluded this group of 36 unmatched HRSH patients and the findings remained stable. The data linkage process is described in Figure 5.

In addition to the NSHRI data items used for Study 1, receipt of psychosocial assessment was also used in Study 2.

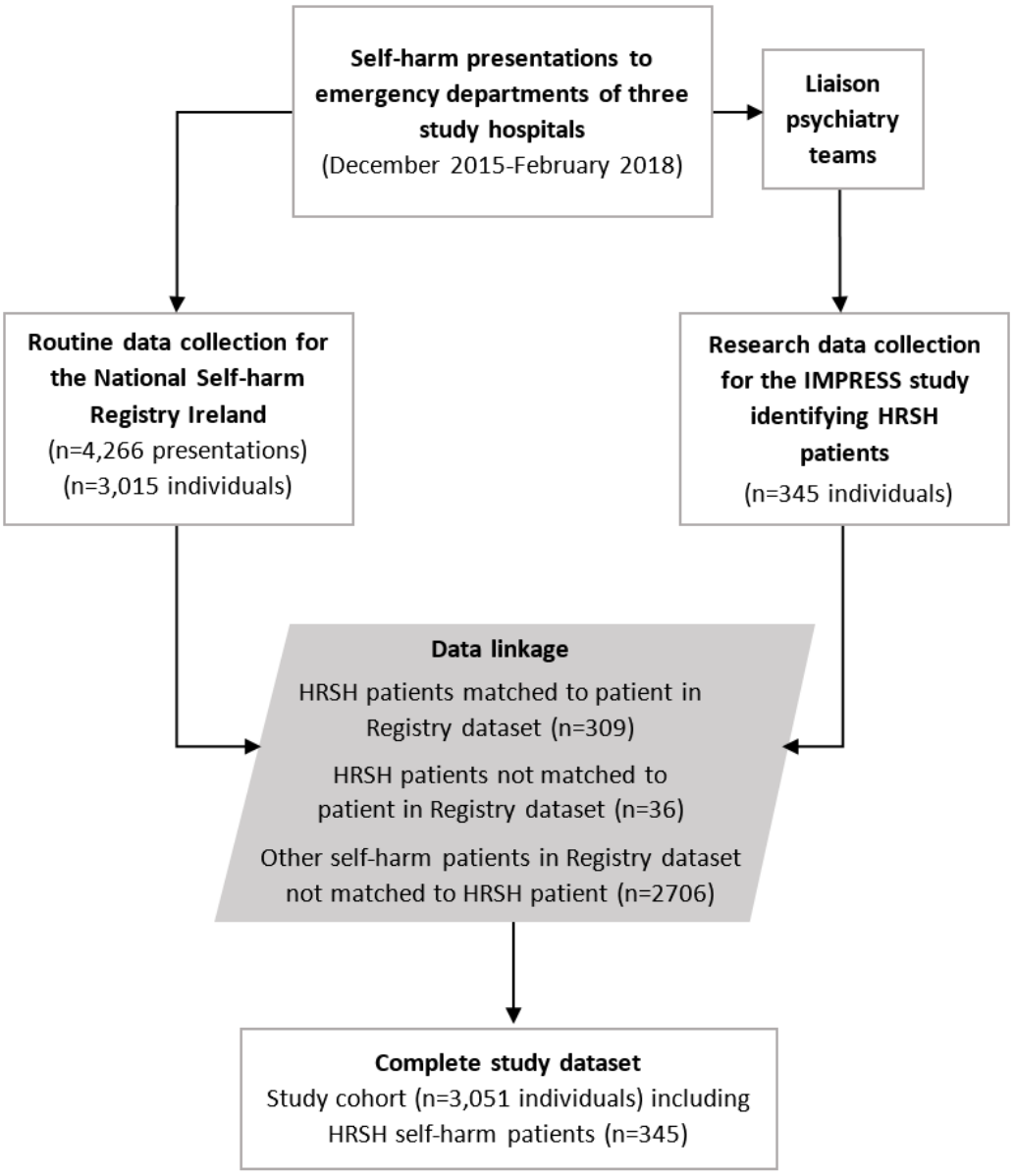


Figure 5. Overview of data collection and data linkage.

2.4. Ethical considerations and data protection

2.4.1. Ethical approval

The IMPRESS study received ethical approval from the Clinical Research Ethics Committee of the Cork University Teaching Hospitals and the HSE Mid-Western Regional Hospital Research Ethics Committee. This ethical approval included the primary IMPRESS data collection and the use of data from the NSHRI. Ethical approval for the NSHRI was received from the National Research Ethics Committee of the Faculty of Public Health Medicine and the relevant hospital or Health Service Executive ethics committees.

2.4.2. Potential risks and benefits to participants of the IMPRESS study

Patients presenting with self-harm may be considered a vulnerable population and it is possible that the discussion of motivations and intentions behind the self-harm may evoke strong emotions. However, previous research involving interviews with people who have engaged in self-harm shows that participants found the interviews with a specially trained professional as beneficial (166, 167). It was anticipated that participants would benefit from the opportunity to share their experiences with an impartial specially trained researcher in a confidential setting and would receive recognition of their distress (detailed overview of training provided in Section 2.2.1.4.). We observed this to be the case. In addition, if the support and/or treatments received by the participant did not match their needs, the interview allowed for the opportunity to discuss alternative options for referrals. A procedure was in place to contact the participants treating team or facilitate alternative options for referral to treatment when a participant requested further support or when acute distress or risk of suicidal behaviour was identified. A letter containing contact details of relevant support and treatment services was given to participants regardless of whether they chose to participate or not.

2.4.3. Data protection

The IMPRESS recruitment protocol complied with the most up-to-date data protection acts during the data collection period (Irish Data Protection Act of 1988 and the Irish Data Protection (Amendment) Act of 2003). The data collection period of the IMPRESS study was completed prior to General Data Protection Regulation (GDPR) becoming applicable to EU member states in May 2018. Following the introduction of the regulation, the study team complied with the GDPR in the use of the collected data. Only anonymised data will be published in academic journal articles, conference papers, and reports. A proportion of interviews took place outside of the research offices and therefore care was taken to ensure confidentiality of data in transit between the interview venue and the research offices as follows: the consent form was removed from the interview schedule as soon as it had been signed and the documents were carried separately. Participants' name, age, date of birth and any other information that could identify them were removed from paper-based records and stored in separate locked filing cabinets from questionnaire information. Questionnaires were given a random unique identification number. Paper-based records were stored in secure cabinets, accessible only to members of the research team who had signed a confidentiality agreement. Electronic data were password-protected and stored on encrypted computers. Participants were permitted access to their personal data at any time and were entitled to withdraw their data from the study up to the point of publication.

2.5. Data analysis

All statistical analyses were conducted using SPSS versions 22-26 and Stata 12 IC for Windows. NVivo11 was used for the qualitative analysis. Specific methodologies and statistical analyses used in the studies are described in Chapters 3-6.

2.5.1. Approach to qualitative analysis

Study 4 is a sequential qualitatively led mixed-methods study. A mixed methods approach was adopted for Study 4 as a means of extending what could be learned from the qualitative

findings. Qualitative methods were used to document patients' experiences of care after a HRSH presentation to hospital. Following the primary analyses, core qualitative findings were quantized and integrated into a quantitative dataset that was used to examine the demographic, psychiatric and psychosocial factors associated with variations in perceptions of care received. This approach was adopted as it has been highlighted as a successful means of facilitating the comparison of qualitative and quantitative data in order to gain a better understanding of a phenomenon (168, 169). Thematic analysis is a methodology that facilitated the integration of qualitative and quantitative data at the analysis. Thematic analysis was chosen for this study because it is a flexible methodology which is suitable for use with large datasets and because it produces clear themes that can be easily quantized, facilitating the integration of qualitative and quantitative data (170). Furthermore, thematic analysis allows for a detailed description of the data, providing clear, unambiguous findings. Thus, it is particularly appropriate for research that is applied in nature such as Study 4 which aimed to provide findings that could directly inform healthcare service planning and policy. More information on the study methodology and approach to analysis is provided in Chapter 6.

Other qualitative methodologies were considered in the planning stages of Study 4. Specifically, interpretative phenomenological analysis (IPA) was considered because it is suited to the study of an individual's lived experience. IPA shares some similarities with thematic analysis. However, IPA is an idiographic mode of inquiry with a strong focus on the meaning that each individual attributes to their experiences, while thematic analysis facilitates the understanding of patterns across a dataset which was a primary objective of Study 4 (171, 172). In addition, the small sample size that is integral to the process of conducting analysis in line with IPA would have been too small to carry out the mixed methods component of Study 4. Grounded theory was also considered as a possible methodology for Study 4 due to its focus on the interconnections between individuals and identification of

patterns across all individuals in a dataset (173). However, the development of theory from the data, a core component of grounded theory, was not in line with the main objectives of Study 4.

2.6. Reflexivity

Reflexivity can be defined as "the process of a continual internal dialogue and critical self-evaluation of researcher's positionality as well as active acknowledgement and explicit recognition that this position may affect the research process and outcome" (174, p220). It involves continued self-appraisal by the researcher, during which they must consider their situatedness within the research and the impact that may have on all aspects of the research process, including the individuals being studied and how data is collected and analysed. For this research, I conducted face-to-face interviews with individuals who had engaged in an act of HRSH and was required to consider ways in which my interactions with these individuals could have been influenced by my personal experiences and existing beliefs.

My academic background is in applied psychology and I had experience of working in a non-clinical research capacity in self-harm and suicide research for over a year prior to the commencement of the data collection for this PhD research. I do not have lived experience of HRSH, or suicidality more broadly. Researching a topic with which one is unfamiliar at a personal level can have advantages. As the researcher is 'ignorant' to the experience under discussion, this puts the participant in the position of the expert which can be empowering (174). However, studying an area in which I had no direct personal experience also has the potential to present some inherent challenges. For example, when studying the unfamiliar, lack of awareness can lead a researcher to use inappropriate language when engaging with a participant. The training received in conducting interviews (Section 2.2.1.4.), as well as listening to audio-recordings of interviews helped to prepare me for how to approach the use of suicide and self-harm related language. The interview training, developed by researchers who were experienced in engaging with HRSH patients, included guidance on appropriate

terms to use when beginning an interaction with a participant. From there, I endeavoured to take the lead of the participant and reflect the terms they used, where appropriate.

A lack of understanding of the participants' lived experience can lead to a researcher viewing the participant through a judging lens. I was conscious of this throughout the data collection period for this research and continually reflected on whether certain disclosures made by participants were eliciting a judgemental reaction from within myself and whether I conveyed any judgment in my interactions with participants. This process was aided by the procedure of documenting reflections for discussion during supervision sessions (Section 2.2.1.4.). My judgement of a participant's experience not only had the potential to impact the interaction with a participant during the interview, but it could also impact the analysis and interpretation of the data. Due to the vulnerability of the HRSH patients, there also was the possibility of that I may over-empathise with their experiences. This was something that I was particularly aware of during the analysis for Study 4. I endeavoured to ensure that the very strong negative views of some of the participants in relation to healthcare services did not lead to resentment within myself of the services, as this resentment would be reflected in how the results would be presented. In addition to remaining aware of the potential for this throughout the study, another member of the study team independently analysed a subset of the qualitative data and a third researcher reviewed and compared the content of our analyses. This was done to ensure that the results reflected the data rather than my potential biases.

2.7. Data on mortality following hospital presented self-harm

The collection of data on mortality following self-harm was planned for Study 1 in this thesis. An application to the Central Statistics Office (CSO) in Ireland to become an Officer of Statistics was made in order to gain access to national mortality data. In the original plan of this body of research, mortality data would be linked with data from the NSHRI in order to examine risk factors for suicide and other causes of premature mortality following hospital presented self-harm. However, operational changes within the CSO and the introduction of General Data

Protection Regulation (GDPR) in 2018 led to strict restrictions on persons external to the CSO accessing non-aggregated data. Therefore, it was not possible to examine mortality outcomes during the PhD programme. Information on the death of a small number of HRSH patients (<5) was received from staff in the IMPRESS hospitals. This information was taken into account in Studies 2 and 3 and the relevant person(s) were removed from prospective analyses.

Chapter 3. Method of self-harm and risk of self-harm repetition: findings from a national self-harm registry

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3.1. Abstract

Background: Risk of self-harm repetition has consistently been shown to be higher following self-cutting compared to intentional drug overdose (IDO) and other self-harm methods. The utility of previous evidence is limited due to the large heterogeneous method categories studied. This study examined risk of hospital presented self-harm repetition according to specific characteristics of self-harm methods.

Methods: Data on consecutive self-harm presentations to hospital emergency departments (2010-2016) were obtained from the National Self-Harm Registry Ireland. Associations between self-harm method and repetition were analysed using survival analyses.

Results: Overall, 65,690 self-harm presentations were made involving 46,661 individuals. Self-harm methods associated with increased repetition risk included minor self-cutting, severe self-cutting, multiple drug IDOs involving psychotropic drugs and self-harm by blunt object. Minor self-cutting was the method associated with highest repetition risk (adjusted hazard ratio (AHR) 1.38, 95% CI 1.31-1.45). Risk of repetition was comparable following IDOs of four or more drugs, involving psychotropic drugs (AHR=1.29, 95 % CI 1.20-1.39), severe self-cutting (AHR 1.25, 95% CI 1.16-1.34) and blunt object (AHR=1.23, 95% CI 1.07-1.42).

Limitations: Information was not available on suicide or other causes of mortality.

Conclusions: Self-harm method and the associated risk of repetition should form a core part of biopsychosocial assessments and should inform follow-up care for self-harm patients. The observed differences in repetition associated with specific characteristics of IDO underline the importance of safety planning and monitoring prescribing for people who have engaged in IDO.

3.2. Introduction

Self-harm is one of the strongest risk factors for both non-fatal self-harm repetition and suicide (11, 47, 73). The individual, societal and economic cost associated with self-harm is significant and increases with repetition (175). To aid clinicians in planning treatment and follow-up, it is important to understand the factors that are associated with increased risk of self-harm repetition (49, 76, 79). Method of self-harm has been widely investigated as a risk factor for repetition and self-cutting is the only method consistently associated with repeated self-harm (73). The utility of the evidence emerging from research examining self-harm method as a risk factor for repetition is limited because methods are classified into large heterogeneous groups, most commonly intentional drug overdose (IDO) and self-poisoning combined, and self-cutting (52-54). More detailed examination of self-harm methods has the potential to enhance our understanding of their relationship with non-fatal repetition (53).

Intentional drug overdose (IDO) is the most common method of hospital presented self-harm, involved in more than two thirds of presentations (37, 38, 51). Previous studies reported lower risk of self-harm repetition following IDO compared to self-cutting and similar risk compared to other types of self-injury (38, 52-54). However, episodes of IDO are not homogeneous in terms of clinical characteristics and medical severity. Increased number of tablets and multiple drugs taken in IDO are associated with higher levels of suicidal intent (22, 55), more extensive medical intervention and greater risk of fatality (56, 57). Specific characteristics of IDOs have been largely overlooked in large scale prospective studies of self-harm. One study, conducted over 20 years ago, found that ingestion of more than one drug was associated with increased risk of IDO repetition (74). In addition, use of benzodiazepines in IDO has been found to be a significant predictor of short-term risk of repetition (75).

Self-cutting is involved in approximately 20% of self-harm presentations to hospital (38, 53, 60). Hospital presentations resulting from self-cutting can vary widely in terms of injury severity (61). So far, only one study has examined the severity of self-cutting and repetition of

self-harm observing that increased severity was associated with reduced self-harm repetition overall, but the authors noted an increased risk of repetition using high lethality methods (61). The relationship between repetition risk and self-cutting severity has not been examined in comparison with any other self-harm methods. Other methods of self-harm, such as attempted hanging, attempted drowning and self-harm with a blunt object, have received little individual consideration in relation to risk of non-fatal repetition.

Within this context, the present study examined the risk of self-harm repetition according to the characteristics of self-harm method(s) involved in an index self-harm presentation using national self-harm surveillance data from hospital emergency departments (EDs).

3.3 Methods

3.3.1. Setting and sample

The National Self-Harm Registry Ireland (NSHRI) collects data on consecutive patients who present to EDs as a consequence of self-harm. Since 2006, the NSHRI has full national coverage of all 36 acute hospitals in Ireland.

The NSHRI uses the following definition of self-harm 'an act with non-fatal outcome in which an individual deliberately initiates a non-habitual behaviour, that without intervention from others will cause self-harm, or deliberately ingests a substance in excess of the prescribed or generally recognised therapeutic dosage, and which is aimed at realising changes that the person desires via the actual or expected physical consequences' (17). The definition includes acts involving varying levels of suicidal intent and various underlying motives. Presentations involving acts without intention to self-harm, including accidental overdoses of medication, street drugs or alcohol, are not recorded in the NSHRI. All self-harm presentations to the ED are included in the NSHRI data irrespective of whether the presentation results in hospital admission. More information on data collection and quality assurance has been reported elsewhere (38).

Analyses were conducted for presentations recorded between 1 January 2010 and 31 December 2016. The dataset was restricted to individuals who did not present to hospital with self-harm during 2007-2009, in order to maximise the number of true first presentations after 1 January 2010. A similar method was used by Perry and colleagues (38). All repeat presentations, rather than first repeat presentations only, were included in the analyses, with each repeat presentation becoming an index presentation.

3.3.2. Data items

Data Registration Officers (DROs) collect data on self-harm presentations according to standardised methods of case ascertainment and definition. The following core data items routinely collected by the DROs were accessed: demographic characteristics (age and sex), method(s) of self-harm and alcohol involvement. Self-harm repetition was defined as a presentation to an ED as a result of a self-harm act following an index self-harm presentation at any time during the 7-year study period. All repeated self-harm presentations were included in the definition of self-harm repetition irrespective of method involved in the repeat act. Encrypted patient initials, sex and date of birth were used to differentiate between self-harm patients and to identify repeat presentations by the same patients. Self-harm presentations by the same individual occurring on the same day were recorded once to ensure that all presentations represented distinct events. Only individuals who had no self-harm presentation in the 3 years prior to the study period were included in the analyses. The study examined all presentations (including first and repeat presentations) as index presentations using repeat event analysis. Self-harm history reflected the number of presentations an individual had prior to an index presentation during the study period.

Method of self-harm was recorded according to the Tenth Revision of the WHO's International Classification of Diseases (ICD-10) codes for intentional injury (50). IDO was defined as the intentional ingestion of more than the prescribed or recommended dose of any drug, as well as IDO of illegal drugs (ICD codes X60-X64). IDO was categorised according to patient-reported

number of tablets, number of drugs and class of drugs taken. Categories of drug class were psychotropic drugs, analgesic drugs and other prescription or over-the-counter drugs. Psychotropic drugs included: minor tranquilisers, major tranquilisers, barbiturates/anti-epileptic drugs, antidepressants and other mood stabilisers. Analgesic drugs included: paracetamol, opiates, salicylates and non-steroidal anti-inflammatory drugs (NSAIDs). Analgesic and opiate drug groups include compound drugs. Self-poisoning was defined as the ingestion of substances other than drugs, including organic solvents, pesticides, gases and other noxious substances (ICD codes X66-X69). Self-cutting severity was operationalised according to treatment received. Minor self-cutting included injuries that required no treatment, wound cleaning or steri-strips only, while severe self-cutting included injuries that required sutures or plastic surgery referral. Self-harm by blunt object (ICD code X79) included self-battery and head-banging. Analyses were based on method involvement rather than primary or sole method. Where multiple methods were involved in a self-harm presentation, up to 5 methods were recorded.

3.3.3. Statistical analyses

Cox proportional hazard models were fitted to estimate time to self-harm repetition according to the following method variables: number of tablets, number of drugs and class of drugs taken in IDO, self-cutting severity, blunt object, attempted hanging, attempted drowning, self-poisoning with non-ingestible substances, jumping from a height, crashing a motor vehicle and lying or jumping in front of a moving object. To analyse multiple methods involved in each presentation, methods were included in analyses as separate variables with 'all other methods' as the reference category. Number of tablets, number of drugs, and class of drugs taken in IDO were examined separately in univariable models. To avoid collinearity, these characteristics of IDOs were entered as a combined variable in multivariable models (number of drugs / number of tablets and number of drugs / class of drugs). The following co-variates were included in the multivariable model: sex, age, alcohol involvement and self-harm history.

Adjusted Hazard ratios (AHR) with 95% confidence intervals (95% CI) were calculated. To further illustrate the findings, Kaplan-Meier curves were plotted, truncated at 24 months.

Follow-up time after an index self-harm presentation varied depending on the point during the study period when the presentation occurred due to the fixed final date, 31 December 2016, ranging from 1 day to 7 years. Variable length of follow-up was accounted for in the analyses. The study used repeat event analyses in that all repeat presentations, were included in the analyses with each repeat presentation becoming an index presentation. Lack of independence of observations between presentations made by the same individual was adjusted for by using robust analyses that modified the variance of estimates.

Nelson Aalen graphical tests showed reasonably parallel lines indicating that the assumption of proportional hazards was upheld. The assumption was tested using post-estimation statistics on the basis of Schoenfeld residuals (176). The post estimation statistics were statistically significant for some variables. However, Spearman's Rho coefficients were small (ranging from .015 to .057), indicating little violation of the proportional hazards assumption. Analyses were carried out using SPSS 22 and Stata 12 for Windows.

3.3.4. Ethics statement

Ethical approval for the NSHRI was granted by the National Research Ethics Committee of the Faculty of Public Health Medicine. Ethical approval was also received from the relevant hospital or Health Service Executive ethics committees.

3.4. Results

A total of 65,690 self-harm presentations by 46,661 individuals were made to hospital EDs in Ireland from 2010 to 2016 (Table 3). The mean age of self-harm patients was 32.7 years (SD±14.4), with 41.3% of presentations involving individuals in the 25-44-year age range. 53.4% of presentations involved females. The most common self-harm method was IDO (68.3%) followed by self-cutting (23.8%), attempted hanging (6.6%) and attempted drowning (3.0%) (Table 3). IDO was more common among females (74.8% vs 60.9%, $p<0.001$). All other methods examined were more common among males ($p<0.001$): self-cutting (26.2% vs 21.7%), attempted hanging (10.0% vs 3.6%), attempted drowning (3.9% vs 2.3%), self-poisoning (2.4% vs 1.7%), jumping from a height (1.7% vs 0.9%), blunt object (1.1% vs 0.1%), jumping from a moving object (0.9% vs 0.5%) and crashing a motor vehicle (0.6% vs 0.3%). Approximately half of IDOs involved one drug (53.8%) and 46.8% involved less than 30 tablets. Psychotropic drugs were the most common drug class, involved in 45.2% of IDOs. Most self-cutting presentations were minor self-cutting (66.0%).

Table 3 Characteristics of all self-harm presentations and repeat presentations, and Cox proportional hazard survival analyses for time to subsequent self-harm repetition during 2010–2016.

Variable	All self-harm presentations		Repeated self-harm presentation		Univariate Cox proportional hazard survival analysis	
	n	%	n	%	Hazard ratio (95% CI)	*p*
All presentations	65,690	100	19,029	29.0		
Intentional drug overdose (IDO) (X60-X64)	44,890	31.7	12,433	27.7	0.83 (0.79-0.87)	<0.001
Number of drugs taken in IDO (X60-X64)						
1 drug taken	24,130	36.7	6,335	26.3	0.78 (0.74-0.82)	<0.001
2 drugs taken	11,038	16.8	3,122	28.3	0.84 (0.79-0.89)	<0.001
3 drugs taken	5,756	8.8	1,675	29.1	0.87 (0.81-0.93)	<0.001
4+ drugs taken	3,960	6.0	1,301	32.9	1.00 (0.92-1.08)	0.971
Drug class(s) taken in IDO						
Psychotropic	25,260	38.5	7,600	30.1	0.90 (0.69-0.77)	<0.001
Analgesic	18,830	28.7	7,706	25.1	0.74 (0.70-0.78)	<0.001
Other	11,803	18.0	3,231	27.4	0.82 (0.78-0.87)	<0.001
Number of tablets taken in IDO(X60-X64)						
<10 tablets	5,221	8.0	1,342	25.7	0.75 (0.70-0.81)	<0.001
10-19 tablets	9,012	13.7	2,335	25.9	0.77 (0.72-0.82)	<0.001
20-29 tablets	6,777	10.3	1,797	26.5	0.78 (0.73-0.83)	<0.001
30-39 tablets	3,700	5.6	1,094	29.6	0.89 (0.82-0.92)	0.003
40-49 tablets	2,460	3.7	769	31.3	0.95 (0.87-1.03)	0.215
50-59 tablets	1,462	2.2	437	29.9	0.91 (0.81-1.02)	0.100
60-69 tablets	1,080	1.6	331	30.7	0.92 (0.82-1.04)	0.179
70-79 tablets	594	0.9	175	29.5	0.87 (0.75-1.02)	0.096
80 tablets+	1,721	2.6	510	29.6	0.88 (0.79-0.98)	0.018
Unknown quantity of tablets	12,863	19.6	3,643	28.3	0.86 (0.81-0.90)	<0.001
Self-cutting (X78)	15,616	23.8	5,638	36.1	1.50 (1.42-1.58)	<0.001
Severity of self-cutting (X78)						
Minor self-cutting	10,309	15.7	3,886	37.7	1.62 (1.52-1.72)	<0.001
Severe self-cutting	3,414	5.2	1,202	35.2	1.41 (1.30-1.53)	<0.001
Unknown severity self-cutting	1,893	2.9	551	29.1	1.07 (0.94-1.23)	0.318
Attempted hanging (X70)	4,335	6.6	1,199	27.7	0.96 (0.89-1.02)	0.165
Attempted drowning (X71)	1,967	3.0	553	28.1	0.97 (0.88-1.06)	0.499
Self-poisoning (X66-69)	1,329	2.02	315	23.7	0.79 (0.70-0.89)	<0.001
Jumping from a height (X81)	818	1.25	208	25.4	0.88 (0.77-1.02)	0.087
Blunt object (X79)	601	0.9	209	34.8	1.36 (1.16-1.59)	<0.001
Jumping in front of moving object (X81)	456	0.7	144	31.6	1.23(1.04-1.47)	0.049
Crashing motor vehicle (X82)	273	0.4	54	19.8	0.65 (0.50-0.85)	0.001
Alcohol involved	23,160	35.3	6,661	28.8	0.95 (0.91-0.99)	0.021
Sex						
Male	30,597	46.6	8,824	28.8	1	
Female	35,093	53.4	10,205	29.1	1.01 (0.95-1.08)	0.319
Age						
<15 yrs	2,201	3.35	599	27.2	0.91 (0.80-1.02)	0.103
15-24 yrs	22,094	33.6	6,365	28.8	0.95 (0.88-1.01)	0.095
25-44 yrs	27,094	41.3	8,276	30.6	1	
45-64 yrs	12,536	19.1	3,537	28.2	0.911 (0.84-0.99)	0.020
65+yrs	1,765	2.7	252	14.3	0.434 (0.36-0.52)	<0.001
Self-harm history						
No previous presentations	46,661	71.0	9,166	19.6	1	
1 previous presentation	9,166	14.0	3,591	39.2	2.46 (2.37-2.56)	<0.001
2 previous presentations	3,591	5.5	1,809	50.4	3.69 (3.51-3.88)	<0.001
3 previous presentations	1,809	2.8	1,058	58.5	4.91 (4.61-5.23)	<0.001
4+ previous presentations	4,463	6.8	3,405	76.3	9.44 (8.73-10.21)	<0.001

Note: For each method of self-harm variable, the reference category is all presentations not involving that method. Repeated self-harm percentages represent the proportion of those who represented to hospital as a result of self-harm out of the total number of presentations within the relevant category.

3.4.1. Self-harm repetition

During the seven years follow-up, 29.0% of episodes were followed by a repeat self-harm presentation. The median number of repeat presentations was two (interquartile range±1).

Self-cutting

Incidence of repetition was highest following self-cutting compared to all other methods (36.1% vs 26.7% respectively; χ^2=18.3, p<.001). Repetition occurred following 37.7% of minor and 35.2% of severe self-cutting presentations (Table 3). Self-harm repetition was more frequent and occurred earlier following minor compared to severe self-cutting (Figure 6a). In adjusted survival analysis, both minor (AHR 1.38, 95% CI 1.31-1.46) and severe self-cutting were predictive of self-harm repetition (AHR 1.25, 95% CI 1.16-1.34) (Table 4). Minor self-cutting was associated with higher risk of repetition compared to severe-self-cutting (AHR 1.11 95% CI 1.03-1.20, p=0.007).

Intentional drug overdose

Overall, incidence of repetition was lower following IDO compared to non-IDO presentations (27.7% vs 31.7% respectively; χ^2=111.4, p<.001). A repeat self-harm episode occurred following 26.3% of IDOs that involved a single drug only. Repetition was more likely following multiple drug IDOs. A subsequent self-harm presentation occurred following 32.9% of IDOs of four or more drugs (Table 3). Approximately 26% of IDOs involving fewer than 30 tablets were followed by a repeat self-harm presentation while approximately 30% of IDOs of 30 or more tablets were followed by a repeat episode (Table 3). Repetition occurred more frequently following IDOs that involved psychotropic compared to analgesic drugs (30.1% vs 25.1% respectively) (Table 3). The relationships between self-harm repetition and the specific types of psychotropic and analgesic drugs are presented in detail in Supplementary Table 1. The Kaplan-Meier curves (Figure 6b, 6c and 6d) show the cumulative probability of a repeated self-harm presentation in the 24-month period after an index IDO presentation. Figure 6b

illustrates that repetition risk following IDO increased with each additional drug taken. The curves in Figure 6c highlight a pattern of earlier and more frequent repetition following IDOs of 30 or more tablets compared to those involving less than 30 tablets. Figure 6d demonstrates higher repetition risk following IDOs involving psychotropic drugs compared to non-psychotropic IDOs.

In adjusted survival analysis, with number of drugs and class of drug combined, multiple drug IDOs involving psychotropic drugs were associated with increased risk compared to single drug IDOs that did not involve psychotropic drugs. IDOs involving four or more drugs, at least one of which was a psychotropic drug, were associated with 29.3% increased risk of repetition (AHR=1.29, 95 % CI 1.20-1.39). In further adjusted survival analysis, when combined with number of drugs taken, number of tablets taken did not contribute substantially to repetition risk (Supplementary Table 2).

Other Methods

Incidence of repetition was higher after an episode of self-harm by blunt object compared to other self-harm methods (34.8% vs 28.9% respectively; χ^2=9.9, *p*=.002) (Table 3). Repetition was significantly lower following self-poisoning compared to other methods (23.7% vs 29.1% respectively; χ^2=18.3, *p*<.001) and crashing a motor vehicle compared to other methods (19.8% vs 29.01% respectively; χ^2=11.3, *p*<.001). In adjusted survival analysis, self-harm by blunt object was an independent predictor of self-harm repetition, associated with a 23.3% increase in risk compared to presentations not involving a blunt object (AHR=1.23, 95% CI 1.07-1.42) (Table 4). Self-poisoning was associated with a 15.5% decrease in repetition risk compared to other methods (AHR=0.85, 95% CI 0.76-0.96).

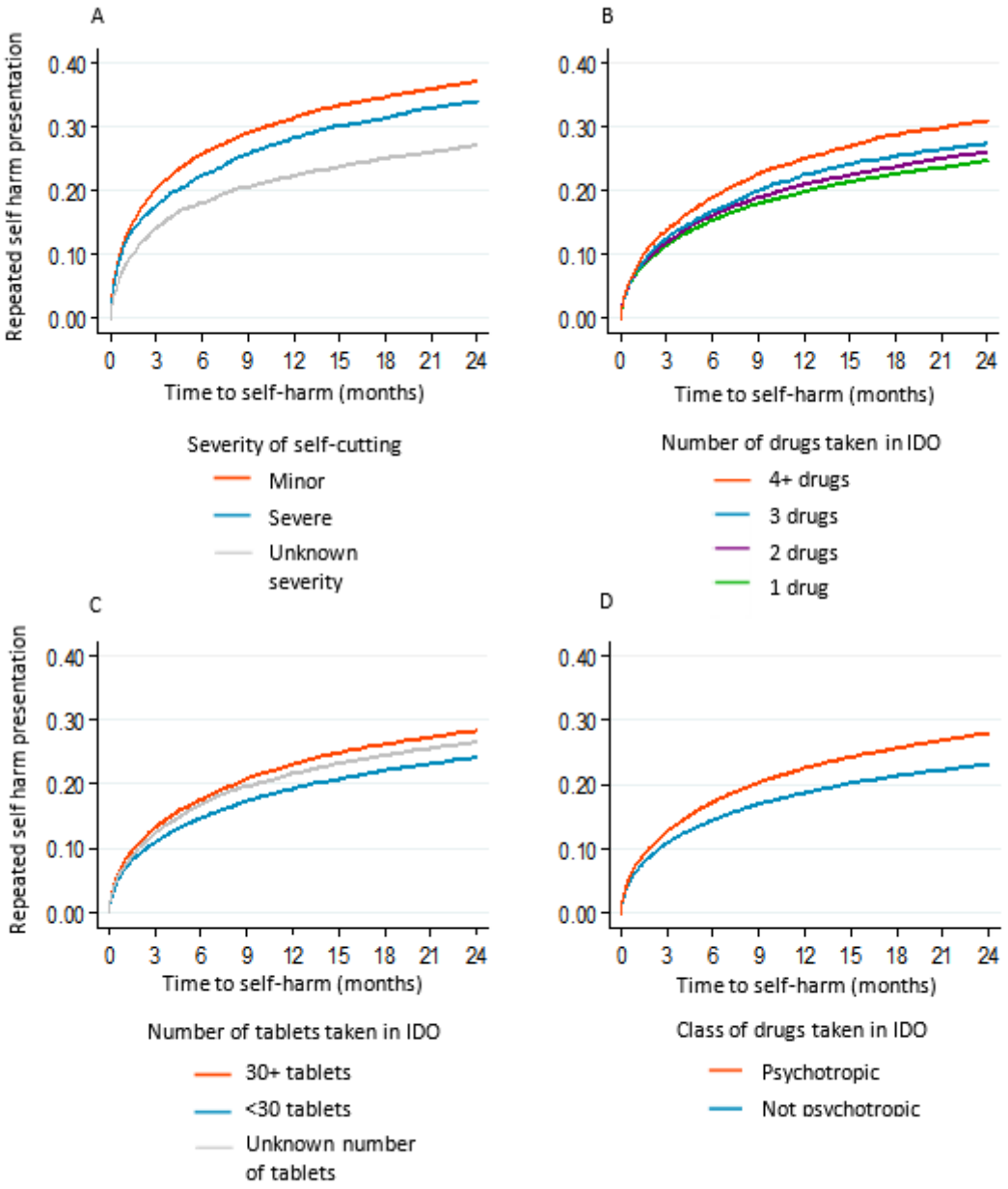


Figure 6. Kaplan-Meier failure curves showing the cumulative probability of a repeated self-harm presentation. The curves show the cumulative probability of a repeated self-harm presentation in the 24-month period after an index self-harm presentation. Variation in the probability of a repeated self-harm presentation is shown by severity of self-cutting (A), by number of drugs taken in intentional drug overdose (IDO) (B), by number of tablets taken in IDO (C), and by the class of drug taken in IDO (D).

Table 4 Multivariable Cox proportional hazard survival analyses for time to subsequent self-harm repetition during 2010–2016.

Variables	Total	
	Hazard ratio (95% CI)	*p*
Number of drugs taken, and class of drug taken in intentional drug overdose (IDO) (X60-X64)		
No psychotropic, 2 drugs	0.94 (0.88-1.02)	0.135
No psychotropic, 3 drugs	0.78 (0.69-0.88)	<0.001
No psychotropic, 4 drugs	0.95 (0.81-1.11)	0.493
Psychotropic, 1 drug	1.06 (1.01-1.12)	0.024
Psychotropic, 2 drugs	1.15 (1.09-1.22)	<0.001
Psychotropic, 3 drugs	1.17 (1.10-1.25)	<0.001
Psychotropic, 4 drugs	1.29 (1.20-1.39)	<0.001
Self-cutting (X78)		
Minor self-cutting	1.38 (1.31-1.45)	<0.001
Severe self-cutting	1.25 (1.16-1.34)	<0.001
Unknown severity self-cutting	1.10 (0.99-1.22)	0.086
Attempted hanging (X70)	1.04 (0.98-1.11)	0.223
Attempted drowning (X71)	1.01 (0.93-1.10)	0.809
Self-poisoning (X66-69)	0.85 (0.76-0.96)	0.007
Jumping from a height (X81)	0.93 (0.81-1.07)	0.298
Blunt object (X79)	1.23 (1.07-1.42)	0.003
Jumping in front of moving object (X81)	1.13 (0.95-1.33)	0.162
Crashing motor vehicle (X82)	0.87 (0.66-1.13)	0.298
Alcohol involved	0.96 (0.93-1.00)	0.031
Sex (female)	1.01 (0.97-1.05)	0.723
Age		
<15yrs	1.17 (1.07-1.28)	<0.001
15-24yrs	1.00 (0.95-1.04)	0.843
25-44yrs	1	
45-64yrs	0.94 (0.89-0.99)	0.016
65+yrs	0.58 (0.51-0.67)	<0.001
Previous self-harm presentations		
1 previous presentation	2.39 (2.30-2.49)	<0.001
2 previous presentations	3.55 (3.37-3.73)	<0.001
3 previous presentations	4.69 (4.39-5.00)	<0.001
4+ previous presentations	8.93 (8.26-9.63)	<0.001

Note: For all method of self-harm variables, the reference category is 'no psychotropic, 1 drug' IDO.

Sex, age and self-harm history

There were no significant sex differences in incidence or risk of self-harm repetition (Table 3 and 4). 28.8% of males and 29.1% of females repeated. When risk of repetition was examined separately by sex, the relationship between self-harm method and repetition was broadly similar (Supplementary Table 3). However, there were some minor differences. In adjusted survival analyses, attempted hanging and jumping in front of a moving object were associated with increased risk of repetition among females but not males (Supplementary Table 3).

Repetition was most likely in the 25-44 years age group (30.6% repeated) and least common among those aged 65 or older (14.3% repeated) (Table 3). In adjusted survival analyses, compared to the 25-44 group, repetition was 41.5% less likely in the 65 or older age group (AHR 0.59 95% CI 0.51-0.67) and 6.1% less likely in the 45-64 age group (AHR 0.94 95% CI 0.89-0.99) (Table 4). Overall, risk of repetition was highest among those aged less than 15 years with an increased risk of 17.0% compared to those aged 25-44 years (AHR 1.17 95% CI 1.07-1.28). Consistent with the overall findings, the <15 years age group had the highest risk of repetition among females. However, among males, those aged 15-24 years were the age group with the highest risk of repetition (Supplementary Table 3).

Repetition risk was significantly higher among patients who had at least one previous self-harm presentation (Table 3 and 4). Repetition risk increased with each additional previous self-harm presentation, with the highest risk following presentations among those with a history of four or more previous presentations (AHR 8.93, 95% CI 8.26-9.63). Figure 7 shows the proportion of repeat self-harm presentations by number and class of drug taken in IDO, severity of self-cutting and previous self-harm history. The graph highlights the overlap in incidence of repetition following self-cutting and IDOs that involved at least four drugs, including psychotropic drugs, a pattern that remained consistent as the number of previous self-harm presentations increased. Figure 7 also illustrates that previous self-harm history was associated with the greatest difference in repetition.

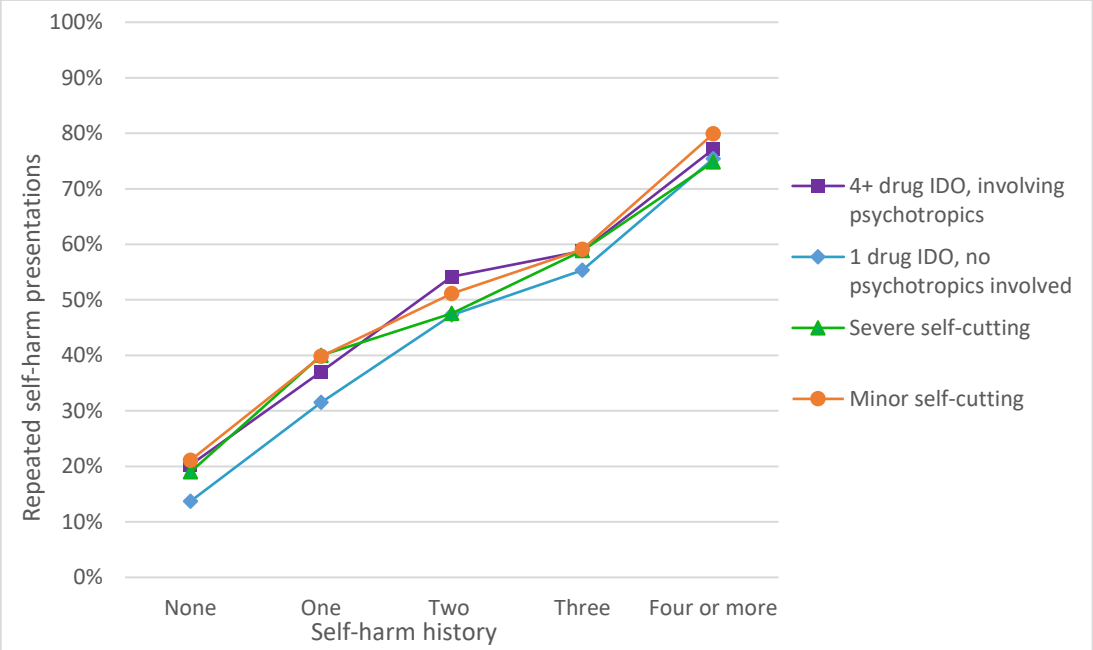


Figure 7. Proportion of repeat presentations in the 24-month period after an index self-harm presentation. Proportion is shown by number and class of drugs taken in IDO, severity of self-cutting and previous self-harm history.

3.5. Discussion

3.5.1. Main findings

This study provides the largest, most in-depth study of the association between method of self-harm and risk of non-fatal repetition using nationally representative data from hospital EDs. Self-harm methods associated with increased repetition risk included minor self-cutting, severe self-cutting, multiple drug IDOs that involved psychotropic drugs and self-harm by blunt object. Minor self-cutting was associated with the highest risk of repetition. Repetition risk was comparable following severe self-cutting, IDOs of four or more drugs that involved psychotropic drugs and self-harm by blunt object.

3.5.2. Findings in relation to previous studies

We found that the relationship between repetition risk and IDO varied according to number and class of drugs taken. When psychotropic drugs were taken in IDO, involvement of multiple drugs was associated with increased risk of repeated self-harm compared to single drug IDOs. This builds on the findings of one previous study of hospital presented IDO which reported

that risk of IDO repetition was higher among those who had taken more than one drug (74). Consistent with our findings, a previous UK-based study identified benzodiazepines, one of the most common psychotropic drugs used in IDO (37, 177), as a significant predictor of short-term repetition (75). Psychotropic drug involvement in IDO is more common among those who are in receipt of a prescription for these drugs and in contact with psychiatric services (178, 179). Psychiatric treatment at the time of a self-harm episode is associated with increased risk of subsequent repetition (73).

IDO is frequently considered a method associated with lower risk of continued self-harm compared to self-cutting (38, 52-54). Overall, we found that incidence of repetition following IDO was significantly lower than self-cutting. However, the previously accepted disparity in repetition risk between self-cutting and IDO was not evident when IDO was categorised according to number of drugs and class of drug taken and self-cutting categorised according to severity. In our study, repetition risk was similar following IDOs of four or more drugs that involved psychotropic drugs and severe self-cutting, which has not been addressed by previous studies. These findings indicate that IDO should not be treated as a homogeneous category when considering the method used in relation to the assessment of risk in a clinical setting. This is further supported by the fact that multiple drug IDOs and increased number of tablets are associated with higher suicidal intent (22, 55), severe medical outcomes (56, 57) and subsequent suicide (180).

Minor self-cutting was the method associated with highest risk of subsequent repetition. This finding compliments a previous study that reported higher risk of repetition following self-cutting requiring little or no treatment compared to self-cutting requiring more extensive medical intervention (61). Larkin et al. observed that use of lethal methods in repeat self-harm was associated with severity of self-cutting (61). If this potential escalation in method lethality resulted in an increase in fatal outcomes from self-harm acts that followed severe self-cutting, this may partly explain the reduction in overall repetition risk associated with severe

compared to minor self-cutting. However, this has not been examined in previous studies. Differences in future risk according to cutting severity may also be influenced by differences in assessment and treatment (61). Patients who are admitted to hospital are more likely to receive a psychosocial assessment compared to those who are discharged directly from the ED (Lilley et al., 2008). Those with more extensive injuries as a result of self-cutting may be more likely to be admitted. Thich could increase the likelihood of receiving a psychosocial assessment, which is associated with reduced risk of self-harm (54).

Self-harm by blunt object was associated with increased risk of repetition. This is a novel finding as repetition following self-harm by blunt object has not been independently examined previously. These findings indicate that, consistent with minor self-cutting, this method of self-injury is associated with ongoing distress despite the likelihood that the resulting physical injuries require minimal medical treatment. However, it is important to note that this self-harm method is relatively uncommon, involved in just 1% of presentations in this sample. Overall other self-harm methods, including attempted hanging, attempted drowning, self-poisoning, jumping from a height, crashing a motor vehicle and jumping in front of a moving object, were not associated with increased repetition risk. The relationship between these methods and non-fatal repetition has received little individual consideration in previous studies. The absence of repetition risk following these methods should not be considered reflective of a profile of reduced risk as they are associated with high lethality (68) and increased risk of subsequent suicide (7, 8). Among females, there was some evidence of an increased risk of repetition following two of the high lethality methods, jumping in front of a moving object and attempted hanging, which are less common among females compared to males (68). Previous research has found that involvement of lethal methods in a self-harm episode increases risk of subsequent suicide among males but not females (181). Furthermore, method-specific lethality is higher among males (68). Thus, it is possible that males who engaged in high lethality methods may have been more likely to have a fatal repeat

episode. This could partly account for the increased risk of non-fatal repetition associated with two high lethality methods among females but not males.

Self-cutting was more frequent in males in the present study. This is in contrast to the view that self-cutting as a more common method among females (182). However, the finding is consistent with previous studies in Ireland (34-36, 62), and with a number of international studies that report a predominance of males presenting to the ED with self-cutting (9, 64, 65). This may reflect the tendency of males to engage in more severe acts of self-cutting (61) and thus they may be more likely to attend hospital as a result of an act of self-cutting, compared with females (183). Although, those presenting with self-cutting are less likely to receive a biopsychosocial assessment (52), it is unlikely that the overrepresentation of men is due to issues in recording lower lethality presentations made by females because the NSHRI collects data on all self-harm cases that present to hospital, including those not seen / assessed. Furthermore, the DROs are trained to record all cases of self-harm irrespective of severity or suicidal intent. Strengths and limitations

This study used data from a national surveillance system including all self-harm presentations to hospital EDs over a seven-year period. The large sample size allowed for the examination of risk factors for self-harm repetition that have received limited attention in previous research. Due to the complete national coverage of hospital-presented self-harm, loss at follow-up was minimised. Analyses were limited to individuals with no self-harm presentation in the 3 years prior to the study period to maximise the likelihood that first patient presentations included in the analyses were first ever presentations. This reduces the potential for results to be biased by lack of information on self-harm history. All repeat presentations, rather than first repeat presentations only, were examined in the sample to avoid an underestimation of repetition (52). However, because individuals commonly switch methods of self-harm from one episode to the next, results from analyses using repeat event analysis need to be interpreted with care (53, 184). There were some limitations to the study.

This study focuses on hospital cases of self-harm only. Therefore, findings cannot be generalised to self-harm repetition not resulting in a hospital presentation. A further limitation relates to missing data: number of tablets taken in IDO and treatment for self-cutting were not recorded in a substantial proportion of presentations (28.7% and 12.1% respectively) as the variables were not always recorded in the case notes. Furthermore, information on toxicology of IDOs was not available. Consequently, data on drugs taken and quantity of tablets taken were based on self-report. In addition, information is not available from the NSHRI on drugs prescribed to the patient at the time of the IDO. Therefore, it was not possible to examine the impact of access to certain drugs and their involvement in IDO. Finally, information on suicide or other causes of mortality is not recorded by the NSHRI. Therefore, cases will have been included in the analyses that should have been censored due to loss of life. As risk of suicide differs according to method of previous non-fatal self-harm (7, 8), it is likely that this will have influenced our results.

3.5.4. Implications

This study found that non-fatal self-harm repetition differs according to specific characteristics of the index self-harm method(s). This highlights that detailed consideration of method of self-harm should form a routine part of biopsychosocial assessment and management of risk and need for self-harm patients.

Previous research has found that hospital care following self-harm presentations to hospital varies depending on the method used, where self-cutting patients were less likely to receive a psychosocial assessment (52). Attitudes to individuals presenting with self-harm vary among healthcare staff (94) and may conceivably contribute to less than optimal experience of care. Minor self-cutting and self-harm by blunt object were identified as significant predictors of repetition. This highlights the necessity for assessment and intervention even if the injuries sustained require little or no medical treatment (52, 61) as they are likely to recur. The study also identified increased severity of self-cutting, a method characteristic previously associated

with high lethality repeat presentations (61), as a predictor of repetition. There is a need for staff educational initiatives and care pathways for plastics surgery services to ensure that all such presentations receive a timely biopsychosocial assessment. Consideration should also be given to mental health service provision of enhanced follow-up for self-cutting presentations that require sutures or plastics intervention.

International guidelines highlight the critical role that clinicians' prescribing practices play in self-harm management and suicide prevention (12, 76, 79). The increased repetition risk associated with multiple drug IDOs in our sample underline the importance of monitoring the availability of multiple drugs, particularly to patients prescribed psychotropic drugs. Furthermore, due to the potential dangers associated with some psychotropic drugs, care should be taken where possible to prescribe drugs that are least toxic in IDO (76, 79). Ongoing awareness training with clinicians may be beneficial to reduce inappropriate prescribing of drugs commonly used in IDO that are associated with increased risk of repetition (12). Limiting the duration/amount of medication prescribed and dispensed for self-harm patients should be considered as a matter of routine. Collaboration with carers to reduce availability of and access to other medication at home should be a routine part of safety planning.

A word of caution is that due to the frequency of method switching between presentations (184), characteristics of self-harm method alone should never be used as static predictors of subsequent repetition. We found that risk of repeated self-harm was high irrespective of the method and a person's risk increased substantially with each repeat presentation. All presentations following self-harm, regardless of method, should receive a standard of assessment and care that includes standardised triage, biopsychosocial assessment, access to skilled clinicians, involvement of family/carers, emergency care plans and appropriate follow-up (49, 76, 79).

Chapter 4. Assessment and self-harm repetition following high risk self-harm presentations to hospital: a cohort study

Authors

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4.1. Abstract

Recent research indicates a rising trend in high-risk self-harm (HRSH) presentations to hospital. This study compared HRSH to other hospital-presented self-harm with respect to: individual characteristics; rate of not receiving a biopsychosocial assessment; and risk of 12-month self-harm repetition. Data were obtained from the National Self-harm Registry Ireland and the Improving Prediction and Risk Assessment of Self-Harm and Suicide (IMPRESS) study. Poisson regression models were estimated. HRSH cases represented one in nine (11.3%, n=345) of the 3,051 self-harm patients in the study cohort. HRSH was significantly more prevalent among persons aged 45-64 years (17.4%), those with a history of one or multiple recent self-harm presentations (14.5%, 17.6%, respectively) and in presentations involving alcohol (21.3% vs 7.7%). Risk of not receiving a biopsychosocial assessment was significantly lower for HRSH patients (7.8% vs 17.4%). HRSH patients showed a similar risk of repetition as other self-harm patients (18.3% vs 16.0%). It is encouraging that rates of non-assessment were especially low in HRSH patients as biopsychosocial assessment is a key component of clinical management of self-harm. Our findings underline the importance of comprehensive screening of self-harm patients for alcohol misuse and dual diagnoses, particularly among those presenting with HRSH.

4.2. Introduction

Recent research indicates a rising trend in the use of highly lethal methods of self-harm (37, 43, 69). These methods are also associated with high suicidal intent (22). Individuals presenting to hospital with self-harm of high lethality or high suicidal intent represent the subgroup of self-harm patients who have come closest to ending their lives (20) and are at increased risk of subsequent suicide (4, 7-11)**.** Previous studies have suggested that the most serious cases of self-harm share similar characteristics with individuals who have died by suicide (20, 27, 143, 144). Few studies have examined the profile of this subgroup of high-risk self-harm (HRSH) patients in comparison with other lower risk self-harm presentations.

Presenting to an emergency department (ED) following a HRSH self-harm act provides an opportunity for suicide prevention among this high-risk group. A thorough biopsychosocial assessment is essential at this juncture to determine the needs and risks of each patient and to tailor their aftercare accordingly (81). Although clinical guidelines recommend that all self-harm patients should receive an assessment (12, 76, 77, 79, 80), considerable variation in assessment rates have been reported previously, as low as 22% (54, 81). It has been hypothesised that persons are selected for assessment based on their clinical severity or perceived risk (82, 83) but this has yet to be directly examined. Therefore, it is unknown what proportion of HRSH patients are among those not being assessed.

Repetition of self-harm is one of the strongest predictors of subsequent suicide (11, 48). Knowledge of the relationship between HRSH and repetition is crucial to the assessment and treatment of persons presenting with these serious self-harm acts. Previous studies have indicated that repetition risk is highest among those presenting with low severity self-harm, particularly repeated episodes of minor self-cutting (10, 61). However, increased risk of repetition following highly lethal self-harm has also been reported (119). No previous studies have examined repetition risk following a HRSH presentation in comparison with other self-harm presentations.

In the current study, we aimed to describe the profile of individuals presenting to hospital with HRSH in comparison with other self-harm patients; and to examine whether HRSH patients were at increased or decreased risk of not receiving a biopsychosocial assessment and of subsequently presenting with further self-harm.

4.3. Methods

4.3.1. Study design and setting

An observational cohort study including all self-harm patients presenting to three urban hospitals in the Republic of Ireland, from December 2014 to February 2018 (inclusive), was conducted. A subgroup of patients was identified from the study cohort that had presented with HRSH. Baseline characteristics, not receiving a biopsychosocial assessment and 12-month hospital presented self-harm repetition were examined in HRSH patients in comparison with other self-harm patients in the cohort.

4.3.2. Case definitions and eligibility criteria

Cases included in the full cohort were adults aged 18 years or older, presenting to one of the study hospitals with self-harm defined as: 'an act with non-fatal outcome in which an individual deliberately initiates a non-habitual behaviour, that without intervention from others will cause self-harm, or deliberately ingests a substance in excess of the prescribed or generally recognised therapeutic dosage, and which is aimed at realising changes that the person desires via the actual or expected physical consequences' (17). HRSH refers to self-harm acts that involved a method associated with high lethality and/or medical severity and/or high suicidal intent. HRSH cases were self-harm patients who met at least one of the following criteria (3, 4, 20, 29):

(i) Extensive medical treatment (including treatment in specialised units including intensive care unit, surgery under general anaesthesia, antidotes for drug overdoses, telemetry or repeated tests).

(ii) Self-harm involving method(s) with high risk of fatality (including attempted hanging, self-strangulation, self-asphyxiation, attempted drowning, jumping from a height or in front of a moving vehicle, crashing a motor vehicle, or gunshot) if witnessed or any other physical evidence of use of high lethality method.

(iii) Clinical impression of high suicide intent.

4.3.3. Data collection and linkage

This study draws on information from two datasets with overlapping data on self-harm presentations to the study EDs: the National Self-Harm Registry Ireland (NSHRI) and the Improving Prediction and Risk Assessment of Self-Harm and Suicide (IMPRESS) study (Figure 8). The NSHRI routinely collects data on all self-harm presentations to EDs in all 36 acute hospitals in the Republic of Ireland. Information on data collection procedures and quality assurance has been reported previously (38). The NSHRI collects data on all self-harm presentations, including multiple presentations made by the same individuals. For the purpose of this study, the first presentation made by an individual during the study period was taken as their index act.

The IMPRESS study identified a consecutive series of patients presenting to the three study EDs with HRSH. Identification of HRSH acts was primarily carried out by the psychiatric teams in the EDs. Members of the study team collaborated with the hospital staff in the classification of HRSH cases and reviewed hospital records to assess the application of the eligibility criteria at regular intervals. Identification of HRSH patients for the IMPRESS study was not limited to individuals who engaged with the psychiatric service in the ED, also including individuals who presented to the ED and left without being seen. The IMPRESS study involved data collection on HRSH patients from ED records and psychiatric files and the recruitment of patients to participate in a prospective interview study. The IMPRESS dataset used in this study is from the data collected from the hospital files. The IMPRESS dataset includes one act only for each person.

The subgroup of HRSH patients within the NSHRI dataset was identified by linking it with the IMPRESS dataset. The NSHRI data is pseudonymised with a unique code for every individual based on encrypted initials, sex and date of birth. For each HRSH patient in the IMPRESS dataset, a code was generated using the same encryption method used by the NSHRI. HRSH patients were matched to patients in the NSHRI dataset who had the same unique code. Where there was no corresponding unique code in the NSHRI dataset, HRSH patients were matched to patients in the NSHRI dataset based on age, sex, date, method of self-harm and presenting hospital. It was not possible to find a match in the NSHRI dataset for 36 HRSH patients identified by the IMPRESS study, indicating that there was no record of their self-harm presentation in the NSHRI. The likelihood of multiple presentations by the same individual being missed by the NSHRI data collection was considered small. Therefore, these cases were included in the NSHRI dataset and it was assumed that they had made no other self-harm presentations to hospital during the study period. In a sensitivity analysis, all analyses were repeated that excluded this group of 36 unmatched HRSH patients and the findings remained stable.

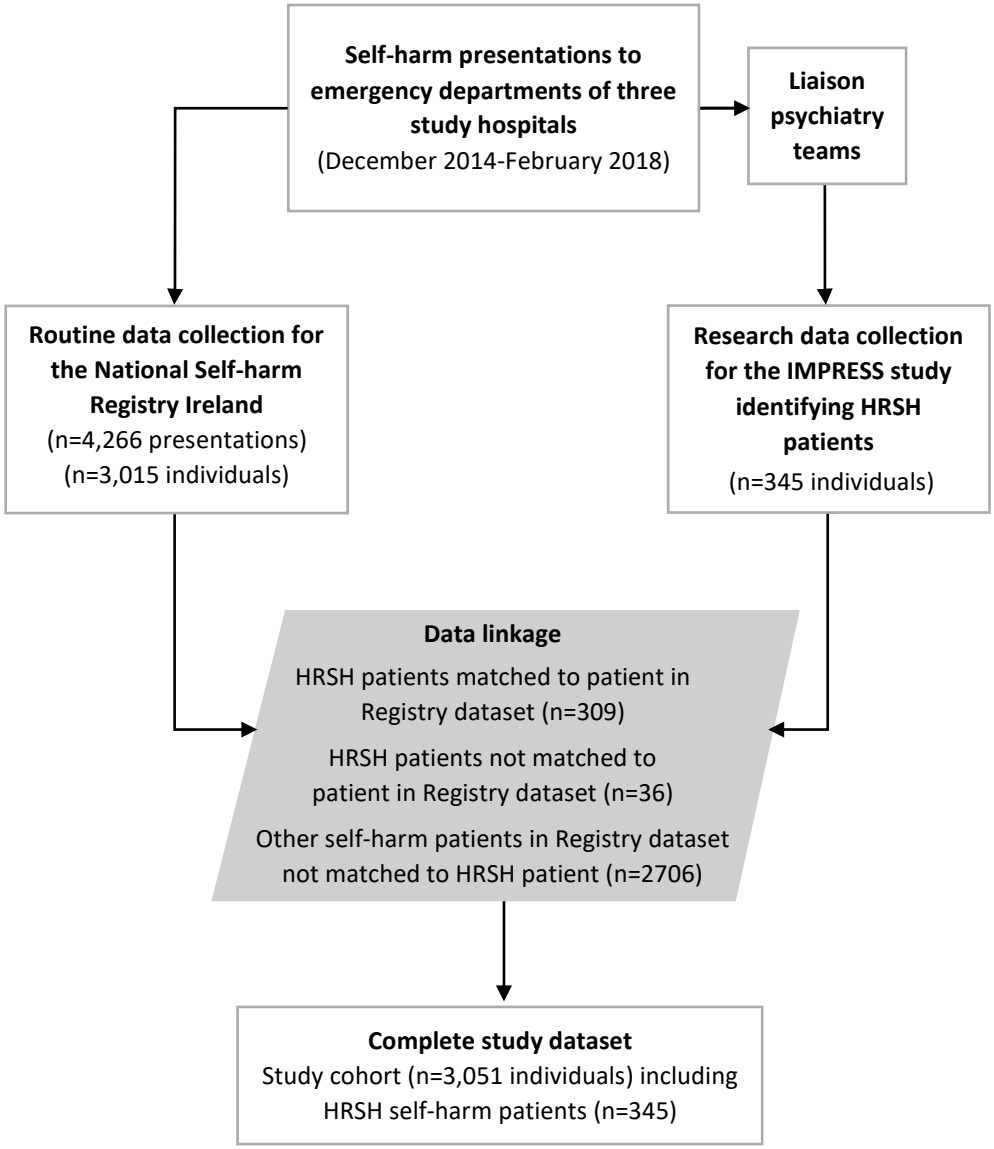


Figure 8. Overview of data collection and data linkage

4.3.4. Data items

The following data items collected for the NSHRI and the IMPRESS dataset were included: sex, age, self-harm method(s), alcohol involvement and receipt of biopsychosocial assessment. Method(s) of self-harm was recorded according to the Tenth Revision of the WHO's International Classification of Diseases (ICD-10) codes for intentional injury (50). IDO was defined as the intentional ingestion of more than the prescribed or recommended dose of any drug, as well as IDO of illegal drugs (ICD codes X60-X64). IDO was categorised according to

patient-reported number of drugs and class of drugs taken. Self-poisoning was defined as the ingestion of substances other than drugs, including organic solvents, pesticides, gases and other noxious substances (ICD codes X66-X69). Biopsychosocial assessment was recorded by the IMPRESS study for HRSH patients and by the NSHRI for other self-harm patients. Information on what healthcare professional conducted the biopsychosocial assessments was not available for all patients. Receipt of biopsychosocial assessment was not known for all patients (18.8%). Recent self-harm history and self-harm repetition was acquired from the NSHRI dataset. Recent self-harm history was defined as the number of self-harm presentations made by a person to any ED in the Republic of Ireland in the 2 years prior to their index presentation. Self-harm repetition was defined as a presentation to an ED as a result of a self-harm presentation to any ED in the Republic of Ireland in the 12 months following their index self-harm presentation. All patients were followed-up for the same length of time (12 months).

4.3.5. Statistical analyses

Analyses were carried out using SPSS 26 and Stata 12 IC for Windows. Chi-squared tests were used to examine the prevalence of HRSH according to individual and episode characteristics. Poisson regression models were used to calculate unadjusted and adjusted risk ratios (RR) for the two outcome variables: no biopsychosocial assessment following index self-harm presentation and repeated self-harm presentation to hospital within 12 months. RRs are a comparison of the risk of an outcome in one group with the risk of an outcome in another group. In this study, the RRs represent the risk of no biopsychosocial assessment and risk of hospital presented self-harm repetition in HRSH patients compared to other self-harm cases.

4.3.6. Ethics statement

The Clinical Research Ethics Committee of the Cork University Teaching Hospitals and the HSE Mid-Western Regional Hospital Research Ethics Committee granted ethical approval for this study. Ethical approval for the NSHRI was received from the National Research Ethics

Committee of the Faculty of Public Health Medicine and the relevant hospital or Health Service Executive ethics committees. Approval has also been granted for the NSHRI by the Health Research Consent Declaration Committee.

4.4. Results

4.4.1. Prevalence of HRSH

Of the 3,051 individuals that presented with self-harm during the study period, 11.3% (n=345) presented with a HRSH act (Table 5). There were significant age differences in the prevalence of HRSH; with an overrepresentation of HRSH cases among those aged 45-64 years (17.4%), while just 7.6% of those aged 18-24 years presented with HRSH (χ^2= 37.1, p<0.001). HRSH acts were significantly more common among individuals presenting with attempted hanging (26.6%), self-poisoning with substances other than drugs (23.5%) and attempted drowning (15.5%), and less prevalent among those presenting with self-cutting (4.8%; χ^2=90.6, p<0.001). There was an increased prevalence of HRSH episodes among IDO presentations that involved multiple drug types (17.7%; χ^2=20.9, p<0.001). Similarly, HRSH presentations were overrepresented in IDOs that involved paracetamol (29.4%; χ^2=152.6, p<0.001), SSRIs (23.0%; χ^2=34.0, p<0.001), tricyclic antidepressants (27.5%; χ^2=12.6, p<0.001) and anti-epileptic drugs (22.5%; χ^2=18.3, p<0.001). One in five presentations involving alcohol were HRSH (21.3%), compared with just 7.7% of presentations that did not involve alcohol (χ^2=108.0, p<0.001). HRSH was significantly more common among those with a recent history of self-harm, particularly those with multiple recent presentations (17.2%), compared with individuals with no recent presentations (10.7%; χ^2=8.7, p=0.013).

Table 5. Baseline characteristics of hospital presenting self-harm and prevalence of high-risk self-harm (HRSH).

		All (3051)		Prevalence of high-risk self-harm (345, 11.3%)		
		n	%	n	%	*p*
Sex	**Male**	1575	51.6	181	11.5	
	Female	1476	48.4	164	11.1	0.740
Age	**18-24**	852	27.9	65	7.6	
	25-44	1357	44.5	142	10.5	
	45-64	689	22.6	120	17.4	
	65+	153	5.01	18	11.8	<0.001
Self-harm method	**IDO**	1,797	58.9	211	11.7	
	Self-cutting	664	21.8	32	4.8	
	Attempted hanging	203	6.7	54	26.6	
	Attempted drowning	148	4.9	23	15.5	
	Self-poisoning	51	1.7	12	23.5	
	Other methods	187	6.1	12	6.4	<0.001
Alcohol involvement	**No**	777	25.5	175	7.7	
	Yes	2272	74.5	165	21.3	<0.001
Previous self-harm	**None**	2672	87.6	285	10.7	
presentations (in last	**One**	227	7.4	33	14.5	
2 years)	**Two or more**	152	5.0	27	17.6	0.008

4.4.2. Biopsychosocial assessment and HRSH

Of the patients that presented with HRSH, just 7.8% did not receive a biopsychosocial assessment (n=27) (Table 6). In unadjusted analysis including patients for whom receipt of assessment was known (n=2477, 81.2%), HRSH patients had a significantly lower risk of non-assessment compared with other self-harm patients (RR 0.45 (95% CI 0.31-0.77)). In adjusted analysis, risk of non-assessment remained significantly lower among HRSH patients (RR 0.39 (95% CI 0.25-0.60)). In the adjusted model, risk of not receiving an assessment was lower among females compared to males (RR 0.64 (95% CI 0.53-0.79)). Compared to the youngest age group (18-24 years), risk of non-assessment was significantly higher among those aged 25-44 years (RR 1.33 (95% CI 1.04-1.70)), while persons aged 65 or over had significantly lower risk of non-assessment (RR 0.50 (95% CI 0.25-0.99)). Risk of not receiving an assessment was significantly higher for individuals with two or more recent self-harm presentations, compared to those with none (RR 1.88 (95% CI 1.35-2.75)).

Factors associated with non-assessment were examined separately for HRSH and other self-harm patients. The relationship between recent self-harm history and not receiving an assessment was more pronounced for HRSH patients. Of the HRSH patients, 22.2% of those with a history of multiple recent self-harm presentations were not assessed, compared with 5.6% of those with a history of none or one recent presentation (Adjusted RR 4.28 (95% CI 1.42-12.9)). Of the other lower risk self-harm patients with multiple recent self-harm presentations, 28.1% were not assessed compared with 17.0% of those without multiple recent acts (Adjusted RR 1.78 (95% CI 1.120-2.65)). Among HRSH patients, self-cutting was also associated with increased risk of non-assessment (Adjusted RR 4.05 (95% CI 1.38-11.94).

Table 6. Risk of not receiving biopsychosocial assessment by HRSH patient status, adjusting for other individual and episode characteristics.

		No biopsychosocial assessment (397, 16.0%)				
		n	***%***	**Unadjusted RR (95% CI)**	**Adjusted RR (95% CI)**	***p***
High risk self-harm	**No**	370	17.4	1	1	
	Yes	27	7.8	0.45 (0.31-0.67)	0.39 (0.25-0.60)	<0.001
Sex	**Male**	243	19.2	1	1	
	Female	154	12.7	0.66 (0.54-0.81)	0.64 (0.52-0.79)	<0.001
Age	**18-24**	94	14.4	1	1	
	25-44	218	19.6	1.36 (1.07-1.73)	1.33 (1.04-1.70)	0.021
	45-64	76	13.0	0.90 (0.67-1.22)	0.95 (0.70-1.29)	0.733
	65+	9	7.3	0.50 (0.25-1.00)	0.50 (0.25-0.99)	0.049
Self-harm method	**Intentional drug overdose**	235	15.9	1	1	
	Self-cutting	92	17.7	1.12 (0.88-1.42)	0.97 (0.76-1.24)	0.803
	Attempted hanging	22	12.7	0.80 (0.52-1.24)	0.77 (0.49-1.20)	0.247
	Attempted drowning	18	13.6	0.86 (0.53-1.39)	0.80 (0.49-1.20)	0.371
	Self-poisoning	5	14.3	0.90 (0.37-2.18)	1.08 (0.44-2.63)	0.865
	Other methods	24	17.4	1.09 (0.72-1.67)	0.96 (0.63-1.47)	0.868
Alcohol involvement	**No**	294	16.7	1	1	
	Yes	98	13.8	0.83 (0.66-1.04)	0.90 (0.71-1.14)	0.380
Previous self-harm presentations (in last 2 years)	**None**	334	15.5	1	1	
	One	30	15.5	1.00 (0.69-1.45)	1.00 (0.69-1.47)	0.991
	Two or more	33	26.8	1.74 (1.21-2.48)	1.88 (1.30-2.71)	0.001

4.4.3. Self-harm repetition and HRSH

In the 12 months following their index self-harm presentation, 63 of the HRSH patients (18.3%) made a repeat self-harm presentation to hospital (Table 7). There was no difference in the risk of repetition between HRSH and other self-harm patients in crude (RR 1.14 (95% CI 0.88-1.49)) and adjusted analyses (RR 1.03 (95% CI 0.76-1.28)). One in three individuals with a history of one recent self-harm presentation repeated in the 12 months following their index act (33.9%), while one in two individuals with multiple recent presentations repeated (48.3%). In adjusted analysis, a history of one recent presentation was associated with 2.56 times the risk of repetition (95% CI 1.96-3.34) compared to those with no recent history and multiple recent presentations was associated with an increased risk of 3.61 (95% CI 2.71-4.81). Receiving a biopsychosocial assessment was not associated with 12-month repetition.

In analyses examining factors associated with repetition risk separately for HRSH and other self-harm patients, recent self-harm history was a stronger predictor of repetition following HRSH. Among HRSH patients with a history of multiple recent presentations, 66.7% made a repeat self-harm presentation within 12 months, compared with 13.2% of HRSH patients with no recent history of self-harm (Adjusted RR 5.82 (95% 3.14-10.79)). Among other self-harm patients with multiple previous presentations, 44.0% repeated compared with 13.3% of those without a recent history of self-harm (Adjusted RR 3.11 (95% 2.23-4.33)).

Table 7. Risk of 12-month self-harm repetition by HRSH patient status, adjusting for other individual and episode characteristics.

		12-month repetition (497, 16.3%)				
		n	***%***	**Unadjusted RR (95% CI)**	**Adjusted RR (95% CI)**	***p***
High risk self-harm	**No**	434	16.0	1	1	
	Yes	63	18.3	1.14 (0.88-1.49)	1.01 (0.77-1.35)	0.920
Psychosocial assessment	**No**	72	18.1	1.08 (0.84-1.39)	0.99 (0.76-1.28)	0.911
	Yes	350	16.8	1	1	
	Unknown	75	13.1	0.78 (0.60-1.00)	0.78 (0.61-1.01)	0.061
Sex	**Male**	242	15.4	1	1	
	Female	255	17.3	1.12 (0.94-1.34)	1.06 (0.89-1.27)	0.512
Age	**18-24**	147	17.3	0.98 (0.80-1.20)	1.06 (0.86-1.31)	0.561
	25-44	239	17.6	1	1	
	45-64	99	14.4	0.82 (0.65-1.03)	0.84 (0.66-1.06)	0.141
	65+	12	7.8	0.45 (0.25-0.80)	0.52 (0.29-0.93)	0.028
Self-harm method	**Intentional drug overdose**	285	15.9	1	1	
	Self-cutting	119	17.9	1.13 (0.91-1.40)	1.05 (0.84-1.34)	0.669
	Attempted hanging	34	16.8	1.06 (0.74-1.51)	1.04 (0.73-1.49)	0.827
	Attempted drowning	26	17.6	1.11 (0.74-1.65)	0.98 (0.66-1.48)	0.936
	Self-poisoning	7	13.7	0.87 (0.41-1.83)	1.03 (0.48-2.19)	0.940
	Other methods	26	13.9	0.88 (0.59-1.31)	0.91 (0.61-1.37)	0.654
Alcohol involvement	**No**	358	15.8	1	1	
	Yes	138	17.8	1.13 (0.93-1.37)	1.04 (0.84-1.27)	0.738
Previous self-harm presentations (in last 2 years)	**None**	347	13.0	1	1	
	One	77	33.9	2.61 (2.04-3.34)	2.56 (1.98-3.26)	<0.001
	Two or more	73	48.3	3.72 (2.89-4.79)	3.61 (2.79-4.69)	<0.001

4.5. Discussion

This is one of few studies examining the profile of the most serious cases of self-harm presenting to the ED**.** HRSH acts accounted for one in nine self-harm presentations during the study period. HRSH was associated with being 45-64 years of age, having a history of recent self-harm presentations and alcohol involvement in the self-harm act. HRSH was less prevalent among persons presenting with self-cutting. Individuals presenting to hospital with HRSH had a significantly lower rate of non-assessment. With the exception of self-harm history, HRSH status was the strongest predictor of receiving a biopsychosocial assessment. HRSH patients showed the same risk of non-fatal self-harm repetition as other self-harm patients.

Previous studies have indicated that the most serious cases of self-harm share similar characteristics with individuals who have died by suicide (20, 27, 143, 144). The age profile of HRSH patients in our sample is reflective of this with significantly more HRSH acts occurring in the 45-64 years age group (185). However, the significant preponderance of men that is a consistent characteristic of the profile of suicide cases (185), also reported in a previous study of 'near fatal' self-harm episodes (29), was not evident in our study. In line with the findings of Douglas et al (29), there was no association between IDO and HRSH in the present study, with the proportion of IDO episodes involving HRSH patients reflecting the pattern seen in the overall self-harm population (186). We did however see some evidence of HRSH IDOs being more 'serious' with an increased involvement of multiple drug types and more toxic drugs, including tricyclic antidepressants. High lethality methods, particularly attempted hanging and self-poisoning with substances other than drugs, were significantly more common among HRSH episodes. Self-cutting was uncommon among HRSH patients indicating that a minority of cutting presentations were of high medical severity and suggesting a profile of lower suicidal intent for self-cutting presentations, in keeping with other studies (61, 186). However, this does not indicate that self-cutting presentations should be considered low risk because considerable evidence shows that patients presenting with self-cutting, particularly less severe episodes, experience prolonged distress with significantly higher risk of repetition compared to other methods (73, 186).

Alcohol involvement was significantly more prevalent in HRSH presentations compared to other self-harm presentations. This finding is in keeping with a previous study which found that those presenting with high lethality acts were more likely to be misusing alcohol (129). This strong relationship between alcohol and HRSH is important to note, given that individuals using and misusing alcohol at the time of a self-harm episode have been identified as a particularly vulnerable group at increased risk of subsequent self-harm repetition and suicide (187, 188). Furthermore, evidence suggests that self-harm patients who have consumed

alcohol receive less comprehensive assessment and aftercare (78, 189, 190). However, this is not supported by the results of the present study which found no association between alcohol involvement and being assessed. Improved expertise in the assessment of potential alcohol disorders or dual diagnoses should be prioritised among HRSH self-harm patients so that aftercare can be tailored to the complex needs of those presenting with self-harm who are misusing alcohol (191).

Less than 10% of HRSH patients did not receive a biopsychosocial assessment. Given the increased risk of subsequent suicide following self-harm involving high lethality methods of self-harm and high suicidal intent, it is encouraging that the majority of HRSH patients are being assessed. However, while certain forms of aftercare would not be suitable for all self-harm patients, international guidelines indicate that all self-harm patients, irrespective of clinical severity or perceived risk, should receive a biopsychosocial assessment. In line with our finding that there was no relationship between non-assessment, the protective effect of assessment has not been found consistently across studies, with some previous research indicating that assessment may be related to an increase in self-harm repetition (83). Previous studies posit that findings indicating either nil or a harmful effect may be biased by an approach to selecting patients for assessment whereby only those considered to be at greatest risk of adverse outcomes are assessed (83, 84, 93). We observed that HRSH episodes are at significantly lower risk of non-assessment which supports this 'confounding by indication'. When using appropriate methods to address this confounding, non-assessment has been found to increase risk of subsequent repetition following hospital presented self-harm (84).

In the 12 months following the index self-harm episode, 16% of persons presented to hospital with a repeat self-harm act, a rate that is consistent with a systematic review of international studies (47). We found that HRSH patients showed the same risk of repetition as other self-harm patients. To our knowledge, no previous study examines risk of hospital presented

repetition following HRSH in comparison with other self-harm presentations. Our findings add to the existing evidence indicating the complexity of the relationship between the severity of a self-harm episode and non-fatal repetition. Elevated risk of repeat presentations has been reported following violent or medically serious suicide attempts (119) while other examinations of high lethality methods and subsequent repetition have found no association or decreased risk of repetition compared with lower lethality methods (10, 186). Studies of IDO and self-cutting in relation to repetition also present conflicting findings with greater severity of self-cutting associated with reduced repetition risk (61, 186) and greater drug quantity in intentional drug overdose conferring increased repetition risk (186). While it was not possible to investigate whether repeated self-harm acts were high risk or not in the present study, a finding that is consistent across previous studies is that lethality of repeated self-harm is elevated following HRSH acts (61, 119, 133).

Recent self-harm history emerged as an important factor related to HRSH, non-assessment and self-harm repetition, emphasising that multiple self-harm repeaters represent a vulnerable group of self-harm patients. Greater prevalence of HRSH among those with a recent history of self-harm is consistent with previous findings relating to 'near fatal' self-harm (29). Prevalence of HRSH acts increased further among those with multiple recent self-harm presentations. Keeping in mind that HRSH patients represent self-harm patients who come closest to ending their lives, these findings are in line with previous research highlighting a strong link between increasing number of repeat self-harm acts conferring increased risk of suicide (48, 192). Despite this, history of multiple recent self-harm presentations increased the risk of non-assessment considerably in our study. This is in keeping with the findings of one previous study that found that history of self-harm was associated with increased non-assessment (78) but in conflict with others that did not confirm this association (83, 84). Notably, the aforementioned studies dichotomised self-harm history rather than examining single and multiple previous acts as in the present study. We found no relationship between

one recent self-harm presentation and assessment, and a 2-fold increased risk of non-assessment among those with multiple recent self-harm acts. Previous evidence has reported negative attitudes among healthcare professionals towards those with a history of repetition (109, 110). This may conceivably contribute to non-assessment when studies have shown that multiple self-harm repeaters may benefit from empathetic interactions that legitimise their distress (97, 193). The only factor that was significantly associated with repetition in our data was recent self-harm; adding to the abundance of previous research indicating that the strongest predictor of repeated self-harm is a history of previous acts, with greater risk as number of previous acts increases (38, 73, 186). Furthermore, this study reported a novel finding that self-harm history was a stronger predictor of repetition among HRSH patients. Of those with a history of multiple recent presentations, 67% of HRSH patients had a repeated presentation compared to 44% of other lower risk self-harm patients. This further emphasises the necessity for assessment of self-harm repeaters, even if the individual has already been assessed by the service previously or is currently engaged with the mental health services, as they are the self-harm patients most likely to represent.

This study used data from a surveillance system including all self-harm presentations to three urban hospital EDs and data on HRSH acts that included consecutive patients identified according to a standardised procedure. Due to the complete national coverage of hospital-presented self-harm, loss at follow-up was minimised, which is a strength of this method. The examination of prevalence of HRSH and psychosocial assessment across three different hospitals adds further weight to conclusions drawn from this study. There were some limitations to the study. HRSH cases were primarily identified and classified by members of the psychiatry teams in the hospitals who had a multitude of competing clinical duties, which may have resulted in missed HRSH cases. However, members of the study team visited the hospitals at regular intervals to review the files and ensure that all eligible cases were identified. While self-harm patients who left the hospital before being seen were reviewed by

the psychiatry teams to identify HRSH cases, it is possible that cases were missed where information documented in the ED prior to their departure was limited. Conversely, it is also possible that, due to the inclusion criteria used in this study, cases of self-harm with low suicidal intent and low medical severity were classified as HRSH. For example, the inclusion criteria for HRSH include IDO presentations where a medical intervention was deemed necessary, including N-acetylcysteine treatment for paracetamol overdoses. Given the high proportion of paracetamol involvement in HRSH presentations, it is likely that some cases involved impulsive IDOs of paracetamol with low suicidal intent that may not have resulted in serious consequences without the intervention. Furthermore, in line with the Tenth Revision of the ICD-10 codes for intentional injury (50), attempted self-strangulation and self-asphyxiation were included in an overall method category with attempted hanging. These methods are associated with lower lethality than attempted hanging, which may have led to the inclusion of presentations in the HRSH group that should have been in the lower severity self-harm group. However, cases of self-strangulation and self-asphyxiation accounted for just 11% of the method category and cases were only included when: the individual was unconscious as result of the act; the person was conscious but was witnessed in suspension or using a ligature and had physical evidence of asphyxiation; or there was physical evidence of suspension or strangulation. Suicidal 'gestures' with a ligature were not included. Nonetheless, if presentations were classified as HRSH in error, this may have impacted the findings arising from a comparison between HRSH presentations with lower severity cases.

A further limitation relates to missing data: receipt of biopsychosocial assessment was not recorded in a substantial proportion of presentations (18.8%). Those who collected the data for this study were not hospital staff and only had access to certain hospital records. Therefore, it is likely that the high proportion of missing data for this variable is related to a lack of integration of records between departments / recording systems within the hospitals. Data linkage was probabilistic due to cases in the NSHRI being pseudonymised. Therefore, we

cannot be certain that all cases matched between datasets were definitely the same person and that no matches were missed. Information on suicide or other causes of mortality was not available meaning that cases may be included in the repetition analyses that should have been excluded due to loss of life. As the HRSH subgroup are likely to have increased suicide risk (4, 7-11), this may have influenced the results. Furthermore, while there was no difference in repetition risk between HRSH patients and those presenting with lower severity self-harm, it is possible that HRSH patients were more likely to repeat with a subsequent act of HRSH (61, 119, 133). This could not be investigated in the present study because repeated self-harm presentations were identified by the NSHRI which collects a minimal set of variables on each presentation. HRSH patients were identified at baseline for the IMPRESS study via the application of the case definition and inclusion criteria by nurses, clinicians and researchers. It was not possible to identify HRSH repeat presentations using the same procedure. Finally, this study focuses on hospital cases of self-harm only. Therefore, findings cannot be generalised to self-harm repetition not resulting in a hospital presentation.

This study of HRSH patients contributes to our understanding of the most serious cases of hospital presented self-harm and how clinical severity relates to assessment and subsequent repetition. While HRSH does not confer an increased risk of non-fatal repetition, HRSH acts were more likely to occur among those who were middle aged and those with a history of recent self-harm, factors which are in themselves risk factors for suicide (48, 185, 192). Furthermore, HRSH was strongly related to alcohol consumption emphasising the importance of comprehensive screening for alcohol misuse following a self-harm presentation, with appropriate follow-up care planning (191). Biopsychosocial assessment is a central component of the management of self-harm in the ED, with the objective of assessing biological, psychological, and social needs, assessing risk of subsequent self-harm or suicide and determining appropriate aftercare (76, 77). In the full cohort, rates of non-assessment were low. A small minority of persons presenting with HRSH did not receive a biopsychosocial

assessment. While this is encouraging, a significantly greater rate of non-assessment was observed among other self-harm patients. Not providing an assessment to all patients represents a missed opportunity for intervention with people presenting to hospital with lower severity self-harm who may be experiencing ongoing distress (84).

Chapter 5. Factors associated with psychiatric admission and subsequent self-harm repetition: a cohort study of high-risk hospital-presenting self-harm

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5.1. Abstract

Background: Individuals presenting to hospital with self-harm of high lethality or high suicidal intent are at high risk of subsequent suicide.

Aim: To examine factors associated with psychiatric admission and self-harm repetition following high risk self-harm (HRSH).

Method: A cohort study of 324 consecutive HRSH patients was conducted across three urban hospitals from December 2014 to February 2018. Information on hospital-presenting self-harm repetition was extracted from the National Self-harm Registry Ireland. Logistic regression models examined predictors of psychiatric admission and self-harm repetition. Propensity score (PS) methods were used to address confounding.

Results: Forty percent of the HRSH cohort were admitted psychiatrically. Factors associated with admission were: living alone, depression, previous psychiatric admission, suicide note and uncommon self-harm methods. History of emotional, physical or sexual abuse was associated with not being admitted. Twelve-month self-harm repetition occurred in 17.3% of cases. Following inverse probability weighting according to the PS, psychiatric admission following HRSH was not associated with repetition. Predictors of repetition were: recent self-harm history, young age (18-24 years) and previous psychiatric admission.

Conclusion(s): Findings indicate that psychiatric admission following HRSH is not associated with repeated self-harm and reaffirms the consistent finding that history of self-harm and psychiatric treatment are strong predictors of repetition.

5.2. Introduction

Repeated self-harm is associated with increased risk of suicide, and this risk increases further with multiple repeated episodes (11, 48). Individuals presenting to hospital with self-harm of high lethality or high suicidal intent represent the self-harm patients who have come closest to ending their lives (20) and are at high risk of subsequent suicide (4, 7-11)**.** This subgroup of high-risk self-harm (HRSH) patients are more likely to have a history of self-harm and to use highly lethal methods in repeated episodes (61), compared to those presenting with lower severity self-harm. Presentation to clinical services provides an important opportunity for intervention among this vulnerable group. To aid clinicians in assessment and treatment allocation, it is important to have an understanding of characteristics of HRSH presentations that confer greater risk of repetition (49, 76, 79). Little is known about predictors of repetition following HRSH presentations to the emergency department (ED).

In order to continually improve the care provided to individuals presenting with HRSH, an understanding of current approaches to aftercare and their impact on patient outcomes is also needed (84, 86, 87). Psychiatric admission is an intensive form of aftercare that is not an appropriate intervention for all patients who have self-harmed (51, 84, 85). Accordingly, rates of psychiatric admission are low across the general self-harm population, ranging from 3-11% in recent studies (51, 84-86). Psychiatric admission is likely to be allocated to those at higher risk of adverse outcomes, such as those presenting with HRSH, as evidenced by elevated psychiatric admission rates following self-harm involving high lethality methods reported previously (51). Studies have indicated that psychiatric admission increases risk of repeated self-harm and suicide (85, 86, 100, 101). However, the relationship between clinical severity and treatment allocation introduces bias to observational studies evaluating the impact of psychiatric admission, as those most likely to have adverse outcomes are those most likely to be admitted (84, 85). Consequently, findings that indicate poor outcomes following admission to psychiatric inpatient settings (101) may be a reflection of this confounding by indication.

Propensity score (PS) methods have been used to address confounding by indication in previous studies of outcomes following treatment among self-harm patients (84, 87, 102). The function of PS methods is to balance the observed differences between treatment groups (194). Treatment effect can then be estimated more accurately between the balanced groups. Using this approach, a large cohort study of hospital-presenting self-harm cases found that the increase in risk of repetition following psychiatric admission that was observed using traditional covariate adjustment was no longer evident when PS methods were used (84). A small minority of patients (3%) were admitted in the aforementioned study, which is the only previous study to use PS methods to investigate repeated self-harm following psychiatric admission (84). A greater understanding of the complex relationship between admission and repetition may be gained by using this analytic approach in an examination of the most serious cases of hospital presented self-harm, who are most likely to receive psychiatric inpatient treatment.

This study investigated psychiatric admission and self-harm repetition following a high-risk self-harm (HRSH) presentation. Specific objectives were: to examine factors associated with psychiatric admission; to use PS methods to investigate the relationship between psychiatric admission and self-harm repetition; and to examine factors associated with repeated self-harm.

5.3. Methods

5.3.1. Study design and participants

A prospective cohort study of 345 consecutive HRSH patients was conducted across three urban hospitals in the Republic of Ireland from December 2014 to February 2018 (inclusive), as part of the Improving Prediction and Risk Assessment of Self-harm and Suicide (IMPRESS) study. HRSH refers to self-harm acts that involve a method associated with high lethality and/or medical severity and/or high suicidal intent. A detailed description of eligibility criteria has been reported previously (193). Identification of HRSH acts was carried out by the psychiatric teams in the study EDs. Members of the study team collaborated with the hospital staff on the classification of HRSH cases and reviewed hospital records to assess the application of the eligibility criteria at regular intervals. Data was collected from electronic ED records and psychiatric files. To maximise the completeness of the dataset, 21 cases were removed from the working dataset because of a high level of missing data, leaving a total of 324 HRSH patients in the sample.

Information on self-harm history and self-harm repetition was acquired from the National Self-Harm Registry Ireland (NSHRI) via data linkage. The NSHRI routinely collects data on all self-harm presentations, including multiple presentations made by the same individuals, to EDs in all 36 acute hospitals in the Republic of Ireland. Information on data collection procedures has been reported previously (38). NSHRI data is pseudonymised with a unique code for every individual based on encrypted initials, sex and date of birth. Following encryption, initials and date of birth are removed from the NSHRI dataset. For each HRSH patient in the IMPRESS dataset, a code was generated using the same encryption method used by the NSHRI. HRSH patients were matched to patients in the NSHRI dataset who had the same unique code. Where there was no corresponding unique code in the NSHRI dataset, HRSH patients were matched to patients in the NSHRI dataset based on age, sex, date of presentation, method of self-harm and presenting hospital. It was not possible to find a match

in the NSHRI dataset for 35 of the 324 HRSH patients included in the sample, indicating that there was no record of their self-harm presentation in the NSHRI. These cases were included in the study cohort. Sensitivity analysis showed that the study findings were similar whether these 35 HSRH cases were included or excluded.

5.3.2. Data items

Data items collected for the IMPRESS study included demographic information, circumstances of the self-harm episode, prescribed medication, psychiatric history, life events, and psychiatric admission following HRSH (Table 1). Data on circumstances of the self-harm episode included: method, alcohol involvement, suicidal intent, suicide note, involvement of prescribed drugs in intentional drug overdose (IDO) and proximal concerns. Method of self-harm was recorded according to the Tenth Revision of the WHO's International Classification of Diseases (ICD-10) codes for intentional injury (50). Analyses were based on method involvement rather than primary or sole method. Suicide intent of the index self-harm presentation was measured using the objective section of the Beck Suicide Intent Scale (SIS) (158). Proximal concerns (listed in Table 1) were the most commonly recorded concerns noted in the biopsychosocial assessments but do not represent a list of concerns included as questions in each assessment.

Psychiatric history data items included any psychiatric diagnoses, mental health treatment and psychiatric admission at any time prior to the index HRSH presentation. Previous diagnoses were recorded based on documentation of a psychiatric disorder rather than based on details of formal diagnoses. Recent self-harm history was defined as the number of self-harm presentations made by a patient to any ED in the country in the two years prior to the index presentation, recorded by the NSHRI. Self-harm repetition was defined as a presentation to an ED as a result of a self-harm following their index self-harm presentation, recorded by the NSHRI. All patients were followed-up for 12 months.

5.3.3. Ethics statement

The Clinical Research Ethics Committee of the Cork University Teaching Hospitals and the HSE Mid-Western Regional Hospital Research Ethics Committee granted ethical approval for this study. Ethical approval for the NSHRI was received from the National Research Ethics Committee of the Faculty of Public Health Medicine and the relevant hospital or Health Service Executive committees. Approval has also been granted for the NSHRI by the Health Research Consent Declaration Committee.

5.3.4. Statistical analyses

Statistical analyses were carried out using SPSS 26 and Stata 12 IC for Windows. Chi-squared tests were used to examine crude associations between all categorical variables and the two outcome variables, psychiatric admission following a HRSH presentation and 12-month hospital presented self-harm repetition. Median scores on the SIS were calculated and the Mann–Whitney U test was used to test for differences between SIS scores and the outcome variables. A multivariable logistic regression model was used to examine factors associated with psychiatric admission. Variables that were associated with admission in crude analyses at the significance level of $p<0.1$ were included in the initial regression model. Backwards selection methods were then applied with variables being removed one at a time until only significant ($p<0.05$) variables remained in the model. Sex and age were included in all models, irrespective of significance level. Likelihood ratio tests conducted at each step and at the end, comparing the final regression model with the initial full model, were all non-significant ($p>0.05$), indicating that the removal of variables did not significantly diminish the explanatory power of the regression model. A backwards stepwise multivariable regression model was also applied to examine factors associated with 12-month self-harm repetition using the same approach used for the outcome of psychiatric admission.

The association between psychiatric admission and 12-month self-harm repetition was then estimated using PS methods to address confounding by indication. A PS estimates a person's

probability of treatment allocation, in this case psychiatric admission, based on observed characteristics (194). Individual PSs were estimated using a multivariable logistic regression with psychiatric admission as the outcome variable and the following explanatory variables: sex, age, living arrangements, employment status, recent self-harm history, previous psychiatric admission, history of foster care / orphanage / adoption, suicide note and proximal alcohol misuse. Associations between psychiatric admission and self-harm repetition were then estimated by multivariable logistic regression models using three PS methods. The primary analysis used inverse probability weighting (IPW) on the PS. The aim of PS methods is to balance the measured covariates between treated and untreated individuals in observational studies (194). IPW achieves this by assigning a weight to each individual according to their PS, creating a pseudo-population with near perfect balance of observed confounders between treatment groups (195, 196). A logistic regression model using the IPW weights is then performed. IPW balanced all the observed covariates between those who were admitted and those who were not (all standardized differences <0.1). None of the weights assigned were large (all weights <6; Appendix 5, Supplementary Figure 1) (196). Secondary sensitivity analyses were conducted using two additional PS methods. Guidance in the literature on the selection of the most appropriate PS method for a particular scenario is limited (196). Thus, a prudent approach is to conduct secondary analyses using alternative methods to examine consistency of the results (196, 197). The first additional method used was PS matching, whereby treated individuals were matched with untreated individuals with a similar PS and a logistic regression was conducted on the matched sample. One-to-one greedy matching was conducted. Greedy matching involves a comparison of every treated case and every untreated case to find the closest match possible (198). This process is repeated with the remaining cases, continuing until there are no more possible matches (198). The degree of covariate balance following matching on the PS is illustrated in Appendix 5, Supplementary Table 4. Lastly, the covariate adjustment method was performed, which involved including the PS as a covariate in a final logistic regression model.

5.4. Results

5.4.1. Baseline characteristics

Characteristic of the cohort of 324 HRSH patients are presented in Table 8. Half (52.8%) were male and ages ranged from 18-87 years (mean=39.6, SD=14.9). A minority (15.8%) had a recent history of hospital-presented self-harm. Most HRSH patients (79.6%) had a history of mental health treatment. Almost 60% of the cohort were prescribed psychotropic medication prior to their HRSH act, of whom most were prescribed multiple medications (86.3%). The most common medications prescribed were antidepressants (78.6%), followed by benzodiazepines (42.3%), anti-psychotics (33.9%), anti-epileptics (14.9%) and other sedative-hypnotics (10.7%). The most common types of antidepressant prescribed to HRSH patients were selective serotonin re-uptake inhibitors (45.8%), followed by noradrenergic and specific serotonergic antidepressants (mirtazapine) (19.6%), serotonin and norepinephrine reuptake inhibitors (18.5%) and tricyclic antidepressants (5.4%). The most common previous mental health diagnosis was depressive disorder (37.6%).

The most common method of self-harm involved in HRSH presentations was intentional drug overdose (IDO) (68.5%), followed by attempted hanging (14.9%) and self-cutting (9.9%). In two out of three IDOs, the drugs taken included those prescribed for the individual (67.4%). Alcohol was involved in half of HRSH presentations (49.2%) and a suicide note was written in 27.1% of episodes. The most common proximal issue was alcohol misuse (36.5%). Interpersonal conflicts were also common proximal factors: with a current or previous romantic partner (28.8%) and with family members, friends, or other acquaintances (29.6%).

In the 12 months following their index presentation, 56 individuals (17.3%) made a repeat self-harm presentation.

Table 8. Characteristics of high-risk self-harm patients and circumstances of self-harm episode.

Variable		All (n=324) n (%)
Sex	Female	153 (47.2)
	Male	171 (52.8)
Age	18-24 years	64 (19.8)
	25-44 years	130 (40.1)
	45-64 years	113 (34.9)
	65+ years	17 (5.3)
Relationship status[a]	In a relationship	122 (38.0)
	Not in relationship	199 (62.0)
Living arrangements[b]	Living Alone	67 (21.1)
	Living with partner or family	209 (65.7)
	Other shared living	42 (13.2)
Employment status	Employed	159 (50.2)
	Not in employment	157 (49.8)
Recent self-harm history	No self-harm presentations	273 (84.3)
	1 self-harm presentation	29 (9.0)
	2+ self-harm presentations	22 (6.8)
Currently prescribed psychotropic drugs		175 (57.2)
Current prescription for physical concern		106 (35.5)
Previous psychiatric admission	No	193 (59.6)
	Yes	111 (34.3)
	Unknown	20 (6.2)
Previous mental health diagnoses	Depressive disorder	121 (37.6)
	Anxiety disorder	43 (13.4)
	Personality disorder	31 (9.7)
	Bipolar affective disorder	14 (4.4)
	Psychotic disorder	15 (4.7)
Reported history of foster care / orphanage / adoption		19 (6.0)
Reported history of emotional / physical / sexual abuse		80 (24.8)
Self-harm method[c]	Intentional drug overdose (IDO)	222 (68.5)
	Self-cutting	32 (9.9)
	Attempted hanging	48 (14.9)
	Attempted drowning	23 (7.1)
	Other methods	24 (7.4)
IDO involved multiple drugs (% of IDO presentations)		120 (56.3)
IDO involved currently prescribed drugs (% of IDO presentations)		128 (67.4)
Alcohol involvement		159 (49.2)
Suicidal intent (median, IQR)		5 (3.7)
Suicide note		87 (27.1)
Reported proximal issues	Alcohol misuse	118 (36.5)
	Conflict with person(s) other than romantic partner	96 (29.6)
	Conflict with current / previous romantic partner	93 (28.8)
	Financial concerns	49 (15.2)
	Legal troubles	42 (13.0)
	Drug misuse	39 (12.1)
	Marriage breakdown	21 (6.5)
	Bereavement of loved one	18 (5.6)

[a] 'In relationship' includes married, cohabiting and relationships of 12 months or more. 'Not in a relationship' includes separated, divorced, widowed, single and short-term relationship.

[b] 'Employed' includes employed, self-employed and full-time student. 'Not in employment' includes unemployed, long-term disability and retired.

[c] 'Other methods' includes self-poisoning with substances other than drugs, self-immolation, crashing a motor vehicle and jumping from a height.

5.4.2. Factors associated with psychiatric admission following HRSH

Following their HRSH episode, 40.4% of individuals were admitted psychiatrically. There were no sex differences in likelihood of admission (Table 9). Psychiatric admission was frequent among those aged 65 years or older (76.5%), who, in multivariable analyses, were 3.4 times more likely to be admitted compared to those in younger age groups (95% CI 0.94-12.50). However, this did not reach statistical significance at $p<0.05$. In adjusted analyses, odds of psychiatric admission were significantly higher among individuals living alone compared to those living with others (OR 2.48 95% CI 1.28-4.80). Psychiatric admission was significantly more likely among individuals with a history of depression (OR 4.04 95% CI 2.26-7.23) and those with a history of previous psychiatric admission(s) (OR 2.63 95% CI 1.48-4.65). Individuals who had written a suicide note were more likely to be admitted (OR 3.47 95% CI 1.89-6.38), as were those whose self-harm episode involved 'other' self-harm methods (including self-poisoning, self-immolation, crashing a motor vehicle, jumping from a height and other specified means) (OR 3.47 95% CI 1.23-9.89). Individuals who disclosed a history of abuse were less likely to be admitted (OR 0.28 95% CI 0.15-0.54).

Table 9. Crude and multivariable analyses of factors associated psychiatric admission.

		Psychiatric admission (n=131, 40.4%)			
		Crude analysis		Multivariable analysis	
		N (%)	*p*	*OR (95% CI)*	*p*
Sex	Male	69 (40.4)		1	
	Female	62 (40.5)	0.975	0.76 (0.44-1.31)	0.325
Age	18-24 years	14 (21.9)		0.72 (0.34-1.49)	0.373
	25-64 years	104 (42.8)		1	
	65+ years	13 (76.5)	<0.001	3.43 (0.94-12.50)	0.061
Living arrangements	With others	88 (35.1)		1	
	Alone	40 (59.7)	<0.001	2.48 (1.28-4.80)	0.007
Previous psychiatric admission	No	67 (31.5)		1	
	Yes	64 (57.7)	<0.001	2.63 (1.48-4.65)	0.001
Depressive disorder	No	61 (30.4)		1	
	Yes	69 (57.0)	<0.001	4.04 (2.26-7.23)	<0.001
Reported history of emotional / physical / sexual abuse	No	111 (45.5)		1	
	Yes	20 (25.0)	0.001	0.28 (0.15-0.54)	<0.001
Self-harm method*	IDO, cutting, attempted hanging, attempted drowning	116 (38.7)		1	
	Other methods	15 (62.5)	0.022	3.48 (1.23-9.89)	0.019
Suicide note	No	83 (35.3)		1	
	Yes	47 (54.0)	0.002	3.47 (1.89-6.38)	<0.001

*IDO=Intentional drug overdose. 'Other methods' includes: self-poisoning with substances other than drugs, self-immolation, crashing a motor vehicle, jumping from a height.
Note: table only shows variables included in the final multivariable regression model.

5.4.3. Psychiatric admission and self-harm repetition

Of those who were admitted, 17.7% made a repeat self-harm presentation within 12 months. In crude analysis, psychiatric admission was not associated with repetition (OR 0.95 95% CI 0.53-1.72) (Table 10). As outlined in *Section 5.4.2*, there were significant differences between those who were and were not admitted. In a multivariable logistic regression with IPW according to the PS, there was no association between psychiatric admission and self-harm repetition (OR 1.13 95% CI 0.50-2.52). Secondary multivariable PS analyses produced similar results (Table 10).

Table 10. Crude, multivariable and propensity score analyses of psychiatric admission and 12-month self-harm repetition.

	Crude analysis – OR (95% CI) (n=323)	Multivariable analysis – OR (95% CI) (n=305)	Propensity score analyses – OR (95% CI)		
			Inverse probability weighting (n=305)	Matching (n=240)	Adjusting for propensity score (n=305)
Psychiatric admission (n=30, 17.7%)	0.95 (0.53-1.72)	0.99 (0.44-2.21)	1.13 (0.50-2.52)	1.14 (0.56-2.34)	1.04 (0.52-2.06)

5.4.4. Factors associated with self-harm repetition

There were no significant sex or age differences in self-harm repetition risk (Table 11). In multivariable analysis, compared with HRSH patients with no prior self-harm presentations, odds of repetition were significantly higher among those with a history of one recent presentation (OR 5.05, 95% CI 2.07-12.28), and greater again among those with multiple recent presentations (OR 14.71 95% CI 5.14-42.06). Individuals with a history of psychiatric admission prior to their HRSH presentation were significantly more likely to repeat self-harm within 12 months (OR 2.09 95% CI 1.03-4.24), compared with those with no prior psychiatric admission. A suicide note was associated with lower odds of repetition (OR 0.40 95% CI 0.17-0.95).

Table 11. Crude and multivariable analyses of factors associated 12-month self-harm repetition.

		12-month self-harm repetition (n=56, 17.3%)			
		Crude analysis		Multivariable analysis	
		n (%)	*p*	OR (95% CI)	*p*
Sex	Male	30 (17.7)		1	
	Female	26 (17.0)	0.877	0.81 (0.41-1.59)	0.539
Age	18-24 years	17 (26.6)		2.23 (1.03-5.0)	
	25+ years	39 (15.1)	0.029	1	0.043
Recent self-harm history	No self-harm presentations	30 (11.0)		1	
	1 self-harm presentation	12 (41.4)		5.05 (2.07-12.28)	<0.001
	2+ self-harm presentations	14 (66.7)	<0.001	14.71 (5.14-42.06)	<0.001
Previous psychiatric inpatient admission	No	27(12.7)		1	
	Yes	29 (26.4)	0.002	2.09 (1.03-4.24)	0.042
Suicide note	No	46 (19.7)		1	
	Yes	9 (10.3)	0.049	0.40 (0.17-0.95)	0.038

Note: table only shows variables included in the final multivariable regression model.

5.5. Discussion

5.5.1. Main findings

To our knowledge, this is the first study to describe the profile of individuals who received inpatient psychiatric admission treatment following a HRSH presentation and to examine predictors of subsequent self-harm repetition. The majority of HRSH patients had a history engaging with mental health services and were prescribed psychotropic medication. Psychiatric admission was associated with living alone, history of depression, previous psychiatric admission(s), suicide note and certain highly lethal methods of self-harm (self-poisoning with substances other than drugs, self-immolation, crashing a motor vehicle and jumping from a height). In multivariable analyses using PS methods, patients admitted to a psychiatric inpatient setting following their HRSH act showed the same self-harm repetition risk as those who were not admitted. Factors that conferred greater risk of repeated self-harm following HRSH were: recent self-harm history, particularly multiple recent presentations, young age and a history of previous psychiatric admission(s).

5.5.2. Findings in relation to other studies

Forty percent of HRSH patients were admitted to a psychiatric inpatient setting following their index presentation. As anticipated, this rate is much higher compared to earlier studies addressing self-harm presentations, which reported rates from 3-11% (51, 84-86). The rate of admission seen in this study is closer to that reported following highly lethal methods of self-harm (51). Arensman et al. (51) found that 30% of those presenting with attempted hanging were admitted to inpatient psychiatric services and 26% were admitted following attempted drowning.

Suicidal intent, measured with the objective section of the Beck SIS (158), was not associated with psychiatric admission. It was not possible to examine the self-report section of the SIS in the present study due to the retrospective nature of the data collection procedure. It is possible that more subjective indicators of suicidal intent may have been related to psychiatric admission. However, previous research has indicated that the objective section of the SIS is a more reliable measure of suicidal intent than the self-report section (9). Writing a suicide note did increase the likelihood of admission, as did methods of self-harm such as self-poisoning, self-immolation, crashing a motor vehicle and jumping from a height (186). These methods are associated with high lethality (67, 199), suicidal intent (22) and increased risk of subsequent suicide (8). A diagnosis of depression, either current or historical, was the strongest predictor of psychiatric admission. Prior psychiatric admission also increased the likelihood of being allocated further psychiatric inpatient treatment. These findings are in line with previous research (85, 87) and indicate that those admitted following self-harm were most often people experiencing enduring mental health issues. Individuals who disclosed a history of emotional, physical or sexual abuse were less likely to be admitted compared to those who did not make such a disclosure. This has not been reported previously. Existing evidence suggests a strong relationship between experiences of abuse and psychiatric disorders and suicidal behaviour (200-202). However, no association between history of abuse

and repeated self-harm was found in this study. Under-reporting of experiences of abuse may have impacted these findings (202-204).

Increased risk of adverse outcomes following admission to a psychiatric unit has been reported previously (85, 86, 100, 101). It has been hypothesised that these findings indicate that psychiatric admission has harmful effects (101, 103). Our findings corroborate recent evidence suggesting that that is not the case (84). We found that psychiatric inpatient admission following HRSH was not related to self-harm repetition risk in analyses using PS methods to minimise the bias introduced by confounding by indication. A previous study that also addressed differences between treatment groups using PS methods likewise reported no association between psychiatric admission and self-harm repetition (84). However, the authors did report an increased risk of self-harm following psychiatric admission for males (84). No such sex differences were observed in the current study but the populations under study were different, with Steeg et al (84) focusing on all hospital presented self-harm.

Recent self-harm history was by far the most significant contributor to subsequent 12-month repeated self-harm following HRSH. This is in keeping with research on medically serious self-harm (4) and studies of all hospital presented self-harm (73, 186). Risk of repetition was particularly high among those with multiple recent presentations. This sharp increase in repetition with multiple previous acts has been observed previously (186). Consistent with Beautrais (4), a history of previous psychiatric inpatient treatment was also associated with repetition risk. These findings indicate the majority of HRSH patients who repeat self-harm within 12 months have a history of ongoing distress and service engagement. Risk of repeated self-harm was also increased among emerging adults. This is in contrast to previous studies of all self-harm presentations (47, 61, 186) and may signify an increased risk specific to young adults who present with severe episodes of self-harm. High repetition risk among emerging adults is a cause for concern given the increasing use of high lethality methods (69) and the high suicide rates in this age group. The reduction in repetition risk among those who wrote a

suicide note mirrors previous findings (74, 205). This should not be interpreted as an indication of lower risk overall, as writing a suicide note may be associated with higher suicidal intent (205) and therefore these individuals may have been more likely to die by suicide during the follow-up period.

5.5.3. Strengths and limitations

This study used baseline data on consecutive HRSH patients that presented to three urban hospital EDs, identified according to a standardised procedure. Data on repeated self-harm were obtained from a surveillance system with complete national coverage of hospital-presented self-harm, minimising the likelihood that patients represented to a hospital outside the study region. The use of PS methods to address confounding is a more robust analytic approach to the analysis of treatment effect than traditional covariate adjustment used in most observational studies in the area (194). Multiple PS methods were used as sensitivity analyses with reassuringly consistent results (206). However, it is possible that not all differences between the treatment groups were captured by the recorded data items. Unmeasured confounding may result in biased estimates. Furthermore, data linkage was probabilistic due to cases in the NSHRI being pseudonymised. Therefore, we cannot be certain that all cases matched between datasets were the same person and that no matches were missed. Moreover, while data was collected in the three hospitals according to a standardised approach, procedures for recording patient information may vary between hospitals. Information on suicide or other causes of mortality was not available, meaning that cases may be included in the repetition analyses that should have been excluded due to loss of life. However, continued engagement with the hospitals did provide some information on mortality and where appropriate, individuals were removed from the follow-up analyses. Finally, this study focuses on hospital cases of self-harm only. Therefore, findings cannot be generalised to self-harm repetition not resulting in a hospital presentation.

A further limitation relates to the inclusion criteria used in this study that may have resulted in self-harm presentations with low medical suicidal intent and low severity being classified as HRSH. For example, the inclusion criteria for HRSH include IDO presentations where a medical intervention was deemed necessary, including N-acetylcysteine treatment for paracetamol overdoses. It is possible that some HRSH presentations involved impulsive IDOs of paracetamol with low suicidal intent that may not have resulted in serious consequences without the intervention. Furthermore, in line with the Tenth Revision of the ICD-10 codes for intentional injury (50), attempted self-strangulation and self-asphyxiation were included in the method category with attempted hanging. These methods are associated with lower lethality than attempted hanging which may have led to the inclusion of cases in the HRSH group that should have been in the lower severity group. However, cases of self-strangulation and self-asphyxiation accounted for just 11% of the method category and cases were only included when: the individual was unconscious as result of the act; the person was conscious but was witnessed in suspension or using a ligature and had physical evidence of asphyxiation; or there was physical evidence of suspension or strangulation. Suicidal 'gestures' with a ligature were not included.

5.5.4. Implications

Our findings indicate that psychiatric inpatient treatment is reserved for the patients at highest risk and that, among those high-risk individuals, admission is not associated with repeated self-harm. This is an important finding given the potential that a perception of psychiatric inpatient care as harmful could inhibit access to care for those in need of it. Previous research with HRSH patients indicated a reluctance to being admitted among individuals with limited prior experience of psychiatric inpatient facilities due to an assumption that their experience would be negative (193). Future research should examine risk of suicide following psychiatric admission among HRSH patients.

This study adds to a significant body of research highlighting that self-harm history is the most important factor predicting subsequent self-harm. Multiple previous presentations increase the risk of repetition further and increase the likelihood that a person presents with an episode of HRSH (Cully et al., under review). These findings highlight the importance of providing a thorough biopsychosocial assessment with a comprehensive aftercare plan for HRSH patients, especially those with a history of self-harm and/or psychiatric inpatient treatment. This emphasis is necessary given that persons presenting with self-harm who have a history of self-harm and mental health service engagement are those most likely to be dissatisfied with the care they receive (193). The findings underline the importance of ongoing skills training for mental health professionals in optimising assessment and management of HRSH patients (207). Emerging adulthood is a life stage associated with high rates of mental disorder, during which time young mental health service users transition from child and adolescent to adult services, the challenges of which are well documented (208, 209). The high repetition risk in our study among young adults presenting with very serious episodes of self-harm further highlights the vulnerability of this group.

Prescribing practices play a critical role in self-harm management and suicide prevention. This is underlined by the high prevalence of medications prescribed to HRSH patients and the use of prescribed medication in IDO. This represents an opportunity for harm reduction. Care should be taken to minimise the availability of drugs to those vulnerable to suicidal behaviour by limiting the quantity of drugs prescribed and dispensed, and by collaborating with family and carers to monitor the availability of medications in the home. Where possible, drugs that are least toxic in overdose should be prescribed.

5.5.5. Conclusions

Improving our understanding of clinical factors associated with HRSH and outcomes following service interventions is essential for the enhancement of patient care and reduction of adverse outcomes. Repeated self-harm does not appear to be related to psychiatric admission

following HRSH. This finding supports previous assertions that adverse outcomes following psychiatric admission are related to confounding by indication (103). However, given the high rates of suicide following discharge from the inpatient setting, an investigation of suicide following psychiatric admission among HRSH patients is needed to build on this evidence. The high risk of repetition among HRSH patients with a history of self-harm and psychiatric admission prior to their index episode highlights the challenge of addressing complex mental health needs in this vulnerable group.

Chapter 6. Patients' experiences of engagement with healthcare services following a high-risk self-harm presentation to a hospital emergency department: a mixed methods study

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6.1. Abstract

Experiences of engaging with healthcare services following a self-harm presentation to hospital of high lethality or high suicidal intent have not been examined previously, despite this subgroup of self-harm patients being at high risk of suicide. Therefore, this study addressed this issue by documenting patients' experiences of engaging with healthcare services after a high-risk self-harm (HRSH) presentation to hospital. Demographic, psychiatric and psychosocial factors associated with variations in perceptions of care received were also examined. Quantitative information was obtained by interview administered questionnaires 0-3 months following a HRSH presentation to hospital. Semi-structured follow-up interviews, conducted, 6-9 months later, provided qualitative data (n = 32). Satisfaction with aftercare varied. Positive experiences of care included *'supportive and compassionate relationships'* and *'timely and comprehensive follow-up care'.* The establishment of trust in the services encouraged help-seeking and psychotropic treatment adherence. Conversely, *'superficial and unsupportive relationships'* and *'care lacking continuity and comprehensiveness'* left some participants feeling isolated, contributing to inhibited help-seeking and resistance to psychotropic treatment. Participants with a history of self-harm and mental health service engagement were more likely to report dissatisfaction with care provided. Those who described unsupportive relationships more frequently reported repeated self-harm, alcohol misuse and hopelessness at follow-up. Our findings show that satisfaction with services, help-seeking and treatment adherence may be improved by ensuring the consistent provision of timely, comprehensive and supportive aftercare following a HRSH presentation. Absence of these aspects of care may contribute to ongoing distress and further suicidal behaviour.

6.2. Introduction

People who present to hospital as a result of self-harm have increased risk of further self-harm, suicide and other causes of mortality (47, 210, 211). Despite the critical opportunity for intervention that arises following a self-harm presentation to the emergency department (ED), previous studies indicate that self-harm patients receive inconsistent and, at times, substandard follow-up care (51, 81, 91). Existing research on patient experience of services largely relate to the general self-harm population (94, 97) or non-suicidal self-injury (95). Self-harm presentations to hospital include episodes with varying levels of suicidal intent and various degrees of medical severity or lethality. Considering this heterogeneity, gaining an understanding of the care needs of self-harm patients as a whole is challenging. Patients presenting to hospital for self-harm involving highly lethal methods or with high suicidal intent represent a subgroup of self-harm patients at particularly high risk of suicide (7-9). The experiences of engaging with healthcare services following a self-harm presentation have not been examined previously among this subgroup of high-risk self-harm patients (HRSH).

Substantial variation in patient experiences of aftercare following self-harm in general have been reported in previous studies (94-97). Reported inconsistencies in patient satisfaction relates to typical aftercare services including care within the ED, inpatient and outpatient psychiatric services, community mental health services, psychotherapy and primary care (94, 96, 97). Service level factors, such as inconsistent referral practices and staff attitudes, contribute to the observed discrepancy in satisfaction with care (94, 96, 110). Patient characteristics may also influence differences in perception of care, as has been found in a previous study of general medical patients (212). Preferences for different forms of therapeutic care among patients with psychological disorders have been found to differ according to certain patient characteristics such as sex, age, marital status and previous experiences of therapy (111, 112). Patient differences in satisfaction with routine aftercare

following self-harm have received little attention with no previous studies focusing on HRSH patients.

In order to facilitate the design and implementation of enhanced self-harm management, it is integral to investigate healthcare service provision from the patients' perspective (94-97). The primary aim of this study was to document patients' experiences of care following a HRSH presentation to hospital. Investigating factors underlying dissatisfaction with care is necessary as it can negatively impact treatment adherence, service engagement and future help-seeking intentions (94-97). Therefore, secondary objectives were to examine the demographic, psychiatric and psychosocial factors associated with variations in perceptions of care received.

6.3. Methods

6.3.1. Study design

A sequential qualitatively led mixed-methods design was used. Quantitative information was obtained by interview administered questionnaires 0-3 months after a HRSH presentation to the hospital ED (n=58). Semi-structured follow-up interviews were conducted 6-9 months later to gain in-depth information on participants' experiences since their self-harm act (n=35). Brief questionnaires were also administered at the end of the follow-up interview. Qualitative methods were used to address the primary study objective. Following the primary analyses, core qualitative findings were quanticized and integrated into a quantitative dataset that was used to address the secondary objectives. This integration of qualitative and quantitative data at the analysis stage was used as a means of extending what could be learned from the qualitative findings independently. This approach was adopted as it has been highlighted as a successful means of facilitating the integration and comparison of qualitative and quantitative data in order to gain a better understanding of a phenomenon (168, 169).

6.3.2. Participants

Participants were identified by psychiatry teams in the EDs and two members of the research team (GC, DL) according to standardized inclusion and exclusion criteria developed by the

research team. Eligible participants were adults aged over 18 years who presented consecutively to the EDs of one of three urban hospitals in the Republic of Ireland and who met one of the following criteria: (i) extensive medical treatment (including treatment in specialized units including intensive care unit, surgery under general anaesthesia, antidotes for drug overdoses, telemetry or repeated tests); (ii) self-harm involving method with high risk of fatality (including attempted hanging, self-strangulation, self-asphyxiation, attempted drowning , jumping from a height or in front of a moving vehicle, crashing a motor vehicle or gunshot) if witnessed or any other physical evidence of use of high lethality method; (iii) clinical impression of high suicide intent (3, 4, 20, 29). Participants were not included if they were not capable of giving informed consent.

6.3.3. Procedure

Participants were approached via telephone or in the hospital approximately 7-10 days following their self-harm presentation. Following receipt of a study information leaflet and letter, patients were invited to take part in a baseline interview, during which questionnaires were administered. The interviews lasted approximately 2.5 hours, with the flexibility to complete the interview over multiple sessions. Sixty-eight individuals who presented to hospital with HRSH patients participated in a baseline interview. This represents 33.7% of the 202 HRSH patients that the researchers were successful in contacting. Of those who were contacted but did not take part, 74 (55.2%) said they did not want to take part at initial contact and 60 (44.8%) engaged initially but stopped responding or decided not to take part during a later phone-call. Those who participated at baseline, consented to be contacted again and were considered appropriate to be contacted for follow-up were invited to take part in a follow-up semi-structured interview approximately 6 months after the self-harm presentation. Of the 68 baseline interviews conducted, it was not possible to recruit 10 participants for a follow-up interview for the following reasons: they did not fully complete the baseline interview and contact was lost (n=3), the baseline interview was completed 5.5

months after the index act (n=1), they were too unwell to be contacted according to family members (n=2), or their phone number disconnected (n=4). Removing these individuals from the sample results in a response rate of 60.3%.

The following topics relating to the patients' engagement with healthcare services were addressed during the follow-up interviews: description of contact with a GP or mental health services, admission to psychiatric unit, challenges in attending appointments with healthcare services, benefits experienced from engagement with healthcare services, adherence to psychotropic medication, difficulties accessing healthcare services, engagement with support group(s) and the role that the healthcare services played following the self-harm presentation. Other topics were addressed during the interviews including: changes in life circumstances, repetition of self-harm and drug and alcohol use. Questionnaires were administered at the end of the follow-up interview. Follow-up interviews were conducted in person by GC and DL at a location convenient to each participant and typically lasted 52 minutes (ranging from 15-94 minutes). One interview was conducted by telephone. Thirty-two of the 35 follow-up interviews were audio-recorded and transcribed verbatim. The remaining three interviews were not audio-recorded at the participants' request (n=1), because it was not possible due to the interview location (n=1) or because the interview was by telephone (n=1).

6.3.4. Data items

The following variables were assessed: demographic information (age, sex, relationship and employment status, General Medical Services (GMS) status (eligibility for free healthcare based on household income), circumstances of self-harm (method, alcohol involvement), psychiatric history (history of self-harm, previous engagement with public mental health services).

Suicidal intent of the index self-harm presentation was measured using the Beck Suicide Intent Scale, a widely used scale with high internal consistency (0.95)(158). Social support was measured at baseline using the ten-item version of the Duke Social Support Inventory (159).

Psychological distress was measured at baseline using the 21-item version of the Depression Anxiety and Stress Scales (DASS-21) (160). The Symptom Checklist-Core Depression (SCL-CD6) scale was used to assess depressive symptoms (161, 162).

Self-efficacy was measured using the 10-item General Self-Efficacy Scale at baseline and follow-up. Hopelessness was also measured at baseline and follow-up using a four-item version of the Beck Hopelessness Scale (164, 165). Aish and Wasserman (164) further proposed that one single item, `the future looks dark to me', would be sufficient to assess hopelessness so this item was examined individually also.

6.3.5. Ethical issues

This study received ethical approval from the Clinical Research Ethics Committee of the Cork University Teaching Hospitals and the HSE Mid-Western Regional Hospital Research Ethics Committee. A procedure was in place to contact the participants treating team or facilitate alternative options for referral to treatment when a participant requested further support or when acute distress or risk of suicidal behaviour was identified.

6.3.6. Analysis

Qualitative analysis was conducted first, followed by secondary quantitative analyses.

Qualitative

Transcribed interviews were imported into NVivo11 for analysis. Thematic analysis was performed in accordance with the study design and led by GC. Using an inductive data-driven approach, all transcripts were read and re-read by GC and all data relating to patient contact with healthcare services following their self-harm presentation were coded (170, 213). DL independently coded 12 interview transcripts following the same approach as GC. FS reviewed 3 transcripts coded by GC and 3 by DL and confirmed consistent coding practices. Emerging themes were reviewed and refined collaboratively by GC, DL, EA & FS. To ensure the interpretation was grounded in the data, constant comparison between emerging themes and

the transcripts was used throughout the analytic process. Quotations were selected from a range of participants to illustrate the core and sub-themes. Ellipses are used to represent words missing from quotations.

Quantitative

Quantitative data from baseline and follow-up interviews were entered into SPSS version 25. Core themes from the qualitative analyses relating to patient satisfaction with care that were reflected on by the majority of the sample were transformed into binary quantitative variables and entered into SPSS. Only those participants whose transcripts were coded under these themes were included in the quantitative analysis. Demographic information, circumstances of the index self-harm episode, psychiatric history, social support and psychological state variables were examined according to these themes by tabulating frequencies and percentages for categorical variables and calculating means and standard deviations for continuous variables. Bivariate relationships were further examined using chi-squared tests and independent samples t-tests for categorical and continuous variables, respectively. Considering the small sample size used in these analyses, a threshold for significance is not being used to determine or interpret statistical significance. Instead, the descriptive and inferential statistics are interpreted as observations to augment the qualitative results rather than as robust statistical findings.

6.4. Results

Table 12 presents patient characteristics at baseline and the care received following the index HRSH episode. The mean age of participants at the time of the index HRSH episode was 42 (SD 12; range 18-68 years) and 56% were female. The most common self-harm method was intentional drug overdose (80%) and 46% of participants had consumed alcohol at the time of the self-harm episode. More than half of the participants reported a previous history of self-harm (59%) and the majority had engaged with the public mental health services in the 12 months prior to the HRSH episode (59%). Following the HRSH episode, 38% of participants

were admitted to a psychiatric inpatient unit. Most participants reported at least one outpatient appointment with the public mental health services (86%), the majority of whom met with a psychiatrist (96%). During the follow-up period, 65% of participants attended their GP for mental health reasons.

Table 12. Patient characteristics at baseline and care received following the index high risk self-harm episode.

Variable	**N (%) (n=32)**
Patient characteristics at baseline	
Female	18 (56)
Living arrangements	
Shared	25 (78)
Alone	07 (22)
Married / cohabiting / long-term relationship	18 (56)
Employed	18 (56)
Medical card holder	16 (50)
History of previous self-harm	19 (59)
Engagement with mental health services in previous 12 months	19 (59)
Follow-up care received	
Public mental health services	28 (88)
Psychiatric admission	12 (38)
Outpatient services	27 (87)
Psychiatrist	26 (84)
Mental health nurse	10 (32)
Counsellor / psychotherapist	05 (16)
Addiction services	05 (16)
General practitioner (for mental health concerns)	20 (65)
Private psychiatrist or counsellor / psychotherapist	12 (35)
Prescribed psychotropic medication	24 (75)

6.4.1. Qualitative

Three core themes were identified that relate to participants' experiences of care following the HRSH episode: *'Relationships with healthcare professionals, 'Continuity and comprehensiveness of care',* and *'Psychiatric inpatient care'.* Two additional core themes were identified reflecting how participants' experiences of care influenced their *'Help-seeking'* behaviour and *'Engagement with psychotropic treatment'*. A final core theme, '*Connecting with other patients / peer support',* was identified relating to engagement with other service

users. Core and sub-themes relating to patient experiences of care and their relationship to help-seeking and psychotropic treatment are presented in Figure 9.

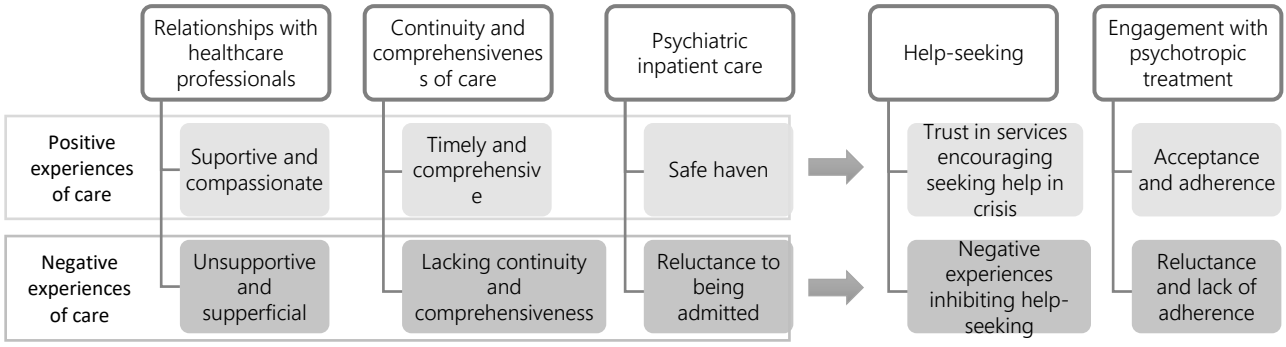


Figure 9. Core and sub-themes relating to patient experiences of engagement with the healthcare services and their relationship to help-seeking and engagement with psychotropic treatment.

Core theme 1: Relationships with healthcare professionals (HCPs)

Supportive and compassionate relationships – someone to talk to.

Most participants described feeling supported and cared for by many of the healthcare professionals (HCPs) they engaged with, particularly with regard to being given the opportunity to talk to someone. Some participants did not have anyone in their lives they could disclose their emotional problems to, while others felt they could not open up to their family or friends because they did not want to worry or burden them with thoughts or feelings they may not understand. One participant described the importance of having a "specific safe place…to talk about what's bothering [her]" because her thoughts would not be "for every audience" (P12). There was also a reassurance felt by participants when they had a person or service that they could reach out to if they felt they needed support. Another participant described feeling comforted "just knowing that they're there and knowing that I could ring them at any time". (P25).

It was important for a positive relationship to develop in order to facilitate an open supportive interaction. A key element to the development of supportive relationships was for the HCP to engage with their patient in an understanding and empathetic way.

> *"I know these doctors, nurses or consultants … are doing their job but it's the way they do it makes a difference … and for me I realize that … they want me to get well …because I feel the sincerity there, they're not just doing their job."*(P4)

> *"She just understood… me, and it was like … she supported me, which was a huge thing."* (P30)

Participants most commonly described ongoing supportive relationships with psychiatric nurses and counsellors in outpatient secondary mental healthcare services and general practitioners (GPs) in the primary care setting.

Unsupportive and superficial relationships.

Lack of "empathy" or "warmth" in the way HCPs interacted with the participants was as an issue for many. This often resulted in participants feeling unsupported by these relationships. Participants who described feeling unsupported in interactions with HCPs were most commonly referring to appointments with a psychiatrist. Some participants felt their appointments with psychiatrists were "empty", involving routine questions that were not relevant to how the participant was presenting. For many participants, this made the appointments feel overly repetitive, somewhat pointless and unhelpful.

> *"I never really liked going to the psychiatrist anyway because it's five minutes … maybe it's just me, but I feel like they're just covering their back to make sure that you don't do anything stupid and they're blamed. Like that's the impression I get. Like I never feel any kind of warmth there."* (P16)

While most participants described feeling supported by their GPs, some participants described their GPs to be lacking in empathy, not taking mental health issues seriously or expressing

judgement regarding their self-harm act. One participant felt that her GP was "*harsh and…not very understanding*" and expressed that "*when you're feeling really vulnerable a little bit of empathy would go a long way*" (P11).

Core theme 2: Continuity and comprehensiveness of care

Timely and comprehensive care.

Timely and regular follow-up. For some participants, follow-up appointments with the outpatient services were organized quickly post-discharge and the had regular appointments from then on, with many participants reporting having "*weekly"* or *"bi-weekly"* appointments. For those who had routinely scheduled appointments, the majority had a clear understanding of the plan for their aftercare.

Complementary care. While almost all the participants had at least one follow-up appointment with a psychiatrist, most participants who reported regular engagement with the outpatient mental health services were engaging with at least one other HCP within the service in addition to the psychiatrist. One participant described seeing the "*the nurse every two weeks… and the* [psychiatrist] *every three months'* (P20). Generally, participants who were given the opportunity to engage with other HCPs in addition to a psychiatrist were more satisfied with the care received compared to those who met with a psychiatrist only. Those engaging in sessions with a nurse or counsellor had the opportunity to talk at length and were less likely to expect this opportunity with the psychiatrist, as described by one participant who reflected that "*by the time* [she] *got to the psychiatrist,* [she] *had talked with the other nurse"* (P23).

Therapeutic benefits. Most participants reported getting therapeutic benefit from their sessions with mental health nurses or counsellors. For some, they felt they were making progress from these sessions in which they gained insight and developed skills for managing their difficulties. In addition to one-on-one sessions, participants described benefiting from

engaging in group therapy courses on topics such as stress management, mindfulness, and self-compassion.

> *"I've been learning a lot about mindfulness and coping strategies … so I've got a hell of a lot more skills than I did a year ago."* (P11)

Care lacking in continuity and intensity.

Inconsistent personnel. Most participants were frustrated by meeting a different HCP at each outpatient appointment. This resulted in the participant needing to repeatedly explain their circumstances. At times, the change in HCP and lack of clear communication between professionals led to confusion in terms of prescribing and diagnoses.

> *"I see a different person every time, which is annoying because then you have to go through everything all over again. And, even last time, I have been off my medication ages…she was like, 'I'll write your prescription now, 80mg…' I was like, 'I'm off tablets,' and she there writing me a prescription. I said, 'I'm off tablets'."* (P26)

Insufficient level of care. Dissatisfaction with the level of care received in the months following the self-harm act was reported by many participants with some receiving little or no aftercare with mental health services. Some participants who had follow-up appointments with a psychiatrist only felt the level of care received was unsatisfactory. This was most commonly due to an over-emphasis on psychotropic medication with limited additional support, as well as the brevity and repetitiveness of appointments.

> *"And all they were interested in was putting up my tablets…and I just said to them … leave my tablets alone."* (P18)

> *"I don't like going to* [outpatient service] *because I just feel they push drugs … there was one guy there … and I just felt if you went in with an in-growing toenail he'd give you tablets."* (P34)

Some participants felt that, as a result of insufficient or unsatisfactory care received from the mental health services, they were overly dependent on their GP and at times felt like a burden.

Lengthy waiting lists. A significant problem expressed by many was the waiting time for follow-up care which participants felt needed to be *"drastically reduced".* Some participants were still waiting to be linked in with aftercare at the time of the follow-up interview. Waiting lists were particularly lengthy for specialist care including addiction services, cognitive behavioural therapy and dialectical behavioural therapy.

> *"Six weeks is a long time to wait for a phone call to get a review. Then it could take another three weeks, so, in effect, it can take anything up to ten, maybe 12 weeks before you actually sit down and talk about your mental health state...Look, if somebody wanted to end their life, I would prioritize that as being urgent when they're being discharged."* (P35)

Post-discharge isolation. Lack of continuity of care following discharge from a psychiatric unit or hospital was an issue raised by participants, with psychiatric admission being described by one participant as "*first aid"* to *"get you barely coping"* (P22). This lack of adequate follow-up post-discharge was described as an obstacle to participants working their *"way out of crisis"* and led to post-discharge isolation among some participants.

Core theme 3: Psychiatric inpatient care

Inpatient setting as a "safe haven"

Most participants who had been admitted as inpatients felt that it was the most appropriate intervention following their self-harm episode. For some this was because it protected them from their own behaviour. One participant reflected that the inpatient experience "*stopped me in my tracks from doing it again"* (P14). Some of those who were admitted to psychiatric facilities felt their inpatient stay was a *"safe haven*", giving them the break they needed to

allow them to reflect on their situation and how to move forward. Among those who felt that the psychiatric inpatient setting was a "*safe"* place, most felt supported by HCPs.

> *"While it's my least favourite place in the world to ever be …* [psychiatric ward] *was very well-staffed and was very well run, very patient orientated and a safe haven when I needed it, and it's very difficult when the safe haven that you need is from yourself."* (P12)

Reluctance to being admitted due to negative experiences or expectations

Reluctance to being admitted to a psychiatric unit following their self-harm episode was felt by many participants with some refusing admission when it was recommended. For some participants, limited prior experience of psychiatric inpatient facilities resulted in apprehension and fear related to an assumption that their experience would be negative. For other participants, previous inpatient experiences in psychiatric facilities had led them to conclude that an admission would not be of any benefit. Absence of therapeutic support or meaningful interactions with HCPs was described by a number of participants as the main failing of their inpatient experience.

> *"I said, 'No way, I'm not going in like', to do what? To walk round the ward or… every day to do nothing, there's no-one to go and help there, there's no nothing like. There's no counsellor available there…or someone to go in have a chat with, there is none of that."* (P18)

Core theme 4: Help-seeking

Trust in services encouraging seeking help in crisis

Most participants felt that they could reach out to the services in times of need and numerous participants had sought help in times of crisis since their HRSH act. An increased awareness of the availability of crisis services did not facilitate help-seeking alone. It was essential that the participant had trust in the services.

> *"Because the support I had from the members of the crisis team, they have made it extremely clear and I had promised them that if I did feel, you know, that I'm getting down or I did feel I would do something … then I promised I would call somebody. Which I did the same day."* (P4)

While some participants felt comfortable reaching out to a team or service, sometimes it was one specific individual they had developed a relationship with that they felt they could go to in times of crisis, most commonly a mental health nurse or GP. Many of the participants described their GPs as an essential source of support in times of crisis, playing an instrumental role in de-escalating serious suicidal thoughts or plans.

> *"I know if I didn't reach out, that I would have done something... I went straight to the doctor at 9am because the thoughts were really bad…, so I knew it was either a matter I was going to do something, or I had to get to the doctor."* (P16)

Negative experiences with services inhibiting help-seeking

Following negative or unhelpful interactions with HCPs some participants described being put off reaching out for help in times of crisis and were also reluctant to continue engaging in scheduled appointments. For some participants, a negative experience with a HCP made them reluctant to reach out to that particular professional again, but they were still open to engaging with another professional. Some participants changed to a different GP practice due to being unhappy with their previous GP and were pleased to feel more supported in the new practice.

For others, the impact of the negative experience had a more widespread impact. One participant reported a desire to engage with a counselling service but was hesitant due to a negative experience with a psychologist during childhood. For another participant, consistent negative interactions with psychiatrists over many years which he felt *"made him feel worse*

than better" led him to conclude that "*I don't know whether I'll go to another psychiatrist. I just don't know can I go through it again"* (P16).

Core theme 5: Engagement with psychotropic treatment

Acceptance of, and adherence to, psychotropic treatment

Most participants who were prescribed psychotropic medication reported adhering to their prescription at the time of the follow-up interview. Clear communication of the purpose of the medication and clarification that immediate effects should not be expected aided adherence. Adherence often went hand-in-hand with the process of accepting the need for medication, with participants becoming more adherent as they came to realize that they needed the support of the medication.

> *"I take them as I should do. That took a while … I suppose it was just in time that I started to realize, if I take them every day like I should … I'd get better faster, basically."* (P33)

This acceptance of the need for psychotropic medication was not always immediate. Some participants described being supported by HCPs during a process to find the right combination and dose of medication that provided the desired benefits with manageable side effects. For example, one participant was finding it challenging to overcome an undesirable side effect but with the support of her mental health nurse, she agreed to "*stay with it for another while*".

Reluctance and lack of adherence to psychotropic treatment

An aversion to taking psychotropic medication was frequently reported by participants. While some were hesitant but accepted the prescription and took the medication, others were unwilling to be medicated. Preconceived ideas about psychotropic medication led to this reluctance among some participants who had minimal prior knowledge. For example, one participant would not take antidepressants because of a belief that they *"make people commit suicide"* while other participants believed that they should be avoided as they are *"addictive"*

or a *"crutch"*. Some participants left their appointments with little understanding of what they had been prescribed or what the purpose was which also resulted in dismissal of their necessity in some cases. Others simply felt they did not need medication leading them to not fill their prescription initially or to stop taking them after a period of adherence.

For some participants, a desire to reduce, change or avoid medication was due to negative side-effects that were making it difficult to experience benefit from it. Side effects reported by participants included feelings of tiredness or grogginess, feelings of emptiness, poor concentration and weight gain.

> *"I know medication is only to help but the way I feel for the last couple of months… I actually feel dead inside, I'm exhausted, tired constantly like, I just don't want to function…"* (P18)

Core theme 6: Connecting with other patients and peer support

Many participants described benefiting from making meaningful connections with other service users. While admitted, participants described a comradery that developed with their fellow patients, benefiting from spending time together doing activities and providing support for one-another, helping reduce feelings of isolation. Some participants who attended group sessions in an outpatient or voluntary setting also described developing significant friendships with other service users, with one participant reflecting that *"*[they] *kind of became a family"* (P33). Across all treatment settings, participants described benefiting from group sessions because of the learning and insight that was gained form others.

> *"The group session was, wow …I was just me being honest, and they were honest… We've learned from each other, which was great."* (P35)

Not all participants who attended group sessions experienced these benefits. For some, opening up in front of others is not easy but was facilitated by ensuring the group was

appropriate for the patient's needs. For example, one younger participant was unhappy in a group of general adults and thrived when changed to a group of adolescents and young adults.

> *"The fact that we can all become friends, and we already know each other inside out from talking at the group."* (P26)

6.4.2. Quantitative

Demographic, psychiatric and psychological characteristics of participants at baseline according to *'relationships with healthcare professionals'* and *'continuity and comprehensiveness of care'* are presented in Table 13. Follow-up participant characteristics according to these core themes are presented in Table 14.

Relationships with healthcare professionals

Younger participants and those with a GMS card were more likely to report experiencing 'superficial and unsupportive' relationships with healthcare professionals. Those who reported a history of self-harm and those reporting engagement with mental health services prior to their index HRSH episode were more likely to have felt unsupported in their relationships with HCPs. Participants who described mostly unsupportive relationships with healthcare professionals had higher levels of depressive symptoms. These participants also tended to have greater levels of hopelessness and psychological distress at baseline.

Of the participants who experienced predominantly 'supportive and compassionate' relationships with HCPs, none had repeated self-harm between the index HRSH episode and the follow-up interview. All three of those who did report a repeated self-harm episode during the follow-up period described mostly 'superficial or unsupportive' relationships during this period (Table 14). None of the participants who self-harmed during the follow-up period presented to hospital as a result of their repeated self-harm act. Participants who felt their interactions with HCPs were unsupportive had higher levels of hopelessness at the time of the follow-up interview, with a markedly higher likelihood of reporting that their future seemed

dark to them compared to those who felt supported by HCPs (94% vs 6%, respectively). General self-efficacy at the time of the follow-up interview was lower among those who perceived their relationships with HCPs to be unsupportive.

Continuity and comprehensiveness of care

Participants who were employed were more likely to perceive their follow-up care to be *'lacking continuity and comprehensiveness'* compared to those who were not in employment at the time of the index act. An unsatisfactory level of care was more frequently described by participants who reported a history of self-harm and those who had engaged with mental health services prior to their index HRSH episode

There were no notable differences in participant characteristics at follow-up between those experiencing care *'lacking continuity and comprehensiveness'* and those who experienced '*timely and comprehensive care'.*

Table 13. Participant characteristics at baseline according to core themes from thematic analysis.

	Relationships with healthcare professionals			Continuity and comprehensiveness of care		
	Supportive and compassionate (n=18)	Unsupportive and superficial (n=13)	*p*	Timely and comprehensive (n=17)	Lacking continuity and comprehensiveness (n=12)	*p*
Demographic characteristics						
Age*	46.3 [10.9]	37.1 [10.5]	0.025	46.2 [12.9]	39.6 [9.7]	0.144
Female	9 (50%)	8 (62%)	0.524	10 (59%)	7 (58%)	0.979
Living Alone	4 (22%)	2 (15%)	0.634	4 (24%)	1 (8%)	0.286
Married / cohabiting	11 (61%)	7 (54%)	0.686	10 (59%)	7 (58%)	0.979
Employed	9 (50%)	9 (69%)	0.284	7 (41%)	10 (83%)	0.023
General Medical Services card holder	6 (33%)	9 (69%)	0.048	9 (53%)	4 (33%)	0.296
Circumstances of self-harm						
Self-harm method intentional drug overdose	15 (83%)	10 (77%)	0.656	15 (88%)	9 (75%)	0.353
Alcohol consumed	6 (35%)	7 (54%)	0.310	6 (38%)	6 (50%)	0.508
Suicidal intent*	19.2 [4.4]	18.0 [5.0]	0.496	18.4 [5.4]	19.1 [3.8]	0.714
Psychiatric history						
History of previous self-harm	8 (44%)	11 (85%)	0.023	7 (41%)	9 (75%)	0.071
Engagement with mental health services in previous 12 months	7 (39%)	11 (85%)	0.011	6 (35%)	10 (83%)	0.010
Recent misuse of alcohol	3 (17%)	2 (15%)	0.924	3 (18%)	3 (25%)	0.630
Depressive symptoms*	24.2 [4.4]	26.8 [3.0]	0.083	24.7 [4.4]	25.4 [3.5]	0.618
Psychological distress*	43.0 [24.1]	56.0 [34.4]	0.226	52.5 [29.1]	45.8 [29.3]	0.551
General Self-Efficacy*	25.8 [5.1]	23.1 [7.7]	0.303	24.7 [5.7]	24.3 [7.1]	0.893
Social support*	20.3 [3.1]	20.3 [3.8]	0.973	19.8 [3.1]	20.9 [4.1]	0.477
Hopelessness*	0.6 [1.1]	1.4 [1.1]	0.123	0.8 [1.2]	0.9 [1.0]	0.805

*Mean [SD]

Table 14. Participant characteristics at follow-up according to core themes from thematic analysis.

	Relationships with healthcare professionals			Continuity and comprehensiveness of care		
	Supportive and compassionate (n=18)	Unsupportive and superficial (n=13)	*p*	Timely and comprehensive (n=17)	Lacking continuity and comprehensiveness (n=12)	*p*
Self-harm repetition since HRSH	0	3 (23%)	0.037	1 (6%)	1 (9%)	0.747
Increase in misuse of alcohol since HRSH	1 (6%)	3 (23%)	0.151	2 (12%)	2 (17%)	0.706
General Self-Efficacy*	28.3 [4.8]	23.2 [7.3]	0.038	27.1 [4.5]	26.5 [7.6]	0.823
Hopelessness*	0.2 [0.4]	1.8 [1.7]	0.008	0.3 [0.8]	1.0 [1.5]	0.203

*Mean [SD]

6.5. Discussion

This study provides insights into individuals' experiences of care following an episode of self-harm of high lethality or high suicidal intent. HRSH presentations are arguably the most serious episodes of self-harm presenting to the ED (7-9, 29) and their perceptions of aftercare have not been examined previously. Satisfaction with follow-up care varied considerably across the sample, dependent largely on participants' perception of the quality of their relationships with HCPs and the continuity and comprehensiveness of care received. Timely and comprehensive care involving supportive and compassionate relationships with HCPS was considered essential following a HRSH episode by most participants.

A substantial proportion of participants experienced an absence of elements of care leaving many feeling isolated and unsupported. Frustration or demoralization was frequently expressed about excessive waiting time, insufficient follow-up including lack of referrals to specialist care, over-reliance on psychotropic treatment and inconsistencies in personnel. This is concerning given that lack of timely and comprehensive care following self-harm or psychiatric hospital discharge is associated with increased risk of suicide (214-217). When participants were linked in with follow-up care, they frequently perceived relationships with HCPs to be superficial and lacking in empathy. Limited previous research has examined HCP-patient relationships in relation to patient outcomes, but one study found that poor HCP-patient relationships was a factor associated with preventable suicides (216). The quantitative findings of this study showed that poor experiences of care may indeed contribute to ongoing distress and further suicidal behaviour. Participants who felt let down by the services, reporting predominantly unsupportive relationships with HCPs were more likely to have repeated self-harm since the index HRSH act and had higher levels of hopelessness at follow-up.

Help-seeking is encouraged among those who are vulnerable to suicide as it creates an opportunity for intervention (218, 219). Consistent with previous research, in this study,

patients' prior experiences of the services had a powerful impact on shaping future help-seeking intentions and behaviours (94, 97). Participants recounted occasions since their HRSH episode when reaching out to a trusted HCP or service de-escalated serious suicidal plans or intentions. The establishment of trust in the services was a key factor in encouraging individuals to seek help in times of crisis. When individuals felt unsupported or let down by a HCP or service, barriers to future help-seeking developed and participants felt discouraged from continuing to engage with routine care. Disengagement with services, particularly among males, has been found to frequently occur prior to suicide (220, 221). In the current study, lack of continuous and supportive care also negatively impacted adherence to psychotropic treatment. Non-adherence to medication, including discontinuation, occurred more frequently when participants did not have a clear understanding of the purpose of the medication, the potential side-effects and when to expect to experience beneficial effects. Continued monitoring and provision of ongoing support in managing side-effects helped participants to accept their psychotropic treatment plan.

Positive experiences of care were also reported by a considerable number of participants in this study with many describing genuine interactions with HCPs who really cared. Psychiatric admission was considered a 'safe haven' by many individuals because it was perceived as a safe space to reflect and process their current difficulties and it provided protection from their own behaviours. These findings are consistent with a review considering patients' experiences of safety during psychiatric inpatient care that found patients' safety is comprised of both psychological and physical safety (222). However, not all participants felt their inpatient stay was beneficial with some reporting a dearth of therapeutic support. Berg and colleagues (222) further highlighted the necessity of incorporating therapeutic needs of patients into a definition of patient safety. Irrespective of whether or not participants perceived their inpatient stay to be a positive intervention, feelings of isolation post-discharge were common. A recent qualitative study also reported similar accounts of isolation post-discharge and found

that urges to self-harm were more likely among participants who had felt abandoned on discharge from hospital and perceived follow-up care to be insufficient (106). These findings have important clinical implications due to the high suicide risk in the period immediately following hospital discharge (105) and the protective role played by enhanced follow-up care during this period (26, 223).

The majority of HRSH patients' outpatient appointments were with community mental health teams (CMHTs). CMHTs are multi-professional teams catering for a particular catchment area, including representatives from psychiatry, mental health nursing, clinical psychology, occupational therapy and social work (224). Research indicates significant variation in the composition, ways of working and effectiveness of CMHTs (225). The experiences of the participants in this study are reflective of this heterogeneity across CMHTs. Some individuals reported receiving comprehensive care, including sessions with a mental health nurse or counsellor in addition to a psychiatrist, that was both regular and initiated shortly after their hospital presentation were largely satisfied with their engagement with the services. While other participants were followed up solely with a psychiatrist and were often frustrated at the brevity of the appointments. More comprehensive follow-up care gave participants the opportunity to talk on a regular basis with a trusted HCP or service. This was powerful for many participants in helping them make progress following the self-harm episode, particularly among those who had not had this opportunity before. In a previous study with high lethality self-harm patients (29), the majority of participants' felt that having someone to talk would have prevented their self-harm episode. These findings indicate that a greater involvement of mental health nurses and counsellors in aftercare for self-harm patients may be beneficial. The advantages of providing comprehensive aftercare involving interventions beyond psychiatry is supported by a strong body of research highlighting the benefit of cognitive behavioural therapy (CBT) and, to a lesser extent dialectic behavioural therapy (DBT), for the treatment of self-harm patients (92).

In addition to mental health nurses and counsellors, many individuals in the present study described their GP as a trusted person who gave them the opportunity to talk. GPs played a vital role for many in terms of providing supportive aftercare, frequently being the HCP individuals turned to in times of suicidal crisis. Some participants had negative experiences with GPs however, reporting that they felt their GP was judgmental and did not take mental health concerns seriously. The significant contribution that primary care plays in care of self-harm patients (89, 90), as well as previously documented increases in GP attendances prior to suicide (Pearson et al. 2009) and a lack of suicide risk assessment training in primary care (226), highlights the need for ongoing education for GPs in mental healthcare and suicide prevention.

Divergent experiences of care may be a reflection of the actual care received or due to differences in needs and expectations between individuals (97, 108-110). In this study, participants with a previous history of self-harm and those reporting recent engagement with mental health services prior to their index episode were more likely to have felt unsupported in their relationships with HCPs and to report an unsatisfactory level of care. This may be due to different expectations among those with prior experience of engaging with the services compared to those with few preconceptions (97, 108). For example, having been through the process previously may result in greater frustration with issues within the services (95). However, it is also possible that those with a history of repeated self-harm and service engagement may have been treated differently by HCPs. Previous reviews found that HCPs commonly expressed negative attitudes towards those with a history of repetition and those the multiple previous admissions (109, 110). Patients reporting negative or unsupportive relationships with HCPs had higher levels of depression at baseline compared to those reporting supportive relationships. This may indicate more severe or enduring mental health conditions making these participants more pessimistic about their interactions with HCPs. The participants who had unsupportive relationships also had lower levels of self-efficacy at the

follow-up interview indicating that they may have been less likely to take responsibility for their recovery and as such have higher demands of support from HCPs. It is also possible that it was more difficult for HCPs to establish a supportive relationship with these participants due to the severity of their conditions. Beliefs of HCPs about the suicidal behaviour as an inevitable or untreatable feature of certain psychological conditions can also create a barrier to meaningful interactions (227).

6.5.1. Strength and limitations

The use of a mixed methods design allowed for in-depth investigation of patient experiences in which they could raise concerns that were of importance to them while also enabling the investigation of variations in satisfaction with healthcare service contact. Thirty-two individual qualitative interviews is a large sample to draw definitive conclusions. However, limited numbers for the quantitative component leaves it difficult to draw definitive conclusions from the quantitative section of the results. The representativeness of the sample of all HRSH patients is unclear due to a low response rate for the baseline interview, however, we have no reason to believe that the group is unrepresentative because the sample was non-selective with all consecutive patients presenting following HRSH approached according to a standardized procedure. While the baseline response rate is relatively low, it is comparable with another similar study (29). The challenge in recruiting individuals to take part in an interview following an act of HRSH is likely due to several factors. While for some, the invitation to participate in an interview was viewed as an opportunity to talk about their experiences with the potential to provide some comfort or catharsis, for others it was anticipated as being too burdensome at a time of acute distress. In addition, challenging life circumstances including homelessness and legal difficulties, as well as misuse of alcohol and drugs were common among the HRSH patients. These circumstances were often the underlying cause for participants disengaging following an initial expression of interest and for non-attendance at scheduled interviews. It is likely that the method of recruitment, most

often involving a first contact by phone, also contributed to the low response rate. Had all participants been invited to participate in person, it is anticipated that more would have taken part. This is supported by the response rate at follow-up which is double the baseline rate. The inclusion of participants with experience of three different hospitals adds further weight to conclusions drawn from this study. To minimize the potential for researcher bias, researchers conducting interviews had regular supervision sessions with a senior member of the research team, transcripts were reviewed and coded by multiple researchers and analyses were conducted in a reflexive manner with constant comparison with the data.

6.5.2. Conclusions

The findings of the current study, in addition to previous studies including the overall self-harm population (94, 96, 97) and non-suicidal self-harm injury (95), highlight the importance of establishing positive, empathic HCP-patient relationships following a self-harm presentation of any lethality or intent. The study findings indicate that satisfaction with services, help-seeking and adherence to treatment following a HRSH presentation may be improved by ensuring the consistent provision of timely, comprehensive and supportive aftercare following a high-risk self-harm presentation. Furthermore, the absence of these aspects of care may contribute to ongoing distress and further suicidal behaviour. Our findings indicate that patients with a history of self-harm and engagement with the mental health services have poorer perceptions of care. Attitudes to individuals presenting with self-harm vary among HCPs (94, 109, 110). Ongoing training with clinicians may be beneficial to improve HCP-patient relationships and improve the quality of patient care (109, 110).

Chapter 7. Discussion

7.1. Chapter overview

This doctoral thesis examined aftercare and self-harm repetition following a high-risk self-harm (HRSH) presentation to hospital. This chapter will provide an overview of the main findings arising from this body of work and interpretation within the context of previous research. The theoretical and clinical implications and recommendations for policy and suicide prevention will be discussed. The strengths and limitations of the current research will be presented, and areas of future research will be discussed.

What was the evidence before this research?

- Existing research on persons presenting to hospital with high risk self-harm (HRSH) indicates that they are a population with enduring mental health issues and at high risk of subsequent suicide.
- Despite this, there are major gaps in the research on the most serious episodes of self-harm:
  - Limited prospective research examining rates and predictors of self-harm repetition.
  - No studies examining assessment and aftercare following HRSH presentations to the ED.
- In addition, there are methodological limitations in most previous studies examining outcomes following psychiatric admission.

What is the added value of this research?

Profile of individuals presenting with HRSH

- This research has confirmed the high prevalence of mental health conditions among HRSH patients and identified alcohol involvement and self-harm history as factors associated with HRSH.
- A high rate of psychotropic drug prescribing was observed and most intentional drug overdoses (IDO) among HRSH patients involved multiple drugs, including drug(s) prescribed for the person.

Aftercare

- Using propensity score methods to account for differences between those who were and were not admitted, psychiatric admission was not associated with repeated self-harm among HRSH patients, supporting previous assertions that adverse outcomes following psychiatric admission are related to confounding by indication.
- Risk of non-assessment in the emergency department was higher among those with a history of self-harm and these patients were more likely to report dissatisfaction with care provided.
- Absence of timely and comprehensive care delivered in an empathetic manner for HRSH patients may contribute to inhibited help-seeking and resistance to psychotropic treatment leads to ongoing distress and further suicidal behaviour.

Self-harm repetition

- Overall, HRSH patients showed similar risk of repetition as other self-harm patients. However, multiple drug IDOs and those involving psychotropic drugs were associated with increased repetition risk.
- Recent self-harm history, young age and previous psychiatric admission(s) were identified as predictors of repeated self-harm following HRSH. Repetition was more common among those reporting unsupportive relationships with healthcare professionals.

What are the implications of the research outcomes?

- The requirement of ongoing training for healthcare professionals is underlined by this research, specifically in optimising assessment and management of HRSH patients, in safe prescribing practices, and interpersonal training to ensure a compassionate and empathic response.
- The findings highlight the importance of assertive follow up to facilitate engagement with aftercare services and reduce feelings of isolation after a HRSH episode.
- The research outcomes indicate that conducting a biopsychosocial assessment needs to be prioritised among individuals with a history of self-harm and/or mental health treatment each time they present to the emergency department.
- Future national suicide prevention policy frameworks should involve the development of clinical guidelines to increase uniformity in safety planning and aftercare for self-harm patients.

7.2. Summary and interpretation of main findings

The main findings arising from the studies in this thesis can be arranged into the following themes:

- Profile of individuals presenting with HRSH (Study 2 and 3)
- Aftercare following high risk self-harm (Studies 2-4)
- Self-harm repetition (Studies 1-4)

The research outcomes from this thesis make significant contributions to gaps in the literature in these areas.

7.2.1. Profile of individuals presenting with HRSH

The profile of persons presenting with HRSH was described in Studies 2 and 3. In Study 2 (Chapter 4), characteristics of HRSH patients were examined in comparison with patients presenting to hospital with lower severity self-harm. In line with previous studies (30, 119, 120), the age profile of HRSH was older than other self-harm cases and more reflective of suicide cases. While there were slightly more males than females in the HRSH group, the significant preponderance of men that is a consistent characteristic of the profile of suicide cases (185), also reported in some previous studies of HRSH (29, 119), was not evident in our study. IDO was the most common method of self-harm among HRSH patients, consistent with existing research on HRSH (27, 29, 118, 120). A unique contribution that this study makes to the existing HRSH research is the findings relating to the characteristics of IDOs; Study 2 findings indicate that HRSH IDOs are more 'serious' with an increased involvement of multiple drug types and more toxic drugs, including tricyclic antidepressants. Alcohol involvement was significantly more prevalent in HRSH presentations compared to other self-harm presentations. This finding is in keeping with a previous study which found that those presenting with high lethality acts were more likely to be misusing alcohol (129).

Study 3 (Chapter 5) provided a more in-depth description of the profile of HRSH patients. The majority of participants were not in a relationship at the time of the self-harm presentation.

Most were living with their partner or a family member and just half were in employment. Four out of five had a history of treatment for mental health issues and one in three had been admitted to a psychiatric inpatient setting in the past. These high rates of previous mental health service engagement are in line with previous HRSH research (2, 3, 124). The most common diagnosis being depressive disorder is also in line with previous studies (122, 126, 127). The majority of participants were prescribed psychotropic medication at the time of the HRSH presentation, of whom most were prescribed multiple medications and antidepressants were the most common medication prescribed. These results are consistent with studies of HRSH occurring in the prison population (2, 3). In two out of three IDOs, the drugs taken included those prescribed for the individual. The most common proximal issues were alcohol misuse and drug misuse. Interpersonal conflicts were also common proximal factors; with a current or previous romantic partner or with family members, friends, or other acquaintances. A suicide note was written in one of every three episodes. One in four participants reported a lifetime history of emotional, physical or sexual abuse. This prevalence of abuse is consistent with high levels of childhood abuse and maltreatment among HRSH patients reported in previous studies (130, 132). This overview contributes to our understanding of individuals presenting with HRSH and the circumstances of their self-harm act which have received limited attention in the existing research.

7.2.2. Aftercare following high risk self-harm

7.2.2.1. Allocation of aftercare

Study 2 examined the extent to which biopsychosocial assessments were conducted among HRSH and lower severity self-harm patients. Individuals presenting to hospital with HRSH had a significantly lower rate of non-assessment (7.8% vs 17.4%). This is a novel finding providing evidence for a high-risk approach to selecting individuals for assessment hypothesised previously, whereby those deemed to be at highest risk of adverse outcomes are those selected for assessment (82, 83). Focusing on the cohort of HRSH patients, Study 3 reported

the proportion of HRSH patients allocated psychiatric inpatient treatment and investigated factors associated with the decision to admit individuals to a psychiatric unit following a HRSH presentation. Forty percent of HRSH patients were admitted to a psychiatric inpatient setting, a considerably higher rate than earlier studies addressing all self-harm presentations (51, 85-87). This is in contrast to the lower rate of admission reported in one previous single-centre study of HRSH patients where 8% were admitted but the rate observed in Study 3 is in line with rates reported following highly lethal methods of self-harm (51). Predictors of psychiatric admission included history of depression, previous psychiatric admission(s), suicide note and certain highly lethal methods of self-harm (including self-poisoning with substances other than drugs, self-immolation, crashing a motor vehicle and jumping from a height). These findings are in line with previous research (85, 87) and indicate that those admitted following self-harm were most often people experiencing enduring mental health issues. Psychiatric admission was allocated following three out of four HRSH presentations involving individuals 65 years and older and the majority of those living alone, further indicating that those most vulnerable were admitted.

7.2.2.2. Experiences of aftercare

Study 4 (Chapter 6) documented HRSH patients' experiences of care in the 6-9 months following their self-harm presentation to hospital. The study reported considerable variation in satisfaction with follow-up care, dependent largely on participants' perception of the quality of their relationships with HCPs and the continuity and comprehensiveness of care received. Timely and comprehensive care involving supportive and compassionate relationships with HCPs was considered essential following a HRSH episode by most participants. Negative aspects of care reported by HRSH patients included lack of empathy from HCPs, excessive waiting time, insufficient follow-up including lack of referrals to specialist care, over-reliance on psychotropic treatment and inconsistencies in personnel. Comprehensive aftercare involving sessions where individuals were given the opportunity to

talk on a regular basis with a mental health nurse, counsellor or other trusted HCP was powerful for many participants in helping them make progress following the self-harm episode. GPs were also reported by many HRSH patients to be a trusted person who gave them the opportunity to talk. Notably, in a previous study about engagement with services prior to HRSH, the majority of participants' felt that having someone to talk would have prevented their self-harm episode (29).

Many participants in Study 4 considered psychiatric admission a 'safe haven' because it was perceived as a safe space to reflect and process their current situation. However, some participants felt let down by their inpatients stay, describing a dearth of therapeutic support. Feelings of isolation post-discharge were common, irrespective of whether the inpatient stay itself was seen as a positive intervention. Furthermore, experiences of aftercare impacted patients' continuted engagement with the services and adherence to psychotropic treatment. Consistent with previous research (94, 97), in this study, patients' experiences of the services also had a powerful impact on shaping future help-seeking intentions and behaviours; those who felt supported by healthcare professionals were more inclined to reach out to the services in times of distress, compared with those who were dissatisfied with their engagement with mental health services.

In Study 4, participants with a previous history of self-harm and those reporting recent engagement with mental health services prior to their index episode were more likely to have felt unsupported in their relationships with HCPs and to report an unsatisfactory level of care. Patients reporting negative or unsupportive relationships with HCPs also had higher levels of depression and lower levels of self-efficacy at baseline compared to those reporting supportive relationships. These are unique findings as no previous research has used a mixed methods approach to explore individual differences associated with experiences of aftercare following self-harm.

7.2.3. Hospital presented self-harm repetition

7.2.3.1. Severity of self-harm and repetition

Two approaches were taken in the thesis to examine the relationship between severity or seriousness of a self-harm act and risk of non-fatal repetition. In Study 1 (Chapter 3), characteristics of self-harm methods were examined in detail in relation to self-harm repetition in a cohort of all self-harm cases presenting to hospital in the republic of Ireland. This study found that minor self-cutting was associated with the highest risk of repetition. We found that the relationship between repetition risk and IDO varied according to number and class of drugs taken. When psychotropic drugs were taken in IDO, involvement of multiple drugs was associated with increased risk of repeated self-harm compared to single drug IDOs. IDO is frequently considered a method associated with lower risk of continued self-harm compared to self-cutting (38, 52-54). In line with this, we found that incidence of repetition following IDO was significantly lower than self-cutting. However, the previously accepted disparity in repetition risk between self-cutting and IDO was not evident when IDO was categorised according to number of drugs and class of drug taken and self-cutting was categorised according to severity. In our study, repetition risk was similar following IDOs of four or more drugs that involved psychotropic drugs and severe self-cutting, which has not been addressed by previous studies. Overall, high lethality self-harm methods, including attempted hanging, attempted drowning, self-poisoning, jumping from a height, crashing a motor vehicle and jumping in front of a moving object, were not associated with increased repetition risk. However, there was evidence of an increased risk following certain high lethality methods among women. These findings indicate that there is a complex relationship between the clinical severity of a self-harm act and the risk of repeated self-harm. Study 2 explored this relationship also by examining whether risk of repetition was higher or lower following HRSH in comparison with lower severity self-harm. We found that HRSH acts had the same repetition risk as other lower severity self-harm acts.

7.2.3.2. Aftercare and repetition following HRSH

Study 2 examined whether receiving a biopsychosocial assessment was related to self-harm repetition within 12 months and found no association. This finding was consistent among the full study cohort and when examining this relationship for HRSH and other self-harm patients separately. This is in line with some previous findings, including a systematic review of 64 studies (98). It has been hypothesised that findings indicating nil effect of assessment may be biased by an approach whereby only those considered to be at greatest risk of adverse outcomes are assessed (83, 84, 93). Accordingly, when using appropriate methods to address this confounding by indication, non-assessment has been found to increase risk of subsequent repetition following hospital presented self-harm (84). It was not possible to address confounding by indication in Study 3 of this thesis due to limited variables in the dataset.

Study 3 investigated the relationship between psychiatric admission and self-harm repetition within 12 months of a HRSH act, using PS methods to adjust for differences between those who were and were not admitted. Using multiple different PS methods, a consistent finding emerged in this study that HRSH patients admitted to a psychiatric inpatient setting following their HRSH act showed the same self-harm repetition risk as those who were not admitted. These findings build on a previous study that also addressed differences between treatment groups using propensity score methods and likewise reported no association between psychiatric admission and self-harm repetition (84).

Study 4 (Chapter 6) used a mixed methods approach to explore patients' experiences of aftercare and how these experiences related to repeated acts of self-harm. In this study repetition of self-harm was not limited to hospital presented self-harm but reflected self-reported repetition, whether or not it resulted in a presentation to hospital. In contrast to the cohort studies (Studies 2 and 3), the quantitative findings of Study 4 indicated that poor experiences of care may indeed contribute to ongoing distress and further suicidal behaviour. In this study, participants who felt let down by the services, reporting predominantly

unsupportive relationships with HCPs, were more likely to have repeated self-harm since the index HRSH act. Consistent with this, a recent systematic review of patients' experiences of care following all hospital-presented self-harm reported that negative experiences of aftercare may increase future self-harm (107).

7.2.3.3. Other factors associated with repetition following HRSH

Study 3 also investigated factors associated with 12-month repetition following HRSH. Recent self-harm history and previous history of psychiatric admission(s) were predictors of self-harm repetition. These findings indicate the majority of HRSH patients who repeat self-harm within 12 months have a history of ongoing distress and service engagement. Risk of repeated self-harm was also increased among emerging adults, with 27% of this age group re-presenting within 12 months. This age difference in repetition is in contrast to previous studies of self-harm presentations in general (47, 61, 186) and may signify an increased risk specific to young adults who present with severe episodes of self-harm. Mirroring previous findings (74, 205), Study 3 observed a reduction in repetition risk among those who wrote a suicide note.

7.2.3.4. Self-harm repetition history

Across Studies 1-4, self-harm history emerged as an important factor related to HRSH, assessment and aftercare, and self-harm repetition. Those with a history of multiple previous self-harm acts appeared to be a particularly vulnerable group. As outlined above, Study 2 observed a greater prevalence of HRSH acts among those with a history of self-harm presentations in the previous two years, particularly those with multiple recent self-harm presentations. In Studies 1-3, which included data on all self-harm presentations and the subgroups of HRSH and lower severity self-harm patients, the strongest predictor of repetition was consistently self-harm history. A dose-response relationship was evident across these studies, with repetition risk increasing with additional previous acts. This was particularly apparent in Study 1 where the large cohort of all self-harm presentations to EDs in the

Republic of Ireland allowed for the examination of 5 levels of self-harm history (from no previous self-harm presentations to four or more previous self-harm presentations). In that study, repetition risk increased with each additional previous self-harm presentation, with the highest risk following presentations among those with a history of four or more previous presentations. This sharp increase in repetition risk with multiple previous acts has been observed previously (186). Study 2 indicated that the association between self-harm history and repeated presentations was particularly apparent for HRSH patients. Among HRSH patients with a history of multiple recent presentations, 67% made a repeat self-harm presentation within 12 months, whilst among lower severity self-harm patients with multiple previous presentations, 44% repeated.

In Study 2, considering all self-harm patients in the cohort, those with a history of two or more self-harm presentations prior to their index act were those at highest risk of not receiving a biopsychosocial assessment compared to those with no self-harm presentations. There was no difference between individuals with one prior presentation and those with none. The relationship between recent self-harm history and not receiving an assessment was more pronounced for HRSH patients. Of the HRSH patients, 22% of those with a history of multiple recent self-harm presentations were not assessed, compared with 6% of those with a history of none or one recent presentation. Of the other lower risk self-harm patients with multiple recent self-harm presentations, just 28% were not assessed compared with 17% of those without multiple recent acts. Furthermore, six months on from their index HRSH act, participants in Study 4 with a previous history of self-harm were more likely to have felt unsupported in their relationships with HCPs and to report an unsatisfactory level of care.

7.3. Theoretical implications

A number of theoretical implications have arisen from the research in this thesis. Firstly, findings from Study 2 of this research indicated a number of differences between individuals presenting with HRSH and lower severity self-harm. Specifically, HRSH was associated with

being 45-64 years of age, having a history of recent self-harm presentations and alcohol involvement in the self-harm act. While the variables available for comparison in this study were somewhat limited, there is little previous evidence describing the profile of HRSH in comparison with other cases of hospital presented self-harm. The findings indicate that HRSH patients are a distinct subgroup of self-harm patients. This conclusion is supported further by findings indicating that HRSH patients are treated differently in clinical practice with high rates of biopsychosocial assessment and psychiatric admission (Studies 2&3).

Considering the findings in light of the stress diathesis model (145, 146), Study 3 revealed that levels of previous adversity may be high among HRSH patients with one in four having experienced some form of abuse in the past and 6% reporting a history of being in foster care or an orphanage. However, variables relating to predispositional risk factors were limited in the data collected for the cohort studies in this thesis. The stress diathesis model proposes that co-occurrence of multiple stressors increases the overall distress experienced by an individual (145). Proximal stressors were very common among HRSH patients including high levels of prior and current mental health treatment, physical ill-health, psychosocial crises including interpersonal conflicts and financial or legal concerns, current alcohol or drug misuse, and a high degree of unemployment and adverse marital status. An examination of subsequent repetition in Study 3 revealed that these proximal psychosocial stressors did not have a strong relationship with subsequent episodes of repeated self-harm. In the multivariable analyses in this study, the substantial increase in risk of repetition associated with previous self-harm history was considerably higher than the risk associated with all other predictors. HRSH patients with one episode of self-harm in the previous two years were five times more likely to present to the ED with repeated self-harm than those with no recent history of self-harm. Those with multiple recent self-harm presentations were 15 times more likely to re-present. This supports the theory of kindling, proposed by van Heeringen (145) and others (150, 151), whereby repeated acts of self-harm increase the accessibility of self-

harming behaviour in a person's memory and as a result less stimuli are needed to trigger an episode of self-harm. As a result, as the number of previous self-harm acts increases, the likelihood of another repeated episode increases also. In addition to Study 3, this is also supported by Studies 1 and 2 in this thesis which also found previous self-harm history to be the strongest predictor of subsequent repetition, with greater risk associated with more previous self-harm acts.

Whilst the psychosocial stressors experienced by individuals at the time of their HRSH act were not predictive of subsequent repetition, it is likely that the multitude of stressors documented will have had an impact in some way. The stress diathesis model further proposes that repeated exposure to stressors may result in reduced resilience to stress and thus, overtime minor stressors may result in repeated suicidal behaviour of increased severity (145). This is in keeping with the findings of Study 2 that showed that HRSH patients were more likely to have a history of self-harm than lower severity self-harm patients, indicating potential escalation in severity with repeated acts of self-harm.

Interpretation of the findings of this thesis can also be aided by considering the Integrated Motivational-Volitional (IMV) model of suicidal behaviour (148). The IMV model proposes that the development of suicidal behaviour occurs across three distinct stages: the pre-motivational phase which is comprised of background factors that create the context in which suicidal behaviour can occur; the motivational phase which involves factors that contribute to the development of suicidal thoughts; and the volitional phase including factors or moderators that facilitate the transition from ideation to behaviour. The volitional moderators, described in Figure 2 (Section 1.10.1), are relevant to the findings of this thesis (148). Studies 3 and 4 in this thesis highlight the high level of psychotropic drug prescribing among individuals prior to a HRSH act and following a HRSH act. Furthermore, the majority of individuals were prescribed multiple drugs, and many were prescribed drugs for physical concerns also. This means that these individuals readily had access to means of self-harm and

Study 3 highlighted that most used their prescribed drugs in their HRSH act. In line with the IMV model, the availability of these drugs may have contributed to the transition from the motivational phase to the volitional phase, from suicidal ideation to suicidal behaviour. The IMV model highlights the potential cyclical nature of suicidal behaviour, as highlighted by the dotted line in Figure 2 (148). Study 1 in this thesis found that increased quantities of psychotropic drugs involved in an index IDO presentation predicted repetition of self-harm suggested that access to means may govern subsequent repeated acts also. The IMV model also includes past suicidal behaviour as a volitional factor. In line with the findings of this thesis and the stress-diathesis model (145), the IMV model proposes that those who engage in repeated acts of self-harm experience increased distress and intention transitions into behaviour more readily with increasing repeated acts (148).

7.4. Clinical implications

Improving our understanding of clinical factors associated with HRSH and outcomes following service interventions is essential for the enhancement of patient care and the reduction of adverse outcomes. The findings of this research have important implications relating to continuity of care and the interpersonal approach of healthcare professionals towards self-harm patients across healthcare settings, including the ED, inpatient and outpatient psychiatric services and primary care. Specific implications concerning the ED setting relate to the assessment of self-harm patients, the allocation of aftercare, and safety planning. Finally, this body of research highlights opportunities for harm reduction through enhanced monitoring of drug prescribing and dispensing.

7.4.1. Implications for clinicians across healthcare settings

The findings from this research highlight the crucial role that interpersonal communication plays in the care of self-harm patients. The findings from Study 4, reflecting patients' own experiences, emphasise the importance of establishing compassionate, empathic HCP-patient relationships following a HRSH presentation. This provides further evidence to support the

model of care of the NCP-SH, an integral component of which is that all self-harm patients should receive an empathic and compassionate response (77). In our research, positive or negative relationships with clinicians had a significant impact on patients' satisfaction with services, adherence to psychotropic treatment, continued engagement with services, and ongoing distress and suicidal behaviour. The importance of establishing a genuine relationship was important for patients across healthcare settings. Relationships between HCPs may be impacted by prejudice and negative attitudes to individuals presenting with self-harm (94, 109, 110, 227). Those with a history of repeated self-harm experience greater negativity and intolerance (110, 228). This was observed in the current research with HRSH patients with a history of prior self-harm and mental health service engagement being those most dissatisfied by their relationships with HCPs. Greater understanding of self-harm and suicidal behaviour is associated with more positive attitudes and a more patient centred approach to care (227). Thus, training programmes on the topic of self-harm that cover particularly vulnerable groups, including HRSH patients and those engaging in repeated self-harm, should be offered during HCPs formal education and throughout their professional career (109, 110). It is important to note that persons presenting with self-harm, particularly HRSH, frequently have enduring and often severe mental health issues that may make it difficult for HCPs to establish supportive relationships. Indeed, in Study 4, higher levels of depression and hopelessness and lower self-efficacy were reported among those who reported negative or unsupportive relationships with HCPs. This further emphasises the complexity of caring for individuals who engage in self-harm and the necessity of ongoing training to equip HCPs with the knowledge and skills to develop meaningful therapeutic alliances. The significant contribution that primary care plays in the care of self-harm patients was evident in this research and indicates the need for ongoing education in mental healthcare and suicide prevention for GPs as well as clinicians in mental health services.

Overall, patients in Study 4 were most satisfied with their engagement with healthcare services when they received care from a multidisciplinary team, with healthcare professionals such as mental health nurses and counsellors, in addition to a psychiatrist. Having additional sessions in which they had an opportunity to talk at length resulted in patients feeling more supported and more content with their appointment with a psychiatrist. In line with a previous Cochrane review (229), these findings indicate that patients who received aftercare from multi-faceted community mental health services often had more positive experiences of care. A substantial proportion of participants in Study 4 described an absence of certain elements of care leaving many feeling isolated and unsupported. Frustration was frequently expressed about excessive waiting times, insufficient follow-up including lack of referrals to specialist care, over-reliance on psychotropic treatment and inconsistencies in personnel. This is concerning given that lack of timely and comprehensive care following self-harm or psychiatric hospital discharge is associated with increased risk of suicide (214-217). The immediate period following discharge from the hospital is a particularly vulnerable period for self-harm patients (223, 230). During this period, assertive follow-up should be conducted routinely, particularly with HRSH patients. This should involve continued interaction with discharged patients to facilitate their engagement with the relevant services, bridging the gap to their follow-up appointment to ultimately reduce feelings of isolation (76, 77).

Study 3 in this thesis found that the majority of HRSH patients had a history of engaging with either primary care or secondary mental health services for treatment of mental health issues prior to their HRSH presentation. This indicates that there were opportunities for intervention among these individuals prior to their self-harm act that brought them close to ending their lives. Previous research indicates that while some completed suicides can occur impulsively and appear unavoidable, these cases may represent a failure to detect individuals at risk (218, 231). This research on HRSH patients contributes to our understanding of the most serious cases of hospital presented self-harm. Consideration of factors associated with HRSH may

facilitate the identification of at-risk individuals in primary care and mental health services. However, as the majority of those who present with these risk factors will not attempt to take their lives, accurate prediction of those at highest risk of suicide will remain a major challenge, particularly when suicidal thoughts or intentions are not disclosed (232, 233). While it may be challenging to accurately identify those at highest risk of suicide, an aspect of clinical practice that is directly modifiable is the attitude of the HCP. Clinicians should approach all patients, and particularly those with identified risk factors, in a compassionate and responsiveness manner, as disclosure of distress and suicidal plans is more likely among individuals who feel supported by the services (Study 4) (94, 97). Furthermore, where individuals have received comprehensive mental healthcare with clear communication of the services available, they are more likely to reach out to the services in times of need (Study 4).

7.4.2. Implications related to assessment and aftercare

Biopsychosocial assessment is internationally recognised as a central component of the management of self-harm in the ED (76, 77). All patients presenting following self-harm regardless of method or severity, should receive a standard of assessment and care that includes standardised triage, bio-psycho-social assessment, access to skilled clinicians, involvement of family/carers, emergency care plans and appropriate follow-up (76, 77, 79). Rates of non-assessment were low across all self-harm patients in this research (Study 2). It is encouraging that only a small minority of persons presenting with HRSH did not receive a biopsychosocial assessment. However, a significantly greater rate of non-assessment was observed among other self-harm patients. Not providing an assessment to all patients represents a missed opportunity for intervention with people presenting with lower severity but who may be experiencing ongoing distress (84). It also limits the possibility of developing a collaborative approach to aftercare involving the support of a patient's family or carer which has the potential to have a powerful protective effect (113-115).

The findings across multiple studies in this thesis add to a significant body of research indicating that self-harm history is the most important factor predicting subsequent self-harm. Furthermore, multiple previous presentations were found to increase the risk of repetition further and increase the likelihood that a person presents with an episode of HRSH. In line with this, HRSH patients with a history of previous psychiatric admission were at increased risk of repetition also. These findings further emphasise the importance of providing a thorough biopsychosocial assessment with a comprehensive aftercare plan for self-harm patients with a history of self-harm and/or a history of psychiatric inpatient treatment each time they present to the ED, even if the individual has already been assessed by the service previously or is currently engaged with the mental health services. This emphasis is necessary; Study 2 in this research found that self-harm patients who presented with multiple previous self-harm acts in the previous two years were at highest risk of non-assessment. This risk was greater among HRSH compared with lower severity self-harm patients. In addition, as mentioned previously, Study 4 in this thesis found that persons presenting with self-harm who have a history of self-harm and mental health service engagement were those most likely to be dissatisfied with the care they received. Again, the findings underline the importance of ongoing skills training for mental health professionals in optimising assessment and management of self-harm patients, particularly those with a history of previous acts [50]. Misconceptions of the inevitability of repeated self-harm need to be addressed within clinical practice and via formal education programmes. While the completion of an assessment is important, the assessment also needs to be of high quality and tailored by a skilled mental health professional to the patient's needs. Those who have presented to the service multiple times previously should not be required to retell their personal history with each re-presentation but should be encouraged to discuss changes in their circumstances and causes of their continued distress (48). Case reviews should be conducted regularly to monitor patterns of attendance and explore possible interventions (48).

To aid clinicians in conducting thorough assessments of the risk and needs of self-harm patients, it is important to understand the factors that are associated with increased risk of self-harm repetition (76, 77). Ongoing educational programmes should be made available to ensure that those conducting assessments have up-to-date knowledge of predictors of repeated suicidal behaviour and particularly vulnerable groups of self-harm patients. A detailed examination of self-harm methods in Study 1 resulted in novel findings that enhance our understanding of their relationship with non-fatal repetition. The study findings counter the previously accepted disparity in repetition risk between self-cutting and IDO, indicating that IDO should not be treated as a homogeneous category when considering the method used in relation to the assessment of risk in a clinical setting. This is further supported by previous research indicating that multiple drug IDOs and increased number of tablets are associated with higher suicidal intent (22, 55), severe medical outcomes (56, 57), subsequent suicide (180) and higher case-fatality (58). Another factor that conferred greater risk of repeated self-harm following HRSH (Study 3) was young age (18-24 years). This is a cause for concern given the increasing use of high lethality methods (69) and the high suicide rates in this age group, particularly male young adults. The high risk of repetition among young people presenting with very serious episodes of self-harm should be considered when conducting assessments and planning aftercare, particularly as many of these individuals will be in the process of transitioning from child and adolescent to adult mental health services (208, 209).

HRSH was found to be strongly related to alcohol consumption in Study 2, emphasising the importance of comprehensive screening for alcohol misuse and dual diagnosis following a self-harm presentation, with appropriate follow-up care planning (191). This is reinforced further considering the finding in Study 3 that alcohol misuse was the most common proximal factor related to individuals HRSH act. Those using and misusing alcohol at the time of a self-harm episode have been identified as a particularly vulnerable group at increased risk of subsequent self-harm repetition and suicide (187, 188). While alcohol misuse is a modifiable risk factor,

providing care for self-harm patients misusing alcohol is complex and often challenging. This is exemplified in Study 4 which found that those who were dissatisfied with their care following HRSH were more likely to be misusing alcohol at follow-up. Improved expertise in the assessment of potential alcohol disorders or dual diagnosis should be prioritised among HRSH self-harm patients so that aftercare can be tailored to the needs of those presenting with self-harm who are misusing alcohol (191). In addition, frontline staff should receive training to equip them with the skills to engage with self-harm patients who are intoxicated or experiencing symptoms of alcohol withdrawal.

The findings indicate that psychiatric inpatient treatment is reserved for the patients at highest risk, indicating that HCPs are appropriately allocating the more intensive forms of treatment. Among those high-risk individuals, psychiatric admission was not found to be associated with repeated self-harm. This is an important finding given that a perception of psychiatric inpatient care as harmful could inhibit access to care for those in need of it. In line with this, in Study 4 some patients with limited prior experience of psychiatric inpatient facilities indicated a reluctance to admission due to an assumption that their experience would be negative. Furthermore, psychiatric admission following their index HRSH act was a positive experience for many individuals because it was perceived as a safe space to reflect on current difficulties and it provided protection from their own behaviour. However, a reluctance towards admission was also reported among those with prior experiences of inpatient care and not all participants who were admitted felt their inpatient stay was beneficial with some reporting a dearth of therapeutic support. This emphasises the importance of addressing the therapeutic needs of patients in psychiatric inpatient settings in addition to ensuring their safety, as highlighted in previous research (222).

7.4.3. Implications for drug prescribing

Prescribing practices play a critical role in self-harm management and suicide prevention [10-12]. This research revealed a number of important findings relating to drug prescribing.

Studies 3 and 4 in this thesis highlight the high level of psychotropic drug prescribing among individuals prior to a HRSH act (57%) and following a HRSH act (75%). Moreover, most of HRSH patients whose self-harm involved IDO took their own prescribed drugs. Compared with lower risk self-harm patients, HRSH patients were more likely to take multiple drugs in IDOs and more toxic drugs, including tricyclic antidepressants. Furthermore, multiple drug IDOs and those involving psychotropic drugs were associated with elevated risk of repetition. These findings underline the importance of monitoring the availability of multiple drugs, particularly to patients prescribed psychotropic drugs and those identified as being at risk of self-harm or with a history of prior self-harm. Monitoring the availability of medications can include phased dispensing, limiting the duration of prescriptions, considering drugs prescribed to the patient by other clinicians and collaboration with family and carers to reduce availability of medication in the home. Quantity of available or "in-possession" drugs and whether an individual is deemed well enough to administer their own medication should be reviewed regularly (234).

Due to the potential risks associated with some psychotropic drugs, care should be taken where possible to prescribe drugs that are least toxic in IDO (234, 235). This recommendation is well established, but the findings of this research indicate that it requires reinforcing as Study 3 showed that a substantial proportion of HRSH patients were prescribed mirtazapine, serotonin and norepinephrine reuptake inhibitors and tricyclic antidepressants which are associated with greater risk of death from overdose compared to other selective serotonin re-uptake inhibitors (234-236). It is particularly important to consider toxicity when multiple drug types are being prescribed due to potential increases in toxicity as a result of drug interactions (234). An example given by the National Institute for Health and Clinical Excellence in the UK (234, 235) describes the prescription of benzodiazepines in combination with anti-epileptic drugs which can increase the risk of respiratory depression. As documented in Study 3, these drugs types were commonly prescribed to HRSH patients. Ongoing awareness training with clinicians may be beneficial to reduce inappropriate prescribing of drugs commonly used in

IDO that are associated with high lethality and increased risk of repetition (12). These implications are particularly relevant for psychiatrists, general practitioners and pharmacists. Where a person is under the care of both mental health services and their GP, responsibilities for prescribing and monitoring should be clearly defined (234). These recommendations are also applicable to general hospital consultants and other healthcare professionals with the responsibility for prescribing medication for physical concerns, as these drugs are often used in IDO also. Healthcare professionals prescribing any medication should consider the patients total prescribed medication load in the consideration of potential drug interactions outlined above.

Lack of adherence to psychotropic treatment can have adverse consequences for an individual who a clinician has deemed in need of medication, but they may also be left with medication that they were prescribed and did not take, which they could lead to stockpiling. The current research found that many HRSH patients were unaware of the types of medication they were prescribed or what it was for. Ensuring that the patient fully understands the purpose of the medication when they may expect to experience the benefits and the potential side-effects can encourage adherence. In line with this, clinical guidelines recommend involving patients in discussions about their psychotropic treatment so that decisions can be made in partnership, providing clear information about what medicines will be prescribed or are being changed, and a timeline for reviewing new medications (234, 237). Clinicians should engage with their patients with regards to their psychotropic treatment on an ongoing and reflexive basis (237).

7.5. Implications for policy and suicide prevention

As outlined, findings from this thesis have implications with direct relevance to suicide prevention within clinical settings with recommendations for improved safety planning and strategies for risk reduction. However, significant gaps exist between research outcomes, policy and clinical practice, with variable rates of implementation of clinical recommendations

reported across hospital services (81, 238, 239). This is evidenced by the large differences in quality of care across clinical services (51, 81, 91) and further supported by the consistent reporting of similar shortcomings in mental healthcare and care of self-harm patients over time (94, 107). Researchers working closely with mental health professionals, clinical services and policymakers increases the likelihood that relevant findings will have a real impact on patient safety and suicide prevention (238). Findings from this research have been presented to healthcare staff in participating hospitals throughout the course of this PhD. Research outcomes and clinical recommendations have also been presented to groups of trainee psychiatrists in University College Cork. Furthermore, the National Suicide Research Foundation (NSRF), where this PhD research was conducted, has close links with the Irish *National Clinical Programme for the Assessment and Management of Patients Presenting to Emergency Department following Self-harm in Ireland* (NCP)(77). The NCP highlights the important role that auditing and monitoring play in the successful implementation of the programme (49). Findings from this thesis can inform this evaluation. A central goal of the NCP is to provide a biopsychosocial assessment to all individuals who present to the emergency department as a result of self-harm (77). Study 2 in this thesis indicate that the NCP are coming close to achieving this target with a low level of non-assessment overall, particularly among those presenting with HRSH. However, there is a group of vulnerable self-harm patients at higher risk of non-assessment, specifically those with a history of multiple recent self-harm presentations. Central objectives of the NCP are to improve access to interventions and facilitate timely engagement with appropriate aftercare for self-harm patients. Findings from Study 4 of this research indicate that not all self-harm patients feel supported in the period following discharge from the ED. Reports of long waiting times, feelings of isolation and dissatisfaction with the nature of the follow-up care provided, suggest that additional improvements are needed in bridging to appropriate follow-up care.

The NSRF also works closely with the National Office for Suicide Prevention (NOSP) which co-ordinates the implementation of Ireland's national suicide prevention strategy*, Connecting for Life* (152). The first objective of Connecting for Life is to 'improve population-wide understanding of suicidal behaviour, mental health and wellbeing, and associated risk and protective factors' (p.30). The findings from all studies included in this research contribute to addressing this objective by providing an enhanced understanding of predictors of repeated self-harm among the full population of self-harm patients and specifically among those presenting with HRSH. *Connecting for Life* identifies people with mental health problems and those with alcohol and drug problems as a priority group at risk of suicidal behaviour. With over 80% having a history of mental health service engagement and a high level of proximal alcohol and drug misuse, HRSH patients are part of this priority group, highlighted as requiring targeted approaches to suicide prevention. Furthermore, the outcomes of Studies 2-4 provide a valuable evidence base for Goal 5: to ensure safe and high-quality services for people vulnerable to suicide. In line with *Connecting for Life,* as well as international suicide prevention initiatives, including *Preventing Suicide: A Global Imperative* (12) and the *United Nations Sustainable Development Goals, Target 3.4 (155),* the findings of this research emphasise the importance of continued training and education for healthcare workers. The research highlights specific areas of training that should be prioritised, namely skills training for healthcare professionals in optimising assessment and management of HRSH patients and in safe prescribing practices.

Access to means has been highlighted as a risk proximal risk factor for suicidal behaviour (146). Restricting availability of means has consistently been shown to be an effective strategy to reduce suicidal behaviour (240-246). One approach to means restriction, highlighted as a specific objective of *Connecting for Life,* is to reduce access to drugs frequently used in IDO (152). Findings from this doctoral research highlight that enhanced monitoring of drugs prescribed to those with mental health conditions is required to reduce individual access to

large quantities of drugs so that harm will be minimised if available drugs are taken together. Recommendations for prescribing practices are described in detail in *Section 1.3.3 Implications for drug prescribing*. Other methods for managing the availability of drugs include safe storage and disposal practices. Guidelines in Ireland and internationally provide recommendations on the safe disposal of controlled drugs if they are unwanted or unused (217, 230). It is important that these recommendations are communicated to those at risk of suicidal behaviour and their family members or carers to minimise the availability of these medications and to reduce the likelihood of stockpiling. Research in this thesis also indicates high proportions of IDOs involving over-the-counter analgesics (Study 1), particularly paracetamol among HRSH patients (Study 2). Previous research indicates the efficacy of the restriction of over-the-counter medications via national legislation (231) (228, 232-238). Since 2011, legislation in Ireland has limited the over-the-counter sale of paracetamol in terms of pack size and number of packs per customer. Studies have shown a decrease in severity of overdoses involving paracetamol since the introduction of this legislation. However, there is evidence indicating lack of compliance across pharmacy and retail outlets (239, 240). Combined with the continued high rates of paracetamol involvement in IDO, this highlights the need for enhanced monitoring and training for pharmacy and retail staff in the importance of adhering to the regulations.

7.6. Future research

Numerous relevant avenues of research could build on the research in this thesis. The key outcome examined throughout the research in this work has been repeated non-fatal self-harm. As outlined in the previous sections, the findings on self-harm repetition in this body of research make an important contribution to the evidence base in the field of suicidal behaviour and to clinical practice and suicide prevention. Nonetheless, further research is needed that examines suicide and other causes of premature mortality following HRSH. HRSH presentations are characterised by factors that confer a high risk of subsequent suicide,

including highly lethal methods, medical severity and high suicidal intent. Furthermore, high rates of suicide following HRSH have been reported. However, studies directly comparing risk of suicide following HRSH compared with lower risk self-harm are lacking. Future research should examine this and should also explore whether factors related to suicide differ between HRSH self-harm patients and other lower risk self-harm patients. A previous study by Beautrais et al. found that the usual increased risk of suicide among males observed following hospital presented self-harm in general, was not observed following HRSH, suggesting that differences in risk factors may exist. In addition, the findings of Study 3 indicating that psychiatric admission is not related to self-harm repetition provides evidence that this form of treatment is not associated with adverse outcomes among HRSH patients. However, it is not possible to come to this conclusion without an examination of mortality. Therefore, a future study that uses propensity score methods to examine the impact of psychiatric admission following HRSH on premature mortality would be beneficial.

Study 2 and Study 4 highlighted differences in the experiences of assessment and aftercare experienced by self-harm repeaters and mental health service users compared to those with little or no history of repetition or service engagement. Further qualitative or mixed methods research is needed that more thoroughly explores the experiences of assessment and aftercare among individuals with a self-harm history and those engaged with mental health services. Furthermore, in-depth research with mental health practitioners exploring the reasons underlying inconsistencies in the approach to the treatment of this group of self-harm patients would provide a more complete understanding of the issue.

A further area of future research arising from this thesis is the proposal to incorporate additional data items in the NSHRI beyond the core data items routinely collected. Factors such as the medical treatment received, and the level of suicidal intent would give a more accurate understanding of the severity of a self-harm presentation. This would allow for the study of HRSH at a much greater scale. It would also facilitate the examination of the severity

of repeated acts of self-harm and the investigation of patterns of escalation in severity of repeat episodes. Inclusion of these factors, as well as others known to be related to the allocation of treatment and/or risk of self-harm or suicide, would facilitate the use of propensity score methods on a larger scale in the examination of routine aftercare and subsequent adverse outcomes. In addition to medical treatment and suicidal intent, such factors may include living arrangements, psychiatric treatment history, depressive disorder, alcohol misuse and the presence of a suicide note. These variables were all routinely available from the IMPRESS study hospitals and so theoretically could be routinely collected in some, if not all hospitals in the country. However, practical difficulties may arise due to differing levels of access afforded to the NSHRI data registration officers and varying recording practices between hospitals.

Finally, given that most HRSH patients were prescribed multiple psychotropic drugs and took these prescribed drugs as part of their self-harm acts, further investigation is warranted into the relationship between drugs prescribed to HRSH patients and use of these drugs in intentional drug overdose. Future research, using a mixed methods approach, would be beneficial to examine combinations of drug types prescribed to HRSH patients, changes to prescribing practices following the HRSH act, quantities of drugs dispensed, hoarding of medication and whether the availability of drugs was related to the decision to act on suicidal thoughts.

7.7. Strengths and limitations

This section provides a description of the strengths and limitations of the thesis as a whole. The strengths and limitations specific to each study are discussed in detail in the relevant chapters.

7.7.1. Strengths

This doctoral work focuses on HRSH patients who are a particularly vulnerable group of self-harm patients at high and enduring risk of suicide and other adverse outcomes (1, 4, 6, 27,

133). The research in this thesis is particularly timely given the increase in HRSH presentations, specifically the use of highly lethal methods, among people in all age groups in recent years (37, 43, 69). A strength of this research is that it builds on previous studies of HRSH that have focused on medically serious self-harm and highly lethal methods by including suicidal intent in the classification of HRSH. As outlined previously, expectations of lethality by individuals who self-harm are frequently inaccurate (19) and this lack of comprehension of the lethality of certain methods or of a substances toxicity may result in those without a strong wish to die losing their lives and those with high suicidal intent experiencing minor medical consequences (25, 26). The definition of HRSH in the present research is more representative of individuals making a serious attempt to take their lives as it not only includes actual or potential lethality, but also desired lethality.

The studies in this thesis uses data from the NSHRI, a national monitoring system of all hospital presented self-harm, or the IMPRESS study, a study on consecutive HRSH patients that presented to three urban hospital EDs identified according to a standardised procedure. Data collected from multiple sites is more robust and results are more generalisable beyond the study sites. In addition, the full dataset from the NSHRI was used to establish self-harm repetition in Studies 1-3. This meant that for Studies 2 & 3 that used baseline data from three study hospitals, repeated self-harm presentations outside of the study area, to any hospital in the country, were included. This meant that loss of follow-up data (repeated self-harm presentations to the ED) was minimal across the prospective studies. The representativeness of the samples and comprehensiveness of follow-up in this research adds weight to recommendations made on the basis of the findings.

Another strength of this research is the different methodological approaches taken, expertly chosen in consultation with my supervisors to best address the specific research questions. The mixed methods approach allowed for the examination of HRSH, aftercare and self-harm repetition from multiple perspectives in order to gain a more comprehensive understanding

of these interrelated topics ((168, 169). The large sample size in Study 1 (n=65,690) allowed for the examination of variables, such as characteristics of IDO, that have received limited attention in previous research due to limited numbers. HRSH patients have been compared with lower severity self-harm in only a limited number of studies as most studies involve primary data collection specifically focused on HRSH patients. The linkage of the IMPRESS and NSHRI datasets is another strength of this doctoral work as it allowed for this comparison to be made in Study 2. In Study 3, a smaller sample size (n=323) was used than the first two studies, but the data collected included a wealth of information on each case that provided rich findings that were complementary to Studies 1 and 2. Finally, Study 4 was even more in-depth, documenting aftercare and repetition from the perspectives of individuals who had presented with HRSH.

The three quantitative studies (1-3) are prospective cohort designs which are the optimum study design for the examination of factors relating to a subsequent outcome (247). A prospective cohort design allows for the examination of factors that precede repetition within a defined follow-up period; this is more accurate than a retrospective approach comparing factors associated with repeaters and non-repeaters (247). While randomised controlled trials are often considered the optimal approach in the examination of the impact of a treatment on patient outcomes, ethical considerations in suicide and self-harm research generally preclude these. Therefore, cohort studies, particularly those using statistical techniques beyond traditional covariate adjustment to adjust for confounding by indication, are considered an appropriate alternative (194, 247). Such studies are also beneficial as they represent the care provided in a pragmatic rather than an experimental setting.

7.7.2. Limitations

A number of limitations related to this body of research must be considered when interpreting the findings. Firstly, HRSH cases were principally identified and classified by members of the psychiatry teams in the hospitals who had a multitude of competing clinical duties, so it is

possible that cases of HRSH were missed. However, the PhD Candidate (GC) and another member of the study team (DL) visited the hospitals at regular intervals to review the files and ensure that all eligible cases were identified. As mentioned previously, a fourth hospital participated in case identification and facilitated recruitment for a number of months. Regular monitoring by GC and DL and the project PI, EA, during this time led to the discontinuation of recruitment in this hospital due to inconsistent application of the eligibility criteria and an excess of missed cases. This highlights the rigour with which the identification of cases within the hospitals was monitored by the study team. Nonetheless, while self-harm patients who left the ED before being seen were reviewed by the psychiatry teams to identify HRSH cases, cases may have been missed by both the psychiatry and research team where information documented in the ED prior to their departure was limited.

In addition to being dependent on hospital staff for identification of HRSH cases, the information collected from hospital files was dependent on the recording of patient information in the hospitals. Overall, collecting information from multiple sites is a strength of the IMPRESS study. However, whilst there are national guidelines for conducting biopsychosocial assessments in Irish hospitals, procedures for conducting assessments and recording patient information are not fully standardised across the three study hospitals. At the beginning of the data collection process, GC and DL made amendments to their data collection procedure and removed variables that could not be collected consistently across the three hospitals. Following completion of data collection, exploratory analyses were conducted to identify any noteworthy differences between the hospitals and nothing of concern arose.

Studies 2-4 in this thesis use a definition of HRSH described in Section 2.1.1.1 that is based on the definitions used in previous high-quality research (2, 3, 20, 27, 29). However, in operationalising this definition, there is a potential that cases of self-harm with low suicidal intent and low medical severity were classified as HRSH. For example, the inclusion criteria for

HRSH include IDO presentations where a medical intervention was deemed necessary, including N-acetylcysteine treatment for paracetamol overdoses. Given the high proportion of paracetamol involvement in the HRSH presentations documented in Study 2, it is likely that some cases involved impulsive IDOs of paracetamol with low suicidal intent that may not have resulted in serious consequences without the intervention. Furthermore, in line with the Tenth Revision of the ICD-10 codes for intentional injury (50), attempted self-strangulation and self-asphyxiation were included in an overall method category with attempted hanging. These methods are generally associated with lower lethality than attempted hanging which may have led to the inclusion of presentations in the HRSH group that should have been in the lower severity self-harm group. However, cases of self-strangulation and self-asphyxiation accounted for just 11% of the method category and cases were only included when: the individual was unconscious as result of the act; the person was conscious but was witnessed in suspension or using a ligature and had physical evidence of asphyxiation; or there was physical evidence of suspension or strangulation. Suicidal 'gestures' with a ligature were not included. Nonetheless, if presentations were classified as HRSH in error, this may have impacted the findings arising from a comparison between HRSH presentations with lower severity cases. Suicidal 'gestures' with a ligature were not included, as confirmed by a review of the detailed notes on the self-harm act for each case by the PhD candidate, GC. Nonetheless, it is possible that some presentations were classified as HRSH in error which this may have impacted the findings in this thesis, particularly those that compare HRSH presentations with lower severity cases.

Absence of certain data items in the NSHRI meant it was not possible to directly identify HRSH cases from within the NSHRI dataset. Specifically, suicidal intent and, with the exception of self-cutting, information on medical severity of self-harm presentations is not recorded by the NSRHI. This meant that it was not possible to apply the definition of HRSH used in the IMPRESS study to the NSHRI dataset. Discussions were had as to how cut-offs could be applied to self-

harm method characteristics that would identify a subgroup of more serious cases. For example, presentations with high numbers of tablets may represent cases with high suicidal intent and potentially serious medical consequences. Selecting subgroups of IDO presentations involving especially toxic drug types was also explored. However, it was determined that cases could not be categorised in a systematic, evidenced based manner. Thus, using an alternative approach, the HRSH cases identified via the IMPRESS study were subsequently linked to the NSHRI dataset. This allowed for the identification of the subgroup of HRSH patients within the NSHRI dataset (Study 2) but with a smaller sample size than if it were possible to identify the cases directly from the NSHRI. As mentioned previously, the data linkage was probabilistic due to cases in the NSHRI being pseudonymised. Therefore, we could not be certain that all cases matched between datasets were definitely the same person and that no matches were missed.

Overall, the response rates to the interviews, particularly the baseline interviews, was low. Therefore, the representativeness of the sample of HRSH patients in Study 4 is unclear. However, we have no reason to believe that the group is unrepresentative because the sample was non-selective, with all consecutive patients presenting following HRSH approached according to a standardized procedure. In the original proposal for this body of research, quantitative data from the interviews was going to be used in the examination of predictors of self-harm repetition following HRSH (Study 3). This would have allowed for the examination of additional life-event factors, psychological factors and more detailed information on prior healthcare contact. However, with an overall sample of 68 and follow-up information only available for 35 individuals, there would not have been sufficient power to detect differences in repetition using interview data. In anticipation of this occurring, the proposal was changed early and the linkage between the IMPRESS hospital data and the NSHRI was planned in order to achieve the Study 3 objectives.

Studies 1-3 in this research examine non-fatal self-harm repetition for varying follow-up periods. Information on suicide or other causes of mortality during these follow-up periods was not available for any of the studies. Originally, it was hoped that data from the Irish Central Statistics Office (CSO) could be used to examine suicide and other causes of premature mortality for Study 1. However, due to aforementioned issues with accessing CSO data, this was not possible. Due to the death registration system in Ireland, there is a 3-4-year lag before complete suicide data are available. Therefore, due to the timing of the primary data collection for this thesis, it was never anticipated that we would be able to access data on mortality following HRSH. As the HRSH subgroup are likely to have high suicide risk (4, 7-11), this may have influenced the results. It is worth noting that continued engagement with the hospitals did provide some information on subsequent mortality and in such cases, these were removed from follow-up analyses where appropriate (<5). Finally, self-harm repetition examined in Studies 1-3 includes hospital cases of self-harm only. Therefore, findings cannot be generalised to self-harm repetition not resulting in a hospital presentation, including those presenting to primary care and other health services.

7.8. Conclusions

Improving our understanding of clinical factors associated with HRSH and outcomes following service interventions is essential for the enhancement of patient care and reduction of adverse outcomes. This research used a mixed methods approach, including a variety of methodologies, to examine the characteristics of HRSH patients and aftercare and self-harm repetition following HRSH. This research highlights the importance of proving timely and comprehensive care to all self-harm patients, delivered in an empathetic manner. Across this research, the vulnerability of self-harm patients with a history of self-harm was highlighted, in terms of the severity of their self-harm acts, their risk of repetition and the quality of the care they receive. Conducting thorough biopsychosocial assessments for individuals with a history of self-harm and/or mental health treatment each time they present to the ED should be

prioritised. The overall findings arising from this thesis underline the importance of ongoing skills training for healthcare professionals in optimising assessment and management of HRSH patients and in safe prescribing practices.

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Appendix 1.

Codebook for collection of hospital data for the Improving Prediction and Risk Assessment of Self-Harm and Suicide (IMPRESS) study

Variable	Value
ID	None
Patient Type	1 = HR 2 = MR 3 = HR and MR
Assessment conducted for patient	1 = No 2 = Yes 3 = Yes but not for the index act
Hospital	1 = CUH 2 = Mercy 3 = UHL
Date of presentation	None
Time of presentation	None
Mode of presentation to hospital	1 = BIBA 2 = Self-presented 3 = Brought in by family/partner/other 4 = GP referral 88 = Not recorded
Date of birth	None
Age at time of presentation	None
Sex	1 = Male 2 = Female
Nationality	1 = Irish 2 = Other 88 = Not recorded
Specify if other Nationality	None
Marital Status	1 = Single 2 = Married 3 = Co-habiting 4 = Long-term relationship: >12 months 5 = Widowed 6 = Divorced 7 = Separated 8 = Short-term relationship. < 12 months 88 = Not recorded
Accommodation	1 = Homeless / no fixed abode 2 = Supervised hostel 3 = Unsupervised hostel 4 = Privately rented or owned House or flat 5 = Council housing 6 = Prison 7 = Other 88 = Not recorded
Specify if other accommodation	None
Living arrangements	1 = Alone 2 = With family of origin 3 = With partner/spouse only 4 = With partner spouse and children 5 = With child(ren) only 6 = Other shared (e.g. friends) 7 = Other 88 = Not recorded

Number of children	None
Employment status	1 = In paid employment (including part-time) 2 = Unemployed 3 = Self-employed 4 = Housewife/husband 5 = Full-time student 6 = Long term disability 7 = Retired 8 = Other 9 = Sick leave 10 = Unpaid occupation 77 = Not applicable 88 = Not recorded
Current profession if employed	None
Sector of employment	1 = Agriculture, forestry and fishing 2 = Mining and quarrying 3 = Manufacturing 4 = Electricity, gas, steam and air conditioning supply 5 = Water supply; sewerage, waste management and remediation activities 6 = Construction 7 = Wholesale and retail trade 8 = Transportation and storage 9 = Accommodation and food service activities 10 = Information and communication 11 = Financial and insurance activities 12 = Real estate activities 13 = Professional scientific and technical activities 14 = Administrative and support service activities 15 = Public administration and defence 16 = Education 17 = Human health and social work activities 18 = Arts, entertainment and recreation 19 = Repair of motor vehicles and motorcycles 20 = Activities of households as employers; undifferentiated goods- and services-producing activities of households 21 = Activities of extra territorial organisations and bodies 22 = Other service activities 77 = Not applicable 88 = Not recorded
In receipt of social welfare	1 = No 2 = Job seekers allowance 3 = Disability allowance 4 = Other or unknown benefit 88 = Not recorded
History of residence in orphanage or foster care	1 = No 2 = Yes 88 = Not recorded

Details history of residence in orphanage or foster care	None
History of criminal activity	1 = No 2 = Yes 88 = Not recorded
Details of forensic history / criminal activity	None
Method of self-harm 1	60 = "60-64" = Drug overdose 65 = Alcohol 66 = Petroleum products, other solvents & their vapours 67 = Other gases & vapours 68 Pesticides, herbicides & other toxic agricultural chemicals 69 = Other chemicals & noxious substances 70 = Hanging, strangulation & suffocation 71 = Submersion (drowning) 72 = Handgun discharge 73 = Rifle, shotgun & larger firearm discharge 74 = Other & unspecified firearm discharge 75 = Explosive material & devices 76 = Fire and flames 77 = Steam, hot vapours & hot objects 78 = Sharp object 79 = Blunt object 80 = Jumping from a high place 81 = Jumping or lying before moving object 82 = Crashing of motor vehicle 83 = Other specified means 84 = Unspecified means 88 = Not recorded
Method of self-harm 2	Code as per Methodofselfharm_1
Method of self-harm 3	Code as per Methodofselfharm_1
Method Additional Detail	None
Multiple methods of self-harm	1 = No 2 = Yes 88 = Not recorded
If IDO or self-poisoning, substance name	None
Drug taken – anti-psychotic drug	1 = No 2 = Yes 77 = Not applicable 88 = Not recorded
Drug taken – tricyclic antidepressant	1 = No 2 = Yes 77 = Not applicable 88 = Not recorded
Drug taken – SSRI or SSNI antidepressant	1 = No 2 = Yes 77 = Not applicable

	88 = Not recorded
Drug taken – lithium or mood stabiliser	1 = No 2 = Yes 77 = Not applicable 88 = Not recorded
Drug taken – other antidepressant	1 = No 2 = Yes 77 = Not applicable 88 = Not recorded
Drug taken – benzodiazepine or hypnotic	1 = No 2 = Yes 77 = Not applicable 88 = Not recorded
Drug taken – paracetamol	1 = No 2 = Yes 77 = Not applicable 88 = Not recorded
Drug taken – paracetamol / opiate compound	1 = No 2 = Yes 77 = Not applicable 88 = Not recorded
Drug taken – salycilate or NSAID	1 = No 2 = Yes 77 = Not applicable 88 = Not recorded
Drug taken – other analgesic	1 = No 2 = Yes 77 = Not applicable 88 = Not recorded
Drug taken – opiate incl. heroin or methadone	1 = No 2 = Yes 77 = Not applicable 88 = Not recorded
Drug taken – insulin	1 = No 2 = Yes 77 = Not applicable 88 = Not recorded
Drug taken – other poisons incl. weed killer or gas	1 = No 2 = Yes 77 = Not applicable 88 = Not recorded
Drug taken – unspecified psychotropic drug	1 = No 2 = Yes 77 = Not applicable 88 = Not recorded
Drug taken – other	1 = No 2 = Yes 77 = Not applicable 88 = Not recorded
If IDO was it a polypharmacy?	1 = No 2 = Yes 77 = Not applicable

	88 = Not recorded
If IDO where did the substance come from	1 = Prescribed for the person 2 = Prescribed for someone else 3 = Combination of tablets prescribed for the person and prescribed for someone else 4 = Combination of tablets prescribed for person and tablets (not prescribed) belonging to others 5 = Not prescribed- e.g. black market, peers, workplace 77= Not applicable 88= Not recorded
Alcohol consumed	1 = No 2 = Yes 88 = Not recorded
Suicide intent scale Q1: Isolation	0 = Somebody present 1 = Somebody nearby, or in visual or vocal contact 2 = No one nearby (or in visual/vocal contact)
Suicide intent scale Q2: Timing	0 = Intervention was probable 1 = Intervention was not likely 2 = Intervention was highly unlikely
Suicide intent scale Q3: Precautions against discovery/intervention	0 = No precautions 1 = Passive precautions 2 = Active precautions
Suicide intent scale Q4: Acting to get help during/after attempt	0 = Notified potential helper 1 = Contacted but did not specifically notify potential helper 2 = Did not contact or notify potential helper
Suicide intent scale Q5: Final acts in anticipation of death	0 = None 1 = Thought about or made some arrangements 2 = Made definite plans or completed arrangements
Suicide intent scale Q6: Active preparation for attempt	0 = None 1 = Minimal to moderate 2 = Extensive
Suicide intent scale Q7: Suicide note	0 = Absence of note 1 = Note written, but torn up; note thought about 2 = Presence of note
Suicide intent scale Q8: Overt communication of intent before attempt	0 = None 1 = Equivocal communication 2 = Unequivocal communication
Proximal concerns - Worried about becoming unemployed	1 = No 2 = Yes Perceived possibility of becoming unemployed 3 = Yes Dismissed from job 4 = Yes - Made redundant 5 = Yes- Became retired 6 = Yes- Other 77 = Not applicable 88 = Not recorded
Proximal concerns - Currently or recently experiencing financial difficulties	1 = No 2 = Yes

	88 = Not recorded
Proximal concerns - Current legal troubles	1 = No 2 = Yes 88 = Not recorded
Proximal concerns - Significant disruption of romantic relationship	1 = No 2 = Yes-Separation 3 = Yes-Divorce 4 = Yes-Break-up 5 = Yes- Argument 6 = Yes- Other 88 = Not recorded
Proximal concerns - Recent significant interpersonal conflict	1 = No 2 = Partner 3 = Family 4 = Friends 5 = Work 6 = Ex-partner 7 = Other 88 = Not recorded
Proximal concerns - Recent significant interpersonal conflict	1 = No 2 = Partner 3 = Family 4 = Friends 5 = Work 6 = Ex-partner 7 = Other 88 = Not recorded
Proximal concerns - Addiction problems at time of SH	1 = No 2 = Alcohol abuse 3 = Drug abuse 4 = Gambling addiction 5 = Other 88 = Not recorded
Proximal concerns - Addiction problems at time of SH	1 = No 2 = Alcohol abuse 3 = Drug abuse 4 = Gambling addiction 5 = Other 88 = Not recorded
Victim of violent or sexual assault at some time in the past	1 = No 2 = Yes, <12 months 3 = Yes, >12 months 4 = Yes, time of occurrence not recorded 88 = Not recorded
Involved in significant vehicle collision at some time in the past	1 = No 2 = Yes, <12 months 3 = Yes, >12 months 4 = Yes, time of occurrence not recorded 88 = Not recorded
Victim of abuse (emotional, sexual, physical, domestic, neglect)	1 = No 2 = Yes, <12 months 3 = Yes, >12 months

	4 = Yes, time of occurrence not recorded 88 = Not recorded
Witness Of Violent Crime at some time in the past	1 = No 2 = Yes, <12 months 3 = Yes, >12 months 4 = Yes, time of occurrence not recorded 88 = Not recorded
Directly witnessed sudden death at some time in the past	1 = No 2 = Yes, <12 months 3 = Yes, >12 months 4 = Yes, time of occurrence not recorded 88 = Not recorded
Severe bullying, torture	1 = No 2 = Yes, <12 months 3 = Yes, >12 months 4 = Yes, time of occurrence not recorded 88 = Not recorded
Directly experienced war, terrorism, or natural disaster at some time in the past	1 = No 2 = Yes, <12 months 3 = Yes, >12 months 4 = Yes, time of occurrence not recorded 88 = Not recorded
Experienced the sudden, unexpected death of a loved one at some time in the past	1 = No 2 = Yes, <12 months 3 = Yes, >12 months 4 = Yes, time of occurrence not recorded 88 = Not recorded
Completed suicide of loved one 1	1 = No 2 = Partner 3 = Immediate family 4 = Extended family 5 = Close friend 6 = Other 88 = Not recorded
How long ago? (suicide of loved one 1)	1 = <12months 2 = >12months 3 = Not applicable 88 = Not recorded
Completed suicide of loved one 2	1 = No 2 = Partner 3 = Immediate family 4 = Extended family 5 = Close friend 6 = Other 88 = Not recorded
How long ago? (suicide of loved one 2)	1 = <12months 2 = >12months 3 = Not applicable 88 = Not recorded
Completed suicide of loved one 3	1 = No 2 = Partner 3 = Immediate family

	4 = Extended family 5 = Close friend 6 = Other 88 = Not recorded
How long ago? (suicide of loved one 3)	1 = <12months 2 = >12months 3 = Not applicable 88 = Not recorded
Completed suicide of loved one 4	1 = No 2 = Partner 3 = Immediate family 4 = Extended family 5 = Close friend 6 = Other 88 = Not recorded
How long ago? (suicide of loved one 4)	1 = <12months 2 = >12months 3 = Not applicable 88 = Not recorded
Bereavement of loved one 1	1 = No 2 = Partner 3 = Immediate family 4 = Extended family 5 = Close friend 6 = Other 88 = Not recorded
How long ago? (bereavement of loved one 1)	1 = <12months 2 = >12months 3 = Not applicable 88 = Not recorded
Bereavement of loved one 2	1 = No 2 = Partner 3 = Immediate family 4 = Extended family 5 = Close friend 6 = Other 88 = Not recorded
How long ago? (bereavement of loved one 1)	1 = <12months 2 = >12months 3 = Not applicable 88 = Not recorded
Bereavement of loved one 3	1 = No 2 = Partner 3 = Immediate family 4 = Extended family 5 = Close friend 6 = Other 88 = Not recorded
How long ago? (bereavement of loved one 1)	1 = <12months 2 = >12months 3 = Not applicable 88 = Not recorded

Bereavement of loved one 4	1 = No 2 = Partner 3 = Immediate family 4 = Extended family 5 = Close friend 6 = Other 88 = Not recorded
How long ago? (bereavement of loved one 1)	1 = <12months 2 = >12months 3 = Not applicable 88 = Not recorded
Family history of mental illness (not including substance abuse)	1 = No 2 = Yes - immediate family 3 = Yes - extended family 4 = Yes - both immediate and extended family 5 = Yes - not specified 88 = Not known
Family history of alcohol abuse	1 = No 2 = Yes - immediate family 3 = Yes - extended family 4 = Yes - both immediate and extended family 5 = Yes - not specified 88 = Not known
Family history of drug abuse	1 = No 2 = Yes - immediate family 3 = Yes - extended family 4 = Yes - both immediate and extended family 5 = Yes - not specified 88 = Not known
Prior self-harm	1 = No 2 = Yes 88 = Not recorded
If prior self-harm, how many	1 = One 2 = Two to three 3 = Four or more 4 = Multiple (quantity unknown) 77 = Not Applicable 88 = Not recorded
Method of most recent SH episode	60 = 60-64 = Drug overdose 65 = Alcohol 66 = Petroleum products, other solvents & their vapours 67 = Other gases & vapours 68 = Pesticides, herbicides & other toxic agri chemicals 69 = Other chemicals & noxious substances 70 = Hanging, strangulation & suffocation 71 = Submersion (drowning) 72 = Handgun discharge 73 = Rifle, shotgun & larger firearm discharge 74 = Other & unspecified firearm discharge 75 = Explosive material & devices

	76 = Fire and flames 77 = Steam, hot vapours & hot objects 78 = Sharp object 79 = Blunt object 80 = Jumping from a high place 81 = Jumping or lying before moving object 82 = Crashing of motor vehicle 83 = Other specified means 84 = Unspecified means 88 = Not recorded 777 = Not applicable
Method of most recent SH episode 2	60 = 60-64 = Drug overdose 65 = Alcohol 66 = Petroleum products, other solvents & their vapours 67 = Other gases & vapours 68 = Pesticides, herbicides & other toxic agri chemicals 69 = Other chemicals & noxious substances 70 = Hanging, strangulation & suffocation 71 = Submersion (drowning) 72 = Handgun discharge 73 = Rifle, shotgun & larger firearm discharge 74 = Other & unspecified firearm discharge 75 = Explosive material & devices 76 = Fire and flames 77 = Steam, hot vapours & hot objects 78 = Sharp object 79 = Blunt object 80 = Jumping from a high place 81 = Jumping or lying before moving object 82 = Crashing of motor vehicle 83 = Other specified means 84 = Unspecified means 88 = Not recorded 777 = Not applicable
Diagnosed or likely schizophrenia and/or other psychotic disorders	1 = No 2 = Yes, <12months 3 = Yes, >12months 4 = Yes, recency not recorded 88 = Not recorded
Diagnosed or likely bipolar affective disorder	1 = No 2 = Yes, <12months 3 = Yes, >12months 4 = Yes, recency not recorded 88 = Not recorded
Diagnosed or likely depressive illness	1 = No 2 = Yes, <12months 3 = Yes, >12months 4 = Yes, recency not recorded 88 = Not recorded
Diagnosed or likely anxiety/phobia/panic disorder/OCD	1 = No 2 = Yes, <12months

	3 = Yes, >12months 4 = Yes, recency not recorded 88 = Not recorded
Diagnosed or likely eating disorder	1 = No 2 = Yes, <12months 3 = Yes, >12months 4 = Yes, recency not recorded 88 = Not recorded
Diagnosed or likely dementia	1 = No 2 = Yes, <12months 3 = Yes, >12months 4 = Yes, recency not recorded 88 = Not recorded
Diagnosed or likely alcohol dependence	1 = No 2 = Yes, <12months 3 = Yes, >12months 4 = Yes, recency not recorded 88 = Not recorded
Diagnosed or likely drug dependence	1 = No 2 = Yes, <12months 3 = Yes, >12months 4 = Yes, recency not recorded 88 = Not recorded
Diagnosed or likely personality disorder	1 = No 2 = Yes, <12months 3 = Yes, >12months 4 = Yes, recency not recorded 88 = Not recorded
Diagnosed or likely adjustment disorder/reaction	1 = No 2 = Yes, <12months 3 = Yes, >12months 4 = Yes, recency not recorded 88 = Not recorded
Diagnosed or likely organic disorder (e.g. acquired brain injury)	1 = No 2 = Yes, <12months 3 = Yes, >12months 4 = Yes, recency not recorded 88 = Not recorded
Diagnosed or likely alcohol misuse, but not dependence	1 = No 2 = Yes, <12months 3 = Yes, >12months 4 = Yes, recency not recorded 88 = Not recorded
Diagnosed or likely drug misuse, but not dependence	1 = No 2 = Yes, <12months 3 = Yes, >12months

	4 = Yes, recency not recorded 88 = Not recorded
Previous MH treatment - Inpatient	1 = No 2 = Yes, <12months 3 = Yes, >12months 4 = Yes, recency not recorded 88 = Not recorded
Previous MH treatment - Outpatient	1 = No 2 = Yes, <12months 3 = Yes, >12months 4 = Yes, recency not recorded 88 = Not recorded
Previous MH treatment - GP	1 = No 2 = Yes, <12months 3 = Yes, >12months 4 = Yes, recency not recorded 88 = Not recorded
Previous MH treatment – Addiction services	1 = No 2 = Yes, <12months 3 = Yes, >12months 4 = Yes, recency not recorded 88 = Not recorded
Previous MH treatment - Private counselling or therapy	1 = No 2 = Yes, <12months 3 = Yes, >12months 4 = Yes, recency not recorded 88 = Not recorded
Previous MH treatment - Community Mental Health Team (CMHT) or Homebase Crisis Team (HBCT)	1 = No 2 = Yes, <12months 3 = Yes, >12months 4 = Yes, recency not recorded 88 = Not recorded
Previous MH treatment - Other	1 = No 2 = Yes, <12months 3 = Yes, >12months 4 = Yes, recency not recorded 88 = Not recorded
Psychotropic medication prescribed	1 = No 2 = Yes 88 = Not recorded
Name psychotropic medication	None
Diagnosed physical illness or physical symptoms	1 = No 2 = Yes 88 = Not recorded
If yes, please give details (phys. illness)	
Physical medication prescribed	1 = No 2 = Yes 88 = Not recorded
Name physical medication	None
After index self-harm episode – psychiatric admission	1 = No 2 = Yes

	77 = Not applicable 88 = Not recorded
Care plan - Outpatient appointment (if not admitted to psychiatric unit)	1 = No 2 = Yes 77 = Not applicable 88 = Not recorded
Care plan - Community base mental health service (if not admitted to psychiatric unit)	1 = No 2 = Yes 77 = Not applicable 88 = Not recorded
Care plan - Crisis nurse telephone call(s) (if not admitted to psychiatric unit)	1 = No 2 = Yes 77 = Not applicable 88 = Not recorded
Care plan - Psychoeducation (if not admitted to psychiatric unit)	1 = No 2 = Yes 77 = Not applicable 88 = Not recorded
Care plan - GP (if not admitted to psychiatric unit)	1 = No 2 = Yes 77 = Not applicable 88 = Not recorded
Care plan - Private counselling or therapy (if not admitted to psychiatric unit)	1 = No 2 = Yes 77 = Not applicable 88 = Not recorded
Care plan - Addiction services (if not admitted to psychiatric unit)	1 = No 2 = Yes 77 = Not applicable 88 = Not recorded
Care plan - Social Worker (if not admitted to psychiatric unit)	1 = No 2 = Yes 77 = Not applicable 88 = Not recorded
Care plan - Psychiatric medication prescribed/changed (if not admitted to psychiatric unit)	1 = No 2 = Yes 77 = Not applicable 88 = Not recorded
RIP as a result of self-harm act	1 = No 2 = Yes 88 = Not recorded
Notes	

Appendix 2.

Baseline interview schedule for the Improving Prediction and Risk Assessment of Self-Harm and Suicide (IMPRESS) study

ID number ☐☐☐☐☐

Improving Prediction and Risk Assessment of Self-harm and Suicide (IMPRESS)

Interview Instrument

National Suicide Research Foundation (NSRF) &

Department of Epidemiology and Public Health, UCC

March 2017

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The study is funded by the Health Research Board

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PREAMBLE **ID Number ☐☐☐**

The aim of the proposed study is to identify predictors of repeated self-harm and suicide among high risk groups of self-harm patients.

This study operates according to a two-step approach:

1. Interviews with persons who have engaged in self-harm to gain insight into their lives and events leading to their hospitalisation
2. Follow-up interviews to establish what factors help to predict whether a person will self-harm again or not

The outcomes of this study will provide timely information on risk factors for suicidality informing short-term and longer-term initiatives to prevent and respond to suicidality.

This interview will cover various items surrounding basic socio-demographic information, ways of coping, social support and other aspects of resilience.

GENERAL INTERVIEW INFORMATION

Place of interview……

Date of interview _____/_____/____
Day Month Year

Time of interview _____ _____
Hour Min

First session

date started: ____/_____/_____
Day Month Year

time started & ended _____ _____ _____ _____
Hour Min Hour Min

If interview completed in two sessions

Second session

date started: ____/_____/_____
Day Month Year

time started & ended _____ _____ _____ _____
Hour Min Hour Min

Presenting hospital……

Date of presentation to hospital _____/_____/____
Day Month Year

6. Special observations or remarks: reason for refusal or interview not taking place or interview partially completed _____

☐ 1. Completed

☐ 2. Partially completed

☐ 3. Not completed

TO BE FILLED IN WHEN THE INTERVIEW IS COMPLETED

1. STANDARD SOCIO-DEMOGRAPHIC INFORMATION

Now that you know what this interview is for and have signed the consent form, let us start with some general questions about yourself (age, gender, occupation etc). If on any question you either cannot or don't want to give an answer, please say so. I would like to emphasise again that participating in this interview is completely voluntary. Now before we start, do YOU have any questions?

1. **Date of birth** _____/_____/_____

2. **Gender**
   - ☐ 1. Male
   - ☐ 2. Female

3. **Nationality** (please specify)……..

4. **Ethnic Origin**

A White	☐ Irish
	☐ Irish Traveller
	☐ White Other
B Black or Black Irish	☐ African
	☐ Any other background
C Asian or Asian Irish	☐ Chinese
	☐ Any other Asian background
D Other including mixed background	(Please specify)……..

5. **Religion** ☐ Roman Catholic ☐ Other (Please specify)……..

6. **Marital status**
   - ☐ 1. Single
   - ☐ 2. Married
   - ☐ 3. Co-habiting
   - ☐ 4. Long-term relationship: >12 months
   - ☐ 5. Widowed
   - ☐ 6. Divorced- if yes, how many times: ……
   - ☐ 7. Separated- if yes, how many times: ……
   - ☐ 8. Other: ……..……..

7. a **Accommodation** (for inpatients give accommodation prior to admission)

☐ 1. Homeless/no fixed abode ☐ 2. Supervised hostel

☐ 3. Unsupervised hostel ☐ 4. Rented or owned house/flat

☐ 5. Other house/flat ☐ 6. Prison

☐ 7. Other (please specify)…….

7. **b** **Corporation housing**

☐ 1. No ☐ 2. Yes.

8. **Living arrangements**

☐ 1. Alone

☐ 2. With family of origin

☐ 3. With partner/wife only

☐ 4. With partner and children

☐ 5. With child(ren) only

☐ 6. Other shared (e.g. friends)

☐ 8. Other (please specify)…….

9. **Number of children** (please specify)

_____

10. **Are you providing care for any children under the age of five years?**

☐ 1. No ☐ 2. Yes.

11. **Do you consider yourself to be:**

☐Heterosexual or straight;

☐Gay or lesbian;

☐Bisexual?

12a. **Employment status**

☐ 1. In paid employment (including part-time)

☐ 2. Unemployed ☐ 3. Self-employed

☐ 4. Housewife/husband ☐ 5. Full-time student

☐ 6. Long term disability ☐ 7. Retired

☐ 8. Other (please specify)…….

12b. i) **Sick leave (prior to index self-harm)**

☐ 1. No ☐ 2. Yes.

ii) If 2, 6, 7 or on sick leave, how long ago did you become *unemployed/stop working due to sickness/disability/retiring*?

(please specify) ……

12c. **Nature of employment contract**

☐ 1. Permanent ☐ 2. Temporary (e.g. agency work)

☐ 3. Fixed-term ☐ 4. Occasional

☐ 5. Sporadic-hourly

12d. **Sector of employment**

☐A AGRICULTURE, FORESTRY AND FISHING

☐B MINING AND QUARRYING

☐C MANUFACTURING

☐D ELECTRICITY, GAS, STEAM AND AIR CONDITIONING SUPPLY

☐E WATER SUPPLY; SEWERAGE, WASTE MANAGEMENT AND REMEDIATION ACTIVITIES

☐F CONSTRUCTION

☐G WHOLESALE AND RETAIL TRADE; REPAIR OF MOTOR VEHICLES AND MOTORCYCLES

☐H TRANSPORTATION AND STORAGE

☐I ACCOMMODATION AND FOOD SERVICE ACTIVITIES

☐J INFORMATION AND COMMUNICATION

☐K FINANCIAL AND INSURANCE ACTIVITIES

☐L REAL ESTATE ACTIVITIES

☐M PROFESSIONAL, SCIENTIFIC AND TECHNICAL ACTIVITIES

☐N ADMINISTRATIVE AND SUPPORT SERVICE ACTIVITIES

☐O PUBLIC ADMINISTRATION AND DEFENCE; COMPULSORY SOCIAL SECURITY

☐P EDUCATION

☐Q HUMAN HEALTH AND SOCIAL WORK ACTIVITIES

☐R ARTS, ENTERTAINMENT AND RECREATION

☐S OTHER SERVICE ACTIVITIES

☐T ACTIVITIES OF HOUSEHOLDS AS EMPLOYERS; UNDIFFERENTIATED GOODS - AND SERVICES-PRODUCING ACTIVITIES OF HOUSEHOLDS FOR OWN USE

☐U ACTIVITIES OF EXTRA TERRITORIAL ORGANISATIONS AND BODIES

12e. **Skill discretion**

☐ 1. With supervisory function

☐ 2. Without supervisory function

13. **Profession** (please specify; include last profession if retired or unemployed) ……..

14. **Place of work or school** (please specify)……..

15. **Medical card** ☐ 1. No ☐ 2. Yes

16. **Highest level of education obtained**

☐ 1. Primary ☐ 2. Secondary

☐ *Junior/Inter Cert*

☐ *Senior/Leaving Cert*

☐ 3. Third level ☐ 4. Other course e.g. PLC, apprenticeship

17. **History of residence in an industrial school, orphanage or foster care as a child?**

☐ 1. No ☐ 2. Yes

18. **History of being in prison at any time** (includes being a remand prisoner)

☐ 1. No ☐ 2. Yes

2. SITUATION AT TIME OF SELF-HARM

Can you tell me in your own words about your recent self-harm episode?

(Interviewer completes this section based on the interviewee's response)

1. **Method of self-harm**

☐ 01 Self-poisoning
☐ 02 Carbon monoxide poisoning
☐ 03 Hanging
☐ 04 Drowning
☐ 05 Firearms
☐ 06 Cutting or stabbing
☐ 07 Jumping from a height
☐ 08 Jumping/lying before a train
☐ 09 Jumping/lying before a road vehicle
☐ 10 Suffocation
☐ 11 Burning
☐ 12 Electrocution
☐ 13 Jumping/lying before an unspecified object
☐ 14 Strangulation
☐ 88 Other (please specify)
☐ 99 Not known

……

2. **If self-poisoning or overdose, specify substance.**

Can you recall the prescription name(s) of the drug(s)?……

…….

(If interviewee is unsure of the prescription name ask them to select from the following categories)

☐ 01 Method not self-poisoning
☐ 02 Anti-psychotic drug
☐ 03 Tricyclic anti-depressant
☐ 04 SSRI/SNRI anti-depressant
☐ 05 Lithium/Mood stabiliser
☐ 06 Other anti-depressant
☐ 07 Benzodiazepine/Hypnotic
☐ 08 Paracetamol
☐ 09 Paracetamol/Opiate compound
☐ 10 Salicylate
☐ 11 Other analgesic
☐ 12 Opiate (heroin, methadone)
☐ 13 Insulin
☐ 14 Other poisons (e.g. weedkiller)
☐ 15 Unspecified psychotropic drug
☐ 16 Other drug (please specify)

……

☐ 99 Not known

3. **If self-poisoning where did the substance come from?**

☐ 1. Prescribed for the person

☐ 2. Prescribed for someone else

☐ 3. Not prescribed (e.g. internet, black market, peers, workplace)
please specify:……

☐ 88. Not applicable (Method not self-poisoning)

☐ 99. Not known

4. (a) **What influenced your choice of method?**

……

……

(b) **In the days / hours leading up to your self- harm episode did you look up information regarding suicide methods on the internet?**

☐ 1. No ☐ 2. Yes

……

……

5. **Was alcohol consumed as part of the act?**

☐ 1. No ☐ 2. Yes

6. **Was the self-harm part of a pact?**

☐ 1. No ☐ 2. Yes

7. **Did you leave a suicide note or other messages including text messages?**

☐ 1. No ☐ 2. Yes (If yes, please give details)

.....

……

8. Circumstances around the act

Can you tell me in your own words about your actions in the hours before you came to hospital? *(Interviewer completes this section based on the interviewee's response)*

a. <u>Isolation</u>

☐ 1. Somebody present

☐ 2. Somebody nearby, or in visual or <u>vocal</u> contact

☐ 3. No one nearby or in visual or vocal contact

Please specify: …….

b. <u>Timing</u>

☐ 1. Intervention is probable

☐ 2. Intervention is not likely

☐ 3. Intervention is highly unlikely

Please specify: …….

c. Precautions against discovery/intervention

☐ 1. No precautions

☐ 2. Passive precautions (as avoiding others but doing nothing to prevent their intervention; alone in room with unlocked door)

☐ 3. Active precautions (as locked door)

Please specify: ……

d. Acting to get help during/after attempt

☐ 1. Notified potential helper regarding attempt

☐ 2. Contacted but did not specifically notify potential helper regarding attempt

☐ 3. Did not contact or notify potential helper

Please specify: ……

e. Final acts in anticipation of death (will, gifts, insurance)

☐ 1. None

☐ 2. Thought about or made some arrangements

☐ 3. Made definite plans or completed arrangements

Please specify: ……

f. Active preparation for attempt

☐ 1. None

☐ 2. Minimal to moderate

☐ 3. Extensive

Please specify: ……

g. Suicide Note

☐ 1. Absence of note

☐ 2. Note written, but torn up; note thought about

☐ 3. Presence of note

Please specify: ……

h. Overt communication of intent before the attempt

☐ 1. None

☐ 2. Equivocal communication

☐ 3. Unequivocal communication

Please specify: ……

i. Alleged purpose or intent

- ☐ 1. To manipulate environment, get attention, revenge
- ☐ 2. Components of 0 and 2
- ☐ 3. To escape, solve problems

j. Expectations of fatality

- ☐ 1. Thought that death was unlikely
- ☐ 2. Thought that death was possible, not probable
- ☐ 3. Thought that death was probable or certain

k. Conception of method's lethality

- ☐ 1. Did less to self than thought would be lethal
- ☐ 2. Was unsure if action would be lethal
- ☐ 3. Equalled or exceeded what s/he thought would be lethal

l. Seriousness of attempt

- ☐ 1. Did not seriously attempt to end life
- ☐ 2. Uncertain about seriousness to end life
- ☐ 3. Seriously attempted to end life

m. Attitude towards living/dying

- ☐ 1. Did not want to die
- ☐ 2. Components of 0 and 2
- ☐ 3. Wanted to die

n. Conception of medical rescuability

- ☐ 1. Thought death would be unlikely with medical attention
- ☐ 2. Was uncertain whether death could be averted by medical attention
- ☐ 3. Was certain of death even with medical attention

o. Degree of premeditation

- ☐ 1. None, impulsive
- ☐ 2. Contemplated for 3 hours or less before attempt
- ☐ 3. Contemplated for more than 3 hours before attempt

Events leading to self-harm

I would like to ask you some questions now regarding your situation in the time prior to your self-harm episode. I will start by listing some possible life events and you can tell me if any of these were relevant to you.

9. In the time prior to your self-harm, had you experienced or were you anticipating:

(a) Becoming unemployed?

☐ No
☐ Made redundant
☐ Perceived possibility of becoming unemployed
☐ Became retired
☐ Not applicable
☐ Dismissed from job

_____weeks _____days _____hours before episode

b) Significant (or perceived significant) disruption of a romantic relationship?

☐ No
☐ Break-up
☐ Separation
☐ Argument
☐ Divorce
☐ Not applicable

_____weeks _____days _____hours before episode

c) Legal troubles or difficulties with the Gardai?

☐ No
☐ Imprisoned at time of self-harm
☐ Arrest
☐ Released from prison
☐ Known to Gardai
☐ Other
☐ Pending court case

_____weeks _____days _____hours before episode

d) Significant interpersonal conflict

☐ No
☐ Friend conflict
☐ Not specified
☐ Work conflict
☐ Familial conflict
☐ Other conflict

_____weeks _____days _____hours before episode

(e) An event which was perceived as traumatic?

☐No
☐Directly witnessed sudden death
☐Victim of violent or sexual assault
☐Severe bullying, torture
☐Involved in significant vehicle collision
☐War, terrorism, or natural disaster
☐Victim of abuse (sexual, physical, domestic, neglect)
☐Sudden, unexpected death of a loved one
☐Witness of violent crime
☐Other (please specify) ……

_____weeks_____days _____hours before episode

(f) The completed suicide or suicidal behaviour of a family member or loved one?

☐ No ☐ Yes

_____weeks _____days _____hours before episode

(g) The anniversary of an important death, an important other loss or another significant anniversary?

☐ No ☐ Yes

_____weeks _____days _____hours before episode

(h) Exposure to the suicide of another person through media or personal acquaintance?

☐ No ☐Media ☐Personal acquaintance

_____weeks _____days _____hours before episode

(i) (a)Major financial difficulties

☐ No
☐Bankruptcy
☐ Lost home
☐Business failure
☐Repossession of belongings, e.g. car
☐Repeated demands from a bank or debt collector
☐Missed mortgage repayments

_____weeks _____days _____hours before episode

(i) (b) Daily financial pressures

☐ No ☐ Yes

_____weeks _____days _____hours before episode

(j) Experience of humiliation or loss of face (*An individual suffers humiliation when he makes a bid or claim to a certain social status and has this bid or claim fail publicly*)

☐No ☐Yes among friends

☐Yes in work ☐Yes among social media

☐Yes in family life ☐Yes, local or national scandal

_____weeks _____days _____hours before episode

(k) Bereavement close family or friend

☐No ☐Yes-friend

☐Yes- family ☐Yes- other

_____weeks _____days _____hours before episode

9. Were there any other major events that had occurred prior to the self-harm episode, which I have not yet mentioned?

☐ 1. No ☐ 2. Yes (If yes, ask about the details of the event(s) and time of occurrence before the self-harm act)

……
……
……
……

10. Did you have a wish to reunite with a deceased loved one or to be reborn?

☐ 1. No ☐ 2. Yes (please give details)

……
……

Recent symptoms/ behaviours

Although the Depression Symptom Checklist is a self-report questionnaire, the items will be read out to the informant to allow for possible literacy problems.

The next part concerns a number of questions about feelings of high or low mood, fatigue, quality of sleep, etc. Please read through the following list of symptoms and tick any of those which were relevant to your situation in the 3 months prior to your self-harm:

12.

How much was he/she bothered by:	Not at all	A little bit	Moderately	Quite a bit	Extremely	Not known
Feeling blue						
Blaming him/herself for things						
Worrying too much about things						
Feeling everything is an effort						
Feeling low in energy or slowed down						
Feeling no interest in things						

13.

Symptoms of Mania	***Yes***	***No***
Excessively "high" mood		
Irritability		
Decreased need for sleep		
Increased energy		
Increased talking, moving, sexual activity		
Racing thoughts		
Disturbed ability to make decisions		
Grandiose notions		
Being easily distracted		

3. REPETITION OF SELF-HARM

I would now like to ask some questions about whether you have harmed yourself since the self-harm episode in _____. Please try to recall as best you can.

1. (a) In the time since the self-harm episode in _____, have you harmed yourself?

☐ 1. No ☐ 2. Yes.

(b) If yes, how many times?

☐ 1. One ☐ 2. Two

☐ 3. Three ☐ 4. Four

☐ 5. Five ☐ 6. Six

☐ 7. Seven ☐ 8. Eight

☐ 9. Nine ☐ 10. Ten

☐ 11. More than ten ☐ 99. Not known

2. Starting with the most recent self-harm episode, can you tell me what month it happened?

(Interviewer completes this question based on the interviewee's response)

Time lapse between the index self-harm act and the self-harm act

	1	2	3	4	5	6	8	9	10
Specify month									
1. Less than 1 day									
2. Less than 1 week									
3. Less than 1 month									
4. Less than 3 months									

3. Method of self-harm

	1	2	3	4	5	6	8	9	10
1. Poisoning									
2. Hanging									
3. Drowning									
4. Cutting									
5. Jumping from height									
6. Jumping in front of moving vehicle									
7. Burning									
8. Other									

…….

4. Medical treatment following self-harm

	1	2	3	4	5	6	8	9	10
1. None									
2. GP									
3. General Hospital									
4. Other									

…….

5. Psychiatric treatment following self-harm
(for example, have you seen a psychiatrist or clinical psychologist?)

	1	2	3	4	5	6	8	9	10
1. None									
2. Inpatient									
3. Outpatient									

…….

6. a) Now I would like to ask you about the <u>last time you harmed yourself</u>. At that time, were there any particular <u>events or circumstances</u> which lead to that act? (Narrative)

……

…… ☐ 99. Not applicable

4. FAMILY AND PERSONAL HISTORY

Now I would like to ask some questions regarding your and your family's history. Please try to recall as best you can.

1. Have either of your parents resided in an orphanage, industrial school or in foster care?

☐ 1. No ☐ 2. Yes (please give details)

……

……

2. Is there a history of mental illness/disorder in the family?

☐ 1. No ☐ 2. Yes (please give details)

……

……

3. Does anyone in your family have a history of substance abuse?

☐ 1. No ☐ 2. Yes (please give details)

……

……

4. Do you have any history of violent behaviour?

☐ 1. No ☐ 2. Yes (please give details e.g. role played by person)

☐ 99. Not known

……

……

5. Is there a family history of violent behaviour?

☐ 1. No ☐ 2. Yes (please give details)

☐ 99. Not known

……

……

6. Do you or anyone in your family have a history of significant physical, sexual or emotional abuse?

☐ 1. No ☐ 2. Yes (please give specific details e.g. person's role in situation)

……

……

5. LIFE EVENTS AND HISTORY

Now I would like to continue with another set of questions, which will focus on the kinds of events and problems you have experienced. There will be questions relating to you and to people who are important to you, and to life events. You will be asked if events occurred in your childhood, later in life or last year. Please answer all questions as best you can and let me know if you need any help.

	Childhood		Later in life		Last year	
	Yes	No	Yes	No	Yes	No
1. Did you ever experience a serious mental or physical illness?						
Details:						
2. Did you ever experience serious injury?						
Details:						
3. Did you ever experience serious assault?						
Details:						

	Yes	No	Yes	No	Yes	No
4. Did a close relative ever experience serious illness?						
Details:						
5. Did a close relative ever experience serious injury?						
Details:						
6. Did a close relative ever experience serious assault?						
Details:						
7. Did you ever experience the death of a partner, parent or child?						
Details:						
8. Did you ever experience the death of a close relative or friend?						
Details:						
9. Did you ever experience separation due to marital difficulties?						
Details:						
10. Did you ever experience breaking off a steady relationship?						
Details:						
11. Did you ever experience a serious problem with a close friend, neighbour, or relative?						
Details:						
12. Were you ever unemployed or seeking work unsuccessfully for more than 1 month?						
Details:						
13. Were you ever fired from a job?						
Details:						
14. Did you ever experience major financial crisis?						
Details:						
15. Did you ever have a problem with the police and a court appearance?						
Details:						
16. Did you ever have something valuable that was lost or stolen?						
Details:						
17. From all events and circumstances mentioned (or recorded by you yourself), which were the three most important, i.e. which three events have most strongly influenced your life?						
a) Most important:						
b) Second most important:						
c)Third most important:						

6. HISTORY OF NON-FATAL SUICIDAL BEHAVIOUR

This part of the interview deals with questions about self-harm that may have occurred before the most recent episode. Examples of this behaviour are self-cutting and taking an overdose of medication.

1. (a) Prior to your recent self-harm act, did you ever before deliberately harm yourself? For example, by taking an overdose of medication or drugs, by attempting to hang or drown yourself?

☐ 1. Yes

☐ 2. No

1. (b) If yes, how many times?

☐ 1. One ☐ 2. Two

☐ 3. Three ☐ 4. Four

☐ 5. Five ☐ 6. Six

☐ 7. Seven ☐ 8. Eight

☐ 9. Nine ☐ 10. Ten

☐ 11. More than ten ☐ 99. Not known

(c) Summary of self-harm history

……

……

……

……

……

2. **Starting with the most recent self-harm episode, can you tell me what month it happened?** *(Interviewer completes this question based on the interviewee's response)*

Time lapse between the index self-harm act and the self-harm act

	1	2	3	4	5	6	8	9	10
Specify month									
1. Less than 1 day									
2. Less than 1 week									
3. Less than 1 month									
4. Less than 3 months									
5. Less than 6 months									
6. Less than 12 months									
7. 12 months or more									

……

3. **Method of self-harm**

	1	2	3	4	5	6	8	9	10
1. Poisoning									
2. Hanging									
3. Drowning									
4. Cutting									
5. Jumping from height									
6. Jumping in front of moving vehicle									
7. Burning									
8. Other									

…….

4. **Medical treatment following self-harm**

	1	2	3	4	5	6	8	9	10
1. None									
2. GP									
3. General Hospital									
4. Other									

…….

5. **Psychiatric treatment following self-harm**
(for example, have you seen a psychiatrist or clinical psychologist?)

	1	2	3	4	5	6	8	9	10
1. None									
2. Inpatient									
3. Outpatient									

…….

6. Can you tell me about the last previous episode of deliberate self-harm?

What was the time lapse between episode of self-harm and recent self-harm act?

☐ 1. less than 1 day ☐ 2. less than 1 week

☐ 3. less than 1 month ☐ 4. less than 3 months

☐ 5. less than 12 months ☐ 6. 12 months or more

Precipitating factors for last previous episode of deliberate self-harm

7. Now I would like to ask you about the last time you harmed yourself, prior to your most recent episode. At that time, were there any particular events or circumstances which lead to that act? (Narrative)

……

…… ☐ 99. Not applicable

There may be many reasons why people try to harm themselves. Please let me know whether you think the problems that I will mention had a major influence, a minor influence or no influence at all on your last previous episode of deliberate self harm.

	PROBLEM CHECKLIST (READ OUT CATEGORIES). SKIP CATEGORIES THAT ARE CLEARLY NOT APPLICABLE

	1. No	2. Minor	3. Major
1. Problems with partner			
2. Problems with parents			
3. Problems with children			
4. Feelings of loneliness			
5. Problems in making or maintaining friendships and social relationships			
6. Rejection by a lover			
7. Physical illness or disability			
8. Mental illness and psychiatric symptoms			
9. Unemployment			
10. Addiction (to alcohol, drugs, medicines, gambling, etc)			

5. Were there any other events or circumstances that had an influence on your harming yourself? (If person mentions one or more events or circumstances, specify)

	1. Minor	2. Major	3. Don't Know
1……			
2……..			
3……..			

7. SUICIDAL BEHAVIOUR BY PERSON'S KNOWN TO THE PERSON (MODELS).

To your knowledge, have any of your family members or close friends ever deliberately harmed him or herself? Can you tell me about the circumstances of this?

1. A. Relationship of model to subject

(model was/is subject's……) MODEL NUMBER

	1.	2.	3.	4.	5.
1. Wife					
2. Husband					
3. Cohabitee					
4. Daughter					
5. Son					
6. Mother					
7. Father					
8. Sister					
9. Brother					
10. Grandmother					
11. Grandfather					
12. Other relative					
13. Close friend					

For each please identify in box as follows: Hanging= H; Overdose= OD; Cutting=SC; Firearms: F; Drowning=D; Poisoning=P; Other=O; Yes but method not specified = NK

B. Type of behaviour MODEL NUMBER

	1.	2.	3.	4.	5.
1. Deliberate self-harm					
2. Suicide					

C. Time lapse between model event and now (in order of which family members appear in A)

1. less than 1 day
2. less than 1 week
3. less than 1 month
4. less than 3 months
5. less than 12 months
6. 12 months or more

MODEL NUMBER

1.	2.	3.	4.	5.

8. CONTACT WITH HEALTH CARE SERVICES

I would now like to ask some questions about the contact you had with the health care services, both with your GP and with mental health care professionals. Please try to recall as best you can.

1. (a) In the last year, did you have contact with your GP or other mental health services?

☐ 1. No ☐ 2. Yes (please give details) ☐99. Not known

……
……

(b) Do you know the (approximate) date of the last contact with the GP or other mental health services?...../...../.....
Day Month Year

(c) If you contacted your GP, how many times was this?

☐ 1. no contact
☐ 2. 1 time
☐ 3. 2-3 times
☐ 4. 4 or more times

(d) Reasons:

☐ 1. Physical
☐ 2. Psychological
☐ 3. Both physical and psychological
☐ 99. Not specified
☐ Not applicable

2. Were you ever diagnosed with a mental disorder?

Diagnosed	Likely
☐	☐ Schizophrenia and/or other psychotic disorders
☐	☐ Bipolar affective disorder
☐	☐ Depressive illness
☐	☐ Anxiety/phobia/panic disorder/OCD
☐	☐ Eating disorder
☐	☐ Dementia
☐	☐ Alcohol dependence
☐	☐ Drug dependence
☐	☐ Personality disorder
☐	☐ Adjustment disorder/reaction
☐	☐ Organic disorder (e.g. acquired brain injury)
☐	☐ Alcohol misuse, but not dependence
☐	☐ Drug misuse, but not dependence

☐ 77 No mental disorder

☐ 88 Other (**please specify disorder**)……..

☐ 99 Not known

3. (a) Prior to the recent self-harm episode, were you ever treated as an inpatient at a psychiatric hospital or on the psychiatric ward of a general hospital?

☐ 1. No ☐ 2. Yes No. of times: _____

If yes, please give details (e.g. number of admissions, reason for admission)
……
……
……

(b) How many times in the last year?

☐ 1. never

☐ 2. 1 time

☐ 3. 2-3 times

☐ 4. 4 times or more

☐ 99. Not known

(c) If you received inpatient psychiatric treatment in the last year, do you know for how many weeks?
Number of weeks:.....

If person cannot remember the exact number of weeks, ask to indicate if the duration was:

☐ less than 4 weeks

☐ between 4 and 16 weeks

☐ between 16 and 52 weeks

☐ other

☐99. Not known

4. (a) Prior to the recent self-harm episode, were you offered outpatient appointments with the mental health services in the last year?

☐ 1. No ☐ 2. Yes

(b) If yes, as far as you are aware, what type of treatment was offered/provided to you?
Please specify type:

☐1. Psychiatric service- public

☐2. Private psychologist/psychiatrist
If type of therapy known please specify (e.g. cognitive behavioural therapy, dialectic behavioural therapy) _____

☐3. Community mental health nurse

☐4. Alcohol/Drug Addiction services

☐5. Consultation service for relationship/sexual problems

☐ 6. Other, please specify _____

(c) Please indicate if you had any difficulty attending these appointments?

☐ 1. No ☐ 2. Yes

(d) Did you feel you benefited from the services?

☐ 1. No ☐ 2. Yes ☐99. Not known

5. Were you on prescribed medication for mental illness in the last year?

☐ 1. No ☐ 2. Yes ☐99. Not known

6. Do you know the name of the medication?

☐ 1. No ☐ 2. Yes (If yes please specify)……...
……

7. Did you comply with the instructions on the medication?

☐ 1. No ☐ 2. Yes (please give details)

……

……

8. Did you face any difficulties in accessing health care services?

☐ 1. No ☐ 2. Yes (please specify below)

……

……

9. Did you have contact with any support group?

☐ 1. No ☐ 2. Yes (please give details)

……

……

9. PHYSICAL HEALTH

Now I would like to ask you about your physical well-being. Please try to recall any physical illnesses or pain which you may have suffered from.

1. Have you been diagnosed with any illness or disease? (Include conditions even if well controlled by treatment)

☐ 1. No ☐ 2. Yes (please specify which illness(es)

……

……

2. Were you in physical pain in the last year?

☐ 1. No ☐ 2. Yes (please give details)

……

……

3. Is this physical illness chronic? (i.e. duration over 12 months)

☐ 1. No ☐ 2. Yes ☐ 3. Not applicable

4. Have you experienced a reduction in your physical capabilities in the last month?

☐ 1. No ☐ 2. Yes (please give details)

……

……

5. (a) Are you on prescribed medication for a physical illness?

☐ 1. No ☐ 2. Yes

(b) **If yes** to the best of your knowledge, do you adhere to the instructions on the medication?

☐ 1. No ☐ 2. Yes

(please give details)……

……
……

10. SUBSTANCE ABUSE

I would now like to ask you about your use, if relevant, of alcohol and drugs and about any recent changes in this behaviour in the last year.

1. Do you have a history of alcohol abuse?

☐ 1. No ☐ 2. Yes (please give details)

……

……

2. Have you made any recent attempts (in the last year) to stop abusing alcohol **for example, abstinence or addiction treatment**?

☐ 1. No ☐ 2. Yes (please give details)

……

……

3. Was there a recent increase in your abuse of alcohol?

☐ 1. No ☐ 2. Yes (please give details)

……

……

4. Had you been drinking at the time of your recent self-harm episode?

☐ 1. No ☐ 2. Yes (please give details)

……

……

5. Do you have a history of drug abuse?

☐ 1. No ☐ 2. Yes (please give details)

……

……

6. Have you made any recent attempts, (in the last year) to stop abusing drugs **for example, abstinence or addiction treatment**?

☐ 1. No ☐ 2. Yes (please give details)

……

……

7. Was there a recent increase in your abuse of drugs?

☐ 1. No ☐ 2. Yes (please give details) ☐99. Not known

……

……

8. Had you been taking drugs at the time of your recent self-harm act?

☐ 1. No ☐ 2. Yes (please give details) ☐99. Not known

……

……

11. ASPECTS OF PERSONALITY

This part of the interview covers some aspects of your personality and how you act in different situations.

	True	False
1. I will often say whatever comes into my head without thinking first.		
2. I enjoy working out problems slowly and carefully		
3. I frequently make appointments without thinking about whether I will be able to keep them.		
4. I frequently buy things without thinking about whether or not I can really afford them.		
5. I often make up my mind without taking the time to consider the situation from all angles		
6. Often, I don't spend enough time thinking over a situation before I act.		
7. I often get into trouble because I don't think before I act.		
8. Many times the plans I make don't work out because I haven't gone over them carefully enough in advance.		
9. I rarely get involved in projects without first considering the potential problems		
10. Before making any important decision, I carefully weigh the pros and cons		
11. I am good at careful reasoning		
12. I often say and do things without considering the consequences.		

12. COPING STYLE

This part of the interview covers some aspects of your approach to **dealing with a problem** when you encounter one in your life. This questionnaire asks you to indicate what you generally do and feel, when you experience stressful events. Obviously, different events bring out somewhat different responses, but think about what you usually would do when you are under a lot of stress.

	Had been doing this…			
	Not at all	A little bit	A medium amount	A lot
1. I've been concentrating my efforts on doing something about the situation I'm in.				
2. I've been saying to myself "this isn't real".				
3. I've been using alcohol or other drugs to make myself feel better.				
4. I've been getting emotional support from others.				

	Had been doing this…			
	Not at all	A little bit	A medium amount	A lot
5. I've been giving up trying to deal with it.				
6. I've been taking action to try to make the situation better.				
7. I've been refusing to believe that it has happened.				
8. I've been saying things to let my unpleasant feelings escape.				
9. I've been getting help and advice from other people.				
10. I've been using alcohol or other drugs to help me get through it.				
11. I've been trying to see it in a different light, to make it seem more positive.				
12. I've been trying to come up with a strategy about what to do.				
13. I've been getting comfort and understanding from someone.				
14. I've been giving up the attempt to cope.				
15. I've been looking for something good in what is happening.				
16. I've been making jokes about it.				
17. I've been accepting the reality of the fact that it has happened.				
18. I've been expressing my negative feelings.				
19. I've been trying to find comfort in my religion or spiritual beliefs.				
20. I've been trying to get advice or help from other people about what to do.				
21. I've been learning to live with it.				
22. I've been thinking hard about what steps to take.				
23. I've been praying or meditating.				
24. I've been making fun of the situation.				

13. SOCIAL NETWORK

This part of the interview covers your social network and any changes in relationships with significant people in your life during the last year. In your own words, how would you describe your relationships with significant people in your life?

	Hardly ever	Some of the time	Most of the time
1. Do you feel you have a definite role in the family and among friends?			
2. Do family and friends understand you?			
3. Do you feel useful to family and friends?			
4. Do you feel listened to by family and friends?			
5. Do you know what's happening with family and friends?			
6. Can you talk about your deepest problems?			

7. How would you describe the level of practical and emotional support and closeness of both immediate and extended family?
(Please give details)

……
……
……

8. Number of family members within 1 hour that you can depend on or feel close to:
…….

9. (Other than at work) How many times during a typical week do you spend some time with someone who does not live with you, that is, you go to see them or they come to visit you, or you go out together?

☐None ☐ once ☐twice ☐three times ☐four times
☐five times ☐six times ☐seven times or more

10. Other than at work) How many times do you talk to someone - friends, relatives or others - on the telephone in a typical week (either they call you, or you call them)?

☐None ☐once ☐twice ☐three times ☐ four times
☐five times ☐six times ☐seven times or more

11. (Other than at work) how often do you go to meetings of social clubs, religious meetings, or other groups that you belong to in a typical week?

☐None ☐ once ☐twice ☐three times ☐four times

☐five times ☐six times ☐seven times or more

14. WELLBEING

This part of the interview covers your wellbeing, and particularly how you've been feeling over the past week. Please indicate how often you have experienced the following.

	Never	Sometimes	Often	Almost always
1. I found it hard to wind down				
2. I was aware of dryness of my mouth				
3 .I couldn't seem to experience any positive feeling at all				
4.I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)				
5. I found it difficult to work up the initiative to do things				
6. I tended to over-react to situations				
7. I experienced trembling (eg, in the hands)				
8.I felt that I was using a lot of nervous energy				
9.I was worried about situations in which I might panic and make a fool of myself				
10.I felt that I had nothing to look forward to				
11. I found myself getting agitated				
12.I found it difficult to relax				
13.I felt down-hearted and blue				
14.I was intolerant of anything that kept me from getting on with what I was doing				
15. I felt I was close to panic				
16.I was unable to become enthusiastic about anything				
17.I felt I wasn't worth much as a person				
18.I felt that I was rather touchy				

19. I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)				
20.I felt scared without any good reason				
21.I felt that life was meaningless				

15. THE FUTURE

This part of the interview covers your thoughts and feelings about the future. Please indicate if you think the following statements are true or false.

1. In the future, I expect to succeed in what concerns me most
   ☐ True ☐ False
2. My future seems dark to me
   ☐ True ☐ False
3. I just don't get the breaks, and there's no reason to believe I will in the future
   ☐ True ☐ False
4. I have great faith in the future
   ☐ True ☐ False

16. WORK

This part of the interview covers your work situation and how your work fits into everyday life. If the person is not employed then answer in reference to their last job.

1. Is there a quiet and pleasant atmosphere at your place of work?

☐ Strongly disagree ☐ Disagree ☐ Agree ☐ Strongly Agree ☐ N\A

2. Is there good collegiality at your work?

☐ Strongly disagree ☐ Disagree ☐ Agree ☐ Strongly Agree ☐ N\A

3. Are your co-workers (colleagues) there for you (to support you)?

☐ Strongly disagree ☐ Disagree ☐ Agree ☐ Strongly Agree ☐ N\A

4. Do people at work understand that you may have had a ‘‘bad’’ day?

☐ Strongly disagree ☐ Disagree ☐ Agree ☐ Strongly Agree ☐ N\A

5. Do you get along well with your supervisors?

☐ Strongly disagree ☐ Disagree ☐ Agree ☐ Strongly Agree ☐ N\A

6. Do you get along well with your co-workers?

☐ Strongly disagree ☐ Disagree ☐ Agree ☐ Strongly Agree ☐ N\A

7. Is there a good atmosphere between you and your colleagues?

☐ Strongly disagree ☐ Disagree ☐ Agree ☐ Strongly Agree ☐ N\A

8. Is there good co-operation between the colleagues at your work?

☐ Strongly disagree ☐ Disagree ☐ Agree ☐ Strongly Agree ☐ N\A

9. Do you feel part of a community at your place of work?

☐ Strongly disagree ☐ Disagree ☐ Agree ☐ Strongly Agree ☐ N\A

These questions are about how you have been during the last 4 weeks.

1. How often have you felt worn out?

☐ Always ☐ Often ☐ Sometimes ☐ Seldom ☐ Never/almost never

2. How often have you felt physically exhausted?

☐ Always ☐ Often ☐ Sometimes ☐ Seldom ☐ Never/almost never

3. How often have you felt emotionally exhausted?

☐ Always ☐ Often ☐ Sometimes ☐ Seldom ☐ Never/almost never

4. How often have you felt tired?

☐ Always ☐ Often ☐ Sometimes ☐ Seldom ☐ Never/almost never

17. SELF-EFFICACY

This part of the interview covers your belief in your ability to handle situations, complete tasks and reach goals. Please indicate the extent to which the following statements are true for you.

1. I can always manage to solve difficult problems if I try hard enough.

☐ Not at all true ☐ Hardly true ☐ Moderately true ☐ Exactly true

2. If someone opposes me, I can find the means and ways to get what I want.

☐ Not at all true ☐ Hardly true ☐ Moderately true ☐ Exactly true

3. It is easy for me to stick to my aims and accomplish my goals.

☐ Not at all true ☐ Hardly true ☐ Moderately true ☐ Exactly true

4. I am confident that I could deal efficiently with unexpected events.

☐ Not at all true ☐ Hardly true ☐ Moderately true ☐ Exactly true

5. Thanks to my resourcefulness, I know how to handle unforeseen situations.

☐ Not at all true ☐ Hardly true ☐ Moderately true ☐ Exactly true

6. I can solve most problems if I invest the necessary effort.

☐ Not at all true ☐ Hardly true ☐ Moderately true ☐ Exactly true

7. I can remain calm when facing difficulties because I can rely on my coping abilities.

☐ Not at all true ☐ Hardly true ☐ Moderately true ☐ Exactly true

8. When I am confronted with a problem, I can usually find several solutions.

☐ Not at all true ☐ Hardly true ☐ Moderately true ☐ Exactly true

9. If I am in trouble, I can usually think of a solution.

☐ Not at all true ☐ Hardly true ☐ Moderately true ☐ Exactly true

THANK YOU FOR COMPLETING THIS INTERVIEW

ADDITIONAL INFORMATION

You may have important additional information that has not already been covered in the interview. Would you like to add anything else?

(Please use this section to record any additional information the informant wishes to share).

…….

…….

…….

…….

…….

Possibility of further follow-up

It is often very valuable to follow up participants in a study to see how their situation and views change over time. Even though we do not currently have funding to so this, there is a possibility that we may have scope to meet with participants again in the coming years. We would not be able to contact you unless we obtain permission now to make contact in the future. Even if you agree now to be contacted, you can decide in the future not to take part in a follow-up. Would you be satisfied for us to keep the option open for future contact?

I hereby give permission to be contacted in future in relation to further research.

☐ No ☐ Yes

Name: _____ Signed:_____

Date:_____/_____/_____

If, when we phone you in six months we have difficulties getting through to you, would it be possible for us to make telephone contact with a family member or friend to help us get in touch with you?

Contact details of alternative contact person:

Name (BLOCK CAPITALS) _____

Phone:_____

E-Mail:_____

Appendix 3.

Follow-up interview schedule for the Improving Prediction and Risk Assessment of Self-Harm and Suicide (IMPRESS) study

ID number ☐☐☐☐☐

Improving Prediction and Risk Assessment of Self-harm and Suicide (IMPRESS)

Follow-up Interview Instrument

National Suicide Research Foundation (NSRF)

Department of Epidemiology and Public Health, UCC

February 2016

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PREAMBLE **ID number ☐☐☐☐☐**

The aim of the study is to identify predictors of repeated self-harm and suicide among high risk groups of self-harm patients.

This study operates according to a two-step approach:

3. Interviews with persons who have engaged in self-harm to gain insight into their lives and events leading to their hospitalisation
4. Follow-up interviews to establish what factors that help to predict whether a person will self-harm again or not

The outcomes this study will provide timely information on risk factors for suicidality informing short-term and longer-term initiatives to prevent and respond to suicidality.

This interview will cover various items that might have changed since the initial interview, such as socio-demographic information, ways of coping, social support and other aspects of resilience.

GENERAL INTERVIEW INFORMATION

Place of interview……

Date of interview _____/_____/____
Day Month Year

Time of interview _____ _____
Hour Min

First session

date started: ____/_____/_____
Day Month Year

time started & ended _____ _____ _____ _____
Hour Min Hour Min

If interview completed in two sessions

Second session

date started: ____/_____/_____
Day Month Year

time started & ended _____ _____ _____ _____
Hour Min Hour Min

6. Special observations or remarks: reason for refusal of follow-up interview or interview not taking place or interview partially completed

_____

☐ 1. Completed

☐ 2. Partially completed

☐ 3. Not completed

TO BE FILLED IN WHEN THE INTERVIEW IS COMPLETED

1. STANDARD SOCIO-DEMOGRAPHIC INFORMATION

Now that you know what the follow-up interview is for and have signed the consent form, let us start with some general questions about things that might have changed for you since the self-harm episode in _____. If on any question you either cannot or don't want to give an answer, please say so. I would like to emphasise again that participating in this interview is completely voluntary. Now before we start, do YOU have any questions?

1. At the first interview, you said that you were _____at the time of the self-harm episode in _____.

   Has there been a change in your **marital status** since the first interview?

   ☐ 1. No ☐ 2. Yes

   If yes:

   ☐ 1. Single
   ☐ 2. Married
   ☐ 3. Co-habiting
   ☐ 4. Long-term relationship (>12 months)
   ☐ 5. Widowed
   ☐ 6. Divorced
   ☐ 7. Separated
   ☐ 8. Other: ……..……

2. At the first interview, you said that you were living in a _____at the time of the self-harm episode in _____.

   Has there been a change in your **accommodation** since then?

   ☐ 1. No ☐ 2. Yes

   If yes i):

   ☐ 1. Homeless/no fixed abode
   ☐ 2. Supervised hostel
   ☐ 3. Unsupervised hostel
   ☐ 4. Rented or owned house/flat
   ☐ 5. Other house/flat
   ☐ 6. Prison
   ☐ 7. Other (please specify)……

   If yes i): Are you living in corporation housing?

   ☐ 1. No ☐ 2. Yes

3. At the first interview, you said that you were living _____at the time of the self-harm episode in _____.

   Has there been a change in your **living arrangements** since then?

   ☐ 1. No ☐ 2. Yes

   If yes:

   ☐ 1. Alone
   ☐ 2. With family of origin
   ☐ 3. With partner/wife only
   ☐ 4. With partner and children
   ☐ 5. With child(ren) only
   ☐ 6. Other shared (e.g. friends)

☐ 8. Other (please specify)
……

4. At the first interview, you said that you *were/were not* providing care for children under the age of five at the time of the self-harm episode in _____.

   Has this situation changed since we last spoke?

   ☐ 1. No ☐ 2. Yes.

5. At the first interview, you said that your employment status was _____ at the time of the self-harm episode in _____.

   Has your employment situation changed since we last spoke?

   ☐ 1. No ☐ 2. Yes.

   If yes:

   ☐1. In paid employment (including part-time)

   ☐2. Unemployed ☐ 3. Self-employed

   ☐ 4. Housewife/husband ☐ 5. Full-time student

   ☐ 6. Long term disability ☐ 7. Retired

   ☐ 8. Other (please specify)

6. At the first interview, you said you were/were not on sick leave. Are you currently on sick leave?

☐ 1. No ☐ 2. Yes.

2. CONTACT WITH HEALTH CARE SERVICES

I would now like to ask some questions about the contact you had with the health care services since the self-harm episode in _____. Please try to recall as best you can.

1. (a) Since the self-harm episode in _____, did you have contact with your GP or mental health services?

☐ 1. No ☐ 2. Yes (please give details) ☐99. Not known

……
……

(b) Do you know the (approximate) date of the last contact with the GP or other mental health services?...../...../.....
Day Month Year

(c) If you contacted your GP since the self-harm episode in _____ how many times was this?

☐ 1. no contact

☐ 2. 1 time

☐ 3. 2-3 times

☐ 4. 4 or more times

(d) Reasons:

☐ 1. Physical

☐ 2. Psychological

☐ 3. Both physical and psychological

☐ 99. Not specified

☐ Not applicable

2. In the time since the self-harm episode in _____, were you diagnosed with a mental disorder or did you receive a re-diagnosis or change in diagnosis?

Diagnosed	Likely
☐	☐Schizophrenia and/or other psychotic disorders
☐	☐Bipolar affective disorder
☐	☐Depressive illness
☐	☐Anxiety/phobia/panic disorder/OCD
☐	☐Eating disorder
☐	☐Dementia
☐	☐Alcohol dependence
☐	☐Drug dependence
☐	☐Personality disorder
☐	☐Adjustment disorder/reaction

☐ ☐Organic disorder (e.g. acquired brain injury)

☐ ☐Alcohol misuse, but not dependence

☐ ☐Drug misuse, but not dependence

☐77 No mental disorder

☐88 Other (**please specify disorder**)……..

☐99 Not known

3. (a) In the time since the self-harm episode in _____, were you treated as an inpatient at a psychiatric hospital or on the psychiatric ward of a general hospital?

☐ 1. No ☐ 2. Yes

If yes, please give details (e.g. reason for admission)
……
……

(b) If yes, how many times?

☐ 1. never ☐ 4. 4 times or more

☐ 2. 1 time ☐99. Not known

☐ 3. 2-3 times

(c) If you received inpatient psychiatric treatment since _____, do you know for how many weeks?
Number of weeks: _____

If person cannot remember the exact number of weeks, ask to indicate if the duration was:

☐ less than 1 day

☐ less than 1 week

☐less than 1 month

☐ less than 3 months

☐ less than 12 months

☐99. Not known

4. (a) Were you offered outpatient appointments with mental health services since the self-harm episode in _____?

☐ 1. No ☐ 2. Yes

(b) If yes, as far as you are aware, what type of treatment was offered/provided to you?

Please specify type:

☐1. Psychiatric service- public

☐2. Private psychologist/psychiatrist

If type of therapy known please specify (e.g. cognitive behavioural therapy, dialectic behavioural therapy) _____

☐3. Community mental health nurse

☐4. Alcohol/Drug Addiction services

☐5. Consultation service for relationship/sexual problems

☐ 6. Other, please specify _____

(c) If yes, please indicate if you had any difficulty attending these appointments?

☐ 1. No ☐ 2. Yes (please give details)

……

……

(d) Did you feel you benefited from the services?

☐ 1. No ☐ 2. Yes(please give details) ☐99. Not known

……

……

5. Were you on prescribed medication for mental illness since the self-harm act in _____?

☐ 1. No ☐ 2. Yes ☐99. Not known

6. Do you know the name of the medication?

☐ 1. No ☐ 2. Yes (If yes please specify)

……

……

7. Were you able to comply with the instructions on the medication?

☐ 1. No ☐ 2. Yes (please give details)

……

……

8. Did you face any difficulties in accessing health care services since the self-harm act in _____?

☐ 1. No ☐ 2. Yes (please specify below)

……

……

9. Did you have contact with any support group since the self-harm act in _____?

☐ 1. No ☐ 2. Yes (please give details)

……

……

3. REPETITION OF SELF-HARM

I would now like to ask some questions about your thoughts and experiences of self-harm since the self-harm episode in _____. Please try to recall as best you can.

7. (a) In the time since the self-harm episode in _____, have you harmed yourself?

☐ 1. No ☐ 2. Yes.

8. If no to Q 1:

a) How are you doing at the moment?

……

……

b) What factors have contributed to you not harming yourself again?

……

……

c) Can you tell me about any thoughts of harming yourself you might have had since we last the last interview?

……

……

d) *[If has had thoughts of self-harm]* **What do you think stopped you from doing it?**

……

……

e) What kind of role did the hospital play after the self-harm episode?

……

……

f) What role do you think that self-harm has played in your life?

……

……

9. If yes to Q1, how many times?

☐ 1. One ☐ 2. Two

☐ 3. Three ☐ 4. Four

☐ 5. Five ☐ 6. Six

☐ 7. Seven ☐ 8. Eight

☐ 9. Nine ☐ 10. Ten

☐ 11. More than ten ☐ 99. Not known

10. Starting with the most recent self-harm episode, can you tell me what month it happened?

(Interviewer completes this question based on the interviewee's response)

Time lapse between the index self-harm act and the self-harm act

	1	2	3	4	5	6	8	9	10
Specify month									
1. Less than 1 day									
2. Less than 1 week									
3. Less than 1 month									
4. Less than 3 months									
5. Less than 4 months									
6. Less than 5 months									
7. 5 months or more									

11. Method of self-harm

	1	2	3	4	5	6	8	9	10
1. Overdose									
2. Hanging									
3. Drowning									
4. Cutting									
5. Jumping from height									
6. Jumping in front of moving vehicle									
7. Burning									
8. Other									

…….

12. Medical treatment following self-harm

	1	2	3	4	5	6	8	9	10
1. None									
2. GP									
3. General Hospital									
4. Other									

…….

13. Psychiatric treatment following self-harm
(for example, have you seen a psychiatrist or clinical psychologist?)

	1	2	3	4	5	6	8	9	10
1. None									
2. Inpatient									
3. Outpatient									

…….

We have now finished the overview and I have a number of more open questions about your thoughts on your self-harm experiences.

14.

a) What factors do you think have contributed to the ongoing repeated acts?

……

……

b) What do you see as the same or different among your self-harm experiences?

……

……

c) Can you tell me in your own words about your most recent self-harm episode?

……

……

d) What led up to your recent self-harm act?

……

……

e) How did you feel afterwards?

……

……

f) *[If hospital treated]* **What was your experience of presenting to hospital?**

……

……

g) How do you feel about the episode now?

……

……

h) What role do you think that self-harm has played in your life?

……

……

(Interviewer completes questions 9-15 based on the interviewee's responses to the previous questions. Ask interviewee for clarification where necessary)

9. Method of self-harm

☐ 01 Overdose
☐ 02 Carbon monoxide poisoning
☐ 03 Hanging
☐ 04 Drowning
☐ 05 Firearms
☐ 06 Cutting or stabbing
☐ 07 Jumping from a height
☐ 08 Jumping/lying before a train
☐ 09 Jumping/lying before a road vehicle
☐ 10 Suffocation
☐ 11 Burning
☐ 12 Electrocution
☐ 13 Jumping/lying before an unspecified object
☐ 14 Strangulation
☐ 88 Other (please specify)

……

☐ 99 Not known

10. If self-poisoning or overdose, specify substance.

Can you recall the prescription name(s) of the drug(s)? ……

……

……..

(If interviewee is unsure of the prescription name ask them to select from the following categories)

☐ 01 Method not self-poisoning
☐ 02 Anti-psychotic drug
☐ 03 Tricyclic anti-depressant
☐ 04 SSRI/SNRI anti-depressant
☐ 05 Lithium/Mood stabiliser
☐ 06 Other anti-depressant
☐ 07 Benzodiazepine/Hypnotic
☐ 08 Paracetamol
☐ 09 Paracetamol/Opiate compound
☐ 10 Salicylate
☐ 11 Other analgesic
☐ 12 Opiate (heroin, methadone)
☐ 13 Insulin
☐ 14 Other poisons (eg weedkiller)
☐ 15 Unspecified psychotropic drug
☐ 16 Other drug (please specify)

……

☐ 99 Not known

11. If self-poisoning or overdose where did the substance come from?

☐ 1. Prescribed for the person
☐ 2. Prescribed for someone else

☐ 3. Not prescribed (e.g. internet, black market, peers, workplace)
please specify:……

☐ 88. Not applicable (Method not self-poisoning)

☐ 99. Not known

12. (a) What influenced your choice of method?

……

……

(b) In the days / hours leading up to your self- harm episode did you look up information regarding suicide methods on the internet?

☐ 1. No ☐ 2. Yes

……

……

13. Was alcohol consumed as part of the act?

☐ 1. No ☐ 2. Yes

14. Was the self-harm of a pact?

☐ 1. No ☐ 2. Yes

15. Did you leave a suicide note or other messages including text messages?

☐ 1. No ☐ 2. Yes (If yes, please give details)

……

……

16. Circumstances around the act
Can you tell me in your own words about your actions in the hours before the most recent self-harm act? *(Interviewer completes this section based on the interviewee's response)*

i. Isolation

☐ 1. Somebody present

☐ 2. Somebody nearby, or in visual or vocal contact

☐ 3. No one nearby or in visual or vocal contact

Please specify: ……

j. Timing

☐ 1. Intervention is probable

☐ 2. Intervention is not likely

☐ 3. Intervention is highly unlikely

Please specify: ……

k. Precautions against discovery/intervention

☐ 1. No precautions

☐ 2. Passive precautions (as avoiding other but doing nothing to prevent their intervention; alone in room with unlocked door)

☐ 3. Active precautions (as locked door)

Please specify: ……

l. Acting to get help during/after attempt

☐ 1. Notified potential helper regarding attempt

☐ 2. Contacted but did not specifically notify potential helper regarding attempt

☐ 3. Did not contact or notify potential helper

Please specify: ……

m. Final acts in anticipation of death (will, gifts, insurance)

☐ 1. None

☐ 2. Thought about or made some arrangements

☐ 3. Made definite plans or completed arrangements

Please specify: ……

n. Active preparation for attempt

☐ 1. None

☐ 2. Minimal to moderate

☐ 3. Extensive

Please specify: ……

o. Suicide Note

☐ 1. Absence of note

☐ 2. Note written, but torn up; note thought about

☐ 3. Presence of note

Please specify: ……

p. Overt communication of intent before the attempt

☐ 1. None

☐ 2. Equivocal communication

☐ 3. Unequivocal communication

Please specify: ……

i. Alleged purpose or intent

☐ 1. To manipulate environment, get attention, revenge

☐ 2. Components of 0 and 2

☐ 3. To escape, solve problems

j. Expectations of fatality

☐ 1. Thought that death was unlikely

☐ 2. Thought that death was possible, not probable

☐ 3. Thought that death was probable or certain

k. Conception of method's lethality

☐ 1. Did less to self that thought would be lethal

☐ 2. Was unsure if action would be lethal

☐ 3. Equaled or exceeded what s/he thought would be lethal

l. Seriousness of attempt

☐ 1. Did not seriously attempt to end life

☐ 2. Uncertain about seriousness to end life

☐ 3. Seriously attempted to end life

m. Attitude towards living/dying

☐ 1. Did not want to die

☐ 2. Components of 0 and 2

☐ 3. Wanted to die

n. Conception of medical rescuability:

☐ 1. Thought death would be unlikely with medical attention

☐ 2. Was uncertain whether death could be averted by medical attention

☐ 3. Was certain of death even with medical attention

o. Degree of premeditation

☐ 1. None, impulsive

☐ 2. Contemplated for 3 hours or less before attempt

☐ 3. Contemplated for more than 3 hours before attempt

Events leading to most recent self-harm

You told me in your own words what led up to the self-harm act. I would like to ask you some specific questions now regarding your situation in the time prior to your most recent self-harm episode in _____. I will start by listing some possible life events and you can tell me if any of these were relevant to you.

17. In the time prior to your self-harm, had you experienced or were you anticipating:

a) Becoming unemployed?
(a) Becoming unemployed?

☐ No
☐ Perceived possibility of becoming unemployed
☐ Dismissed from job
☐ Made redundant
☐ Became retired
☐ Not applicable

_____weeks _____days _____hours before episode

b) Significant (or perceived significant) disruption of a romantic relationship?

☐ No
☐ Separation
☐ Divorce
☐ Break-up
☐ Argument
☐ Not applicable

_____weeks _____days _____hours before episode

c) Legal troubles or difficulties with the Gardai?

☐ No
☐ Arrest
☐ Known to Gardai
☐ Pending court case
☐ Imprisoned at time of self-harm
☐ Released from prison
☐ Other

_____weeks _____days _____hours before episode

d) Significant interpersonal conflict

☐ No
☐ Not specified
☐ Familial conflict
☐ Friend conflict
☐ Work conflict
☐ Other conflict

_____weeks _____days _____hours before episode

(e) An event which was or was perceived as traumatic?

☐No
☐Victim of violent or sexual assault
☐Involved in significant vehicle collision
☐Victim of abuse (sexual, physical, domestic, neglect)
☐Witness of violent crime
☐Directly witnessed sudden death
☐Severe bullying, torture
☐War, terrorism, or natural disaster
☐Sudden, unexpected death of a loved one
☐Other (please specify)
……

_____weeks_____days _____hours before episode

(f) The completed suicide or suicidal behaviour of a family member or loved one?

☐ No ☐ Yes

_____weeks _____days _____hours before episode

(g) The anniversary of an important death, an important other loss or another significant anniversary?

☐ No ☐ Yes

_____weeks _____days _____hours before episode

(h) Exposure to the suicide of another person through media or personal acquaintance?

☐ No ☐Media ☐Personal acquaintance

_____weeks _____days _____hours before episode

(i) (a)Major financial difficulties

☐ No
☐ Lost home
☐Repossession of belongings, e.g. car
☐Missed mortgage repayments
☐Bankruptcy
☐Business failure
☐Repeated demands from a bank or debt collector

_____weeks _____days _____hours before episode

(i) (b) Daily financial pressures

☐ No ☐ Yes

_____weeks _____days _____hours before episode

18. Were there any other major events that had occurred prior to the self-harm episode, which I have not yet mentioned?

☐ 1. No ☐ 2. Yes (If yes, ask about the details of the event(s) and time of occurrence before the self-harm act)

……
……
……

19. Did you have a wish to reunite with a deceased loved one or to be reborn?

☐ 1. No ☐ 2. Yes (please give details)

……
……

Recent symptoms/behaviours

Although the Depression Symptom Checklist is a self-report questionnaire, the items will be read out to the informant to allow for possible literacy problems.

The next part concerns a number of questions about feelings of depression, fatigue, quality of sleep, etc. Please read through the following list of depressive symptoms and tick any of those which were relevant to your situation in the week prior to your self-harm in _____:

20.

How much was he/she bothered by:	**Not at all**	**A little bit**	**Moderately**	**Quite a bit**	**Extremely**	Not known
Feeling blue						
Blaming him/herself for things						
Worrying too much about things						
Feeling everything is an effort						
Feeling low in energy or slowed down						
Feeling no interest in things						

21.

	Yes	***No***
Excessively "high" mood		
Irritability		
Decreased need for sleep		
Increased energy		
Increased talking, moving, sexual activity		
Racing thoughts		
Disturbed ability to make decisions		
Grandiose notions		
Being easily distracted		

4. SUBSTANCE ABUSE

I would now like to ask you about your use, if relevant, of alcohol and drugs and about any recent changes in this behaviour since _____.

1. At the initial interview, you said that you *did*/did not* have history of alcohol abuse.

**If did, proceed to question 2.*

Since then, has your consumption of alcohol changed?

☐ 1. No ☐ 2. Yes (please give details)

……

……

2. Was there an increase or decrease in your use of alcohol?

☐ 1. Increase ☐ 2. Decrease ☐ 3. Neither

……

……

3. Have you made any recent attempts (in the last six months) to stop abusing alcohol **for example, abstinence or addiction treatment**?

☐ 1. No ☐ 2. Yes (please give details)

……

……

4. Had you been drinking at the time of your recent self-harm episode?

☐ 1. No ☐ 2. Yes (please give details)

……

……

5. At the initial interview, you said that you ***did*/did not*** have history of drug abuse.

Since then has your use of drugs changed?

☐ 1. No ☐ 2. Yes (please give details)

……

……

6. Have you made any recent attempts, (in the six months) to stop abusing drugs **for example, abstinence or addiction treatment**?

☐ 1. No ☐ 2. Yes (please give details)

……

……

7. Was there a recent increase in your abuse of drugs?

☐ 1. No ☐ 2. Yes (please give details) ☐99. Not known

……

……

8. Had you been taking drugs at the time of your recent self-harm act?

☐ 1. No ☐ 2. Yes (please give details) ☐99. Not known

……

……

5. ASPECTS OF PERSONALITY

This part of the interview covers some aspects of your personality and how you usually act in different situations.

	True	False
1. I will often say whatever comes into my head without thinking first.		
2. I enjoy working out problems slowly and carefully		
3. I frequently make appointments without thinking about whether I will be able to keep them.		
4. I frequently buy things without thinking about whether or not I can really afford them		
5. I often make up my mind without taking the time to consider the situation from all angles.		
6. Often, I don't spend enough time thinking over a situation before I act.		
7. I often get into trouble because I don't think before I act.		
8. Many times the plans I make don't work out because I haven't gone over them carefully enough in advance.		
9. I rarely get involved in projects without first considering the potential problems		
10. Before making any important decision, I carefully weigh the pros and cons		
11. I am good at careful reasoning.		
12. I often say and do things without considering the consequences.		

6. THE FUTURE

This part of the interview covers your thoughts and feelings about the future

	True	False
1. In the future, I expect to succeed in what concerns me most		
2. My future seems dark to me		
3. I just don't get the breaks, and there's no reason to believe I will in the future		
4. I have great faith in the future		

7. SELF-EFFICACY

This part of the interview covers your belief in your ability to handle situations, complete tasks and reach goals. Please indicate the extent to which the following statements are usually true for you.

10. I can always manage to solve difficult problems if I try hard enough.

☐ Not at all true ☐ Hardly true ☐ Moderately true ☐ Exactly true

11. If someone opposes me, I can find the means and ways to get what I want.

☐ Not at all true ☐ Hardly true ☐ Moderately true ☐ Exactly true

12. It is easy for me to stick to my aims and accomplish my goals.

☐ Not at all true ☐ Hardly true ☐ Moderately true ☐ Exactly true

13. I am confident that I could deal efficiently with unexpected events.

☐ Not at all true ☐ Hardly true ☐ Moderately true ☐ Exactly true

14. Thanks to my resourcefulness, I know how to handle unforeseen situations.

☐ Not at all true ☐ Hardly true ☐ Moderately true ☐ Exactly true

15. I can solve most problems if I invest the necessary effort.

☐ Not at all true ☐ Hardly true ☐ Moderately true ☐ Exactly true

16. I can remain calm when facing difficulties because I can rely on my coping abilities.

☐ Not at all true ☐ Hardly true ☐ Moderately true ☐ Exactly true

17. When I am confronted with a problem, I can usually find several solutions.

☐ Not at all true ☐ Hardly true ☐ Moderately true ☐ Exactly true

18. If I am in trouble, I can usually think of a solution.

☐ Not at all true ☐ Hardly true ☐ Moderately true ☐ Exactly true

THANK YOU FOR COMPLETING THIS INTERVIEW

How has your experience of this interview been overall?

……

……

……

……

Would you say that you have found this interview beneficial?

☐ 1. Yes ☐ 2. No

(please give details)……

……

……

ADDITIONAL INFORMATION

You may have important additional information that has not already been covered in the interview. Would you like to add anything else?

……

……

……

……

ID number ☐☐☐☐☐

Possibility of further follow-up

As I mentioned at the end of the previous interview, it is often very valuable to follow up participants more than once in a study to see how their situation and views change over time. Even though we do not currently have funding to do this, there is a possibility that we may have scope to meet with participants again in the coming years. We would not be able to contact you unless we obtain permission now to make contact in the future. Even if you agree now to be contacted, you can decide in the future not to take part in a follow-up. Would you be satisfied for us to keep the option open for future contact?

I hereby give permission to be contacted in future in relation to further research.

☐ No ☐ Yes

Name: _____ Signed:_____

Date:_____/_____/_____

Appendix 4.

Supplementary material for Study 1

Supplementary Table 1. Use of specific drugs in all intentional drug overdose (IDO) presentations and all repeat presentations from 2010 to 2016 and cox proportional hazard survival analyses for time to subsequent self-harm repetition of any method following IDO presentation during 2010–2016.

Variables	All IDO presentations		Repeated self-harm presentations		Univariate		Multivariate	
	n	%	n	%	Hazard ratio (95% CI)	*p*	Hazard ratio (95% CI)	*p*
Psychotropic drugs								
Minor tranquilisers	16,926	37.7	5,310	31.4	1.25 (1.20-1.31)	<0.001	1.18 (1.13-1.23)	<0.001
Major tranquilisers	3,721	8.3	1,370	36.8	1.49 (1.38-1.60)	<0.001	1.12 (1.05-1.19)	<0.001
Antidepressants	6,598	14.7	1,869	28.3	1.01 (0.96-1.07)	0.637	1.04 (0.99-1.10)	0.132
Mood stabilisers	3,189	7.1	983	30.8	1.14 (1.06-1.23)	<0.001	1.02 (0.95-1.09)	0.554
Barbiturates/ anti-epileptics	2,677	6.0	929	34.7	1.35 (1.25-1.47)	<0.001	1.09 (1.01-1.72)	0.021
Analgesic drugs								
Paracetamol	13,121	29.2	3,286	25.0	0.86 (0.81-0.91)	<0.001	0.97 (0.92-1.02)	0.180
Opiates	5,466	12.2	1,405	26.7	0.89 (0.83-0.96)	0.002	0.95 (0.88-1.02)	0.140
Salicylates	1,255	2.8	310	24.7	0.84 (0.74-0.95)	0.007	0.92 (0.82-1.04)	0.179
Non-steroidal anti-inflammatory drugs	5,881	13.1	1,334	22.7	0.76 (0.71-0.81)	<0.001	0.92 (0.86-0.97)	0.004
Other medical drugs	11,803	26.3	3,231	27.4	0.99 (0.95-1.04)	0.757	1 (reference)	

Note: Repeated self-harm percentages represent the proportion of those who re-presented to hospital as a result of self-harm out of the total number of presentations within the relevant category. In univariable analyses, for each drug type variable, the reference category is all presentations not involving that drug type. Multivariable regression is adjusted for sex, age group, alcohol consumption and self-harm history.

Supplementary Table 2. Multivariable Cox proportional hazard survival analyses for time to subsequent self-harm repetition during 2010–2016.

Number of tablets and number of drugs taken in intentional drug overdose (IDO) (X60-X64)	Hazard ratio (95% CI)	*p*
<30 tablets, 2 drugs	1.09 (1.02-1.16)	0.007
<30 tablets, 3 drugs	1.10 (1.01-1.20)	0.034
<30 tablets, 4+ drugs	1.28 (1.14-1.44)	<0.001
30+ tablets, 1 drug	1.08 (1.01-1.17)	0.030
30+ tablets, 2 drugs	1.11 (1.03-1.19)	0.006
30+ tablets, 3 drugs	1.11 (1.02-1.21)	0.015
30+ tablets, 4+ drugs	1.29 (1.17-1.34)	<0.001
Unknown drug/tablet quantity	1.09 (1.04-1.14)	0.001

Note: Reference category is '<30 tablets, 1 drug' IDO. Adjusted for self-cutting severity, blunt object, attempted hanging, attempted drowning, self-poisoning, jumping from a height, crashing motor vehicle, jumping in front of moving object, sex, age group, alcohol consumption and self-harm history.

Supplementary Table 3. Multivariable Cox proportional hazard survival analyses for time to subsequent self-harm repetition during 2010–2016 for males and females.

Variables	Male Hazard ratio (95% CI)	*p*	Female Hazard ratio (95% CI)	*p*
Number of drugs taken and class of drug taken in intentional drug overdose (IDO) (X60-X64)				
No psychotropic, 2 drugs	1.03 (0.92-1.15)	0.640	0.90 (0.81-0.99)	0.033
No psychotropic, 3 drugs	0.83 (0.68-1.02)	0.071	0.75 (0.64-0.88)	0.001
No psychotropic, 4+ drugs	1.02 (0.80-1.30)	0.881	0.89 (0.72-1.10)	0.294
Psychotropic, 1 drug	1.08 (0.99-1.16)	0.071	1.04 (0.97-1.11)	0.231
Psychotropic, 2 drugs	1.17 (1.08-1.26)	<0.001	1.14 (1.06-1.22)	<0.001
Psychotropic, 3 drugs	1.17 (1.06-1.29)	0.002	1.18 (1.08-1.28)	<0.001
Psychotropic, 4+ drugs	1.30 (1.16-1.45)	<0.001	1.28 (1.17-1.41)	<0.001
Self-cutting (X78)				
Minor self-cutting	1.37 (1.28-1.49)	<0.001	1.39 (1.30-1.48)	<0.001
Severe self-cutting	1.17 (1.07-1.32)	0.002	1.33 (1.20-1.47)	<0.001
Unknown severity self-cutting	0.85 (0.75-0.99)	0.032	1.42 (1.22-1.64)	<0.001
Attempted hanging (X70)	0.98 (0.90-1.07)	0.625	1.15 (1.04-1.27)	0.008
Attempted drowning (X71)	0.99 (0.87-1.11)	0.808	1.03 (0.90-1.17)	0.656
Self-poisoning (X66-69)	0.83 (0.70-0.97)	0.021	0.88 (0.75-1.03)	0.116
Jumping from a height (X81)	0.86 (0.72-1.03)	0.096	1.02 (0.82-1.28)	0.831
Blunt object (X79)	1.15 (0.95-1.40)	0.142	1.33 (1.09-1.63)	0.005
Jumping in front of moving object (X81)	0.94 (0.76-1.17)	0.600	1.47 (1.12-1.93)	0.005
Crashing motor vehicle (X82)	0.80 (0.57-1.12)	0.199	0.96 (0.62-1.49)	0.852
Alcohol consumed	1.00 (0.95-1.05)	0.964	0.92 (0.88-0.97)	0.001
Age				
<15yrs	0.90 (0.73-1.11)	0.336	1.21 (1.10-1.33)	<0.001
15-24yrs	1.08 (1.01-1.15)	0.030	0.93 (0.87-0.98)	0.012
25-44yrs	1		1	

45-64yrs	0.98 (0.90-1.05)	0.528	0.91 (0.85-0.97)	0.003
65+yrs	0.53 (0.42-0.67)	<0.001	0.62 (0.52-0.74)	<0.001
Self-harm history				
1 previous presentation	2.36 (2.23-2.50)	<0.001	2.41 (2.28-2.54)	<0.001
2 previous presentations	3.39 (3.15-3.66)	<0.001	3.65 (3.40-3.91)	<0.001
3 previous presentations	4.47 (4.06-4.91)	<0.001	4.83 (4.42-5.28)	<0.001
4+ previous presentations	8.55 (7.56-9.66)	<0.001	9.07 (8.25-9.98)	<0.001

Note: For all method of self-harm variables, the reference category is 'no psychotropic, 1 drug' IDO.

Appendix 5.

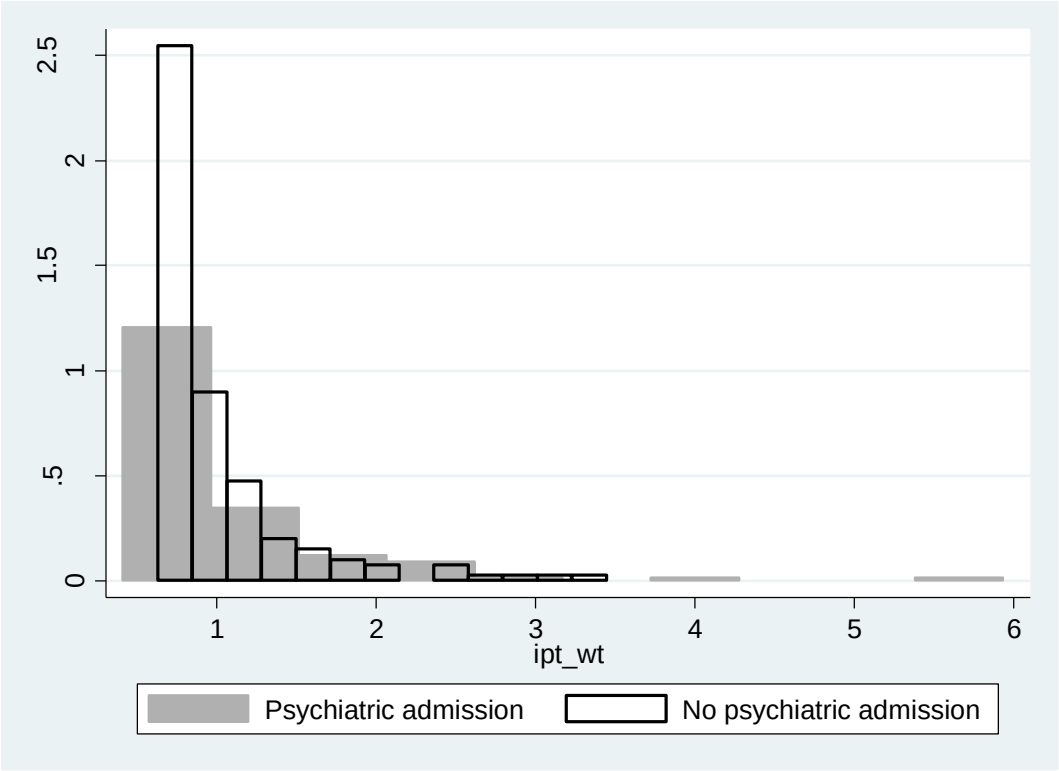
Supplementary material for Study 3

Supplementary Table 4. Baseline versus propensity score matched covariate balance between individuals admitted and not admitted to psychiatric inpatient care

		Baseline			Matched		
		Psychiatric admission (n=120)	No psychiatric admission (n=185)	Standardised differences	Psychiatric admission (n=120)	No psychiatric admission (n=120)	Standardised differences
Sex	**Male**	52.5%	54.1%	-0.031	52.5%	49.6%	0.059
	Female	47.5%	45.9%	0.031	47.5%	50.4%	-0.059
Age	**18-24**	10.8%	25.9%	-0.398	10.8%	13.3%	-0.075
	25-44	41.7%	39.5%	0.045	41.7%	46.9%	-0.106
	45-64	36.7%	32.4%	0.089	36.7%	36.3%	0.008
	65+	10.8%	2.2%	0.357	10.8%	3.5%	0.285
Living arrangements	**Living Alone**	30.8%	14.1%	0.411	30.8%	22.1%	0.198
	Living with partner or family	60.0%	70.3%	-0.217	60.0%	66.4%	-0.132
	Other shared living	9.2%	15.7%	-0.198	9.2%	11.5%	-0.077
Employment status	**Employed**	45.8%	53.5%	-0.154	45.8%	49.6%	-0.075
	Not employed	54.2%	46.5%	0.154	54.2%	50.4%	0.075
Recent self-harm history	**No self-harm presentations**	85.8%	82.7%	0.086	85.8%	85%	0.025
	1 self-harm presentation	7.5%	10.3%	-0.097	7.5%	8%	-0.017
	2+ self-harm presentations	6.7%	7.0%	-0.014	6.7%	7.1%	-0.016
Previous psychiatric admission	**No**	50.8%	75.7%	-0.533	50.8%	64.6%	-0.281
	Yes	49.2%	24.3%	0.533	49.2%	35.4%	0.281
Personality disorder	**No**	91.7%	88.6%	0.101	91.7%	90.3%	0.049
	Yes	8.3%	11.4%	-0.101	8.3%	9.7%	-0.049
Reported history of foster care / orphanage / adoption	**No**	95.8%	93.0%	0.125	95.8%	94.7%	0.054
	Yes	4.2%	7.0%	-0.125	4.2%	5.3%	-0.054

Suicide note	**No**	62.5%	78.9%	-0.367	62.5%	67.3%	-0.100
	Yes	37.5%	21.1%	0.367	37.5%	32.7%	0.100
Proximal alcohol misuse	**No**	70.8%	58.4%	0.263	70.8%	69.9%	0.020
	Yes	29.2%	41.6%	-0.263	29.2%	30.1%	-0.020

Supplementary Figure 1. Inverse probability weighting weights among individuals admitted and not admitted to psychiatric inpatient care



Appendix 6.

Research output, dissemination and training

Academic papers based on the empirical research included in this thesis

Year	Published peer-reviewed papers
2020	**Cully G,** Leahy D, Shiely F and Arensman E. Patients' Experiences of Engagement with Healthcare Services Following a High-Risk Self-Harm Presentation to a Hospital Emergency Department: A Mixed Methods Study. Archives of Suicide Research 2020:1-21.
2019	**Cully G,** Corcoran P, Leahy D, Griffin E, Dillon C, Cassidy E, Shiely F, Arensman E. Method of self-harm and risk of self-harm repetition: findings from a national self-harm registry. Journal of Affective Disorders. 2019;246:843-850.

Year	Papers under review
2020	**Cully G,** Corcoran P, Leahy D, Cassidy E, Griffin E, Shiely F, Arensman E. Assessment and self-harm repetition following high risk self-harm presentations to hospital: A cohort study. Submitted to: Psychiatry Research.
2020	**Cully G,** Corcoran P, Leahy D, Cassidy E, Steeg S, Griffin E, Shiely F, Arensman E. Factors associated with psychiatric admission and subsequent self-harm repetition: a cohort study of high-risk hospital-presenting self-harm. Submitted to: Journal of Mental Health.

Other academic papers and reports based on research collaborations during the PhD

Year	Published peer-reviewed papers
2020	Arensman E, Troya MI, Nicholson S, Sadath A, **Cully G,** Costa APR, Benson R, Corcoran P, Griffin E, Williamson E and Eustace J. Study protocol for the implementation and evaluation of the S elf-harm Assessment and Management for General Hospitals programme in Ireland (SAMAGH). BMC health services research. 2020; 20(1), pp.1-8.

2018	McTernan N, Spillane A, **Cully G**, Cusack E, O'Reilly T, Arensman E. Media reporting of suicide and adherence to media guidelines. International journal of social psychiatry. 2018 Sep;64(6):536-44.
2018	Dillon CB, McMahon E, **O'Regan G,** Perry IJ. Associations between physical behaviour patterns and levels of depressive symptoms, anxiety and well-being in middle-aged adults: a cross-sectional study using isotemporal substitution models. BMJ Open. 2018 Jan 1;8(1):e018978.
2017	Griffin E, Dillon CB, **O'Regan G,** Corcoran P, Perry IJ, Arensman E. The paradox of public holidays: Hospital-treated self-harm and associated factors. Journal of affective disorders. 2017 Aug 15;218:30-4.
2017	McMahon EM, Corcoran P, **O'Regan G,** Keeley H, Cannon M, Carli V et al. Physical activity in European adolescents and associations with anxiety, depression and well-being. European child & adolescent psychiatry. 2017 Jan 1;26(1):111-22.

Year	**Papers under review**
2020	Troya MI, **Cully G**, Leahy D, Cassidy E, Sadath A, Nicholson S, Costa APR, Alberdi-Páramo I, Jeffers A, Shiely F, Arensman E. The association between childhood sexual abuse, self-harm repetition, and suicidal intent: a mixed-methods study. Submitted to: British Journal of Psychiatry.
2020	Benson R, Rigby J, Brunsdon C, **Cully G**, Too LS, Corcoran P, Arensman E. A systematic review of statistical methods for detecting suicide and self-harm clusters. Submitted to: BMC Medical Research Methodology.

Year	**Published reports**
2020	McTernan N, Griffin E, **Cully G**, Kelly E, Hume S, O'Reilly D, Corcoran P. Self-harm in Irish Prisons 2018: Second report from the Self-harm Assessment and Data Analysis (SADA) Project. Irish Prison Service.
2018	Griffin E, **Cully G,** Corcoran P, Hume S, Kelly E, O'Reilly D. Self-harm in Irish Prisons 2017: First report from the Self-harm Assessment and Data Analysis (SADA) Project. Irish Prison Service.

2017	McMahon E, **O'Regan G,** Corcoran P, Arensman E, Cannon M, Williamson E, Keeley H. Young lives in Ireland: A school based study of mental health and suicide prevention. Cork: National Suicide Research Foundation. 2017.
2016	World Health Organization. Practice manual for establishing and maintaining surveillance systems for suicide attempts and self-harm. Geneva: World Health Organization. Report No.: 9241549572.

Presentations during the PhD

Date	**Oral presentations**
October, 2020	**Cully G**. Assessment and aftercare following hospital-presented high-risk self-harm. University College Cork Deanery Day, University College Cork.
September, 2019	**Cully G,** Leahy D, Shiely F and Arensman E. Patients' experiences of engagement with healthcare services following a high-risk self-harm presentation to a hospital emergency department: a mixed methods study. Society for Social Medicine & Population Health Annual Scientific Meeting.
October, 2018	**Cully G,** Leahy D, Corcoran P, Shiely F, Cassidy E, Arensman E. Hospital management following high risk suicidal behaviour and patient experience of care received. 25th British Isles Research Workshop on Suicide and Self Harm, Oxford.
September, 2018	**Cully G.** Researching vulnerable populations: overcoming ethical, methodological and personal challenges, Health Research Board Research Leaders Awards Annual Meeting, Royal College of Surgeons Ireland, Dublin.
September, 2018	**O'Regan G,** Corcoran P, Leahy D, Griffin E, Dillon C, Cassidy E, Shiely F Arensman E. Method of self-harm and risk of self-harm repetition: findings from a national self-harm registry. 17th European Symposium on Suicide and Suicidal Behaviour, Ghent.
May, 2018	**O'Regan G,** Corcoran P, Leahy D, Griffin E, Dillon C, Cassidy E, Shiely F Arensman E. Method of self-harm and risk of self-harm repetition: findings from a national self-harm registry. Faculty of Public Health's Annual Summer Scientific Meeting, Royal College of Physicians of Ireland, Dublin.
December, 2017	**O'Regan G,** Corcoran P, Leahy D, Griffin E, Dillon C, Arensman E. Is there an association between methods of self-harm and risk of self-harm repetition? Findings

	from the National Self-Harm Registry Ireland. New Horizons Translational Research Conference, University College Cork, Cork.
June, 2017	**O'Regan G,** McCarthy J, Larkin C, Leitao S, Greiner B, Cassidy E, Leahy D, Arensman E. Profile of people presenting to hospital with high risk suicidal behaviour. 2nd Suicide and Self-Harm Early Career Researchers' Forum, University of Glasgow, Glasgow.
April, 2017	McMahon E, **O'Regan G,** Corcoran P, Arensman E, Cannon M, Williamson E, Keeley H. Young lives in Ireland: A school-based study of mental health and suicide prevention. From Evidence into Practice: New insights into the assessment and management of self-harm and youth mental health and suicide prevention, National Suicide Research Foundation, University College Cork, Cork.
November 2016	**O'Regan G,** McCarthy J, Larkin C, Leitao S, Greiner B, Cassidy E, Leahy D, Arensman E. Profile of people presenting to hospital with high risk self-harm. National Health Services Research Institute Conference, University College Cork, Cork.
October, 2016	**O'Regan G,** McMahon EM, Keeley H, Corcoran P. Factors associated with suicidal thoughts and suicide attempts among Irish adolescents. Association for Child and Adult Mental Health International Research Conference, Cork.
March, 2016	**Cully G,** Arensman E. Examination of predictive factors associated with short- and long-term risk of repetition of nonfatal self-harm and suicide among high risk groups as identified by the National Self-Harm Registry Ireland. Data Registration Officer Meeting, Dublin.

Poster presentations

Date	**Poster presentations**
May, 2018	**O'Regan G,** Corcoran P, Leahy D, Griffin E, Dillon C, Cassidy E, Shiely F Arensman E. Method of self-harm and risk of self-harm repetition: findings from a national self-harm registry. Faculty of Public Health's Annual Summer Scientific Meeting, Royal College of Physicians of Ireland, Dublin.
December, 2016	**O'Regan G,** McCarthy J, Larkin C, Leitao S, Greiner B, Cassidy E, Leahy D, Arensman E. Hospital presented self-harm surveillance data: Benefits and clinical implications. New Horizons Translational Research Conference, University College Cork.

October, 2016	**O'Regan G,** McCarthy J, Larkin C, Leitao S, Greiner B, Cassidy E, Leahy D, Arensman E. Hospital presented self-harm surveillance data: Benefits and clinical implications. Irish Association for Suicidology, 20th Annual Conference: From Hope to Action: Interventions that Work for Suicidal Persons, Killarney.

Training courses and workshops completed

Date	Course / workshop details	Location
February, 2019	Odyssey Workshop, Mary Kate O'Regan, University College Cork.	Cork
February, 2019	PG 6024 Qualitative Research Inquiry, Eileen Savage, University College Cork.	Cork
January, 2019	Good Clinical Practice Training, HRB Clinical Research Facility Cork.	Cork
January, 2019	Society for Social Medicine & Population Health Early Career Workshop.	Dublin
December, 2018	Children First Training, Health Service Executive.	Online
June, 2018	NVivo Training Workshop, University College Cork.	Cork
December, 2017	PG7048 Generic and Transferable Skills Portfolio, University College Cork.	Cork
May, 2016	Introduction to Rates and Survival Analysis, School of Social and Community Medicine, University of Bristol.	Bristol
May, 2016	Introduction to Linear and Logistic Regression Models, School of Social and Community Medicine, University of Bristol.	Bristol
May, 2016	Introduction to data analysis with Stata, Darren Dahly, University College Cork.	Cork
April, 2016	Turbocharge Your Writing, Hugh Kearns, Flinders University.	Cork
March, 2016	Introduction to Stata Data Analysis and Statistical Software, Brendan Halpin, University of Limerick.	Cork

March, 2016	Academic Writing Workshop, Ivan J Perry, University College Cork.	Cork
January, 2016	Statistical Considerations in Clinical Trial Design, HRB Trials Methodology Research Network.	Cork

Awards and achievements received

Year	**Award / achievement**
2016	Awarded the Eadbhard O'Callaghan Memorial Research Award for best oral presentation at the Association for Child and Adult Mental Health International Research Conference.
2016	Awarded a College of Medicine and Health, University College Cork doctoral student travel bursary of €650

Appendix 7.

Published PhD papers

Journal of Affective Disorders 246 (2019) 843–850

Contents lists available at ScienceDirect

Journal of Affective Disorders

journal homepage: www.elsevier.com/locate/jad

Research paper

Method of self-harm and risk of self-harm repetition: **findings** from a national self-harm registry

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ARTICLE INFO

Keywords:
Self-harm
Self-harm method
Self-harm repetition
Risk factor
Risk assessment
Mental health

ABSTRACT

Background: Risk of self-harm repetition has consistently been shown to be higher following self-cutting compared to intentional drug overdose (IDO) and other self-harm methods. The utility of previous evidence is limited due to the large heterogeneous method categories studied. This study examined risk of hospital presented self-harm repetition according to specific characteristics of self-harm methods.

Methods: Data on consecutive self-harm presentations to hospital emergency departments (2010–2016) were obtained from the National Self-Harm Registry Ireland. Associations between self-harm method and repetition were analysed using survival analyses.

Results: Overall, 65,690 self-harm presentations were made involving 46,661 individuals. Self-harm methods associated with increased repetition risk included minor self-cutting, severe self-cutting, multiple drug IDOs involving psychotropic drugs and self-harm by blunt object. Minor self-cutting was the method associated with highest repetition risk (adjusted hazard ratio (AHR) 1.38, 95% CI 1.31–1.45). Risk of repetition was comparable following IDOs of four or more drugs involving psychotropic drugs (AHR = 1.29, 95% CI 1.20–1.39), severe self-cutting (AHR 1.25, 95% CI 1.16–1.34) and blunt object (AHR = 1.23, 95% CI 1.07–1.42).

Limitations: Information was not available on suicide or other causes of mortality.

Conclusions: Self-harm method and the associated risk of repetition should form a core part of biopsychosocial assessments and should inform follow-up care for self-harm patients. The observed differences in repetition associated with specific characteristics of IDO underline the importance of safety planning and monitoring prescribing for people who have engaged in IDO.

Self-harm is one of the strongest risk factors for both non-fatal self-harm repetition and suicide (Carroll et al., 2014; Chan et al., 2016; Larkin et al., 2014b). The individual, societal and economic cost associated with self-harm is significant and increases with repetition (Sinclair et al., 2011). To aid clinicians in planning treatment and follow-up, it is important to understand the factors that are associated with increased risk of self-harm repetition (Health Service Executive, 2017; NICE, 2004, 2011). Method of self-harm has been widely investigated as a risk factor for repetition and self-cutting is the only method consistently associated with repeated self-harm (Larkin et al., 2014b). The utility of the evidence emerging from research examining self-harm method as a risk factor for repetition is limited because methods are classified into large heterogeneous groups, most commonly intentional drug overdose (IDO) and self-poisoning combined and self-cutting (Bergen et al., 2010; Birtwistle et al., 2017; Lilley et al., 2008). More detailed examination of self-harm methods has the potential to enhance our understanding of their relationship with non-fatal repetition (Birtwistle et al., 2017).

Intentional drug overdose (IDO) is the most common method of hospital presented self-harm, involved in more than two thirds of presentations (Arensman et al., 2018; Geulayov et al., 2016; Perry et al., 2012). Previous studies reported lower risk of self-harm repetition following IDO compared to self-cutting and similar risk compared to other types of self-injury (Bergen et al., 2010; Birtwistle et al., 2017; Lilley et al., 2008; Perry et al., 2012). However, episodes of IDO are not homogeneous in terms of clinical characteristics and medical severity.

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Increased number of tablets and multiple drugs taken in IDO are associated with higher levels of suicidal intent (Haw et al., 2015; Townsend et al., 2001), more extensive medical intervention and greater risk of fatality (Hori and Kinoshita, 2016; Neeleman and Wessely, 1997). Specific characteristics of IDOs have been largely overlooked in large scale prospective studies of self-harm. One study, conducted over 20 years ago, found that ingestion of more than one drug was associated with increased risk of IDO repetition (Owens et al., 1994). In addition, use of benzodiazepines in IDO has been found to be a significant predictor of short term risk of repetition (Cooper et al., 2006).

Self-cutting is involved in approximately 20% of self-harm presentations to hospital (Birtwistle et al., 2017; Hawton et al., 2007; Perry et al., 2012). Hospital presentations resulting from self-cutting can vary widely in terms of injury severity (Larkin et al., 2014a). So far, only one study has examined the severity of self-cutting and repetition of self-harm observing that increased severity was associated with reduced self-harm repetition overall but the authors noted an increased risk of repetition using high lethality methods (Larkin et al., 2014a). The relationship between repetition risk and self-cutting severity has not been examined in comparison with any other self-harm methods. Other methods of self-harm, such as attempted hanging, attempted drowning and self-harm with a blunt object, have received little individual consideration in relation to risk of non-fatal repetition.

Within this context, the present study examined the risk of self-harm repetition according to the characteristics of self-harm method(s) involved in an index self-harm presentation using national self-harm surveillance data from hospital emergency departments (EDs).

1. Methods

1.1. Setting and sample

The National Self-Harm Registry Ireland (NSHRI) collects data on consecutive patients who present to EDs as a consequence of self-harm. Since 2006, the NSHRI has full national coverage of all 36 acute hospitals in Ireland.

The NSHRI uses the following definition of self-harm 'an act with non-fatal outcome in which an individual deliberately initiates a non-habitual behaviour, that without intervention from others will cause self-harm, or deliberately ingests a substance in excess of the prescribed or generally recognised therapeutic dosage, and which is aimed at realising changes that the person desires via the actual or expected physical consequences' (Platt et al., 1992). The definition includes acts involving varying levels of suicidal intent and various underlying motives. Presentations involving acts without intention to self-harm, including accidental overdoses of medication, street drugs or alcohol, are not recorded in the NSHRI. All self-harm presentations to the ED are included in the NSHRI data irrespective of whether the presentation results in hospital admission. More information on data collection and quality assurance has been reported elsewhere (Perry et al., 2012).

Analyses were conducted for presentations recorded between 1 January 2010 and 31 December 2016. The dataset were restricted to individuals who did not present to hospital with self-harm during 2007–2009, in order to maximise the number of true first presentations after 1 January 2010. A similar method was used by Perry et al. (2012). All repeat presentations, rather than first repeat presentations only, were included in the analyses with each repeat presentation becoming an index presentation.

1.2. Data items

Data Registration Officers (DROs) collect data on self-harm presentations according to standardised methods of case ascertainment and definition. The following core data items routinely collected by the DROs were accessed: demographic characteristics (age and sex), method(s) of self-harm and alcohol involvement. Self-harm repetition was defined as a presentation to an ED as a result of a self-harm act following an index self-harm presentation at any time during the 7-year study period. All repeated self-harm presentations were included in the definition of self-harm repetition irrespective of method involved in the repeat act. Encrypted patient initials, sex and date of birth were used to differentiate between self-harm patients and to identify repeat presentations by the same patients. Self-harm presentations by the same individual occurring on the same day were recorded once to ensure that all presentations represented distinct events. Only individuals who had no self-harm presentation in the 3 years prior to the study period were included in the analyses. The study examined all presentations (including first and repeat presentations) as index presentations using repeat event analysis. Self-harm history reflected the number of presentations an individual had prior to an index presentation during the study period.

Method of self-harm was recorded according to the Tenth Revision of the WHO's International Classification of Diseases (ICD-10) codes for intentional injury (World Health Organization, 2008). IDO was defined as the intentional ingestion of more than the prescribed or recommended dose of any drug, as well as IDO of illegal drugs (ICD codes X60-X64). IDO was categorised according to patient-reported number of tablets, number of drugs and class of drugs taken. Categories of drug class were psychotropic drugs, analgesic drugs and other prescription or over-the-counter drugs. Psychotropic drugs included: minor tranquilisers, major tranquilisers, barbiturates/anti-epileptic drugs, antidepressants, and other mood stabilisers. Analgesic drugs included: paracetamol, opiates, salicylates, non-steroidal anti-inflammatory drugs (NSAIDs). Analgesic and opiate drug groups include compound drugs. Self-poisoning was defined as the ingestion of substances other than drugs, including organic solvents, pesticides, gases and other noxious substances, with non-ingestible chemical substances (ICD codes X66-X69). Self-cutting severity was operationalised according to treatment received. Minor self-cutting included injuries that required no treatment, wound cleaning or steri-strips only while severe self-cutting included injuries that required sutures or plastic surgery referral. Self-harm by blunt object (ICD code X79) included self-battery and head-banging. Analyses were based on method involvement rather than primary or sole method. Where multiple methods were involved in a self-harm presentation, up to 5 methods were recorded.

1.3. Statistical analyses

Cox proportional hazard models were fitted to estimate time to self-harm repetition according to the following method variables: number of tablets, number of drugs and class of drugs taken in IDO, self-cutting severity, blunt object, attempted hanging, attempted drowning, self-poisoning with non-ingestible substances, jumping from a height, crashing a motor vehicle and lying or jumping in front of a moving object. To analyse multiple methods involved in each presentation, each specific method was treated as a dummy variable. A series of univariate models assessed the time to repetition for each specific method. In the multivariate model, the reference category for all method variables was IDOs involving one non-psychotropic drug. Number of tablets, number of drugs, and class of drugs taken in IDO were examined separately in univariate models. To avoid collinearity, these characteristics of IDOs were entered as a combined variables in multivariate models (number of drugs / number of tablets and number of drugs / class of drugs) The following co-variates were included in the multivariate model: sex, age, alcohol involvement and self-harm history. Adjusted Hazard ratios (AHR) with 95% confidence intervals (95% CI) were calculated. To further illustrate the findings, Kaplan-Meier curves were plotted, truncated at 24 months.

Follow-up time after an index self-harm presentation varied depending on the point during the study period when the presentation occurred due to the fixed final date, 31 December 2016, ranging from 1

day to 7 years. Variable length of follow-up was accounted for in the analyses. The study used repeat event analyses in that all repeat presentations were included in the analyses with each repeat presentation becoming an index presentation. Lack of independence of observations between presentations made by the same individual was adjusted for by using robust analyses that modified the variance of estimates.

Nelson Aalen graphical tests showed reasonably parallel lines indicating that the assumption of proportional hazards was upheld. The assumption was tested using post-estimation statistics on the basis of Schoenfeld residuals (Grambsch and Therneau, 1994). The post estimation statistics were statistically significant for some variables. However, Spearman's Rho coefficients were small (ranging from 0.015 to 0.057) indicating little violation of the proportional hazards assumption. Analyses were carried out using SPSS 22 and Stata 12 for Windows.

1.4. Ethics statement

Ethical approval for the NSHRI was granted by the National Research Ethics Committee of the Faculty of Public Health Medicine. Ethical approval was also received from the relevant hospital or Health Service Executive ethics committees.

2. Results

A total of 65,690 self-harm presentations by 46,661 individuals were made to hospital EDs in Ireland from 2010 to 2016 (Table 1). The majority of presentations (41.3%) were made by patients in the 25–44 year age range (mean age = 32.7, SD ± 14.4). 53.4% of presentations involved females. The most common self-harm method was IDO (68.3%) followed by self-cutting (23.8%), attempted hanging (6.6%) and attempted drowning (3.0%) (Table 1). IDO was more common among females (74.8% vs 60.9%, $p < .001$). All other methods examined were more common among males ($p < .001$): self-cutting (26.2% vs 21.7%), attempted hanging (10.0% vs 3.6%), attempted drowning (3.9% vs 2.3%), self-poisoning (2.4% vs 1.7%), jumping from a height (1.7% vs 0.9%), blunt object (1.1% vs 0.1%), jumping from a moving object (0.9% vs 0.5%) and crashing a motor vehicle (0.6% vs 0.3%). Approximately half of IDOs involved one drug (53.8%) and 46.8% involved less than 30 tablets. Psychotropic drugs were the most common drug class, involved in 45.2% of IDOs. Most self-cutting presentations were minor self-cutting (66.0%).

2.1. Self-harm repetition

During the seven years follow-up, 29.0% of episodes were followed by a repeat self-harm presentation. The median number of repeat presentations was two (interquartile range ± 1).

2.1.1. Self-cutting

Incidence of repetition was highest following self-cutting compared to all other methods (36.1% vs 26.7% respectively; $\chi^2 = 18.3$, $p < .001$). Repetition occurred following 37.7% of minor and 35.2% of severe self-cutting presentations (Table 1). Self-harm repetition was more frequent and occurred earlier following minor compared to severe self-cutting (Fig. 1a). In adjusted survival analysis, both minor (AHR 1.38, 95% CI 1.31-1.46) and severe self-cutting were predictive of self-harm repetition (AHR 1.25, 95% CI 1.16–1.34) (Table 2). Minor self-cutting was associated with higher risk of repetition compared to severe-self-cutting (AHR 1.11 95% CI 1.03–1.20, $p = .007$).

2.1.2. Intentional drug overdose

Overall, incidence of repetition was lower following IDO compared to non-IDO presentations (27.7% vs 31.7% respectively; $\chi^2 = 111.4$, $p < .001$). A repeat self-harm episode occurred following 26.3% of IDOs that involved a single drug only. Repetition was more likely following multiple drug IDOs. A subsequent self-harm presentation occurred following 32.9% of IDOs of four or more drugs (Table 1). Approximately 26% of IDOs involving less than 30 tablets were followed by a repeat self-harm presentation while approximately 30% of IDOs of 30 or more tablets were followed by a repeat episode (Table 1). Repetition occurred more frequently following IDOs that involved psychotropic compared to analgesic drugs (30.1% vs 25.1% respectively) (Table 1). The relationships between self-harm repetition and the specific types of psychotropic and analgesic drugs are presented in detail in Supplementary Table 1. The Kaplan–Meier curves (Fig. 1b, c and d) show the cumulative probability of a repeated self-harm presentation in the 24-month period after an index IDO presentation. Fig. 1b illustrates that repetition risk following IDO increased with each additional drug taken. The curves in Fig. 1c highlight a pattern of earlier and more frequent repetition following IDOs of 30 or more tablets compared to those involving less than 30 tablets. Fig. 1d demonstrates higher repetition risk following IDOs involving psychotropic drugs compared to non-psychotropic IDOs.

In adjusted survival analysis, with number of drugs and class of drug combined, multiple drug IDOs involving psychotropic drugs were associated with increased risk compared to single drug IDOs that did not involve psychotropic drugs. IDOs involving four or more drugs, at least one of which was a psychotropic drug, were associated with 29.3% increased risk of repetition (AHR = 1.29, 95% CI 1.20–1.39). In further adjusted survival analysis, when combined with number of drugs taken, number of tablets taken did not contribute substantially to repetition risk (Supplementary Table 2).

2.1.3. Other methods

Incidence of repetition was higher after an episode of self-harm by blunt object compared to other self-harm methods (34.8% vs 28.9% respectively; $\chi^2 = 9.9$, $p = .002$) (Table 1). Repetition was significantly lower following self-poisoning compared to other methods (23.7% vs 29.1% respectively; $\chi^2 = 18.3$, $p < .001$) and crashing a motor vehicle compared to other methods (19.8% vs 29.01% respectively; $\chi^2 = 11.3$, $p < .001$). In adjusted survival analysis, self-harm by blunt object was an independent predictor of self-harm repetition, associated with a 23.3% increase in risk compared to presentations not involving a blunt object (AHR = 1.23, 95% CI 1.07–1.42) (Table 2). Self-poisoning was associated with a 15.5% decrease in repetition risk compared to other methods (AHR = 0.85, 95% CI 0.76–0.96).

2.1.4. Sex, age and self-harm history

There were no significant sex differences in incidence or risk of self-harm repetition (Tables 1 and 2). 28.8% of males and 29.1% of females repeated. When risk of repetition was examined separately by sex, the relationship between self-harm method and repetition was broadly similar (Supplementary Table 3). However, there were some minor differences. In adjusted survival analyses, attempted hanging and jumping in front of a moving object were associated with increased risk of repetition among females but not males (Supplementary Table 3).

Repetition was most likely in the 25–44 years age group (30.6% repeated) and least common among those aged 65 or older (14.3% repeated) (Table 1). In adjusted survival analyses, compared to the 25–44 group, repetition was 41.5% less likely in the 65 or older age group (AHR 0.59 95% CI 0.51–0.67) and 6.1% less likely in the 45–64 age group (AHR 0.94 95% CI 0.89–0.99) (Table 2). Overall, risk of repetition was highest among those aged less than 15 years with an increased risk of 17.0% compared to those aged 25–44 years (AHR 1.17 95% CI 1.07–1.28). Consistent with the overall findings, females in the < 15 years age group had the highest risk of repetition; however, males aged 15–24 years were the age group with the highest risk of repetition (Supplementary Table 3).

Repetition risk was significantly higher among patients who had at least one previous self-harm presentation (Tables 1 and 2). Repetition risk increased with each additional previous self-harm presentation,

Table 1
Characteristics of all self-harm presentations and repeat presentations, 2010–2016 and Cox proportional hazard survival analyses for time to subsequent self-harm repetition during 2010–2016.

Variable	All self-harm presentations		Repeated self-harm presentation		Univariate Cox proportional hazard survival analysis	
	n	%	n	%	Hazard ratio (95% CI)	*p*
All presentations	65,690	100	19,029	29.0		
Intentional drug overdose (IDO) (X60-X64)	44,890	31.7	12,433	27.7	0.83 (0.79–0.87)	< 0.001
Number of drugs taken in IDO (X60-X64)						
1 drugs taken	24,130	36.7	6,335	26.3	0.78 (0.74–0.82)	< 0.001
2 drugs taken	11,038	16.8	3,122	28.3	0.84 (0.79–0.89)	< 0.001
3 drugs taken	5,756	8.8	1,675	29.1	0.87 (0.81–0.93)	< 0.001
4 + drugs taken	3,960	6.0	1,301	32.9	1.00 (0.92–1.08)	0.971
Drug class(s) taken in IDO						
Psychotropic	25,260	38.5	7,600	30.1	0.90 (0.69–0.77)	< 0.001
Analgesic	18,830	28.7	7,706	25.1	0.74 (0.70–0.78)	< 0.001
Other	11,803	18.0	3,231	27.4	0.82 (0.78–0.87)	< 0.001
Number of tablets taken in IDO (X60-X64)						
< 10 tablets	5,221	8.0	1,342	25.7	0.75 (0.70–0.81)	< 0.001
10–19 tablets	9,012	13.7	2,335	25.9	0.77 (0.72–0.82)	< 0.001
20–29 tablets	6,777	10.3	1,797	26.5	0.78 (0.73–0.83)	< 0.001
30–39 tablets	3,700	5.6	1,094	29.6	0.89 (0.82–0.92)	0.003
40–49 tablets	2,460	3.7	769	31.3	0.95 (0.87–1.03)	0.215
50–59 tablets	1,462	2.2	437	29.9	0.91 (0.81–1.02)	0.100
60–69 tablets	1,080	1.6	331	30.7	0.92 (0.82–1.04)	0.179
70–79 tablets	594	0.9	175	29.5	0.87 (0.75–1.02)	0.096
80+ tablets	1,721	2.6	510	29.6	0.88 (0.79–0.98)	0.018
Unknown quantity of tablets	12,863	19.6	3,643	28.3	0.86 (0.81–0.90)	< 0.001
Self-cutting (X78)	15,616	23.8	5,638	36.1	1.50 (1.42–1.58)	< 0.001
Severity of self-cutting (X78)						
Minor self-cutting	10,309	15.7	3,886	37.7	1.62 (1.52–1.72)	< 0.001
Severe self-cutting	3,414	5.2	1,202	35.2	1.41 (1.30–1.53)	< 0.001
Unknown severity self-cutting	1,893	2.9	551	29.1	1.07 (0.94–1.23)	0.318
Attempted hanging (X70)	4,335	6.6	1,199	27.7	0.96 (0.89–1.02)	0.165
Attempted drowning (X71)	1,967	3.0	553	28.1	0.97 (0.88–1.06)	0.499
Self-poisoning (X66-69)	1,329	2.02	315	23.7	0.79 (0.70–0.89)	< 0.001
Jumping from a height (X81)	818	1.25	208	25.4	0.88 (0.77–1.02)	0.087
Blunt object (X79)	601	0.9	209	34.8	1.36 (1.16–1.59)	< 0.001
Jumping in front of moving object (X81)	456	0.7	144	31.6	1.23(1.04–1.47)	0.049
Crashing motor vehicle (X82)	273	0.4	54	19.8	0.65 (0.50–0.85)	0.001
Alcohol involved	23,160	35.3	6,661	28.8	0.95 (0.91–0.99)	0.021
Sex						
Male	30,597	46.6	8,824	28.8	1	
Female	35,093	53.4	10,205	29.1	1.01 (0.95–1.08)	0.319
Age						
< 15yrs	2,201	3.35	599	27.2	0.91 (0.80–1.02)	0.103
15–24 yrs	22,094	33.6	6,365	28.8	0.95 (0.88–1.01)	0.095
25–44 yrs	27,094	41.3	8,276	30.6	1	
45–64 yrs	12,536	19.1	3,537	28.2	0.911 (0.84–0.99)	0.020
65 + yrs	1,765	2.7	252	14.3	0.434 (0.36–0.52)	< 0.001
Self-harm history						
No previous presentations	46,661	71.0	9,166	19.6	1	
1 previous presentation	9,166	14.0	3,591	39.2	2.46 (2.37–2.56)	< 0.001
2 previous presentations	3,591	5.5	1,809	50.4	3.69 (3.51–3.88)	< 0.001
3 previous presentations	1,809	2.8	1,058	58.5	4.91 (4.61–5.23)	< 0.001
4 + previous presentations	4,463	6.8	3,405	76.3	9.44 (8.73–10.21)	< 0.001

Note:. For each method of self-harm variable, the reference category is all presentations not involving that method. Repeated self-harm percentages represent the proportion of those who re-presented to hospital as a result of self-harm out of the total number of presentations within the relevant category.

with the highest risk following presentations among those with a history of four or more previous presentations (AHR 8.93, 95% CI 8.26–9.63). Fig. 2 shows the proportion of repeat self-harm presentations by number and class of drug taken in IDO, severity of self-cutting and previous self-harm history. The graph highlights the overlap in incidence of repetition following self-cutting and IDOs that involved at least four drugs, including psychotropic drugs, a pattern that remained consistent as the number of previous self-harm presentations increased. Fig. 2 also illustrates that previous self-harm history was associated with the greatest difference in repetition.

3. Discussion

3.1. Main findings

This study provides the largest, most in-depth study of the association between method of self-harm and risk of non-fatal repetition using nationally representative data from hospital EDs. Self-harm methods associated with increased repetition risk included minor self-cutting, severe self-cutting, multiple drug IDOs that involved psychotropic drugs and self-harm by blunt object. Minor self-cutting was associated with the highest risk of repetition. Repetition risk was comparable following severe self-cutting, IDOs of four or more drugs that involved psychotropic drugs and self-harm by blunt object.

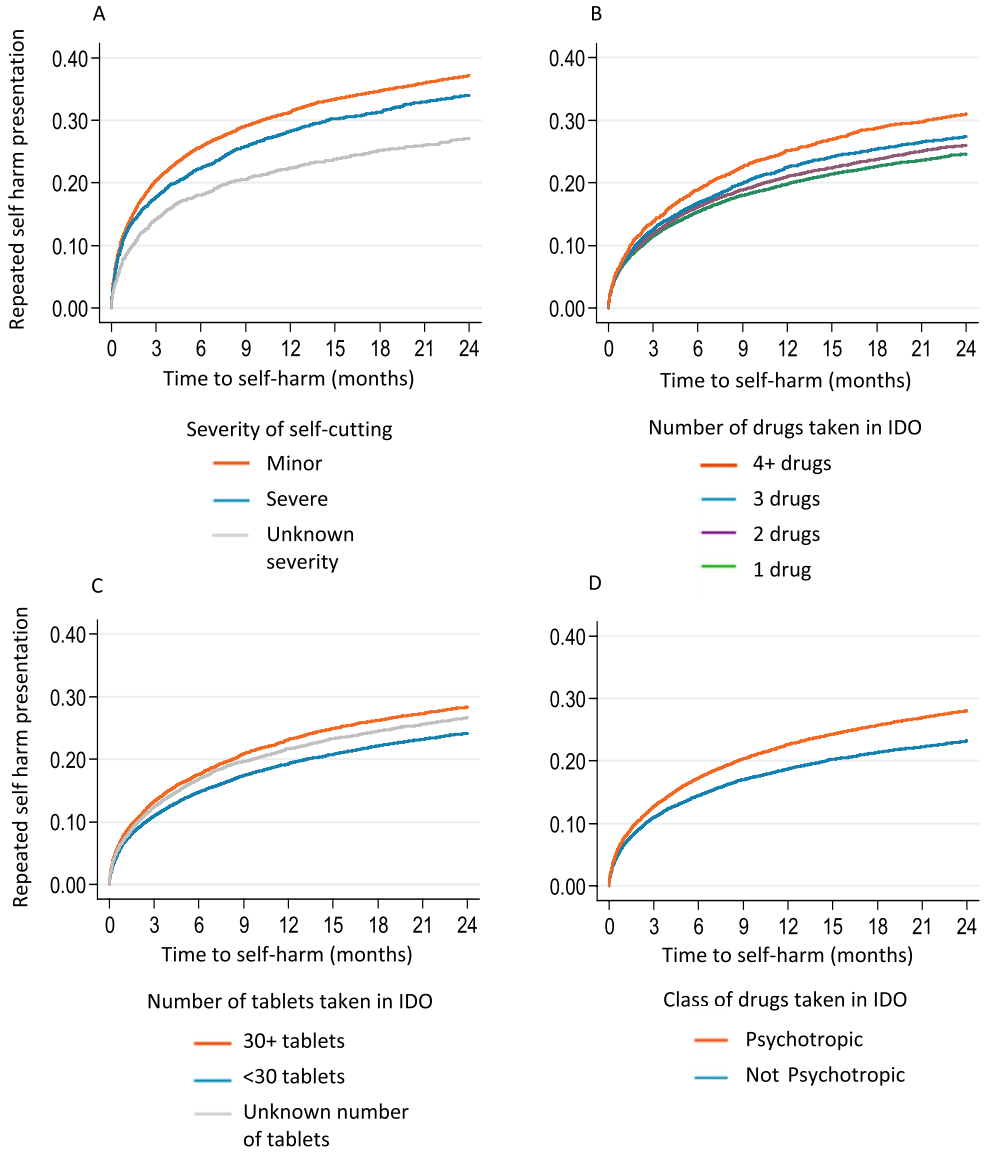


Fig. 1. Kaplan-Meier failure curves showing the cumulative probability of a repeated self-harm presentation. The curves show the cumulative probability of a repeated self-harm presentation in the 24 month period after an index self-harm presentation. Variation in the probability of a repeated self-harm presentation is shown by severity of self-cutting (A), by number of drugs taken in intentional drug overdose (IDO) (B), by number of tablets taken in IDO (C), and by the class of drug taken in IDO (D).

3.2. Findings in relation to previous studies

We found that the relationship between repetition risk and IDO varied according to number and class of drugs taken. When psychotropic drugs were taken in IDO, involvement of multiple drugs was associated with increased risk of repeated self-harm compared to single drug IDOs. This builds on the findings of one previous study of hospital presented IDO which reported that risk of IDO repetition was higher among those who had taken more than one drug (Owens et al., 1994). Consistent with our findings, a previous UK-based study identified benzodiazepines, one of the most common psychotropic drugs used in IDO (Daly et al., 2018; Geulayov et al., 2016), as a significant predictor of short term repetition (Cooper et al., 2006). Psychotropic drug involvement in IDO is more common among those who are in receipt of a prescription for these drugs and in contact with psychiatric services (Corcoran et al., 2013; Tournier et al., 2009). Psychiatric treatment at the time of a self-harm episode is associated with increased risk of subsequent repetition (Larkin et al., 2014b).

IDO is frequently considered a method associated with lower risk of continued self-harm compared to self-cutting (Bergen et al., 2010; Birtwistle et al., 2017; Lilley et al., 2008; Perry et al., 2012). Overall, we found that incidence of repetition following IDO was significantly lower than self-cutting. However, the previously accepted disparity in repetition risk between self-cutting and IDO was not evident when IDO was categorised according to number of drugs and class of drug taken and self-cutting categorised according to severity. In our study, repetition risk was similar following IDOs of four or more drugs that involved psychotropic drugs and severe self-cutting, which has not been addressed by previous studies. These findings indicate that IDO should not be treated as a homogeneous category when considering the method used in relation to the assessment of risk in a clinical setting. This is further supported by the fact that multiple drug IDOs and increased number of tablets are associated with higher suicidal intent (Haw et al., 2015; Townsend et al., 2001), severe medical outcomes (Hori and Kinoshita, 2016; Neeleman and Wessely, 1997) and subsequent suicide (Carter et al., 2005).

Minor self-cutting was the method associated with highest risk of subsequent repetition. This finding compliments a previous study that

Table 2
Multivariate Cox proportional hazard survival analyses for time to subsequent self-harm repetition during 2010–2016.

Variables	Total Hazard ratio (95% CI)	*p*
Number of drugs taken and class of drug taken in intentional drug overdose (IDO) (X60-X64)		
No psychotropic, 2 drugs	0.94 (0.88–1.02)	0.135
No psychotropic, 3 drugs	0.78 (0.69–0.88)	< 0.001
No psychotropic, 4+ drugs	0.95 (0.81–1.11)	0.493
Psychotropic, 1 drug	1.06 (1.01–1.12)	0.024
Psychotropic, 2 drugs	1.15 (1.09–1.22)	< 0.001
Psychotropic, 3 drugs	1.17 (1.10–1.25)	< 0.001
Psychotropic, 4+ drugs	1.29 (1.20–1.39)	< 0.001
Self-cutting (X78)		
Minor self-cutting	1.38 (1.31–1.45)	< 0.001
Severe self-cutting	1.25 (1.16–1.34)	< 0.001
Unknown severity self-cutting	1.10 (0.99–1.22)	0.086
Attempted hanging (X70)	1.04 (0.98–1.11)	0.223
Attempted drowning (X71)	1.01 (0.93–1.10)	0.809
Self-poisoning (X66-69)	0.85 (0.76–0.96)	0.007
Jumping from a height (X81)	0.93 (0.81–1.07)	0.298
Blunt object (X79)	1.23 (1.07–1.42)	0.003
Jumping in front of moving object (X81)	1.13 (0.95–1.33)	0.162
Crashing motor vehicle (X82)	0.87 (0.66–1.13)	0.298
Alcohol involved	0.96 (0.93–1.00)	0.031
Sex (female)	1.01 (0.97–1.05)	0.723
Age		
< 15yrs	1.17 (1.07–1.28)	< 0.001
15–24yrs	1.00 (0.95–1.04)	0.843
25–44yrs	1	
45–64yrs	0.94 (0.89–0.99)	0.016
65 + yrs	0.58 (0.51–0.67)	< 0.001
Previous self-harm presentations		
1 previous presentation	2.39 (2.30–2.49)	< 0.001
2 previous presentations	3.55 (3.37–3.73)	< 0.001
3 previous presentations	4.69 (4.39–5.00)	< 0.001
4 + previous presentations	8.93 (8.26–9.63)	< 0.001

Note: For all method of self-harm variables, the reference category is 'no psychotropic, 1 drug' IDO.

reported higher risk of repetition following self-cutting requiring little or no treatment compared to self-cutting requiring more extensive medical intervention (Larkin et al., 2014a). Larkin et al. observed that use of lethal methods in repeat self-harm was associated with severity of self-cutting (Larkin et al., 2014a). If this potential escalation in method lethality resulted in an increase in fatal outcomes from self-harm acts that followed severe self-cutting, this may partly explain the reduction in overall repetition risk associated with severe compared to minor self-cutting. However, this has not been examined in previous studies. Differences in future risk according to cutting severity may also be influenced by differences in assessment and treatment (Larkin et al., 2014a). Patients who are admitted to hospital are more likely to receive a psychosocial assessment compared to those who are discharged directly from the ED (Lilley et al., 2008). Those with more extensive injuries as a result of self-cutting may be more likely to be admitted, which could increase the likelihood of receiving a psychosocial assessment which is associated with reduced risk of repeated self-harm (Bergen et al., 2010).

Self-harm by blunt object was associated with increased risk of repetition. This is a novel finding as repetition following self-harm by blunt object has not been independently examined previously. These findings indicate that, consistent with minor self-cutting, this method of self-injury is associated with ongoing distress despite the likelihood that the resulting physical injuries require minimal medical treatment. However, it is important to note that this self-harm method is relatively uncommon, involved in just 1% of presentations in this sample. Overall, other self-harm methods, including attempted hanging, attempted drowning, self-poisoning, jumping from a height, crashing a motor vehicle and jumping in front of a moving object, were not associated with increased repetition risk. The relationship between these methods and non-fatal repetition has received little individual consideration in previous studies. The absence of repetition risk following these methods should not be considered reflective of a profile of reduced risk as they are associated with high lethality (Mergl et al., 2015) and increased risk of subsequent suicide (Bergen et al., 2012; Runeson et al., 2010). Among females, there was some evidence of an increased risk of repetition following two of the high lethality methods, jumping in front of a moving object and attempted hanging, which are less common among females compared to males (Mergl et al., 2015). Previous research has found that involvement of lethal methods in a self-harm episode increases risk of subsequent suicide among males but not females (Skogman et al., 2004). Furthermore, method-specific lethality is higher among males (Mergl et al., 2015). Thus, it is possible that males who engaged in high lethality methods may have been more likely to have a fatal repeat episode. This could partly account for the increased risk of non-fatal repetition associated with two high lethality methods among females but not males.

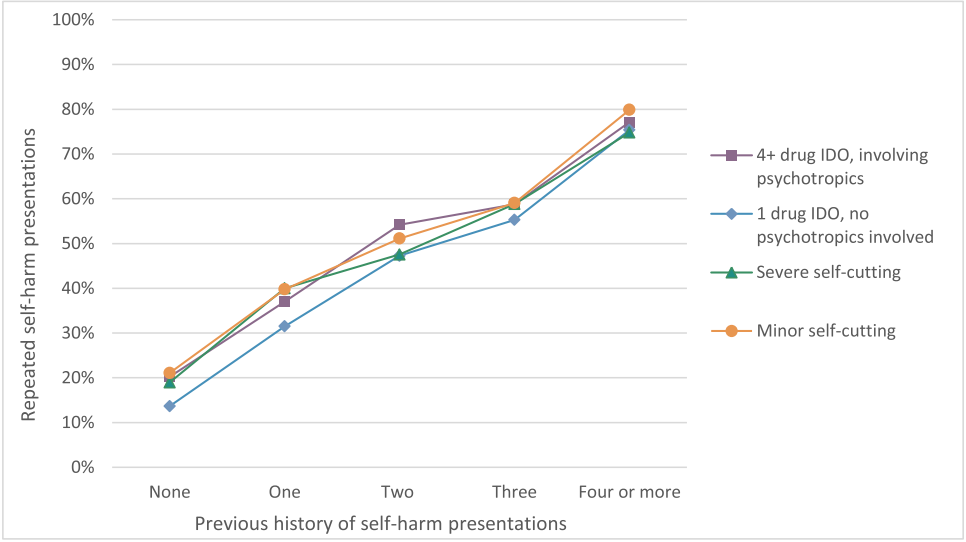


Fig. 2. Proportion of repeat presentations in the 24 month period after an index self-harm presentation. Proportion is shown by number and class of drugs taken in IDO, severity of self-cutting and previous self-harm history.

3.3. Strengths and limitations

This study used data from a national surveillance system including all self-harm presentations to hospital EDs over a seven-year period. The large sample size allowed for the examination of risk factors for self-harm repetition that have received limited attention in previous research. Due to the complete national coverage of hospital-presented self-harm, loss at follow-up was minimised. Analyses were limited to individuals with no self-harm presentation in the 3 years prior to the study period to maximise the likelihood that first patient presentations included in the analyses were first ever presentations. This reduces the potential for results to be biased by lack of information on self-harm history. All repeat presentations, rather than first repeat presentations only, were examined in the sample to avoid an underestimation of repetition (Lilley et al., 2008). However, because individuals commonly switch methods of self-harm from one episode to the next, results from analyses using repeat event analysis need to be interpreted with care (Birtwistle et al., 2017; Owens et al., 2015). There were some limitations to the study. This study focuses on hospital cases of self-harm only. Therefore, findings cannot be generalised to self-harm repetition not resulting in a hospital presentation. A further limitation relates to missing data: number of tablets taken in IDO and treatment for self-cutting were not recorded in a substantial proportion of presentations (28.7% and 12.1% respectively) as the variables were not always recorded in the case notes. Furthermore, information on toxicology of IDOs was not available. Consequently, data on drugs taken and quantity of tablets taken was based on self-report. In addition, information is not available from the NSHRI on drugs prescribed to the patient at the time of the IDO. It was, therefore, not possible to examine the impact of access to certain drugs and involvement in IDO. Finally, information on suicide or other causes of mortality is not recorded by the NSHRI. Therefore, cases will have been included in the analyses that should have been censored due to loss of life. As risk of suicide differs according to method of previous non-fatal self-harm (Bergen et al., 2012; Runeson et al., 2010), it is likely that this will have influenced our results.

3.4. Implications

This study found that non-fatal self-harm repetition differs according to specific characteristics of the index self-harm method(s). This highlights that detailed consideration of method of self-harm should form a routine part of psychosocial assessment and management of risk and need for self-harm patients.

Previous research has found that hospital care following self-harm presentations to hospital varies depending on the method used, where self-cutting patients were less likely to receive a psychosocial assessment (Lilley et al., 2008). Attitudes to individuals presenting with self-harm vary among healthcare staff (Taylor et al., 2009) and may conceivably contribute to less than optimal experience of care. Minor self-cutting and self-harm by blunt object were identified as significant predictors of repetition. This highlights the necessity for assessment and intervention even if the injuries sustained require little or no medical treatment (Larkin et al., 2014a; Lilley et al., 2008) as they are likely to recur. The study also identified increased severity of self-cutting, a method characteristic previously associated with high lethality repeat presentations (Larkin et al., 2014a), as a predictor of repetition. There is a need for staff educational initiatives and care pathways for plastics surgery services to ensure that all such presentations receive a timely psychosocial assessment. Consideration should also be given to mental health service provision of enhanced follow-up for self-cutting presentations that require sutures or plastics intervention.

International guidelines highlight the critical role that clinicians' prescribing practices play in self-harm management and suicide prevention (NICE, 2004, 2011; World Health Organization, 2014). The increased repetition risk associated with multiple drug IDOs in our sample underline the importance of monitoring the availability of multiple drugs, particularly to patients prescribed psychotropic drugs. Furthermore, due to the potential dangers associated with some psychotropic drugs, care should be taken where possible to prescribe drugs that are least toxic in IDO (NICE, 2004, 2011). Ongoing awareness training with clinicians may be beneficial to reduce inappropriate prescribing of drugs commonly used in IDO that are associated with increased risk of repetition (World Health Organization, 2014). Limiting the duration/amount of medication prescribed and dispensed for self-harm patients should be considered as a matter of routine. Collaboration with carers to reduce availability of and access to other medication at home should be a standard part of safety planning.

A word of caution is that due to the frequency of method switching between presentations (Owens et al., 2015), characteristics of self-harm method alone should never be used as static predictors of subsequent repetition. We found that risk of repeated self-harm was high irrespective of the method and a person's risk increased substantially with each repeat presentation. All presentations following self-harm regardless of method, should receive a standard of assessment and care that includes standardised triage, bio-psycho-social assessment, access to skilled clinicians, involvement of family/carers, emergency care plans and appropriate follow-up (Health Service Executive, 2017; NICE, 2004, 2011).

4. Author contribution

GC, PC, EA and DL conceived of and designed the study. GC drafted the manuscript. EG, CD and PC were responsible for data collection and preparation of the dataset. GC and PC conducted statistical analyses and interpreted the data. GC, PC, DL, EG, CD, FS, EC and EA assisted with interpretation of the data and commented on drafting the manuscript. All authors read and approved the final manuscript.

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Competing Interests

The authors have no competing interests.

CONFLICT OF INTEREST

None.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jad.2018.10.372.

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Patients' Experiences of Engagement with Healthcare Services Following a High-Risk Self-Harm Presentation to a Hospital Emergency Department: A Mixed Methods Study

Grace Cully, Dorothy Leahy, Frances Shiely, and Ella Arensman

ABSTRACT

Experiences of engaging with healthcare services following a self-harm presentation to hospital of high lethality or high suicidal intent have not been examined previously, despite this subgroup of self-harm patients being at high risk of suicide. Therefore, this study addressed this issue by documenting patients' experiences of engaging with healthcare services after a high-risk self-harm (HRSH) presentation to hospital. Demographic, psychiatric and psychosocial factors associated with variations in perceptions of care received were also examined. Quantitative information was obtained by interview administered questionnaires 0–3 months following a HRSH presentation to hospital. Semi-structured follow-up interviews, conducted, 6–9 months later, provided qualitative data ($n = 32$). Satisfaction with aftercare varied. Positive experiences of care included "*supportive and compassionate relationships*" and "*timely and comprehensive follow-up care*." The establishment of trust in the services encouraged help-seeking and psychotropic treatment adherence. Conversely, "*superficial and unsupportive relationships*" and "*care lacking continuity and comprehensiveness*" left some participants feeling isolated, contributing to inhibited help-seeking and resistance to psychotropic treatment. Participants with a history of self-harm and mental health service engagement were more likely to report dissatisfaction with care provided. Those who described unsupportive relationships more frequently reported repeated self-harm, alcohol misuse, and hopelessness at follow-up. Our findings show that satisfaction with services, help-seeking and treatment adherence may be improved by ensuring the consistent provision of timely, comprehensive and supportive aftercare following a HRSH presentation. Absence of these aspects of care may contribute to ongoing distress and further suicidal behavior.

KEYWORDS

Healthcare services; mixed methods; self-harm; suicidal intent

INTRODUCTION

People who present to hospital as a result of self-harm have increased risk of further self-harm, suicide and other causes of mortality (Bergen et al., 2012b; Carroll, Metcalfe, & Gunnell, 2014; Hawton et al., 2015). Despite the critical opportunity for intervention that arises following a self-harm presentation to the emergency department (ED), previous studies indicate that self-harm patients receive inconsistent and, at times, substandard follow-up care (Arensman et al., 2018; Cooper, Murphy, Jordan, & Mackway-Jones,

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2008; Cooper et al., 2013). Existing research on patient experience of services largely relates to the general self-harm population (Taylor, Hawton, Fortune, & Kapur, 2009; Hunter, Chantler, Kapur, & Cooper 2013; Cooper et al., 2013) or non-suicidal self-injury (Lindgren, Svedin, & Werkö, 2018). Self-harm presentations to hospital include episodes with varying levels of suicidal intent and various degrees of medical severity or lethality. Considering this heterogeneity, gaining an understanding of the care needs of self-harm patients as a whole is challenging. Patients presenting to hospital for self-harm involving highly lethal methods or with high suicidal intent represent a subgroup of self-harm patients at particularly high risk of suicide (Bergen et al., 2012a; Harriss & Hawton, 2005; Runeson, Tidemalm, Dahlin, Lichtenstein, & Långström, 2010). The experiences of engaging with healthcare services following a self-harm presentation have not been examined previously among this subgroup of high risk self-harm patients (HRSH).

Substantial variation in patient experiences of aftercare following self-harm in general have been reported in previous studies (Hunter et al., 2013; Lindgren et al., 2018; Shand, Vogl, & Robinson, 2018; Taylor et al., 2009). Reported inconsistencies in patient satisfaction relate to typical aftercare services including care within the ED, inpatient and outpatient psychiatric services, community mental health services, psychotherapy and primary care (Taylor et al., 2009; Hunter et al., 2013; Shand et al., 2018). Service level factors, such as inconsistent referral practices and staff attitudes, contribute to the observed discrepancy in satisfaction with care (Saunders, Hawton, Fortune, & Farrell, 2012; Shand et al., 2018; Taylor et al., 2009). Patient characteristics may also influence differences in perception of care, as has been found in a previous study of general medical patients (Quintana et al., 2006). Preferences for different forms of therapeutic care among patients with psychological disorders have been found to differ according to certain patient characteristics such as sex, age, marital status, and previous experiences of therapy (Liddon, Kingerlee, & Barry, 2018; McHugh, Whitton, Peckham, Welge, & Otto, 2013). Patient differences in satisfaction with routine aftercare following self-harm have received little attention with no previous studies focusing on HRSH patients.

In order to facilitate the design and implementation of enhanced self-harm management, it is integral to investigate healthcare service provision from the patients' perspective (Hunter et al., 2013; Lindgren et al., 2018; Shand et al., 2018; Taylor et al., 2009). The primary aim of this study was to document patients' experiences of care following a HRSH presentation to hospital. Investigating factors underlying dissatisfaction with care is necessary as it can negatively impact treatment adherence, service engagement and future help-seeking intentions (Hunter et al., 2013; Lindgren et al., 2018; Shand et al., 2018; Taylor et al., 2009). Therefore, secondary objectives were to examine the demographic, psychiatric, and psychosocial factors associated with variations in perceptions of care received.

MATERIALS AND METHODS

Study Design

A sequential qualitatively led mixed-methods design was used. Quantitative information was obtained by interview administered questionnaires 0–3 months after a HRSH presentation to the hospital ED ($n = 58$). Semi-structured follow-up interviews were

conducted 6–9 months later to gain in-depth information on participants' experiences since their self-harm act ($n = 35$). Brief questionnaires were also administered at the end of the follow-up interview. Qualitative methods were used to address the primary study objective. Following the primary analyses, core qualitative findings were quantitized and integrated into a quantitative dataset that was used to address the secondary objectives. This integration of qualitative and quantitative data at the analysis stage was used as a means of extending what could be learned from the qualitative findings independently. This approach was adopted as it has been highlighted as a successful means of facilitating the integration and comparison of qualitative and quantitative data in order to gain a better understanding of a phenomenon (Bazeley, 2012; Fetters & Molina-Azorin, 2017).

Participants

Participants were identified by psychiatry teams in the EDs and two members of the research team (GC and DL) according to standardized inclusion and exclusion criteria developed by the research team. Eligible participants were adults aged over 18 years who presented consecutively to the EDs of one of three urban hospitals in the Republic of Ireland and who met one of the following criteria: (i) extensive medical treatment (including treatment in specialized units including intensive care unit, surgery under general anesthesia, antidotes for drug overdoses, telemetry, or repeated tests); (ii) self-harm involving methods with high risk of fatality (including attempted hanging, self-strangulation, self-asphyxiation, attempted drowning, jumping from a height or in front of a moving vehicle, crashing a motor vehicle, or gunshot) if witnessed or any other physical evidence of use of high lethality method; (iii) clinical impression of high suicide intent (Beautrais, 2004; Douglas et al., 2004; Levi-Belz & Beautrais 2016; Marzano, Fazel, Rivlin, & Hawton, 2010). Participants were not included if they were not capable of giving informed consent.

Procedure

Participants were approached via telephone or in the hospital approximately 7–10 days following their self-harm presentation. Following receipt of a study information leaflet and letter, patients were invited to take part in a baseline interview, during which questionnaires were administered. Those who participated at baseline and consented to be contacted again were invited to take part in a follow-up semi-structured interview approximately 6 months after the self-harm presentation. The following topics relating to the patients' engagement with healthcare services were addressed during the follow-up interviews: description of contact with primary care or mental health services, admission to psychiatric unit, challenges in attending appointments with healthcare services, benefits experienced from engagement with healthcare services, adherence to psychotropic medication, difficulties accessing healthcare services, engagement with support group(s) and the role that healthcare services played following the self-harm presentation. Other topics were addressed during the interviews including: changes in life circumstances, repetition of self-harm and drug and alcohol use. Questionnaires were

administered at the end of the follow-up interview. Follow-up interviews were conducted in person by GC and DL at a location convenient to each participant and typically lasted 52 min (ranging from 15 to 94 min). One interview was conducted by telephone. Thirty-two of the 35 follow-up interviews were audio-recorded and transcribed verbatim. The remaining three interviews were not audio-recorded at the participants' request ($n = 1$), because it was not possible due to the interview location ($n = 1$) or because the interview was by telephone ($n = 1$).

Data Items

The following variables were assessed: demographic information (age, sex, relationship and employment status), General Medical Services (GMS) status (eligibility for free healthcare based on household income), circumstances of self-harm (method and alcohol involvement), psychiatric history (history of self-harm and previous engagement with public mental health services).

Suicidal intent of the index self-harm presentation was measured using the Beck Suicide Intent Scale, a widely used scale with high internal consistency (0.95) (Beck, Kovacs, & Weissman, 1979). Social support was measured at baseline using the ten-item version of the Duke Social Support Inventory (Wardian, Robbins, Wolfersteig, Johnson, & Dustman, 2013). Psychological distress was measured at baseline using the 21-item version of the Depression Anxiety and Stress Scales (DASS-21) (Lovibond & Lovibond 1995). The Symptom Checklist-Core Depression (SCL-CD6) scale was used to assess depressive symptoms (Bech, Bille, Møller, Hellström, & Østergaard, 2014; Magnusson Hanson et al., 2014).

Self-efficacy was measured using the 10-item General Self-Efficacy Scale (Scholz, Doña, Sud, & Schwarzer, 2002) at baseline and follow-up. Hopelessness was also measured at baseline and follow-up using a four-item version of the Beck Hopelessness Scale (Aish & Wasserman, 2001; Beck, Weissman, Lester, & Trexler, 1974). Aish and Wasserman (2001) further proposed that one single item, "the future looks dark to me," would be sufficient to assess hopelessness so this item was examined individually also.

Ethical Issues

This study received ethical approval from the Clinical Research Ethics Committee of the Cork University Teaching Hospitals and the HSE Mid-Western Regional Hospital Research Ethics Committee. A procedure was in place to contact the participants treating team or facilitate alternative options for referral to treatment when a participant requested further support or when acute distress or risk of suicidal behavior was identified.

Analysis

Qualitative analysis was conducted first, followed by secondary quantitative analyses.

Qualitative

Transcribed interviews were imported into NVivo version 11 for analysis. Thematic analysis was performed in accordance with the study design and led by GC. Using an inductive data-driven approach, all transcripts were read and re-read by GC and all data relating to patient contact with healthcare services following their self-harm presentation were coded (Braun & Clarke, 2006; Braun, Clarke, Hayfield, & Terry, 2019). DL independently coded 12 interview transcripts following the same approach as GC. FS reviewed three transcripts coded by GC and three by DL and confirmed consistent coding practices. Emerging themes were reviewed and refined collaboratively by GC, DL, EA, and FS. To ensure the interpretation was grounded in the data, constant comparison between emerging themes and the transcripts was used throughout the analytic process. Quotations were selected from a range of participants to illustrate the core and sub-themes. Ellipses are used to represent words missing from quotations.

Quantitative

Quantitative data from baseline and follow-up interviews were entered into SPSS version 25 (SPSS, Chicago, IL). Core themes from the qualitative analyses relating to patient satisfaction with care that were reflected on by the majority of the sample were transformed into binary quantitative variables and entered into SPSS. Only those participants whose transcripts were coded under these themes were included in the quantitative analysis. Demographic information, circumstances of index self-harm episode, psychiatric history, social support and psychological state variables were examined according to these themes by tabulating frequencies and percentages for categorical variables and calculating means and standard deviations for continuous variables. Bivariate relationships were further examined using chi-squared tests and independent samples t-tests for categorical and continuous variables, respectively. Considering the small sample size used in these analyses, a threshold for significance is not being used to determine or interpret statistical significance. Instead the descriptive and inferential statistics are interpreted as observations to augment the qualitative results rather than as robust statistical findings.

RESULTS

Table 1 presents patient characteristics at baseline and the care received following the index HRSH episode. The mean age of participants at the time of the index HRSH episode was 42 (SD 12; range 18–68 years) and 56% were female. The most common self-harm method was intentional drug overdose (80%) and 46% of participants had consumed alcohol at the time of the self-harm episode. More than half of the participants reported a previous history of self-harm (59%) and the majority had engaged with the public mental health services in the 12 months prior to the HRSH episode (59%). Following the HRSH episode, 38% of participants were admitted to a psychiatric inpatient unit. Most participants reported at least one outpatient appointment with the public mental health services (86%), the majority of whom met with a psychiatrist (96%). During the follow-up period, 65% of participants attended their GP for mental health reasons.

TABLE 1. Patient characteristics at baseline and care received following the index high risk self-harm (HRSH) episode.

Variable	*N* (%) (*n* = 32)
Patient characteristics at baseline	
Female	18 (56)
Living arrangements	
Shared	25 (78)
Alone	07 (22)
Married/cohabiting/long-term relationship	18 (56)
Employed	18 (56)
Medical card holder	16 (50)
History of previous self-harm	19 (59)
Engagement with mental health services in previous 12 months	19 (59)
Follow-up care received	
Public mental health services	28 (88)
Psychiatric admission	12 (38)
Outpatient services	27 (87)
Psychiatrist	26 (84)
Mental health nurse	10 (32)
Counselor/psychotherapist	05 (16)
Addiction services	05 (16)
General practitioner (for mental health concerns)	20 (65)
Private psychiatrist or counselor/psychotherapist	12 (35)
Prescribed psychotropic medication	24 (75)

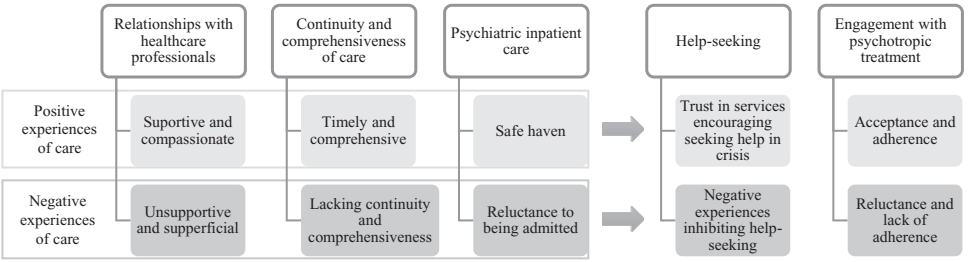


FIGURE 1. Core and sub-themes relating to patient experiences of engagement with the healthcare services and their relationship to help-seeking and engagement with psychotropic treatment.

Qualitative

Three core themes were identified that relate to participants' experiences of care following the HRSH episode: "*Relationships with healthcare professionals*," "*Continuity and comprehensiveness of care*," and "*Psychiatric inpatient care*". Two additional core themes were identified reflecting how participants' experiences of care influenced their "*Help-seeking*" behaviour and "*Engagement with psychotropic treatment*." A final core theme, "*Connecting with other patients and peer support*," was identified relating to engagement with other service users. Core and sub-themes relating to patient experiences of care and their relationship to help-seeking and psychotropic treatment are presented in Figure 1.

Core Theme 1: Relationships with Healthcare Professionals (HCPs)

Supportive and Compassionate Relationships—Someone to Talk to. Most participants described feeling supported and cared for by many of the healthcare professionals (HCPs) they engaged with, particularly with regard to being given the opportunity to talk to someone. Some participants did not have anyone in their lives they could disclose their emotional

problems to while others felt they could not open up to their family or friends because they did not want to worry or burden them with thoughts or feelings they may not understand. One participant described the importance of having a "*specific safe place… to talk about what's bothering* [her]" because her thoughts would not be "*for every audience*" (P12). There was also a reassurance felt by participants when they had a person or service that they could reach out to if they felt they needed support. Another participant described feeling comforted "*just knowing that they're there, and knowing that I could ring them at any time*." (P25).

It was important for a positive relationship to develop in order to facilitate an open supportive interaction. A key element to the development of supportive relationships was for the HCP to engage with their patient in an understanding and empathetic way.

> I know these doctors, nurses or consultants … are doing their job but it's the way they do it makes a difference … and for me I realize that … they want me to get well … because I feel the sincerity there, they're not just doing their job (P4)

> She just understood… me, and it was like … she supported me, which was a huge thing (P30)

Participants most commonly described ongoing supportive relationships with psychiatric nurses and counselors in outpatient secondary mental healthcare services and general practitioners (GPs) in the primary care setting.

Unsupportive and Superficial Relationships. Lack of "*empathy*" or "*warmth*" in the way HCPs interacted with the participants was as an issue for many. This often resulted in participants feeling unsupported by these relationships. Participants who described feeling unsupported in interactions with HCPs were most commonly referring to appointments with a psychiatrist. Some participants felt their appointments with psychiatrists were "*empty*," involving routine questions that were not relevant to how the participant was presenting. For many participants, this made the appointments feel overly repetitive, somewhat pointless and unhelpful.

> I never really liked going to the psychiatrist anyway because it's five minutes … maybe it's just me, but I feel like they're just covering their back to make sure that you don't do anything stupid and they're blamed. Like that's the impression I get. Like I never feel any kind of warmth there. (P16)

While most participants described feeling supported by their GPs, some participants described their GPs to be lacking in empathy, not taking mental health issues seriously or expressing judgment regarding their self-harm act. One participant felt that her GP was "*harsh and… not very understanding*" and expressed that "*when you're feeling really vulnerable, a little bit of empathy would go a long way*" (P11).

Core Theme 2: Continuity and Comprehensiveness of Care

Timely and Comprehensive Care. Timely and Regular Follow-up. For some participants, follow-up appointments with the outpatient services were organized quickly post-discharge and they had regular appointments from then on, with many participants reporting having "*weekly*" or "*bi-weekly*" appointments. For those who had routinely scheduled appointments, the majority had a clear understanding of the plan for their aftercare.

Complementary Care. While almost all the participants had at least one follow-up appointment with a psychiatrist, most participants who reported regular engagement with the outpatient mental health services were engaging with at least one other HCP within the service in addition to the psychiatrist. One participant described seeing the "*the nurse every two weeks… and the* [psychiatrist] *every three months*" (P20). Generally, participants who were given the opportunity to engage with other HCPs in addition to a psychiatrist were more satisfied with the care received compared to those who met with a psychiatrist only. Those engaging in sessions with a nurse or counselor had the opportunity to talk at length and were less likely to expect this opportunity with the psychiatrist, as described by one participant who reflected that "*by the time* [she] *got to the psychiatrist,* [she] *had talked with the other nurse*" (P23).

Therapeutic Benefits. Most participants reported getting therapeutic benefit from their sessions with mental health nurses or counselors. For some, they felt they were making progress from these sessions in which they gained insight and developed skills for managing their difficulties. In addition to one-on-one sessions, participants described benefiting from engaging in group therapy courses on topics such as stress management, mindfulness, and self-compassion.

> I've been learning a lot about mindfulness and coping strategies … so I've got a hell of a lot more skills than I did a year ago. (P11)

Care Lacking in Continuity and Intensity. Inconsistent Personnel. Most participants were frustrated by meeting a different HCP at each outpatient appointment. This resulted in the participant needing to repeatedly explain their circumstances. At times, the change in HCP and lack of clear communication between professionals led to confusion in terms of prescribing and diagnoses.

> I see a different person every time, which is annoying because then you have to go through everything all over again. And, even last time, I have been off my medication ages … she was like, 'I'll write your prescription now, 80mg … ' I was like, 'I'm off tablets,' and she there writing me a prescription. I said, 'I'm off tablets'. (P26)

Insufficient Level of Care. Dissatisfaction with the level of care received in the months following the self-harm act was reported by many participants with some receiving little or no aftercare with mental health services. Some participants who had follow-up appointments with a psychiatrist only felt the level of care received was unsatisfactory. This was most commonly due to an over-emphasis on psychotropic medication with limited additional support, as well as the brevity and repetitiveness of appointments.

> And all they were interested in was putting up my tablets … and I just said to them … leave my tablets alone. (P18)

> I don't like going to [outpatient service] because I just feel they push drugs … there was one guy there … and I just felt if you went in with an in-growing toenail he'd give you tablets. (P34)

Some participants felt that, as a result of insufficient or unsatisfactory care received from the mental health services, they were overly dependent on their GP and at times felt like a burden.

Lengthy Waiting Lists. A significant problem expressed by many was the waiting time for follow-up care which participants felt needed to be "*drastically reduced*." Some participants were still waiting to be linked in with aftercare at the time of the follow-up interview. Waiting lists were particularly lengthy for specialist care including addiction services, cognitive behavioral therapy, and dialectical behavioral therapy.

> Six weeks is a long time to wait for a phone call to get a review. Then it could take another three weeks, so, in effect, it can take anything up to ten, maybe 12 weeks before you actually sit down and talk about your mental health state … Look, if somebody wanted to end their life, I would prioritize that as being urgent when they're being discharged. (P35)

Post-Discharge Isolation. Lack of continuity of care following discharge from a psychiatric unit or hospital was an issue raised by participants, with psychiatric admission being described by one participant as "*first aid*" to "*get you barely coping*" (P22). This lack of adequate follow-up post-discharge was described as an obstacle to participants working their "*way out of crisis*" and led to post-discharge isolation among some participants.

Core Theme 3: Psychiatric Inpatient Care

Inpatient Setting as a "safe haven". Most participants who had been admitted as inpatients felt that it was the most appropriate intervention following their self-harm episode. For some this was because it protected them from their own behavior. One participant reflected that the inpatient experience "*stopped me in my tracks from doing it again*" (P14). Some of those who were admitted to psychiatric facilities felt their inpatient stay was a "*safe haven*," giving them the break they needed to allow them to reflect on their situation and how to move forward. Among those who felt that the psychiatric inpatient setting was a "*safe*" place, most felt supported by HCPs.

> While it's my least favorite place in the world to ever be … [psychiatric ward] was very well-staffed and was very well run, very patient orientated and a safe haven when I needed it, and it's very difficult when the safe haven that you need is from yourself. (P12)

Reluctance to Being Admitted due to Negative Experiences or Expectations. Reluctance to being admitted to a psychiatric unit following their self-harm episode was felt by many participants with some refusing admission when it was recommended. For some participants, limited prior experience of psychiatric inpatient facilities resulted in apprehension and fear related to an assumption that their experience would be negative. For other participants, previous inpatient experiences in psychiatric facilities had led them to conclude that an admission would not be of any benefit. Absence of therapeutic support or meaningful interactions with HCPs was described by a number of participants as the main failing of their inpatient experience.

> I said, 'No way, I'm not going in like', to do what? To walk round the ward or … every day to do nothing, there's no-one to go and help there, there's no nothing like. There's no counselor available there … or someone to go in have a chat with, there is none of that. (P18)

Core Theme 4: Help-Seeking

Trust in Services Encouraging Seeking Help in Crisis. Most participants felt that they could reach out to the services in times of need and numerous participants had sought

help in times of crisis since their HRSH act. An increased awareness of the availability of crisis services did not facilitate help-seeking alone. It was essential that the participant had trust in the services.

> Because the support I had from the members of the crisis team, they have made it extremely clear and I had promised them that if I did feel, you know, that I'm getting down or I did feel I would do something … then I promised I would call somebody. Which I did the same day. (P4)

While some participants felt comfortable reaching out to a team or service, sometimes it was one specific individual they had developed a relationship with that they felt they could go to in times of crisis, most commonly a mental health nurse or GP. Many of the participants described their GPs as an essential source of support in times of crisis, playing an instrumental role in de-escalating serious suicidal thoughts or plans.

> I know if I didn't reach out, that I would have done something … I went straight to the doctor at 9am because the thoughts were really bad …, so I knew it was either a matter I was going to do something or I had to get to the doctor. (P16)

Negative Experiences with Services Inhibiting Help-Seeking. Following negative or unhelpful interactions with HCPs some participants described being put off reaching out for help in times of crisis and were also reluctant to continue engaging in scheduled appointments. For some participants, a negative experience with a HCP made them reluctant to reach out to that particular professional again but they were still open to engaging with another professional. Some participants changed to a different GP practice due to being unhappy with their previous GP and were pleased to feel more supported in the new practice.

For others, the impact of the negative experience had a more widespread impact. One participant reported a desire to engage with a counseling service but was hesitant due to a negative experience with a psychologist during childhood. For another participant, consistent negative interactions with psychiatrists over many years which he felt "*made him feel worse than better*" led him to conclude that "*I don't know whether I'll go to another psychiatrist. I just don't know, can I go through it again*" (P16).

Core Theme 5: Engagement with Psychotropic Treatment

Acceptance of, and Adherence to, Psychotropic Treatment. Most participants who were prescribed psychotropic medication reported adhering to their prescription at the time of the follow-up interview. Clear communication of the purpose of the medication and clarification that immediate effects should not be expected aided adherence. Adherence often went hand-in-hand with the process of accepting the need for medication, with participants becoming more adherent as they came to realize that they needed the support of the medication.

> I take them as I should do. That took a while … I suppose it was just in time that I started to realize, if I take them every day like I should … I'd get better faster, basically. (P33)

This acceptance of the need for psychotropic medication was not always immediate. Some participants described being supported by HCPs during a process to find the right

combination and dose of medication that provided the desired benefits with manageable side effects. For example, one participant was finding it challenging to overcome an undesirable side effect but with the support of her mental health nurse, she agreed to "*stay with it for another while*."

Reluctance and Lack of Adherence to Psychotropic Treatment. An aversion to taking psychotropic medication was frequently reported by participants. While some were hesitant but accepted the prescription and took the medication, others were unwilling to be medicated. Preconceived ideas about psychotropic medication led to this reluctance among some participants who had minimal prior knowledge. For example, one participant would not take antidepressants because of a belief that they "*make people commit suicide*" while other participants believed that they should be avoided as they are "*addictive*" or a "*crutch*." Some participants left their appointments with little understanding of what they had been prescribed or what the purpose was which also resulted in dismissal of their necessity in some cases. Others simply felt they did not need medication leading them to not fill their prescription initially or to stop taking them after a period of adherence.

For some participants, a desire to reduce, change or avoid medication was due to negative side-effects that were making it difficult to experience benefit from it. Side effects reported by participants included feelings of tiredness or grogginess, feelings of emptiness, poor concentration, and weight gain.

> I know medication is only to help but the way I feel for the last couple of months … I actually feel dead inside, I'm exhausted, tired constantly like, I just don't want to function. (P18)

Core Theme 6: Connecting with Other Patients and Peer Support

Many participants described benefiting from making meaningful connections with other service users. While admitted, participants described a comradery that developed with their fellow patients, benefiting from spending time together doing activities and providing support for one-another, helping reduce feelings of isolation. Some participants who attended group sessions in an outpatient or voluntary setting also described developing significant friendships with other service users, with one participant reflecting that "[they] *kind of became a family*" (P33). Across all treatment settings, participants described benefiting from group sessions because of the learning and insight that was gained form others.

> The group session was, wow … I was just me being honest, and they were honest … We've learned from each other, which was great. (P35)

Not all participants who attended group sessions experienced these benefits. For some, opening up in front of others is not easy but was facilitated by ensuring the group was appropriate for the patient's needs. For example, one younger participant was unhappy in a group of general adults and thrived when changed to a group of adolescents and young adults.

> The fact that we can all become friends, and we already know each other inside out from talking at the group. (P26)

Quantitative

Demographic, psychiatric and psychological characteristics of participants at baseline according to "*relationships with healthcare professionals*" and "*continuity and comprehensiveness of care*" are presented in Table 2. Follow-up participant characteristics according to these core themes are presented in Table 3.

Relationships with Healthcare Professionals

Younger participants and those with a GMS card were more likely to report experiencing "*superficial and unsupportive*" relationships with healthcare professionals. Those who reported a history of self-harm and those reporting engagement with mental health services prior to their index HRSH episode were more likely to have felt unsupported in their relationships with HCPs. Participants who described mostly unsupportive relationships with healthcare professionals had higher levels of depressive symptoms. These participants also tended to have greater levels of hopelessness and psychological distress at baseline.

Of the participants who experienced predominantly "*supportive and compassionate*" relationships with HCPs, none had repeated self-harm between the index HRSH episode and the follow-up interview. All three of those who did report a repeated self-harm episode during the follow-up period described mostly "*superficial or unsupportive*" relationships during this period (Table 3). None of the participants who self-harmed during the follow-up period presented to hospital as a result of their repeated self-harm act. Participants who felt their interactions with HCPs were unsupportive had higher levels of hopelessness at the time of the follow-up interview, with a markedly higher likelihood of reporting that their future seemed dark to them compared to those who felt supported by HCPs (94% *vs.* 6%, respectively). General self-efficacy at the time of the follow-up interview was lower among those who perceived their relationships with HCPs to be unsupportive.

Continuity and Comprehensiveness of Care

Participants who were employed were more likely to perceive their follow-up care to be "*lacking continuity and comprehensiveness*" compared to those who were not in employment at the time of the index act. An unsatisfactory level of care was more frequently described by participants who reported a history of self-harm and those who had engaged with mental health services prior to their index HRSH episode.

There were no notable differences in participant characteristics at follow-up between those experiencing care "*lacking continuity and comprehensiveness*" and those who experienced "*timely and comprehensive care*."

DISCUSSION

This study provides insights into individuals' experiences of care following an episode of self-harm of high lethality or high suicidal intent. HRSH presentations are arguably the most serious episodes of self-harm presenting to the ED (Bergen et al., 2012a; Douglas et al., 2004; Harriss & Hawton, 2005; Runeson et al., 2010) and their

TABLE 2. Participant characteristics at baseline according to core themes from thematic analysis.

	Relationships with healthcare professionals			Continuity and comprehensiveness of care		
	Supportive and compassionate ($n = 18$)	Unsupportive and superficial ($n = 13$)	p	Timely and comprehensive ($n = 17$)	Lacking continuity and comprehensiveness ($n = 12$)	p
Demographic characteristics						
Age, mean [SD]	46.3 [10.9]	37.1 [10.5]	.025	46.2 [12.9]	39.6 [9.7]	.144
Female	9 (50%)	8 (62%)	.524	10 (59%)	7 (58%)	.979
Living alone	4 (22%)	2 (15%)	.634	4 (24%)	1 (8%)	.286
Married/cohabiting	11 (61%)	7 (54%)	.686	10 (59%)	7 (58%)	.979
Employed	9 (50%)	9 (69%)	.284	7 (41%)	10 (83%)	.023
General Medical services card holder	6 (33%)	9 (69%)	.048	9 (53%)	4 (33%)	.296
Circumstances of self-harm						
Self-harm method intentional drug overdose	15 (83%)	10 (77%)	.656	15 (88%)	9 (75%)	.353
Alcohol consumed	6 (35%)	7 (54%)	.310	6 (38%)	6 (50%)	.508
Suicidal intent, mean [SD]	19.2 [4.4]	18.0 [5.0]	.496	18.4 [5.4]	19.1 [3.8]	.714
Psychiatric history						
History of previous self-harm	8 (44%)	11 (85%)	.023	7 (41%)	9 (75%)	.071
Engagement with mental health services in previous 12 months	7 (39%)	11 (85%)	.011	6 (35%)	10 (83%)	.010
Recent misuse of alcohol	3 (17%)	2 (15%)	.924	3 (18%)	3 (25%)	.630
Depressive symptoms, mean [SD]	24.2 [4.4]	26.8 [3.0]	.083	24.7 [4.4]	25.4 [3.5]	.618
Psychological distress, mean [SD]	43.0 [24.1]	56.0 [34.4]	.226	52.5 [29.1]	45.8 [29.3]	.551
General Self-Efficacy, mean [SD]	25.8 [5.1]	23.1 [7.7]	.303	24.7 [5.7]	24.3 [7.1]	.893
Social support, mean [SD]	20.3 [3.1]	20.3 [3.8]	.973	19.8 [3.1]	20.9 [4.1]	.477
Hopelessness, mean [SD]	0.6 [1.1]	1.4 [1.1]	.123	0.8 [1.2]	0.9 [1.0]	.805

TABLE 3. Participant characteristics at follow-up according to core themes from thematic analysis.

	Relationships with healthcare professionals			Continuity and comprehensiveness of care		
	Supportive and compassionate ($n = 18$)	Unsupportive and superficial ($n = 13$)	p	Timely and comprehensive ($n = 17$)	Lacking continuity and comprehensiveness ($n = 12$)	p
Repetition of self-harm since HRSH	0	3 (23%)	.037	1 (6%)	1 (9%)	.747
Increase in misuse of alcohol since HRSH	1 (6%)	3 (23%)	.151	2 (12%)	2 (17%)	.706
General self-efficacy, mean [SD]	28.3 [4.8]	23.2 [7.3]	.038	27.1 [4.5]	26.5 [7.6]	.823
Hopelessness, mean [SD]	0.2 [0.4]	1.8 [1.7]	.008	0.3 [0.8]	1.0 [1.5]	.203

perceptions of aftercare have not been examined previously. Satisfaction with follow-up care varied considerably across the sample, dependent largely on participants' perception of the quality of their relationships with HCPs, and the continuity and comprehensiveness of care received. Timely and comprehensive care, involving supportive and compassionate relationships with HCPS, was considered essential following a HRSH episode by most participants.

A substantial proportion of participants experienced an absence of elements of care leaving many feeling isolated and unsupported. Frustration or demoralization was frequently expressed about excessive waiting time, insufficient follow-up including lack of referrals to specialist care, over-reliance on psychotropic treatment and inconsistencies in personnel. This is concerning given that lack of timely and comprehensive care following self-harm or psychiatric hospital discharge is associated with increased risk of suicide (Appleby, Dennehy, Thomas, Faragher, & Lewis, 1999; Burgess, Pirkis, Morton, & Croke, 2000; Desai, Dausey, & Rosenheck, 2005; Meehan et al., 2006). When participants were linked in with follow-up care, they frequently perceived relationships with HCPs to be superficial and lacking in empathy. Limited previous research has examined HCP-patient relationships in relation to patient outcomes but one study found that poor HCP-patient relationships was a factor associated with preventable suicides (Burgess et al., 2000). The quantitative findings of this study showed that poor experiences of care may indeed contribute to ongoing distress and further suicidal behavior. Participants who felt let down by the services, reporting predominantly unsupportive relationships with HCPs, were more likely to have repeated self-harm since the index HRSH act and had higher levels of hopelessness at follow-up.

Help-seeking is encouraged among those who are vulnerable to suicide as it creates an opportunity for intervention (Cleary, 2017; Hamdi, Price, Qassem, Amin, & Jones, 2008). Consistent with previous research, in this study, patients' prior experiences of the services had a powerful impact on shaping future help-seeking intentions and behaviors (Hunter et al., 2013; Taylor et al., 2009). Participants recounted occasions since their HRSH episode when reaching out to a trusted HCP or service de-escalated serious suicidal plans or intentions. The establishment of trust in the services was a key factor in encouraging individuals to seek help in times of crisis. When individuals felt unsupported or let down by a HCP or service, barriers to future help-seeking developed and participants felt discouraged from continuing to engage with routine care.

Disengagement with services, particularly among males, has been found to frequently occur prior to suicide (O'Neill, Corry, McFeeters, Murphy, & Bunting, 2016; Pompili et al., 2009). In this study, lack of continuous and supportive care also negatively impacted adherence to psychotropic treatment. Non-adherence to medication, including discontinuation, occurred more frequently when participants did not have a clear understanding of the purpose of the medication, the potential side-effects and when to expect to experience beneficial effects. Continued monitoring and provision of ongoing support in managing side-effects helped participants to accept their psychotropic treatment plan.

Positive experiences of care were also reported by a considerable number of participants in this study with many describing genuine interactions with HCPs who really cared. Psychiatric admission was considered a "safe haven" by many individuals because it was perceived as a safe space to reflect and process their current difficulties and it provided protection from their own behaviors. These findings are consistent with a review considering patients' experiences of safety during psychiatric inpatient care that found patients' safety is comprised both psychological and physical safety (Berg, Rørtveit, & Aase, 2017). However, not all participants felt their inpatient stay was beneficial with some reporting a dearth of therapeutic support. Berg et al., (2017) further highlighted the necessity of incorporating therapeutic needs of patients into a definition of patient safety. Irrespective of whether or not participants perceived their inpatient stay to be a positive intervention, feelings of isolation post-discharge were common. A recent qualitative study also reported similar accounts of isolation post-discharge and found that urges to self-harm were more likely among participants who had felt abandoned on discharge from hospital and perceived follow-up care to be insufficient (Owen-Smith et al., 2014). These findings have important clinical implications due to the high suicide risk in the period immediately following hospital discharge (Chung et al., 2019) and the protective role played by enhanced follow-up care during this period (Appleby, Shaw, et al., 1999; Bickley et al., 2013).

Individuals who received comprehensive care, including sessions with a mental health nurse or counselor in addition to a psychiatrist, that was both regular and initiated shortly after their hospital presentation were largely satisfied with their engagement with the services. While participants who were followed up solely with a psychiatrist were often frustrated at the brevity of the appointments, more comprehensive follow-up care gave participants the opportunity to talk on a regular basis with a trusted HCP or service. This was powerful for many participants in helping them make progress following the self-harm episode, particularly among those who had not had this opportunity before. In a previous study with high lethality self-harm patients (Douglas et al., 2004), the majority of participants' felt that having someone to talk would have prevented their self-harm episode. In addition to mental health nurses and counselors, many individuals in this study described their GP as a trusted person who gave them the opportunity to talk. GPs played a vital role for many in terms of providing supportive aftercare, frequently being the HCP individuals turned to in times of suicidal crisis. Some participants had negative experiences with GPs, whom they felt were judgmental and did not take mental health concerns seriously. The significant contribution that primary care plays in care of self-harm patients (Fox, Stallard, & Cooney, 2015; Mughal et al., 2019),

as well as previously documented increases in GP attendances prior to suicide (Pearson et al., 2009) and a lack of suicide risk assessment training in primary care (Saini, While, Chantler, Windfuhr, & Kapur, 2014), highlights the need for ongoing education for GPs in mental healthcare and suicide prevention.

Divergent experiences of care may be a reflection of the actual care received or due to differences in needs and expectations between individuals (Hunter et al., 2013; Kapur et al., 2006; Rayner, Blackburn, Edward, Stephenson, & Ousey, 2019; Saunders et al., 2012). In this study, participants with a previous history of self-harm and those reporting recent engagement with mental health services prior to their index episode were more likely to have felt unsupported in their relationships with HCPs and to report an unsatisfactory level of care. This may be due to different expectations among those with prior experience of engaging with the services compared to those with few preconceptions (Hunter et al., 2013; Kapur et al., 2006). For example, having been through the process previously may result in greater frustration with issues within the services (Lindgren et al., 2018). However, it is also possible that those with a history of repeated self-harm and service engagement may have been treated differently by HCPs. A prior review found that HCPs commonly expressed negative attitudes toward those with a history of repetition and those the multiple previous admissions (Rayner et al., 2019; Saunders et al., 2012). Patients reporting negative or unsupportive relationships with HCPs had higher levels of depression at baseline compared to those reporting supportive relationships. This may indicate more severe or enduring mental health conditions making these participants more pessimistic about their interactions with HCPs. The participants who had unsupportive relationships also had lower levels of self-efficacy at the follow-up interview indicating that they may have been less likely to take responsibility for their recovery and as such have higher demands of support from HCPs. It is also possible that it was more difficult for HCPs to establish a supportive relationship with these participants due to the severity of their conditions. Beliefs of HCPs about the suicidal behavior as an inevitable or untreatable feature of certain psychological conditions can also create a barrier to meaningful interactions (Awenat et al., 2017).

Strength and Limitations

The use of a mixed methods design allowed for in-depth investigation of patient experiences in which they could raise concerns that were of importance to them while also enabling the investigation of variations in satisfaction with healthcare service contact. Thirty-two individual qualitative interviews are a large sample to draw definitive conclusions. However, limited numbers for the quantitative component leaves it difficult to draw definitive conclusions from the quantitative section of the results. The representativeness of the sample of all HRSH patients is unclear due to a low response rate for the baseline interview, however, we have no reason to believe that the group is unrepresentative because the sample was nonselective with all consecutive patients presenting following HRSH approached according to a standardized procedure. The inclusion of participants with experience of three different hospitals adds further weight to conclusions drawn from this study. To minimize the potential for researcher bias, researchers conducting interviews had regular supervision sessions with a senior member of the

research team, transcripts were reviewed and coded by multiple researchers and analyses were conducted in a reflexive manner with constant comparison with the data.

CONCLUSIONS

The findings of this study, in addition to previous studies including the overall self-harm population (Hunter et al., 2013; Shand et al., 2018; Taylor et al., 2009) and non-suicidal self-harm injury (Lindgren et al., 2018), highlight the importance of establishing positive, empathic HCP-patient relationships following a self-harm presentation of any lethality or intent. The study findings indicate that satisfaction with services, help-seeking, and adherence to treatment following a HRSH presentation may be improved by ensuring the consistent provision of timely, comprehensive and supportive aftercare following a HRSH presentation. Furthermore, the absence of these aspects of care may contribute to ongoing distress and further suicidal behavior. Our findings indicate that patients with a history of self-harm and engagement with the mental health services have poorer perceptions of care. Attitudes to individuals presenting with self-harm vary among HCPs (Rayner et al., 2019; Saunders et al., 2012; Taylor et al., 2009). Ongoing training with clinicians may be beneficial to improve HCP-patient relationships and improve the quality of patient care (Rayner et al., 2019; Saunders et al., 2012).

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