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Self-cutting and prospective repetition of self-harm:

Studies of emergency department presentations in Ireland

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Submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Health Services Research

National University of Ireland, Cork.

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July 2013

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Declaration

This thesis is my own work and has not been submitted for another degree, either at University College Cork or elsewhere.

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Celine Larkin

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I am fortunate and privileged to have had great encouragement and many shining examples of patience, diligence, and creativity from those I love, and glad to have made so many new friends along the way.

"In friendship or in love,

the two side by side raise hands together

to find what one cannot reach alone"

Kahlil Gibran

Abstract

Background

Self-harm places an individual at increased risk of future self-harm and suicide, and indicates distress and maladaptive coping. Those who present to hospital with self-cutting form a significant minority of self-harm patients who are at increased risk of prospective repetition of self-harm and suicide compared with those presenting with intentional overdose. In addition to increased risk, there is emerging evidence of demographic, psychological, clinical, and social differences between those presenting with self-cutting and those presenting with overdose.

Aim and Key Objectives

The aim of the current doctoral work was to examine in detail the association between presenting with self-cutting and risk of prospective repetition. The objectives were: to identify evidence-based risk factors for repetition of self-harm among those presenting to emergency departments with self-harm; to compare demographic and presentation characteristics and prospective repetition across presentations of self-cutting only, self-cutting plus intentional overdose, and intentional overdose only; to compare prospective repetition and other characteristics within self-cutting presentations based on the type of treatment received; to compare self-cutting and intentional overdose patients on psychological risk and protective factors for repetition; and to examine the lived experience of engaging in repeated overdose and self-cutting.

Methods

The current doctoral work used a mixed-methods approach and is comprised of one systematic review and four empirical studies. The empirical studies were two registry-based prospective studies of Irish hospital presentations of self-harm, one

prospective structured interview study, and one qualitative study using Interpretative Phenomenological Analysis.

Results

The systematic review identified several consistent and emerging risk factors for repetition of self-harm, compared to which self-cutting had a medium-sized effect. The registry studies demonstrated that the involvement of self-cutting, particularly less medically severe self-cutting, confers an increased risk of 1-month and 12-month repetition among Irish index self-harm presentations. The structured psychological study detected higher hopelessness and lower non-reactivity to inner experience among those presenting with self-cutting, and higher depression among those who repeated self-harm. Repeaters had lower baseline levels of protective psychological factors than non-repeaters and continued to have higher depression and hopelessness at follow-up. Finally, the qualitative study indicated that self-harm is a purposeful action taken in response to an overwhelming situation and is evaluated afterwards in terms of personal and social effects. Chosen method of self-harm seemed to be influenced by the desired outcome of the self-harm act, capability, accessibility and previous experience.

Conclusion

Despite limitations in terms of recruitment rates, the work presented in this thesis is innovative in examining the issue of the association between self-cutting and repetition from multiple perspectives. No one factor can reliably predict all repetition but self-cutting represents one consistent and easily detected risk factor for repetition. Those who present with self-cutting exhibit significant differences on demographic, clinical, and psychological variables compared with those presenting with intentional overdose, and seem to exhibit a more vulnerable profile. However, those who present with self-cutting do not form a discrete or homogenous group, and self-harm methods and levels of suicidal intent are liable to fluctuate over time.

What is already known on this topic

- Those who present to hospital with self-cutting are at increased risk of prospective repetition of self-harm and suicide compared with those presenting with intentional overdose.

-There are some differences between self-cutting patients and other self-harm patients in demographic and presentation characteristics.

What this thesis adds

-No one factor can reliably predict all repetition but self-cutting represents a consistent and easily detected risk factor for repetition

-Those who present with self-cutting in Ireland have an elevated risk of prospective repetition compared with those presenting with intentional overdose

- More superficial self-cutting is associated with increased risk of repetition, while more severe self-cutting is associated with male gender

-Those who present with self-cutting exhibit significant differences on demographic, clinical, and psychological variables compared with those presenting with intentional overdose

-Choice of method of self-harm may be influenced by accessibility, capability, previous experience, and intended outcome, and may have a dose-response relationship with vulnerability

-Those who present with self-cutting are not a discrete or homogenous group, and self-harm methods and levels of suicidal intent are liable to fluctuate over time

“Le Moi-peau est donc le modèle d’un lien dialectique entre le psychisme et le corps: lien mutuel où la psyche s’appuie sur le corps autant que le corps s’appuie sur la psyché”

“The Skin Ego represents a dialectical relationship between the psyche and the body: a mutual bond whereby the psyche relies on the body as the body relies on the psyche”

Anzieu Didier, 1974

Preface

The current thesis focuses on examining the association between presenting with self-cutting as a method of self-harm and risk of prospective repetition of self-harm. The thesis begins with an introduction to the state-of-the-art in self-harm research, covering aspects of terminology, epidemiology, and aetiology of self-harm. The subsequent chapter focuses on literature specific to current research question, namely examining the evidence around differences between those presenting with self-cutting and those presenting with other forms of self-harm, with a particular focus on self-harm repetition. This leads into the five studies of the thesis. These studies involve a variety of methodologies to examine the association between self-cutting and repetition and are comprised of the following:

- A systematic review of risk factors for repetition of self-harm among those presenting with self-harm to emergency departments
- A epidemiological registry-based study comparing demographic and clinical characteristics of presentations involving self-cutting to presentations of intentional overdose
- A epidemiological registry-based study comparing demographic and clinical characteristics of self-cutting presentations based on extensiveness of treatment received
- A structured psychological study comparing psychological risk factors for repetition between self-cutting and overdose patients
- A qualitative study examining the lived experience of repeated self-cutting and overdose.

Each of these studies is self-contained and presented in a format suitable for publication, with its own introduction, methods, results and discussion. In order to

illustrate the link to the main research question, each of the empirical chapters is accompanied by two short sections: a section preceding the chapter which gives the rationale of the study and a section succeeding the chapter which outlines the main implications of the study in the context of the thesis. The thesis ends with a chapter discussing the implications of the work as a whole, as well as a critical appraisal of the approach used.

Chapter 1: Introduction to Self-Harm

Ireland has a population of 4.2 million people and a life expectancy that is higher than the European average. In a recent large-scale study, most people reported that their quality of life was 'very good' or 'good', and rated their health as 'excellent', 'very good' or 'good' (Barry, Van Lente, Molcho, Morgan, McGee, Conroy et al., 2009). Nonetheless, psychological distress in the Irish general population is not uncommon, with one population survey (Doherty, Moran, Kartalova-O'Doherty, & Walsh, 2008) finding that 14% of the sample reported experiencing mental health problems in the previous year, of whom only a small minority had sought help from health services. The approximately 12,000 cases of self-harm presenting to emergency departments each year in Ireland are likely to be the "tip of the iceberg" of self-harm prevalence but they represent a population for whom much can be done in terms of preventing further self-harm, treating co-occurring mental health problems, and facilitating broader wellbeing.

This chapter is intended to provide a critical summary of relevant extant research in the area of self-harm. It includes a general introduction to the topic of deliberate self-harm, including: rationale for viewing self-harm as a significant health problem; definitions of self-harm; self-harm rates among hospital presentations and in community settings; methods of self-harm; and relevant theories of self-harm.

Self-harm as a Significant Health Problem.

Fatal and non-fatal self-harm have serious consequences for individuals and society. The World Health Organisation (Lozano, Naghavi, Foreman, Lim, Shibuya, Aboyans et al., 2013) reported that, in 2010, among those aged 15-49 years, self-inflicted injuries were the fifth leading cause of death among women and the sixth leading cause of death among men. In the eight wealthiest regions of the world, self-harm was in the top eight leading causes of years of life lost, and across all countries has increased (absolutely and relatively) as a cause of years of life lost between 1990 and 2010. Not only is a person who presents with deliberate self-harm (DSH) at higher risk of future self-harm (Christiansen & Jensen, 2007), but they are also at much higher risk of dying by suicide. Indeed, Hawton and colleagues (Hawton, Zahl, & Weatherall, 2003) found that the risk of suicide in the year after a self-harm episode was 66 times that of the general population and Christiansen and Jenson (2007) found that the risk of suicide within 5.5 years of a self-harm episode was 60 times that of matched controls. Owens, Horrocks, and House (2002) reported that suicide risk among self-harm patients is hundreds of times higher than that of the general population and used findings from a systematic review to calculate that as many as two-thirds of suicides may be preceded by a self-harm presentation in the year before death. Some studies have found that those who engage in self-harm are also at elevated risk of all-cause mortality (Christiansen & Jensen, 2007; Hall, O'Brien, Stark, Pelosi, & Smith, 1998; Ostamo & Lönnqvist, 2001).

Self-harm indicates a person's distress and, in turn, may cause distress to the patient and their family (Byrne, Morgan, Fitzpatrick, Boylan, Crowley, Gahan et al., 2008; Oldershaw, Richards, Simic, & Schmidt, 2008; Raphael, Clarke, & Kumar, 2006), and could lead to lasting medical morbidity. There are also wider societal

effects, in terms of social modelling (Hawton, Rodham, Evans, & Weatherall, 2002; Taiminen, Kallio-Soukainen, Nokso-Koivisto, Kaljonen, & Helenius, 1998) and financial costs within and beyond healthcare settings (Corso, Mercy, Simon, Finkelstein, & Miller, 2007; Kapur, House, Creed, Feldman, Friedman, & Guthrie, 1999; NOSP, 2009; O'Sullivan, Lawlor, Corcoran, & Kelleher, 1999; Yeo, 1993).

The consequences of DSH as outlined above are largely negative. However, self-harm can serve as a red flag to health services: A patient presenting to an emergency department with DSH is more likely than other patients to have a psychiatric or substance abuse problem (Haw, Hawton, Houston, & Townsend, 2001) and to die prematurely by suicide or other means (Bergen, Hawton, Waters, Ness, Cooper, Steeg et al., 2012). Therefore, a presentation of self-harm allows a valuable opportunity for intervention in what might otherwise be a group with hidden morbidity and risk.

Definition and Terminology of Self-Harm

Defining deliberate self-harm has proved difficult as its criteria vary according to academic discipline and geographical area. Following Skegg (2005), I contend that there are three levels of intention relevant to DSH: intention to initiate the behaviour, intention to cause harm, and intention to cause death. The first level is the intention involved in the initiation of the behaviour. A person who jumps from a height initiates that behaviour intentionally whereas a person who falls from a height has not done so intentionally. The second level of intention is the intention to cause harm. A person might jump from a height intentionally (for example to escape a dangerous situation) but might not intend to cause harm to their body. Similarly, one

might engage in drug or alcohol abuse in spite of, rather than because of, the potential harmful effects. Although some writers in the area object to the use of the word "deliberate" in relation to self-harm because of the word's implications of manipulation, this term helps to convey that the behaviour was initiated intentionally and was intended to cause harm, in contrast with accidental injuries.

The third level of intention is probably the most contentious: suicidal intent. Some definitions of self-harm have explicitly excluded cases based on level of suicidal intent while some researchers have made it an explicit criterion. Skegg (2005) claims that most people who engage in intentional overdose "neither want nor expect to die" (p.1472) and points out that the majority of those who self-harm are alive five years after the episode. Moreover, a number of studies examining motives for self-harm have reported ambivalence around the intended outcome of engaging in self-harm. For example, Morey, Corcoran, Arensman, & Perry (2008) reported that, while just over 60% of adolescents who reported self-harm endorsed a wish to die as a motive for self-harm, no respondent reported a wish to die as a sole motive for self-harm. By allowing respondents to endorse more than one motive (c.f. Grøholt, Ekeberg, & Haldorsen, 2000), the authors were able to demonstrate an element of ambivalence towards dying of among those who self-harm. Similarly, McAuliffe, Arensman, Keeley, Corcoran and Fitzgerald (2007) reported that all but one of the 146 self-harm patients in their sample endorsed multiple motives for engaging in self-harm. In light of this ambiguous relationship between self-harm and suicidal intent, it seems wise to exclude suicidal intent as a criterion of DSH. Rather, it may be more useful to define self-harm as behaviours that are intentionally initiated and which are intended to cause self-harm, thereby incorporating varying levels of suicidal intent. Such an approach allows for the measurement of suicidal

intent as a variable of clinical interest and facilitates the ad hoc classification of self-harm acts on the basis of suicidal intent where appropriate.

The terminology around self-harm has evolved significantly over the last few decades and there is still much variation in the terms used. Given that both self-harm and suicide involve self-destructive behaviour using similar methods (e.g. self-cutting, overdose, hanging, etc.) and given the relatively high rates of suicide among those who engage in self-harm, and given that some self-harm is motivated by a wish to die, self-harm is often referred to as "attempted suicide", "parasuicide", and "suicidal behaviour". The term "suicide" is relatively widely accepted as meaning the intentional killing of the self. However, not all self-harm involves an explicit wish to die and the motives underlying self-harm can be complex, contradictory, and rapidly fluctuating. The term "self-harm" allows for the study of behaviours that entail intentional self-harm without making assumptions around suicidal intent. However, research centres in the US have continued to use the term "attempted suicide" for self-harm with high suicidal intent or lethality, and "self-harm" for self-harm with low suicidal intent or lethality.

Some self-harm terminology refers specifically to methods of self-harm used. For example, intentional overdose, attempted hanging, attempted drowning, firearms, jumping from a height etc. are often considered "attempted suicide" while intentional "minor" self-injury (such as self-cutting or self-burning) are referred to self-harm or self-injury. Unfortunately, assumptions around suicidal intent are often made on the basis of method of self-harm used rather than on the basis of a validated measure of suicidal intent (Arensman & Keeley, 2012). Another variation in terminology used occurs when methods of self-harm are grouped as self-poisoning (involving intentional excessive ingestion of medication or toxic substances) and

self-injury (other methods including self-cutting, jumping, firearms, attempted hanging, and self-burning).

These aspects of DSH are best encapsulated by a definition proposed by Kreitman (in De Leo, Burgis, Bertolote, Kerkhof, & Bille-Brahe, 2006; 1969) and used in the WHO/EURO Multicentre Study on Suicidal Behaviour:

> "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 recognized therapeutic dosage, and which is aimed at realising changes which the subject desired via the actual or expected physical consequences".

In addition to allowing for any level of suicidal intent, this definition does not specify a level of medical lethality required for inclusion. Therefore, it allows for the inclusion of episodes where a person intended to engage in a behaviour that would cause harm but was interrupted and prevented from doing so, and also the inclusion of episodes with low-lethality methods. The definition was originally used to delineate parasuicide but De Leo and colleagues (2006) argue that the prefix "para-" had connotations of mimicking or pretending and, as such, could be interpreted as a pejorative term.

The widespread use of this definition of self-harm within European studies allows for valid cross-country comparisons of self-harm rates and risk factors, and for the implementation of multisite interventions. The definition is less widely used in the US, where self-harm tends to be dichotomised into between minor self-injury and suicide attempts. The gap between European and North American

understandings of self-harm are set to be increased further following the imminent introduction of the American Psychological Association's fifth edition of the Diagnostic and Statistical Manual. The developers proposed the inclusion of a diagnosis of non-suicidal self-injury if a person fulfils the criteria outlined in Box 1.1.

In addition to widening the gap in research priorities between North America and other developed nations, such a diagnosis presents several difficulties. In terms in internal validity, the above diagnosis adopts arbitrary cut-offs in terms of time and frequency of self-harm: for example the person must have engaged in self-injury on at least five days in the last year. Moreover, the diagnosis treats suicidal intent as a dichotomous variable (contrary to the hundreds of studies using Beck's Suicidal Intent Scale, which operationalizes suicidal intent as a continuous variable), which could be assumed on the basis of the method used. Although there is evidence to suggest that those engaging in self-cutting do have lower suicidal intent scores (Harriss, Hawton, & Zahl, 2005), assuming that those who use lower-lethality methods have no suicidal intent is ill-advised. The association between lethality and suicidal intent is not perfect (Zhang & Xu, 2007), and low-lethality index episodes do not preclude eventual suicide, and may in fact be associated with increased suicide risk (Cooper, Kapur, Webb, Lawlor, Guthrie, Mackway-Jones et al., 2005). In addition to issues around the validity of this particular diagnosis, there are issues around the legitimacy of diagnoses more generally. Diagnosis has been portrayed alternately as a socio-politically constructed means of exculpation (Summerfield, 2001), a product and cause of iatrogenic stigmatisation (Sartorius, 2002), and a tool of social control (Brown, 1995). Conversely, individuals experiencing mental health difficulties may experience relief following diagnosis because it can allow access to

restricted resources, such as therapies and state financial assistance (Commander, Dharan, Odell, & Surtees, 1997). It remains to be seen what effect the proposed

A. In the last year, the individual has, on 5 or more days, engaged in intentional self-inflicted damage to the surface of his or her body, of a sort likely to induce bleeding or bruising or pain (e.g., cutting, burning, stabbing, hitting, excessive rubbing), for purposes not socially sanctioned (e.g., body piercing, tattooing, etc.), but performed with the expectation that the injury will lead to only minor or moderate physical harm. The behavior is not a common one, such as picking at a scab or nail biting.

B. The intentional injury is associated with at least 2 of the following:

1. Psychological Precipitant: Interpersonal difficulties or negative feelings or thoughts, such as depression, anxiety, tension, anger, generalized distress, or self-criticism, occurring in the period immediately prior to the self-injurious act.

2. Urge: Prior to engaging in the act, a period of preoccupation with the intended behavior that is difficult to resist.

3. Preoccupation: Thinking about self -injury occurs frequently, even when it is not acted upon.

4. Contingent Response: The activity is engaged in with the expectation that it will relieve an interpersonal difficulty, or negative feeling or cognitive state, or that it will induce a positive feeling state, during the act or shortly afterwards.

C. The behavior or its consequences cause clinically significant distress or interference in interpersonal, academic, or other important areas of functioning. (This criterion is subject to final approval on the use of criteria that relate symptoms to impairment).

D. The behavior does not occur exclusively during states of psychosis, delirium, or intoxication. In individuals with a developmental disorder, the behavior is not part of a pattern of repetitive stereotypies. The behavior cannot be accounted for by another mental or medical disorder (i.e., psychotic disorder, pervasive developmental disorder, mental retardation, Lesch-Nyhan Syndrome, stereotyped movement disorder with self-injury, or trichotillomania).

E. The absence of suicidal intent has either been stated by the patient or can be inferred by repeated engagement in a behavior that the individual knows, or has learnt, is not likely to result in death.

Box 1.1. Draft diagnostic criteria for non-suicidal self-injury. Source: American Psychiatric Association Diagnostic and Statistical Manual V, accessed 23/10/12 at http://www.dsm5.org/ProposedRevisions/Pages/proposedrevision.aspx?rid=443#

definition will have if it is included in the finalised Manual, which is to be published in 2013.

Methods of Self-Harm

Classification of self-harm behaviours.

There is a wide range of behaviours that might be considered types of DSH. The most common methods of DSH in hospital presentations tend to come under the categories of self-poisoning and self-injury. Self-poisoning is generally taken to refer to the "intentional self-administration of more than the prescribed dose of any drug, and includes poisoning with non-ingestible substances, overdoses of 'recreational drugs' and severe alcohol intoxication where clinical staff consider such cases to be acts of self-harm" (Harriss & Hawton, 2005). Deliberate self-poisoning is covered in the tenth version of the International Classification of Diseases (ICD-10; WHO, 1994) under the codes X60-69, which includes such codes as "intentional self-poisoning by and exposure to alcohol" (X65) and "intentional self-poisoning by and exposure to pesticides" (X68). Self-injury is considered to be "any injury recognised as having been deliberately self-inflicted" (Hawton, Fagg, & Simkin, 1988). It is covered by the ICD-10 codes X70-84, including such codes as "intentional self-harm by explosive material" (X75) and "intentional self-harm by sharp object" (X78). The definitions of methods of DSH outlined above do not include the criterion of suicidal intent but allow varying levels of intention to harm, where self-poisoning

must be intended to cause harm where this is not specified in the definition of self-injury. Perhaps it is assumed that the immediate and foreseeable effect of an injury is pain and harm, whereas ingesting poisons may have other intended effects.

Distribution of self-harm methods.

The proportions of various self-harm methods within self-harm differs greatly between hospital-based studies and community-based studies of self-harm. This section presents evidence from Irish and international studies that intentional overdose predominates in hospital-based studies whereas self-cutting predominates in community-based studies.

Numerous studies have reported that intentional overdose is the most common method seen in hospital presentations of self-harm. Out of 12,216 self-harm presentations to Irish emergency departments in 2011, 68.8% involved intentional overdose, 24.7% involved self-cutting and a small number involved other forms of DSH such as hanging and drowning (NSRF, 2012; Figure 1.1).

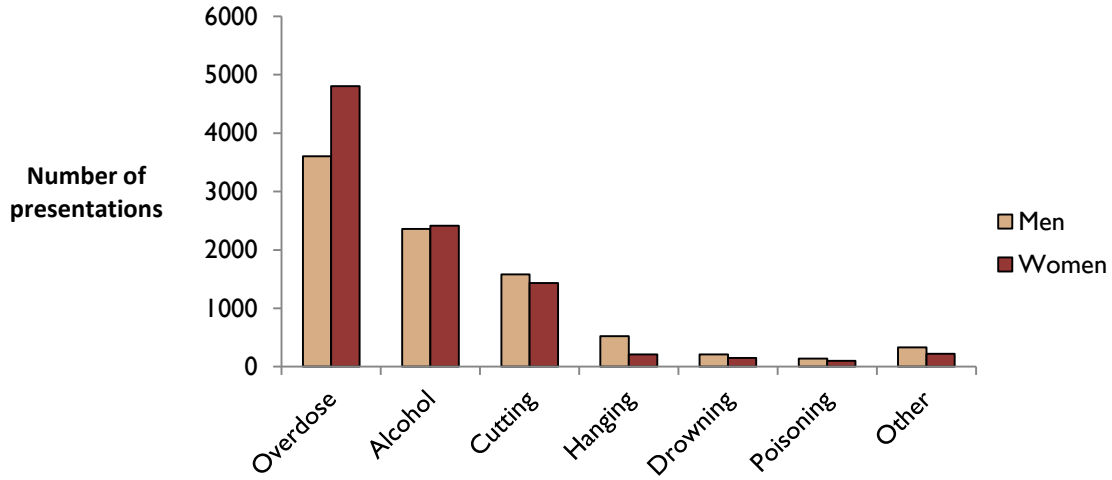


Figure 1.1. Distribution of methods of self-harm in hospital presentations of self-harm by gender. *Source: NSRF (2012)*

The proportions presenting with each method in Ireland seem to be similar to those in the UK (Hawton, Bergen, Casey, Simkin, Palmer, Cooper et al., 2007), US (Claassen, Trivedi, Shimizu, Stewart, Larkin, & Litovitz, 2006) and other European countries (Michel, Ballinari, Bille-Brahe, Bjerke, Crepet, De Leo et al., 2000). The drugs most commonly seen in intentional overdose presentations in Ireland in 2011 were minor tranquillisers and paracetamol (NSRF, 2012). Evidence to suggest that self-cutting is the most common method of self-injury comes not only from Ireland but also the UK (Gunnell, Bennewith, Peters, House, & Hawton, 2005; Hawton et al., 2007) and Europe (Michel et al., 2000). According to one study, self-cutting is inflicted using predominantly razors, knives or glass (Horrocks, Price, House, & Owens, 2003).

Despite consistencies among European countries, methods of DSH and the proportion of presentations involving particular methods can vary across countries, presumably depending on the physical or cognitive availability of means. For example, a study of self-poisoning presentations in Sri Lanka (Eddleston, Sheriff, & Hawton, 1998) showed that ingestion of pesticide and yellow oleander seeds were the most common forms of self-poisoning. This pattern is troubling as these forms of self-poisoning are more likely to result in death than overdose by medicines (Eddleston, Gunnell, Karunaratne, de Silva, Sheriff, & Buckley, 2005). Conversely, interventions to reduce the availability of particular methods of DSH have been successful in reducing the number of DSH episodes involving those methods. The withdrawal of distalgesic (co-proxamol) from the Irish market in 2006 was followed by a decrease in intentional overdose by distalgesic (Corcoran, Reulbach, Keeley, Perry, Hawton, & Arensman, 2010). Similarly, the limitations on pack size in the sale of paracetamol in the UK in 1998 was followed by a 15% reduction in overdose

of paracetamol in non-compound form (Hawton, Townsend, Deeks, Appleby, Gunnell, Bennewith et al., 2001). The interventions described above incurred minimal substitution of methods.

Compared with hospital-based studies of DSH, community-based studies reveal different patterns in the frequency of DSH methods. Outside of healthcare settings, the most commonly reported method of DSH is self-cutting (Morey et al., 2008; Nixon, Cloutier, & Jansson, 2008). This divergent pattern may be due to the fact that most population-based studies are conducted in schools and hence involve younger participants, or alternatively because those who self-cut are less likely to present to hospital. The evidence seems to support the latter hypothesis. Two studies examining hospital admission data for patients under 16 years and under 20 years respectively (Hawton, Fagg, & Simkin, 1996; Olfson, Gameroff, Marcus, Greenberg, & Shaffer, 2005) revealed ratios of self-poisoning to self-injury similar to those found among adult hospital presentations. In addition, a school-based study of adolescents aged 15 and 16 years (Madge, Hewitt, Hawton, de Wilde, Corcoran, Fekete et al., 2008) found that those who self-cut were more than three times less likely to present to hospital after an episode of DSH than those who intentionally overdosed.

Rates of Self-Harm

This section will present evidence of the prevalence of self-harm in Ireland and internationally in men and women and across age-groups.

Hospital-based rates of self-harm.

Ireland is the only country in the world with a dedicated national registry of deliberate self-harm presentations and, until recently, the rates of DSH seemed to have stabilised. Age-standardised person-based rates of DSH derived from the National Registry of Deliberate Self-Harm Ireland reports (NSRF, 2002, 2003, 2004, 2005, 2006, 2008, 2009, 2010, 2011) during the ten-year period from 2001 to 2010 are illustrated in Figure 1.2. The overall increase in national self-harm rates since 2007 is primarily due to an increase among males, with male rates increasing from 162 per 100,000 in 2007 to 205 per 100,000 in 2010, while female rates have remained relatively stable.

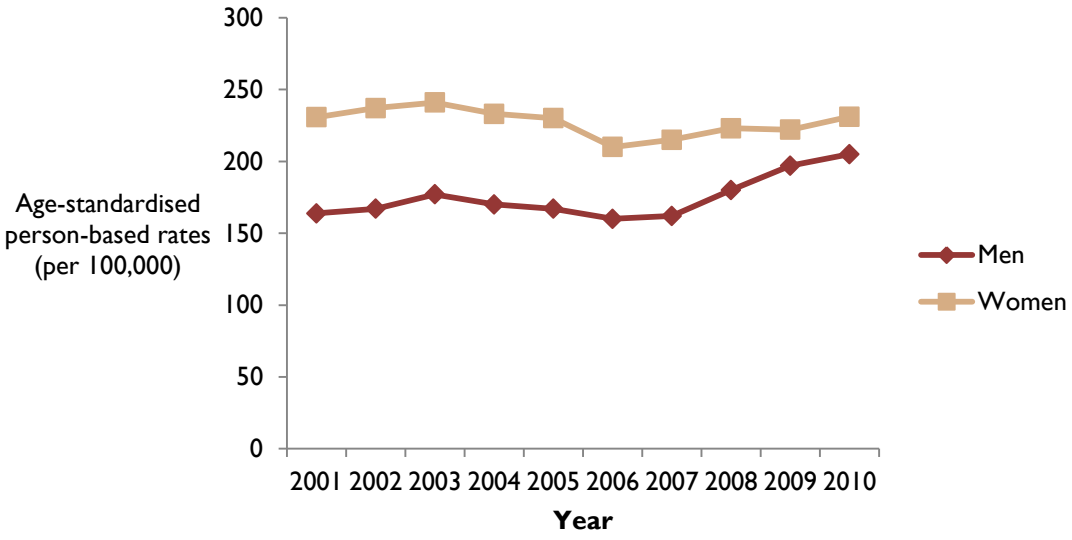


Figure 1.2. Age-standardised person-based rates (per 100,000) of hospital presentations of deliberate self-harm in Ireland 2001-2010, shown by gender

Rates of DSH vary greatly globally. Self-harm seems to be of especially high prevalence in the United Kingdom. A multicentre study of self-harm found that age-standardised rates ranged from 285 per 100,000 for males in Oxford to 460 per

100,000 for males in Leeds, and 342 per 100,000 for females in Oxford to 587 per 100,000 for females in Manchester (Hawton et al., 2007). There is similar variation across Europe. The monitoring arm of the EURO-WHO multicentre study of parasuicide (WHO, 1999) examined rates of deliberate self-harm at 16 sites across Europe. The 1995 data show that the highest rate was in Rennes, France, where they were 380 per 100,000 for males and 544 per 100,000 for females. The lowest rate for males was in Padua, Italy, with 51 per 100,000 and the lowest for females was in Ljubljana, Slovenia, with rates of 79 per 100,000.

A US-based study using a number of data sources to examine the prevalence of DSH reported between 127.2 and 164.7 presentations per year per 100,000 people (Claassen et al., 2006). New Zealand rates of self-harm ranged from 119.0 per 100,000 to 158.3 per 100,000 across four districts (Hatcher, Sharon, & Collins, 2009). A study in Sri Lanka examined rates of self-poisoning only, and reported an incidence rate of 363 per 100,000 (Eddleston, Sudarshan, Senthilkumaran, Reginald, Karalliedde, Senarathna et al., 2006). In contrast, the rate of DSH in Léon in Nicaragua was reported to be 66 per 100,000 (Caldera, Herrera, Renberg, & Kullgren, 2004) and in Brazil was reported to be just 5.8 per 100,000 (Gawryszewski & Rodrigues, 2006). Despite the wide range of prevalence rates across the world, it is evident that deliberate self-harm is a significant health problem that affects both developed and developing countries across the world.

Hospital-based rates by gender.

Across the world, rates of DSH are consistently higher among women than men. In Ireland, there were 6,386 female presentations of DSH in 2011 compared with 5,830 male presentations (NSRF, 2009), representing a male:female ratio of 1:1.1. A

similar pattern of a slight majority of women among self-harm presentations emerges in the UK (Gunnell et al., 2005; Wilkinson, Taylor, Templeton, Mistral, Salter, & Bennett, 2002), Europe (Bille-Brahe, 2001; Schmidtke, Bille-Brahe, De Leo, Kerkhof, Bjerke, Crepet et al., 1996), US (Claassen et al., 2006) and New Zealand (Hatcher et al., 2009).

Although there were more female than male presentations of DSH in Ireland in 2011 (NSRF, 2012), this finding was not consistent across age-groups. There were over three times as many female as male presentations in the 10-14 years age-group, yet there were slightly more male than female presentations in the 20-34 year age-group. This patterns resembles UK, with two studies finding that men outnumber women in the 25-34 years (Wilkinson et al., 2002) and 30-34 years (Hawton et al., 2007) age-groups respectively. Therefore, although a DSH patient in UK or Ireland is more likely to be female, this is not necessarily true of DSH patients aged between 20 and 35 years.

Hospital-based rates by age-group.

There is a strong association between younger age and DSH presentation. In Ireland, there are extensive differences in the prevalence of DSH across age-groups. Age-standardised DSH rates peak in females aged 15-19 years and in men aged 20-24 years (NSRF, 2006, 2008, 2009, 2010), as shown by data from 2011 in Figure 1.3.

A similar picture emerges from England (Hawton et al., 2007), Europe (Bille-Brahe, 2001), and the US (Claassen et al., 2006), with the age distribution of DSH skewing towards younger age. There is some evidence of a similar pattern in developing countries (Caldera et al., 2004; Fleischmann, Bertolote, De Leo, Botega, Phillips, Sisask et al., 2005). Men aged younger than 35 years and women aged

younger than 25 years are at particularly high risk of DSH. Considering that all of the above studies were conducted within a decade, it is possible that these higher rates among younger people are the result of a cohort effect and that, as the cohort

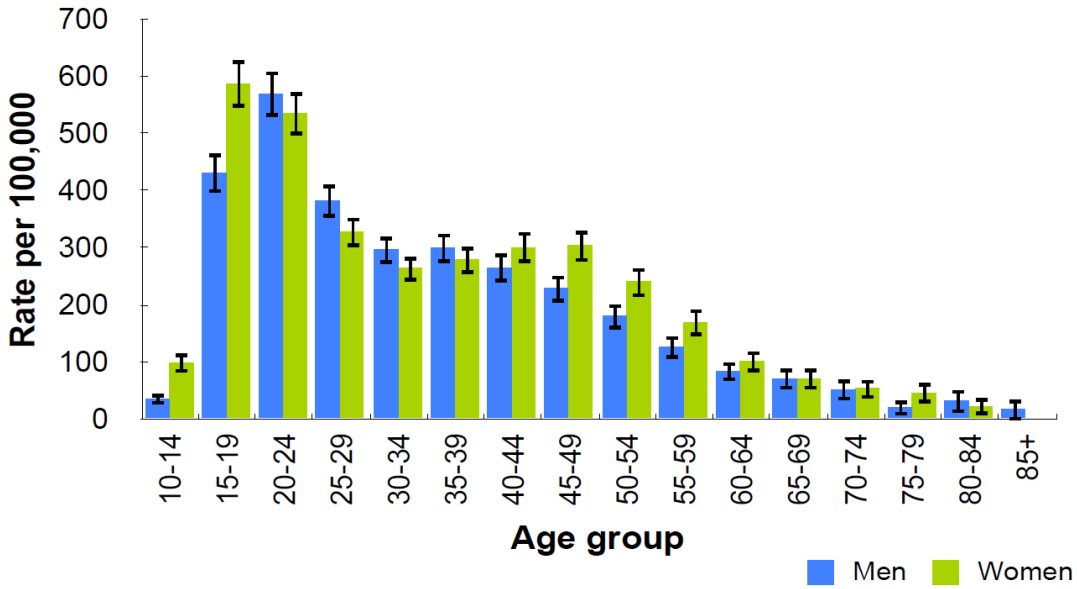


Figure 1.3. Rates of self-harm presentations across age-groups in Ireland in 2011 *(Source: NSRF, 2012)*

ages, DSH rates will peak among older age-groups. This is unlikely to be the sole explanation, however, considering that studies conducted in the 1970s, 1980s and 1990s also show a predominance of young people among those who self-harm (Arensman, Kerkhof, Hengeveld, & Mulder, 1995; Bancroft, Skrimshire, Reynolds, Simkin, & Smith, 1975; Fuller, Rea, Payne, & Lant, 1989; Morgan, Burns-Cox, Pocock, & Pottle, 1975).

Population-based rates of self-harm.

Population-based studies of DSH have been less prevalent than studies conducted in hospital settings and many of them include only school-going children, revealing

high levels of self-reported DSH. In particular, the Child and Adolescent in Europe Study (Madge et al., 2008) of 15-17 year-old secondary school students found that 4.3% of boys and 13.5% of girls reported having engaged in DSH in their lifetime. The proportion of Irish adolescents in the study reporting previous DSH was close to the European average: 4.4% of boys and 13.9% of girls (Morey et al., 2008). Two studies of Irish adults have yielded lower proportions of persons reporting self-harm A study using face-to-face interviews with a nationally representative sample found that 0.4% of participants reported having engaged in DSH in the past 12 months (Barry et al., 2009), similar to that reported by De Leo Cerin, Spathonis, and Burgis (2005) in Australia. Another Irish study which only recruited men aged 18 to 34 years and which also involved face-to-face interviews revealed a much higher lifetime prevalence of 4.6% (Begley, Chambers, Corcoran, & Gallagher, 2005). In a study based on data from ten countries involved in the WHO multisite intervention study on suicidal behaviours (SUPRE-MISS), between 0.4% (Hanoi) and 4.2% (Karaj) of participants reported in face-to-face interviews having ever attempted suicide (Bertolote, Fleischmann, De Leo, Bolhari, Botega, De Silva et al., 2005). Another international study combined data from similar household surveys conducted in nine diverse countries, (Weissman, Bland, Canino, Greenwald, Hwu, Joyce et al., 1999). The self-reported rates of lifetime suicide attempts ranged from 0.7% in Lebanon to 5.9% in Puerto Rico.

"Hidden self-harm".

There is accumulating evidence that much DSH is hidden; DSH that comes to the attention of health services is often referred to as merely the "tip of the iceberg". As outlined above, rates of DSH appear to be markedly higher in self-report population-based studies than in studies based on hospital presentations. Many population-based

studies were conducted in schools and it is possible that the variation in rates is due to a higher prevalence of DSH among adolescents than other age-groups. However, the nationally representative Slán study (Barry et al., 2009) in Ireland revealed rates of DSH that were twice as high as those recorded by the National Registry of Deliberate Self-harm Ireland. Moreover, this study found that only half of the participants had presented to hospital following the DSH episode. An Irish study of men aged 18-34 years found that only 37.5% of participants who had self-harmed presented to hospital (Begley et al., 2005). A population study of suicidal behaviour undertaken as part of the WHO Multisite Intervention Study on Suicidal behaviours (SUPRE-MISS) showed that the proportion of people who self-harm who present to hospital varied greatly across countries, from 88% in Chennai to 22% in Hanoi (Bertolote et al., 2005). In a school-based (CASE) study of Irish 15-17 year-olds (Morey et al., 2008), only 11.3% of participants reported presenting to hospital following DSH. In the CASE study, Irish adolescents were among those least likely to present to hospital with self-harm. The proportion of Irish adolescents who sought any help (either social or health services) after self-harm was just 40%, the lowest compared with adolescents in the six other centres (Ystgaard, Arensman, Hawton, Madge, van Heeringen, Hewitt et al., 2009). It is clear that, to obtain an accurate picture of the prevalence of self-harm, one must include methods to detect self-harm that does not result in hospital presentation.

A person might decide against presenting to hospital because the medical severity of the DSH is low, and the person does not see a visit to hospital as necessary. Such an explanation is supported by the finding that those who self-cut are less likely to present to hospital than those who overdose (Madge et al., 2008). However, part of the reluctance of those who self-harm to present to hospital might

be explained by the anticipation or previous experience of emergency departments as unappealing. A visit to the emergency department may be an unpleasant experience for any patient, especially where resources are particularly limited (Coughlan & Corry, 2007; Gilligan, Gupta, Singh, Winder, O'Kelly, & Hegarty, 2007). This negative experience may be compounded when a patient presents in a distressed state and is perceived by healthcare workers in a negative light. DSH patients often feel that they are perceived as "time-wasters" by healthcare workers and that communication with emergency department staff may be unsupportive or critical (Horrocks, Hughes, Martin, House, & Owens, 2005; Sinclair & Green, 2005).

In summary, this section has examined rates of self-harm, both that presenting to hospital and that which is untreated. It is evident that self-harm is a cause for concern in terms of its prevalence and consequences. Why is such a risky and damaging behaviour so widespread? The next section reviews theories that attempt to account for self-harm behaviour.

Theories of Self-Harm

Much of the high-quality research on self-harm has focussed on accurate monitoring of the epidemiology and medical management of self-harm. While this approach has been useful in clarifying the extent of the health problem, mobilising support from policymakers, and opening dialogue around previously stigmatised behaviour, it has neglected the theoretical bases of self-harm. Although there are numerous theories which purport to account for self-harm, few of these have been rigorously tested or

applied to prediction and intervention. This seems to partly stem from problems around operationalization of key constructs (although recently the European Parasuicide Study Interview Schedule from the WHO Multicentre Study on Suicide Attempts has helped to standardise the instruments and definitions used). This section outlines the development of prominent biological and psychological models of self-harm, leading into a description of the psychobiological model used in the current research.

Biological models.

Stress-diathesis models of psychopathology have been applied to schizophrenia, post-traumatic stress disorder and phobias, as well as to suicidal behaviour. Diathesis is taken to mean "a predispositional factor, or set of factors, that makes possible a disordered state" (p.34, Ingram & Luxton, 2005). Ingram and Luxton (2005) argue that diatheses for various psychopathologies were traditionally conceptualised as biological and genetic vulnerabilities, but that they have more recently been expanded to include certain stable psychological factors. "Stress", on the other hand, can refer to social adversity, major life events, or the accumulation of minor hassles.

Stress-diathesis models usually propose that, in order to develop a particular syndrome, a person must be exposed to both a diathesis and a stressor. For suicidal behaviour, Mann (2002, 2003) proposed that the stressor could be the exacerbation of a psychiatric disorder or the occurrence of a psychosocial crisis. "Diathesis" in this case refers to a biological vulnerability which underlies personality traits of aggression-impulsivity, hopelessness, or pessimism. Distal risk factors such as chronic substance abuse, head injury or childhood sexual or physical abuse can

increase the diathesis. Mann and Currier (2007) propose the involvement of a number of biological systems in the diathesis for suicidal behaviour based on a review of studies of biological markers for suicidal behaviour. Low serotonergic activity is predominantly the result of genetics but also early life experience, chronic medical illness, and alcoholism/substance abuse. The review found an association between localised serotonin dysfunction in the prefrontal cortex and suicidal behaviour, which is distinct from the more generalised dysfunction associated with depressive episodes. They also posit that the role of serotonin dysfunction in suicidal behaviour is likely to be linked with suicidal intent rather than impulsivity. Moreover, a low ratio of dopamine to serotonin metabolites was associated with future suicidal behaviour. Noradrenergic overactivity is associated with severe agitation but there is mixed evidence as to its power to predict suicidal behaviour. The authors report a strong association between hypothalamic-pituitary axis abnormalities and future suicidal behaviour. Mann's model is useful is elucidating the biological bases of suicidal behaviour and has been subsequently used as a basis for psychological models of self-harm.

Psychological models.

Despite the commonly-held perception of self-harm as a "cry for help", most current psychological theories of self-harm conceive self-harm as a response to intrapersonal distress rather than as an instrument to effect changes in interpersonal relationships.

The "cry of pain" model (Williams, 1997) emerged from the idea that the suicidal behaviour is a response to a feeling of entrapment or "arrested flight". Stemming from the evolutionary literature, the perception of entrapment is preceded by an experience of defeat. Social rank theory suggests that limited resources result

in animals competing to secure resources, resulting in "winners" and "losers". "Losers" can either escalate their efforts, an action that is likely to result in physical harm, or de-escalate their efforts, which results in reduced confidence. Having found themselves in a defeat situation, they may experience entrapment because of an inability to negotiate a way out of the situation.

Williams' theory is also informed by Baumeister's (1990) conceptualisation of suicidal behaviour as a means of escape. Baumeister argued that an aversive state of negative affect can arise out of two types of situations: either a person fails to meet their own ideals or they fail to meet the perceived ideals of others. The person is motivated to escape this aversive situation through suicidal behaviour.

Drawing on social rank theory and the conceptualisation of suicide as escape, Williams and Pollack used the concepts of defeat and entrapment to explain suicidal behaviour (Pollock & Williams, 2004; Williams, 1997; Williams & Pollock, 2008). The "defeat" event may occur in the form of uncontrollable inner turmoil or a psychosocial crisis, similar to the stressor proposed by Mann. There is an element of pre-existing vulnerability to defeat, whereby a person may be predisposed to pay particular attention to signals of defeat. This implies that it is not necessarily the characteristics of the event itself that are defeating but rather the interpretation of the situation. Entrapment within the defeat situation is prolonged by a perception that one cannot escape and that the situation will continue indefinitely. The inability to escape is related to poor problem-solving skills, which may in turn be related to lower specificity of autobiographical memory and hence a reduced ability to recall how similar problems were solved in the past. The perception that the situation will continue indefinitely is related to hopelessness and an inability to imagine a positive

future. The relationships among the components of the model are illustrated in Figure 1.4.

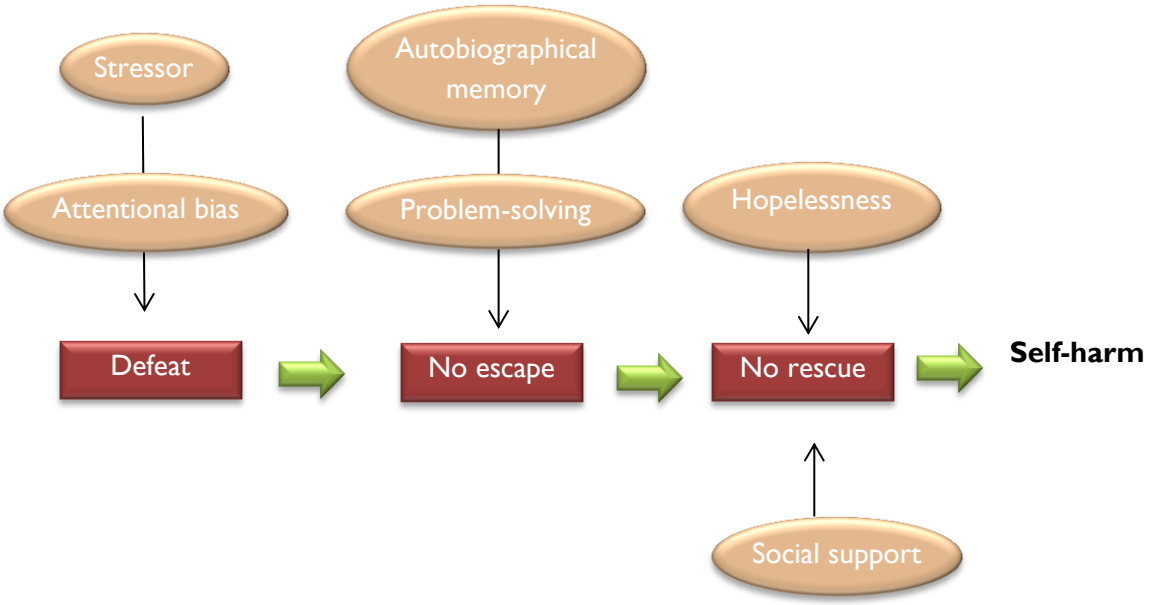


Figure 1.4. "Cry of pain" model of suicidal behaviour, adapted from Williams & Pollock (2008)

The authors propose that earlier experiences of entrapment are characterised by higher levels of "protest" which may be associated with anxiety or anger, but that, over time, entrapment leads to despair, associated with hopelessness and depression. This process is theorised to be associated with differential activation, a learned association between low mood and suicidal ideation.

Recent research seems to support this psychological theory of suicidal behaviour with studies reporting associations between self-harm and deficits in problem-solving (Howat & Davidson, 2002; Pollock & Williams, 2004), autobiographical memory (Arie, Apter, Orbach, Yefet, & Zalzman, 2008), entrapment (Rasmussen, Fraser, Gotz, MacHale, Mackie, Masterton et al., 2010), defeat (O Connor, 2003)

and lack of rescue (Rasmussen et al., 2010). More recently, O'Connor (2011) has further built upon the "Cry of pain" model (Figure 1.5), mapping the process that leads from defeat through entrapment to suicidal ideation and behaviour, including such constructs as goal adjustment and perfectionism.

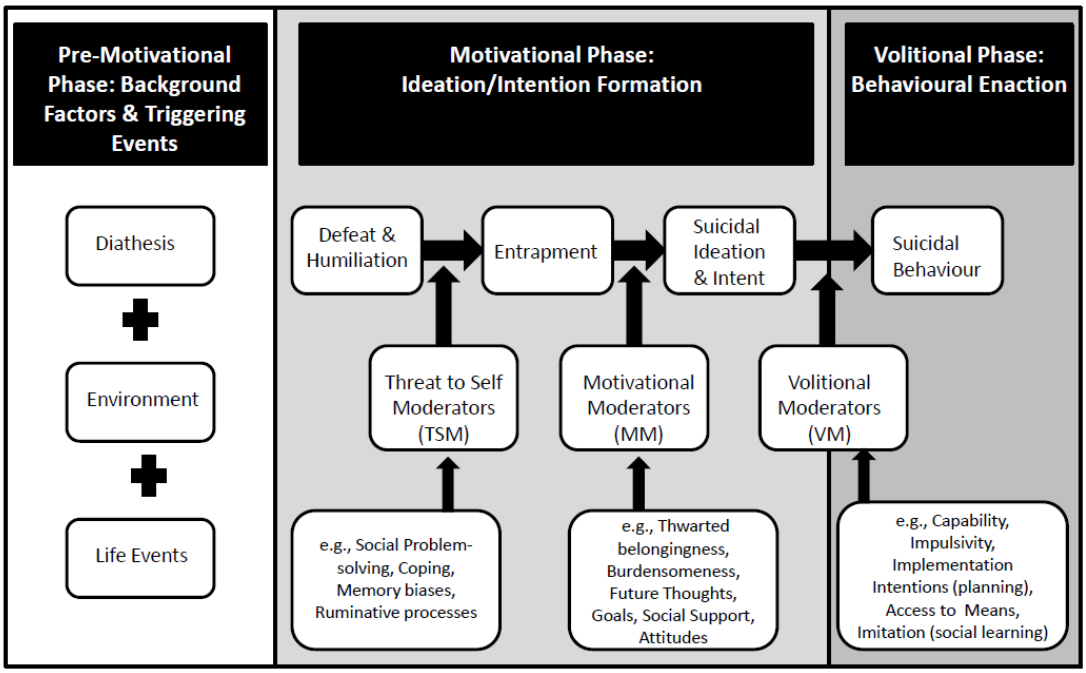


Figure 1.5. O'Connor's *(2011)* integrated motivational-volitional model of self-harm

He found that goal re-engagement moderated and mediated the association between socially prescribed perfectionism (perceiving that others have high expectations of one) and suicidal ideation in Scottish undergraduates (O'Connor & Forgan, 2007). Moreover a longitudinal study of 515 school-going adolescents (O'Connor, Rasmussen, & Hawton, 2010) showed that, while acute life stress alone predicted self-harm, it also interacted with socially prescribed perfectionism to predict self-harm. O'Connor, Whyte, Fraser, Masterton, Miles, & MacHale (2007) explicate the role of perfectionism in self-harm by linking it to both the Baumeister's conceptualisation of suicide as escape (from perceived inability to meet own or others' expectations) and Williams' "cry of pain" model (theorising that "higher

levels of perfectionism increase one's sensitivity to environmental cues that signal defeat, rejection and loss", p.1545).

The "cry of pain" model is becoming well-established but it is unclear how well the model accounts for repetition of self-harm. Repetition has been relatively neglected in relation to this model. One study (Rasmussen et al., 2010) examined the association between the theory's constructs and retrospective repetition of self-harm. That study recruited patients presenting to hospital with self-harm and hospital controls, and compared the model's constructs across three groups (self-harm patients with previous self-harm, self-harm patients without previous self-harm, and controls). There were significant group effects for scores on the Defeat Scale (Gilbert & Allan, 1998), the Entrapment Scale (Gilbert & Allan, 1998), Medical Outcomes Study (MOS) social support survey (Sherbourne & Stewart, 1991), and future thinking task (FTT; MacLeod et al., 1998). Post-hoc tests, however, showed that the only scores that differed significantly between first-time and repeat self-harmers were positive future thinking scores.

The evidence outlined above indicates that the "cry of pain" model is gathering support within self-harm research, but there are numerous other psychological theories of self-harm that have recently emerged that are of relevance to the current research.

Klonsky (2009) reviewed the functions of "non-suicidal" self-injury. Interestingly, the review found that the evidence converged on the function of emotional regulation (reflective of the theories of self-harm in general), and that there was less evidence to support other functions, such as ending dissociation, sensation-seeking, and influencing others. Cognitive emotional regulation strategies

are also identified by Slee and colleagues (Slee, Arensman, Garnefski, & Spinhoven, 2007) as central to cognitive-behavioural approaches to self-harm. They found effects on self-harm for both cognitive content strategies and cognitive process strategies. While the "cry of pain" model of self-harm theorises primarily around the aetiology of self-harm, theories addressing emotional regulation derive from therapeutic settings and are central to cognitive-behavioural interventions for self-harm.

Psychobiological model of suicidal behaviour.

Van Heeringen (2001, 2003) proposes a model of suicidal behaviour that ties together the biological and psychological correlates of suicidal behaviour, as well as suggesting hypothetical mechanisms by which diathesis for suicidal behaviour may increase in line with the suicidal process model. He aligns findings from different levels of reductionism to generate three strands of the diathesis or suicidal behaviour (Table 1.1). For example, Van Heeringen maps what Williams and Pollock label the "defeat" component of the diathesis onto corresponding concepts from clinical phenomenology (sensitivity to social stress), neuropsychology (attentional bias, to be measured using a modified Stroop test), neuroanatomy (frontotemporal cortex and hippocampus), personality (reward dependence), and neurobiology (norepinephrine, serotonin$_{1A}$ system, hyperactivity of the hypothalamo-pituitary-adrenal axis, and arginine vasopressine). Van Heeringen proposes that the "no escape" component of the diathesis is related to impaired problem-solving, which may be assessed using neuropsychological tests of working memory and autobiographical memory generalization. This component is hypothetically linked to the prefrontal cortex, but there is no evidence as to the personality traits or neurobiological correlates of the

component. The "no rescue" component of the model is linked to hopelessness, which may be assessed using the future thinking task. It is proposed that this third component is related to the dorsolateral prefrontal cortex and the amygdala, is associated with harm avoidance, and is related to the serotonin$_{2A}$ and dopamine systems.

Table 1.1.

Van Heeringen's (2003) Hypothetical Psychobiological Model

Cognitive psychology	Clinical phenomenology	Neuropsychology (assessment)	Neuroanatomy	Personality	Neurobiology
Loser status	Sensitivity to social stress	Attention (modified Stroop)	FTC + HC	RD	NE 5-HT$_{1A}$ HPA AVP
No escape	Impaired problem-solving	Memory (working memory; AMT)	PFC	—	—
No rescue	Hopelessness Impulsivity Aggression	Fluency (modified fluency task)	(DL)PFC + A	HA	5-HT$_{2A}$ Dopamine

A= amygdala; AVP=arginine vasopressine; AMY= autobiographical memory test; (DL)PFC= dorsolateral (prefrontal cortex); FTC=frontotemporal cortex; HA= harmavoidance; HC=hippocampus; HPA=hypothalamo-pituitary-adrenal axis; NE=norepinephrine; RD=reward dependence; 5-HT$_{1a}$=serotonin-$_{1A}$ system; 5-HT$_{2a}$=serotonin-$_{2A}$ system.

Van Heeringen and colleagues (2003) compared these variables in nine suicide attempters and 13 controls and found that those who had attempted suicide had lower binding potential of frontal 5-HT receptors, higher levels of hopelessness, higher scores on the temperament (biologically-related) dimension harm avoidance and lower scores on the character (learning-related) dimensions of self-directedness and cooperativeness. In addition, the study found a significant association between hopelessness, binding index and harm avoidance in those who had attempted suicide.

Van Heeringen expresses some uncertainty as to where impulsivity and aggression fit within the model and ventures that they may be required to break through behavioural inhibition.

In addition to proposing that three main components of the diathesis for suicidal behaviour span a number of domains, Van Heeringen's model is noteworthy because it suggests processes by which stress and diathesis might interact. Although the diathesis is trait-like, it has potential to change over time due to exposure to stressors. Van Heeringen mentions two mechanisms by which this might occur. Firstly, animal studies have shown that chronic stress may cause disturbance to the serotonin$_{1A}$ system (Leonard, 2005), hence affecting increasing sensitivity to signals of defeat. Moreover, cortisol has been shown to destroy cells in the hippocampus, which may further affect memory and problem-solving and increase the perception of "no escape". These findings suggest that continuing exposure to stressors increases the diathesis for suicidal behaviour and is supported by findings that the stressor involved in suicidal behaviour becomes less prominent over time (Neeleman, de Graaf, & Vollebergh, 2004), perhaps as the diathesis for suicidal behaviour increases. Therefore, although there is evidence that genetic factors (Li & He, 2006a; Li & He, 2006b) and childhood abuse (Molnar, Berkman, & Buka, 2001; Paolucci, Genuis, & Violato, 2001) may be responsible for the formation of the diathesis, ongoing psychosocial adversity serves to exacerbate a person's vulnerability to suicidal behaviour.

Although the above discussion focuses on the potential of diathesis to be increased by stressors, the converse may also be true, in that the diathesis also may have the potential to be decreased through intervention. Mindfulness-based cognitive therapy has been shown to reduce overgeneral autobiographical memory in formerly

depressed patients (Williams, Teasdale, Segal, & Soulsby, 2000) and has been used employed as an effective intervention to reduce recurrence of suicidal behaviour (Williams, Duggan, Crane, & Fennell, 2006). Given the part that overgeneralised memory plays in the diathesis for suicidal behaviour, this promising intervention may represent a means by which to reduce the diathesis, at least in terms of the "no escape" component.

In terms of the terminology used to classify stress-diathesis models, Van Heeringen describes his model as an "interactive model with a continuous diathesis" (van Heeringen, 2001). Under the terminology presented by Ingram and Luxton (2005), the model would be described as, not just "interactive", but "dynamic", as the relationship between the stress and diathesis may change over time.

In summary, the past decades have seen a number of prominent theories of suicidal behaviour emerge, which have tended to build and expand on previous models. These largely congruent models will be drawn upon as appropriate in the current thesis.

Self-Harm Repetition: Prevalence and Consequences

As well as indicating pre-existing vulnerabilities, self-harm is associated with increased risk in terms of future fatal and non-fatal self-harming behaviour. Repetition of self-harm is common, particularly in the weeks following an index episode (Gilbody, House, & Owens, 1997; Gunnell, Bennewith, Peters, Stocks, & Sharp, 2002). A systematic review by Owens, Horrocks and House (2002) reviewed research relating to fatal and non-fatal repetition of self-harm. They reported that the

median proportion of DSH patients repeating self-harm within one year was 16%, with an interquartile range of 12-25%. In addition to indicating ongoing distress, presenting with repeat self-harm is also associated with future suicide. A study comparing the risk of suicide of first-time DSH patients with repeat DSH patients found that the latter group were more than twice as likely to die by suicide during the 23-year study period (Figure 1.6; Zahl & Hawton, 2004). Female repeat DSH patients were particularly at risk, with 3.5 times higher suicide risk compared with female first-time DSH patients. Further analyses showed that female multiple repeaters (those with more than two DSH episodes) had a significantly higher risk of dying by suicide than female single repeaters (those with two DSH episodes).

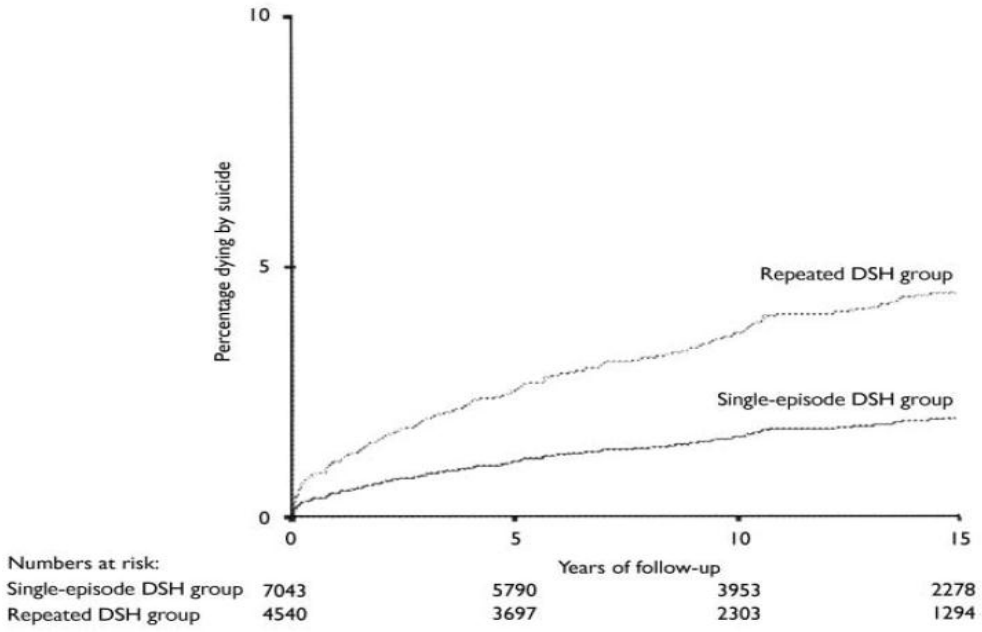


Figure 1.6. Survival analysis of self-harm patients over 15-year follow-up (Zahl and Hawton, 2004)

In terms of the resource use of this at-risk repeater group, Sinclair Gray, Rivero-Arias, Saunders, & Hawton (2011) conducted a cost analysis involving a sample of 78 DSH patients, who were traced for up to 40 years. They examined the participants' use of health and social services, including primary care, emergency department presentations, medical/surgical procedures, psychiatric care, psychotropic prescriptions, and social service visits and residential placements. The authors conclude that multiple repeat DSH patients incurred the highest costs in relation to these services.

These findings suggest that repetition of self-harm confers high personal and societal costs. Self-harm patients represent an "indicated" group in terms of suicide prevention (Bertolote et al., 2005; Muñoz, Mrazek, & Haggerty, 1996), and that targeting effective and intensive interventions aimed at preventing repetition may be an efficient way to reduce suicide rates at a societal level.

Conclusion

This chapter has presented a critical appraisal of extant research on self-harm, including nomenclature, epidemiology, aetiology and outcomes related to self-harm. It also presented the case for considering self-harm, particularly repeated self-harm, as a significant health problem. It lays the foundation for the next chapter, which will examine the particular association between the use of self-cutting as a method of self-harm and prospective repetition of self-harm.

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Chapter 2: Scope of the Current Research: The Association between Self-Cutting and Repetition

This chapter provides a critical summary of extant literature relating to the central research question. The chapter reviews the evidence for grouping self-harm patients on the basis of method, comparing self-cutting patients and other self-harm patients on the basis of demographic and psychological characteristics, functions and consequences, health service management, and repetition. The final section draws together the bodies of evidence around self-harm methods and self-harm repetition to form the current research question: What is the nature of the association between self-cutting and self-harm repetition?

Factors Associated with Self-Harm Methods

Demographic characteristics

Studies of hospital presentations of DSH have consistently found that women outnumber men among presentations of self-harm by self-poisoning (Hawton, Bergen, Casey, Simkin, Palmer, Cooper et al., 2007; Hawton, Zahl, & Weatherall, 2003; Horrocks, Price, House, & Owens, 2003; Lilley, Owens, Horrocks, House, Noble, Bergen et al., 2008; Michel, Ballinari, Bille-Brahe, Bjerke, Crepet, De Leo et al., 2000), with Finland forming a rare exception (Ostamo & Lönnqvist, 1994). This pattern has been replicated in population-based studies self-harm (Barry, Van Lente, Molcho, Morgan, McGee, Conroy et al., 2009; Morey, Corcoran, Arensman, & Perry, 2008). The relationship between gender and self-injury is somewhat more

contentious. There has long been an association in the literature between self-injury, younger age, and female gender. In terms of gender, school-based studies provide support for such an association, with young women being far more likely to report engaging in self-cutting than young men (Morey et al., 2008; Rodham, Hawton, & Evans, 2004; Young, Van Beinum, Sweeting, & West, 2007). However, this association between female gender and self-injury does not hold for hospital presentations, as more large-scale hospital-based studies point to an excess of men within self-injury presentations. Studies from the UK and Europe have shown an association between male gender and self-injury (Hawton et al., 2003; Horrocks et al., 2003; Michel et al., 2000; O'Loughlin & Sherwood, 2005) so that, although self-harm patients are more likely to be female, a self-injury patient is more likely to be male. When self-cutting in particular is examined, there some studies have found that slightly more women present with self-cutting than men (Bennett, Coggan, Hooper, Lovell, & Adams, 2002; Horrocks et al., 2003; Lilley et al., 2008), while others have reported a male majority within self-cutting (Brakoulias, Ryan, & Byth, 2006; Harriss, Hawton, & Zahl, 2005; Hawton, Harriss, Simkin, Bale, & Bond, 2004; O'Loughlin & Sherwood, 2005). These studies indicate that there are differences between self-cutting and other self-harm presentations in terms of gender profile.

Hawton and colleagues' (2004) comparison of self-cutting and self-poisoning patients showed that, though data from the years 1976-1988 did not show a relationship between age and method of DSH, the data from 1988 to 1998 did, with self-cutters more likely than self-poisoners to be under the age of 35 (Hawton et al., 2004). Data on Irish presentations in 2011 (NSRF, 2012) also supports the association between self-cutting and younger age, with a significantly higher proportion of self-cutting within DSH among those aged 15-24 years compared with

other age-groups. Similarly, Horrocks, Price, House and Owens (2003) showed that patients aged between 25 and 34 years of age were significantly overrepresented among those who self-injured compared with those who self-poisoned and Horrocks, House and Owens (2002) showed the association between younger age and self-cutting in particular. Lilley and colleagues (2008) reported a higher median age among those presenting with self-cutting. It seems that, with increasing age, self-cutting becomes less prevalent within self-injury, as alternative methods of self-injury begin to form a larger proportion of episodes within self-injury. These studies indicate that age varies significantly among those presenting with various self-harm methods.

Psychological characteristics

Although there have been very few studies comparing psychological variables associated with self-cutting to those associated with other methods of self-harm, those that have done so have revealed differences among self-harm methods.

A study of consecutive self-harm admissions in a Malaysian hospital by Sorketti and Zuraida (2007) found that, compared with those presenting with self-poisoning, those who presented with self-cutting more often expressed a wish to die and self-punishment as motives for self-harm. Patients presenting with self-poisoning were more likely to endorse interpersonal/communication motives, namely wanting to find out if someone loved them and wanting to get attention. Rodham and colleagues (2004) examined the reasons for self-harm reported by 306 school-going adolescents in England. When presented with a list of eight possible reasons, these who engaged in self-cutting were significantly less likely than those

who engaged in self-poisoning to report that they had engaged in self-harm because they had wanted to die or because they had wanted to find out if somebody really loved them. A logistic regression to predict method of DSH found that only "wish to die" was a significant predictor of self-harm method, with an odds ratio of 2.3 associated with self-poisoning. When participants were asked to spontaneously generate reasons for engaging in DSH, those who had engaged in self-poisoning were more likely to cite escape, an argument or a wish to die, while those who had self-cut were more likely to mention self-directed anger as a reason for DSH. The same study found that those who had self-cut were significantly more likely than those who had self-poisoned to think about engaging in DSH for less than an hour before doing so.

In line with these findings indicating that those who had self-cut were less likely to endorse a wish to die as a reason for self-harm, a study of patients presenting with self-harm to an emergency department in Oxford found that those who had self-cut had a significantly lower median score on the Beck Suicide Intent Scale than those who presented with other forms of DSH (Harriss et al., 2005). A study from Oxford (Hawton et al., 2004) compared self-cutting patients to self-poisoning patients over two data collection periods and found that, for the period 1988-1998, self-cutting patients were more likely to have low suicidal intent scores. Moreover, Sisask, Kõlves, and Värnik (2009) reported a significant association between Pierce Suicide Intent Scale scores and method of self-harm, whereby the highest scores were among those engaging in self-poisoning and the lowest were among those using sharp objects to self-harm.

Tsirigotis, Gruszczynski, & Lewik-Tsirigotis (2012) used a Polish adaptation of Kelley's Chronic Self-Destructiveness Scale to examine indirect self-destructive

factors in those presenting with self-cutting and those presenting with overdose. ”Poor health maintenance” was independently associated with overdose, whereas “transgression”, “lack of planning”, and “helplessness and passiveness” were associated with self-cutting.

Despite emerging evidence of differences on psychological measures between those engaging in self-cutting and those engaging in overdose, these factors are of limited use in terms of understanding the aetiology of specific types of self-harm and how to prevent them.

Psychiatric diagnoses.

Differences between those who self-cut and those who self-poison also extend to the psychiatric diagnoses within the groups. For example, in a cross-sectional study of patients seen by a consultation liaison service in Australia, Brakoulias, Ryan, and Byth (2006) found that patients who had self-cut were half as likely to receive a diagnosis of major depressive disorder as those who had self-poisoned (8.5% of 165 vs 17.8% of 1024), who were, in turn, half as likely to receive that diagnosis as “violent self-harmers” (37.7% of 61). In contrast, Lilley and colleagues (2008) found that those who presented to emergency departments in Manchester, Leeds and Oxford with self-cutting were significantly more likely to have a history of mental health problems than those who presented with self-poisoning. In Leeds alone, Horrocks, House and Owens (2002) found that those who presented with self-cutting were more likely to have a history of contact with mental health services. Hawton and colleagues (2004) reported that those who self-cut were more likely to misuse alcohol. In the US, a similar picture of higher psychiatric morbidity in self-cutting patients emerges: Olfson, Gameroff, Marcus, Greenberg, and Shaffer (2005)

reported that almost three-quarters of a sample of young people presenting with self-cutting met the criteria of a mental disorder compared with just under half of those presenting with self-poisoning. In a study of women presenting with overdose, Law, Coll, Tobias, and Hawton (1998) found that there was a relationship between previous psychiatric history and number of previous overdoses but not number of previous self-injury episodes. Conversely, there was an association between presence of a current psychiatric disorder and number of previous self-injury episodes but not number of previous overdoses.

Psychosocial adversity

Differences in social circumstances also seem to be evident between self-cutting and overdose patients. The study by Hawton et al. (2004) comparing self-cutting and self-poisoning patients found that those who self-cut were more likely to live alone. An earlier study by Robinson and Duffy (1989) found that those who presented with self-injury were more likely to have received or initiated violence with relatives in the preceding five years, to have a criminal record and to be unemployed. Coll, Law, Tobias and Hawton (1998) found that, among women presenting with self-poisoning, there was an increased risk of childhood sexual abuse among multiple repeaters and particularly those with a history of self-injury. In a community sample of Finnish adolescents (Laukkanen, Rissanen, Honkalampi, Kylmä, Tolmunen, & Hintikka, 2009), social isolation, daily smoking and substance misuse were associated with a history of self-cutting but not a history of any self-harm.

Significance of Self-Harm Methods

Functions of self-harm methods.

In light of the differences between self-cutting and overdose patients outlined in quantitative studies, an important issue is the extent to which intentional overdose and self-cutting differ as experienced behaviours. Are they simply two interchangeable methods towards the same end or are there aspects of each that are unique and irreplaceable? In keeping with recent findings of lower suicidal intent among those who self-cut (Harriss et al., 2005; Hawton et al., 2004; Sisask et al., 2009), much of the literature focussing on self-cutting has conceptualised it as a behavioural category separate, sometimes even antithetical, to suicide attempts. This conceptualisation seems to stem from the notion of self-cutting as a maladaptive coping mechanism, rather than a method of taking one's life (Haines & Williams, 1997; Klonsky, 2009). For example, the proposed DSM-V diagnosis of non-suicidal self-injury includes self-cutting and specifies that "the absence of suicidal intent is either reported by the patient or can be inferred by frequent use of methods that the patient knows, by experience, not to have lethal potential". Some authors in the area have even proposed that self-cutting may be a way to avoid suicide, by providing relief from emotions that might otherwise overwhelm a person (Klonsky & Muelhenkamp, 2007). Ross and McKay (1979: in Briere & Gil, 1998) suggest that "self-mutilation is actually counter-intentional to suicide, rather than suicidal".

Examining the lived experiences of self-harm, Crouch and Wright's (2004) qualitative study refers briefly to differences between overdose and self-cutting from the perspective of adolescent inpatients and relates choice of self-harm methods to self-identification with one method or the other. The immediate biological effects of

the behaviours certainly appear to differ. In most cases a person who engages in self-cutting will maintain consciousness, whereas a person who has engaged in intentional overdose might not. This mirrors the idea in the literature that self-cutting may be related to feeling too much or too little (Horne & Csipke, 2009), indicating the role of overwhelming emotion or dissociation resulting from trauma. Self-cutting seems to be effective in temporarily ending dissociation, particularly among those with borderline personality disorder, with Favazza (1996) declaring that "cutting is far and away the best mechanism [to end depersonalisation] and patients discover that", and offering an effective behavioural response to racing thoughts and intense negative emotion. Part of the functions of self-cutting behaviour may be related to characteristics of the behaviour itself. However, the prevalence of BPD among those presenting with self-cutting is not high enough to account for all self-cutting presentations, and Marchetto (2006) showed that repeated self-cutting can occur in the absence of borderline personality disorder and, though less often, in the absence of trauma.

A further experiential difference between self-cutting and intentional overdose is presence of blood in self-cutting. According to Favazza (1998), blood is an important symbol across cultures and plays a fundamental part in the act of self-cutting, a notion echoed in qualitative studies of the experience of self-cutting (Harris, 2000; Himber, 1994; Rao, 2006). Another interesting experiential aspect of self-cutting is the role of pain. Some theorists argue that self-cutting allows inner emotional pain to be worn on the outside, to make it more visible to the person engaging in self-cutting or to those around them (Harris, 2000; Straker, 2006). Others argue that the pain arising from self-cutting allows a person to end a period of dissociation (Russell, Moss, & Miller, 2010). Those who self-cut may have high pain

thresholds that increase further during times of stress (Bohus, Limberger, Ebner, Glocker, Schwarz, Wernz et al., 2000), and cortisol levels have been shown to peak just before self-cutting (Sachsse, Von Der Heyde, & Huether, 2002). In addition to the importance of blood and pain, another important issue is that of scarring. The body of a person who recovers from an overdose may have no visible traces of the experience, while many of those who self-cut extensively may be left physically scarred.

There is very little research on the decision-making process involved in choosing a self-harm method, but a qualitative study by Biddle, Donovan, Owen-Smith, Potokar, Longson, Hawton et al. (2010) explored this issue in relation to attempted hanging. They found that those who engaged in attempted hanging did so largely because of positive attitudes towards a death by hanging (seeing it as clean, quick and painless). Moreover, the method was seen as easily accessible and realisable. In a quantitative study of those presenting with paracetamol (Hawton, Ware, Mistry, Hewitt, Kingsbury, Roberts et al., 1995), availability and known lethality also emerged as the main factors influencing their choice of self-harm method.

Differential health services management by self-harm method.

The method of DSH that a person uses may affect their access to health services, both in terms of the decision to seek treatment and the service provided once they enter the healthcare setting. In a multisite study of 15- to 17-year-olds, Madge and colleagues (2008) found that 6.9% of acts that involved self-cutting only resulted in presentation to hospital compared with 17.9% of episodes involving multiple

methods and 18.1% of episodes involving overdose. Hawton, Rodham, Evans, and Harriss (2009) used data from the English schools involved in the same study to compare adolescents who had presented to hospital following self-harm to those who had engaged in self-harm without presenting to hospital. Their results could help to explain why the most common method in population-based studies is self-cutting and the most common method in hospital-based studies is overdose: They found that those who engaged in self-poisoning or another single method of self-harm were six times more likely to report presenting to hospital with self-harm compared to those who engaged in self-cutting alone. Those who engaged in multiple methods were three times more likely to present to hospital compared to those who engaged in self-cutting alone. These findings suggest that much of the "hidden" self-harm outlined in the previous chapter may be comprised of self-cutting, rather than other self-harm acts.

The health services management of DSH in relation to triage, admission, assessment, and follow-up rates seems to differ according to the method of DSH used. Horrocks et al. (2002) found that those presenting with self-cutting to emergency departments in Leeds tended to be assigned lower triage categories than those presenting with self-poisoning. Data from the National Registry of Deliberate Self-Harm Ireland (NSRF, 2012) shows that recommended next care varies across DSH methods. Among those who presented with overdose in 2010, 32.7% received general admission, compared with only 14.2% of those who presented with self-cutting. A multicentre study in England (Lilley et al., 2008) found that almost 60% of people presenting with self-poisoning to emergency departments were admitted to general hospital compared with 12.3% of those who presented with self-cutting. Similarly, a study of young people presenting with self-harm in Auckland (Bennett

et al., 2002) reported that 60% of those who presented with overdose were hospitalised compared to 26% of those who self-cut. Barr, Leitner, and Thomas (2004) reported that self-harm patients who took early discharge from hospital, either from the emergency department or an inpatient bed, were less likely to used self-cutting as a method of self-harm. In a study of young self-harm presentations in the US, Olfson et al (2005) found a weak association between presenting with self-cutting and not receiving admission. All of these studies indicate a lower likelihood of admission among those presenting with self-cutting.

Being admitted to hospital or not can affect the likelihood of receiving adequate care. According to the UK's National Institute for Health and Clinical Excellence (2004), an assessment of self-harm patients' needs and risk should be undertaken by healthcare workers "as part of a therapeutic process to understand and engage the service user". There is no data available on the rates of psychosocial assessment performed in Ireland, and specific Irish guidelines for assessment have not yet been developed. However, evidence from the UK suggests that those who are admitted to hospital are more likely to receive a psychosocial assessment after self-harm than those who are discharged without admission (Hawton et al., 2007; Hawton, Fagg, & Simkin, 1996). In addition, UK studies suggest that patients who do not receive an assessment are up to twice as likely to repeat DSH (Hickey, Hawton, Fagg, & Weitzel, 2001; Kapur, House, Dodgson, May, & Creed, 2002). A number of studies have found that the likelihood of receiving a psychosocial assessment may be influenced by the method of DSH involved. Horrocks et al. (2002) found that those presenting with self-cutting were more likely than those presenting with self-poisoning to receive direct discharge without psychosocial assessment. In a multisite study in the UK, Gunnell, Bennewith, Peters, House, and

Hawton (2005) examined the factors influencing the likelihood of a psychosocial assessment being carried out and found that episodes involving self-cutting were significantly less likely to result in a psychosocial assessment when compared with all other episodes of DSH. Further analysis of the same data (Bennewith, Peters, Hawton, House, & Gunnell, 2005) indicated that the association between non-assessment and self-cutting was due to the lower likelihood of admission among those who self-cut. Barr, Leitner, and Thomas (2005) also found that 53.7% of those presenting with self-poisoning received a specialist assessment compared with 39% of those presenting with self-cutting. Moreover, in contrast to overdose patients, those presenting with self-cutting became less likely to receive an assessment as the number of prior attendances increased. Lilley and colleagues (2008) found that 42.1% of self-cutting patients received psychosocial assessment compared with 64% of self-poisoners. They adjusted for hospital admission and demonstrated that there was still a significant relationship between self-cutting and not receiving a psychosocial assessment. There were exceptions in two studies of adolescent self-harm presentations in New Zealand. A study of young people presenting with self-harm to emergency departments in Auckland (Bennett et al., 2002) reported that those presenting with self-cutting were more likely to receive a psychosocial assessment. In addition, a study of an Auckland adolescent outpatient psychiatric clinic (Fortune, 2006) found no difference between care of those presenting with self-cutting versus other self-harm patients in terms of clinicians' actions (risk assessment, recording treatment goals, and contact with referral agent) or client attendance.

There seems to be important differences in recommended follow-up according to method of self-harm used. A study of patients seen by an Australian

liaison psychiatry service (Brakoulias et al., 2006) showed that patients who self-cut were more than twice as likely to be recommended for follow-up from a community mental health team as those who self-poisoned. A study based in England also found that those who had presented with self-cutting were more likely to have follow-up arrangements made than those who had engaged in overdose (Gunnell et al., 2005). However, it is unclear the extent to which the patients received the recommended follow-up. The study by Horrocks et al (2003) found that those who self-injured did not receive the same access to specialist follow-up as those who had self-poisoned. An earlier study (Gunnell, Bennewith, Peters, Stocks, & Sharp, 2002) showed no difference between patients who self-cut and other self-harm patients in the proportions consulting their general practitioner in the four weeks after presenting to hospital with self-harm. These findings suggest that the lower engagement in follow-up services among those who self-cut may be attributable to restricted access, rather than patient disengagement. Studies examining attitudes of healthcare workers towards those who self-harm have shown that these workers may be ill-informed about the risks associated with DSH (Crawford, Geraghty, Street, & Simonoff, 2003) and may have personal negative attitudes towards self-harming patients (Sidley & Renton, 1996). There are no extant studies that compare staff attitudes towards self-cutting and those towards other forms of DSH. However, Friedman and colleagues (2006) examined the attitudes of emergency department staff to patients presenting with self-cutting only. They found that, although two-thirds of staff reported feeling concern for such patients, over half of respondents reported feeling frustrated.

It seems that those who present with self-cutting may be less likely to receive an adequate healthcare response to their self-harm episode, partly because they are

less likely to present to hospital and partly because the services offered to them appear to be more limited.

Outcomes associated with self-harm methods.

One of the earliest papers examining prospective repetition of DSH found an association between method and repetition, whereby those who presented with self-injury were more likely to repeat DSH within one year than those who presented with self-poisoning (Kessel & McCulloch, 1966). This finding has been supported by accumulating evidence that choice of DSH method may affect the likelihood of repetition of DSH, with self-cutting in particular conferring increased risk. Hawton and colleagues (2004) identified two samples of DSH patients presenting to emergency departments in Oxford and compared those who had self-cut to those who had self-poisoned. Compared with those who self-poisoned, patients who self-cut were 1.5 times more likely (1976-1988) and twice as likely (1988-1998) to have a history of self-harm. Comparing across self-cutting, overdose and other self-harm presentations to an adolescent outpatient unit, Fortune (2006) found that those presenting with self-cutting were more likely than those presenting with other forms of self-harm to have a history of suicidal ideation and had a greater number of previous self-harm episodes. Similarly, Horrocks and colleagues (2003) compared patients who had self-injured to those who had self-poisoned and found that self-injurers were more likely to have a history of DSH.

Studies adopting prospective designs have yielded similar results. A multicentre study in England used emergency department records to explore repetition up to 18 months after an index self-harm presentation (Lilley et al., 2008). They found that those who had self-cut or used combined methods (usually self-

cutting and self-poisoning) at the index episode were more likely to repeat than those who presented with self-poisoning or self-injury other than cutting. Moreover, those who had self-cut or used combined methods tended to repeat sooner after the index than the other DSH patients. Cooper, Kapur, Dunning, Guthrie, Appleby, and Mackway-Jones (2006) and Bilén, Ottosson, Castrén, Ponzer, Ursing, Rant et al (2010) also reported higher rates of repetition among those presenting with self-cutting.

The above studies looked at self-cutting in particular but there have been a number of studies that include cutting within a wider self-injury category and which have found similar results. A register-based study in Denmark (Christiansen & Jensen, 2007) included data from 1995-2000 with a mean follow-up period of 3.9 years and found a significant difference in repetition rates according to method of DSH. The researchers found that index cases involving gas, cutting or stabbing were 1.3 times more likely to re-present with DSH during the study period. Similarly, Hultén and colleagues (2001) used data from the WHO/EURO Multicentre Study to examine repetition of DSH among 15-19 year-olds. The patients were followed up for an average of 3.9 years. The authors categorised method of DSH as "hard" (self-injury: ICD codes X70-84) or "soft" (self-poisoning: X60-69). They found that using a "hard" method of DSH at the index episode was associated with a risk of repetition that was 1.5 times that of those who used "soft" methods of DSH. A study which compared repetition rates among those who had presented with self-poisoning only to rates among those who had presented with self-injury alone or in combination with self-poisoning in Ireland (Corcoran, Keeley, O'Sullivan, & Perry, 2004) found that the latter group were 2.2 times more likely to repeat DSH within 12 months.

In addition to the increased risk of repetition associated with self-cutting, there is emerging evidence that self-cutting may confer increased risk of suicide following DSH. Cooper and colleagues (2005) followed up almost 8000 patients for four years and found that those who self-cut at the index episode were twice as likely to die by suicide (p=0.06). Bergen et al (2012) reported similar risk of suicide among those who presented with self-cutting. A study in Sweden by Runeson et al. (2010) based on a sample of 48,689 self-harm patients found no increased risk of suicide associated with self-cutting as compared with self-poisoning over a follow-up period of 21-31 years. This does not necessarily contradict the findings of the studies in Britain however, because the Swedish sample was limited to those who had been admitted to inpatient care as opposed to all self-harm presentations, and hence was likely to have differentially excluded self-cutting patients, who are less likely to be admitted.

Processes Underlying Repetition of Self-Harm.

In order to explore why those who self-cut are at increased risk of repeated self-harm, it is necessary to examine existing theories of repetition. Despite the plethora of theories that purport to account for self-harm, there are few that attempt to explain why some people repeat self-harm and why others do not. Models that attempt to account for repetition of self-harm tend to either focus on pre-existing vulnerability for repetition, or on behavioural contingencies for self-harm: these will be discussed below.

The suicidal process model proposes that suicidal behaviour occurs on a continuum and increases over time. Understanding suicidal behaviour as occurring

on a continuum involves conceptualising key variables (e.g. severity of DSH, suicidal intent, lethality of method of DSH, and risk of suicide) as continuous, rather than categorical, variables which differ between and within individuals. Moreover, because similar stressors may result in differing suicidal reactions in different people, the diathesis for suicidal behaviour also operates on a continuum. The suicidal process model proposes that a person's vulnerability to suicidal behaviour increases over time. Post (1992) found that each episode of depression leaves neurological residues that render a person more vulnerable to future episodes. This process is referred to as "kindling", whereby repeated exposure to stress results in neuronal change, which leads to a vulnerability to future stress that is more trait-like than state-like. Neeleman, de Graaf and Volleberg (2004) conducted a study of Dutch adults which measured suicidality at two time-points twelve months apart. They found that mental illness was more strongly associated with suicidality at follow-up among those who had reported suicidality at baseline than those who had not. The inverse was true for negative life events, with negative life events more strongly associated with follow-up suicidality among those without baseline suicidality compared with those with baseline suicidality. The authors conclude that, at the start of the suicidal process, the stressors associated with suicidal behaviour are external but that, as the process progresses, the stressors become more autonomic. This conclusion echoes that of Williams and Pollock (Williams & Pollock, 2008) who maintained that earlier stages of defeat are associated with protest, which, over time, turns to despair. David Rudd emphasises the importance of recognising the fact that risk of self-harm and suicide is fluid over time, of acknowledging "the reality that suicidal crises come and go, that some aspects of risk are enduring, and that all patients have different levels of vulnerability to experience

another suicidal crisis in the future" (p.409; Jobes, Rudd, Overholser, & Joiner Jr, 2008).

Lau, Segal and Williams (2004) applied Teasdale's differential activation hypothesis to suicidal behaviour and suggested that the diathesis of cognitive reactivity ("the activation of negative information processing biases when an individual experiences dysphoric mood") is what differentiates those who experience recurring suicidal behaviour from those who do not repeat. Arising from this hypothesis, the authors propose that earlier episodes of self-harm are more strongly related to psychosocial stressors whereas later episodes will require less of an external trigger, drawing on the concept of kindling, which was originally proposed in relation to depression. This finding has been supported by several cross-sectional studies of self-harm patients (Crane, Williams, Hawton, Arensman, Hjelmeland, Bille-Brahe et al., 2007; Neeleman et al., 2004).

Another possible explanation for repetition is that, of those who have sufficient vulnerability to engage in self-harm, those with a greater level of vulnerability (such as abuse, genetic predisposition, and deficits in problem-solving and memory) are more likely to go on to engage in self-harm again after an index episode. Yet another possibility is that suicidal ideation occurs with comparable frequency across self-harmers but that higher levels of volitional moderators, such as capability, access to means, and imitation (O'Connor, 2011) place some individuals at higher risk of engaging repeatedly in self-harm than others. Certainly, in one cross-sectional study of retrospective repetition (Rasmussen, Fraser, Gotz, MacHale, Mackie, Masterton et al., 2010), repeaters obtained similar scores on suicidal ideation as non-repeaters but scored non-significantly lower on measures of social support.

Given that each act of self-harm a person engages in confers increased risk of further self-harm, a helpful framework for examining how the consequences of self-harm may affect repetition risk is that proposed by Nock and Prinstein (2004), which suggests two axes: social versus automatic and negative versus positive reinforcement. Several models of self-harm identify negative reinforcement as the process underlying repetition, most often focussing on self-injury. The Experiential Avoidance Model of self-harm (Chapman, Gratz, & Brown, 2006) conceptualises self-injury (with "no intent to die") as a means of experiential avoidance, which becomes increasingly powerful through escape conditioning, and becomes an automatic response to negative emotional stimuli. The authors suggest several mechanisms by which self-harm reduces emotionally aversive states, including the opioid hypothesis, distraction, and self-punishment. More recently, Stanley, Sher, Wilson, Ekman, Huang, & Mann (2010) proposed a model of non-suicidal self-harm based on the principle of homeostasis. The model arose from their finding of lower levels of cerebrospinal fluid endogenous opioids (namely β-endorphin and met-enkephalin) in psychiatric patients with history of self-injury compared with psychiatric patients without a history of non-suicidal self-injury. Interestingly, all patients in the study, including controls, had a history of repeated suicide attempts (presumably referring to incidents of more medically severe self-harm with higher suicidal intent), indicating that the differences on endogenous opioids may be specific to those engaging in self-harm that involves (a) self-injury and/or (b) low suicidal intent. Therefore it is possible that the process of negative/positive physiological reinforcement relates specifically to self-injury, rather than to self-harm more generally. Unlike the Experiential Avoidance Model, the model proposed by Stanley and colleagues is not cyclical and does not refer specifically to

the processes by which an index episode of self-harm renders a person at higher risk of future self-harm.

As well as potential positive and negative physiological reinforcement of self-harm, repetition may be understood in the context of positive and negative social reinforcement. Following from Nock and Prinstein's (2004) framework, self-harm may be conceptualised as a means of escaping a negative situation by eliciting help (negative reinforcement), or as a means of bringing about positive social interactions (positive reinforcement). Increased interpersonal support may not have originally been a motive to engage in self-harm; Chapman and colleagues (2006) refer to such unintended positive interpersonal effects as "secondary gain", which they suggest helps to challenge the stereotype of self-harm as manipulative.

In summary there are several theoretical approaches to repetition, which may be divided into vulnerability-based approaches (which arise from studies of self-harm more generally) and reinforcement-based approaches (which tend to focus on self-injury). There is a lack of empirical testing of these models and it is unclear whether repetition of self-harm is more usefully conceptualised as vulnerability-based, operant, or a combination of both.

Methodological Issues in Self-Harm Repetition.

Repetition may be examined in a number of ways, but informing risk assessments and interventions with self-harm patients requires that repetition be examined prospectively. Cross-sectional studies of association between retrospective repetition and risk factors cannot provide evidence that a particular risk factor pre-dated

repetition, unless the factor is relatively fixed (such as gender). Follow-up of self-harm patients through registers or interviews allows for the identification of baseline risk factors that predict repeated self-harm ahead of time, allowing for targeted intervention of high-risk individuals.

A second methodological consideration is the unit of analysis within register studies of self-harm: unlike other dichotomous outcomes, such as death or disease onset, self-harm repetition is an outcome that can occur more than once. Lilley and colleagues (2008) used Kaplan-Meier curves to show how the proportion of non-repeaters decreased over time, producing two curves: one based on the time from an index episode to a repeat episode (person-based) and one from each episode to a repeat episode (event-based). The first method revealed a repetition rate after 12 months similar to that of a recent systematic review (Owens, Horrocks, & House, 2002) while the second method revealed a repetition rate of 31% at 12 months. The authors maintain that person-based estimates of repetition greatly underestimate the extent of DSH repetition.

A third methodological issue around repetition is the methods used to detect it. Studies of self-harm that recruit from hospitals tend to detect repetition through hospitals and may underestimate the true extent of repetition, given the evidence outlined earlier that the majority of self-harm episodes do not result in hospital presentation. Unfortunately, using follow-up interviews has its own drawbacks in the form of attrition and recall bias.

Self-Cutting and Repetition: A Poorly Understood Association

Why should self-cutting be associated with an increased risk of repetition of self-harm? Following from the theoretical approaches to repetition outlined above, there are two broad explanations. It is apparent from the association between self-cutting and more severe psychopathology that those who self-cut exhibit a more vulnerable profile. It is possible that those who engage in self-cutting have pre-existing characteristics that place them at higher risk of repetition. An alternative explanation is that the consequences of self-cutting differ from the consequences of other self-harm methods. Perhaps there is something inherent in the act of self-cutting that makes it self-reinforcing. Alternatively, the increased risk of repetition associated with self-cutting might be caused by health services responses to these patients, considering that those who engage in self-poisoning and more lethal forms of self-injury are more likely to be admitted to hospital, more likely to receive a psychosocial assessment, and hence perhaps more likely to receive effective interventions to prevent further DSH. It is also possible that interventions may be differentially effective for self-cutting and other self-harm patients. Although high-quality prospective studies have demonstrated a robust association between self-cutting and repetition, potential mechanisms for such an association have never been empirically tested.

Summary and Research Aims

This literature review has provided a critical overview of self-harm research, focussing in particular on methods of self-harm and the association between methods and characteristics of self-harm presentations. It is clear that there are significant

differences between self-cutting and overdose patients in terms of demographic and clinical characteristics but that there is a dearth of research into why such differences should exist. While self-cutting and intentional overdose may seem fundamentally different in terms of the experience of the behaviours themselves and their physical and psychological consequences, the two are often grouped within the broader category of self-harm. Much European research over the past two decades has tended to label self-harm as an action that is undertaken intentionally to cause harm to oneself, regardless of the function of the behaviour or underlying suicidal intent. This approach has helped to launch large-scale epidemiological studies and successful collaborative suicide prevention initiatives across and beyond the region. In addition, it has helped to discredit the myth that self-injury was somehow "less serious" than self-poisoning. However, empirical evidence suggests a consistent association between self-cutting and repetition, the mechanisms of which have been largely ignored. Such an association has implications for the effective management of self-harm patients in emergency department settings.

The aims of the current thesis are as follows:

1. To examine self-cutting as a risk factor for repetition within the context of previous research on risk factors for prospective repetition of self-harm
2. To examine the association between self-cutting and prospective repetition in an Irish context in particular
3. To examine potential subgroups within self-cutting presentations and how these subgroups differ in terms of repetition risk
4. To compare self-cutting and intentional overdose patients on demographic, presentation, baseline psychological variables, and outcome
5. To explore the lived experience of repeated self-cutting and overdose

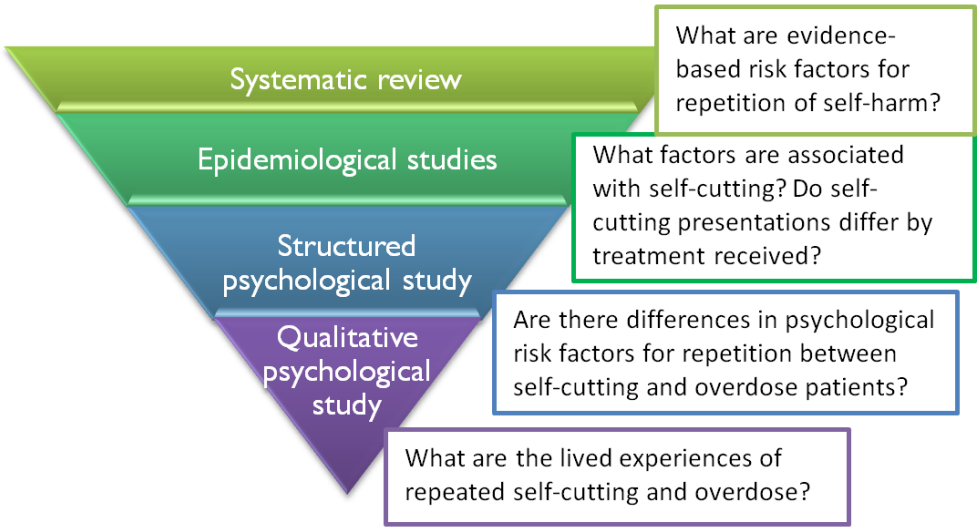


Figure 2.1. Schematic diagram of multiple methodologies and corresponding research questions in the current thesis

These aims are realised by the implementation of a multi-method approach (Figure 2.1), using systematic review, an epidemiological registry approach, psychological measurement, and phenomenological approaches to address various research questions related to the association between self-cutting and repetition. Given that self-harm is a topic whose aetiology and consequences span multiple domains, the current approach is intended to give a holistic view on the association between self-cutting and repetition, from the global to the ideographic.

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Chapter 3: Risk Factors for Repetition of Self-Harm: A Systematic Review of Prospective Hospital-Based Studies

Rationale

The previous chapter detailed the significance of repetition as an outcome after an index episode of self-harm in terms of suicide risk, healthcare costs and continuing morbidity. Efforts within the health service to reduce repetition among self-harm patients must begin with early identification of those at risk of further self-harm. Risk assessment of those presenting with self-harm forms an integral part of suicide prevention strategy in many countries as a means of allocating interventions in a group at indicated risk. Despite the recognition that risk assessments ought to incorporate evidence-based risk factors for repetition of self-harm, there are few resources at a clinician's disposal which provide guidance on which factors to assess. It is not the case that the topic has not been investigated; indeed, there have been dozens of high-quality studies testing a variety of risk factors. However, the body of literature is vast and often contradictory. Recent published reviews of risk factors for repetition of self-harm seem unsuitable for risk assessments as they have included studies of community samples, have been unsystematic, or cover just one year of publications.

The current study is a systematic review of risk factors for repetition that is intended to inform risk assessments of self-harm patients. Moreover, it provides a context for the interpretation of the usefulness of self-cutting as a risk factor for repetition.

Risk Factors for Repetition of Self-Harm: A Systematic Review of Prospective Hospital-Based Studies

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Abstract

Self-harm entails high costs to individuals and society in terms of suicide risk, morbidity, and healthcare expenditure. Repetition of self-harm confers yet higher risk of suicide and risk assessment of self-harm patients forms a key component of the health care management of self-harm patients. To date, there has been no systematic review published which synthesises the extensive evidence on risk factors for repetition. This review is intended to identify risk factors for prospective repetition of self-harm after an index self-harm presentation, irrespective of suicidal intent. We included journal articles, abstracts, letters and theses in any language published up to June 2012 which adopted a cohort study design to examine factors associated with prospective repetition among those presenting with self-harm to emergency departments. A systematic search located 129 relevant studies, which were quality-assessed and synthesised in narrative form. Some risk factors were studied extensively and were found to have a consistent association with repetition (previous self-harm, history of psychiatric treatment, current psychiatric treatment, alcohol misuse/dependence, drug misuse/dependence, personality disorder, living alone, schizophrenia, unemployment, not being married) while mood disorder was less reliable as a predictor of repetition. However, the sensitivity values of these

measures varied greatly across studies. Psychological risk factors and protective factors have been relatively under-researched but show emerging associations with repetition. Composite risk scales tended to have high sensitivity but poor specificity. The results suggest a dose-response relationship between vulnerability and repetition risk. Many risk factors for repetition of self-harm match risk factors for initiation of self-harm, but the most consistent evidence for increased risk of repetition comes from long-standing psychosocial vulnerabilities, rather than characteristics of an index episode. The current review will enhance prediction of self-harm and assist in the efficient allocation of intervention resources.

Introduction

Suicide is a significant health problem worldwide, with up to one million lives being lost to suicide annually (WHO, 1999). Non-fatal deliberate self-harm (DSH) is yet more prevalent and is associated with increased risk of suicide (Christiansen & Jensen, 2007; Hawton, Zahl, & Weatherall, 2003b; Owens, Horrocks, & House, 2002) and high costs in terms of health service resource utilisation (Sinclair, Gray, & Hawton, 2006). Repetition of self-harm is common, particularly in the first weeks after an index hospital presentation of self-harm (Gilbody, House, & Owens, 1997; Gunnell, Bennewith, Peters, Stocks, & Sharp, 2002). The individual and societal costs associated with DSH escalate with repetition: Those who repeat self-harm are more than twice as likely to die by suicide compared with those who had engaged in DSH on one occasion only (Zahl & Hawton, 2004). Health service costs also increase with repetition (Sinclair, Gray, Rivero-Arias, Saunders, & Hawton, 2010) and repetition is indicative of persistent difficulties (Hepple & Quinton, 1997; Sjöström, Hetta & Waern, 2009).

The effective prevention of self-harm requires multi-level intervention, ranging from community-based mental health promotion campaigns to clinical interventions with high-risk individuals (Hegerl, Wittenburg, Arensman, Van Audenhove, Coyne, McDaid et al., 2009). However, accurate identification of individuals at risk of future self-harm is challenging. Extant research suggests that one of the strongest predictors of future self-harm is previous self-harm (Christiansen & Jensen, 2007) but there is not a perfect relationship between the two. A systematic review (Owens et al., 2002) reported that a median of 16% of self-harm patients repeat within one year, with the implication that presenting with self-harm in itself is an inadequate predictor of future self-harm.

With increasing constraints on acute hospital resources, those conducting risk assessments of self-harm patients could benefit from information on additional risk factors for future self-harm so as to effectively allocate resources to those most at risk. Indeed, risk assessment forms part of the recommended care for those presenting to UK emergency departments with self-harm (NICE, 2004). Such a risk assessment should include "identification of the main clinical and demographic features known to be associated with risk of further self-harm and/or suicide, and identification of the key psychological characteristics associated with risk, in particular depression, hopelessness and continuing suicidal intent" (p. 27). Unfortunately, this guidance is not sufficiently detailed and no recently published review exists which offers a comprehensive overview of risk factors for repetition of self-harm among self-harm patients. Similar reviews are out-dated (Myers, 1988), limited to non-suicidal self-injury (Fliege, Lee, Grimm, & Klapp, 2009), limited to psychometric assessment tools (Randall, Colman, & Rowe, 2011), or limited to examining one risk factor (McMillan, Gilbody, Beresford, & Neilly, 2007). The current systematic review is a synthesis of extant research on risk factors for repetition of self-harm among those presenting to emergency departments with self-harm. The purpose of this review to distil a burgeoning field into a digestible format for those conducting risk assessments of self-harm patients and to identify risk factors that are consistently associated with self-harm repetition, as well as identifying under-researched factors that show promising associations with repetition.

Method

Inclusion Criteria.

The definition of deliberate self-harm used was that adopted in the WHO/EURO study, namely "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 recognized therapeutic dosage, and which is aimed at realising changes which the subject desired via the actual or expected physical consequences" (Platt, Bille-Brahe, Kerkhof, Schmidtke, Bjerke, Crepet et al., 1992). This definition does not assume or preclude suicidal intent and the degree or presence of suicidal intent as stated in the studies did not influence the decision to include papers in the review.

As this review is intended to inform health professionals who conduct risk assessments with patients presenting with self-harm, we included only hospital-based studies, which recruited self-harm patients after they had presented to hospital with self-harm and which measured potential risk factors soon after presentation. Studies were included if an outcome measure was prospective repetition of self-harm, either self-reported or derived from hospital records, over any length of follow-up. Both approaches to detecting repetition are of value: Self-report is subject to report bias but is effective in detecting "hidden" self-harm whereas hospital records are less prone to report bias but limited to those who present to observed hospitals. Because of the focus on prediction over time, studies were included if they adopted a longitudinal study design and excluded if they adopted a cross-sectional design. Included studies were those that compared factors between repeaters and non-repeaters.

Studies were excluded if they were part of an intervention study, except in cases where the study involved only patients from the control arm. Language of publication did not form an exclusion criterion.

Search strategy.

Journal articles, abstracts, letters and theses published in all years up to June 2012 were included. A literature search was conducted using the following databases: Scirus, PubMed, and PsycInfo. MeSH was used to generate synonyms for deliberate self-harm (DSH). We searched for articles containing the following terms: synonyms for DSH (e.g., "self-harm", "attempted suicide", "parasuicide", "self-injur*", "self-poison*"), synonyms for repetition (e.g., "repeat*", "recur*", "re-present*", "recidiv*") , and synonyms for cohort study (e.g., "follow-up", "retrospective", "predict*", "prospective", "longitudinal"). For example, using the following identified 640 records in PsycInfo: ("self-harm*" OR "attempted suicide" OR "suicide attempt*" OR "self-injur*" OR "parasuicide*" OR "suicidal" OR "self-poison*" OR "self-cut*") AND (re-present* OR repeat* OR repetition OR recur* OR recidiv*) AND (cohort OR longitudinal OR "follow-up" OR "followed up"OR prospective OR predict*) in "alltext" with no limits.

The process of study selection is illustrated in Figure 3.1.

Data Collection.

The following data were extracted from each located article: authors and year of publication; setting; location; eligibility criteria (suicidal intent: methods of self-harm; admission status); recruitment process; response rate; baseline number of

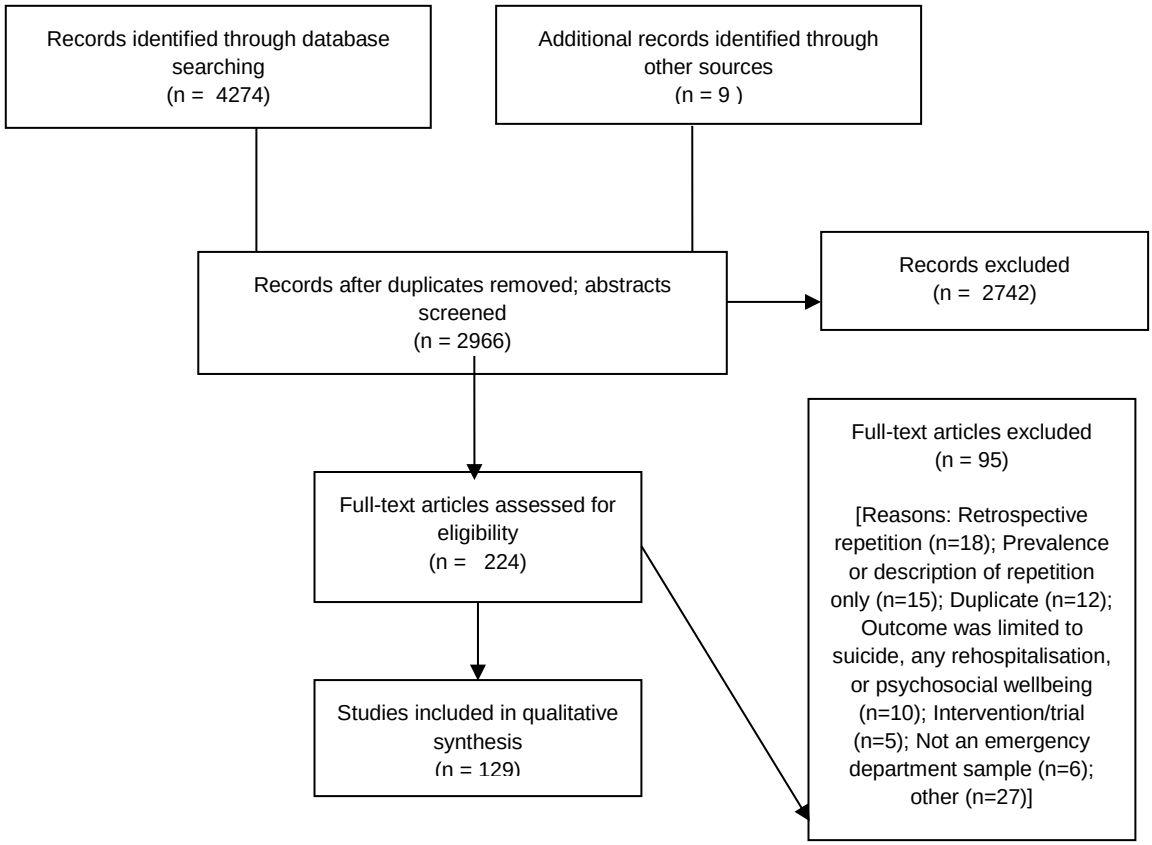


Figure 3.1. Flowchart of included and excluded studies

participants; factors measured and operationalization used; duration of follow-up; means of repetition detection; retention rate; statistical methods used. Papers were later revisited and authors contacted to create crosstabs of certain variables, with counts of cases for repetition (yes/no) by risk factor (present/absent) for inclusion on forest plots of prediction values.

Quality assessment.

The quality of the included studies was assessed using the original instrument outlined in Table 3.1. Strong evidence for the identification of a risk factor would be

Table 3.1.

Quality Assessment Tool Used to Assess Located Studies Including Scoring Criteria

Criterion	Scoring
Representativeness	1: Random/consecutive and response rate>70%
	0.5: Restrictive inclusion/exclusion criteria or response rate<70%
	0: Convenience sampling
Adequate power	1: Describes power calculations and was adequately powered
	0.5: Does not describe calculations but is adequately powered (n>175)
	0: Is not adequately powered
Appropriate outcome measure	1: Both self-report and hospital records
	0.5: Hospital records or self-report with ≤20% attrition
	0: Self-report with >20% attrition
Controlling for confounder variables	1: Confounders controlled for by design or statistical analysis
	0: Confounders not controlled for
Appropriate statistical analyses	1: Appropriate statistical analyses used
	0.5: Appropriate statistical analyses used in univariate or multivariate analyses only
	0: Appropriate statistical analyses not used

derived from a study which included all presentations of self-harm, which reported sample size calculations and was adequately powered, which used both self-report and hospital records to detect repetition, which controlled for confounders and which used appropriate statistical analyses. The selection of quality criteria for the instrument was based on key methodological concerns of extant checklists/guidelines while being tailored specifically to cohort studies of self-harm patients. In line with a systematic review of existing quality assessment tools (Sanderson, Tatt, & Higgins, 2007), our original instrument incorporates items for

five core quality concerns including selecting study participants, measuring outcomes, addressing design-specific sources of bias, control of confounding and analysing data (von Elm, 2007). The cut-off points adopted in the instrument are based on typical recruitment/retention rates and means of repetition detection in published cohort studies of self-harm patients. The cut-off for adequate power (n=175) is the minimum number of participants required to detect a small-medium Cohen's d of 0.3 in a two-tailed *t* test of independent samples with alpha level of 0.05.

The score obtained using this tool is not necessarily a reflection of the quality of the study overall but rather the evidence that a particular risk factor is associated with repetition. For example, a well-designed study of adolescents would receive a score of 0.5 on "sampling" because the study excluded those who were not adolescent. Moreover, a number of studies did not focus on repetition as an outcome but as a factor associated with an alternative variable (e.g., Hawton, Houston, Haw, Townsend, & Harriss, 2003a; Zahl & Hawton, 2004). These studies included multivariate analyses in predicting other variables but not repetition and they would receive a mark of zero for "controlling for confounder variables".

Synthesis of included studies.

Given the multitude of risk factors investigated in the included studies, most of the associations between risk factors and repetition are presented in narrative form, giving an indication of the magnitude, direction, and statistical significance of associations across studies. Where counts of exposure and outcome were reported, odds ratios were calculated and used to inform the narrative; otherwise, we used the

original reported effect sizes, namely hazard ratios (HR), odds ratios (OR) and relative risk (RR) for dichotomous variables. For continuous variables, Cohen's *d* was calculated where possible.

A small number of risk factors were selected for more detailed analysis. These factors were selected on the basis that they were examined extensively and appeared to show some consistency in their association with repetition, including: previous self-harm, personality disorder, previous psychiatric treatment, current psychiatric treatment, mood disorder, schizophrenia, alcohol misuse, drug misuse, unemployment, living alone, and being single/divorced/widowed. In order to more closely examine the usefulness of these factors, the sensitivity and specificity of each factor in predicting repetition in each study were calculated. Forest plots of the values were generated using Review Manager 5.1 ("Review Manager (RevMan) [Computer program]. Version 5.1. ," 2008), but pooled estimates of predictive values were not calculated on the basis that the definition of a positive test varied among studies and often depended on judgment rather than measurement (Macaskill, Gatsonis, Deeks, Harbord, & Takwoingi, 2010). Some included studies reported that the association between one of these 11 factors and repetition had been examined but did not report counts of exposure and outcome measures. In these cases, authors were contacted to obtain count data and these studies were excluded from forest plots if data was not made available. The characteristics of the included studies are tabulated in Appendix 1.

Results

Characteristics of located studies.

The systematic literature search located 129 studies (Figure 3.1). The number of baseline participants ranged from 22 to 50891, with 23 studies involving less than 100 patients, 64 with between 100 and 1000 patients and 42 involving more than 1000 patients. The majority of included studies were conducted in Europe (106/129), of which 56 were conducted in the UK. Out of the 23 remaining studies, nine were conducted in Australia or New Zealand, eight were conducted in the US or Canada, two in India and one study each in Fiji, Hong Kong, Nicaragua, and Kuwait. One was published in the 1960s, nine in the 1970s, 11 in the 1980s, 37 in the 1990s, 52 in the 2000s and 20 since 2010. In terms of the level of suicidal intent of the self-harm episodes, no studies were identified which included only non-suicidal self-injury, 11 studies included only patients who confirmed that their self-harm was intended to cause death, seven studies did not provide adequate information on intent, and the remainder (n=111) of the studies included self-harm of all levels of suicidal intent. The shortest follow-up period was three months, the longest was 41 years, with the most common follow-up period being 12 months. Given that cohort study design was one of the inclusion criteria of the review, the design of the studies was largely homogeneous but the quality of the procedures of data collection and analyses varied. The mean quality score for studies was 3.0 out of a maximum score of 5. Using the scale outlined above, 44 studies scored up to and including 2.5 (low), 55 scored 3-3.5 (medium), and 30 scored 4 or over (high). The frequencies of scores for each of the five quality criteria are summarised in Table 3.2. The majority of the studies succeeded in recruiting a representative sample and in conducting appropriate statistical analyses. Many studies were underpowered but the larger studies tended to rely on only hospital records to detect repetition. About half of the

studies controlled for confounding and such analyses were more common in publications from recent years.

Table 3.2

Frequencies of Each Score on Quality Assessment Tool of Located Studies (n=129)

	Score		
Criterion	*0*	*0.5*	*1*
Representativeness	1	54	74
Adequate power	52	75	2
Appropriate outcome measure	19	99	11
Controlling for confounding variables	59	-	70
Appropriate statistical tests	6	0	123

Distal Risk Factors.

Demographic factors.

Gender.

The majority of located studies examined the association between gender and repetition of self-harm. Of the 68 studies reporting univariate analyses, the majority of studies found no significant difference in prospective repetition between males and females, regardless of quality. Higher-quality studies were more likely to find that gender significantly affected repetition risk (probably as reflection of larger sample sizes), but statistically significant effect sizes were almost equal in reporting males and females as being at higher risk of repetition, and effect sizes were small. Of the 22 high-/medium-quality studies using multivariate analyses, seven showed

an effect for gender, of which five indicated that females were at higher risk with associated odds ratios ranging from 1.4 [95% confidence interval (CI): 1.1 to 1.7] (Bilén, Ottosson, Castrén, Ponzer, Ursing, Ranta et al., 2010) to 2.56 (95% CI: 1.05-6.25) (Johannessen, Dieserud, Jakhelln, Zahl, & De Leo, 2009). Overall these findings represent mixed evidence of an association between gender and repetition.

Age.

Fifty-eight studies examined the association between repetition and age. Twenty-nine studies operationalized age as a continuous variable, of which four high-/medium-quality studies and three low-quality studies reported a significant association between decreasing age and repetition, with non-repeaters being younger by three to seven years. Only one lower-quality study found an increased risk of repetition with increasing age. Twenty-one studies involving adult participants used age-groups to explore an association with repetition. In general there was an association between young adulthood (approximately 20-54 years of age) and repetition, compared with other self-harm patients whereas four studies found no association between age-group and repetition. Four studies which dichotomised age into two age-groups, of which three found higher repetition rates in the younger age-group. Taken as a whole, these studies indicate that those who go on to repeat tend to be younger than non-repeaters, except within adolescent groups where there is some evidence that older adolescents are at higher risk than younger adolescents. Few studies examined whether gender moderated the association between repetition and age. Only one study (McEvedy, 1997) reported a significant interaction

(whereby male repeaters were older than male non-repeaters with no corresponding age difference between female repeaters and non-repeaters).

Ethnicity and nationality.

Compared with other demographic factors, ethnicity has been relatively under-researched. Three recent high-/medium-quality UK studies of overlapping cohorts found a significantly lower rate of repetition among those of non-White ethnicity, with rate ratios ranging from 0.56 to 0.70 for South Asian and Black patients (Johnston, Cooper, Webb, & Kapur, 2006) . The sample size was much smaller in a study from the US (Peterson & Bongar, 1990) so the decreased risk of repetition among those who were not of White or Black ethnicity did not reach statistical significance. A lower-quality study by Groholt, Ekeberg, and Haldorsen (2006) found that the proportion of patients with parents from Asia or Africa did not differ significantly between repeaters and non-repeaters. These findings suggest an emerging inverse association between non-White ethnicity and repetition in UK populations, though verification in independent cohorts is required.

In terms of the role of nationality, Mehlum et al. (2010) found a lower rate of repetition among non-Europeans as compared with Norwegians in a Norwegian study, an association that persisted multivariate analysis, whereas lower quality studies found no significant association in univariate analyses between nationality and repetition.

Dispositional psychological risk factors.

Hopelessness.

Twenty-five studies have examined hopelessness as a predictor of DSH repetition. One systematic review (McMillan, Gilbody, Beresford, & Neilly, 2007) exploring whether a high score (≥9) on the Beck Hopelessness Scale could predict DSH located six studies, four of which were conducted in emergency department settings; three studies meet the inclusion of the current review (Colman, Newman, Schopflocher, Bland, & Dyck, 2004; Hawton, Houston, Haw, Townsend, & Harriss, 2003; Sidley, Calam, Wells, Hughes, & Whitaker, 1999) and one does not because it involved an intervention (Tyrer, Thompson, Schmidt, Jones, Knapp, Davidson et al., 2003)[1]. McMillan and colleagues found that using a cut-off point of 9 gave a pooled sensitivity of 0.77 (95%CI: 0.72–0.81) and pooled specificity of 0.41 (95% CI: 0.37–0.45) with a pooled diagnostic odds ratio of 2.27 (95% CI: 1.53–3.37). They concluded that the low specificity of the BHS in predicting repetition in their meta-analysis precludes the use of the BHS as a tool to allocate treatment, as it would identify more patients as being at risk than could be feasibly offered treatment. Since the systematic review was conducted, two further high-medium quality studies examined the association between high BHS scores and repetition of DSH (McAuliffe, Corcoran, Hickey, & McLeavey, 2008; Randall, Rowe, & Colman, 2012). Both found no statistically significant difference in repetition risk associated with scoring over 14, with odds ratios of 1.90 and 1.41 respectively.

Eight studies (of which five were of high-/medium-quality) used the BHS as a continuous variable in univariate analyses and reported significantly higher scores in repeaters than non-repeaters (differences in mean scores between repeaters and non-repeaters ranged from 1.0 to 4.9 points). Five studies have found no significant difference on BHS scores between repeaters and non-repeaters, although three of these reported that repeaters had a higher mean score on the BHS that did not quite

reach statistical significance, with effects sizes (Cohen's *d*) ranging from 0.62 to 0.83. Controlling for a variety of psychiatric, psychological and demographic variables, Beautrais (2004) revealed a statistically significant adjusted odds ratio of 1.13 associated with each point increase on the BHS. Similarly, Verkes, Fekkes, Zwinderman, Hengeveld, Van der Mast, Tuyl et al., (1997) controlled for several biological measures and suicidal ideation and reported a statistically significant hazard ratio of 1.16 associated with repetition. Three high-/medium-quality studies using multivariate models reported increased odds of repetition that were not statistically significant. Overall, these findings indicate a consistent moderate association between BHS scores and repetition.

One high-/medium-quality study (Kapur, Cooper, King-Hele, Webb, Lawlor, Rodway et al., 2006) reported a significantly increased repetition hazard ratio among those who seemed hopeless at the mental state assessment (HR: 1.29, 95% CI: 1.17-1.43). One lower-quality study (Wiktorsson, Marlow, Runeson, Skoog, & Waern, 2011) reported that self-reported hopelessness using one item from the Geriatric Depression Scale did not predict repetition in a sample of patients aged over seventy years. Sidley et al. (1999) examined hopelessness using both the Beck Hopelessness Scale and the future fluency task over a six-month follow-up period. The analysis showed that BHS scores were univariately associated with repetition at one and six months, whereas positive future fluency had a sizeable association with repetition at six months only (d=0.57).

Trait anger, aggression and impulsivity.

Two high-/medium-quality studies used Spielberger's State-Trait Anger Scale. Colman (Colman, 2000) dichotomised participants based on a median split, finding a

repetition odds ratio of 1.61 associated with higher trait anger scores. The association barely reached statistical significance and did not emerge as an independent predictor of repetition in a logistic regression. Hawton et al (1999) found that adolescents who repeated self-harm scored slightly lower on trait anger (d=-0.16), but the difference was not statistically significant.

Yeh, Hung, Lee, Lin, Chiu, Huang et al (2012) reported non-significantly higher aggression scores in repeaters than non-repeaters, with a small effect size (d= 0.17) using four items from the Buss-Perry Aggression Questionnaire . Three high-/medium-quality studies and one lower-quality study have shown a higher risk of repetition among those with a criminal record or a history of violence against others, with a particularly strong association in males (Haw, Bergen, Casey, & Hawton, 2007). Five studies found no significant association between a history of violence/criminal record and repetition, but those reporting effect sizes showed that a tendency for higher repetition risk among those with such a history. Overall these findings emerging evidence of a small association between repetition and criminal record/history of violence.

One high-/medium-quality study (Randall et al., 2012) reported that an increase of one standard deviation on the hostility subscale of the Brief Symptom Inventory was associated with a significant increase in the risk of repetition (OR=1.58, 95% CI: 1.06-2.36), but the association did not persist in multivariate analyses. Two studies (Brittlebank, Cole, Hassanyeh, Kenny, Simpson, & Scott, 1990; Sakinofsky & Roberts, 1990) reported a significant positive association between repetition and baseline external hostility, with effect sizes in the latter of d=0.48. These studies also examined internal hostility, with the lower-quality study (Brittlebank et al., 1990) reporting a positive association with repetition and the

high-/medium-quality study (Sakinofsky & Roberts, 1990) finding a non-significant association in the same direction (*d*=0.32).

Seven studies examined the association between impulsivity and repetition. Four high-/medium-quality studies used the Barratt Impulsivity Scale (BIS) and, using a variety of cut-off scores, all found a positive small to medium associations with repetition. Randall et al (2012) also examined subscales within the BIS, and found an increased risk of repetition with each standard deviation increase in (OR 1.59; 95%- CI 1.06-2.38), attentional impulsiveness (OR 1.68; 95% CI 1.13- 2.51), cognitive instability (OR 1.49; 95% Cl 1.02-2.18), motor (OR 1.68; 95% CI 1.10-2.56), and motor impulsiveness (OR 1.64; 95% CI 1.08-2.52). Cognitive instability and attentional impulsiveness remained significant in multivariate analysis controlling for demographic and presentation characteristics. Yeh et al (2012) reported significantly higher impulsivity scores in repeaters than non-repeaters, with a moderate effect size (*d*= 0.57) using five items from the Impulsivity Rating Scale. Three studies found that impulsivity was non-significantly higher in repeaters using Eysenck's I-V-E Impulsivity Questionnaire (Evans et al, 1996; d=0.03), a composite score of the Youth Self-Report and Child Behavior Checklist (Groholt, 2006; d=0.30), and the Plutchik Impulsivity Scale (Hawton et al., 1999; d=0.09) respectively. These results suggest a positive association between repetition and impulsivity, specifically as measured by the Barrett Impulsivity Scale.

Problem-solving and autobiographical memory.

Four studies, all of medium/high quality, have measured limited problem-solving ability/negative problem-solving skills as a potential risk factor for repetition. In terms of interpersonal problem-solving, one study (Hawton, Kingsbury,

Steinhardt, James, & Fagg, 1999) found that repeaters identified far fewer means on the Means Ends Problem-Solving Procedure (*d*=0.83). The difference between repeaters and non-repeaters was no longer statistically significant after controlling for scores on the Beck Depression Scale. Using the relevancy ratio derived from the same scale, Dieserud et al (2003) found a non-significant positive effect in univariate analysis (*d*=-0.41), but in a model adjusted for age, sex, previous self-harm, suicidal intent and medical risk of index episode, one standard deviation increase on the MEPS relevancy ratio was related to decreased repetition risk, with an odds ratio of 3.1 (95% CI: 1.0-9.8). In terms of impersonal problem-solving, McAuliffe et al (2008) reported that scoring in the highest tertile on the Optional Thinking Test was associated with reduced repetition, but only in those with no history of self-harm prior to the index episode.

Three studies examined self-rated problem-solving ability. Links et al (2012) found that none of the subscales of the Problem-Solving Inventory was associated with repetition, with odds ratios at and close to 1.00 for the three subscales. Dieserud et al (2003) used the total score of the same scale and found that an increase of one standard deviation was barely associated with repetition in univariate analysis (OR= 2.9, 95% CI: 1.0-8.1) and in a model adjusted for age, sex, previous self-harm, suicidal intent and medical risk of index episode (OR=2.8, 95% CI: 1.0-7.4). In a sample of adolescents, Hawton et al (1999) used the Self-Rating Problem Solving Inventory and found a non-significant inverse association between mean scores and repetition (*d*=0.58). A lower-quality study by Scott et al (1997) found that repeaters scored significantly lower (*d*=-0.76) on the Problem-Solving Scale, a measure of self-rated problem-solving ability. These findings indicate some evidence of an

association between repetition and problem-solving, but little evidence of an association between repetition and self-rated problem-solving.

Related to problem-solving ability is autobiographical memory specificity and, in a high-/medium-quality study, Sidley et al. (1999) found that repeaters had higher baseline mean scores for latency (*d*=0.71) and fewer specific responses (*d*=-0.64) to positive cues on the Autobiographical Memory Test than non-repeaters at one month, but the differences were not significant at six (latency: *d*=0.19; number of specific response: *d*=-0.16) or twelve months (latency: *d*=0.24; number of specific response: *d*=-0.15). None of the subscores on the AMT was a significant predictor in a logistic regression to predict repetition at any of the three time-points.

Self-esteem and self-efficacy.

Most of the studies examining the relationship between self-esteem and repetition used the Rosenberg Self-Esteem Scale. Two high-/medium-quality studies (Beautrais, 2004; Colman, 2000) found slightly higher scores on the Self-Esteem Scale among repeaters than non-repeaters. In contrast a high-/medium-quality study by Petrie et al (1988) reported that lower self-esteem was associated with increased risk of repetition, and one lower-quality study (Groholt et al., 2006) averaged responses on the Scale and reported lower mean self-esteem scores among repeaters (*d*=0.90, *r*= 0.41). In addition, four studies, of which three were high-/medium-quality, found non- significant negative associations between repetition and self-esteem, demonstrating effect sizes *d* ranging from -0.04 to -0.41. Taken as a whole these studies provide mixed evidence around the association between self-esteem and repetition.

Dieserud and colleagues (2003) found a very large negative association between repetition and scores on the Generalized Self-Efficacy Scale (GSE: Schwarzer, 1993) in univariate (*d*=-1.23), and the association remained after adjusting for sex, age, previous self-harm, suicidal intent, medical severity of self-harm (OR=3.7, 95% CI: 1.3-10.5). Sakinofsky & Roberts (1990) used Rotter's Locus of Control Scale and found no difference between repeaters and non-repeaters in univariate analysis (*d*=0.004). A stepwise discriminant function analysis identified internal locus of control as a predictor.

One high-/medium-quality study (Randall et al., 2012) found that there was no association between a one standard deviation increase on the Brief Symptom Inventory's "interpersonal sensitivity" subscale (which measures feelings of inadequacy and inferiority) and repetition (OR= 1.11, 95% CI: 0.75-1.63).

Sense of coherence.

Two high-/medium-quality studies found a significant inverse association between repetition and sense of coherence in multivariate analysis, although in the study by Sjöström et al (2012), the association did not remain after adjustment for depression and anxiety symptomatology. In a lower quality study, Wiktorsson et al. (2011) found no association between sense of coherence and repetition in elderly self-harm patients.

Alexithymia.

In a high-/medium-quality study, Links et al.(2012) reported a slightly decreased risk of repetition associated with increasing scores on the Toronto Alexithymia Scale

(TAS-20) in multivariate analyses controlling for hopelessness, impulsivity, and living circumstances (OR=0.93, 95% CI: 0.87–0.99).

Neuroticism.

Beautrais (2004) examined the association between trait neuroticism and repetition and found that repeaters scored significantly higher than non-repeaters on neuroticism on the short form of the Eysenck Personality Questionnaire (mean: 6.2 vs 7.1, $p<0.01$). The association did not persist in multivariate analyses.

Personality disorders.

Thirteen studies, twelve of which were high-/medium-quality, reported a statistically significant association between having a personality disorder (most often diagnosed using the ICD or DSM and documented in hospital notes) and repeating self-harm, with univariate odds ratios ranging from 1.7 (95% CI: 1.4-2.0; Bilén et al., 2010) to 4.88 (95% CI: 1.27-18.72; Vajda & Steinbeck, 2000) and exceptionally high odds ratio in one study of economically active men aged 16-64 years (OR= 7.25, 95% CI: 5.22-10.05; Morton, 1993). In contrast, two high-/medium-quality studies and two low-quality studies found no statistically significant association. Taken as a whole, these studies provide evidence of a relatively consistent and large association between personality disorders and repetition. The values for sensitivity and specificity of personality disorder in predicting repetition were calculated where possible and are presented in Figure 3.2. The studies demonstrated a large variation in sensitivity from 0.01 to 0.70, but specificity was better with a lowest value of 0.54.

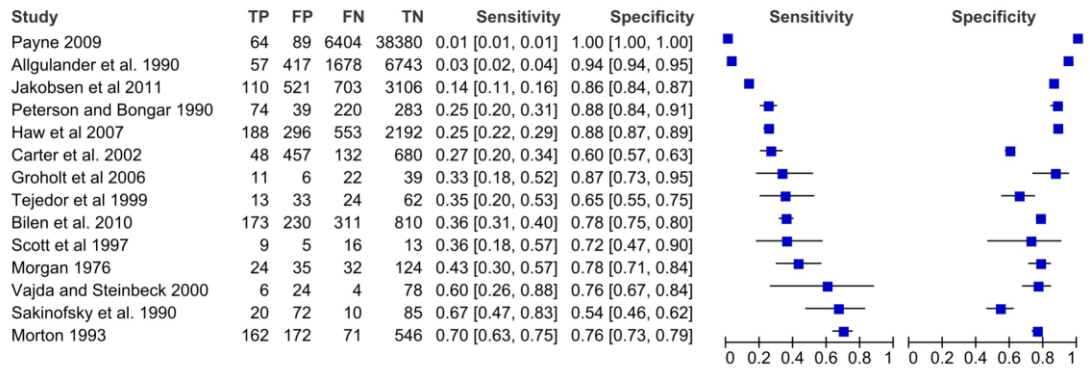


Figure 3.2. Forest plot of sensitivity and specificity of personality disorder in predicting repetition

In terms of specific personality disorders, one high-/medium-quality study and two low-quality studies found a significant positive association between 12-month repetition and a diagnosis of sociopathy. A high-/medium quality study by Söderberg et al. (2004) found significantly higher repetition rates among self-harm patients with borderline personality disorder (BPD) compared with other self-harm patients, with repetition rates almost twice as high among the former (OR:4.8, 95% CI 1.3–17.8). However, controlling for gender, childhood abuse, and age eliminated this association. In a high-/medium-quality study, Links et al (2012) found no association between a diagnosis of BPD and repetition of self-harm (OR= 1.08, 95% CI 0.44–2.64). A lower-quality study by Cailhol et al. (2007) reported that, among BPD patients presenting with self-harm, there was no difference between repeaters and non-repeaters in terms of the number of DSM IV criteria for BPD present (*d*=0.09). However, those BPD patients who met the diagnostic criterion relating to suicidal behaviour were slightly more likely to repeat self-harm.

Biological risk factors.

Two studies (Träskman-Bendz, Alling, Oreland, Regnéll, Vinge, & Ohman, 1992; Verkes et al., 1997) examined the association between repetition and platelet monoamine oxidase activity and found that levels were almost identical between repeaters and non-repeaters. Three high-/medium-quality studies examined serotonin function in particular. Courtet et al (2004) explored the association between a gene coding for the rate-limiting enzyme of serotonin synthesis and found no association. The same study found a large positive association between repetition and having a short-short genotype for a gene coding for functional polymorphism in the serotonin transporter gene promoter region in univariate (OR= 5.0, 95% CI: 1.66-15.02) and multivariate analyses (OR= 5.4; 95% CI: 1.6–20.8) controlling for gender, age, impulsivity, history of major depressive disorder, history of substance or alcohol abuse or dependence, and history of self-harm. A high-/medium-quality study by Verkes et al. (1997) reported that those with higher platelet serotonin were at slightly higher risk of repetition during a 12-month follow-up period (OR=1.22, 95% CI: 1.07-1.38). In another high-/medium-quality study, Sjöström et al.(2009) found that repeaters were much more likely to experience frequent nightmares in univariate (OR= 3.15, 95% CI: 1.51-6.57) and multivariate analyses (adjusted for sex, axis I disorders and antidepressant use), an association which they hypothesised may be related to serotonergic dysregulation. There were no significant associations between repetition and difficulties initiating sleep (OR=1.18, 95% CI: 0.58-2.38), maintaining sleep (OR= 1.46, 95% CI: 0.71-2.98) or early morning awakening (OR= 1.46, 95% CI: 0.71-2.98). Similarly, a lower quality study (Wiktorsson et al., 2011) found no difference in baseline sleep problems between repeaters and non-repeaters. Träskman-Bendz et al. (1992) found no association between repetition and

cerebrospinal fluid (CSF) hydroxyindoleacetic acid, a main metabolite of serotonin. Verkes et al.(1997) explored the association between repetition and paroxetine (an SSRI antidepressant) binding but found no significant association.

Only one study examined the association between dopamine and repetition, with Träskman-Bendz et al. (1992) finding no significant association between repetition and CSF homovanillic acid, a main metabolite of dopamine.

Träskman-Bendz et al. (1992) found a positive association between repetition risk and levels of CSF 3-methoxy-4-hydroxyphenylglycol (a main noradrenaline metabolite) at the $p<0.1$ level. The same study found no association between repetition and urinary noradrenaline-adrenaline ratio. Träskman-Bendz et al. (1992) also reported an association between repetition and lower 24-hour urinary cortisol levels but no association between repetition and post dexamethasone-suppression test plasma cortisol levels. In a lower quality study, Hassanyeh et al.(1989) examined whether there was an association between repetition and experiencing premenstrual tension at the time of an index episode but found no signficant association.

In conclusion, serotonergic function may be useful in identifying those at risk of repetition, but other biological measures do not show the same potential.

Trauma and adversity.

Sexual abuse.

Four high-/medium-quality studies and two lower-quality studies reported an increased risk of repetition among those who had been sexually abused. Effect sizes

were smaller in the higher-quality studies, with odds ratios ranging from 1.72 to 2.34, than in the two lower-quality studies (ORs of 6.0 and 7.2). Haw et al. (2007) found a statistically significant association between sexual abuse and repetition in women (OR=2.11, 95% CI: 1.44-3.09) and not in men (OR=1.64, 9%CI: 0.78-3.44). Van Egmond, Garnefski, Jonker, & Kerkhof (1993) included women only and also found a significantly higher risk of repetition in those who had been sexually abused (OR=2.23, 95% CI: 1.07-4.64). In a high-/medium-quality study, Sinclair et al. (2007) found a borderline significant relationship between childhood sexual abuse and recent DSH in univariate analyses (OR= 2.65, 95% CI: 1.01–6.98), but controlling for autobiographical memory specificity at follow-up rendered this association non-significant (OR=1.59, 95% CI: 0.52–4.90). One high-/medium-quality study (Steeg, Kapur, Webb, Applegate, Stewart, Hawton et al., 2012a) grouped sexual, physical and mental abuse and found that it was associated with increased risk of repetition (relative risk: 1.2, 95% CI:1.0–1.3). Just one study of adults (Bilén et al., 2010) found no statistical significant association in adults, although the risk of repetition was higher in those who reported sexual abuse (OR=1.4, 95% CI: 0.9 to 2.1).

In three studies of adolescents (which also were three studies that included only those with a confirmed intention to die), a history of sexual abuse was not found to have a statistically significant association with repetition, with odds ratios ranging from 1.35 (Méan, Camparini Righini, Narring, Jeannin, & Michaud, 2005) to 1.79 (Vajda & Steinbeck, 2000).

These findings indicate a relatively consistent association between repetition and sexual abuse in adults, but larger-scale studies are required to investigate the association in adolescents.

Physical abuse.

Two high-/medium-quality studies found an increased risk of repetition associated with a history of physical abuse with a hazard ratio of 1.4 (95% CI 1.16-1.70) (Kapur et al., 2006) and an odds ratio of 2.01 (95% CI: 1.33-3.05) (Keeley, O'Sullivan, & Corcoran, 2003) respectively, but these associations did not remain statistically significant in multivariate analyses. Colman (2000) found a significantly higher proportion of repeaters than non-repeaters had experienced physical abuse at the hands of a parent (OR = 1.96, CI = 1.21-3.18) One lower-quality study (Yip, Hawton, Liu, Ng, Kam, Law et al., 2011) reported a large association between repetition and identifying self-harm as a consequence of childhood physical abuse with an odds ratio of 5.09 (95% CI: 1.53-16.89). Two high-/medium quality studies and one lower quality study found no statistically significant association between repetition and a history of physical abuse, although the odds ratios ranged from 1.19 (Groholt et al., 2006) to 1.69 (Beautrais, 2004).

An association between repetition and being a victim of violence was found in two high-/medium-quality studies and two low-quality studies, with odds ratios ranging from 1.83 (Haw et al., 2007) to 5.32 (Yip et al., 2011). Buglass and Horton found an association in only one of three cohorts in one paper (Buglass & Horton, 1974b) and in women only in another paper based on the same dataset (Buglass & Horton, 1974a).

Taken together these studies suggest emerging evidence of an association between repetition and being a victim of violence, but less consistent evidence of an association between repetition and physical abuse.

Family factors.

Two high-/medium-quality studies and three lower-quality studies reported that a family psychiatric history did not distinguish repeaters from non-repeaters, with calculable odds ratios of 7.25 (95% CI: 0.37-140.2) (Sertöz, 2010) and 0.60 (95% CI: 0.18-2.00) (Suleiman, Moussa, & El-Islam, 1989). In contrast, in a study of adolescents, one high-/medium-quality study reported increased risk of repetition among self-harm patients who parents had a history of mental disorders due to substance use (OR=1.33, 95% CI: 1.05-1.70), which persisted in multivariate analyses, but no association with parents having any other mental disorder.

Two high-/medium-quality studies and one lower quality study found that those who were separated from or bereaved of parents in childhood were at increased risk of repetition, and two lower quality studies found no increased risk. A high-/medium-quality study by Beautrais (2004) found that repeaters were more likely to have parents who had separated or divorced than non-repeaters (OR: 2.20, 95% CI: 1.21- 3.99). Family economic circumstances were examined in the same study, which found that repeaters were significantly more likely to have experienced poor familial economic circumstances (OR=1.80, 95% CI: 1.03-3.15).

A high-/medium-quality study by Keeley et al. (2003) reported that repetition rates were significantly higher among patients who, at baseline, reported having a dysfunctional family of origin (OR=2.13, 95% CI: 1.53-2.98). In a lower quality study, Hassanyeh et al.(1989), however, failed to find an association between repetition of self-harm and either the quality of parental relationship or the extent to which one reports an unhappy childhood. In a lower-quality study of people aged 15-24, Santos et al. (Santos, Saraiva, & De Sousa, 2009) examined the association between high emotional expression (reflecting hostility, emotional overinvolvement, and critical comments) in the home and risk of repetition, with a non-significant odds

ratio of 3.5 (0.37-39.97). Beautrais (2004) reported that emotional abuse had an association with repetition that was close to statistical significance (OR=1.66, 95% CI: 0.96-2.89). In a lower-quality study (Yip et al., 2011), repetition was not statistically significantly associated with identifying self-harm as being a consequence childhood emotional abuse/neglect (OR=5.29, 95% CI: 0.31-89.57). Groholt et al. (2006) found that repeaters were as likely as non-repeaters to come from a two-parent family, to have parents who were often drunk, or to have been involved with child protective services. However, in the same study, the care and control in the patients' relationships with parents affected repetition risk, with repeaters having lower mean scores on maternal (*d*=-0.40) and paternal (*d*=-0.55) care in univariate analyses, and having an affectionless controlling father emerged as a significant independent predictor of repetition (relative risk= 2.52, 95% CI: 1.15–5.50).

Suicidal behaviour by others.

Five high-/medium-quality studies and four lower-quality studies failed to find a link between a family history of suicide and repetition, with non-significant odds ratios ranging from 0.96 (Courtet et al., 2004) to 1.96 (Christiansen & Jensen, 2007). Just one low-quality study (van Aalst, Shotts, Vitsky, Bass, Miller, Meador et al., 1992), which included only high-lethality self-harm, found a far higher prevalence of family suicide among repeaters (OR=6.33, 95% CI: 1.29 -31.09). Given the positive direction of the associations reported, it is possible that lack of statistical significance in many of the studies is a reflection of the relative rarity of familial suicide. However, the effect sizes suggest that the effect of familial suicide on repetition is likely to be small.

In a high-/medium-quality study, Hjelmeland (1996) found a positive association between having friends or relatives complete suicide and increased risk of repetition (OR=1.84, 95%CI: 1.23- 2.74), an association that was stronger in multivariate analysis in the subgroup of patients with a history of previous self-harm. She found no association between self-harm by a friend or relative and risk of repetition. In high-/medium-quality studies, Colman (2000) found that neither self-harm nor suicide by loved ones was associated with repetition, with non-significant odds ratios of 1.28 in both univariate and multivariate analyses, and Keeley et al.(2003) reported a non-significant positive association in univariate analysis between repetition of self-harm and having a suicide or parasuicide model (OR=1.42, 95% CI: 0.77-2.62). Taken together these studies represent little evidence for social modelling effects in repetition, but some limited evidence of a weak association between familial suicidal behaviour and repetition.

Number of adversities.

The mean number of adversities endured was examined in two studies. One study was high-/medium-quality (Beautrais, 2004) and found higher scores among repeaters (mean 1.9 vs 1.4). The other study was of lower quality (Groholt et al., 2006) and found a small difference in number of adversities between repeaters and non-repeaters that was not quite of statistical significance (d=0.19).

Socio-economic factors.

Social class.

Three high-/medium-quality studies found that those of lower social class were more likely to repeat self-harm, with odds ratios of 1.49 (Carter, Clover, Bryant, & Whyte, 2002) to 2.41 (Morgan, Barton, Pottle, Pocock, & Burns-Cox, 1976), with Buglass and Horton (Buglass & Horton, 1974d) reporting that the association was particular to males. Two high-/medium-quality studies and one lower quality study found no statistically significant association. Two lower quality studies examined economic situation: Groholt et al. (2006) used parental occupation as a measure of socioeconomic status and found no difference in the measure between repeaters and non-repeaters while Cailhol et al. (2007) found an association between lower economic level and repetition that approached statistical significance (OR=2.30, 95% CI 0.96- 5.52) . Despite promise of a link between social class and repetition in earlier studies, there is mixed evidence as to its value in predicting repetition.

Educational history.

Level of education reached seems to have little if any effect of repetition risk. Three high-/medium-quality studies found a significant protective effect of reaching a higher level of education with odds ratios ranging from 0.15 (95% CI : 0.03–0.81) (McAuliffe et al., 2008) to 0.70 (95% CI: 0.49-0.99) (Christiansen & Jensen, 2007). However seven high-/medium-quality studies and three lower-quality studies found no statistically significant difference in education level between repeaters and non-repeaters, although the effect sizes suggest a very small protective effect. One high-/medium-quality study (Johannessen, Dieserud, De Leo, Claussen, & Zahl, 2011) found that students/pupils were at significantly reduced risk of repetition at 6-month (OR= 0.49, 95% CI: 0.24-0.99), one-year (OR=0.45, 95% CI: 0.24-0.84), and five-year (OR=0.46, 95% CI: 0.29-0.73) follow-up, with the magnitude of the

associations persisting in multivariate analyses controlling for age. A lower quality study by Groholt et al. (2006) found that, among adolescents, there was no notable difference in the proportion of students between repeaters and non-repeaters. One high-/medium-quality study (Beautrais, 2004) found that, among self-harm patients of all ages, repeaters were more likely to have experienced problems at school (OR=2.2, 95%CI 1.28-3.77). In conclusion, any protective effect of education level on repetition risk is likely to be negligible.

Proximal Risk Factors

Proximal psychological risk factors.

History of psychiatric treatment.

History of psychiatric treatment has been widely examined in association with repetition. Twenty-two studies reported a significantly increased risk of repetition associated with having a history of psychiatric treatment of which 19 were high-/medium-quality and three were lower quality. Odds ratios were mostly around 3.00. Seven studies found no significant association, of which four were high-/medium-quality and three were lower quality. However, those studies reporting effect sizes indicated that the effects were in the positive direction. A high-/medium quality-study by Bergen et al. (2010) found an increased risk of repetition associated with previous psychiatric treatment in multivariate Cox regression analyses (with dichotomous outcome: repeat/ no repeat) but not in multiple failure Cox regression analysis with stratified episodes. Overall, these findings indicate a consistent and sizeable association between repetition and a history of psychiatric treatment. The

values for sensitivity and specificity of history of psychiatric treatment in predicting repetition were calculated where possible and are presented in Figure 3.3. The sensitivity of the factor was extremely variable and specificity was mostly moderate.

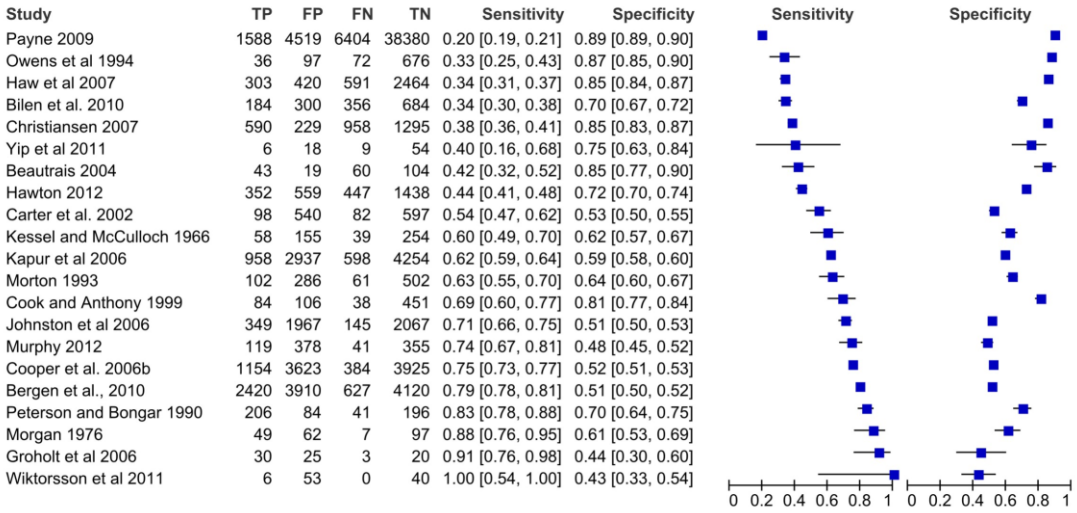


Figure 3.3. Forest plot of sensitivity and specificity of previous psychiatric treatment in predicting repetition

Current psychiatric treatment at the time of the index episode was significantly associated with an increased risk of repetition in nine high-/medium-quality studies and had no association with repetition in one lower-quality study. The effect sizes were around 2.5. These studies indicate a consistent medium-sized association between current psychiatric treatment and repetition. The values for sensitivity and specificity of current psychiatric treatment in predicting repetition were calculated where possible and are presented in Figure 3.4. Sensitivity values mostly fell around 0.3 and specificity tended to be quite high, around 0.8.

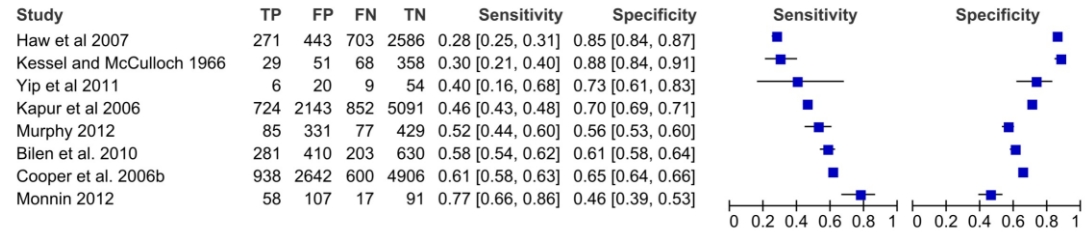


Figure 3.4. Forest plot of sensitivity and specificity of current psychiatric treatment in predicting repetition

Psychiatric diagnoses.

Mood disorders.

A diagnosis of mood disorder (most often major depression) has been found to increase the risk of repetition in univariate and multivariate analyses in eight high-/medium-quality studies and one lower-quality study with sizeable odds ratios, ranging from 2.18 (Payne, Oliver, Bain, Elders, & Bateman, 2009) to 6.19 (Hawton et al., 1999). Given the magnitude of these effect sizes, it is surprising that 16 studies failed to find an association between a diagnosis of mood disorder and repetition, of which 12 were high-/medium-quality and five were lower quality, with many odds ratios hovering around 1.00. The values for sensitivity and specificity of mood disorder in predicting repetition were calculated where possible and are presented in Figure 3.5. The values for specificity varied greatly, as did the values for specificity.

In a multicentre study, Kapur et al.(2006) examined the association between repetition and a number of depressive symptoms. Repetition rates were higher among those who experienced feelings of depression (HR: 1.28, 95% CI: 1.14-1.44;

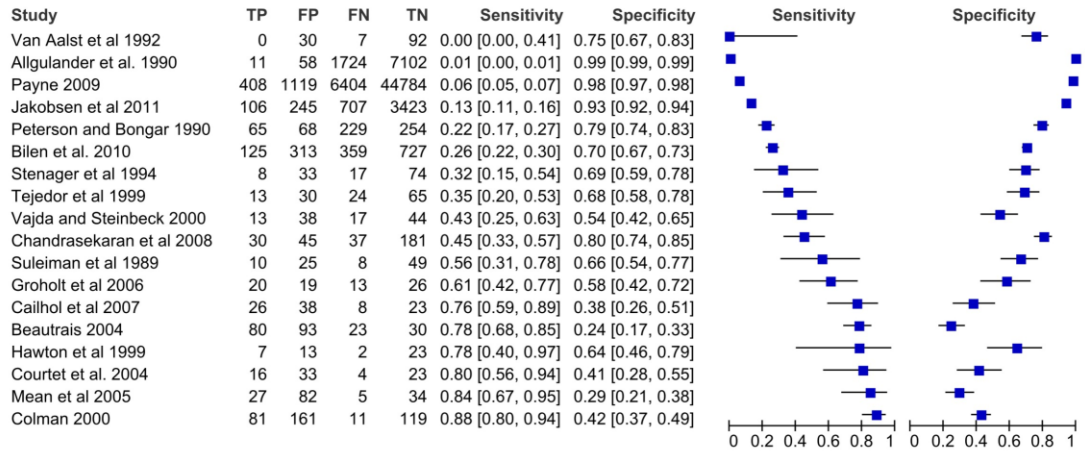


Figure 3.5 Forest plot of sensitivity and specificity of mood disorder in predicting repetition

OR= 1.31, 95% CI: 1.16- 1.49), sleep disturbance (HR: 1.20, 95% CI: 1.09-1.33; OR=1.23, 95% CI 1.10- 1.38), or appetite disturbance (HR: 1.22, 95% CI: 1.10-1.43), but none of these variables were significant in multivariate analyses. Being treated with antidepressants was associated with a small increase in repetition risk in three studies, becoming protective in multivariate analyses in one study (Christiansen & Jensen, 2007) but remaining a risk factor in another (Bilén et al., 2010). Wiktorsson et al.(2011) found no association between repetition and having an antidepressant prescription at baseline.

The association between bipolar disorder and repetition was examined in two medium/high-quality studies only, one of which found a moderate significant positive association (Payne et al., 2009) and one of which found a large effect, which was not statistically significant (Chandrasekaran & Gnanaselane, 2008). Two medium/high-quality studies examined the association between repetition and

dysthymic disorder: one found no association and one found an increased risk with an odds ratio of 4.2 (Tejedor, Díaz, Castillón, & Pericay, 1999).

Overall, these studies indicate that, despite their role in the initiation of self-harm behaviour, mood disorders are not consistently predictive of self-harm repetition.

Anxiety disorders.

Anxiety disorders have been examined in seven studies. Five studies, of which four were high-/medium-quality, found no statistically significant association between anxiety disorder and repetition, with small effect sizes alternating between protective and risk effects. Two high-/medium-quality study (Bilén et al., 2010; Jakobsen, Christiansen, Larsen, & Waaktaar, 2011) found a significant association between anxiety disorder and repetition in univariate analysis but not multivariate analysis. Christiansen and Jensen (2007) found, in univariate but not in multivariate analyses, that patients who repeated were significantly more likely to have been treated with anxiolytic or sedative/hypnotic drugs prior to the index episode (OR= 1.43, 95% CI: 1.21- 1.69). These findings suggest that there anxiety disorder is not predictive of repetition.

Schizophrenia.

All but two of the twenty-one studies examining the association between schizophrenia reported increased odds of repetition in this group (with odds ratios ranging from 1.24 to 7.76). However, the association only reached statistical significance in eight studies, most likely reflecting the relative rarity of this diagnosis. The values for sensitivity and specificity of schizophrenia in predicting

repetition were calculated where possible and are presented in Figure 3.6. Again reflecting the relative rarity of the diagnosis, sensitivity values were very low but specificity values tended to be close to 1.00.

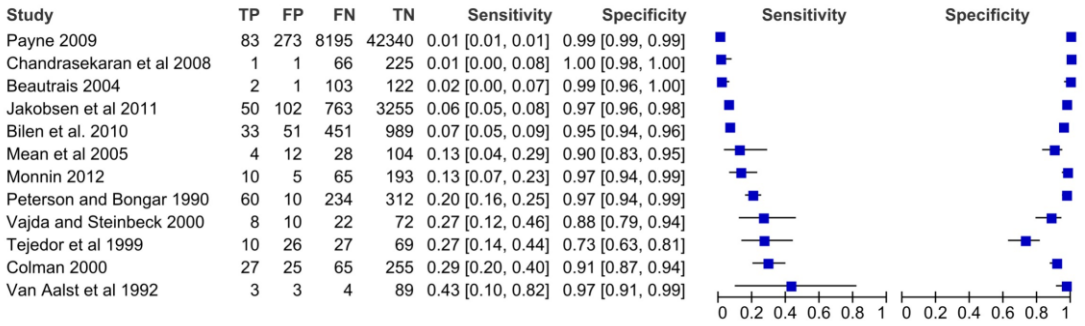


Figure 3.6. Forest plot of sensitivity and specificity of schizophrenia in predicting repetition

One high-/medium-quality study (Randall et al., 2012) reported that a non-significantly increased repetition risk with each increase of a standard deviation on the paranoid ideation (OR=1.37, 95% CI: 0.94-2.02) and psychoticism (OR=1.46, 95% CI: 0.98-2.19) subscales of the Brief Symptom Inventory. In a high-/medium-quality study, Kapur et al.(2006) reported that the presence of hallucinations (measured using clinicians' judgment after assessment) was significantly associated with a higher risk of repetition in univariate (HR=1.82, 95% CI: 1.56-2.14) and multivariate analyses (HR; 1.21, 95% CI:1.02-1.44). Two studies (2007; Jakobsen et al., 2011) found that repeaters were more likely than non-repeaters to have been previously treated with antipsychotics with hazard ratios of 1.5 and 1.7 respectively.

These findings suggest that a diagnosis of schizophrenia confers a moderately higher risk of repetition, but that the factor may have limited sensitivity given its low prevalence.

Other Axis I disorders.

Four high-/medium-quality studies and one lower quality study examined the role of adjustment disorder in repetition and found no notable association between the two factors. Eating disorder was examined in just three studies, of which just one (Beautrais, 2004) found a significant association, with an odds ratio of 3.11 (95% CI: 1.06- 9.15) in univariate analysis. One high-/medium-quality study (Randall et al., 2012) reported that an increase of one standard deviation on the obsessive-compulsive subscale of the Brief Symptom Inventory was associated with a significant increase in the risk of repetition (OR=1.49, 95% CI: 1.00-2.21), but the association did not persist in multivariate analyses.

The categorisation of behavioural disorder (including eating, sleep, sexual disorders) was significantly associated with repetition in one high-/medium-quality study with an odds ratio of 2.27 (95% CI: 1.62-3.19), an association that persisted in multivariate analyses.

Beautrais (2004) found a borderline significant association between antisocial disorder and repetition (OR= 1.88, 95% CI 1.07- 3.33), and one lower quality study (Groholt et al., 2006) found a non-significant positive association between disruptive disorders and repetition (OR= 2.04, 95% CI: 0.67- 6.19). In a high-/medium-quality study, Colman (2000) measured lifetime history of post-traumatic stress disorder

(PTSD) and found an association with increased risk of repetition (OR= 2.13, 95% CI: 1.32-3.44). One high-/medium quality study (Monnin, Thiemard, Vandel, Nicolier, Tio, Courtet et al., 2012) found a significant association between current PTSD at baseline and subsequent repetition with an odds ratio of 2.36 (95% CI: 1.13- 4.92).

Organic mental disorder was explored in two high-/medium-quality studies (Bilén et al., 2010; Jakobsen et al., 2011) and the association with repetition was not statistically significant in either one, neither was mental disorder due to substance use related to repetition in the latter study. In a high-/medium-quality study, Lebret and colleagues (2006) found that memory disorder in elderly self-harm patients was close to being statistically significantly positively associated with repetition. In a lower quality study of elderly patients, Wiktorsson et al. (2011) found no significant association between repetition and cognitive capacity (measured using the Mini Mental State Examination).

Comorbidity.

Three studies reported a significantly greater number of disorders among repeaters, of which two were high-/medium-quality (Beautrais, 2004; Jakobsen et al., 2011) and one was lower quality (Groholt et al., 2006). In a high-/medium-quality study, Links et al. (2012) found a non-significant positive association between repetition and meeting the criteria for more than one Axis-II disorder (OR= 1.73, 95% CI: 0.63–4.78). A lower-quality study by Hawton et al.(2003) found that patients with comorbid psychiatric and personality disorders were far more likely to repeat DSH compared to other self-harm patients (OR= 6.13, 95% CI: 2.49-15.11). Vajda and Steinbeck (2000) found an association between comorbidity and repetition

in univariate (OR= 3.80, 95% CI: 1.58-9.12) but not multivariate analyses in a high-/medium-quality study. These studies suggest that those with comorbid psychiatric disorders are at increased risk of repetition.

General mental health.

Two high-/medium-quality studies (Chandrasekaran & Gnanaselane, 2008; Tejedor et al., 1999) found medium-sized negative associations between repetition and scores on the Global Assessment of Functioning Scale. One high-/medium-quality study (Randall et al., 2012) found an increased risk of repetition associated with a one-standard-deviation increase on the Global Severity Index of the Brief Symptom Inventory (OR=1.64; 95% CI: 1.10-2.46), but less pronounced associations between repetition and scores on the Inventory's Positive Symptom Distress Index (OR=1.45, 95% CI: 0.97-2.17) and the Positive Symptom Total (OR=1.28, 95% CI: 0.89-1.84). Tejedor et al. (1999) found no significant association between repetition and scores on the Brief Psychiatric Rating Scale. In a lower quality study, Groholt et al. (2006) used one item to assess self-perceived general mental health and found no statistically significant difference in scores between repeaters and non-repeaters (d=-0.40). In a high-/medium-quality study, Hjelmeland (1996) reported that identifying a psychiatric problem as one's main problem was associated with prospective repetition (OR=1.66, 95% CI: 1.14- 2.41), particularly in those with no previous history of self-harm before the index episode (OR: 2.09, 95% CI: 1.13- 3.88). Mayo's (1974) lower-quality study found that repeaters were significantly more likely than non-repeaters to have poor psychosocial functioning. These findings suggest that self-report general mental health measures are not likely to be very effective in identifying those at risk of repetition.

Depression.

Twelve studies examined whether the Beck Depression Inventory (BDI) differentiated between repeaters and non-repeaters. Six high-/medium-quality studies and one lower quality study failed to find a statistically significant association with repetition in univariate analyses, although the reported associations were positive in direction and small to moderate in magnitude (range: *d*=0.17-0.58). Five studies also conducted multivariate analyses and found no significant association between BDI scores and repetition. Two lower-quality studies (Groholt et al., 2006; Scott et al., 1997) found a significantly higher mean baseline score on the BDI among repeaters than non-repeaters, with *d*s of 0.80 and 0.31 respectively, and a high-/medium-quality study by Hjelmeland et al. (1998) found an association between repetition and BDI scores in a logistic regression. One high-/medium-quality study (Monnin et al., 2012) found a significant association between BDI score and repetition in women only (*d*=0.52). Based on these studies, there seems to be moderate association between BDI scores and repetition but studies of the association have tended to be statistically underpowered.

One high-/medium-quality study (Tejedor et al., 1999) and two lower quality studies (Cailhol et al., 2007; Hassanyeh et al., 1989) found small non-significant associations between repetition and score on the Hamilton Depression Rating Scale (*d*=0.13-0.25). A high-/medium-quality study by Chandrasekaran and Gnanaselane (2008) found signficantly higher scores on the Montgomery Asberg Depression Rating Scale in non-repeaters than repeaters (*d*=-0.25), whereas a lower quality study (Wiktorsson et al., 2011) used the same scale and found no association with repetition. One high-/medium-quality study (Randall et al., 2012) found increased

risk of repetition associated with a one-standard deviation increase on the Brief Symptom Inventory's depression subscale (OR=1.37, 95% CI: 0.92-2.05).

Anxiety.

In one high-/medium-quality study, a one-standard deviation increase on the anxiety subscale of the Brief Symptom Inventory (Randall et al., 2012) was barely associated with future self-harm in univariate (OR=1.54, 95% CI: 1.03-2.30) but was not associated in multivariate analysis. In the same study, scores on the phobic anxiety subscale were not statistically associated with repetition (OR=1.36, 95% CI: 0.93-1.99). In a high-/medium-quality study, Tejedor et al. (1999) used the Hamilton Anxiety Rating Scale and found no significant difference in mean baseline anxiety scores between repeaters and non-repeaters (d=0.15), and baseline anxiety was not a significant predictor of repetition in a proportional hazards model. Morgan et al. (1976) used the Middlesex Hospital Questionnaire in a high-/medium-quality study to assess anxiety and reported that scores for anxiety were higher among repeaters, particularly among women. One lower quality study (Wiktorsson et al., 2011) used the Brief Scale for Anxiety and found no significant association with repetition. Overall, it seems that higher levels of anxiety do not confer increased risk of repetition.

State anger.

Using Spielberger's State-Trait Anger Scale, Colman (2000) reported that repetition was associated with higher scores in univariate (OR= 2.09) but not multivariate analyses, and Hawton et al. (1999) found a medium-sized effect (d=0.40) that did not reach statistical significance.

Substance misuse.

Alcohol abuse/dependence was examined in 33 studies. Nineteen high-/medium-quality studies reported an increased risk of repetition associated with alcohol abuse/dependence, with most odds ratios close to 2.00. Fourteen additional studies (of which nine were high-/medium-quality) found no statistically association between alcohol abuse/dependence and repetition, although the associations tended to be in positive direction. Such evidence demonstrates a relatively consistent and moderate association between repetition and alcohol abuse/dependence. The values for sensitivity and specificity of alcohol misuse in predicting repetition were calculated where possible and are presented in Figure 3.7. Sensitivity values were consistently low, mostly around 0.2, while specificity values mostly fell around 0.80.

Drug abuse/dependence was examined in 23 studies. Thirteen high-/medium-quality studies reported a positive association between repetition and drug abuse/dependence with slightly larger effect sizes than those seen in studies of alcohol dependence. Ten studies found no statistically significant association, of which eight were high-/medium-quality and two were lower quality. Taken as a whole, these studies suggest there is a moderately increased risk of repetition among those with drug misuse/dependence and repetition. The values for sensitivity and specificity of drug misuse in predicting repetition were calculated where possible and are presented in Figure 3.8. Like alcohol misuse, the sensitivity values for drug misuse were low, with most of the values falling around 0.20, whereas specificity tended to be very high.

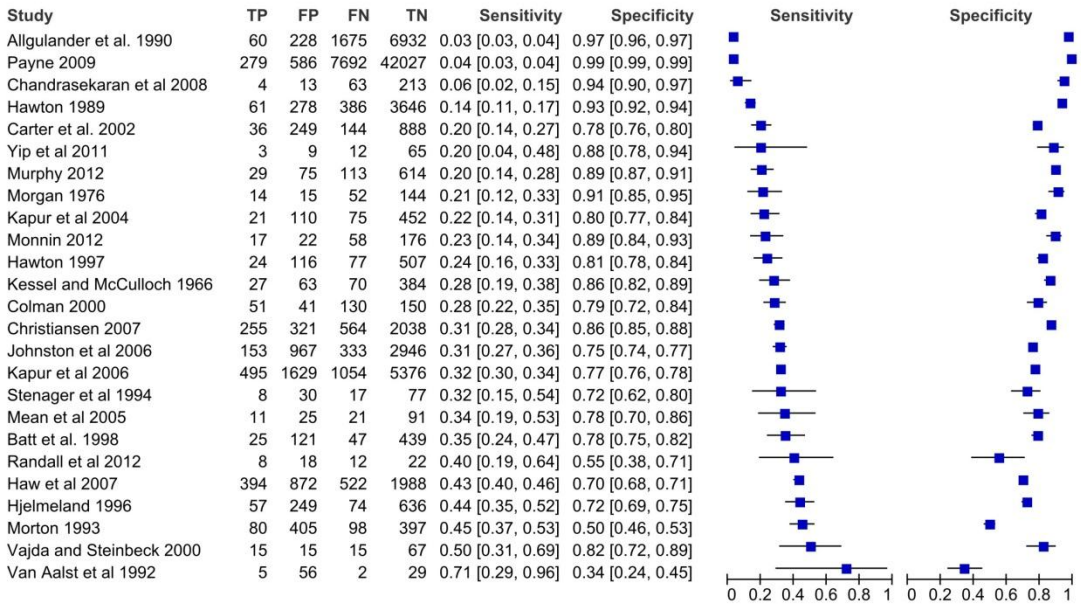


Figure 3.7. Forest plot of sensitivity and specificity of alcohol misuse in predicting repetition

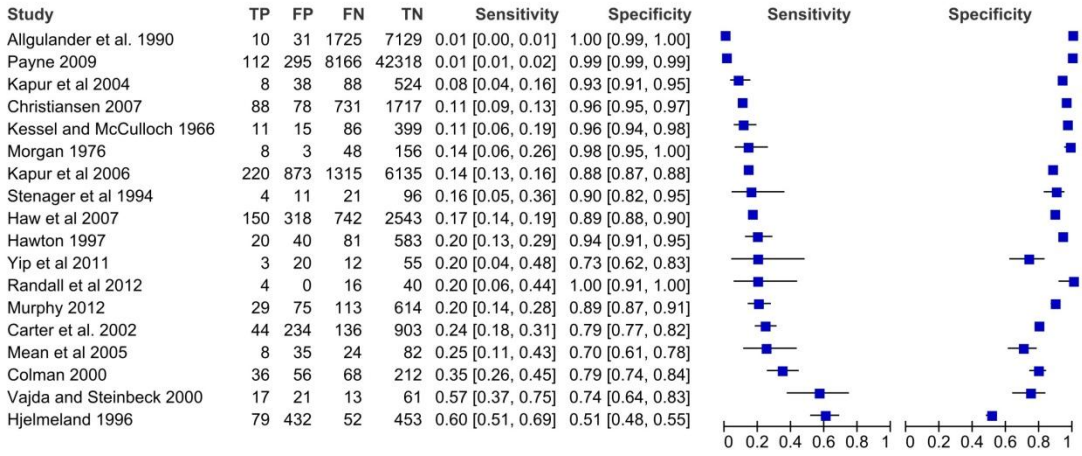


Figure 3.8. Forest plot of sensitivity and specificity of drug misuse in predicting repetition

Nine studies examined the effect of a diagnosis of substance use disorder on repetition: one high-/medium-quality study (Bilén et al., 2010) found an increased

risk of repetition associated with the diagnosis (OR=1.42, 95% CI 1.08- 1.86) and eight studies found no effect, of which seven were high-/medium-quality and one was lower quality. There was no consistency in the direction of the associations reported.

Two high-/medium-quality studies (Crawford & Wessely, 1998; Monnin et al., 2012) found that those with substance misuse/dependence were twice as likely to repeat and a lower-quality study by Suleiman et al (Suleiman et al., 1989) had an odds ratio of 7.2 (95% CI: 1.11-46.88), whereas two lower-quality studies (Cailhol et al., 2007; Kapur, House, Dodgson, May, & Creed, 2002; Suleiman et al., 1989) found no association.

Psychosocial adversity.

Problem scales.

Three high-/medium-quality studies and two lower quality studies used a variety of scales to measure the extent to which patients had experienced stressful life events in the time preceding the self-harm episode. Two high-/medium-quality studies (Chandrasekaran & Gnanaselane, 2008; Sakinofsky & Roberts, 1990) found that repeaters were significantly more likely to have experienced stressful life events using the Presumptive Stressful Life Events Scale (d=0.47) and an original scale respectively (d=0.69). In a lower quality study, Yip and colleagues (2011) found that high number of personal problems was associated with increased risk of repetition (OR=1.83, 95% CI: 1.19-2.81). Two studies (Scott et al., 1997; Tejedor et al., 1999) found no significant difference between repeaters and non-repeaters on

scores on the Paykel Life Events Inventory (OR=1.57, 95% CI: 0.13- 18.66) and Axis IV of the DSM-III-R respectively (OR=0.53, 95% CI: 0.22-1.24). These results indicate emerging evidence that those who repeat self-harm are more likely to report adverse life events.

Specific problems.

Fourteen studies examined associations between specific problems and repetition. Work or school problems had a medium-sized protective effect against repetition in four high-/medium quality studies (Cooper, Kapur, Dunning, Guthrie, Appleby, & Mackway-Jones, 2006; Kapur et al., 2006; Keeley et al., 2003; Steeg et al., 2012a) with odds ratios from 0.52 to 0.74. Three lower quality studies (Groholt et al., 2006; Suleiman et al., 1989; Yip et al., 2011) reported non-significant effects in both directions. Eight studies examined the association between repetition and relationship problems. Relationship problems had a moderate protective effect against repetition if the relationship in question was one with a partner (ORs: 0.53 to 0.64), friends (ORs: 0.66 to 0.90), or others (ORs: 0.64 to 0.90). On the other hand, reporting problems with family relationships conferred a slightly increased risk of repetition (ORs: 1.02 to 2.91). Four high-/medium-quality studies found a moderate protective effect of financial problems on repetition (Cooper et al., 2006; Haw et al., 2007; Kapur et al., 2006; Steeg et al., 2012a) with odds ratios ranging from 0.59 to 0.82, whereas four studies reported non-significant associations in both directions, of which two were high-/medium-quality (Buglass & Horton, 1974c; Keeley et al., 2003) and two were lower quality (Garzotto, Siani, Tansella, & Tansella, 1976; Yip et al., 2011). Legal problems had a protective effect against repetition in one study (Bilén et al., 2010), with an odds ratio of 0.66, were positively associated with repetition in males in another study (Haw et al., 2007), with an odds ratio of 1.42,

and had no sizeable association with repetition in four other studies (Cooper et al., 2006; Kapur et al., 2006; Keeley et al., 2003; Steeg et al., 2012a). Four high-/medium-quality studies (Cooper et al., 2006; Haw et al., 2007; Kapur et al., 2006; Steeg et al., 2012a) found consistent (ORs: 1.32-1.42) univariate associations between housing problems and repetition, and Haw and colleagues found a multivariate association with frequent repetition in men only (OR=1.81, 95% CI: 1.09-3.02). One high-/medium-quality study (Keeley et al., 2003) found an increased risk of repetition associated with the imprisonment of self or other (OR=2.26, 95% CI: 1.16-4.40). In a high-/medium-quality study, Morgan et al. (1976) found that non-repeaters were more likely to report that the index episode was not precipitated by any upset (OR= 2.47, 95% CI: 1.29- 4.74) but Sertöz's (2010) high-/medium-quality study found that repeaters and non-repeaters were equally likely to report that life events were associated with the index episode (OR= 0.92, 95% CI: 0.15-5.51). In summary, there is emerging evidence of a protective effect on repetition of some life problems, most consistently work/school problems and relationship problems with partners or friends.

Stressful life events.

Four studies (all of high-/medium quality) examined the association between pregnancy-related problems and repetition. One study (Kapur et al., 2006) found a significant inverse association between repetition and experiencing a miscarriage/stillbirth (OR= 0.34, 95% CI: 0.14-0.84) while two studies revealed no association (Bilén et al., 2010; Cooper et al., 2006). One study (Keeley et al., 2003) found reduced odds of repetition associated with having a pregnancy-related problem and repetition (OR=0.54, 95% CI: 0.21-1.39). Five high-/medium-quality studies (Christiansen & Jensen, 2007; Cooper et al., 2006; Keeley et al., 2003; Murphy,

Kapur, Webb, Purandare, Hawton, Bergen et al., 2012) and one lower quality study (Yip et al., 2011) examined the link between bereavement and repetition and found no statistically significant association, with odds ratios ranging from 0.82 to 1.57. Three studies found that repeaters and non-repeaters were equally likely to experience bullying, of which two were high-/medium-quality (Cooper et al., 2006; Kapur et al., 2006) and one was lower-quality and involved adolescents only (Groholt et al., 2006). These findings represent little evidence of an association between specific stressful events and repetition.

Employment.

The relationship between unemployment and repetition of self-harm has been explored in thirty-two studies. Nine studies, of which five were high-/medium-quality, found a significant positive association with moderate odds ratios using univariate analyses. Twenty studies found no statistically significant association between repetition and unemployment in univariate analyses, with small effect sizes more commonly in a positive direction. Ten high-/medium-quality studies conducted multivariate analyses. Two studies reported a positive significant relationship between unemployment and repetition of self-harm (Johnston et al., 2006; Kapur et al., 2006), two studies reported an association particularly in females (Evans, Reeves, Platt, Leibenau, Goldman, Jefferson et al., 2000; Hawton, Fagg, & Simkin, 1988) and six found no association (Carter, Whyte, Ball, Carter, Dawson, Carr et al., 1999; Colman et al., 2004; Cook & Anthony, 1999; Johannessen et al., 2009; Links et al., 2012; Morton, 1993). Again, odds ratios tended to be around 1.4. Taken as a whole, these studies yield evidence of a small positive association between repetition and unemployment. The values for sensitivity and specificity of unemployment in predicting repetition were calculated where possible and are

presented in Figure 3.9. There was great variation in sensitivity values for unemployment, though most values fell between 0.4 and 0.8. Specificity was also variable with values ranging from 0.25 to 0.97.

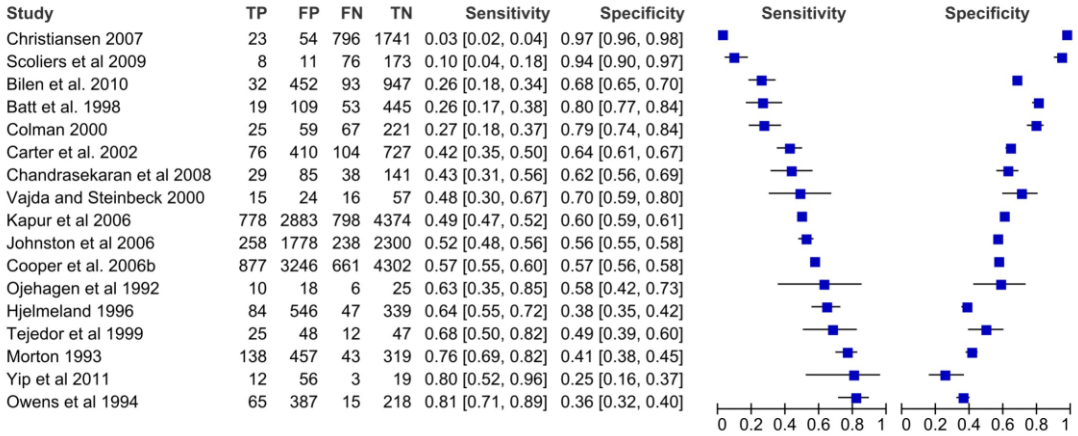


Figure 3.9. Forest plot of sensitivity and specificity of unemployment in predicting repetition

Three high-/medium-quality studies examined the association between repetition and receiving state disability payments, one of which (Bilén et al., 2010) found a positive association in univariate analyses (OR=1.61, 95% CI: 1.26- 2.05) and not multivariate analysis, and two of which found no association (Christiansen & Jensen, 2007; Links et al., 2012). Two high-/medium-quality studies found a positive association between repetition and being a pensioner/retired (Carter et al., 1999; Christiansen & Jensen, 2007), with odds ratios of 1.67 and 1.52 respectively, and one high-/medium-quality study found no association (Kapur et al., 2006). In a high-/medium-quality study, Scoliers et al. (2009) found no association between repetition and having one's own source of income as opposed to being financially dependent on others.

Housing conditions.

Homelessness was significantly associated with repetition in univariate analyses in three high-/medium-quality studies (Haw, Hawton, & Casey, 2006; Kapur et al., 2006; Peterson & Bongar, 1990) with diverse effect sizes (1.46-3.88). Only Kapur et al.(2006) undertook multivariate analyses, in which the association no longer remained.

Similar effect sizes for repetition were associated with living in an institution or group residence in three high-/medium-quality studies in univariate analyses (Kapur et al., 2006; Murphy et al., 2012; Peterson & Bongar, 1990), but again this association did not persist in multivariate analyses (Kapur et al., 2006; Murphy et al., 2012). Conversely, one high-/medium-quality study reported an association between repetition and living in a shelter in multivariate but not univariate analysis (Links et al., 2012).

Four studies examined the association between repetition and having spent less than a year at the current address, with two low-quality studies reporting sizeable positive associations in univariate analyses (Garzotto et al., 1976; Siani, Garzotto, Tansella, & Tansella, 1979) and two high-/medium-quality studies reporting no association (Buglass & Horton, 1974c; Hjelmeland, 1996). Having had four changes of residence in the past five years was associated with repetition in two of three cohorts in one high-/medium-quality study (Buglass & Horton, 1974c), but had no association in a lower-quality study (Garzotto et al., 1976). Living in overcrowded conditions was examined in two studies, with no association emerging in one study (Garzotto et al., 1976) and an association in females only in the other (Buglass & Horton, 1974c). In one high-/medium-quality study (Wang & Mortensen, 2006), being a newcomer to the city was positively associated with repetition in univariate analysis but not multivariate analyses. These results

represent emerging evidence of an association between repetition and homelessness, but less consistent evidence of an association between repetition and frequent relocation.

Area-level factors.

Area-level factors were examined in four studies, all of which were of high-/medium quality. Johnston et al. (2006) explored multiple area-level factors and found that only an area's proportion of White inhabitants was associated with repetition, with areas with the lowest proportions of White inhabitants having higher rates of repetition (adjusted OR=1.45, 95% CI: 1.14-1.84). Payne et al. (2009) found that those in the third and fifth most deprived quintiles (using the Carstairs Deprivation Index) were slightly more likely to repeat self-harm than those in the least deprived quintile in univariate and multivariate analyses. Wang and Mortensen (2006) found no significant association between repetition and living in a rural versus urban area. As part of a multicentre study of self-harm, Bergen et al. (2010) found a significant association between study site and repetition in multivariate analyses, with Oxford patients being at higher risk of repetition than Manchester or Derby patients, even after controlling for demographic and assessment variables.

Social support

Living circumstances.

Eighteen studies examined the association between repetition and living alone. Most studies reported that those who live alone are more likely to repeat self-harm, with positive odds ratios ranging from 1.06 to 3.28, and most falling around

1.5. Five studies conducted multivariate analyses: the association persisted in one study (Steeg et al., 2012a) but not in the other four (Christiansen & Jensen, 2007; Colman, 2000; Kapur et al., 2006; Murphy et al., 2012). Haw & Hawton (2010) found an association in women (OR=1.77, 95% CI: 1.34-2.33) but not in men. Haw et al.(2007) found that those who repeated four or more times were significantly more likely to live alone than those who did not repeat (OR=2.28, 95% CI 1.69-3.07), but there was no significant association in those who repeated between one and three times (OR=1.16, 95% CI: 0.98-1.39). Living alone did not emerge as a significant predictor of extent of repetition in a multivariate model. These studies show a fairly consistent moderate-sized association between living alone and repeating self-harm. The values for sensitivity and specificity of living alone in predicting repetition were calculated where possible and are presented in Figure 3.10. The values for sensitivity of living alone in detecting repetition risk were fairly consistently moderate, with corresponding high values for specificity.

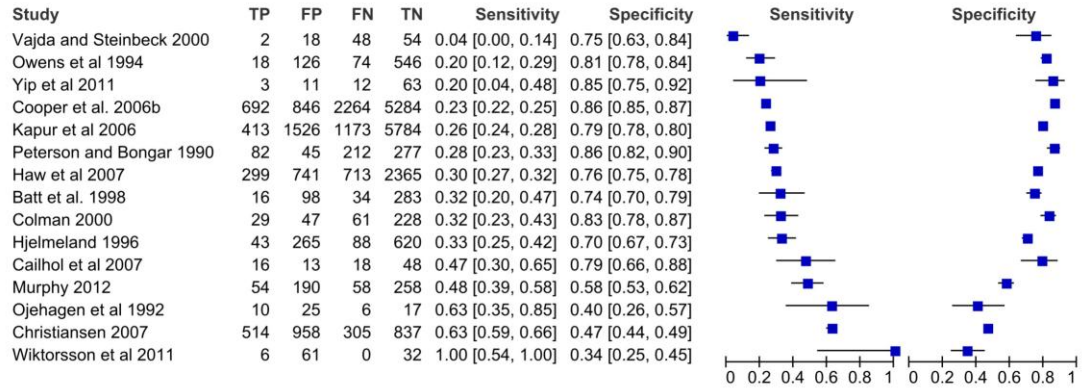


Figure 3.10. Forest plot of sensitivity and specificity of living alone in predicting repetition

Nuclear family structure.

Fifteen studies found a significantly lower risk of repetition associated with being married or cohabiting compared with being single, divorced or widowed, of

which thirteen were high-/medium-quality. Odds ratios ranged from 0.29 (Yip et al., 2011) to 0.80 (Kapur et al., 2006). Twenty-three studies found no significant association between marital status and repetition, of which 16 were high-/medium-quality studies. Most of these studies showed a moderate protective effect, with similar odds ratios to those studies reporting statistically significant findings. A high-/medium-quality study by Haw et al. (2007) found a significantly higher risk of repetition associated with being single or divorced in males only, while Buglass and Horton reported an increased risk in females only (Buglass & Horton, 1974d).

Just one lower quality study reported a significantly increased risk of repetition associated with being married (McEvedy, 1997) and the effect size was small and of borderline significance. These results suggest a small and fairly consistent association between being married and lower risk of repetition. The sensitivity and specificity of being single/divorced/widowed in predicting repetition were calculated where possible and are presented in Figure 3.11. Values for sensitivity were highly variable and there was also little consistency in specificity values.

Four studies examined the association between having children and repetition. One lower-quality study (Suleiman et al., 1989) found no association between repetition and having children (OR=2.22, 95% CI: 0.78- 6.32), one high-/medium-quality study (Bilén et al., 2010) found a negative association between repetition and having young children in univariate and multivariate analyses (OR=0.54, 95% CI: 0.36- 0.81), and two high-/medium-quality studies found no association between having children and repetition (Caldera, Herrera, Kullgren, & Renberg, 2007; Christiansen & Jensen, 2007).

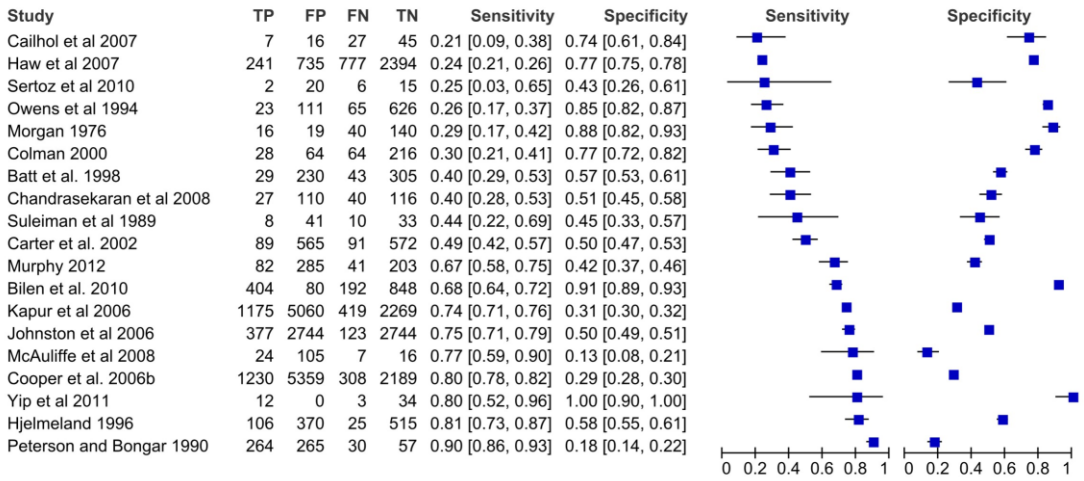


Figure 3.11. Forest plot of sensitivity and specificity of being single/divorced/widowed in predicting repetition

Christiansen and Jensen (2007) found an increased risk of repetition among patients without a link to a parent (OR= 1.27 , 95% CI: 1.07- 1.50), but this small effect disappeared with multivariate analyses.

Perceived social support.

Six studies examined the association between repetition and perceived social support, of which one was lower-quality (Scott et al., 1997). Two studies (Haw et al., 2007; Scott et al., 1997) found a positive association between repetition and reporting poor supports or social isolation in univariate analyses, with odds ratios of 1.38 and 6.29 respectively; the association in the former was more pronounced in women. Four studies found no significant association between perceived social support and repetition (Chandrasekaran & Gnanaselane, 2008; Colman, 2000; Keeley et al., 2003; Sakinofsky & Roberts, 1990), with very small effect sizes. Loneliness was significantly associated with repetition in Colman (2000) with much increased odds (OR=2.63) but had no effect on repetition in two lower quality

studies (Groholt et al., 2006; Wiktorsson et al., 2011). Groholt et al. (2006) also reported that repeaters were almost as likely as non-repeaters to seek parental (d=0.11) or peer (d=0.18) support in times of distress.

Physical health.

Fourteen studies examined the association between physical health problems and repetition. Two high-/medium-quality studies (Haw et al., 2007; Vajda & Steinbeck, 2000) showed a sizeable positive association with repetition (ORs= 2.15 and 1.88). Two high-/medium-quality studies (Sertöz, 2010; Stenager, Stenager, & Jensen, 1994) found a greatly decreased risk of repetition among those with physical health problems (ORs= 0.09 and 0.26), with the latter reporting the association in non-depressed patients only. Ten studies found no association between repetition and physical health problems, of which eight were of high-/medium quality, with effect sizes emerging as small and operating in both directions. These findings represent little evidence of a consistent association between repetition and physical health problems.

One high-/medium-quality study (Randall et al., 2012) found higher levels of somatization (as measured by the Brief Symptom Inventory) conferred higher risk of repetition (OR=1.55, 95% CI 1.03-2.34), but the association did not persist in multivariate analyses. Two studies examined the importance of self-reported general health; one high-/medium-quality study (Colman et al., 2004) found a negative association with repetition in multivariate analyses (OR= 2.01) and one lower quality study (Groholt et al., 2006) found no association in univariate analyses (d=0.12).

One high-/medium-quality (Stenager et al., 1994) and one lower quality study (Yip et al., 2011) investigated the effect of regular and daily pain on repetition and found a non-significant protective effect.

In a high-/medium-quality study, Hjelmeland (1996) reported that, among men with a history of self-harm, contact with the health services in the month prior to an index episode was associated with repetition (OR=1.88, 95% CI:1.20- 2.95).

In terms of specific somatic diagnoses, one high-/medium-quality study (Hawton, Fagg, & Marsack, 1980) and one lower quality study (Mackay, 1979) reported considerably higher risk of repetition among those with epilepsy (ORs=7.73 and 3.01). One high-/medium-quality study reported a borderline significantly higher risk of repetition of self-poisoning associated with central nervous system disease in men only in multivariate analyses (Allgulander & Fisher, 1990).

Suicidality.

Previous self-harm.

Sixty studies examined the association between previous self-harm and repetition. Using univariate analyses, 43 studies reported a significantly higher risk of repetition associated with previous self-harm, of which 30 were high-/medium-quality. Previous self-harm was consistently associated with a higher risk of repetition, with most odds ratios above 2.0. Seven studies reported a positive association between previous and subsequent self-harm that did not reach statistical significance. Furthermore, a significant positive relationship between previous self-harm and repetition was found in multivariate analyses in 20 high-/medium-quality

studies, with effect sizes becoming slightly attenuated. A high-/medium-quality study by Bergen et al. (2010) found an increased risk of repetition associated with previous self-harm in multivariate Cox regression analyses (HR=1.58, 95% CI: 1.48–1.69) but not in multiple failure Cox regression analysis with stratified episodes (HR=0.98, 95% CI: 0.93–1.04).

Taken as a whole, these studies provide exceptionally consistent evidence of a medium-sized association between previous self-harm and repetition. The sensitivity and specificity of previous self-harm in predicting repetition were calculated where possible and are presented in Figure 3.12.

Suicidal ideation.

With suicidal thoughts as a dichotomous variable, two high-/medium-quality studies (Cooper et al., 2006; Kapur et al., 2006) found a significant moderate association with repetition (ORs= 1.85 and 1.53) and two studies found no association, of which one was high-/medium-quality (Wang, Nielsen, Bille-Brahe, Hansen, & Kolmos, 1985) and one was lower quality (Spirito, Lewander, Fritz, Levy, & Kurkjian, 1994). A high-/medium-quality study by Verkes et al.(1997) used item 9 from the BDI to measure suicidal ideation and found that suicidal ideation was significantly associated with repetition in a Cox regression analysis (HR= 1.57,95% CI: 1.18-2.09). These studies suggest a small but fairly consistent association between repetition and suicidal ideation at the time of assessment.

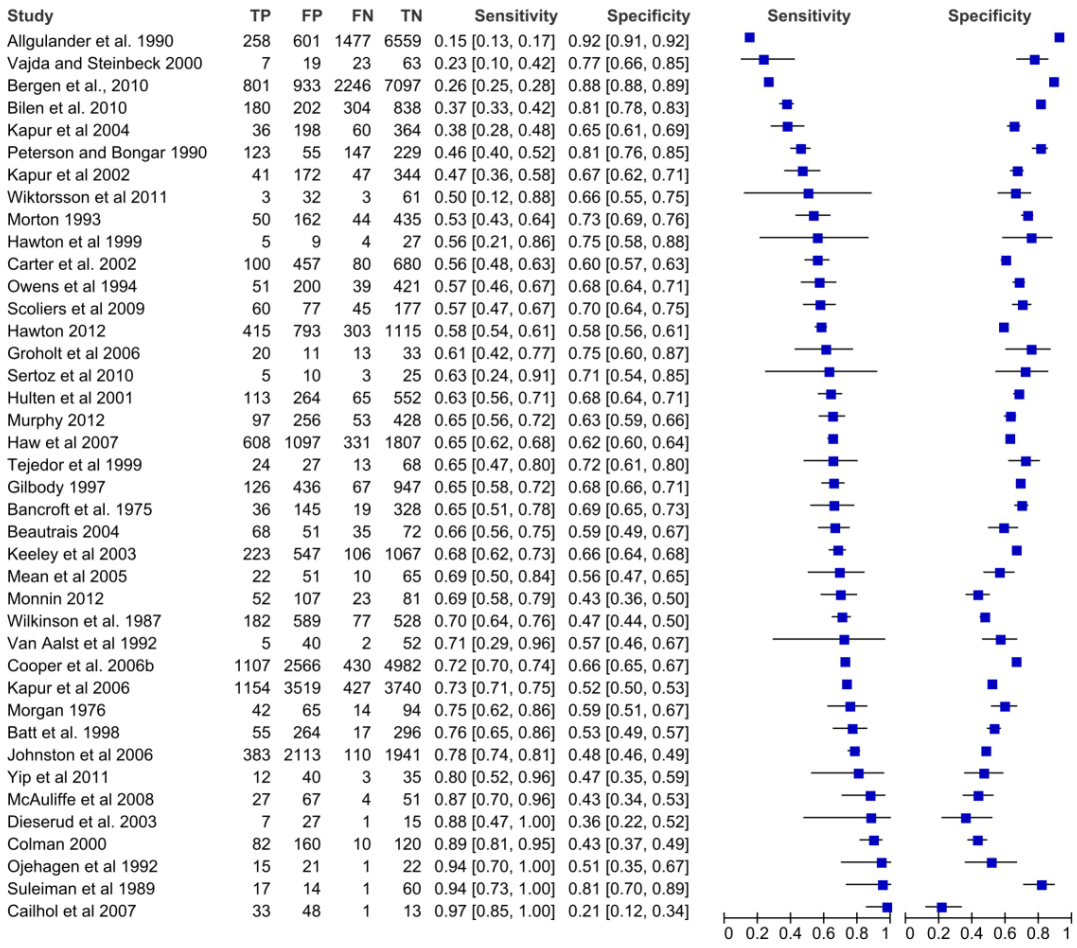


Figure 3.12. Forest plot of sensitivity and specificity of previous self-harm in predicting repetition

Six studies examined the association between repetition and attitudes towards living at the time of assessment. Two high-/medium-quality studies found a medium-sized positive association between repetition and regretting surviving in univariate analyses only (Morgan et al., 1976; Sathianathan & Sadowski, 1996). One high-/medium-quality study (Beautrais, 2004) found that those who repeated were more likely to feel angry (OR=2.24, 95% CI:1.09- 4.62) and less likely to feel relieved (OR=0.54, 95% CI: 0.32- 0.91) that they did not die. Suicidal plans at the time of assessment had a significant medium-sized association with repetition in

univariate analyses in a high-/medium-quality study by Cooper et al. (2006) and in univariate and multivariate analyses in a high-/medium-quality study by Kapur et al. (2006) but the association did not reach significance in univariate analyses in a lower-quality study by Suleiman et al. (1989). One high-/medium-quality study (Beautrais, 2004) found that repeaters were more likely to report that, after the index episode, they still had thoughts that they wanted to die (OR= 2.05, 1.20-3.49) and that they believed they would make another suicide attempt (OR= 3.15, 1.62-6.15).

These studies indicate a consistent and medium-sized association between repetition and continuing suicidality at the time of assessment.

Characteristics of index episode.

Method of self-harm.

Self-injury compared with self-poisoning

Twenty-two studies explored the association between method used in the index self-harm episode and risk of repetition. Nine studies compared repetition rates between those presenting with self-poisoning and those presenting with self-injury. Three studies found a moderately increased risk of repetition associated with self-injury in univariate analyses whereas five high-/medium-quality studies and one lower quality study found moderate non-significant negative associations in univariate and multivariate analyses. Five studies examined whether the involvement of self-poisoning either alone or in combination with self-injury affected repetition risk. Two high-/medium-quality studies found no effect (Bilén et al., 2010; Caldera et al., 2007) and two lower-quality studies (Nordentoft & Branner, 2008; Suleiman et al., 1989) found considerably higher risk associated with the involvement of self-poisoning, with odds ratios of 3.10 and 6.29. Six studies

examined the effect on repetition of involvement of self-injury, either alone or in combination with self-poisoning. Five studies found a slightly increased risk of repetition associated with the involvement of self-injury, of which all were high-/medium-quality (Bergen et al., 2010; Corcoran, Keeley, O'Sullivan, & Perry, 2004; Haw et al., 2007; Hawton, Bergen, Kapur, Cooper, Steeg, Ness et al., epub ahead of print; Kapur et al., 2006). One high-/medium-quality study found no association (McAuliffe et al., 2008).

Six high-/medium-quality studies reported an increased risk of repetition associated with involvement of self-cutting in particular, with odds ratios ranging from 1.18 to 2.25. One high-/medium-quality study found a slightly increased risk associated with using self-cutting, stabbing or gas, compared with medications (Christiansen & Jensen, 2007).

Two high-/medium-quality studies (Bilén et al., 2010; Gibb, Beautrais, & Fergusson, 2005) found that an index episode involving major self-injury conferred a considerably higher of repetition, whereas two high-/medium-quality studies found a smaller non-significant protective effect (Murphy et al., 2012; Perry, Corcoran, Fitzgerald, Keeley, Reulbach, & Arensman, 2012), and Steeg et al (2012) found a small non-significant increased risk. A lower-quality study of trauma admissions by Van Aalst et al. (1992) found that repeaters were less likely to have used a gun (OR=0.25, 95% CI: 0.05-1.20) but were significantly more likely to suffer blunt trauma (OR=6.33, 95% CI: 1.29-31.09). Based on these studies, there is fairly consistent evidence of an association between repetition and self-injury, particularly self-cutting, with medium effect sizes.

Type of drug used in overdose.

In two lower-quality studies of intentional overdose presentations, ingesting multiple drugs was found to increase the risk of repetition (OR=1.65, 95% CI: 1.11-2.46) in one study (Owens, Dennis, Read, & Davis, 1994) and to decrease risk (OR 0.70, 95% CI: 0.47 to 1.07) in another study (Taylor, Cameron, & Eddey, 1998).

The association between repetition and the type of drug used in overdose was investigated in seven studies. Ingesting a neuroleptic as part of an overdose decreased the risk of repetition among men (OR= 0.65, 95% CI: 0.49- 0.85) in one high-/medium-quality study (Allgulander & Fisher, 1990). Another high-/medium-quality study (Payne et al., 2009) found a moderately increased risk of repetition associated with overdose by anticonvulsants, antidepressants, antidiabetic drugs, benzodiazepines, or opiates compared with paracetamol with odds ratios ranging from 1.14 for antidepressants to 1.68 for benzodiazepines. Steeg et al. (2012a) found higher rates of repetition among those presenting with overdoses of benzodiazepines (RR= 1.3, 95% CI: 1.2–1.4) and overdoses of antipsychotics (RR= 1.4, 95% CI: 1.3–1.6) compared with other self-harm presentations. Presenting with an overdose of paracetamol was reduced with reduced risk (RR= 0.80. 95% CI: 0.70–0.90). In a lower-quality study, Suleiman et al.(1989) found that repeaters were far more likely to have used prescription drugs only in the index episode than non-repeaters (OR=5.0, 95% CI; 1.34-18.73). One lower-quality study (Mayo, 1974) found no association between repetition and category of drug (hypnotics, psychotropics, or narcotics) used in overdose. Overall, it seems that the type of drug ingested in overdose is not particularly useful in predicting repetition.

Suicidal intent.

The suicidal intent associated with an index episode has been widely explored as a potential risk factor for repetition of self-harm. Sixteen studies examined the association between repetition and total Beck Suicide Intent Scale score. Three studies, one high-/medium-quality (Hjelmeland, 1996) and two lower-quality (De Leo, Padoani, Lonnqvist, Kerkhof, Bille-Brahe, Michel et al., 2002; Öjehagen, Regnéll, & Träskman-Bendz, 1991), found a significant moderate negative association with repetition, with a larger effect for men (*d*= -0.43) than women (*d*=-0.15) in Hjelmeland's study. Two high-/medium-quality studies (Harriss, Hawton, & Zahl, 2005; Haw et al., 2007) found a negative association with repetition in males only. Eleven studies found no association with repetition, of which seven were high-/medium-quality. Effects tended to be small to moderate (*d*= -0.17 to +0.59) and were more often in a positive direction. In a high-/medium-quality study, Colman (2000) used principal component analysis to split the scale into "intent" and "intervention" and found a significant positive association between repetition and intent (OR= 1.72, *p*=0.03) but not intervention (OR=1.59, *p*=0.08). These results indicate that the suicidal intent associated with an index episode is not a reliable predictor of repetition.

Fifteen studies examined specific characteristics of the index episode and their association with repetition. A wish to die was positively associated with repetition in one high-/medium-quality study (Kapur et al., 2006) with a small odds ratio of 1.19 (95% CI: 1.06-1.33) but had small non-significant associations in both directions in seven studies, of which five were high-/medium-quality. Premeditation had a small positive association with repetition in two studies (Kapur et al., 2006; Sathianathan & Sadowski, 1996), a moderate negative association in one study (Kessel & McCulloch, 1966), and non-significant small associations in both

directions in four studies (Batt, Eudier, Le Vaou, Breurec, Baert, Curtes et al., 1998; Bilén et al., 2010; Spirito et al., 1994; Wang et al., 1985), overall representing little evidence of an association with repetition.

Leaving a suicide note had a medium-sized positive association with repetition in two high-/medium-quality studies (Sathianathan & Sadowski, 1996; Wang et al., 1985), a small negative association in one high-/medium-quality study (Beautrais, 2004) and one lower quality study (Owens et al., 1994), and negligible associations in four studies. Compiling a will had a large inverse association with repetition (OR=0.10, 95% CI: 0.01-0.81) in one low-quality study with patients with borderline personality disorder (Cailhol et al., 2007). Conversely, a small association between repetition undertaking final acts in preparation did not reach statistical significance (OR= 1.41, 95% CI: 0.80-2.47) in a high-/medium-quality study (Beautrais, 2004). Taking steps to avoid discovery was moderately associated with repetition (RR= 1.75, 95% CI: 1.24- 2.47) in one high-/medium-quality study (Sathianathan & Sadowski, 1996) and had non-significant positive associations in four other studies, of which three were high-/medium-quality. Isolation at the time of the act had no significant association with repetition in one high-/medium-quality study (Wang et al., 1985) and one lower quality study (Spirito et al., 1994). Help-seeking during or after the act had non-significant negative associations with repetition in two studies, one high-/medium-quality (Wang et al., 1985) and one lower quality (Spirito et al., 1994). The expected lethality of the act had no association with repetition in one lower quality study (Spirito et al., 1994).

These findings suggest that level of suicidal intent and related behaviours are not useful in predicting repetition of self-harm.

Lethality.

The association between repetition and lethality or medical seriousness was examined in 17 studies. One high-/medium-quality study found a sizeable positive association and three studies of varying quality found moderate inverse associations. The remainder of the studies reported non-significant effect sizes, the majority of which were small in magnitude and operated in both directions. In summary, these studies provide little evidence of a consistent association between lethality and repetition.

Alcohol involvement.

Ten studies examined whether the involvement of alcohol in the index episode is associated with repetition. Three studies, of which two were lower-quality, found sizeable significant positive associations in univariate analyses and one high-/medium-quality study (Peterson & Bongar, 1990) found a moderate protective effect. One of these studies (Wang & Mortensen, 2006) also conducted multivariate analyses in which the positive association persisted (OR= 2.57, 95% CI: 1.05-6.55). Seven studies, of which five were high-/medium-quality, found non-significant associations between repetition and alcohol involvement in the index self-harm episode. Effects tended to be small and in a positive direction. These studies indicate little evidence of an association between alcohol involvement and repetition.

Motives for self-harm.

In terms of motives for self-harm, Scott et al. (1997) found a large significant positive association between externally directed motives and repetition in univariate analysis (OR= 6.29, 95% CI: 1.19-33.3). Suleiman et al (1989) Colman (2000) and

Hjelmeland et al. (1998) found no association with repetition, except that in the latter study women endorsing the motive "to make things easier for someone" were more likely to repeat than men endorsing this item (OR=2.77). Internally directed motives increased the risk of repetition in univariate (OR=2.02) but not multivariate analyses by Colman (2000), and had no effect on repetition in Hjelmeland et al. (1998) and (Suleiman et al., 1989).

Reporting that self-harm was a direct response to mental symptoms had a moderate positive association with repetition with odds ratios on 1.84 and 1.38 in two high-/medium-quality studies (Cooper et al., 2006; Kapur et al., 2006). Similarly, Steeg et al (2012a) reported higher risk of repetition among those who reported that their self-harm was as a response to mental symptoms (relative risk=1.5, 95% CI: 1.4–1.6), whereas Murphy, Kapur, Webb, Purandare, Hawton, Bergen et al (2012) found no significant association in a study of patients aged over 60 years (OR=1.04, 95% CI: 0.72-1.49).

Non-verbal behaviour during assessment

One study (Archinard, Haynal-Reymond, & Heller, 2000) examined whether patients' non-verbal behaviour at the time of assessment was related to repetition. Patients' non-verbal responses to questions about their own risk of repetition and their opinions of care received were videotaped and subsequently blindly coded by multiple assessors. Comparing eleven repeaters (after 24 months) to eleven non-repeaters matched on gender, age, and previous self-harm episodes, the authors found that repeaters more often displayed repeaters had a significantly higher activity of the mouth (when not speaking) and looked significantly more downwards

than non-repeaters. These indicators were more accurate than the clinician's prediction in identifying repeaters.

Predictive Scales.

In addition to exploring the role of individual risk factors in repetition, seven studies created or adapted scales to identify those at high risk of repetition. Such a tool should have good sensitivity and specificity and should be easy to administer in a busy emergency department setting. Scales discussed here are Buglass & Horton's (1974c) scale, the Edinburgh Risk of Repetition Scale (Kreitman & Foster, 1991), the Manchester Self-harm Rule (Cooper et al., 2006), a preliminary statistical model for identifying repeaters of parasuicide (Corcoran, Kelleher, Keeley, Byrne, Burke, & Williamson, 1997), a scale by Petrie and Brook (1992), Colman's risk factor scale (2000; Colman et al., 2004), the ReACT rule (Steeg, Kapur, Webb, Applegate, Stewart, Hawton et al., 2012b), Assessment for Repeated Suicide (Yeh, Hung, Lee, Lin, Chiu, Huang et al., 2012), and adjustments of the Suicide Assessment Scale (Stanley, Träskman-Bendz, & Stanley, 1986) and the SAD-PERSONS scale (Patterson, Dohn, Bird, & Patterson, 1983) to predict repetition of self-harm rather than suicide.

Buglass and Horton scale.

The Buglass and Horton scale (1974c) consists of six dichotomous items (sociopathy; problem in the use of alcohol; previous psychiatric in-patient care; previous psychiatric out-patient care; previous parasuicide admission; and not living with a relative), the presence of each being assigned a value of one. The validity of the scale was examined in six further studies. In the original high-/medium-quality

study (Buglass & Horton, 1974c), patients who scored 0 had only a 5 per cent chance of repetition while those who scored 5 or 6 had a 48% chance of repetition. The scale's sensitivity was 88% and specificity was 56%. Within the same study, the authors found the predictive power slightly reduced in a validation check with two more cohorts. Two lower quality studies in Italian samples (Garzotto et al., 1976; Siani et al., 1979) found similarly good specificity (83% in both) and medium sensitivity (67% and 65% respectively) but each pointed to four additional variables that discriminated between repeaters and non-repeaters that were not present in the original scale. In a high-/medium-quality study, Myers (1988) reported acceptable sensitivity and specificity (76% and 63% respectively) for the instrument and, more recently, another high-/medium-quality study by Scoliers and colleagues (2009) found that a medium score on the scale was associated with a higher risk of repetition than a low score in both univariate and multivariate analyses (OR= 2.91, 95% CI: 1.65- 5.12). In a high-/medium-quality study, Sidley et al. (1999) found a large positive association between repetition and number of Buglass and Horton's risk factors present in univariate analyses at six-month- (d= 0.69) and 12-month-follow-up (d= 0.72). However, multivariate analyses revealed that it was previous self-harm that was responsible for this association and the addition of the other risk factors in the scale did not enhance the prediction model. Scott et al.(1997) found that having a score of greater than three on the scale was not more likely among repeaters than non-repeaters (OR=1.13, 95% CI: 0.31- 4.03), but the sample in that lower-quality study was limited to patients who received a score of one or higher on the scale.

Kreitman and Foster scale.

Kreitman and Foster (1991) developed a scale whose validity was examined in three further studies. The scale developed in a high-/medium-quality study by Kreitman and Foster (1991) was designed to be suitable for both clinical and research settings, with dichotomous responses in the former version and weighted responses in the latter. The 11 items on the scale are: previous parasuicide, personality disorder, alcohol problems, previous psychiatric treatment, unemployment, social class, drug abuse, criminal record, violence (given or received), age and marital status. The authors used a fresh cohort to validate the scale and found that repeaters were unlikely to be classified as low risk, particularly among men classified using the research version. However, for every five patients classified as high-risk, about two repeated, while on average over half of those in the middle-risk group were repeaters. Three high-/medium-quality studies explored the predictive value of this scale. Evans et al. (2000) used the 11 items from the Kreitman and Foster scale and found that in males only previous DSH was independently associated with repetition and in females, previous DSH, past psychiatric contact and unemployment were independently associated with repetition. Carter et al.(2002) found a significant relationship between repetition and scores on the scale but conclude that the sensitivity and specificity were low at 26% and 84% respectively. Hawton and Fagg (1995) compared the clinical and research versions of the scale in males and females in two cohorts. The sensitivity of the scale was mediocre and they found that the research version outperformed the clinical version in one of the cohorts. The scale performed less well when repetition was calculated per full year as opposed to per calendar year and when repetitions were based on persons rather than admissions. They conclude that focussing on admissions rather than persons confers a risk of "spuriously increasing the apparent

performance of the scale" (p. 267). The study also compared the scale to Buglass and Horton's (1974c) scale, and found that overall the scales performed comparably.

Manchester self-harm rule.

In a derivation set of 6,933 self-harm presentations, Cooper et al.(2006) explored the association between repetition and fifty explanatory variables in assessed self-harm patients in a high-/medium-quality study. An optimal decision rule was generated using four dichotomous variables: any history of self-harm, previous psychiatric treatment, benzodiazepine use in this attempt, and any current psychiatric treatment. A positive response to any of the four variables indicated risk, correctly identifying 94% of repeaters in the derivation set and 97% of repeaters in the validation set. This exceptionally high sensitivity, however, was accompanied by a low specificity (25% and 26% in the derivation set and validation set respectively). The rule additionally predicted all completed suicides. A further study using the same data showed that the sensitivity of the rule was superior to that of risk assessments by both mental health specialists and ED physicians (Cooper, Kapur, & Mackway-Jones, 2007). However, more recently, the rule did not perform well in a sample of Canadian patients presenting with suicidal ideation and self-harm (Randall et al., 2012), demonstrating good sensitivity (95.1%) but poor specificity (14.7%). Similarly, an English study using two data-sets recently reported high sensitivity (98% and 97% respectively) and low specificity (17% and 20%).

Suicide risk scales.

In a high-/medium-quality study, Waern et al. (2010) used the modified Suicide Assessment Scale (SUAS) to predict repetition of self-harm. The tool contains the following items rated on a five-point scale: sadness and despondency,

tension, emotional withdrawal, perceived loss of control, and suicidal thoughts. Patients who obtained a high score on the SUAS (>30) were significantly more likely to repeat, even after adjustment for age, sex, anxiety and depression. A cut-off score of 24 optimised sensitivity and specificity, which were quite poor at 61% and 40% respectively. However, when analyses were repeated with the subgroup that was receiving psychiatric treatment at follow-up, sensitivity for that cut-off score increased to 79% while specificity decreased to 32%.

The SAD-PERSONS scale (Patterson et al., 1983) was originally based on risk factors for suicide and has ten dichotomous items: sex, age, depression, previous attempt, ethanol abuse, rational thinking, social support, organised plan, no spouse, and sickness. A score of 0-4 indicates low risk and 5-10 indicates high risk. The scale was used in a lower quality study by Öjehagen et al. (1992) to predict repetition of self-poisoning. They found no association between repetition and scores on the scale (d= 0.44).

Other predictive scales.

The following scales have not yet been validated. In developing a scale for the prediction of repetition, Corcoran et al.(1997) identified eleven predictor variables in a high-/medium-quality study: any previous act of self-harm, main method of self-harm used, alcohol taken at time of act, drugs taken as part of act, change in domestic situation near time of act, history of abuse of street drugs, marital status, level of education, harm caused by alcohol, age, and sex. They identified three cut-off points which can be adopted for acceptable sensitivity and specificity, high sensitivity, or high specificity, depending on the purposes of the investigation. The scale also allows for the classification of patients into low-, medium-, and high-

risk groups. In multivariate analyses in a high-/medium-quality study, Colman et al.(2000; 2004) identified four independent dichotomous risk factors for repetition: prior history of self-harm, lifetime history of schizophrenia, lifetime history of depression, and fair or poor physical health over the preceding three months. Constructing a risk factor scale and giving equal weighting to each item, he concluded that a cut-off score of between two and three optimised sensitivity and specificity at 73.9% and 70.0% respectively. In a high-/medium-quality study, Petrie and Brook (1992) conducted a discriminant analysis to investigate how a number of variables (age, employment, sense of coherence subscales, living alone, previous attempts, method of self-harm, hopelessness, sex, marital status, self-esteem, depression) discriminated between repeaters and non-repeaters. The analysis indicated that the rule had a specificity of 67.9% and a sensitivity of 63.2%.

More recently the ReACT rule (Steeg et al., 2012a) has been developed including non-assessed presentations. It states that a person is at high to moderate risk of repetition if they report recent self-harm (self-harm in the past year), are living alone or are homeless, present with self-cutting as a method of self-harm, and are receiving treatment for a current psychiatric disorder. In the derivation data, the rule had 95% sensitivity and 21% specificity. The rule was tested in external test data from another site and showed decreased sensitivity (90%) but improved specificity (34%).

Yeh et al. (2012) developed the Assessment for Repeated Suicide using a number of self-report items from well-established measures of hopelessness, impulsivity, aggression, and suicidal ideation. Repeaters scored more highly than non-repeaters, with a moderate to large effect size (d= 0.64). A logistic regression controlling for age and marital status showed a small but statistically significant

association between total ARS scores and repetition (OR = 1.06, 95% CI = 1.03, 1.09).

Discussion

Summary.

This review synthesises studies examining risk factors for repetition of self-harm after an index hospital presentation of self-harm. We identified factors that have been examined in relationship to repetition of self-harm and found several factors that consistently had statistically significant associations with repetition. However, forest plots for these factors demonstrated poor sensitivity of individual risk factors in predicting repetition. Our findings also suggest that extant scales for predicting repetition of self-harm generally have adequate sensitivity but poor specificity.

Methodological considerations.

There are a number of methodological concerns to bear in mind in the interpretation of this review. In spite of relatively narrow inclusion criteria, the included studies were heterogeneous in terms of the instruments used to measure risk factors, the duration of follow-up, and methods used to detect repetition. While it is of value to form a broad overview of risk factors for repetition, future reviews could focus on specific follow-up periods or specific measures of risk factors. We calculated and presented sensitivity and specificity values for selected risk factors; while helpful in terms of investigating the predictive value of individual risk factors, this approach did not enable us to examine how various combinations of risk factors

might result in redundancy or increased predictive value. In terms of external validity, the current review was limited to longitudinal/prospective studies of hospital presentations of self-harm. Therefore, the risk factors for future self-harm identified in the review may not be applicable to the prediction of future self-harm in non-clinical groups. This approach allowed us to inform risk assessments conducted in acute hospital settings but further work is required to elucidate risk factors for repetition of self-harm among the sizeable population of self-harmers that never comes to the attention of emergency health services. Although some of the studies included in the current review counted a small number of completed suicides in the "repeaters" group, we did not explicitly address risk factors for suicide among self-harm patients. Although fatal repetition is rarer than non-fatal repetition, it is nonetheless an important clinical outcome, and designating suicide cases as non-repeaters in the current review could have resulted in the underestimation of the effect of some risk factors. For example, suicidal intent was not consistently associated with repetition in the included studies, but suicidal intent is an important predictor of eventual suicide (Harriss & Hawton, 2005). It should be acknowledged than the current review does not address all factors that may be of use in assessing risk in self-harm patients, and that further research is required to synthesise extant research on risk factors for completed suicide. Moreover, a factor such as drug abuse, though there is no strong evidence for an association with repetition, may still be considered important in the context of a needs assessment. This review therefore does not include all the measures that may be of interest to those conducting a complete psychosocial assessment. Another potential limitation of the review is that the vast majority of studies were conducted in Europe. It is unclear whether this

uneven distribution of studies is a fair reflection of the international research agenda or an indication of inclusion criteria that favoured the inclusion of European studies.

Factors associated with repetition.

Through a systematic search, we located 129 eligible studies. Several risk factors have been studied extensively and were chosen for inclusion in forest plots of sensitivity and specificity. These factors included ten factors which demonstrated consistent associations with repetition (previous self-harm, history of psychiatric treatment, current psychiatric treatment, alcohol misuse/dependence, drug misuse/dependence, living alone, unemployment, mood disorder, schizophrenia, not being married, and personality disorder), as well as mood disorder whose association with repetition emerged as less consistent. Other factors such as criminal record/history of violence, being a victim of violence, reporting adverse life events, homelessness, impulsivity, problem-solving, suicidal ideation at the time of assessment, psychiatric comorbidity, sexual abuse, Beck Hopelessness Scale score, presenting with self-cutting, and younger age also showed emerging evidence of an association with repetition. Although the review focussed on individual risk factors, the results support the notion of a dose-response relationship between vulnerability and likelihood of self-harm. A stepwise increase in the number of previous self-harm episodes has been shown to be consistently associated with a higher risk of prospective repetition (Haw et al., 2007; Perry et al., 2012). Similarly, having greater number of psychiatric disorders was associated with a higher risk of repetition in the current review. Such findings suggest that self-harm repetition is related to a constellation of related vulnerabilities, which need to be assessed at the time of presentation. Psychiatric morbidity and treatment history are usually routinely assessed at presentation and may therefore be easily incorporated into risk

assessments. Existing risk factor scales incorporate most of the consistent predictors identified in the current review. Four of the scales included age (Corcoran et al., 1997; Kreitman & Foster, 1991; Öjehagen et al., 1992; Petrie & Brook, 1992), three included previous psychiatric treatment (Buglass & Horton, 1974c; Cooper et al., 2006; Kreitman & Foster, 1991), four included alcohol problems (Buglass & Horton, 1974c; Corcoran et al., 1997; Kreitman & Foster, 1991; Öjehagen et al., 1992), and all of the scales with one exception (Waern et al., 2010) included previous self-harm as a risk factor. Despite the association between hopelessness and repetition, only one scale incorporated this risk factor (Petrie & Brook, 1992) and the inclusion of marital status as a predictor in four scales (Corcoran et al., 1997; Kreitman & Foster, 1991; Öjehagen et al., 1992; Petrie & Brook, 1992) belies the mixed association with repetition found in this review.

Clinical implications.

Clinical guidelines for the management of self-harm recommend a risk assessment as part of the assessment process (NICE, 2004). However, to date, no review has been published that draws together the extensive research on risk factors for repetition in order to inform these risk assessments. The current review suggests a number of easily measured risk factors which can be incorporated into risk assessments. It must be borne in mind, however, that these factors have only a predictive and not a causal association with repetition. It is possible that the risk factors identified in the review do not confer an inherent risk for repetition but rather affect the likelihood that a person will receive an assessment or access the support and treatment they require. Patients who misuse alcohol, have personality disorders, or an extensive history of self-harm may be the very patients least likely to engage with services but they are also perhaps less likely to encounter a positive response

from health service providers. Engaging in self-harm indicates distress and coping difficulties and all patients should be facilitated in a way that recognises and addresses their needs. The findings of this review can be used to identify who is at risk of repetition such that constrained resources can be directed to those most at risk. Moreover, the review can serve to dispel misconceptions around the association between some factors and repetition, for example we found that a patient who does not report a wish to die is just as prone to repetition as a patient who does report a wish to die. We can conclude that there are a number of factors that are consistently associated with repeated self-harm, that represent items that should be part of any clinical assessment tool used to assess risk of repeated self-harm. However, the variable performance of these factors in terms of their sensitivity underlines the difficulty in predicting repetition, and suggests that accurate prediction of repetition of self-harm remains a challenge.

Theoretical implications.

Despite the wide variety of theoretical frameworks within the self-harm literature (Baumeister, 1990; Horne & Csipke, 2009; Klonsky, 2009; Mann, 2003; O'Connor, 2003; van Heeringen, 2001; Williams, 1997), there is a dearth of theories that attempt to explain why a minority of those who present with self-harm will go on to repeat self-harm. The predictors of repetition identified in the current review span psychiatric, psychological and social domains, but seem to echo the factors involved in the initiation of self-harm. It might be argued that those who repeat self-harm prospectively possess risk factors for self-harm initiation to a higher degree than those who do not repeat self-harm. This is particularly applicable to continuous factors such as hopelessness, problem-solving ability, self-efficacy, sense of coherence and serotonergic functioning. This suggests that repetition risk might be

associated with pre-existing vulnerability, as well as being affected by self-harm consequences in terms of access to appropriate health and social services. Interestingly, certain stressors such as work/school problems and relationship problems were associated with non-repetition. This is in line with the "suicidal process" model, which conceptualises suicidal behaviour as becoming increasing autonomous with repetition (Neeleman, de Graaf, & Vollebergh, 2004).

It is of note that depression, a state measure considered to be the "final common pathway leading to suicidal behaviour" (van Heeringen, 2001, p. 138), was not particularly useful in predicting repetition. It may be that differences between repeaters and non-repeaters emerge in the period after an index episode where those who go on to repeat continue to experience depressive symptoms for a longer period or experience recurring depression at a later time. Hawton et al. (1999) assert that depression plays an important role in repetition as BDI scores mediated the relationship between problem-solving and repetition. In a comparison of female self-harm patients and non-self-harming controls, Slee, Garnefski, Spinhoven and Arensman (2008) found that, after controlling for depression severity, suicidal cognitions and non-acceptance of emotional responses independently predicted self-harm. The study showed alternative pathways for suicidal behaviour which paved the way for a cognitive-behavioural approach to decreasing suicidal cognitions and increasing acceptance of emotional responses (Slee, Garnefski, van der Leeden, Arensman, & Spinhoven, 2008).

In spite of the association in the current review between diathesis factors and repetition, it is not necessarily true that stressors have no role to play. The current study was focussed on prediction of future self-harm at the time of an index episode. An alternative approach to explore the processes involved in repetition is to compare

index episodes of self-harm to repeat episodes. This approach allows for the investigation of the association between repetition and life circumstances, such as psychosocial adversity. It is conceivable that those who go on to repeat self-harm are those who experience more psychosocial adversity in the period after presenting with an index episode of self-harm.

Future research.

This review indicates a number of consistent, widely studied predictors of repetition of self-harm. Future research could ascertain the respective strength of each of these predictors using meta-analysis, following the approach of McMillan et al. (2007). This review shows a number of risk factors which have been less extensively studied but which have so far exhibited positive associations with self-harm repetition. These risk factors should be incorporated in future self-harm studies in order to verify their usefulness in predicting repetition. A sizeable portion of these factors are psychometric measures, which tend to be beyond the scope of large register-based studies. However, the addition of one or two psychological variables to register proformas could potentially enhance repetition prediction, theory, and psychological interventions.

In the course of the review, we identified a small number of factors for which there was mixed evidence of predictive power, some of which are often assumed to have a strong association with repetition (e.g., female gender, suicidal intent, lethality). Further research should focus on identifying potential interactions with other variables, which might account for such mixed results. Ten scales for the prediction of repetition were identified. Although most of the predictors identified during the current review were included in most of the scales, these scales were

lacking in a number of ways. Many of the scales had been driven by data from one sample, included items that were selected based on univariate associations with repetition, and adopted simple sum scores. Further work is required in the development and testing of risk assessment scales that reveal higher levels of specificity in identifying people at high risk of repetition. To date, only two of the scales have been validated in subsequent studies. The factors identified in the current review should be validated for the prediction of self-harm in a fresh cohort using multivariate analyses.

There exist a variety of interventions which aim to prevent repetition of self-harm (Hawton, Arensman, Townsend, Bremner, Feldman, Goldney et al., 1998) and, although there is evidence that these are effective, the mechanisms involved are not routinely examined. Another way to identify factors associated with repetition would be to identify active components within effective complex interventions to reduce repetition. Such process evaluations can build a case for causal associations and make for more cost-effective and targeted interventions, as well as suggesting risk factors for future research. Conversely, the risk factors generated by the current review could point to targets for intervention, both psychological (e.g., hopelessness, problem-solving) and social (e.g., homelessness, victimisation). Finally, studies which follow up self-harm patients in the time after an index episode have the opportunity to provide a more complete picture of participants' situations by focussing on other outcomes such as psychopathology, wellbeing, and psychosocial circumstances in addition to repetition of self-harm.

Conclusion.

This review indicated a substantial number of studies of risk factors for repetition, most of which were of adequate quality. It appears that the most consistent predictor of repetition of self-harm is a history of self-harm, but there are several other risk factors emerging from the literature. This review is intended to inform those who conduct risk assessments of self-harm patients but also to identify gaps in extant research so that the focus can move from the identification of individual risk factors to a more comprehensive theoretical account of self-harm repetition.

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Implications

This study involved locating, evaluating, and integrating studies that investigated risk factors for repetition of self-harm among self-harm patients, with a view to informing risk assessments in emergency medicine settings. Although some of the factors had acceptable sensitivity and sensitivity, they were risk factors that required either self-report or good hospital record linkage. These means of obtaining information cannot be taken for granted in emergency presentations of self-harm. Self-report of factors is not possible when a participant is unconscious or unwilling. Moreover, Irish hospitals do not use unique patient identifiers and there is often no linkage of patient data among services. If the aim of assessing risk in self-harm patients is to identify at the earliest stage those who are likely to repeat self-harm, then a risk factor that relates to an aspect of the index episode of self-harm is of particular clinical utility. In the systematic review, few of the factors relating to the index episode of self-harm were consistently associated with repetition. Presenting with self-cutting was an exception, emerging as consistently associated with repetition. Moreover, there is emerging evidence that presenting with self-cutting confers increased risk of fatal repetition of self-harm, with two high-quality studies demonstrating an increased risk of completed suicide among those presenting with self-cutting. The involvement of self-cutting in an index episode is a factor that may serve as a "red flag" indicating repetition risk to health service providers.

Chapter 4: Factors Associated with Self-Cutting as a Method of Self-Harm: Findings from the Irish National Registry of Deliberate Self-Harm

Rationale

The preceding systematic review indicated that those presenting with self-cutting represent a group at increased risk of prospective repetition of self-harm. One paper that was located in the systematic review (Perry, Corcoran, Fitzgerald, Keeley, Reulbach, & Arensman, 2012) demonstrated an association in Irish self-harm patients in particular. Apart from differences in repetition rates, it is unclear whether self-cutting patients form a distinct group within self-harm patients in terms of demographic and presentation characteristics. Moreover, it is unclear whether those who engage in both self-cutting and overdose in an index episode more closely resemble self-cutting or overdose patients. The current study uses a large-scale registry to compare these characteristics across those presenting with self-cutting, those presenting with overdose, and those presenting with self-cutting plus overdose.

Factors associated with self-cutting as a method of self-harm: Findings from the Irish National Registry of Deliberate Self-Harm

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Abstract

Research indicates that patients presenting to hospital with self-cutting differ from those with intentional overdose in demographic and clinical characteristics. However, large-scale national studies comparing self-cutting patients to those using other self-harm methods are lacking. The current study aimed to explore important differences between hospital-treated self-cutting and intentional overdose, to examine the role of gender in moderating these differences, and to elucidate the characteristics and outcomes of those patients presenting with combined self-cutting and overdose. Between 2003 and 2010, the Irish National Registry of Deliberate Self harm recorded 42,585 self-harm presentations to Irish hospital emergency departments meeting the study inclusion criteria. Data were obtained on demographic and clinical characteristics by data registration officers operating independently from the hospitals. Self-cutting only was significantly more common in males than females, with an overrepresentation of males aged < 45 years. Independent of gender, self-cutting as sole method was significantly associated with no fixed abode, residing in inpatient setting, city residence, absence of alcohol, out of hours and weekend presentation, and repetition risk within 12 months after the index episode. In females those aged < 55 years were overrepresented among self-

cutting only presentations. The demographic and clinical differences between self-harm patients underline the presence of different subgroups with implications for service provision and prevention of repeated self-harm. Given the relationship between self-cutting and subsequent repetition, service providers need to ensure that adequate follow-up arrangements and supports are in place for the patient.

Introduction

Self-harm poses a significant health problem. In addition to the high human and financial burden of self-harm itself, individuals who engage in self-harm are at increased risk of repetition of self-harm (Cooper, Kapur, Dunning, Guthrie, Appleby, & Mackway-Jones, 2006; Haw, Bergen, Casey, & Hawton, 2007; Owens, Horrocks, & House, 2002), suicide (Cooper, Kapur, Webb, Lawlor, Guthrie, Mackway-Jones et al., 2005; Owens et al., 2002; Owens, Wood, Greenwood, Hughes, & Dennis, 2005), and all-cause mortality (Hawton, Harriss, & Zahl, 2006). Much of the practice policy around self-harming behaviour classifies diverse methods under the rubric of "self-harm". It is unclear whether this blanket approach to self-harm patients is appropriate or whether the characteristics and needs of self-harm patients differ by self-harm method used. In Ireland (Perry et al., 2012), as in the UK (Hawton, Bergen, Casey, Simkin, Palmer, Cooper et al., 2007), Europe (Michel, Ballinari, Bille-Brahe, Bjerke, Crepet, De Leo et al., 2000), and the US (Claassen, Trivedi, Shimizu, Stewart, Larkin, & Litovitz, 2006), self-cutting is the second most common method of hospital-treated self-harm, with the most common method being intentional overdose. There is emerging evidence of significant differences between those who engage in self-cutting and those who engage in intentional overdose. Although community studies have identified self-cutting as the most common method of self-harm (Morey, Corcoran, Arensman, & Perry, 2008; Nixon, Cloutier, & Jansson, 2008; Ystgaard, Reinholdt, Husby, & Mehlum, 2003), intentional overdose is the most common self-harm method in hospital presentations (Gunnell, Bennewith, Peters, House, & Hawton, 2005; Hawton et al., 2007; Michel et al., 2000; Olfson, Marcus, & Bridge, 2012), suggesting that self-cutting episodes are less likely to result in hospital presentation. There are also gender differences between

self-cutting and overdose, with female patients tend to form a majority within intentional overdose presentations but self-cutting presentations display a more even gender distribution (Harriss, Hawton, & Zahl, 2005; Hawton, Harriss, Simkin, Bale, & Bond, 2004; Horrocks, Price, House, & Owens, 2003; Lilley, Owens, Horrocks, House, Noble, Bergen et al., 2008; O'Loughlin & Sherwood, 2005). In addition, patients presenting with self-cutting are more likely to have a history of repeated self-harm (Hawton et al., 2004; Lilley et al., 2008), Lilley et al (2008) also showed that individuals presenting with self-cutting were at higher risk of prospective repetition than those with presenting with intentional overdose or those using more than one method of self-harm and yet they were less likely to be admitted to hospital or to receive a psychosocial assessment. Kapur, Murphy, Cooper, Bergen, Hawton, Simkin et al. (2008) also found evidence for a decreased likelihood of self-cutting patients receiving a psychosocial assessment following presentation to hospital compared to those using other self-harm methods. This is a matter of concern since long-term follow-up studies report a significantly increased risk of suicide among patients presenting to hospital due to self-cutting (Bergen, Hawton, Kapur, Cooper, Steeg, Ness et al., 2011; Cooper et al., 2005). Research involving psychiatric patients indicates that self-cutting is prevalent among those diagnosed with Borderline Personality Disorder (BPD) (Oumaya, Friedman, Pham, Abou, Guelfi, & Rouillon, 2008) and eating disorder (Corstorphine, Waller, Lawson, & Ganis, 2007) and appears to be primarily associated with affect dysregulation and impulsivity. However, these studies mostly include women and have not compared patients who engage in self-cutting only to those using other self-harm methods.

The current study used data from the National Registry of Deliberate Self-Harm Ireland and aims to examine (a) differences between hospital-treated self-

cutting and intentional overdose, (b) the role of gender in moderating these differences, and (c) characteristics and outcomes of patients presenting with combined self-cutting and overdose.

Methods

Design and setting.

The National Registry of Deliberate Self-Harm Ireland is a hospital based monitoring system for deliberate self-harm operated by the National Suicide Research Foundation on an ongoing basis. The number of hospitals that contributed full calendar year data to the Registry increased from 37 hospitals for 2003 to 38 for 2004-2005 and all 40 hospitals for 2006-2010. All data are collected by Data Registration Officers (DROs), who operate independently of the hospitals and work according to standard operating procedures which take into account patient confidentiality. The Registry's standardised methodology is described in detail elsewhere (Perry et al., 2012). DROs visit emergency departments and review case notes to identify cases of self-harm through the standardised application of the case definition and inclusion/exclusion criteria. The details of these presentations are recorded on laptop computers and are sent to a centralised database. DROs work closely with the Registry directors to ensure the "caseness" of recorded episodes. Audits incorporating crosschecks among DROs showed high levels of agreement on case ascertainment with kappa statistics exceeding 0.9. The Registry has been an ongoing system since 2003 and therefore allows for prospective follow-up.

Study population.

The National Registry of Deliberate Self-Harm Ireland 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'(Perry et al., 2012). The definition includes acts involving varying levels of suicidal intent and various underlying motives such as loss of control, cry for help or self-punishment. It includes any method of self-harm where it is clear that harm was intentionally self-inflicted, regardless of the level of suicidal intent, but excludes cases where an individual dies in the emergency department. Alcohol is considered a method of self-harm when it was deemed to have been used as a means to intentionally inflict physical harm. Accidental overdoses e.g., an individual who ingests excess medication without any intention to self-harm, are excluded. Also excluded are self-inflicted injuries that clinicians note as occurring as a result of stereotypic movement associated with developmental disorder or cognitive disability.

For the purpose of the current study, presentations from the Registry were included if they were (a) the first presentation by an individual in the study period, (b) involved self-cutting as the sole method, combined self-cutting and intentional overdose of medication in the same presentation, or intentional overdose of medication as the sole method, and (c) occurred between 1st January 2003 and 31st December 2009 to allow 12 months follow-up.

Variables.

DROs use a standardised approach to extract information from case notes on the following variables: encrypted patient initials, gender, date of birth, area of residence, living circumstances (private dwelling, prison, no fixed abode/shelter, inpatient setting of any kind, other), date and hour of attendance, method(s) of self-harm (ICD-10 codes), drugs taken, whether alcohol is consumed (yes/no/missing), and recommended next care. Data on repetition are obtained by identifying patients whose gender, encrypted initials and date of birth are identical.

Ethical approval.

Ethical approval has been granted by the National Research Ethics Committee of the Faculty of Public Health Medicine. The Registry has also received ethical approval from the relevant hospitals and Health Service Executive Committees. The National Suicide Research Foundation is registered with the Data Protection Agency and complies with the Irish Data Protection Act of 1988.

Statistical analyses.

First self-harm presentations during the study period were selected on the basis of whether they involved self-cutting only, self-cutting plus intentional overdose, or intentional overdose only. Prospective repetition was operationalised at three levels: the presence of another presentation of self-harm (regardless of the self-harm method used) within 30 days of the index presentation, between 31 days and 12 months after the index presentation, or no repetition within 12 months of the index presentation.

Pearson chi squared tests were used to compare proportions across these groups in relation to another categorical variable. When χ^2 tests revealed a significant association, Cramer's V was calculated as a measure of the strength of association among categorical/ordinal variables which adjusts for a large sample size.(Agresti, 2007) Its value usually falls between 0 and 1 and is interpreted much in the same way as a correlation coefficient, indicating a very weak association if < 0.1, a weak association if < 0.3, a moderate association if < 0.5 and a strong association if 0.5+.Univariate odds ratios and corresponding 95% confidence intervals were also calculated.

Multinomial regression analysis was used to identify factors associated with "self-cutting only" and "self-cutting plus intentional overdose" using the "intentional overdose only" group of presentations as the reference category. Independent categorical variables were gender, age group (reference group: 55+ years), city residence (reference group: non-city residence), living circumstances (reference group: private household), involvement of alcohol (reference group: none), presentation between 9am and 5pm (reference group: presenting outside 9am to 5pm), presentation on a weekend day (reference group: presenting on a weekday), and occurrence of a subsequent self-harm presentation within one year (reference group: none). A series of multinomial regression analyses were run to assess whether the effect of each independent variable was modified by gender. Effect modification was determined for 5 of the 7 independent variables. Consequently, separate multivariate models were estimated for each gender. The significance level α was set at 0.05. All statistical tests were two-sided.

Results

The sample.

Between 2003 and 2010, 87,085 self-harm presentations to emergency departments in the Republic of Ireland were recorded by the Registry, involving 55,228 individuals. The number of persons whose first episode occurred between 2003 and 2009 (to allow for a one-year follow-up period for each index episode) was 48,206, of whom 26,653 (55.3%) persons were female. Of the 48,206 first self-harm episodes occurring between 2003 and 2009, 42,585 episodes involved either self-self-cutting only (n=6,398), overdose only (34,445), or a combination of self-cutting and overdose (n=1,742), of which episodes by females comprised 24,775 (58.2%) episodes.

Demographic characteristics.

Table 4.1 compares the demographic characteristics of presentations of self-cutting only, presentations of self-cutting plus overdose, and presentations of overdose only.

Gender was significantly associated with method of self-harm (χ^2=1033.9, p<0.001; Cramer's V=0.16), with 21.4% of male first presentations involving self-cutting only compared with 10.4% of female first presentations (OR=2.39, 95%CI 2.26-2.52). Similarly, males were over-represented among presentations of self-cutting plus overdose (4.5% vs. 3.8%; OR=1.39, 95%CI 1.26-1.53). Age was significantly associated with method of self-harm in both males (χ^2=303.3, p<0.001; Cramer's V=0.09) and females (χ^2=283.1, p<0.001; Cramer's V=0.08). Area of residence was

Table 4.1.

Characteristics of Presentations Involving Self-Cutting only (S-C), Self-Cutting and Intentional Overdose (S-C + OD), and Intentional Overdose only (OD).

		Men			Women			Total
		S-C	S-C + OD	OD	S-C	S-C + OD	OD	
Presentations		3820 (21.4%)	807 (4.5%)	13183 (74.0%)	2578 (10.4%)	935 (3.8%)	21262 (85.8%)	42585
Age*	<15years	56 (25.8%)	11 (5.1%)	150 (69.1%)	113 (12.8%)	35 (4.0%)	737 (83.3%)	1102
	15-24 years	1542 (26.2%)	334 (5.7%)	4015 (68.2%)	1086 (12.1%)	467 (5.2%)	7392 (82.6%)	14836
	25-34 years	1136 (23.0%)	243 (4.9%)	3558 (72.1%)	653 (12.0%)	223 (4.1%)	4549 (83.9%)	10362
	35-44 years	648 (18.2%)	130 (3.7%)	2773 (78.1%)	397 (8.5%)	126 (2.7%)	4129 (88.8%)	8203
	45-54 years	271 (14.0%)	56 (2.9%)	1603 (83.1%)	219 (7.3%)	61 (2.0%)	2731 (90.7%)	4941
	55+ years	167 (13.0%)	33 (2.6%)	1084 (84.4%)	110 (5.9%)	23 (1.2%)	1724 (92.8%)	3141
Lives in a city*	Yes	1252 (24.8%)	293 (5.8%)	3512 (69.4%)	858 (14.2%)	255 (4.2%)	4933 (81.6%)	11103
	No	2568 (20.1%)	514 (4.0%)	9671 (75.8%)	1720 (9.2%)	680 (3.6%)	16329 (87.2%)	31842
Living circumstances *	No fixed abode	146 (31.0%)	24 (5.1%)	301 (63.9%)	44 (27.0%)	9 (5.5%)	110 (67.5%)	634
	Inpatient	59 (43.1%)	3 (2.2%)	75 (54.7%)	40 (21.7%)	6 (3.3%)	138 (75.0%)	321
	Prisoner	74 (63.2%)	1 (0.9%)	42 (35.9%)	6 (54.5%)	2 (18.2%)	3 (27.3%)	128
	Other	229 (27.8%)	39 (4.7%)	555 (67.4%)	156 (14.2%)	42 (3.8%)	904 (82.0%)	1925
	Private	3312 (20.4%)	740 (4.6%)	12210 (75.1%)	2332 (10.0%)	876 (3.8%)	20107 (86.2%)	39577
Presented 9am -5pm[a]*	Yes	913 (19.2%)	215 (4.5%)	3622 (76.3%)	649 (9.5%)	247 (3.6%)	5904 (86.8%)	11550
	No	2864 (22.2%)	585 (4.5%)	9446 (73.3%)	1902 (10.7%)	683 (3.9%)	15141 (85.4%)	30621
Presented at weekend*	Yes	1310 (23.8%)	275 (5.0%)	3926 (71.2%)	869 (11.0%)	328 (4.1%)	6738 (84.9%)	13446
	No	2510 (20.4%)	532 (4.3%)	9257 (75.3%)	1709 (10.1%)	607 (3.6%)	14524 (86.2%)	29139
Alcohol involvement*	Yes	1244 (15.3%)	398 (4.9%)	6514 (79.9%)	739 (7.6%)	394 (4.0%)	8627 (88.4%)	17916
	No	2576 (26.7%)	409 (4.2%	6669 (69.1%)	1839 (12.2%)	541 (3.6%)	12635 (84.1%)	24669
12-month repetition*	<30 days	245 (26.9%)	55 (6.0%)	611 (67.1%)	181 (18.6%)	60 (6.2%)	733 (75.3%)	1885
	31 days-1 year	430 (23.3%)	92 (5.0%)	1323 (71.7%)	354 (13.7%)	132 (5.1%)	2097 (81.2%)	4428
	No	3154 (20.9%)	660 (4.4%)	11249 (74.7%)	2043 (9.6%)	743 (3.5%)	18432 (86.9%)	36272

[a]414 cases missing

*p<0.05 in chi square analyses

also significantly associated with method of self-harm in males (χ^2=80.9, p<0.001; Cramer's V=0.07) and females (χ^2=131.0, p<0.001; Cramer's V=0.07), with presentations involving self-cutting, alone and in combination with overdose, overrepresented among presentations by patients living in cities. Living circumstances were significantly associated with method of self-harm, with patients of no fixed abode/shelter, prisoners, and inpatients over-represented among self-cutting presentations in both males (χ^2=218.9, p<0.001; Cramer's V=0.08) and females (χ^2=128.1, p<0.001; Cramer's V=0.05).

Clinical characteristics.

Table 4.1 shows that method of self-harm was significantly associated with having consumed alcohol at the time of presentation in both males (χ2=342.9, p<0.001; Cramer's V=0.14) and females (χ2=139.6, p<0.001; Cramer's V=0.08). Absence of alcohol involvement was associated with self-cutting only, whereas presence of alcohol was associated with intentional overdose, in both males and females. For those engaging in self-cutting and overdose combined no significant difference was found in terms of alcohol involvement. Hour of presentation was significantly associated with method of self-harm, with self-cutting only presentations less likely to occur between 9am and 5pm in both males (χ2=18.7, p<0.001; Cramer's V=0.03) and females (χ2=8.4, p=0.01; Cramer's V=0.02). Similarly, presenting at the weekend was associated with method of self-harm in males (χ2=32.1, p<0.001; Cramer's V=0.04) and females (χ2=8.5, p=0.01; Cramer's V=0.02).

Repetition.

Repetition in the 12 months after an index episode was significantly associated with method of self-harm, with those presenting with self-cutting only significantly more likely to repeat particularly within 30 days (males: OR=1.43, 95%CI: 1.23-1.67; females: OR=2.23, 95%CI: 1.88-2.64) and also within between 31 days and one year (males: OR=1.16, 95%CI: 1.04-1.31; females: OR=1.52, 95%CI: 1.35-1.72). There was a more marked association in females ($\chi 2$=154.9, p<0.001; Cramer's V=0.06) than males ($\chi 2$=32.2, p<0.001; Cramer's V=0.03).

Factors independently associated with method of self-harm.

Multinomial logistic regression analyses were conducted to identify factors independently associated with method of self-harm in males and females (Table 4.2). Significant effect modification was identified for age group, type of residence, city residence, presenting at the weekend and repetition.

Among both males and females, factors independently associated with "self-cutting only" presentations (compared with "intentional overdose only" presentations) were: being a city resident; being of no fixed abode, residing in an inpatient setting or other health, social and custodial institutions; presenting outside 9am to 5pm; presenting at the weekend; no alcohol involvement; repeating within 12 months after the index episode. In terms of significant gender differences, among males those aged < 45 years and among females those aged < 55 years were overrepresented among patients presenting with self-cutting only.

Being aged less than 35 years, being a city resident, presenting at the weekend, and repeating within 30 days of the index episode were independently

Table 4.2.

Univariate and Multivariate Odds Ratios Obtained in Multinomial Regression Using "Intentional Overdose Only" as Reference Category

			Self-cutting only		Self-cutting + overdose	
			Univariate OR (95% CI)	Multivariate OR (95% CI)	Univariate OR (95% CI)	Multivariate OR (95% CI)
Males	Age	Aged <15years	**2.42 (1.71-3.43)**	**2.07 (1.45-2.96)**	**2.41 (1.19-4.87)**	**2.57 (1.27-5.22)**
		Aged 15-24 years	**2.49 (2.10-2.96)**	**2.34 (1.96-2.79)**	**2.73 (1.90-3.93)**	**2.69 (1.87-3.88)**
		Aged 25-34 years	**2.07 (1.74-2.47)**	**2.01 (1.68-2.41)**	**2.24 (1.55-3.25)**	**2.16 (1.49-3.13)**
		Aged 35-44 years	**1.52 (1.26-1.82)**	**1.54 (1.28-1.86)**	**1.54 (1.04-2.27)**	1.48 (1.00-2.18)
		Aged 45-54 years	1.10 (0.89-1.35)	1.12 (0.91-1.39)	1.15 (0.74-1.78)	1.10 (0.71-1.71)
	Lives in a city	Yes	**1.34 (1.24-1.45)**	**1.28 (1.18-1.39)**	**1.57 (1.35-1.82)**	**1.61 (1.38-1.87)**
	Living circumstances	No fixed abode	**1.79 (1.46-2.19)**	**1.64 (1.32-2.02)**	1.32 (0.86-2.01)	1.08 (0.70-1.67)
		Inpatient	**2.90 (2.06-4.09)**	**2.55 (1.79-3.65)**	0.66 (0.21-2.01)	0.71 (0.22-2.25)
		Prisoner[a]	**6.50 (4.44-9.50)**	**4.89 (3.32-7.20)**	-	-
		Other	**1.52 (1.30-1.78)**	**1.45 (1.23-1.71)**	1.16 (0.83-1.62)	1.15 (0.83-1.61)
	Presented 9am -5pm[b]	Yes	**0.83 (0.77-0.90)**	**0.79 (0.72-0.86)**	0.96 (0.82-1.13)	1.02 (0.87-1.20)
	Presented at weekend	Yes	**1.23 (1.14-1.33)**	**1.27 (1.17-1.38)**	**1.22 (1.05-1.42)**	**1.19 (1.03-1.39)**
	Alcohol involvement	Yes	**0.49 (0.46-0.53)**	**0.51 (0.47-0.56)**	0.99 (0.86-1.15)	1.05 (0.91-1.21)
	12-month repetition	<30 days	**1.43 (1.23-1.67)**	**1.43 (1.22-1.67)**	**1.53 (1.15-2.04)**	**1.55 (1.16-1.06)**
		31 days-1 year	**1.16 (1.04-1.31)**	**1.17 (1.04-1.32)**	1.19 (0.95-1.49)	1.20 (0.96-1.51)
Females	Age	Aged <15years	**2.40 (1.82-3.17)**	**2.36 (1.78-3.13)**	**3.56 (2.09-6.07)**	**3.98 (1.33-6.80)**
		Aged 15-24 years	**2.30 (1.88-2.82)**	**2.32 (1.88-1.85)**	**4.74 (3.11-7.22)**	**4.85 (3.18-7.41)**
		Aged 25-34 years	**2.25 (1.83-2.77)**	**2.28 (1.84-2.82)**	**3.68 (2.38-5.67)**	**3.57 (2.31-5.51)**
		Aged 35-44 years	**1.51 (1.21-1.86)**	**1.54 (1.23-1.92)**	**2.29 (1.46-3.58)**	**2.13 (1.36-3.34)**
		Aged 45-54 years	1.36 (0.99-1.59)	**1.33 (1.05-1.69)**	**1.67 (2.03-2.72)**	1.58 (0.97-2.57)
	Lives in a city	Yes	**1.65 (1.21-1.80)**	**1.61 (1.47-1.76)**	**1.24 (1.07-1.44)**	**1.26 (1.09-1.47)**
	Living circumstances	No fixed abode	**3.45 (2.43-4.91)**	**2.53 (1.76-1.64)**	1.88 (0.95-3.72)	1.58 (0.79-3.16)
		Inpatient	**2.50 (1.75-3.56)**	**2.05 (1.41-2.97)**	1.00 (0.44-2.27)	1.09 (0.48-2.50)
		Prisoner[a]	**-**	**-**	**-**	**-**
		Other	**1.49 (1.25-1.77)**	**1.38 (1.15-1.65)**	1.07 (0.78-1.46)	1.04 (0.76-1.43)
	Presented 9am -5pm[b]	Yes	**0.88 (0.80-0.96)**	**0.83 (0.76-0.92)**	0.93 (0.80-1.08)	1.01 (0.87-1.18)
	Presented at weekend	Yes	**1.10 (1.01-1.20)**	**1.15 (1.05-1.25)**	**1.17 (1.02-1.34)**	1.13 (0.99-1.30)
	Alcohol involvement	Yes	**0.59 (0.54-0.64)**	**0.61 (0.56-0.67)**	1.07 (0.93-1.22)	**1.17 (1.02-1.34)**
	12-month repetition	<30 days	**2.23 (1.88-2.64)**	**2.24 (1.88-2.66)**	**2.03 (1.55-2.67)**	**2.16 (1.64-2.85)**
		31 days-1 year	**1.52 (1.35-1.72)**	**1.55 (1.37-1.75)**	**1.56 (1.29-1.89)**	**1.68 (1.39-2.04)**

[a]Prisoner category excluded where n was low

[b]414 cases missing

associated with males who engaged in self-cutting and overdose combined. Among females who used these two methods independent associations were found for being aged less than 45 years, being a city resident, alcohol involvement and repeating within 12 months after the index presentation.

Discussion

Main findings.

Using national data on hospital presentations, this study compared the characteristics of self-harm presentations involving self-cutting only, presentations of self-cutting and intentional overdose combined, and presentations of intentional overdose only, and identified factors independently associated with method of self-harm. We found that presentations of self-cutting only and presentations of intentional overdose only differed significantly on each of the examined variables, whereas "self-cutting plus overdose" presentations share some similarities with "self-cutting only" presentations and some similarities with "intentional overdose only" Male and female presentations were largely similar within "self-cutting only" presentations, but varied on a number of factors within the group "self-cutting plus overdose".

Overall, the results suggest that patients presenting with self-cutting as the sole method of self-harm are not identical to the majority subgroup of self-harm patients (i.e. those presenting with intentional overdose only), forming a group with an over-representation of males, younger people, city residents, individuals residing in health, social and custodial institutions, and high risk of repetition. "Self-cutting only" was overrepresented among out-of-hours presentations and was less likely to

involve alcohol consumption. The service implications of such differences are compounded by the fact that the medical management of self-cutting will differ markedly from that adopted for intentional overdose, being concerned with wound closure rather than toxicology. It is likely that patients presenting with self-cutting may require less medical observation and may be in a position to receive a psychosocial assessment sooner after presentation than overdose patients. This potentially lower medical complexity must be considered alongside the increased risk of repetition among patients presenting with self-cutting only and the potential need for more intense psychosocial intervention, particularly in the few weeks after the index episode. The need to provide a psychosocial assessment to patients engaging in self-cutting as a matter of routine is also supported by findings from studies in the UK (Bergen et al., 2011; Cooper et al., 2005; Lilley et al., 2008).

The differences between "intentional overdose only" and "self-cutting plus overdose" presentations were less striking than the differences between "intentional overdose only" and "self-cutting only" presentations, suggesting that it may be the methods of self-harm themselves that are clinically significant, rather than the number of methods used. There was one exception to this pattern in the multinomial regression: in females, alcohol consumption was significantly associated with presentations of "self-cutting plus overdose" whereas there was a significant inverse association with "self-cutting only". Boenisch, Bramesfeld, Mergl, Havers, Althaus, Lehfeld et al.(2010) similarly found an association between alcohol consumption and method of self-harm, reporting that patients with alcohol use disorder who had consumed alcohol were significantly less likely than other self-harm patients to have used high-risk methods (jumping from height, hanging, shooting).

For the most part, our findings suggest that, when examining factors associated with methods of self-harm, more striking differences may be revealed by comparing presentations based on the methods themselves, rather than based on whether or not methods of self-harm occurred in combination.

There are a number of recommendations for service provision arising from the current findings. Presentations of self-cutting only were proportionally more likely to occur out-of-hours as compared with presentations of intentional overdose. Earlier studies have found that self-harm patients presenting out-of-hours are less likely to receive a psychosocial or psychiatric assessment compared with those presenting during office hours (Gunnell et al., 2005), and that patients engaging in self-cutting are the least likely to receive a psychosocial assessment (Bergen, Hawton, Waters, Cooper, & Kapur, 2010; Gunnell et al., 2005). It appears that the services in place for self-harm patients are at their lowest at the times when the demand for them is greatest and that this paradox is even more striking for self-cutting patients, who are yet more likely to present out-of-hours. Care must be taken to prioritise assessment for these patients. Services intended to facilitate self-harm patients, regardless of self-harm method, will not have the capacity to assist these patients if they operate during office hours only and services should be adapted to fit the prevailing patterns of self-harm presentations.

In terms of aftercare, given that patients presenting with self-cutting are more likely to live in a city (and therefore more likely to have easier access to services), follow-up arrangements with psychiatric or social services should be emphasised. Extended contact with relevant services may help to reduce the high rates of early repetition of self-harm among self-cutting patients seen in the current study and previous research (Bergen et al., 2010; Lilley et al., 2008). There are a number of

empirically supported interventions to reduce repetition of self-harm, including dialectical behavioural therapy and problem-solving therapy (Hawton, Arensman, Townsend, Bremner, Feldman, Goldney et al., 1998) and, more recently, cognitive-behavioural therapy (Slee, Garnefski, van der Leeden, Arensman, & Spinhoven, 2008) and mindfulness-based cognitive therapy (Williams, Duggan, Crane, & Fennell, 2006). Given the emerging evidence of differences in motives for self-harm (Rodham, Hawton, & Evans, 2004), psychosocial difficulties (Hawton et al., 2004), and suicidal intent (Harriss et al., 2005) between those who engage in self-cutting and those who engage in overdose, there may a need to take account of self-harm method used by participants when evaluating interventions for self-harm.

In addition to implications for hospital management, a number of findings emerged that challenge dominant beliefs about self-cutting patients. The association between male gender and self-cutting is one that runs contrary to the concept of self-cutting as a "female problem" (Skegg, 2005). Indeed, the current study found a higher absolute number of male than female presentations among "self-cutting only" patients. This study joins an emerging body of research revealing similar proportions of self-cutting within self-harm presentations among men and women (Harriss et al., 2005; Hawton et al., 2004; Horrocks et al., 2003; Lilley et al., 2008; O'Loughlin & Sherwood, 2005). The over-representation of males in self-cutting in the current study could be attributed to a tendency of men to inflict more severe damage when self-cutting, increasing the likelihood that they will present to hospital. Certainly men appear to have a higher physical pain threshold (Chesterton, Barlas, Foster, Baxter, & Wright, 2003) and this hypothesis is further supported by previous research showing a tendency towards higher potential lethality of self-harm generally in males as compared with females (Haw, Hawton, Houston, & Townsend, 2003).

The study outcomes also revealed an association between self-cutting and age, whereby univariate and multivariate analyses showed that young to middle adulthood was particularly associated with self-cutting. A multi-centre study in England also showed that, compared to those presenting with other methods of self-harm, patients presenting with self-cutting tend to be younger (Lilley et al., 2008). It is beyond the scope of the current study and the available data to explore the basis of this association, but the "suicidal process" model suggests that, in the absence of intervention, individuals progress to more lethal self-harm over time (Neeleman, de Graaf, & Vollebergh, 2004; van Heeringen, Hawton, & Williams, 2000). Future research is required to examine the trajectories of self-harm methods and lethality over time within persons.

Our finding that those who presented with self-cutting were more likely to repeat self-harm replicates extant large-scale studies (Bilén, Ottosson, Castrén, Ponzer, Ursing, Ranta et al., 2010; Cooper et al., 2006; Lilley et al., 2008), and raises questions about the mechanisms of the association between self-cutting and repetition. Further longitudinal research is required to examine whether the association is attributable to, for example, underlying characteristics of individuals engaging in self-cutting (such as higher levels of impulsivity, lower problem-solving skills) or perhaps a reflection of the effect of the behaviour itself (such behavioural reinforcement through short-term positive physiological or social effects).

The current study was in a position to examine the representation of particular vulnerable groups within categories of self-harm methods. Being of no fixed abode, residing in a shelter or an inpatient setting were associated with "self-cutting only" in both males and females. These findings underline the need for initiatives aimed at restricting access to sharp objects in such settings. The potential

effectiveness of such initiatives is supported by consistent positive effects of restricted access to other potentially harmful and lethal means in terms of reduced self-harm and suicide risk (Florentine & Crane, 2010; Mann, Apter, Bertolote, Beautrais, Currier, Haas et al., 2005).

Limitations and strengths.

The large scale and ongoing nature of the Registry enabled the comparison between subgroups of self-harm patients and prospective follow-up. However, the large scale precludes the collection of more detailed psychological data which could shed further light on the distinction between self-cutting and intentional overdose patients.

The current study was limited to using hospital-based records and hence was unable to examine self-harm that was not hospital-treated or self-harm managed solely in primary care. One large-scale school-based study of self-harm revealed that episodes of self-cutting are disproportionately unlikely to result in hospital presentation (Madge, Hewitt, Hawton, de Wilde, Corcoran, Fekete et al., 2008). Moreover, the detection of repetition after an index episode was limited to hospital-treated repeat episodes, rather than using a more proactive follow-up method such as interviewing patients to ascertain self-reported repetition. This may lead to the underestimation of repetition, particularly for self-cutting. As a result of current legislation on data protection and the lack of unique patient identifiers in Ireland, we were unable to adopt suicide as an outcome in the current study.

The current study examined both demographic and presentation characteristics and therefore it was necessary to choose between a person-based and episode-based approach. Choosing to use each patient's first presentation in the

study period as the index episode rendered the demographic comparisons more reliable but this approach meant we were unable to allow for changes in presentation characteristics over repeated presentations. Another limitation is that the quality of the registry data depends on the quality of the medical records. However, agreement on case ascertainment among DROs was examined with kappa statistics exceeding 0.9 reflecting high levels of agreement.

Conclusions.

The current study is the first to use a national registry to demonstrate important differences between self-cutting and overdose patients, with significant implications for the epidemiology and management of self-harm.

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Implications

The preceding study used data from presentations to hospital with self-harm in Ireland to compare demographic and presentation characteristics across those presenting with self-cutting, those presenting with overdose, and those presenting with self-cutting plus overdose. We found small differences among the groups. Involvement of self-cutting was associated with male gender, younger age, living in a city, living in an institution or being homeless, presenting out-of-hours, and not consuming alcohol. Those who presented with self-cutting were at increased risk of repetition within 30 days and 1 year of an index presentation. The risk of repetition was similar among those who presented with both overdose and self-cutting in an index episode. Therefore, it seems that the involvement of self-cutting confers increased risk of repetition. Most of the other risk factors for repetition identified in the current study were in line with the results of the systematic review of risk factors for repetition.

Chapter 5: Severity of Hospital-Treated Self-Cutting and Risk of Future Self-Harm: A National Registry Study

Rationale

The previous studies suggested a consistent link between prospective repetition and presenting with self-cutting in an index episode. The severity of self-cutting can vary greatly between presentations and there has been little investigation of the relationship between self-cutting severity and repetition. The current study examines whether the characteristics of self-cutting patients vary by the severity of self-cutting (using medical treatment received as a proxy for severity), and whether there is an association between prospective repetition and severity of self-cutting.

Severity of hospital-treated self-cutting and risk of future self-harm: A national registry study

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Abstract

Risk assessment forms a key component in self-harm management. Among self-harm presentations generally, lethality of an index act is a poor predictor of future non-fatal repetition. However, no study has examined whether severity of an index self-cutting episode is associated with prospective repetition. This study was intended to examine factors associated with severity of self-cutting and in particular the association between severity of self-cutting and prospective repetition of self-harm. All index self-cutting presentations to emergency departments in Ireland over five years were grouped by treatment received and compared on the basis of demographic and clinical characteristics. Receiving more extensive medical treatment was associated with male gender, being aged more than 15 years, and not combining self-harm methods. Receiving less extensive treatment conferred a higher risk of prospective 12-month repetition, even after controlling for demographic and clinical characteristics. The results indicate that the already-elevated repetition risk among self-cutting patients is further increased for those receiving less extensive wound closure treatment. The study also identified a subgroup of males engaging in more severe self-cutting with low risk of non-fatal repetition but who may instead be at high suicide risk.

Background

In the year following a self-harm presentation to emergency care, 16% of self-harm patients will re-present with another episode of self-harm (Owens, Horrocks, & House, 2002). Risk of repetition is an important clinical outcome as it indicates on-going distress and is associated with an increased risk of eventual suicide (Cooper, Kapur, Webb, Lawlor, Guthrie, Mackway-Jones et al., 2005). The assessment of risk of repetition of self-harm, therefore, forms a key part of the emergency department management of self-harm patients (NICE, 2004, 2011). The lethality of an index act has been widely investigated as a risk factor for prospective self-harm repetition in this population, with many cohort studies failing to find any association between lethality and future repeated self-harm (Chandrasekaran & Gnanaselane, 2008; Dieserud, Røysamb, Braverman, Dalgard, & Ekeberg, 2003; Hjelmeland, 1996; Kapur, House, Dodgson, May, & Creed, 2002; Tejedor, Díaz, Castillón, & Pericay, 1999). However, there is evidence of an association between index self-harm method and prospective repetition: patients presenting with self-cutting to emergency departments appear to form a subgroup at increased risk of prospective fatal and non-fatal self-harm repetition compared with other self-harm patients (Bergen, Hawton, Waters, Ness, Cooper, Steeg et al., 2012; Bilén, Ottosson, Castrén, Ponzer, Ursing, Ranta et al., 2010; Lilley, Owens, Horrocks, House, Noble, Bergen et al., 2008).

Patients presenting with self-cutting form a minority within emergency presentations of self-harm (Claassen, Trivedi, Shimizu, Stewart, Larkin, & Litovitz, 2006; Hawton, Bergen, Casey, Simkin, Palmer, Cooper et al., 2007; Michel, Ballinari, Bille-Brahe, Bjerke, Crepet, De Leo et al., 2000; Perry, Corcoran, Fitzgerald, Keeley, Reulbach, & Arensman, 2012). The act of self-cutting

encompasses a wide range of medical severity from superficial damage requiring no treatment to severe damage requiring plastic surgery. In large-scale prospective studies of self-harm, the significance of self-cutting severity is often overlooked: despite the profile of increased risk of further self-harm and suicide among those presenting with self-cutting, no further detailed information is available on subtypes of self-cutting in terms of severity and associated factors. One of the few studies to examine the factors associated with self-cutting severity (Fujioka, Murakami, Masuda, & Doi, 2012) found that those presenting with deep cutting were more likely to be male, less likely to have a history of self-cutting, and more likely to have a prior psychiatric history. It appears that medical severity has never been tested as a risk factor for prospective repetition among those presenting with self-cutting. The aim of the current study is to compare self-cutting patients according to the treatment they received with respect to demographic and clinical characteristics, as well as prospective repetition.

Methods

Data source.

The National Registry of Deliberate Self-Harm Ireland is a hospital-based monitoring system for deliberate self-harm covering all 40 hospitals in the country. The Registry uses the WHO/EURO definition of self-harm (Platt, Bille-Brahe, Kerkhof, Schmidtke, Bjerke, Crepet et al., 1992), which includes all intentionally initiated drug overdoses, poisoning or self-injurious behaviour, regardless of suicidal intent. Data are collected by Data Registration Officers (DROs) who review emergency departments case notes to identify cases of self-harm through the

standardised application of the case definition and inclusion/exclusion criteria (NSRF, 2011; Perry et al., 2012). Audits incorporating crosschecks among DROs showed high levels of agreement on case ascertainment with kappa statistics exceeding 0.9. For the study period 2007 to 2011, the Registry had 100% coverage of all hospital emergency departments in Ireland. For the current analyses, we defined index episodes as the first self-cutting presentation by an individual in the study period.

Variables.

Treatment received was operationalized as five categories: no treatment or wound cleaning only, steri-strips, sutures, referral for plastic surgery, or unknown). Repetition of self-harm comprised a re-presentation with any form of self-harm to any emergency department in Ireland during the 12 months after an index episode. Data on repetition are obtained by identifying cases within the Registry with identical gender, encrypted initials and date of birth.

Ethical approval.

Ethical approval has been granted by the National Research Ethics Committee of the Faculty of Public Health Medicine. The Registry has also received ethical approval from all hospitals and Health Service Executive Committees. The National Suicide Research Foundation is registered with the Data Protection Agency and complies with the Irish Data Protection Act of 1988.

Analysis.

Associations between self-cutting treatment and patient and presentation characteristics were tested using chi square tests. The magnitudes of associations are illustrated using Cramér's V. The same approach was used to examine the association between 12-month repetition of self-harm and demographic and presentation variables. For the repetition analyses, we only included presentations between 1st January 2007 and 31st December 2010 to allow 12 months' follow-up. A direct logistic regression (with repetition of self-harm as the dependent variable) was used to examine the effect of self-cutting treatment on repetition risk independently of other factors. All tests were two-sided with the alpha value set at 0.05. All analyses used SPSS version 16.0 for Windows.

Results

Between 2007 and 2011, there were 59155 presentations of self-harm in Ireland. There were 13344 presentations of self-cutting, involving 9268 individuals. Information on treatment received for self-cutting was available for 7486 (80.8%) of the 9268 index self-cutting cases. Table 5.1 shows the characteristics of patients and presentations for the 7486 index self-cutting presentations for which treatment information was available, as well as for the 1782 index self-cutting presentations for which treatment information was not available. The univariate and multivariate associations with repetition are presented in Table 5.1 using chi squared values and odds ratios respectively.

Table 5.1

Demographic and presentation characteristics of self-cutting patients by treatment received and likelihood of repetition

Variable		Total index self-cutting presentations 2007-2011 (n=9268)	No treatment/ cleaning (n=1674)	Steri-strips (n=3498)	Sutures (n=1914)	Plastic surgery referral (n=400)	Treatment unknown (n=1782)	Cramer's V†
Gender	Female	4104	850 (20.7%)	1734 (42.3%)	720 (17.5%)	121 (2.9%)	679 (16.5%)	**0.13*** **
	Male	5164	824 (16.0%)	1764 (34.2%)	1194 (23.1%)	279 (5.4%)	1103 (21.4%)	
Age	<15yrs	251	82 (32.7%)	113 (45.0%)	18 (7.2%)	2 (0.8%)	36 (14.3%)	**0.07*** **
	15-24 yrs	3737	695 (18.6%)	1470 (39.3%)	714 (19.1%)	133 (3.6%)	725 (19.4%)	
	25-34 yrs	2482	400 (16.1%)	873 (35.2%)	581 (23.4%)	115 (4.6%)	513 (20.7%)	
	35-44 yrs	1569	267 (17.0%)	599 (38.2%)	363 (23.1%)	66 (4.2%)	274 (17.5%)	
	45-54 yrs	830	156 (18.5%)	314 (37.8%)	153 (18.4%)	50 (6.0%)	157 (18.9%)	
	55+ yrs	399	74 (18.5%)	129 (32.3%)	85 (21.3%)	34 (8.5%)	77 (19.3%)	
Lives in a city	Yes	3188	491 (15.4%)	1092 (34.3%)	474 (14.9%)	148 (4.6%)	983 (30.8%)	**0.07*** **
	No	6080	1183 (19.5%)	2406 (39.6%)	1440 (23.7%)	252 (4.1%)	799 (13.1%)	
Living circumstances	No fixed abode	280	40 (14.3%)	108 (38.6%)	38 (13.6%)	7 (2.5%)	87 (31.3%)	**0.05*** **
	Inpatient	67	3 (4.5%)	20 (29.9%)	26 (38.8%)	5 (7.5%)	13 (19.4%)	
	Prisoner	43	4 (9.3%)	6 (14.0%)	21 (48.8%)	2 (4.7%)	10 (23.3%)	
	Other	412	60 (14.6%)	164 (39.8%)	92 (22.3%)	20 (7.9%)	76 (18.4%)	
	ate	8466	1567 (18.5%)	3498 (37.7%)	1737 (20.5%)	366 (4.3%)	1596 (18.9%)	

Table 5.1 (contd.)

Variable		Total index self-cutting presentations 2007-2011 (n=9268)	No treatment/ cleaning (n=1674)	Steri-strips (n=3498)	Sutures (n=1914)	Plastic surgery referral (n=400)	Treatment unknown (n=1782)	Cramer's V†
Brought in by	Yes	4454	733 (16.5%)	1698 (38.1%)	1026 (23.0%)	261 (5.9%)	736 (16.5%)	**0.10*** **
ambulance	No	4814	941 (19.5%)	1800 (37.4%)	888 (18.4%)	139 (2.9%)	1046 (21.7%)	
Presented 9am-5pm	Yes	2438	423 (17.4%)	963 (39.5%)	493 (20.2%)	120 (4.9%)	439 (18.0%)	0.03
	No	6830	1251 (18.3%)	2535 (37.1%)	1421 (20.8%)	280 (4.1%)	1343 (19.7%)	
Presented at weekend	Yes	3006	508 (16.9%)	1105 (36.8%)	662 (22.0%)	131 (4.4%)	600 (20.0%)	**0.03***
	No	6262	1116 (18.6%)	2393 (38.2%)	1252 (20.0%)	269 (4.3%)	1182 (18.9%)	
Alcohol involvement	Yes	3314	683 (20.6%)	1375 (41.5%)	805 (24.3%)	110 (3.3%)	341 (10.3%)	**0.06*** **
	No	5954	991 (16.6%)	2123 (35.7%)	1109 (18.6%)	290 (4.9%)	1441 (24.2%)	
Combined with other	Yes	2477	644 (26.0%)	1093 (44.1%)	323 (13.0%)	66 (2.7%)	351 (14.2%)	**0.18*** **
method(s)	No	6791	1030 (15.2%)	2405 (35.4%)	1591 (23.4%)	334 (4.9%)	1431 (21.1%)	
Self-cutting treatment	No treatment/ cleaning	1178	-	-	-	-	-	-

Steri-strips	2824
Sutures	1515
Referral to plastic surgery	322
Unknown	1411

*p<0.05 **p<0.01 ***p<0.001
†Calculated only for cases where treatment was known

Females, adolescents and children were overrepresented among self-cutting patients receiving steri-strips and those receiving no medical treatment. People living in rural areas were overrepresented among self-cutting patients receiving sutures and steri-strips. Patients brought into hospital by ambulance were overrepresented among those receiving sutures while among patients who were not brought in by ambulance those for whom treatment was unknown were overrepresented. People who had used alcohol at the time of the self-harm act were overrepresented among those who received sutures, steri-strips and those receiving no medical treatment. Patients who presented with multiple self-harm methods were overrepresented among those receiving steri-strips and those receiving no medical treatment while patients who used cutting as the sole method were overrepresented among those receiving sutures. Prospective repetition of self-harm within 12 months was significantly associated with less extensive treatment, such as steri-strips or no medical treatment.

Other factors significantly associated with repetition were female gender, young age, homelessness, and combining self-harm methods, living in a city, being brought in by ambulance, being an inpatient, and presenting on a weekday. The association between less extensive treatment and prospective repetition remained significant in a logistic regression to predict repetition.

Discussion

The present study shows significant differences in demographic and presentation characteristics across self-cutting treatment groups. Patients who received less extensive treatment for self-cutting were more likely to repeat self-harm within 12 months, even after controlling for demographic and clinical variables. The study

used a large database with complete national coverage and adopted a prospective design to test a hitherto unexamined risk factor for repetition of self-harm.

This study complements recent evidence of an association between self-cutting and risk of repetition by identifying a subgroup of self-cutting at yet higher risk. No previous study has examined the association between prospective repetition and treatment for self-cutting. However, a small clinical study (Fujioka et al., 2012) reported a higher prevalence of previous self-cutting among those with superficial wrist-cutting compared to those with deeper wounds. Further evidence is required to ascertain whether such an association is confounded by assessment and follow-up arrangements for such presentations, given that those presenting with self-cutting generally are less likely to receive assessment and admission (Lilley et al., 2008). Further, it remains to be seen whether severity of self-cutting is also related to subsequent suicide risk. Such an association could operate in either direction: with those engaging in superficial cutting forming a more severe profile in general, or with those engaging in deeper self-cutting moving more quickly to suicide as opposed to non-fatal repetition.

Hospital-based risk assessments of self-harm patients are intended to detect those at increased risk of repetition of self-harm. Treatment received for self-cutting represents a useful indicator of repetition risk, because many of the well-researched and consistent predictors of repetition, such as substance misuse (Christiansen & Jensen, 2007; Kapur, Cooper, King-Hele, Webb, Lawlor, Rodway et al., 2006), psychiatric morbidity (Bergen, Hawton, Waters, Cooper, & Kapur, 2010; Carter, Clover, Bryant, & Whyte, 2002; Mehlum, Jørgensen, Diep, & Nrugham, 2010), and history of sexual abuse (Beautrais, 2004; Yeo & Yeo, 1993), require self-report or well-maintained information systems. In contrast, the medical severity of a self-

cutting episode will be immediately evident to assessors, allowing for the earliest possible identification and intervention for at-risk patients. It appears that "minor" self-cutting should not be considered trivial, as it confers a yet further increased risk of non-fatal repetition among those presenting with self-cutting, a subgroup of self-harm patients already at elevated risk of further self-harm and suicide.

This study identified a number of additional risk factors for repetition that are in line with previous evidence including female gender (Bilén et al., 2010; Haukka, Suominen, Partonen, & Lonnqvist, 2008), young to middle age (Kapur et al., 2006; Mehlum et al., 2010), homelessness (Haw, Hawton, & Casey, 2006), and combining self-harm methods (Lilley et al., 2008), and, also in keeping with previous studies, we found no association with alcohol consumption (Bilén et al., 2010; Peterson & Bongar, 1990). Such findings suggest that the risk factors for repetition among self-harm patients more generally may be equally applicable to those presenting with self-cutting. We found increased risk of repetition associated with variables whose relationship with repetition has been less often examined, namely living in a city, being brought in by ambulance, being an inpatient, and presenting on a weekday.

In addition to risk of repetition, we found several patient differences according to the severity of self-cutting. Those requiring more extensive treatment for self-cutting were more likely to be male, aged more than 25 years, less likely to be living in a private residence, more likely to be brought by ambulance, more likely to present at the weekend, less likely to have consumed alcohol, and less likely to present with multiple self-harm methods. A previous study also found that males and those with a psychiatric history were over-represented among those with deeper wounds (Fujioka et al., 2012), but it otherwise seems that factors associated with severity of self-cutting have been relatively neglected within the self-harm research.

In terms of other possible groupings of those who self-cut, several studies of self-cutting among adolescents found clinically meaningful subgroupings among those who self-cut (Matsumoto, Imamura, Chiba, Katsumata, Kitani, & Takeshima, 2008; Matsumoto, Yamaguchi, Chiba, Asami, Iseki, & Hirayasu, 2004) based on bodily site and self-reported pain.

There were several limitations to the current study. Treatment received for self-cutting was not known for almost one-fifth of the presentations included in the analyses and these presentations may have differed from other self-cutting presentations on variables other than those measured. Indeed, treatment was less likely to be known for those who lived in a city and for those who had not consumed alcohol. Another limitation is that the association between repetition and treatment received for self-cutting may be mediated by psychosocial treatment. Finally, the Registry does not represent persons who engaged in self-harm without seeking secondary care, in whom the association between self-cutting severity and repetition may differ.

Early classifications of self-injury (Favazza, 1989; Pao, 2011) and more recent developments such as the forthcoming DSM diagnostic category of "non-suicidal self-injury" have consigned clinical significance to the severity of self-cutting, yet there is surprisingly little empirical evidence to suggest that severity of self-cutting indicates underlying group differences. Given the implications and consequences of receiving a psychiatric diagnoses (Rogers & Dunne, 2011; Wykes & Callard, 2010), the empirical validity of such classifications should be more widely examined. Our study is the first to examine severity of self-cutting in relation to prospective repetition and the first to use such a large database to examine other factors associated with self-cutting severity.

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Implications

The current study indicated that several characteristics of those presenting with self-cutting differ based on the extensiveness of treatment received, including gender, age, time of presentation, alcohol involvement and whether self-cutting was combined with other methods. Moreover, less extensive treatment conferred increased risk of short-term repetition.

The preceding studies suggest that self-cutting (particularly self-cutting that requires less extensive treatment) may act as a "red flag" to those conducting risk assessments of self-harm patients. While this information is useful in indicating those at risk, it is less useful in terms of prevention of repetition, as simply limiting access to self-cutting implements is not straightforward. Examining potential mechanisms might offer the opportunity to intervene more effectively to attenuate the increased risk among this group of presentations.

Chapter 6: Are individual differences related to self-harm method and repetition? A cohort study of hospital presentations of self-cutting and overdose

Rationale

The systematic review and registry studies indicated that those who present with self-cutting are at increased risk of prospective repetition of self-harm. These findings have implications for health services, in that self-cutting can be used by health care providers as an indicator of increased risk of repetition.

However, studies based on epidemiological data are of limited use in exploring the processes involved in self-harm repetition. Intervening to reduce and prevent a particular outcome involves identifying mutable factors that are responsible for the outcome and intervening by modifying these factors. It is clear that presenting with self-cutting does not in itself cause re-presentation of self-harm, because not all those who present with self-cutting re-present with further self-harm. Therefore, it is likely that the association is moderated or mediated by other variables. There are a number of potential mechanisms for the association. For example, it is possible that there are certain factors that predispose an individual to both repetition and engaging in self-cutting (e.g. a factor such as impulsivity or emotional reactivity). Alternatively, perhaps the association between self-cutting and repetition is as a result of the effects of self-cutting, in that self-cutting is effective in ending unpleasant feelings or eliciting positive feelings, or improves the person's life situation by ending negative social experiences or bringing about positive social experiences. Another possible explanation is that the baseline likelihood of

repetition of self-harm is similar among those presenting with self-cutting and those presenting with overdose, but that interventions are more accessible or more effective for those engaging in overdose.

The current study is intended to further explore the association between presenting with self-cutting and repeating self-harm by examining potential psychological differences between self-cutting and overdose patients and relating those to repetition. This study seeks to complement the registry studies, by including self-reported repetition and psychological measures.

Are individual differences related to self-harm method and repetition? A cohort study of hospital presentations of self-cutting and overdose

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Abstract

Individuals who present with self-harm are at elevated risk of further self-harm and suicide, and these risks are yet higher among patients who self-cut. It is unclear whether such increased risk is related to concurrent psychological differences between self-cutting and other self-harm patients. The current study compared Irish self-cutting (n=8) and intentional overdose patients (n=21) recruited between October 2010 and May 2012 on several psychological measures (including depression, hopelessness, impulsivity, problem-solving, aggression, and suicidal intent) and followed up patients three months later (n=19) to detect repetition and re-administer psychological measures. At baseline, those who presented with self-cutting had significantly higher levels of hopelessness (r = 0.39, p=0.04) and significantly lower levels of non-reactivity to inner experience (d = 1.23, p<0.01) than those presenting with overdose. Compared with non-repeaters, those who repeated within three months of an index presentation scored significantly lower at baseline on non-judging of inner experience (d = 1.10, p=0.05) and were significantly more likely to have received psychiatric admission in response to the index episode (p=0.05). As a whole, scores on depression and hopelessness decreased significantly between baseline and follow-up, but repeaters' scored significantly higher on depression and hopelessness than non-repeaters at follow-up. Limitations were that the power to detect differences between groups was small and

measures were administered some weeks after the index presentation. The findings suggest that hopelessness and mindfulness assessed soon after presentation could help to account for the association between self-cutting and repetition, allowing for more effective identification and reduction of repetition risk.

Introduction

Self-harm is a significant health problem, in terms of health services burden and associated suicide risk, with suicide rates up to 30 times higher among those presenting with self-harm compared with the general population (Cooper, Kapur, Webb, Lawlor, Guthrie, Mackway-Jones et al., 2005). The initiation of suicidal behaviour is conceived as being related an interaction between stress (such as life events or psychiatric illness) and diathesis (biological substrates relating to trait hopelessness, impulsivity, emotional regulation difficulties, working memory and problem-solving deficits) (van Heeringen, 2003; van Heeringen, Hawton, Williams, & Mark, 2008). A median of 16% of those presenting to hospital with self-harm will re-present with self-harm in the year after an index episode (Owens, Horrocks, & House, 2002). Repetition of self-harm indicates on-going distress and confers increased risk of further non-fatal self-harm and suicide (Sinclair, Gray, Rivero-Arias, Saunders, & Hawton, 2010; Zahl & Hawton, 2004). Several recent systematic reviews (Larkin, Di Blasi, & Arensman, under review; NICE, 2011; Randall, Colman, & Rowe, 2011) have synthesised the evidence on risk factors for repetition and have located dozens of studies examining epidemiological and psychiatric risk factors. Despite the promise they may hold for intervention development, psychological risk factors for repetition have been examined less often. However, there is emerging evidence of an association between prospective repetition and baseline levels of hopelessness, social problem-solving, impulsivity, and autobiographical memory (Beautrais, 2004; Hawton, Kingsbury, Steinhardt, James, & Fagg, 1999; McMillan, Gilbody, Beresford, & Neilly, 2007; Sidley, Calam, Wells, Hughes, & Whitaker, 1999).

Several recent high-quality large-scale studies of prospective repetition have reported that presenting with self-cutting as a method of self-harm in an index episode confers an increased risk of self-harm repetition (Bilén, Ottosson, Castrén, Ponzer, Ursing, Ranta et al., 2010a; Cooper, Kapur, Dunning, Guthrie, Appleby, & Mackway-Jones, 2006; Lilley, Owens, Horrocks, House, Noble, Bergen et al., 2008a; Perry, Corcoran, Fitzgerald, Keeley, Reulbach, & Arensman, 2012). Moreover, there is emerging evidence that those who present with self-cutting are at elevated risk of subsequent suicide (Bergen, Hawton, Waters, Ness, Cooper, Steeg et al., 2012). Self-cutting presentations represent approximately 20% of all presentations of self-harm and this factor has unique advantages in terms of flagging repetition risk as it can be recognised easily and quickly by front-line staff in emergency department settings. However, self-cutting alone cannot predict non-fatal repetition, as its effects on repetition risk are moderate. Moreover, it is unclear whether the risk factors for repetition of self-harm more generally apply to self-cutting presentations because most of the studies of prospective repetition do not compare risk factors for repetition among subgroups of self-harm presentations.

As well as being more likely to repeat self-harm, there is increasing evidence that, compared with overdose patients, those presenting with self-cutting are more likely to be male and younger (Hawton, Harriss, Simkin, Bale, & Bond, 2004; Marchetto, 2006; Perry et al., 2012). Individuals presenting with self-cutting are less likely than overdose patients to receive admission or psychosocial assessment (Lilley et al., 2008a). They also appear to differ from those engaging in other methods of self-harm on several psychological variables. In a community-based study of adolescents, Hawton, Harris and Rodham (2010) found that, compared with those who engaged in intentional overdose, adolescents who had engaged in self-cutting

more seldom wished to die and their self-harm was more often impulsive. However, there were no differences on measures of depression, anxiety, impulsivity, self-esteem, or coping strategies. Tolmunen, Rissanen, Hintikka, Maaranen, Honkalampi, Kylmä et al. (2008) found that adolescents who self-cut reported higher levels of dissociation than those engaging in other forms of self-harm. Sorketti and Zuraida (2007) compared patients presenting with self-cutting and those presenting with intentional overdose and found higher rates of major depression in the former. Hawton, Harriss, Simkin, Bale, & Bond (2004) reported lower Beck Suicidal Intent Scores among those who presented with self-cutting. In a community sample of Finnish adolescents (Laukkanen, Rissanen, Honkalampi, Kylmä, Tolmunen, & Hintikka, 2009), social isolation, daily smoking and substance misuse were associated with a history of self-cutting but not self-harm.

It seems that engaging in self-cutting is consistently associated with self-harm repetition among emergency department presentations. Differential predictors for repetition between self-cutting and overdose patients would have implications both for practice (in terms of increasing the accuracy of risk assessment of self-harm patients) and theory (method of self-harm may need to be added as moderators in models accounting for repetition).

The current study examines the predictive value and stability of emerging psychological risk factors for repetition over a three-month follow-up and the extent to which these factors distinguish between self-cutting and overdose patients. Among those presenting with self-cutting, we expected a higher rate of repetition, higher scores on traits and states associated with self-harm initiation, and lower scores on protective factors. We also hypothesised that repeaters would score higher on these risk factors and lower on protective factors. It was expected that the trait-

like variables would remain stable during follow-up, while depression and hopelessness would decrease over time.

Method

Design and sampling.

The study was conducted according to a prospective design and recruited patients presenting to two emergency departments in Cork City 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" (Platt, Bille-Brahe, Kerkhof, Schmidtke, Bjerke, Crepet et al., 1992). In order to allow effective comparison, recruitment was limited to those presenting with either intentional self-cutting or intentional overdose with the purpose of causing harm. In order to be included, patients had to be deemed by the recruiter (crisis nurse, assessment nurse or liaison psychiatrist) to be capable of comprehending the nature of the study and weighing the decision to participate. Psychiatric diagnosis and substance misuse did not form exclusion criteria in the current study unless they influenced capacity to consent. Because of restraints on resources it was not possible to provide translation services for those who were unable to comprehend English and these patients were excluded.

Recruitment took place through trained crisis nurses and out-of-hours liaison psychiatry services in Cork, Ireland, between October 2010 and May 2012. Staff

members were asked to distribute an informational letter and a resource pack (with details of relevant local support services) to eligible patients and details of willing patients were forwarded to the research team. Eligible patients were contacted by telephone 5-7 days after discharge and invited to take part in an interview at a location of their choosing (median 16 days after presentation). Recruiting 21 overdose patients and eight self-cutting patients conferred 80% power to detect an effect size of 1.2 or more.

Procedure.

Baseline interviews were conducted at a location of the participant's choice, at a university meeting room (n=15; 52%), the participant's home (n=10; 34%), or a neutral location, such as a community centre in the participant's neighbourhood (n=4; 14%). Interviews lasted a median of 90 minutes (range: 50-330 minutes). The interview was comprised of a number of psychometric questionnaires and cognitive tasks. As a means of minimising attrition, six weeks after the initial interview, participants were contacted by telephone for a brief discussion of their current situation. Three months after the initial interview, patients were contacted by telephone to arrange a follow-up interview. The follow-up interview schedule was identical to the baseline schedule, except that questions about previous self-harm were limited to the preceding three months. If there had been no repetition of self-harm during the follow-up, the Beck Suicide Intent Scale was omitted.

Ethical considerations.

Ethical approval was granted by the Clinical Research Ethics Committee, University College Cork (Appendix 2). There were a number of procedures in place to protect participants, including providing a resource pack detailing local services and obtaining fully informed consent, and the interviewer was trained and supervised in identifying those at high risk of repeat self-harm or suicide. Participants received a phone-call six weeks after the initial interview to check in with the participant and obtain any reflections on the initial interview. At this point and at the three-month follow-up interview, the participants were again given contact details for the interviewer and asked whether they required any specific assistance in accessing relevant support and treatment services.

Measures.

For the most part, the variables selected for inclusion in the current study were derived from Van Heeringen's (2003) psychobiological model of suicidal behaviour, many of which are linked to repetition and/or method of self-harm in extant research. The measures are described in the same order that they appeared in the interview schedule.

Characteristics of self-harm episode.

The current study recorded the method(s) of self-harm used in the index episode (self-cutting or intentional overdose), whether or not alcohol was involved in the index act, and hospital management of the index episode (no admission, general admission, psychiatric admission). Engaging in self-cutting as a method of self-

harm has been associated with repetition in several previous studies in UK populations (Bilén, Ottosson, Castrén, Ponzer, Ursing, Ranta et al., 2010b; Cooper et al., 2006; Lilley, Owens, Horrocks, House, Noble, Bergen et al., 2008b). There is previous research suggesting that alcohol consumption is higher in those who present with self-cutting (Hawton et al., 2004). The management of a self-harm presentation has been linked to likelihood of repetition in several studies (Hickey, Hawton, Fagg, & Weitzel, 2001; Kapur, House, Dodgson, May, & Creed, 2002). Therefore we hypothesised a higher risk of repetition among those presenting with self-cutting and with alcohol consumption, and among those receiving psychiatric admission.

Suicidal intent.

There is evidence of an inverse association between suicidal intent scores and repetition in previous studies (De Leo, Padoani, Lonnqvist, Kerkhof, Bille-Brahe, Michel et al., 2002; Harriss, Hawton, & Zahl, 2005; Haw, Bergen, Casey, & Hawton, 2007; Hjelmeland, Stiles, Bille-Brahe, Ostamo, Renberg, & Wasserman, 1998). Moreover, presenting with self-cutting has been previously associated with lower scores on the Beck SIS compared with self-poisoning (Harriss et al., 2005). The Suicide Intent Scale (Beck, Schuyler, & Herman, 1974a) is a 15-item semi-structured interviewer rating scale with a range of scores from 0-30. It is divided into two sections, dealing with "objective" and "subjective" characteristics of the index episode. This two-factor structure was later verified (Mieczkowski, Sweeney, Haas, Junker, Brown, & Mann, 1993). The scale has been shown to have high internal consistency (Beck et al., 1974a; Spirito, Sterling, Donaldson, & Arrigan, 1996) and high inter-rater reliability (Beck et al., 1974a; Mieczkowski et al., 1993). The scale

also has acceptable divergence from measures of hopelessness, depression and suicidal ideation (Spirito et al., 1996), as well as validity in distinguishing between suicide attempters and completers (Harriss & Hawton, 2005). The scale's internal consistency in the current sample was adequate (α=0.80). We anticipated that suicidal intent scores would be lower in repeaters than non-repeaters, and lower in those who presented with self-cutting than those who presented with intentional overdose.

Depression.

The Beck Depression Inventory-II (Beck, Steer, & Brown, 1996) is a self-report questionnaire is based on the DSM-IV diagnostic criteria for depression, such as those concerning sleep, appetite and concentration. The BDI-II contains 21 items (marked on a four-point scale from zero to three), which are summed to give a total score. The scale demonstrates high internal consistency (Krefetz, Steer, Gulab, & Beck, 2002; Storch, Roberti, & Roth, 2004; Whisman, Perez, & Ramel, 2000) and good concurrence with other depression scales (Krefetz et al., 2002; Storch et al., 2004) and with diagnostic criteria of major depressive disorder (Lasa, Ayuso-Mateos, Vázquez-Barquero, Díez-Manrique, & Dowrick, 2000; Sprinkle, Lurie, Insko, Atkinson, Jones, Logan et al., 2002). The Inventory's internal consistency in the current sample was high (α=0.91). Brakoulias, Ryan, and Byth (2006) found that patients who had self-cut were half as likely to receive a diagnosis of major depressive disorder as those who had self-poisoned (8.5% of 165 vs 17.8% of 1024). Therefore we anticipated lower levels of depression among those who presented with self-cutting. Based on the findings of the systematic review, it was not expected that repeaters would score differently from non-repeaters on the BDI.

Beck Hopelessness Scale.

Hopelessness was measured using the widely-used 20-item Beck Hopelessness Scale (Beck, Weissman, Lester, & Trexler, 1974b). This scale is a self-report questionnaire consisting of items relating to views of the future, which are positively (e.g. "I have great faith in the future") and negatively worded (e.g. "My future seems dark to me"), with response categories limited to true and false. Possible scores range from 0 to 20. The scale has adequate convergence with other measures of hopelessness (Beck et al., 1974b) and high internal consistency (Beck et al., 1974b; Young, Halper, Clark, Scheftner, & Fawcett, 1992). The inventory's internal consistency in the current sample was high (α=0.91). The Beck Hopelessness Scale has been demonstrated to have adequate sensitivity and specificity in predicting future suicidal behaviour in a systematic review by McMillan, Gilbody, Beresford, and Neilly (2007), and therefore we anticipated higher levels of hopelessness among those who repeated self-harm. Given the lower rate of depression diagnosis in those presenting with self-cutting (Brakoulias et al., 2006), we expected lower scores on hopelessness in this group.

Previous self-harm.

The measure used to assess a history of self-harm was that used in the WHO/EURO Multicentre Study on Parasuicide (Kerkhof, Bernasco, Bille-Brahe, Platt, & Schmidtke, 1989). This is an interviewer-administered instrument which does not assume suicidal intent and includes diverse methods of DSH, including overdose, drowning, hanging, cutting, burning, jumping from a height, jumping in front of a moving vehicle, and miscellaneous other methods. Previous self-harm places a

person at increased risk of future suicidal behaviour (Carter, Clover, Bryant, & Whyte, 2002; Cooper et al., 2006; Corcoran, Keeley, O'Sullivan, & Perry, 2004; Crawford & Wessely, 1998). One study found that those presenting with self-cutting were more likely to have a history of self-harm compared with those presenting with self-poisoning (Hawton et al., 2004). Given these findings, we hypothesised that previous self-harm would be more common among those who presented with self-cutting and those who went on to repeat self-harm.

Modified Emotional Stroop Test.

In keeping with Van Heeringen's (2003) model, defeat was operationalised as attentional bias towards negative emotional stimuli and was assessed using a modified emotional Stroop test (Becker, Strohbach, & Rinck, 1999). Five cards, each with 15 adjectives of similar valences and stimulation levels (positive/high-stimulation, negative/high-stimulation, positive/low-stimulation, negative/low-stimulation, neutral) coloured red, blue, green, and brown were presented to participants and they were asked to call out the colour of the words as quickly as possible. Cue cards were presented in a random order to balance practice effects. Attentional bias was operationalized as the difference in reading time between the negative cards and neutral cards and between positive cards and neutral cards respectively. Williams, Mathews, and MacLeod (1996) reviewed over seventy studies that used the emotional Stroop test to examine cognitive bias in psychopathology and showed that the differences on the test varied by disorder under investigation and not as the result of artefactual variables. Williams, Mathews, and MacLeod (1996) showed that presenting the cues on cards produces replicable

effects to presenting them on a computer or tachistoscope despite card presentation tending to result in larger interference effects. Although sensitivity to defeat is theorised as being associated with self-harm initiation, there are no previous studies examining its association with self-harm repetition or self-harm method. It was hypothesised that higher sensitivity to social defeat as measured by the emotional Stroop test would confer higher risk of repetition and would be higher among those who presented with self-cutting.

Autobiographical Memory Test.

Overgeneralisation of autobiographical memory is theorised by Van Heeringen (2003) to underlie problem-solving deficits observed in self-harm patients. In the Autobiographical Memory Test (AMT: Williams & Dritschel, 1988), the participant is given 30 seconds to recall a specific memory in response to cards presenting alternating positive (happy, surprised, safe, successful, interested) and negative (clumsy, angry, sorry, hurt, lonely) cue words. The memory is coded as "specific" if the duration of the incident described was less than 24 hours, "categoric" if it refers to a memory response that summarized a number or category of events, and "extended" if it refers to a memory of a particular time period lasting longer than a day. High inter-rater reliability has been demonstrated in several studies (Griffith, Sumner, Debeer, Raes, Hermans, Mineka et al., 2009; Heeren, Van Broeck, & Philippot, 2009; Kaviani, Rahimi, Rahimi-Darabad, & Naghavi, 2003; Raes, Hermans, De Decker, Eelen, & Williams, 2003). Recent studies have supported a one-factor structure such that valence of cues does not seem to affect specificity of memories (Griffith, Kleim, Sumner, & Ehlers, 2012; van Vreeswijk & de Wilde,

2004). However, a study of individuals presenting with self-harm (Sidley et al., 1999) showed an association between repetition and responses to positive cues only. Therefore, the current study examines average responses to positive and negative cues, as well as total scores. A recent study demonstrated acceptable internal consistency in a clinical sample (Griffith et al., 2012) and in the current sample, the internal consistency of the total scale was also acceptable (α=0.70). Scores on AMT were associated with repetition at one month after an index episode in one previous study (Sidley et al., 1999) and with retrospective repetition in two other studies (Rasmussen, O'Connor, & Brodie, 2008; Sinclair, Crane, Hawton, & Williams, 2007). We hypothesised that AMT scores would be higher among repeaters and those who presented with self-cutting.

Aggressive impulsivity.

Aggression was measured using the Buss-Perry Aggression Questionnaire-Short Form (Bryant & Smith, 2001). This instrument is a 12-item self-report questionnaire with four subscales: anger, hostility, physical aggression, and verbal aggression. Responses are given on a six-point Likert scale. The four subscales have been verified in a confirmatory factor analysis (Diamond & Magaletta, 2006). Its developers found that this shortened version was psychometrically superior to its parent questionnaire, the Buss-Perry Aggression Questionnaire. A study with a large sample of federal offenders (Diamond & Magaletta, 2006) reported good internal consistency, as well as demonstrating the scale's convergent and discriminant validity. The internal consistency of the scale in the current sample was high (α=0.86). Prospective repetition of self-harm among self-harm patients is associated

with a history of violence against others (Buglass & Horton, 1974; Haw et al., 2007; Siani, Garzotto, Tansella, & Tansella, 1979) and external hostility (Brittlebank, Cole, Hassanyeh, Kenny, Simpson, & Scott, 1990; Sakinofsky & Roberts, 1990). There is no evidence of a difference in aggression levels between self-cutting and overdose patients but Robinson and Duffy (1989) reported that self-injury patients were more likely to have initiated violence with relatives in the preceding five years than self-poisoning patients. Therefore, we hypothesised that those who presented with self-cutting and those who went on to repeat self-harm would have higher baseline levels of aggression.

Impulsivity was measured using an abbreviated 15-item version (BIS-15; Spinella, 2007) of the 30-item Barratt Impulsiveness Scale (BIS 11; Patton, Stanford, & Barratt, 1995). Responses to items are given on a four-point scale ("rarely/never"," occasionally", "often", and "almost always/always"). The original instrument had good psychometric properties (Patton et al., 1995) and the BIS-15 has good internal consistency and convergent validity (Orozco-Cabal, Rodriguez, Herin, Gempeler, & Uribe, 2010; Spinella, 2007). In the current sample, the BIS demonstrated acceptable internal consistency (α=0.81). Four studies have examined the association between repetition and scores on the Barratt Impulsivity Scale (BIS): one found a significant positive association in univariate analysis only (Beautrais, 2004), one found a significant positive association in multivariate analyses (Courtet, Picot, Bellivier, Torres, Jollant, Michelon et al., 2004), and two (Links, Nisenbaum, Ambreen, Balderson, Bergmans, Eynan et al., 2012; Randall, Rowe, & Colman, 2012) found an increased risk in both univariate and multivariate analyses. Using the Plutchik Impulsivity Scale, Hawton, Harris and Rodham (2010) found no difference in impulsivity between adolescents who self-cut and those who engaged in

intentional overdose, but those who self-cut more often reported that they thought about engaging in self-harm for less than an hour before engaging in it. Based on these studies, we anticipated that those who self-cut and those who repeated self-harm would have higher levels of impulsivity than other self-harm patients.

Five Facet Mindfulness Scale.

Despite mindfulness being an important component of several successful interventions for self-harm (Linehan, Armstrong, Suarez, Allmon, & Heard, 1991; Williams, Duggan, Crane, & Fennell, 2006) by reducing overgeneral autobiographical memory (Williams, Teasdale, Segal, & Soulsby, 2000) and reducing thought suppression (Hepburn, Crane, Barnhofer, Duggan, Fennell, & Williams, 2009), it appears that levels of mindfulness in repeaters and those who self-cut have never been examined. The Five Facet Mindfulness Questionnaire (FFMQ: Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006) was developed by combining a number of existing mindfulness questionnaires. The questionnaire has been validated with meditating and non-meditating populations (Baer, Smith, Lykins, Button, Krietemeyer, Sauer et al., 2008) and doctoral work by West (2008) suggests that the conceptualisation of mindfulness by the FFMQ is closely related to the type of mindfulness targeted in the Dialectical Behaviour Therapy treatment paradigm. A study with a Dutch translation of the scale demonstrated high internal consistency and good test-retest reliability (Veehof, ten Klooster, Taal, Westerhof, & Bohlmeijer, 2011). In order to minimise response burden on participants, just three of the five subscales of the FFMQ were used in the current study. "Non-reactivity to inner experience" (e.g. "I perceive my feelings and emotions without having to react

to them"), "non-judging of experience" (e.g. "I disapprove of myself when I have irrational ideas"), and "acting with awareness" (e.g. "When I do things, my mind wanders off and I'm easily distracted") were deemed to be relevant to the current study so these scales were included in the interview schedule. The internal consistency of these 23 items in the current study was good (α=0.81). It was hypothesised that those who repeated self-harm and those who presented with self-cutting would have lower scores on all three subscales.

Future Fluency Test.

Future fluency refers to an individual's ability to identify events that will occur in their lives over specific periods of time in the future, and is identified by Van Heeringen (2003) as a potential means of neurocognitive assessment of the construct of "no rescue". The modified future fluency test (MacLeod, Rose, & Williams, 1993) was used in the current study to assess how many positive events participants are able to identify as occurring over the next week, year and 5-10 years. The test has been shown to have acceptable inter-rater reliability (Sidley et al., 1999) in a sample of self-harm patients and adequate convergent and divergent validity with other measures of hopelessness (MacLeod, Tata, Tyrer, Schmidt, Davidson, & Thompson, 2005; O'Connor, Fraser, Whyte, MacHale, & Masterton, 2008). Based on previous findings of lower future fluency in prospective (Sidley et al., 1999) and retrospective repeaters (Rasmussen, Fraser, Gotz, MacHale, Mackie, Masterton et al., 2010), we expected repeaters to have lower future fluency.

Means Ends Problem-Solving Test.

Related to the theoretical construct of "no escape" is problem-solving ability, allowing an individual to extricate themselves from an aversive situation (van Heeringen, 2003). The Means Ends Problem-Solving Procedure (Platt & Spivack, 1975) presents subjects with a challenging situation in vignette-form and requires them to detail the steps the protagonist can take reach in order to reach a specified resolution. Relevant means are summed to give a total score, and a relevancy ratio can also be used. The MEPS has demonstrated good internal consistency (Marx, Williams, & Claridge, 1992) and inter-rater reliability (Eidhin, Sheehy, O'Sullivan, & McLeavey, 2002; Linda, Marroquín, & Miranda, 2012; Platt & Spivack, 1975). Because the developers demonstrated a one-factor structure and that it is not necessary to use all the vignettes, a shorter version of the MEPS was used in the current study, with four [Vignettes 2, 4, 6, and 8 (Platt & Spivack, 1975)] vignettes being administered. Two previous studies have found an inverse association between problem-solving and prospective repetition in univariate analyses (Hawton et al., 1999; Scott, House, Yates, & Harrington, 1997) but problem-solving has not yet been compared between self-cutting and overdose patients. We expected poorer problem-solving among those who repeated and those who presented with self-cutting.

For 25 of the interviews, the MEPS was scored by two independent raters to measure inter-rater reliability. The intra-class correlation coefficients (using a two-way mixed model and a consistency definition) were acceptable at 0.74 for the total means and 0.61 for the relevancy ratio respectively.

Analysis.

The normality of the distributions of variables for the whole sample and for the follow-up sample was examined using the Shapiro-Wilk test. Independent samples t tests, Mann Whitney U tests, and chi square tests were used as appropriate to compare those presenting with self-cutting to those presenting with overdose and to compare the baseline scores of those who went to repeat and those who did not go on to repeat during follow-up. The absolute stability of psychological variables was assessed using paired t tests and Wilcoxon signed rank tests and the relative stability of psychological variables was assessed using Pearson's r and Spearman's rho as appropriate (Gustavsson, Weinryb, Göransson, Pedersen, & Åsberg, 1997). All tests were two-sided and all analyses were conducted using IBM SPSS 20.

Results

Baseline sample.

Of the 132 patients who were invited to take part by hospital staff, 84 (63.6%) agreed to have their details forwarded to the research team. Among the patients for whom we had contact details, the most common reasons for non-participation were that patients were non-contactable (n=45; 53.6%) or not interested (n=30; 35.7%). Twenty-nine patients (28.2%) completed with baseline interview. Comparing the 29 participants who took part and the 103 who did not, there were no significant differences in gender (55.3% vs. 58.6% female) or method of self-harm (22.3% vs. 27.6% self-cutting).

Twenty-nine participants (mean age=33.34 years, SD =11.84) completed the baseline interview, of whom 12 (41.4%) were male. Upon presenting with the index episode of self-harm, eighteen of the participants received general admission and six participants received psychiatric admission. The characteristics of the baseline sample are summarised in Table 6.1, which also compares the baseline characteristics of those who presented with intentional overdose (n=21) to those who presented with self-cutting (n=8). Figure 6.1 illustrates baseline risk and protective factors in self-cutting and overdose patients. Compared with those who presented with overdose, those who presented with self-cutting scored significantly lower on the FFMQ subscale "non-reactivity to inner experience" and significantly higher on the Beck Hopelessness Scale. There were associations that approached statistical significance ($p<0.15$) between self-cutting and lower total means scores on the MEPS, higher scores on the FFMQ subscale "acting with awareness", and lower attentional bias on the Stroop negative low stimulation task.

The majority (n=22; 75.9%) of participants reported having engaged in self-harm prior to the index episode, of whom six had one previous episode, two had two previous episodes, three had three previous episodes, and 11 had four or more previous episodes. Among those who had a history of self-harm, seven participants switched method between the index episode and the most recent episode preceding the index episode.

Table 6.1.

Baseline scores on variables and their associations with method of index self-harm episode (self-cutting versus overdose)

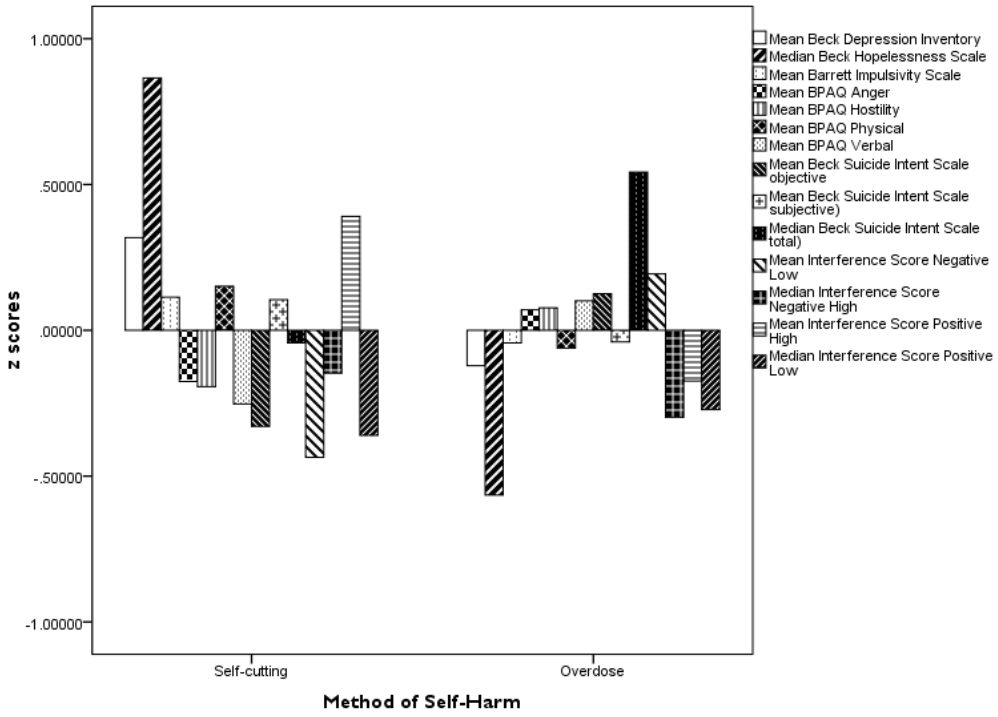
	Recruited		Self-cutting		Overdose				
Normally distributed variables	*n*[1]	*Mean (SD)*	*n*[1]	*Mean (SD)*	*n*[1]	*Mean (SD)*	*t*	*Effect size (d)*	*p*
Age	29	33.45 (11.84)	8	34.50 (14.82)	21	33.05 (10.90)	0.29	0.11	0.77
Beck Depression Inventory II	29	25.35 (13.46)	8	29.63 (11.75)	21	23.71 (13.97)	1.06	0.41	0.30
Barrett Impulsivity Scale-15	29	40.41 (8.45)	8	41.38 (8.52)	21	40.05 (8.61)	0.37	0.14	0.71
Total MEPS means	25	8.04 (4.47)	8	6.12 (4.88)	17	8.94 (4.10)	-1.51	-0.63	0.15
BPAQ-SF									
Anger	28	3.86 (1.56)	8	3.58 (1.50)	20	3.97 (1.61)	-0.58	-0.23	0.57
Hostility	28	3.88 (1.11)	8	3.67 (0.99)	20	3.97 (1.16)	-0.64	-0.25	0.53
Physical	28	2.88 (1.61)	8	3.13 (1.81)	20	2.78 (1.56)	0.50	0.20	0.62
Verbal	28	3.11 (1.41)	8	2.75 (1.42)	20	3.25 (1.42)	-0.84	-0.33	0.41
FFMQ									
Act aware	27	22.52 (6.65)	8	25.75 (5.75)	19	21.16 (6.67)	1.70	0.68	0.10
Non-react	27	17.85 (5.10)	8	13.75 (4.10)	19	19.58 (4.51)	-3.14	**-1.23**	**<0.01**
Non-judge	27	20.59 (8.07)	8	21.75 (6.14)	19	20.11 (8.86)	0.48	0.19	0.64
Future fluency task	25	5.76 (2.91)	8	6.13 (4.19)	17	5.59 (2.21)	0.34	0.17	0.74
Beck Suicide Intent Scale									
Objective	29	5.90 (3.10)	8	4.87 (2.53)	21	6.29 (3.26)	-1.10	-0.42	0.28
Subjective	29	8.86 (3.69)	8	9.25 (3.11)	21	8.71 (3.95)	0.34	0.13	0.73
Total	29	14.76 (5.97)	8	14.13 (4.09)	21	15.00 (6.63)	-0.43	-0.13	0.67
Modified emotional Stroop task									
Interference score negative low stimulation	26	0.52 (2.37)	8	0.79 (2.04)	19	1.94 (2.95)	-1.52	-0.62	0.14
AMT Positive	25	0.58 (0.29)	7	0.57 (0.29)	18	0.59 (0.29)	-1.33	-0.05	0.90
Non-normally distributed variables	*n*[1]	*Median*	*n*[1]	*Median*	*n*[1]	*Median*	*U*	*Effect size (r)*	*p*
Beck Hopelessness Scale	28	6.00 (4.25-15.00)	8	14.00 (7.00-16.80)	20	5.5 (3.00-13.50)	39.50	**-0.39**	**0.04**
MEPS relevancy ratio	25	0.90 (0.73-1.00)	8	0.91 (0.29-1.0)	17	0.9 (0.81-1.00)	57.50	-0.12	0.55
AMT Total	25	0.60 (0.50-0.75)	7	0.60 (0.50-0.60)	18	0.60 (0.48-0.80)	54.50	-0.10	0.60
AMT Negative	25	0.60 (0.40-0.80)	7	0.6 (0.4-0.6)	18	0.6 (0.4-0.8)	44.00	-0.24	0.27
Modified emotional Stroop task									
Interference score negative high stimulation	26	0.00 (-1.28-1.75)	8	0.20 (-.98-1.70)	18	-0.20 (-1.52-1.95)	65.50	-0.07	0.72
Interference score positive low stimulation	26	-0.25 (-1.43-2.18)	8	-0.50 (-1.78-3.50)	18	-0.20 (-0.95-2.18)	64.00	-0.09	0.66
Interference score positive high stimulation	26	-0.55 (-2.63-0.90)	8	0.10 (-1.42-1.86)	18	-0.65 (-2.75-0.45)	52.50	-0.21	0.28
Categoric variables	*n*[1]	n (%) with factor	*n*[1]	n (%) with factor	*n*[1]	n (%) with factor	Chi		*p*
Psychiatric admission	29	6 (20.7%)	8	2 (25.0%)	21	4 (19.0%)	0.13		0.72
Alcohol involved	29	16 (55.2%)	8	6 (75.0%)	21	10 (47.6%)	1.76		0.19
Male sex	29	12 (41.4%)	8	4 (50.0%)	21	8 (38.1%)	0.34		0.56
Previous self-harm	29	22 (75.9%)	8	7 (87.5%)	21	15 (71.4%)	0.82		0.37

[1]Ns vary because some participants elected not to complete some measures

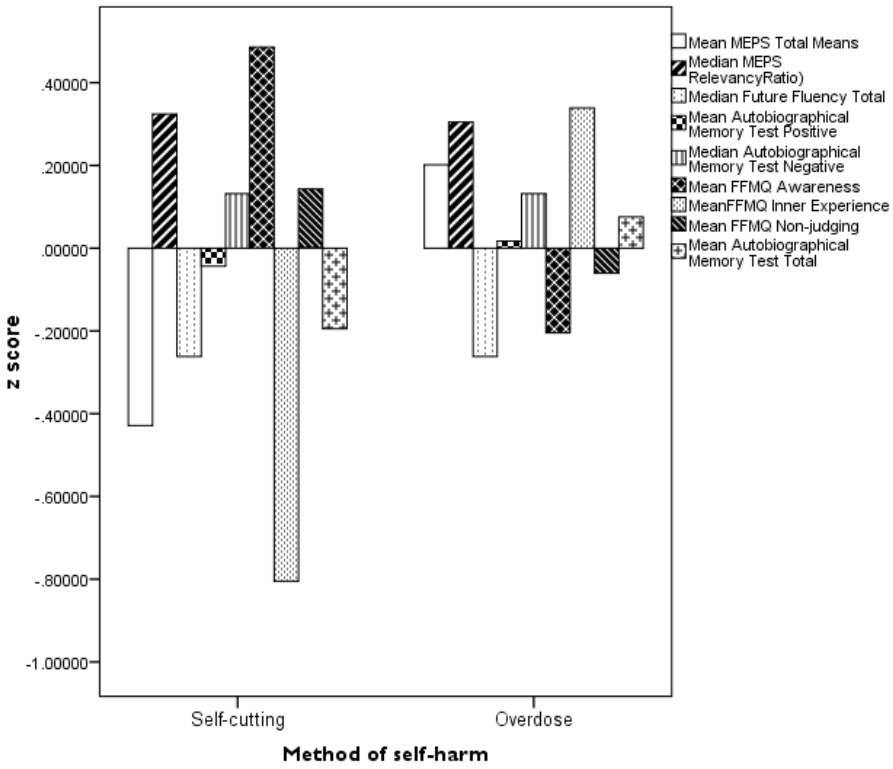
AMT= Autobiographical memory task; MEPS= Means Ends Problem-Solving Procedure; BPAQ= Buss Perry Aggression Questionnaire; FFMQ= Five Facet Mindfulness Questionnaire

Figure 6.1. Mean/median z scores for baseline (a) risk factors and(b) protective factors and method of self-harm

(a) Risk factors and self-harm method



(b) Protective factors and self-harm method



Situation at follow-up.

Nineteen participants (65.5%) were successfully contacted and were willing to take part in a follow-up interview three months after the baseline interview. Reasons for non-participation in the follow-up were that the participants were non-contactable (n=9) or felt that they did not wish to revisit the index episode (n=1). Those who were lost to follow-up did not differ significantly from those who were followed up on any of the baseline variables. For the 19 individuals who were followed up, mean scores on depression were significantly higher at baseline (mean= 26.89, sd= 14.45) than at follow-up (mean=18.26, sd=14.51; t=3.29, p=0.01), and there was also a non-significant reduction in median hopelessness scores between baseline (median=9.00, IQR= 5.00-16.00) and follow-up (median=7.00, IQR= 2.00-11.00; p=0.18).

At the follow-up interview, five (26.3%) of the participants reported repeating self-harm since the index episode, of whom three repeated once, one repeated twice and one repeated four times. For the first repeated episode in each case, four of the participants used the same method as the index act and one participant switched method to self-cutting from overdose. None of the participants presented to hospital with their repeated episodes; one participant presented to their general practitioner for treatment. Table 6.2 compares the baseline characteristics of those who went on to repeat during follow-up to those who did not. Figure 6.2 illustrates baseline risk and protective factors in repeaters and non-repeaters. Repeaters scored significantly lower on “non-judging of inner experience” from the FFMQ and less likely to have a history of previous self-harm and were more likely

Table 6.2

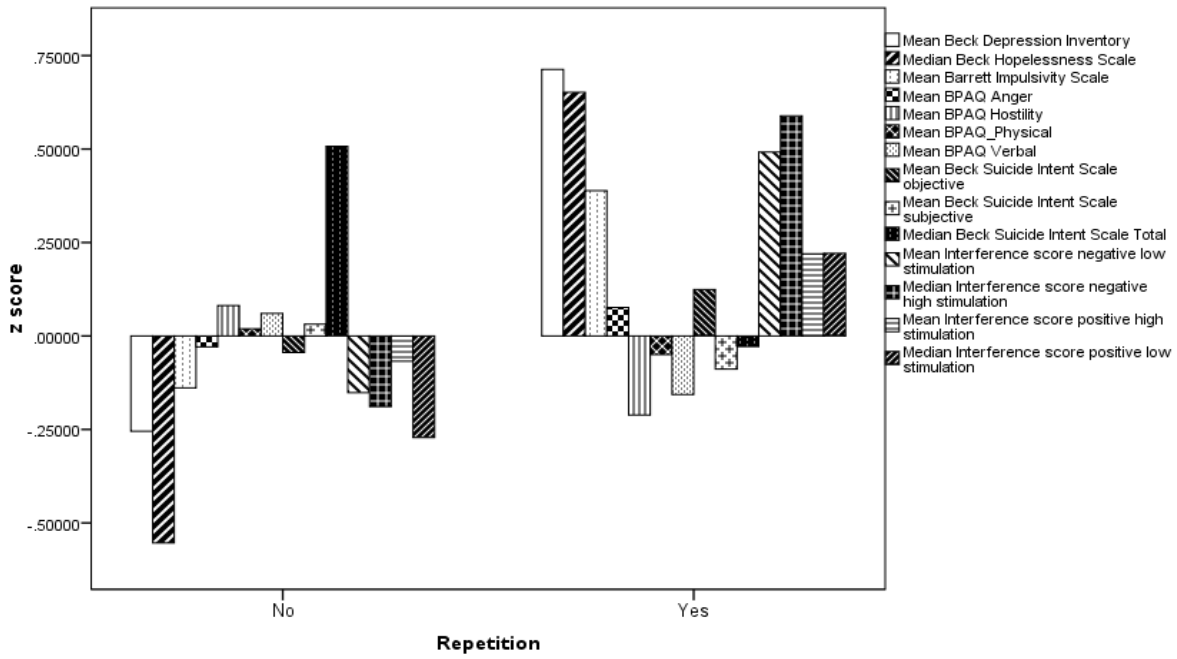
Baseline scores on variables and their associations with prospective repetition of self-harm

	Followed up		Repeat		No repeat				
Normally distributed variables	*n*[1]	*Mean (SD)*	*n*[1]	*Mean (sd)*	n	*Mean*	*t*	*Effect size (d)*	*p*
Age	19	36.37 (11.10)	5	33.40 (11.87)	14	37.43 (11.51)	0.67	-0.32	0.51
Beck Depression Inventory II	19	26.89 (14.45)	5	37.20 (14.29)	14	23.21 (13.07)	-2.01	0.97	0.06
Barrett Impulsivity Scale-15	19	39.53 (6.87)	5	42.20 (5.12)	14	38.57 (7.32)	-1.01	0.49	0.33
Total MEPS means	16	8.56 (4.10)	4	8.00 (7.25)	12	8.75 (2.90)	0.30	-0.16	0.76
BPAQ-SF									
Anger	18	3.89 (1.46)	5	4.00 (1.56)	13	3.86 (1.48)	-0.20	0.10	0.85
Hostility	18	3.83 (1.10)	5	3.60 (1.11)	13	3.92 (1.13)	0.54	-0.27	0.59
Physical	18	2.54 (1.41)	5	2.47 (1.10)	13	2.56 (1.56)	-0.13	-0.06	0.90
Verbal	18	2.74 (1.33)	5	2.53 (0.99)	13	2.82 (1.46)	0.40	-0.20	0.69
FFMQ									
Act aware	17	22.24 (6.27)	4	20.00 (9.49)	13	22.92 (5.27)	0.81	-0.42	0.43
Non-react	17	17.94 (4.52)	4	16.50 (6.14)	13	18.38 (4.11)	0.72	-0.37	0.48
Non-judge	17	19.53 (7.43)	4	13.25 (8.54)	13	21.46 (6.17)	2.14	**-1.10**	**0.05**
Beck Suicide Intent Scale									
Objective	19	6.05 (2.80)	5	6.40 (3.71)	14	5.93 (2.56)	-0.32	0.15	0.76
Subjective	19	9.11 (3.45)	5	8.80 (1.92)	14	9.21 (3.96)	0.22	-0.11	0.83
Modified emotional Stroop task									
Interference score negative low stimulation	17	0.49 (2.61)	4	1.78 (3.95)	13	0.10 (2.11)	-1.62	0.41	0.35
Interference score positive high stimulation	17	-1.82 (3.72)	4	-1.00 (5.53)	13	-2.07 (3.24)	0.49	0.25	0.63
Non-normally distributed variables	*n*[1]	*Median*	*n*[1]	*Median*	n	*Median*	*U*	*Effect size (r)*	*p*
Beck Suicide Intent Scale Total	19	18.00 (10.00-20.00)	5	15.00 (10.5-10.0)	14	18.00 (9.50-19.50)	34.50	-0.01	0.96
Beck Hopelessness Scale	18	7.50 (4.75-16.00)	4	13.50 (7.00-17.50)	14	6.00 (3.75-15.25)	13.50	-0.36	0.13
Future fluency task	16	4.50 (4.00-7.50)	4	3.50 (1.50-7.00)	12	5.00 (4.00-7.50)	13.00	-0.34	0.21
MEPS relevancy ratio	16	0.92 (0.78-1.00)	4	0.86 (0.37-1.00)	12	0.92 (0.88-1.00)	19.50	-0.14	0.60
Autobiographical memory test									
Total	17	0.60 (0.45-0.65)	5	0.50 (0.30-0.55)	12	0.60 (0.53-0.78)	14.50	-0.41	0.17
Positive	17	0.60 (0.30-0.70)	5	0.40 (0.20-0.60)	12	0.60 (0.60-0.80)	16.00	-0.38	0.16
Negative	17	0.60 (0.40-0.70)	5	0.40 (0.30-0.70)	12	0.60 (0.45-0.75)	23.50	-0.17	0.51
Modified emotional Stroop task									
Interference score negative high stimulation	17	0.10 (-1.55-1.80)	4	2.45 (-2.33-8.13)	13	0.10 (-1.40-1.15)	23.00	-0.08	0.79
Interference score positive low stimulation	17	-0.20 (-1.65-2.05)	4	1.60 (-2.40-8.83)	13	-0.30 (-1.65-1.30)	18.00	0.22	0.36
Categoric variables	*n*[1]	n (%) with factor	*n*[1]	n (%) with factor	N	n (%) with factor	Chi		*p*
Self-cutting involved	19	6 (31.6%)	5	2 (40.0%)	14	4 (28.6)%	0.22		0.64
Psychiatric admission	19	5 (26.3%)	5	3 (60.0%)	14	2 (14.3%)	3.97		**0.05**
Alcohol involved	19	11 (57.9%)	5	3 (60.0%)	14	8 (57.1%)	0.01		0.91
Male sex	19	6 (31.6%)	5	1 (20.0%)	14	5 (35.7%)	0.42		0.52
Previous self-harm	19	17 (89.5%)	5	3 (60.0%)	14	14 (100.0%)	6.26		**0.01**

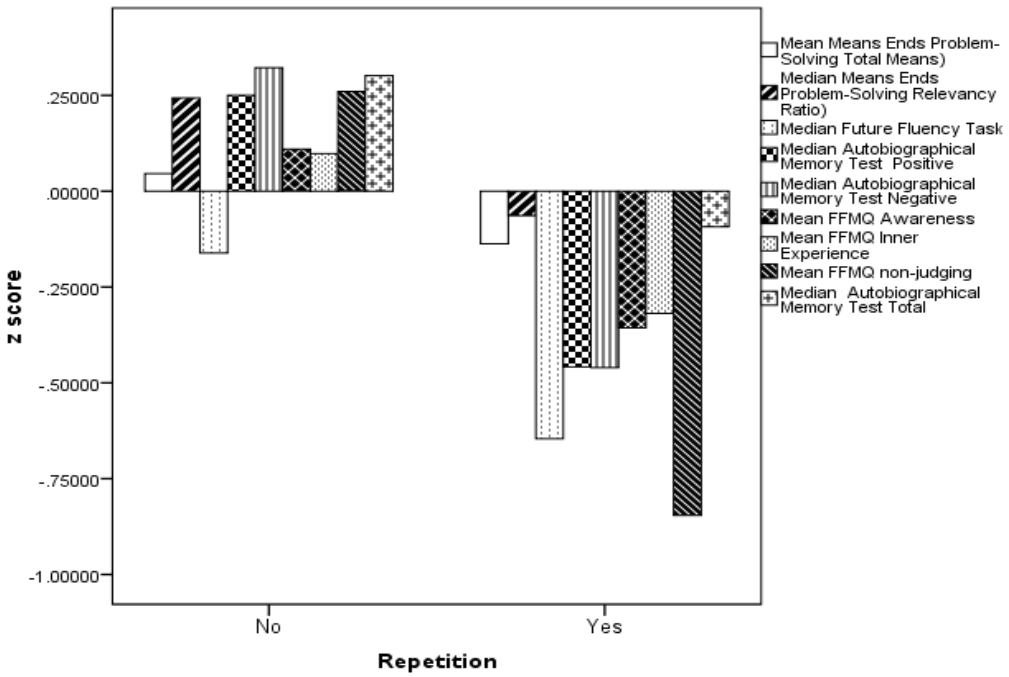
[1]*N*s vary because some participants elected not to complete some measuresMEPS= Means Ends Problem-Solving Procedure; BPAQ= Buss Perry Aggression Questionnaire; FFMQ= Five Facet Mindfulness Questionnaire

Figure 6.2. Mean/median z scores for baseline (a) risk factors and(b) protective factors and prospective repetition of self-harm

(a) Risk factors and self-harm repetition



(b) Protective factors and self-harm repetition



to have received psychiatric admission during the index presentation. There were borderline significant ($p<0.15$) associations between repeating and higher baseline scores on depression and hopelessness. Comparing mean scores of the Beck Suicide Intent Scale for index and repeat episodes, the repeaters' scores were higher for the index episode than the most recent repeat episode on the objective subscale [6.40 (sd=3.71) vs 6.00 (sd=5.52), t=0.20, p=0.85], subjective subscale [8.80 (sd=1.92) vs 6.00 (sd=5.52), t=1.02, p=0.366] and total scale [15.20 (sd=4.69) vs 12.00 (sd=8.80), t=0.77, p=0.48] but none of these differences were statistically significant. Repeaters had significantly higher mean scores than non-repeaters on both depression [38.40 (sd=10.96) vs 12.36 (sd=10.96); t=4.04, $p<0.01$] and hopelessness [11.80 (sd=3.70) vs 5.64 (sd=5.24); t=2.40, p=0.03] at follow-up.

Stability of measures between baseline and follow-up.

Tests of stability are presented in Table 6.3. Measures of aggression and impulsivity displayed good absolute and relative stability in this sample. Within the Five Facet Mindfulness Questionnaire, "acting with awareness" was stable over the three months, but "non-judging of inner experience" and "non-reactivity to inner experience" demonstrated poorer relative stability within the sample, as did the modified emotional Stroop task, autobiographical memory test, and total means scores on the MEPS. Relevancy ratios on the MEPS had higher absolute and relative stability. In terms of the stability of hopelessness levels, median scores on both the Beck Hopelessness Scale and Future Fluency task improved slightly between baseline and follow-up.

Table 6.3

Baseline scores and follow-up scores on trait-like variables and corresponding values for absolute and relative stability

Normally distributed variables	*n*[1]	Baseline mean (sd)	Follow-up mean (sd)	Difference	Absolute stability (t)	p (two-tailed)	Relative stability (*r*)	p (two-tailed)
Barrett Impulsivity Scale-15	18	38.94 (6.58)	39.22 (9.19)	+0.28	0.19	0.85	0.76	**<0.01**
BPAQ								
Anger	18	3.89 (1.46)	3.50 (1.35)	-0.39	-1.42	0.17	0.66	**0.03**
Hostility	18	3.83 (1.10)	3.72 (1.39)	-0.11	-0.38	0.71	0.52	**0.03**
Physical	18	2.54 (1.41)	2.59 (1.33)	+0.06	0.17	0.87	0.47	**0.05**
Verbal	18	2.74 (1.33)	2.94 (1.07)	+0.20	0.75	0.46	0.56	**0.02**
FFMQ								
Act aware	17	22.24 (6.27)	22.24 (7.23)	0.00	0.00	1.00	0.70	**<0.01**
Non-react	17	17.94 (4.52)	18.65 (5.00)	+0.76	0.48	0.64	0.18	0.49
Non-judge	17	19.53 (7.43)	21.82 (6.07)	+2.29	1.18	0.25	0.31	0.25
MEPS total means	14	8.14 (3.37)	8.71 (3.77)	+0.57	0.54	0.60	0.40	0.16
Modified emotional Stroop test								
Interference score positive high stimulation	16	-1.47 (3.55)	-0.78 (3.20)	-0.69	-0.74	0.47	0.39	0.13
Interference score negative low stimulation	16	0.33 (2.60)	-1.26 (2.74)	-1.58	-1.49	0.16	-0.26	0.33
Non-normally distributed variables	*n*[1]	Baseline median (IQR)	Follow-up median (IQR)	Difference	Absolute stability (Wilcoxon)	p (two-tailed)	Relative stability (rho)	p (two-tailed)
Future fluency task	14	5.00 (4.00-8.00)	6.00 (2.75-8.00)	+1.00		0.80	0.18	0.52
Beck Hopelessness Scale	17	9.00 (5.00-16.00)	7.00 (2.00-11.00)	-2.00		0.13	0.33	0.18
Autobiographical memory test								
Positive	15	0.60 (0.60-0.80)	0.60 (0.40-0.80)	0.00		0.97	0.30	0.28
Negative	15	0.60 (0.60-0.80)	0.60 (0.40-0.80)	0.00		0.29	0.31	0.27
MEPS relevancy ratio	14	0.92 (0.83-1.00)	0.91 (0.83-1.00)	-0.01		0.80	0.62	**0.02**
Modified emotional Stroop test								
Interference score negative high stimulation	16	0.20 (-1.49-1.85)	-0.65 (-2.25-1.20)	-0.60		0.16	-0.04	0.87
Interference score positive low stimulation	17	-0.20 (-1.65-2.05)	-0.10 (-1.10-1.40)	+0.10		0.90	-0.26	0.32

[1]*N*s vary because some participants elected not to complete some measures

MEPS= Means Ends Problem-Solving Procedure; BPAQ= Buss Perry Aggression Questionnaire; FFMQ= Five Facet Mindfulness Questionnaire

Discussion

The purpose of the present study was to examine how several theoretically-derived psychological variables were associated with self-harm method and prospective repetition of self-harm in a small sample of self-harm patients. We found that, compared with 21 overdose patients, eight patients who presented with self-cutting scored higher on hopelessness and lower on non-reactivity to inner experience. In addition, there were non-significant differences on depression, impulsivity, problem-solving, previous self-harm and repeated self-harm between self-cutting and overdose patients. All of these findings were in line with our hypotheses, except for the higher hopelessness in those presenting with self-cutting. Following up patients three months after the baseline interview, those who went on to repeat scored lower at baseline on non-judging of inner experience, and were less likely to have a history of self-harm and more likely to have been admitted for psychiatric treatment at baseline. As expected, repeaters demonstrated non-significantly higher scores than non-repeaters on depression, impulsivity, and hopelessness, and non-significantly lower scores on problem-solving, mindfulness, autobiographical memory specificity, and future fluency. Those who repeated continued to have high levels of depression and hopelessness at follow-up, as compared to those who did not repeat in the intervening period. None of the repeaters sought hospital treatment for their repeated episodes.

These findings offer preliminary evidence of psychological differences in between self-cutting and overdose patients and contribute to a growing body of evidence of differences between overdose and self-cutting patients in terms of characteristics and outcome. Little attention has been paid to potential psychological differences between those presenting with self-cutting and those presenting with

other methods. There is growing evidence that repeated self-cutting is not solely attributable to borderline personality disorder and trauma (Marchetto, 2006). Given that, in our small sample, those presenting with self-cutting had higher levels of hopelessness than those presenting with overdose at baseline, it is plausible that the association between self-cutting and prospective repetition seen in several large-scale studies (Bilén et al., 2010a; Lilley et al., 2008a; Perry et al., 2012) may be related to hopelessness, a consistent predictor of repetition among those presenting to hospital with self-harm (McMillan et al., 2007). However, the small sample size in the current study precluded direct testing of this hypothesis. Those who self-cut also scored lower on the "non-reactivity to inter experience" subscale of the Five Facet Mindfulness Questionnaire. Lower distress tolerance has been theorised to be related to self-injury (defined as the deliberate, direct destruction or alteration of body tissue without conscious suicidal intent) in particular (Chapman, Gratz, & Brown, 2006), in that self-injury is seen as an emotional regulation strategy that facilitates experiential avoidance. The lower levels of tolerance towards distressing inner experiences among those in our sample who self-cut may reflect the immediate experiential effects of self-cutting compared with intentional overdose. Conversely, the participants who had presented with self-cutting scored slightly higher on the "acting with awareness" subscale of the FFMQ than those presenting with overdose, which could suggest that any reduced mindfulness may be specific to certain components of the construct. Several cognitive treatments for self-harm include strategies to increase mindfulness (Linehan, 1987; Slee, Spinhoven, Garnefski, & Arensman, 2008; Williams et al., 2006), and it would be of interest to examine whether these interventions are differentially effective depending on the method of self-harm an individual engages in. Similarly, given the lower scores on the Means Ends Problem-

Solving Procedure among those presenting with self-cutting in the current study, it might also be that problem-solving interventions for self-harm may be differentially effective in this group of patients. Considering the increased risk of further fatal and non-fatal repetition among those presenting with self-cutting, it is encouraging that the differences noted in the current study seem to be related mostly to mutable constructs, that may be attenuated through psychological interventions. Although the findings were in keeping with our hypotheses and with relevant previous research, these findings were based on a very small sample and need to be investigated on a larger scale with a consecutive sample.

It is notable that one of the five participants who repeated switched method of self-harm from the index episode (from overdose to self-cutting), a finding that echoes Lilley et al.'s (2008a) that 21% of patients switched method of self-harm between index and repeat episodes In addition, recent studies of self-cutting among adolescents found clinically meaningful subgroupings among those who self-cut (Matsumoto, Imamura, Chiba, Katsumata, Kitani, & Takeshima, 2008; Matsumoto, Yamaguchi, Chiba, Asami, Iseki, & Hirayasu, 2004). It seems that, despite some differences on psychological variables, those presenting with self-cutting may not represent a distinct or homogenous group. The mutability of method of self-harm and level of suicidal intent seen in the current study and previous research has implications for the ongoing debate around the proposed diagnostic category of "non-suicidal self-injury", as patients' self-harm methods and suicidal intent can change even in a relatively short follow-up period.

In our sample, there were notable differences between those who repeated during the three-month follow-up and those who did not. Those who went on to repeat scored lower on non-judging of inner experience. To our knowledge, this

variable has never been examined in relation to risk of prospective repetition, but such a tendency could serve to prolong experiences of depression and hopelessness germane to self-harm repetition. Indeed, in the current study, those who repeated had higher follow-up levels of depression and hopelessness than those who did not repeat. Persistent depression after a self-harm episode has been linked to repetition in larger samples (Scoliers, Portzky, van Heeringen, & Audenaert, 2009; Sjöström, 2009). The finding that those who repeated were more likely to have received psychiatric admission in the current study is in line with several large-scale studies of prospective repetition (Bilén et al., 2010a; Haw et al., 2007; Mehlum, Jørgensen, Diep, & Nrugham, 2010) and may be indicative of higher psychiatric morbidity in this group, echoing Sorketti and Zuraida's (2007) findings. One exceptional finding in the current study was that those who repeated were less likely to have a history of self-harm than those who did not repeat. This finding contrasts with extensive evidence that those with a history of self-harm are at higher risk of repetition, and that indeed there is an accumulating risk of prospective repetition with a higher number of previous self-harm episodes (Haw et al., 2007; Perry et al., 2012). Such an aberrant finding may be attributable to the very high prevalence of previous self-harm in this small sample as a whole, but particularly among those who were followed up successfully. It also may be a reflection of the current study's small sample size, which may have limited the generalizability of the findings.

In our analysis, we examined the stability of theoretically-derived variables over time. As expected, impulsivity and aggression remained stable between baseline and follow-up assessment. These traits have been linked to the aetiology of self-harm behaviour and reflect evidence of a biological diathesis for the behaviour. Scores on the cognitive tasks did not remain stable over the follow-up period and performance

on these measures generally improved along with levels of depression and hopelessness. Such improvements may reflect overall improvement in functioning in the period after a self-harm episode.

The current study had a number of limitations. The sample was very small although efforts were made to recruit on the basis of consecutive presentations. However, those who were successfully recruited did not differ significantly from the non-recruited group on either gender or method of self-harm, which supports the generalizability of the findings. Recruitment directly in the emergency department might have increased uptake but there would have been ethical and practical implications around privacy and confidentiality. The current findings should therefore be interpreted with caution and further research is required to examine the replicability of the current findings in a larger consecutive sample. Another limitation of the study is that some weeks elapsed between presentation and the index interview. Although many of the constructs measured are deemed to be trait-like, some measures such as depression and hopelessness could decrease rapidly in the aftermath of a suicidal crisis, such that the current findings might be limited in terms of their applicability to risk assessment, which usually takes place in the hours following an index presentation. Previous studies (Lavender & Watkins, 2004; MacLeod et al., 1993) have controlled for cognitive fluency when measuring future fluency. Therefore, it is a limitation of the current study that this was not measured or controlled for here, particularly given that cognitive fluency may be lower among those with depression (Lavender & Watkins, 2004). Finally, although the study was intended to be observational, the six-week follow-up call with participants to minimise attrition may have acted as an intervention in the current study. Previous studies have shown that low-touch contact interventions such as telephone calls

(Vaiva, Vaiva, Ducrocq, Meyer, Mathieu, Philippe et al., 2006) and postcards (Carter, Clover, Whyte, Dawson, & D'Este, 2007) can act to reduce repetition. Therefore the 6-week telephone contact may have acted to reduce the rate of repetition of self-harm in the current study.

Despite these limitations the current study had several strengths and innovative aspects. The study's prospective design allowed for the follow-up of patients during a period of the highest risk of repetition (Lilley et al., 2008a; Perry et al., 2012), and the retention rate was in line with similar previous studies. Focussing on a clinical sample ensured the inclusion of those at high risk of suicide and also allowed for the timely measure of constructs. The study was the first to compare those presenting with self-cutting to those presenting with overdose on these theoretically-derived psychological measures. An additional strength is that the study incorporated self-reported repetition, which would have been undetected if hospital records had been relied upon as none of the repeated episodes resulted in hospital presentation in the current study.

Given the accumulating evidence that those who present with self-cutting are more likely than overdose patients to repeat self-harm fatally and non-fatally, the current study provides preliminary evidence of important psychological differences between self-cutting and overdose patients. These differences warrant further investigation and may hold promise for more targeted interventions in this heterogeneous group of patients. Equally significant is that methods of self-harm and level of suicidal intent varied between episodes. As a whole, these findings can help to inform the on-going debate around the significance of self-harm method, particularly in light of recent developments towards a diagnosis of non-suicidal self-injury.

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Implications

The preceding structured psychological study was intended to compare repeaters to non-repeaters on several theoretically derived psychological variables, and to examine whether method of self-harm was associated with these variables. The results indicate that, compared with those presenting with overdose, those whose index episode involved self-cutting scored higher than on hopelessness and lower on non-reactivity to inner experience. Moreover, those who repeated during the three-month follow-up had lower baseline levels of non-judgement of inner experience and were more likely to receive psychiatric admission. Although the study had a number of limitations, the results suggest significant psychological differences between self-cutting and overdose patients that could help to account for the association between self-cutting and repetition.

Chapter 7: "Breaking Points" and “Turning Points": The Lived Experience of Emergency Department Self-Harm Patients

Rationale

The preceding study investigated the hypothesis that those who engage in repeated self-harm have higher levels of diathesis-type risk factors for self-harm than those who do not repeat. An alternative explanation of repetition is that an index act of self-harm makes repetition more likely because of the effects it has on the individual’s circumstances. Such effects might vary between individuals and their particular circumstances, or could be a function of the nature of the act itself. This topic has not been widely researched and little is known about the potential mechanisms by which the aftermath of a self-harm act affects the likelihood of another act being undertaken. Because of the relative dearth of research in the area, it seems appropriate to employ an inductive qualitative approach to examining the issues of self-harm repetition and self-harm methods. This qualitative study is intended to confer greater understanding of the experiences of those presenting to emergency departments with self-cutting and intentional overdose.

"Breaking Points" and “Turning Points": The Lived Experience of Emergency Department Self-Harm Patients

Celine Larkin, Zelda Di Blasi, & Ella Arensman

Abstract

Dozens of quantitative studies have examined risk factors for repetition of self-harm, but few studies have examined the lived experience of repeated self-harm among those presenting to emergency departments with self-harm. The current study explores the experiences of young self-harm repeaters who presented to emergency departments in order to inform management and prevention of self-harm. Four young people who engaged in self-harm on multiple occasions using multiple self-harm methods were interviewed and followed up three months later when possible. Participants completed semi-structured interviews. The transcripts were analysed using Interpretative Phenomenological Analysis, which emphasizes individual lived experience and the meanings attached to those experiences. The themes we generated were: “enduring adversity”, “self-harm as contextual”, “agency through self-harm”, “self(-harm) as socially aberrant”, and “road to recovery”. The index self-harm episode was often portrayed as a turning point for participants, one which allowed them to begin the process of recovery. We discuss the themes in the context of existing evidence and propose a circular model of the process of repetition of self-harm based on current analysis and extant evidence. Self-harm may represent a turning point to begin collaboration between patients and practitioners towards a shared goal of recovery. Our findings indicate that proactive intervention is required with those who self-harm and those who seek to prevent self-harm.

Introduction

Self-harm, referring to intentional self-injury or self-poisoning with any level of suicidal intent, indicates distress and confers increased risk of suicide (Hawton, Zahl, & Weatherall, 2003). There have been considerable contributions to theory on self-harm in recent decades. Despite arising from diverse fields of enquiry, prominent models of self-harm share several components. For example, it is widely accepted that some people are more likely to engage in self-harm behaviours because of pre-existing vulnerability, whether that vulnerability is seen as arising from genetics (Mann, 2003), avoidant response tendency (Chapman, Gratz, & Brown, 2006), perfectionism (O'Connor, Rasmussen, & Hawton, 2012), or problem-solving deficits (Linehan, 1987). It is also generally accepted that, among those with such vulnerabilities, self-harm occurs as a response to a challenging situation, such as environmental stressors (Linehan, 1987), unwanted internal experience (Chapman et al., 2006), thwarted belongingness or perceived burdensomeness (Van Orden, Merrill, & Joiner, 2005), or acute psychosocial crisis (Mann, 2003).

Self-harm research is dominated by quantitative approaches, with a focus on issues of prevalence and risk factors. Although such approaches produce an evidence-based picture of epidemiology and aetiology, they do not facilitate a deeper understanding of the subjective experience and significance of self-harm (Hjelmeland & Knizek, 2010). Community-based qualitative studies of self-harm have underlined the roles of adverse life experiences, negative emotions, and subsequent relief from distress (Alexander & Clare, 2004; Brooke & Horn, 2011; Privé, 2007; Rao, 2006; Rissanen, Kylmä, & Laukkanen, 2008). However, the profile of those who self-harm without seeking medical attention differs somewhat from those presenting to hospital with self-harm, as evidenced by a large quantitative

study of European adolescents (Ystgaard, Arensman, Hawton, Madge, van Heeringen, Hewitt et al., 2009). Few studies have examined the experiences of those presenting to emergency departments with deliberate self-harm.

Crocker et al (2006) used interpretative phenomenological analysis (IPA) to analyse accounts of people aged more than 65 years who had recently presented to hospital with a suicide attempt. The authors used verbatim quotations to illustrate three themes: the struggles endured by participants before and since the attempt, the attempts to maintain or regain control, and visibility and connectedness, or the lack thereof. In terms of health service experiences, participants were frightened of being perceived as timewasters. Harris (2000) conducted a qualitative study of self-harming women and found experiences of "hostile care" in emergency departments, including feeling infantilized and being labelled as timewasters by staff. She concluded that this "hostile care" is the result of divergent views of participants and professionals on the logic of self-harm, whereby participants view it as a means to regain control and limit damage to the self, and professionals interpret it as a lack of control and rationality and as a destructive act. In a qualitative study by Hume and Platt (2007), notable findings included a variety of treatment preferences across participants, a mostly positive evaluation of hospital staff, and the view of some participants that "the more harm you do, the less help you get" (p.7).

A systematic review by Taylor, Hawton, Fortune, and Kapur (2009) included both quantitative and qualitative studies of attitudes of self-harm patients towards clinical services. They found that self-harm patients often felt that they were not adequately informed or involved in decisions around their care. Patients also reported an overemphasis on physical care over psychosocial support in emergency departments, with some reports of care being conditional on a promise not to repeat

self-harm. These findings are consistent with a systematic review by Saunders, Hawton, Fortune and Farrell (2011) who reported largely negative attitudes among general hospital staff towards self-harm patients compared to other patients, although training was effective in improving attitudes towards and knowledge about self-harm.

Taking into account the lack of theory development on the issue of self-harm repetition, this study was intended to provide a deeper understanding of the subjective experience of self-cutting and of intentional overdose, of the meaning of repetition of self-harm, and of participants' experiences of medical treatment of self-harm.

Method

Design.

This study was part of a larger prospective study of hospital presentations of self-harm. Interviews took place soon after presentation (mean: 22 days after presentation, SD: 8.9 days) and again three months later to examine recovery and repetition during the follow-up period.

Recruitment.

Participants from a larger hospital-based survey were invited to participate in a qualitative study to discuss their experiences in greater detail. The larger study involved recruiting those presenting with overdose or self-cutting to emergency departments in two large hospitals in Ireland. Recruitment was facilitated by crisis nurses working in psychiatry services, who forwarded contact details of willing participants. For studies using Interpretative Phenomenological Analysis (IPA),

Smith, Flowers, and Larkin (2009) recommend selecting a relatively homogenous group of participants and we attempted to recruit a homogenous sample by specifying narrow criteria for eligibility. In Ireland, self-harm is most prevalent among young people (Perry, Corcoran, Fitzgerald, Keeley, Reulbach, & Arensman, 2012) so recruitment focused on those aged less than thirty years. We were particularly interested in those who had engaged repeatedly in self-harm, so participants were invited to participate in the qualitative interview if they had experience of at least two methods of self-harm, and had engaged in self-harm on more than one occasion. All of those who were invited to take part in the qualitative study agreed to take part.

The participants were three women and one man, who ranged in age from 19 to 26 years. Three of the participants had histories of self-cutting, three had histories of overdose, and one had a history of self-burning. The most recent self-harm episode involved overdose for three of the participants and self-cutting for one participant.

Procedure.

Qualitative interviews were conducted with a subsample of participants from the larger survey study a week after a structured interview in a location of the participant's choosing.

The qualitative interviews were semi-structured and used open-ended questions (Table 7.1). Interviews lasted between 45 minutes and an hour and two of the four participants took part in a follow-up interview three months after the first interview. All interviews were tape-recorded and the transcription procedure

followed that described by Smith et al. (2009), aiming to produce a semantic record of the interview, including notes of nonverbal utterances.

Table 7.1.

Interview Questions Used for Initial and Follow-up Interviews

Topic	Question
Precipitants of index episode	What led up to your recent presentation to hospital?
	What was it like for you just before you swallowed the tablets/self-cut?
Aftermath of index episode	How were you immediately afterwards?
	What was your experience of presenting to hospital?
	How do you feel about the episode now?
Recurring experiences of self-harm	Can you tell me about the first time you harmed yourself?
	What do you see as the same or different among your experiences of self-harm?
	Can you tell me about any experiences or thoughts of self-harm you have had since we last met?*
Social influences	How did your family/friends respond to your self-harm?
	Have you had any experiences of people you know harming themselves or taking their own lives?
	What should health services and others know about self-harm?
Role of self-harm in life	How is your life at the moment?*
	What role do you think self-harm has played in your life?*

*Asked at follow-up interview only

Ethical considerations.

Ethical approval was granted by the Clinical Research Ethics Committee, University College Cork. There were a number of procedures in place to protect participants, including providing a resource pack detailing local services and obtaining fully informed consent, and the interviewer was trained and supervised in identifying those at high risk of repeat self-harm or suicide. Participants received a phone-call six weeks after the initial interview to check in with the participant and obtain any reflections on the initial interview. At this point and at the three-month follow-up interview, the participants were again given contact details for the interviewer and

asked whether they required any specific assistance in accessing relevant support and treatment services.

We took a number of actions to counteract the power asymmetry inherent to research interviews (Kvale & Brinkmann, 2009). For example, we chose the location of the interview collaboratively with participants to maximize their comfort and ensure confidentiality. The interviewer's responses were empathic, adopting a "naïve but curious" stance (Smith et al., 2009).

Analysis.

The research question of the qualitative component of the current research is: "How do self-cutting and overdose patients make meaning of their repeated self-harm?". We addressed this question using an interpretative phenomenological analysis (IPA) approach (Smith et al., 2009) because the two central concerns within IPA are particular experiences and the meanings attached by an individual to those experiences. Given the wide range of motives, methods, and contexts of self-harm behaviour, IPA is well-placed to address heterogeneity across experiences. Moreover, its ideographic approach has the added benefit of being a closer approximation for clinical presentations than larger-scale aggregations of experience. IPA is not designed to provide explanatory theories of behaviour, but rather to explore the meaning of individual experience and thereby increase understanding of individuals' experiences, while acknowledging that it is impossible for the researcher to have direct access to another's experience.

The analysis begins with initial reading of the transcript and reflection on one's own preconceptions and emerging understanding. The first level of coding is phenomenological or descriptive coding, which identifies the key concerns and

experiences being described, the meaning given to these, and the stance the participant takes in relation to these experiences. The next stage of analysis is interpretative coding which identifies emerging themes within the material, as well as noting imagery, metaphor, and genre. Themes are identified within one transcript initially, and then across transcripts. In integrating themes across transcripts, a structure emerges to demonstrate the relationships among themes. This structure forms the basis for a narrative, which incorporates verbatim quotes to illustrate each theme.

Results

The analysis of the participants' accounts led to the identification of five super-ordinate themes: enduring adversity; self-harm as contextual; agency through self-harm; self(-harm) as socially aberrant; and road to recovery. The themes within these super-ordinate themes are presented in Table 7.2, and examples of excerpts from each subtheme can be found in Appendix 3.

Enduring adversity.

The first super-ordinate theme that was generated from the data was "enduring adversity". The participants recounted long-standing patterns of adversity, such as long-standing familial problems, such as problematic relationships with one or both parents, parental substance abuse, and abuse or conflict between parents, which affected how they currently deal with challenges: In addition, all of the participants indicated they had had long-term suicidal ideation or depression before the index episode of self-harm, for example one participant "used to go around, day in day out, I'd be thinking about hurting myself two or three times a day". Stemming from

Table 7.2

Summary of Themes and Super-Ordinate Themes

Super-ordinate theme	Theme
Enduring adversity	Poor parental relationships
	Long-term suicidal ideation/behaviour
	Recurring patterns of suicidality
Self-harm as contextual	Context of loss/powerlessness
	Social defeat as trigger
	Breaking point
	Overwhelming negative emotion
	Alcohol as facilitator
Self-harm as agency	"Just doing it"
	Planning
	Concealing self-harm and evading assistance
	Conviction/ambivalence in decision
	Desiring effective execution of plan
	Evaluation of performance
	Dynamism within/between acts
Self(-harm) as socially aberrant	Labelling as "crazy": own and perceived others'
	Negative social response
	Self(-harm) as burdensome
	Self-harm as shameful
	Health service as disempowering
	Desiring solitude after self-harm
Road to recovery	Striving for recovery
	Self-harm as positive turning point
	Lessons to self/others
	Communication as protective

longstanding adversity, the participants' descriptions of past self-harm behaviour was characterized by chronicity and recurrent patterns.

> It's how I cope, it's just almost become a habit like, d'y'know there hasn't been…any time after alcohol and something has gone wrong, this [self-cutting] is what I have done in the last year.

Self-harm as contextual.

The vulnerability that the participants described as arising from difficult family situations and long-term depression and ideation was only translated into self-harm behaviour in specific contexts. Such contexts included powerlessness and loss, social defeat, and intoxication. These contextual situations were largely portrayed as outside of the participants' control.

Some of the participants described precipitant social situations that were characterized by powerlessness.

> He went into the room next door the spare room to emm write a letter, so I was like "Oh, in that letter now he's he's dumping me like, he's he's writing a letter", I was like "What the hell am I doing sitting here, while he's dumping me?"

Two of the participants described experiences of loss in connection with self-harm, for example the suicide of one participant's grandmother "was a huge shock huge surprise it kinda hit us all pretty tough pretty hard yeah." Some participants identified "trigger" situations that occurred in the hours before self-harm acts, whereas others reported that some self-harm had no obvious "trigger". Where there

were “trigger” situations, they tended to be situations of what could be described as “social defeat”, including arguments, false accusations and infidelity.

> I think if my boyfriend hadn’t have come over and we didn’t end up having that talk, you know that’s why I was so upset like that pushed me, like if he didn’t come over I probably wouldn’t have taken the overdose then, I’m not saying I wouldn’t have done it eventually but maybe that evening I wouldn’t have done it

In contrast, some incidents of self-harm had no obvious external “trigger” in the hours leading up to the episode.

Alcohol consumption was a common contextual factor in participants’ accounts of self-harm behaviour. Alcohol intoxication was identified as a necessary but not sufficient criterion for self-harm, facilitating self-harm through a number of mechanisms, including affecting decision-making, increasing sensitivity to social defeat situations, and decreasing fear or pain. In these accounts, becoming intoxicated was conceptualized as a state (rather than an action), which disrupted the participant’s normal physical and mental processes, such as pain perception, inhibition, fear, and rationality.

All participants described having experiences of overwhelming negative emotion, most often sadness or anger, in the run-up to self-harm behaviour. Participants described a “breaking point” where they felt stretched to their limits by the situation they found themselves in: “[the argument] like pushed me over some kind of a level that I couldn’t take it any more like it just…I felt like there really was no other option, that this was the final straw.” Engaging in self-harm was depicted as related to context, but, for some, so too was the severity of self-harm once it was initiated.

In summary, the participants described a number of aspects of context (such as social defeat triggers, loss and powerlessness, alcohol consumption, and overwhelming negative emotion) which influenced their decision to engage in self-harm and the severity of self-harm once it was initiated; for the most part, the participants' accounts portray self-harm as a contextualized phenomenon. Moreover, there were elements of passivity in the participants' accounts of the contexts around self-harm, with the participants often portraying themselves as powerless objects of others' negative action, whether that "other" is a person or an intoxicant.

Agency through self-harm.

Although the participants depicted the context of self-harm as external, the actions involved in carrying out self-harm were personal and active, for example as a means of escape or respite from adverse situations. For example, one participant responded that "I think that when I first took the pills I just wanted to sleep for a long time and get everyone to leave me alone for a while and let me sleep". Participants alluded to aspects of planning and executing plans of self-harm. Choosing a method of self-harm was influenced by a number of concerns, including anticipated pain, effectiveness, and availability. Participants often identified particular desired outcomes, though the nature of the outcomes varied across participants.

> I didn't actually know what would happen, I didn't like, but I just wanted something bad to happen like. I wanted you know, my heart to stop or whatever you know I just wanted me I wanted to die like

Self-harm was engaged in with purpose and conviction by the participants. Two participants spoke of calmness and conviction following the decision to engage in

the index overdose; one participant was “adamant to go through with what I was going through”, whereas the other two participants had an ambivalent attitude towards the outcome of the self-harm act. For example, one participant recalled that he was “just so fed up and so tired of everything I just…I didn’t care what happened, to be honest I didn’t care like”. Sometimes the intentions of the participants changed as the self-harm act itself unfolded, with one participant describing herself as becoming “on a roll” after taking the first few tablets.

Participants spoke about attempting or planning to conceal evidence of the self-harm act, sometimes as a way of protecting loved ones, but also as a way of ensuring that they were not prevented from engaging in the self-harm act. When participants were discovered to have engaged in self-harm (most often through others’ deduction, rather than through participants’ help-seeking), they often attempted to evade assistance by physically resisting others’ intervention or denying that they had harmed themselves. Interruption of the self-harm act was considered thwarting by some participants and was met by anger: “I was pretty pissed off really actually that they’d that they had eh come across me.” Two of the participants spoke of feelings of relief following self-harm, particularly self-cutting, with one describing the feeling as “release”. Some of the participants evaluated their performance of self-harm and based judgments of their self-worth on their perceived success or failure. One participant said “It sounds really strange but I was just proud of myself that I was able to do it this time you know?” whereas another described how “I couldn’t even I couldn’t even fucking manage to do this [overdose] properly”. In contrast to the passivity evoked in their accounts of the context of self-harm, the participants take ownership of the act of self-harm by describing the actions taken to ensure that

their particular goals are achieved and their responses to being able or unable to achieve those goals.

Self(-harm) as socially aberrant.

Although engaging in self-harm was recounted by participants as a private act, resulting in private relief, the consequences of self-harm tended to be related back to social consequences, which were largely negative. Each of the participants spontaneously identified unique stigmatic labels that they anticipated others using: "screwed up in the head", "lunatic", "crazy" and "basket case". Such terms were used to refer to the person who self-harms, rather than to the behaviour. None of the participants recounted others actually using these labels, but felt that others did or would silently label them in this way.

Relatives' responses to discovering that the participant had engaged in self-harm were often characterized by negative emotion, such as anger, upset, or incomprehension, whereby the question of why the participant had engaged in self-harm was wielded as an accusatory rhetorical question (such as "what did you do that for?") rather than a genuine attempt to understand. A participant's boyfriend "saw all the cuts and things and he was just like more or less like giving out to me like mad and saying 'How could you do such a thing? Jesus Christ!'". Other relatives responded to self-harm by minimizing it or by "sweeping it under the rug", with connotations of self-harm as something murky that ought to be hidden. Participants' regret around the self-harm episode was related to its effect on others' impressions of them, rather than the effects on the participant directly. When describing waiting in the emergency department with her parents, one participant "felt like a huge

disappointment at that stage em yeah felt really bad, really really bad, em, so I just, y'know I just couldn't bring myself to look at them really." In addition to feeling shame, some participants felt that having others know about their self-harm reduced their autonomy as others "tiptoed" around them, reinforcing their perception that self-harm had adversely affected their relationships: "people treat you differently like, it's almost like they treat you like a child and they're walking around like on broken eggshells around you and I hate that". Moreover, the perception of themselves or their self-harm behaviour as a burden appeared in a number of accounts, with one participant saying "when you're in that frame of mind you think that they're better off without you." The participants also labelled their own behaviour as "unhealthy" and "stupid", suggesting a perceived gap between their ways of responding to challenges and expected or "normal" ways of responding. Nonetheless, three of the participants indicated that suicidal behaviour can be justified and that similar experiences or an empathic stance would be the most effective means of support for those in distress. For example, one participant said "I'm always confused when I hear people saying that [suicide is selfish] because thinking 'Jesus Christ, I mean imagine the suffering he must have gone through to actually want to kill himself, you know?"

The participants' perceptions and fears of stigma were borne out in their experiences of the emergency department, which were characterized by passivity and disempowerment, with some notable exceptions where staff took care to keep the participant informed. One participant "went to a side room, there was some nurse there and I wasn't being very cooperative and she was pretty busy so she was like 'Why are you here? Tell me now'". Two of the participants described how particular staff members in the hospital attempted to frighten the participant with stories of

lasting scars and slow painful death to discourage the participant from repeating self-harm.

One of the ways that some participants dealt with feelings of shame and burdensomeness in the emergency department was to seek solitude physically or mentally, for example by keeping their eyes shut or removing themselves to the bathroom. Two of the participants depicted physical harm as "real" harm, and this depiction was reinforced by the precedence given to medical care in the emergency department. One participant explained that "the problem you had previously doesn't matter cos you now have an actual problem that needs to be taken care of." The perception of physical harm as "real" harm added to feelings of shame and burdensomeness when participants contrasted their needs to other patients in the emergency department, with their evaluation of legitimacy being based on both the medical severity of the harm and whether the harm was self-inflicted.

> I even said to the nurse I was like "Why am I in a room and that old woman's on a trolley like I've no problem sleeping on a trolley for the night" d'y'know and like I'd say it's just y'know taking up their time when there was no need d'y'know when there's people that are actually sick and d'y'know and need the help

The participants' views of their own self-harm and the perceptions of others' views of it reflected their positioning of themselves and self-harm as aberrant from the norm, a view that was further reinforced by their experiences in emergency departments. Portraying self-harm as aberrant was achieved by relating it to irrational/abnormal thinking and by placing it at odds to the dominant priorities and beliefs within family, work, and health systems.

Road to recovery.

Despite the shame the participants experienced in the aftermath of self-harm episodes, participants identified the self-harm episode as a positive turning point, a wake-up call that made the unsupportable preceding situation (for example depression, alcohol use, ideation, and repeated self-harm) undeniably apparent to themselves and others. The self-harm episode was seen as a significant event that had resulted in positive life change.

> I hate that it happened but I'm grateful because once it happened things have changed so much since like everything like I'm I don't drink everything's like my life is great now d'y'know what I mean I've never like I used to go around day in day out I'd be thinking about hurting myself two or three times a day, I don't know, d'y'know I think like I know it's horrible to say I'm glad it happened.

In some of the accounts, the index episode was presented as a necessary event in the road to recovery: "if this overdose hadn't happened [sigh] em I think I'd still be just plodding along like and denying that I have anything, any issues." The participants spoke of the recent self-harm episode as a learning opportunity for themselves and for loved ones. Lessons learned included the importance of communication, the effects of extant difficulties (depression and repeated self-harm) on loved ones, and avoiding antagonistic situations. At follow-up interviews three months later, the index self-harm episode continued to be interpreted in a positive light in terms of effecting changes that the participants saw as necessary.

Circular model.

Based on the current analysis and on existing qualitative and quantitative research on self-harm, we developed a circular model (Figure 7.1) that attempts to describe the processes involved in the aetiology and maintenance of self-harm.

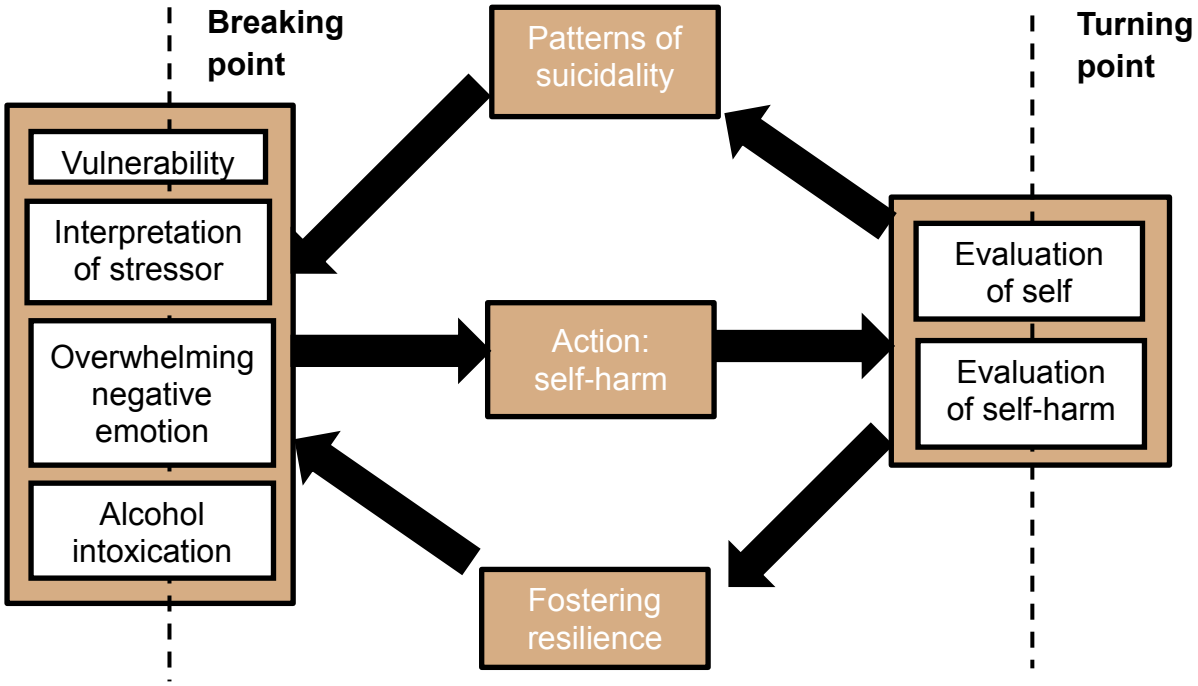


Figure 7.1. Circular model of repetition of self-harm derived from current analysis and extant literature.

Our model suggests that the decision to engage in self-harm comes after a "breaking point", at which individuals' vulnerability, perception of stressors, and often alcohol intoxication interact to render them feeling unable to cope with overwhelming negative emotions. Self-harm is engaged in actively and the consequences of the action lead to a re-evaluation of self-harm and of the self. Reflecting on the consequences can be followed by a "turning point" where the individual starts to believe that it is important to begin engage in a process of recovery and building resilience through improved communication and self-care. In

contrast, a positive view of the self-harm act and negative view of the self might serve to increase the risk of future suicidal behaviour. The discussion places this model in the context of previous research and theory.

Discussion

To our knowledge, this study is the first in which IPA has been used to examine the experiences of young people presenting to emergency departments with self-harm. This qualitative methodology has roots in health psychology and is particularly suited to exploring subjective experience. The major themes that were generated in the analysis of these participants' accounts were "enduring adversity", "self-harm as contextual", "agency through self-harm", "self(-harm) as socially aberrant", and "road to recovery". These themes characterize self-harm as a dynamic personal action that affects and is affected by participants' social lives. Based on the current analysis and extant research we have proposed a circular model of the processes involved in self-harm repetition. Our model overlaps with existing models in terms of the concepts of pre-existing vulnerability, stressors, and emotional regulation difficulties (Baumeister, 1990; Chapman, Gratz, & Brown, 2006; Mann, 2003; Slee, Garnefski, Spinhoven, & Arensman, 2008; Williams, 1997). Although there have been many theoretical models of the aetiology of suicidal behaviour, few theories have addressed the issue of repetition of self-harm, in terms of its causes and consequences. Those that have taken account of repetition have suggested negative reinforcement (Chapman et al., 2006), habituation (Van Orden, Merrill, & Joiner, 2005), and serotonergic system deterioration (Van Heeringen & Marusic, 2003) as potential facilitators of repetition of self-harm. Our model therefore has the potential

to enhance existing models by recognizing the dynamism of self-harm behaviour and suggesting time-based opportunities for intervention.

The participants in our study made sense of their self-harm behaviour by recounting longstanding interpersonal and psychological difficulties, which they felt reduced their ability to cope with current challenges. This theme is borne out in the international research on self-harm, in that those who engage in self-harm are far more likely to have experienced abuse and mental health problems (Santa Mina & Gallop, 1998; Suominen, Henriksson, Suokas, Isometsä, Ostamo, & Lönnqvist, 1996). Such adversity might be particularly linked to repetition of self-harm (Beautrais, 2004). Moreover, there is a high prevalence of depression among self-harm patients, and the "kindling" hypothesis of mood disorder suggests that each new episode of depression confers an increased risk of further depressive episodes (Kendler, Thornton, & Gardner, 2000).

The participants' accounts included accounts of interpersonal conflict and rejection in the run-up to a self-harm episode. Numerous qualitative studies of self-harm have pointed to the significance of interpersonal conflict and loss in self-harm (Alexander & Clare, 2004; Privé, 2007; Rao, 2006; Rissanen, Kylmä, & Laukkanen, 2008). Such experiences have been characterized as "social defeat" in evolutionary psychology accounts of depression and self-harm, with social defeat events being particularly depressogenic in those with predispositional oversensitivity to signals of social defeat (Van Heeringen & Marusic, 2003). The interaction between pre-existing vulnerability and the experience of life stressors is characterized as dynamic within the literature, such that greater exposure to stressors increases the diathesis for suicidal behaviours (Van Heeringen & Marusic, 2003), and recent empirical evidence showed that earlier self-harm episodes are more likely to be triggered by

stressful life events, with subsequent episodes becoming more autonomous and more strongly linked to psychiatric disorder (Neeleman, de Graaf, & Vollebergh, 2004).

In the current study, participants portrayed recent alcohol consumption as a facilitating factor in self-harm, mediated by depressed mood and increased sensitivity to social stressors. Although extant research suggests an association between self-harm and alcohol consumption/alcohol addiction (Haw, Hawton, Casey, Bale, & Shepherd, 2005), there has been very little empirical exploration of potential mechanisms, such as increased distress, depressed mood, reduced problem-solving ability and inhibition, increased aggression, and expectations translating ideation into action (Hufford, 2001; O'Connell & Lawlor, 2005).

Another aspect of the context of self-harm among the participants in the current study was overwhelming negative emotion arising from a situation of social defeat. Several other qualitative studies of self-harm have reported negative emotions related to interpersonal conflict in the lead-up to self-harm episodes (Alexander & Clare, 2004; Brooke & Horn, 2010; Privé, 2007; Rao, 2006; Rissanen, Kylmä, & Laukkanen, 2008). Baumeister (1990) notes the role of negative affect in the lead-up to suicidal behaviour, particularly feelings of sadness and anger arising from interpersonal loss or from a perception of self as inadequate. Several interventions have focused on the link between overwhelming negative emotion and engaging in self-harm, equipping self-harm patients with more adaptive emotional regulation strategies (Gratz, 2007; Slee, Garnefski, Spinhoven, & Arensman, 2008).

One of the interesting themes emerging from the current analysis is the "breaking point", whereby the participants felt unable to cope with overwhelming negative emotion they were experiencing and responded by deciding to engage in

self-harm. In deciding to engage in self-harm, choosing a method of self-harm, carrying out the act of self-harm, and evaluating how they had performed, the participants in the current study took ownership of the self-harm episodes. There is little existing research on the decision-making processes involved in self-harm. However, a recent model proposed by O'Connor (2011) integrates existing theories on suicidal behaviour with the Theory of Planned Behaviour (Ajzen, 1991), and lists volitional moderators (such as capability, access to means, and social learning), which facilitate the progression from ideation to self-harm acts. This aspect of the theory has since been supported using data from a large school-based survey (O'Connor, Rasmussen, & Hawton, 2012). There is also emerging evidence of the importance of imagery in the enactment of self-harm behaviour (Crane, Shah, Barnhofer, & Holmes, 2012; Holmes, Crane, Fennell, & Williams, 2007). Our findings suggest that self-harm is similar in many ways to other forms of personal action, involving planning, execution, and evaluation. To this end, our findings echo O'Connor's (2003) assertion that self-harm should be conceived as a "normal" rather than "abnormal" behaviour.

In our circular model, we posit that evaluations of the self and of the self-harm episode are inter-related, and are linked both to recovery and to repetition of self-harm. As echoed by our findings, Alexander and Clare (2004) reported that participants viewed self-harm as a source of pride. Conversely, the participants in our study also experienced shame in revealing their self-harm experiences to others. Participants' experience of self-harm as socially aberrant echoes theoretical constructs of stigma and self-stigma. Corrigan and Watson (2002) propose three components of stigma: stereotyping, prejudice, and discrimination. The stereotyping to which participants refer in the current study was mostly anticipated or perceived

stereotyping, rather than overt labelling by others. The labels in the current study focused on perceived rationality and irrationality, not on other negative attributes (like manipulating or attention-seeking) that have been previously noted (Thompson, Powis, & Carradice, 2008). Prejudice was experienced by the participants in emergency departments and they experienced discrimination in work and family spheres in the aftermath of a self-harm episode. In that the participants seemed to hold prejudicial attitudes towards their own self-harm, it seems that their stigma was mostly "self-stigma" (Corrigan & Watson, 2002). Shame might serve to maintain self-harm, because it has been suggested that the shame experienced in the aftermath of a self-harm episode might act as a precipitant for further self-harm (Gratz, 2007). In addition to the social consequences of the self-harm act, the participants' evaluation of the act was related to whether they had achieved the intended outcome and the nature of the unintended outcomes, such as physical effects.

In the current study, patterns of suicidality were portrayed as somewhat autonomous, with participants tending to respond to crises by imagining or enacting self-harm. Certainly, one of the most consistent predictors of prospective repetition of self-harm is a history of self-harm prior to the index episode (Beautrais, 2004), indicating an accumulation of risk of further repetition with each repetition. Whether this association is a result of behavioural reinforcement or pre-existing vulnerability remains to be seen, but there is emerging evidence both of a dose-response relationship between adverse life events and repetition (Madge, Hawton, McMahon, Corcoran, De Leo, de Wilde et al., 2011), and of a decreasing association between life events and self-harm with repetition (Neeleman, de Graaf, & Vollebergh, 2004). This tendency to engage in self-harm as a response to life stressors or psychological difficulties is not immutable, however, because there have been successes in

preventing repetition using cognitive-behavioural therapy, even among multiple repeaters (Slee, Garnefski, van der Leeden, Arensman, & Spinhoven, 2008).

For the participants in the current study, the aftermath of self-harm episodes involved re-evaluation of the self and of the self-harm act and a realization that the preceding situation was untenable and required action. Although a self-harm episode can be perceived by family and health services as representing the onset of difficulties, the participants interpreted the index self-harm episode as the beginning of a process of recovery, echoing an earlier qualitative study of overdose patients (Sinclair & Green, 2005). Literature around recovery in mental health points to the significance of a "turning point" in the process of recovery (Allott, Loganathan, & Fulford, 2002). Although both our analysis and previous research (Harris, 2000; Taylor, Hawton, Fortune, & Kapur, 2009) have pointed to a disjuncture between services users' needs and health services' response, the "turning point" represents a movement towards a shared goal, namely preventing further self-harm. Healthcare providers need to recognize that this shift might not occur immediately after a self-harm episode, but that maintaining an empathic and supportive stance could create opportunities to foster recovery (Jordan, McKenna, Keeney, Cutcliffe, Stevenson, Slater et al., 2012). In addition to engaging with health services, the participants in the current study identified additional means of reducing their risk of future self-harm and fostering resilience, for example avoiding antagonistic situations and alcohol consumption. Such actions could help to interrupt the association between the vulnerability towards suicidal behaviour and the self-harm action, by reducing the effects of social stressors, negative emotion, and alcohol.

This article represents a new addition to a small but growing body of literature on the lived experience of self-harm. By recruiting a sample of participants

who had experience of repeated episodes of self-harm with a variety of self-harm methods, we were able to propose a circular model of the processes involved in repeated self-harm. The IPA approach allowed for in-depth analysis of participants' accounts and to our knowledge this is the first article in which IPA is employed to examine the experience of young services-users presenting with repeated self-harm. A potential limitation of the current study is that the accounts elicited were obtained in a semi-structured interview that took place one week after an initial structured interview, which might have affected the richness of data obtained in the qualitative interview. When a general question is preceded by a specific question, the information proffered for the second may be constrained by the first (Mason, Carlson, & Tourangeau, 1994; Vitale, Armenakis, & Feild, 2008). Moreover, response alternatives available in closed-ended questions can lead a respondent to draw particular conclusions about the investigator's expectations and modify their response to subsequent questions (Schwarz, 1999). In order to minimise these effects and to reduce the risk of participant fatigue and socially desirable responding, we allowed a week to elapse between the structured and qualitative interviews. This process allowed the initial semi-structured interview to act as a screening process by which to recruit suitable participants to take part in the qualitative interview. Although the sample size was small, this is in keeping with the ideographic approach of IPA and allowed for in-depth analysis of the participants' accounts. However, it is possible that the sample used was not as homogenous as it might have been, given that the participants were three females and one male. The purpose of obtaining a homogenous sample in IPA is to allow the researcher to examine convergence and divergence across participants' experiences, rather than participants' characteristics

(Smith et al., 2009). Therefore the inclusion of more males in the current study would have allowed more detailed comparison across experiences.

The findings of the current article have a number of implications for the management and treatment of those who present with self-harm. Health service providers are in a unique position to facilitate the recovery of self-harm patients; however, the stigmatization of self-harm patients in health care settings can impede this opportunity to engage an often-marginalized group. The concept of the "turning point", with its emphasis on shared priorities between service users and service providers, has applications for the training of staff to improve attitudes and knowledge. Beyond health care settings, initiatives to prevent self-harm initiation and self-harm repetition need to take account of the pre-existing vulnerability of those who engage in self-harm and act to reduce this vulnerability through proactive interventions. More generally, the issue of stigma raised in the current study is a societal issue. Stigma could be doubly detrimental to those who self-harm, increasing distress among those who are perhaps less well-equipped than others to cope with distress, but could be reduced through increasing knowledge and increasing contact with the stigmatized group (Penn & Couture, 2002). Our findings suggest avenues to intervene with those who self-harm and those who seek to prevent or reduce self-harm both within the health services and further afield.

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Implications

This study was intended to explore the experience of self-harm and repetition of self-harm among those who presented with self-cutting and intentional overdose. The participants' accounts referred to the circumstances that facilitated self-harm, the actions involved in self-harm, how the experience was evaluated, and how that related to recovery and repetition. It seems that there are a number of findings that relate to the processes involved in repetition, and how the risk of repetition might be modified. In the discussion section, I will integrate the evidence of all of the studies described here with an existing model of self-harm to propose an exploratory model of self-harm repetition that incorporates aspects of increased diathesis as well as the effects of an index self-harm act on subsequent acts.

Chapter 8: Discussion

This doctoral thesis examined the issue of self-harm repetition and how repetition risk relates to self-cutting. This discussion is intended to: summarise the methods and findings of the five studies; describe the limitations and strengths of the current approach; propose a new expanded model of self-harm repetition incorporating self-harm method; and outline the implications of the current work for health service providers and researchers.

Summary

This doctoral work examined risk factors for repetition, with particular attention to method of self-harm. Most previous work on self-harm repetition has been purely epidemiological, and this thesis represents a unique contribution to the evidence base by virtue of its multilevel approach and innovative subject matter. The work has theoretical and practical implications for the management and prevention of self-harm.

The aim of the research was to explore the association between self-cutting and repetition, and this aim was fulfilled by adopting multiple methodologies (Figure 8.1) to explore this topic from varying perspectives. The intersection between method of self-harm and risk of repetition was approached from a variety of angles, incorporating one paper focussing on repetition (systematic review), two papers

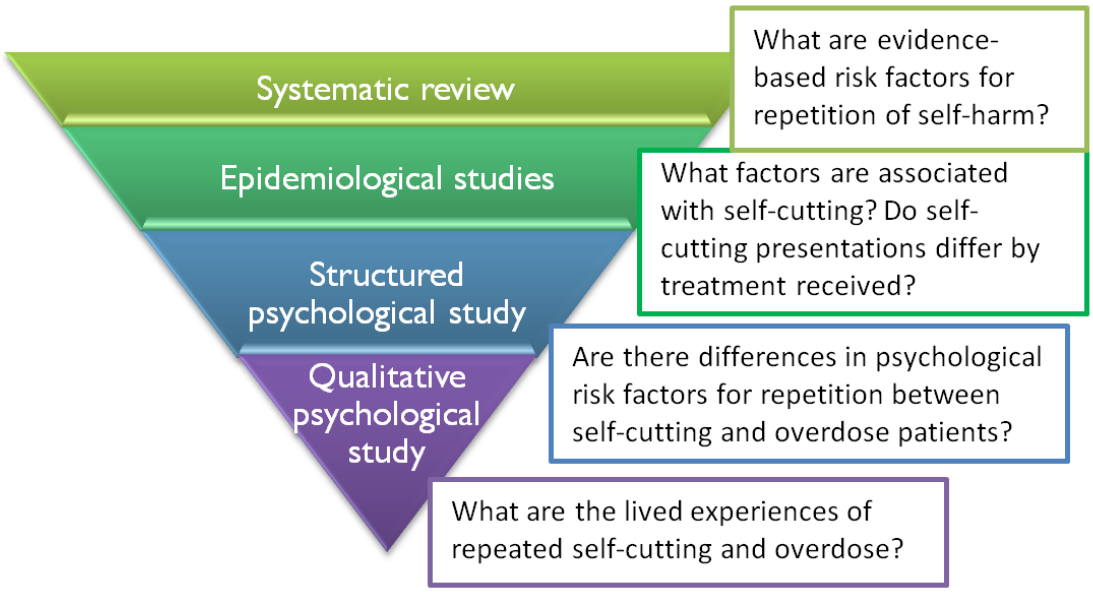


Figure 8.1. Schematic diagram of multiple methodologies and corresponding research questions in the current thesis

focussing on method of self-harm (registry papers) and two papers focussing on the intersection between the two (quantitative and qualitative psychological studies).

Systematic review.

The first study in the current thesis was a systematic review of risk factors for repetition of self-harm. With increasing attention being paid to the effective prediction of repetition of self-harm, there have been several reviews synthesising the evidence (NICE, 2011; Randall, Colman, & Rowe, 2011). However, the systematic review presented in this thesis was the first attempt to review all factors affecting prospective repetition of self-harm among those presenting to hospital with self-harm. The review synthesised many studies, taking account of study quality, generating a list of evidence-based risk factors for repetition and included

computation of the sensitivity and specificity of selected risk factors. Although there were numerous factors that were consistently associated with repetition (such as previous self-harm, prior psychiatric treatment and substance abuse), individual risk factors had poor sensitivity. Self-cutting as a predictor of repetition was relatively under-researched but had a statistically and clinically significant association with prospective repetition in six high-quality studies. The effect size of the association was moderate, with an odds ratio of about 2. In contrast to other risk factors for repetition, presenting with self-cutting does not usually require patient disclosure or efficient hospital record systems, allowing for very early detection of repetition risk and appropriate intervention.

Epidemiological studies.

The second study examined factors associated with self-cutting in Irish presentations of self-harm. It involved a large dataset of consecutive presentations of self-harm over eight years. We found that those presenting with self-cutting were more likely to be male, were younger, less likely to have consumed alcohol, more likely to live in a city or in an institution, and were more likely to present out-of-hours. Moreover, we demonstrated a statistically and clinically significant between repetition (within 30 days and within one year) and involvement of self-cutting in an index episode of self-harm, compared with those presenting with intentional overdose only, particularly among women. We showed that risk of repetition was similar between presentations of self-cutting only and presentations of intentional overdose plus self-cutting. This study supported existing evidence of an association between self-

cutting and repetition, and also suggested that the profile of presentations involving self-cutting differs somewhat from presentation of intentional overdose.

Examining self-cutting presentations in further detail, the third study examined how presentation characteristics were associated with the extensiveness of treatment for self-cutting. The nature of self-cutting varies across presentations but the clinical implications of severity of self-cutting have been relatively neglected in the literature. This study showed that more extensive treatment for an index self-cutting presentation was associated with male gender, older age, not combining self-cutting with other methods of self-harm, and lower risk of repetition within 30 days and one year. However, there were no significant differences among treatment groups of self-cutting patients on several additional variables, such as time of presentation, living in an institution and alcohol consumption. These results that there are patients within self-cutting presentations who are at yet higher risk, and that presenting with less severe self-cutting may be a useful indicator of repetition risk.

Structured psychological study.

The fourth study was a structured psychological study that was intended to test whether individuals presenting with self-cutting differed from those presenting with overdose on psychological risk factors for repetition. This study was a cohort study of individuals presenting with self-harm examining trait-like components of Williams' Cry of Pain model using Van Heeringen's operationalisations. Comparing eight patients who presented with self-cutting to 21 patients presenting with overdose, baseline levels of hopelessness were significantly higher and non-reactivity to inner experience was significantly lower among those presenting with

self-cutting. There were also significant differences between those who repeated during the three-month follow-up and those who did not: repeaters had higher baseline levels of depression and lower levels of non-judgment of inner experience. They were also more likely to have received psychiatric admission at baseline, and, in contrast to existing evidence, were less likely to have previous experience of self-harm. These findings suggest that hopelessness and mindfulness may be useful in accounting for the association between self-cutting and repetition, and may be useful in targeting interventions to those at risk.

Qualitative study.

Like the structured psychological study, the fifth study assigned equal importance to method of self-harm and repetition, using interpretative phenomenological analysis to examine accounts of individuals who had repeatedly engaged in self-harm using multiple methods of self-harm. This analysis generated several themes related to self-harm experience, namely long-standing vulnerability, self-harm as a product of context, agency through self-harm, self(-harm) as socially aberrant, and road to recovery. These themes and related subthemes informed a circular model of self-harm behaviour that juxtaposed recovery as an agentic process and a tendency towards suicidality as an autonomic process. In participants' accounts, choice of self-harm method seemed to be influenced by desired outcome, availability, anticipated responses of others, and perceived capability.

Taken as a whole, the findings of the thesis suggest that those presenting with self-cutting are a subgroup at increased risk of repetition and who differ from those

presenting with overdose on several additional variables. Our findings suggest that the association between self-cutting and repetition may be mediated by psychological variables such as hopelessness and mindfulness. Nonetheless, the studies presented here suggest that methods of self-harm and level of suicidal intent are liable to change over time. It is also evident that there are differences within self-cutting presentations and that these are unlikely to form a discrete homogenous group. In summary, although presence of self-cutting and severity of self-cutting may be used to inform risk assessments and possibly intervention, those who present with self-cutting do not comprise a static or homogenous group of individuals.

Theoretical Implications

The theoretical implications of this thesis relate mainly to the validity of referring to self-cutting as a grouping feature of self-harm presentations, and to the theoretical bases of repetition.

Self-cutting as a homogenous subgroup of self-harm patients?

The existing literature and current research indicate numerous differences between those who present with self-cutting and those who present with overdose. Those who self-cut are more likely to be male, younger, to have a psychiatric history, and are more likely to repeat fatally and non-fatally in the future. Despite this profile of increased risk, they are less likely to receive assessment and admission after presentation. However, those who self-cut do not form a homogenous group. It is evident from the second registry study reported here that repetition risk and some patient characteristics vary by extensiveness of required treatment for self-cutting.

Moreover, several previous studies have indicated significant subgroupings within those who self-cut. In a study of adolescents in juvenile correctional institutions, Matsumoto, Yamaguchi, Chiba, Asami, Iseki, & Hirayasu (2004) reported significant differences among those engaging in self-cutting based on bodily site of self-cutting. Those whose cutting involved wrist-cutting were more likely to have a history of suicidal ideation and suicide attempts, whereas dissociative experiences and anger-induced cutting were more common among those whose cutting involved arm-cutting. In a separate sample of juvenile offenders, Matsumoto, Imamura, Chiba, Katsumata, Kitani, & Takeshima (2008) found that those who reported no pain during self-cutting are more likely to have a history of suicidal ideation compared with those who did not report such analgesia during self-cutting. Combined, these studies indicate important differences in characteristics and outcome between subgroups of those engaging in self-cutting. As such, helpful as it is to use method of self-harm as a marker of repetition risk, it is equally important to recognise the heterogeneity of those engaging in self-cutting.

An expanded model of repetition

Very little attention has been paid to potential psychological mechanisms accounting for the association between self-cutting and repetition. Theories abound around the aetiology of suicidal behaviour but there are few theories purporting to account for why some individuals go on to repeat self-harm while others engage in it on one occasion only. In this section, I propose a model of self-harm (Figure 8.2) that integrates O'Connor's (2011) model with existing theory and research on repetition. The model integrates evidence on a pre-existing tendency to repeat as well as suggesting how the consequences of an index episode can affect the likelihood of repetition. The model by O'Connor (2011) was chosen because of its focus on the

particular psychological processes involved in the development of suicidal behaviour, a focus which is appropriate when considering how best to intervene to prevent suicidal behaviour.

It seems that those who repeat self-harm tend to have higher levels of risk factors for initiation of self-harm. The systematic review indicated some consistent risk factors for repetition of self-harm, including childhood sexual abuse and personality disorder, which may be seen as being related to the diathesis and environment components of O'Connor's (2011) model. Receiving psychiatric treatment and substance misuse also emerged as risk factors for repetition: Mann (2002, 2003) interprets psychiatric disorders as stressors within his stress-diathesis model of suicidal behaviour. In the qualitative analysis in the current thesis, the participants understood their repeated self-harm behaviour as linked to long-standing vulnerability, including family crises, suicidal ideation, and depression. Taken as a whole, the current studies suggest that those who go on to repeat could have relatively high levels of the factors involved in the aetiology of self-harm. Using Van Heeringen's conceptualisation of the stress-diathesis relationship as a dynamic model with a continuous diathesis, it is conceivable that repeaters of self-harm are those with a greater diathesis for self-harm, such that a lower level of stressor in required to activate and reactivate a suicidal state. This certainly resembles concepts of reduced distress tolerance and cognitive reactivity in other models (Chapman, Gratz, & Brown, 2006; Lau, Segal, & Williams, 2004).

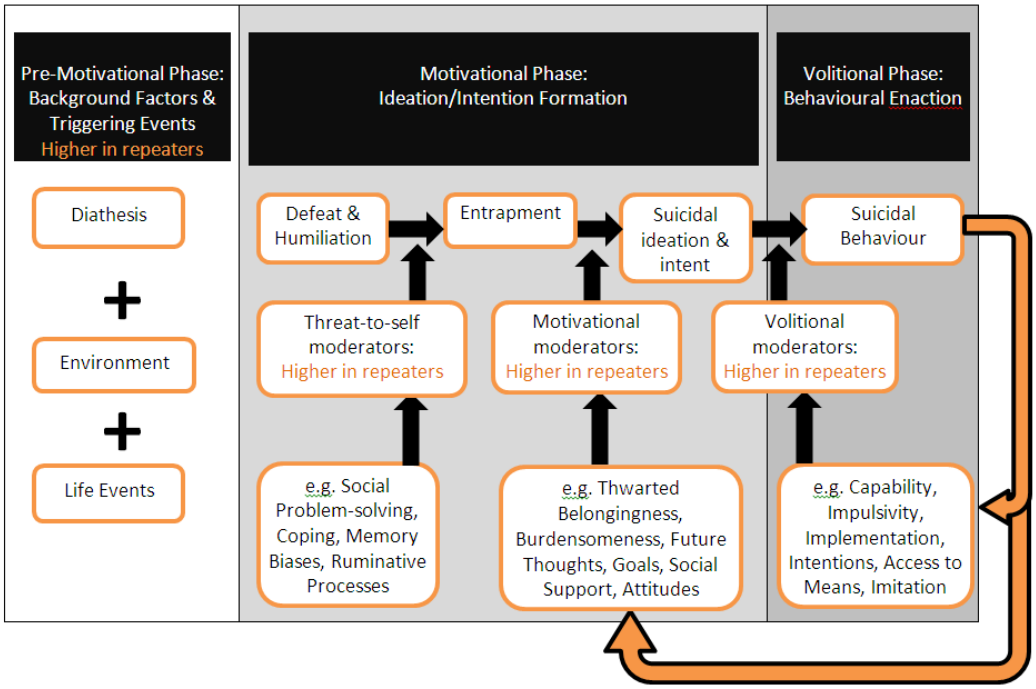


Figure 8.2: Expanded model based on motivational-volitional model of suicidal behaviour (O'Connor, 2011)

Moreover, using O'Connor's model, there also seem to be increased levels of threat-to-self, motivational, and volitional moderators among those who engage in self-harm repeatedly. The systematic review indicated poorer problem-solving skills and (in one study) reduced specificity of autobiographical memory among those who went on to repeat self-harm. Studies using retrospective self-report of repetition have also indicated lower levels of problem-solving, autobiographical memory specificity, and passive-avoidant coping strategies among repeaters (Hawton, Kingsbury, Steinhardt, James, & Fagg, 1999; McAuliffe, Corcoran, Keeley, Arensman, Bille-Brahe, De Leo et al., 2006; Rasmussen, O'Connor, & Brodie, 2008), although the association between autobiographical memory specificity and repetition seems to be reversed in those with a diagnosis of borderline personality

disorder (Startup, Heard, Swales, Jones, Williams, & Jones, 2001). In terms of motivational moderators, the systematic review suggested an association between prospective repetition of self-harm and positive future fluency (Sidley, Calam, Wells, Hughes, & Whitaker, 1999) and hopelessness (McMillan, Gilbody, Beresford, & Neilly, 2007) respectively. The association between hopelessness and repetition was also supported by the structured psychological study in the current thesis. However, there was neither a difference on autobiographical memory specificity between prospective repeaters and non-repeaters in the structured psychological study presented here, nor between retrospective repeaters and non-repeaters in a larger recent study (Rasmussen, Fraser, Gotz, MacHale, Mackie, Masterton et al., 2010). Attitudes towards self-harm are conceived as a motivational moderator in O'Connor's model, but unfortunately there does not seem to be any studies that compare repeaters and non-repeaters on attitudes towards self-harm. However, Beautrais (2004) found a higher risk of prospective repetition among those who were not relieved that they did not die, who were angry they did not die, and who thought they would make another attempt. Further research is required to measure attitudes towards an index attempt more directly, and to examine their association with repetition. In terms of social support, the systematic review indicated that living alone and not being married were consistently associated with repetition. There were inconsistent findings on the effect of perceived social support on prospective repetition, with just one high-quality study (Haw, Bergen, Casey, & Hawton, 2007) reporting an association, though an association has been shown in several studies examining retrospective repetition of self-harm (Öjehagen, Regnéll, & Träskman-Bendz, 1991; Rasmussen et al., 2010). Goal engagement was recently examined in a prospective study (O'Connor, O'Carroll, Ryan, & Smyth, 2012) wherein baseline

difficulty with re-engagement of goals was an independent predictor of repetition two years after an index self-harm presentation on those with a history of previous self-harm. Feelings of thwarted belongingness and burdensomeness have not yet been compared between repeaters and non-repeaters. As a whole, it seems that those who engage repeatedly in self-harm demonstrate higher levels of the factors associated with the aetiology of self-harm.

As well as repeaters having a greater predisposition towards self-harm than those who do not repeat, it is also plausible that the consequences of an index self-harm episode affect the likelihood of repetition. Arising from the findings of the qualitative study and existing literature, I propose that the effects of a self-harm episode on the likelihood of a further self-harm episode might be explained by its impact on motivational and volitional moderators. For a number of the moderators, the episode might increase the moderator, leading to an immediate increased risk of repetition. The self-harm episode might serve to attenuate other moderators, thereby increasing positive attitudes towards self-harm and leading to a longer-term increase in risk of repetition.

In terms of motivational moderators, the qualitative analysis indicated that an index self-harm episode can result in stigma and self-stigma. Such effects could serve to increase feelings of thwarted belongingness and burdensomeness and to lower perceived and actual social support. Viewing the self-harm episode as a "failure" could conceivably serve to rule out self-harm as an option in the future, but it might also encourage the person to re-engage with self-harm as a goal in itself. Where self-harm was viewed as a potential means of improving the person's situation, a lack of improvement in the aftermath of an episode could lead to a loss of hope and a dearth of positive future events. All of the above assume some level of

disappointment or "failure" associated with the self-harm episode. However, where an act is "successful" in terms of bringing about the desired outcome (such as relief, release, and increased formal and informal support), this might result in a more positive attitude towards self-harm, increasing the likelihood of re-occurrence in the future.

Volitional moderators that could be affected by an index act include capability and implementation intentions. When a person has overcome initial inhibitions (such as fear of pain, adverse physical outcome, potential effects on relatives) once to engage in self-harm, they are perhaps more likely to feel capable of engaging in it again. The literature around "non-suicidal self-injury" contains many references to habituation to pain with repeated episodes, but there has been little empirical testing of this hypothesis. One study of adolescent psychiatric inpatients (Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006) found that number of episodes of "NSSI" (as assessed by the Functional Assessment of Self-Mutilation tool, which does not appear to actually assess suicidal intent of self-injury episodes) was unrelated to level of pain reported. However, those who reported no pain during "NSSI" reported twice as many lifetime suicide attempts (as assessed by the Diagnostic Interview Schedule for Children, which includes questions on thoughts, plans, and attempts to kill oneself) as those who reported some experience of physical pain during "NSSI". Although the design was cross-sectional, it suggests a degree of habituation among those with more experience of self-harming behaviour. In relation to implementation intentions, creating a plan to enact self-harm would be easier if such a plan has already been developed and implemented on a previous occasion, providing a template for the repeated episode. Even if the method of self-

harm used is changed, there are other aspects to planning, such as timing and location, which could be re-enacted or refined.

Bringing the vulnerability-based and consequence-based processes together, it is possible that the predisposition towards repetition (because of increased diathesis and early life circumstances) could interact with the consequences of an episode to place an individual at higher risk of repetition. Perhaps the negative effects and reinforcing elements of self-harm episodes disproportionately affect those with greater diathesis. For example, those whose self-harm act is likely to result in a loss of social support would require good social problem-solving skills to attenuate the effect of the episode on their social support network. Where a person had lower problem-solving skills, the effects of an index act of self-harm on their social world could be relatively more detrimental.

The health service response to a self-harm episode can also be interpreted within this framework. Indeed, Van Heeringen (2001) names access to mental health care as a threshold factor in the movement from suicidal ideation to suicidal behaviour. A presentation of self-harm can represent an opportunity for intervention to reduce a person's vulnerability for suicidal ideation and behaviour. Receiving a psychosocial assessment has been shown to be associated with the risk of repetition using an observational design (Bergen, Hawton, Waters, Cooper, & Kapur, 2010) and there are growing numbers of evidence-based treatments for self-harm (Hawton, Arensman, Townsend, Bremner, Feldman, Goldney et al., 1998). Health services are in a position to decrease feelings of burdensomeness and thwarted belongingness though an empathic response and to decrease diathesis through effective psychosocial intervention. Conversely, a negative and stigmatising response by

health service professionals could serve to increase feelings of burdensomeness and thwarted belongingness.

A large part of this thesis focussed on how self-harm method is associated with repetition risk. Using this newly expanded model, the association between repetition and method of self-harm may be explained from the perspective of a pre-existing vulnerability and in terms of the consequences of an index episode.

It is possible that the hypothesised increased predisposition towards repetition affects the choice of method of self-cutting as a method of self-harm. The association between self-cutting and repetition might explained by traits or states that make both self-cutting and repetition more likely. For example, self-harm patients with high levels of impulsivity might be more likely to choose to engage in self-cutting than overdose, and their impulsivity could also place them at an increased risk of repetition, as evidenced by the systematic review. Although in the structured psychological study presented in the current thesis, the difference in impulsivity scores between self-cutting and overdose patients were not large enough to reach statistical significance, an earlier study found that self-cutting episodes by adolescents were more likely to be impulsive than overdose episodes (Hawton, Harriss, & Rodham, 2010). Similarly, self-cutting can be seen as a violent form of self-harm in that it involves injury, and hence could be associated with higher levels of aggression, which in turn was related to repetition in the systematic review. However, this hypothesis is not supported by the findings of the structured psychological study, which found slightly higher levels of self-reported other-directed aggression among those who engaged in intentional overdose. This finding echoes recent findings that violent offenders were actually less likely to use violent methods of suicide than non-violent offenders (Webb, 2012). It remains to be seen

whether those who self-cut express greater inward-directed aggression than those who overdose, but certainly in a community sample they were more likely to endorse "to punish myself" as a motive for self-harm (Madge, Hewitt, Hawton, de Wilde, Corcoran, Fekete et al., 2008). Finally, experiencing sexual abuse increases a person's risk of self-harm repetition, and self-cutting seems to be particularly associated with ending dissociative experiences, self-punishing, and re-establishing corporal boundaries in non-clinical populations (Matsumoto et al., 2004; Rodham, Hawton, & Evans, 2004; Suyemoto & MacDonald, 1995; van der Kolk, Perry, & Herman, 1991).

In terms of consequences of self-harm, it seems likely that there is greater positive reinforcement (e.g. pleasant feeling) or negative reinforcement (e.g. ending dissociation, reducing tension) associated with self-cutting than overdose in the period immediately after the index episode, which might add to the higher rate of repetition among those who have engaged in self-cutting. Because such an experiential effect would occur quickly after engaging in the behaviour, it is likely to result in a stronger conditioning effect. Another aspect of the consequences of a self-harm episode is the health service response. It is possible that the method with which a person presents to hospital could moderate the effect of the self-harm episode on future repetition. For example, although no study has examined attitudes towards self-cutting compared with attitudes towards overdose, it could be that a person presenting with self-cutting experiences more stigma after an episode, which could increase feelings of thwarted belongingness, burdensomeness, and low perceived and actual social support and thereby increase the risk of future suicidal ideation. Conversely, health services' response to self-harm can serve as a protector against repetition of self-harm by putting interventions in place to reduce risk, but there is

increasing evidence that those who present with self-cutting are less likely to receive admission and psychosocial assessment (Lilley, Owens, Horrocks, House, Noble, Bergen et al., 2008). In terms of the effect of method on volitional moderators, self-cutting might also be differentially associated with social learning because of its conspicuousness, and one study demonstrated a larger role for social modelling among adolescents who self-cut than those who engaged in overdose, particularly in girls (Hawton et al., 2010). As previously mentioned, it has been shown in that episodes of self-cutting in adolescents tend to be more impulsive than episodes of overdose (Hawton et al., 2010), and access to means is likely to be higher with self-cutting, both of which might combine to increase risk of repetition with self-cutting. The success of several interventions in preventing self-harm by preventing access to means illustrate the key role of such threshold factors (van Heeringen, 2003) in the movement from ideation to self-harm behaviour, but limiting access to means of self-cutting is likely to prove very challenging.

If we assume that the risk factors for suicide are similar to those for repetition of self-harm, the higher rate of suicide among those who present with self-cutting (Bergen, Hawton, Waters, Ness, Cooper, Steeg et al., 2012) suggests that behavioural contingencies alone cannot account for the association between self-cutting and fatal and non-fatal repetition: very few suicides use self-cutting as a method. Therefore the association between self-cutting and repetition is likely to be due to a combination of both higher pre-existing vulnerability and behavioural contingencies.

In summary, the extant evidence and current work supports the notion that self-harm repetition is pa
cutting.

Health Service Implications

Based on three possible levels of suicide prevention (Bertolote, 2004; Muñoz, Mrazek, & Haggerty, 1996), those who present to emergency services may be considered at indicated risk of suicide and self-harm, in that they have already demonstrated some level of suicidal behaviour. Although not all of those who present with self-harm will engage in self-harm in the future, and not all of those who will self-harm in the future will have previously presented with self-harm, such a presentation represents a valuable opportunity for intervention in what might otherwise be an undetected at-risk group. Moreover, the risk factors that emerged from the systematic review indicate that repeaters tend to have a constellation of difficulties, including substance misuse, sexual abuse, personality disorder, and psychiatric problems, which may place them at elevated risk of additional adverse outcomes. To use the analogy of self-harm as an iceberg with the majority of episodes remaining undetected and untreated, this move from "below the waterline" to engaging with services must be met with an appropriate service response. One aspect of service response is the interpersonal communication between self-harm patients and staff. One systematic review has indicated that health service experiences of self-harm patients are influenced by staff's prejudice and negative attitudes (Taylor, Hawton, Fortune, & Kapur, 2009), and clinical staff themselves also report negative attitudes towards self-harm patients (Saunders, Hawton, Fortune, & Farrell, 2012). There is some evidence that interventions to increase knowledge and improve attitudes towards self-harm patients can be effective (Patterson, Whittington, & Bogg, 2007) and these may help to reduce the experiences of stigma by self-harm patients in the emergency department.

In addition to an empathic approach to communicating with patients, an appropriate service response involves a psychosocial assessment that incorporates an evidence-based risk assessment and a needs assessment (NICE, 2004; NICE, 2011). This approach seems to be effective, in that receiving a psychosocial assessment renders self-harm patients at lower risk of repetition of self-harm (Bergen et al., 2010). In the absence of a randomised controlled trial it is unclear whether the assessment itself lowers risk or whether those who receive assessments have a lower risk of repetition to begin with. In any case, those who present with self-cutting are less likely to receive a psychosocial assessment then other self-harm patients (Lilley et al., 2008). Health service providers should be aware that self-cutting patients are at increased risk of repetition and that (as indicated by the current systematic review) neither lethality nor suicidal intent of an index episode should preclude psychosocial assessment or intervention.

Beyond psychosocial assessment, recent years have seen an increase in the variety of therapies available. Cognitive behavioural therapy has become well established as a psychological treatment for depression, anxiety and other psychiatric conditions (Butler, Chapman, Forman, & Beck, 2006), and problem-solving-focussed approaches have been developed for those engaging in self-harm (Hawton et al., 1998). Dialectical behavioural therapy is a more resource-intensive therapeutic approach. Originally developed for women with borderline personality disorder (Linehan, 1987), it has more recently been shown to reduce self-harm repetition in self-harm patients and adolescents (Low, Jones, Duggan, Power & MacLeod, 2001 ; Verheul, van der Bosch, Koeter, de Ridder, Stinjnen, & van den Brink, 2003) in those diagnosed with borderline personality disorder. In an Irish setting, DBT offered through the Endeavour programme in the Health Service Executive South

has reported preliminary success in reducing self-harm in men and women. Mindfulness-based cognitive therapy is another recent addition and, although it has yet to be evaluated in a randomised controlled trial, it may help to reduce repetition by tackling cognitive reactivity in suicidal patients (Williams, Duggan, Crane, & Fennell, 2006). As well as more intensive psychological therapies, larger-scale minimal interventions, such as follow-up postcards (Carter, Clover, Whyte, Dawson, & Este) or telephone calls (Vaiva, Ducrocq, Meyer, Mathieu, Philippe, Libersa et al., 2006) may have had smaller effects with relatively low costs.

Given the heterogeneity of self-harm patients in terms of methods, motives, diagnoses, self-harm histories, and level of engagement, it is unlikely that there is one intervention that will successfully prevent repetition among all self-harm patients. Process evaluations of complex interventions could help to disentangle the active components of these interventions and allow patients to access the therapy best suited to their circumstances and specific needs.

Research Implications

There are several promising avenues of further research arising from the current work.

Firstly, there are several testable hypotheses arising from the new extended model outlined earlier in this chapter. For example, compared with those who will not repeat self-harm, I hypothesised that those who will repeat have a more pronounced biological diathesis, poorer social problem-solving and coping and greater memory biases and rumination, higher levels of social disconnectedness and fewer goals and positive future events, and higher levels of impulsivity and

capability. Future research could also test whether positive effects (e.g. relief, escape, support, self-efficacy) of an index episode reinforce self-harm by affecting volitional moderators (specifically capability and implementation intentions) and attitudes and whether negative effects (e.g. stigma, ill health, lowered self-esteem) of an index episode increase risk of self-harm ideation by affecting motivational moderators, such as social disconnectedness and reduced future thoughts and goals. The current thesis examined some potential mechanisms of the association between repetition and self-harm method, but future research could test how choice of method in an index episode moderates an act's effects [which may be conceived as positive interpersonal (support)/intrapersonal (relief, escape) and negative interpersonal (stigma, social disconnectedness) /intrapersonal (ill health, lowered self-esteem)]. In addition to these specific hypotheses, there are a number of additional research topics. Following on from the exploratory study examining differential risk factors for repetition following self-cutting and intentional overdose, there is scope for larger-scale studies on this topic. This could be achieved by re-analysing data from existing cohort studies of self-harm patients by dividing patients on the basis of method used. If it is verified that risk factors for repetition differ between self-cutting and overdose patients, it could then follow that interventions may be differentially effective for these two groups, a hypothesis that might also be tested by re-analysing data from existing studies.

The focus in the current work was on non-fatal repetition as an outcome after self-harm presentation. A natural extension from this approach would be to identify consistent risk factors for suicide after self-harm (which would be efficiently achieved using a systematic review approach). There is likely to be some degree of overlap with the risk factors for repetition, but other factors (such as male gender)

may be associated with prospective suicide. Such a study would represent a valuable contribution to risk assessment of self-harm patients. In terms of alternative outcomes beyond self-harm and suicide, few studies have examined psychiatric disorders and psychological wellbeing in the aftermath of a self-harm episode. Finally, person-based analyses of the trajectories of self-harm repetition in terms of intent, lethality, and self-harm methods used would allow for greater insight into the suicidal process over time.

Strengths of Current Approach

The current doctoral work has several strengths and innovations. All of the studies included in the thesis adopted a cohort design, which is optimal if the focus is on identifying factors that predict a particular outcome. Choosing one time-point (in this case an index episode) for measuring a risk factor and observing the occurrence of repetition in the subsequent time period ensures that the exposure to a risk factor precedes a given outcome. Although cross-sectional designs examining retrospective repetition can detect differences between repeaters and non-repeaters, they cannot indicate whether such differences preceded repetition.

The current work focussed on hospital presentations of self-harm, a subgroup of self-harmers who are arguably at the more severe end of the spectrum of suicidal behaviour in terms of psychosocial risk (Groholt, Ekeberg, Wichstrom, & Haldorsen, 2000). Moreover, while it examined the Irish situation in depth, the work included an analysis of international evidence through the systematic review. The current research is useful for those working with self-harm presentations in emergency departments for risk assessment, but also potentially management and prevention, by

identifying risk factors for repetition and elucidating service users' experiences.

Another strength of the current work is that it adopted a variety of methodologies chosen on the basis of various research questions to explore the topic of repetition of self-harm. Self-harm is recognised as a complex issue whose aetiology is likely to cross many domains, and the systematic review conducted as part of this thesis demonstrated that the risk factors for repetition of self-harm likewise span many domains, encompassing social, psychiatric, psychological and biological factors. Using the current multi-method approach allowed the topic to be investigated from a number of perspectives, and each approach was intended to compensate for the inherent limitations of the other approaches. There is increasing recognition of the value of using multiple research methods to investigate a research topic, and conflicting ontologies need not be an issue if the methods used are driven by distinct research questions (Johnson & Turner, 2003).

In spite of the plethora of theories around self-harm and suicidal behaviour, there are few models that attempt to explain why some individuals go on to repeat self-harm while the majority do not. Moreover, there are many dozens of studies examining risk factors for repetition of self-harm but most of these are epidemiological and do not propose explanations of repetition. The current investigation has contributed to the theoretical basis of self-harm research by proposing a testable model of the processes involved in self-harm repetition. This model was derived from the current research, as well as extant evidence and theory, and includes a number of testable hypotheses. Further work is required to test these hypothesised processes and to examine the relative contribution of each to repetition risk, but the model presented here represents a starting point for a more theoretically-driven and systematic approach to the study of self-harm repetition.

This doctoral work is particularly timely, given the increasing recognition of the significance of method used in an index self-harm presentation. Several studies demonstrating the increased risk of non-fatal (Bilén, Ottosson, Castrén, Ponzer, Ursing, Ranta et al., 2010; Cooper, Kapur, Dunning, Guthrie, Appleby, & Mackway-Jones, 2006; Hawton, Bergen, Kapur, Cooper, Steeg, Ness et al., epub ahead of print; Lilley et al., 2008; Perry, Corcoran, Fitzgerald, Keeley, Reulbach, & Arensman, 2012; Steeg, Kapur, Webb, Applegate, Stewart, Hawton et al., 2012) and fatal (Bergen et al., 2012) repetition of self-harm among those who present with self-cutting have been conducted in recent years and this thesis adds to this growing body of evidence, as well as proposing potential explanations for the association. Given the proposed DSM 5 diagnosis of non-suicidal self-injury, it is particularly useful to address the clinical significance of method of self-harm in terms of outcomes and concurrent psychological characteristics.

Limitations of Current Approach.

The limitations of each study's method were discussed within the individual papers, so this section will examine the limitations of the overall approach used.

The current approach focussed on prospective repetition of self-harm among those presenting with self-harm because it was intended to assist those seeking to predict repetition in healthcare settings. Effective identification of risk factors requires a longitudinal design which measure exposure at one time-point and outcome at a subsequent time-point. However, many of those who did not repeat during follow-up in the current studies might have had previous episodes of self-harm before the index episode. The approach adopted here has implications for theory, because one possible explanation of repetition is that there are characteristics

within individuals that determine whether they are "repeaters" or not. If that is the case, then many of the participants would have been incorrectly designated as "non-repeaters", which was true for actuarial purposes but not necessarily true from a theoretical perspective. The reason for not examining retrospective repetition within the registry was that the analyses were based on index episodes in the study period so as to avoid counting repeated episodes by the same person. If multiple presentations by the same person were counted as separate presentations, then certain demographics might have been over-represented, and the same person could have contributed demographic data multiple times across multiple self-harm method groupings. Although focussing on prospective repetition in the current thesis was useful from a health service perspective, it may be less useful when it comes to theory development.

In the studies presented here, repetition was treated as a dichotomous outcome. There are several more sophisticated approaches to repetition, such as operationalizing repetition as an ordinal or continuous variable and using time-to-event analysis. It was not possible to examine extent of repetition in detail in the structured psychological study because of the small number of repeaters, but it could potentially have been a valuable addition to the two registry studies. Operationalizing repetition as a time-based variable using survival analysis has shown that the relative strength of predictors can differ by length of follow-up within a cohort in several studies (Sidley et al., 1999; Wang & Mortensen, 2006). The maximum length of follow-up in studies in the current thesis was one year, and while this is a limitation, it is also a pragmatic approach given that the risk of non-fatal and fatal repetition is highest immediately after an index episode. Related to this issue is that the current studies examined only non-fatal repetition as our systems do not

currently allow linkage to suicide statistics. An individual who died by suicide during the study period in the registry studies would have been included in the non-repeater group if they do not re-present alive to hospital with self-harm. Though unlikely, if any of the participants in the structured psychological study had taken their life during the study period, the researcher would not have been aware of this and participants who could not be contacted were simply excluded from the follow-up analysis. Suicide is an important clinical outcome, though fortunately a rarer one, and where possible it should be used as an outcome of longitudinal studies of self-harm. By excluding suicide as an outcome in the current research, it is likely that the prevalence of repetition of suicidal behaviour and the predictive strength of some risk factors were underestimated.. This is especially true of the registry studies because the numbers of patients were so large that suicides certainly occurred during follow-up. Beyond the presence or absence of repetition, an important aspect to repetition is the nature of repeated episodes in terms of method, severity, suicidal intent, and treatment received. It was possible to examine this aspect in the structured psychological study but it would have been interesting to examine these aspects in the larger registry studies to examine the trajectories of suicidal behaviour across repeated episodes. This is a promising avenue for further research, especially considering that the registry is one of few data sources containing data on medical treatment of self-cutting. Another limitation in focussing on repetition as the primary outcome is that it downplays the significance of other clinically relevant outcomes, such as psychiatric symptomatology, psychological wellbeing, and social adjustment in the period after an index episode of self-harm. There was limited information available on such outcomes in the structured psychological study but larger-scale studies of psychosocial outcomes would be a valuable addition to the literature.

Moreover, a repeat hospital presentation for self-harm is not necessarily an adverse outcome: it may be seen as positive compared to an outcome of fatal repetition or non-presenting with a repeat act because of a previous negative hospital experience. In summary, given the prevalence and consequences of repetition, it is an important indicator of a patient's wellbeing in the aftermath of an index episode, but it does not provide the full picture of a patient's outcome.

Another limitation of the current approach is that the designation of "self-cutting" or "intentional overdose" was based on the method used in an index presentation, but the method of self-harm used is likely to vary across repeated episodes. A previous study (Lilley et al., 2008) has indicated that, although most patients do not switch methods, a significant minority of self-harm patients who re-present with self-harm do so with a different method to that used in the index episode. Moreover, as evidenced in the registry study comparing self-cutting and intentional overdose patients, a significant minority of presentations involve multiple methods of self-harm within the same presentation. Therefore, it must be borne in mind that the method of self-harm used is only a characteristic of a presentation rather than of an individual.

On a related point, the literature review at the beginning of this thesis outlined how those who engage in self-cutting are less likely to present to hospital than those who engage in intentional overdose. A limitation of the current work is that the findings apply only to hospital presentations of self-harm. It is likely that those who present to hospital after self-cutting are not representative of all of those who engage in self-cutting. Moreover, there are very few studies that examine risk factors for prospective repetition among those who self-harm in the community.

Further work is required to examine how applicable these findings are to self-cutting more generally.

Most individuals presenting with self-harm meet the criteria for at least one psychiatric diagnosis (Haw, Hawton, Houston, & Townsend, 2001; Suominen, Henriksson, Suokas, Isometsä, Ostamo, & Lönnqvist, 1996). Psychiatric diagnoses are likely to have an effect on repetition of self-harm and the current systematic review indicated an increased risk of repetition among those with diagnoses of personality disorder and of schizophrenia. A limitation of the current approach is that psychiatric diagnoses were not taken into account. For the registry studies, it was impossible to control for diagnoses because they are not routinely recorded. In the structured psychological study, the emphasis was on psychological variables and it was clear that the addition of a diagnostic interview would have further increased the length of the interview, thereby potentially affecting uptake and retention. An alternative approach could have been to ask participants about whether they had psychiatric diagnoses but this approach could result in unreliable data. While this is a limitation of the current approach, the theoretical models through which the findings were interpreted (O'Connor, 2011; van Heeringen, 2003) seek to move beyond psychiatric diagnoses in explaining suicidal behaviour and propose mechanisms that are hypothesised to underlie suicidal behaviour across and beyond diagnostic categories.

Conclusion

Self-harm is significant health problem whose aetiology spans multiple domains and whose consequences can be severe and far-reaching. The current work focussed on

those who present to hospital with self-cutting as a group at indicated risk of future self-harm, given that repetition indicates on-going distress and confers risk of further non-fatal and fatal self-harm. The approach adopted incorporated a variety of methods to examine self-harm repetition and the significance of self-cutting from multiple perspectives. The findings generated will help to inform health service providers attempting to conduct evidence-based risk assessments and to engage patients in effective interventions. The work has also contributed to the theory around self-harm repetition by proposing an expanded model based on prominent models and previous and current research. Given its multifaceted approach, innovative subject matter, and novel theoretical contribution, this doctoral thesis is intended to represent a unique contribution to the body of evidence on self-harm and risk of repetition.

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Appendices

Appendix 1: Details of included studies for systematic review

Appendix 2: Ethics approval for interview studies

Appendix 3: Master table of themes and subthemes for qualitative study including sample excerpts

Appendix 1: Details of included studies for systematic review

Characteristics of Studies of Deliberate Self-Harm (DSH) Repetition Included in the Systematic Review

Authors & Year	Level of intent	Method	Baseline N and Population [% male]	Setting and location	Follow-up (years)	Repetition detection (retention rate)	Circumstances of baseline data collection	Quality
Adam et al., (1983)	All	All	98: Admitted for any intentional self-destructive act, however minor (32%)	A&E Dept, Christchurch Hospital	1.5-2	Interview (89%)	In hospital, 84% within 2 days	2.5
Aghanwa (2004)	All	All except habitual wrist-cutting	128: Suicide attempters, excludes non-suicidal wrist-cutting (31%)	Consultation- Liaison psychiatric service, Suva, Fiji	Max 2.5	Records	Liaison psychiatry records	2
Allgulander & Fisher (1990)	All	Psychoactive drug self-poisoning	8895:Admissions of intentional self-poisoning with psychoactive drugs (38%)	Stockholm county, Sweden	<10	Records	Records	3.5
Antretter et al.(2006)	All	All	238: Presented with DSH (41.4%)	Pecs, Hungary and Hall, Austria	2	Records and interview	Interview and records	4
Archinard (2000)	All	All	22: Presented with suicide attempt (26%)	emergency ward of Geneva University Hospitals	2	Records	Interview	1.5
Bancroft et al	All	All	528: Presenting with DSH	General hospital, Oxford	0.25-0.5	Records	Records	3

(1975)								
	All	All	632: Admitted with DSH (37%)	University hospital, Rennes, France	0.5	Records	Psychiatric assessment	3
Batt et al. (1998)	All	"Medically serious"	302: Medically serious DSH (45%)	Sole regional ED at Christchurch Hospital	5	Interview (81%)	Interview	3.5
Beautrais (2004)	All	All	8030: Presenting with DSH (41.8%)	All hospitals in Oxford, Manchester and Derby	2	Records	Proforma	4
Bergen et al.(2010)	All	All	1524: Presenting with DSH (35%)	General hospital Stockholm, Sweden.	1	Records	Records	4
Bilén et al (2010)	All	All	61:Presenting with DSH (39%)	District general hospital, Newcastle-upon-Tyne, UK.	0.25-0.66	Postal questionnaire (85%)	Postal questionnaire	2.5
Brittlebank et al.(1990)	All	All	2809: Admissions of parasuicide	Edinburgh Regional Poisoning Centre	1	Records	Records	3
Buglass & Horton (1974a, 1974b)	All	All	95:Suicide attempt, borderline personality disorder patients only (16%)	Emergency department, Geneva University Hospital	1	Records	Interview	2
Cailhol et al. (2007)	All	All	204: Cases of parasuicide living in the study area (31%)	Hospital admissions in Leon, Nicaragua	2-5	Self-report and records (52%)	Hospital interview usually within 24–48 hrs	3.5
Caldera et al.(2007)	All	Self-poisoning and overdose	1317: Presenting with deliberate self-poisoning (38%)	Hospital presentations in Newcastle, Australia	1	Records	Records	3.5
Carter et	All	Self-	1241: Presenting with	Hospital presentations in	<1	Records	Records	3.5

al.(2002)		poisoning and overdose	deliberate self-poisoning (35%)	Newcastle, Australia				
Carter et al.(1999)	All	All	341: Presenting with DSH, with a score of greater than 25 on the Mini-Mental State Examination (45%)	Tertiary hospital in India	2	Interview (85.9%)	Interview in ward	3.5
Chandrasekaran & Gnanaselane (2008)	All	All	2614 (40%)	County of Funen, Denmark	Mean 2.88	Records	Records	4
Christiansen & Jensen (2007)	All	All	507: Presenting with DSH (33%)	All emergency departments in Edmonton, Alberta, Canada	1-2	Self-report; (83.6%)	Interview in home within 2 weeks	4
Colman (2000); Colman et al (2004)	All	Overdose	678: Intentional overdose of pharmaceutical substances (42%)	Emergency admissions unit in City of Coventry	2	Records	Records	3.5
Cook & Anthony (1999)	All	All	14997: Presented with DSH (42.1%)	Three general hospitals in Manchester, two in Derby and one in Oxford	1	Records	Records	4
Cooper et al (2010)	All	All	7185: Presented with DSH (44%)	All emergency departments in Manchester and Salford	1	Records	Records	3
Cooper et al.(2006)	All	All	9086: Presented with DSH (44%)	All emergency departments in Manchester and Salford	0.5	Records	Records	4
Cooper et	All	All	1257: Presented with	10 emergency depts, 5	1	Records	Records	4

al.(2006)			DSH (45%)	psychiatric hospitals and 3 prisons in south-west of Ireland		(53%)		
Corcoran et al.(2004)	All	All	212: Presented with DSH	Psychiatry and general hospitals, Cork, Ireland	0.5	Records	Records	3.5
Corcoran et al.(1997)	All	All except self-mutilation	103: Hospitalized in the unit after a suicide attempt (17%)	Psychiatric unit, Montpellier, France	1	Interview (74%)	In hospital	3
Courtet et al.(2004)	All	All	308: Presented with DSH	16 randomly selected general practices, Southwark, South London	<1.5	Records	Records	3
Crawford & Wessely (1998)	All	All	106: Suicidal behaviour, aged >60 years (37%)	Health facilities at nine sites across Europe	1	Interview (59%)	Interview	1.5
De Leo et al.(2002)	All	All	50: Presented with DSH (34%)	Asker & Baerum: a local general hospital	1.5	Self-report (90%) and hospital records	Interview after discharge, mean 20.4 days after episode	3.5
Dieserud et al. (2003)	All	All	467: Admitted following DSH and referred for psychiatric assessment (47% male)	Bristol Royal Infirmary	1	Self-report (90%)	Soon after admission	4
Evans et al.(2000)	All	All	120: Psychiatric admissions following parasuicide	Psychiatric University Clinic of Verona	1	Self-report (76%)	Records	1.5
Garzotto et al.(1976)	Confirmed intent	All	65: Admissions for a suicide attempt (17%), aged 11-19 years	Children's Hospital, Centre Hospitalo-Universitaire, Nancy,	10	Survey (55%) and records	Records	2.5

				France		(92%)		
Géhin et al.(2009)	All	All	3690: Admitted for attempted suicide (40%)	Christchurch Hospital, New Zealand	<10	Records	Records	3.0
Gibb et al.(2005)	All	Self-poisoning and overdose	1576: Attended with self-poisoning	Medical ward/A&E Leeds General Infirmary	1	Records	Records	2.5
Gilbody, House & Owens (1997)	All	Self-poisoning and overdose	2492: Admitted for self-poisoning, aged 12 -20 years (26%)	Hospitals in Oxford region	1-5	Records	Records	2.5
Goldacre & Hawton (1985)	Confirmed intent	"Medically serious"	92: Admission following a suicide attempt, aged <18 years (10%)	Six medical wards in Oslo, Norway	9	Self-report (79%)	Unclear	2.5
Groholt et al.(2006)	All	All	381: Presented with DSH (42%)	A&E departments in Bristol and Bath	1	Records	Records	3
Gunnell et al.(2002)	All	All	2719: Presented with DSH (42%)	General hospital in Oxford	<8	Records (91.5%)	Records	4
Harriss et al.(2005)	All	All	98: Admitted with DSH	Newcastle-upon-Tyne	1.5	GP questionnaire (72.4%)	Interview	2.5
Hassanyeh et al. (1989)	All	All	18199: Admitted with an ICD diagnosis of attempted suicide (49%)	Finland	Mean 3.6	Records	Records	4
Haukka et al.(2008)	All	All	7856: Presented with DSH (38%)	General hospital in Oxford	1	Records	Records	4
Haw & Hawton (2010)	All	All	4167: Presented with DSH (39%)	General hospital in Oxford	3-10	Records	Records	4

Haw et al.(2007)	All	All	8368: Presented with DSH (42%)	General hospital in Oxford	1	Records	Records	4
Haw et al.(2006)	All	All	150: Presented with DSH (39%)	General hospital in Oxford	1-1.66	Interview	Interview, 71% within a week	2
Haw et al.(2003)	All	All	5205: Presented with DSH, aged <18 years (25.5%)	Six general hospitals in Oxford, Manchester & Derby	3-11 years	Records	Records	3.5
Hawton et al (epub ahead of print)	All	All	710: Presented with DSH, aged <15 years (16%)	General hospital in Oxford	1.66-23	Records	Hospital: records and self-report	2.5
Hawton & Harriss (2008)	All	All	730: Presented with DSH, aged >60 years (37.1%)	General hospital in Oxford	<23	Records	Records	2.5
Hawton & Harriss (2006)	All	All (excluding repetitive minor self-injury)	150: Presented with DSH, excluding repetitive minor self-injury, (39%)	General hospital in Oxford	1-1.66	Self-report (79%)	Interviews, 71% within 7 days	1.5
Hawton et al.(2003)	All	All (excluding repetitive minor self-cutting)	146: Presented with DSH (39%)	General hospital in Oxford	1-1.33	Interview (80.8%)	Interview, 71% within a week	2.5
Hawton et al.(2002)	All	Overdose	45: Admitted with intentional self-	General hospital in Oxford	1	Records	Interviewed within 24 hours	3

			poisoning, aged 12-18 years (16%)					
Hawton et al. (1999)	All	All	724: Presented with DSH (38.7%)	General hospital in Oxford	1	Records	Records	3
Hawton et al.(1997)	All	All	1180: Presented with DSH (39%)	General hospital in Oxford	1	Records	Records	3
Hawton & Fagg (1995)	All	All	2282: Presented with DSH, aged10-19 years (27%)	General hospital in Oxford	1	Records	Records	2.5
Hawton & Fagg (1992)	All	All	4371: Referred following suicide attempt (35.2%)	Emergency Psychiatric Services, general hospital in Oxford	1	Records	Records	3
Hawton et al.(1989)	All	All	?: Presented with DSH, females only	General hospital in Oxford	1	Records	Records	2.5
Hawton et al. (1988)	All	All	1291: Admitted for DSH (31%)	General hospital in Oxford	1	Records	Records	3
Hawton et al.(1980)	All	All	100: Presenting with attempted suicide, aged > 65 years (36%)	General hospital in Oxford	Avg 3.5	Records & interview (58%)	Records	2.5
Hepple & Quinton (1997)	All	All	552: WHO definition of DSH (37%)	Five Nordic centres	1	Records	Records	4
Hjelmeland et al.(1998)	All	All	1016: Medically treated parasuicides, (40%)	All general and psychiatric hospitals, community health centres, and GPS in Sør-Trøndelag (county in Norway)	1	Records	Interview and records	4

Hjelmeland (1996)	All	All	1264: Attempted suicide, aged 15-19 years (28%)	Emergency departments in hospitals in Padova, Helsinki, Oxford,Stockholm, Umeå ,Sør-Trøndelag, Würzburg	Mean 3.9	Records	Records	3.5
Hultén et al.(2001)	All	All	4170: attempted suicide aged 10-22 years	Hospitals in National Patient register, Denmark	Mean 4.5	Records	Records	4
Jakobsen et al (2011)	All	All	1304: Admitted after a suicide attempt (32%)	General hospital Asker , & municipal suicide prevention team Baerum	0.5, 1, & 5	Records	Records	4
Johannessen et al (2011)	All	All	330: Admitted after a suicide attempt (32%)	Local psychiatric hospital, Bærum, Norway	1	Records	Records	4.5
Johannessen et al.(2009)	All	All	4743: Presenting with DSH (39%)	Three hospitals providing emergency care in the city of Manchester	0.5	Records	Records	4
Johnston et al. (2006)	All	All	9213: Presenting with DSH (43%)	4 emergency departments in Manchester & Salford	1	Records	Records	4
Kapur et al. (2006)	All	Self-poisoning and overdose	658: Presenting with intentional self-poisoning (44%)	4 emergency departments in Manchester & Salford	0.5	Records	Records	3
Kapur et al.(2004)	All	Self-poisoning and overdose	604: Presenting with intentional self-poisoning (45%)	Six general hospitals in north west England	1	Records	Records	2.5

Kapur et al.(2002)	All	All	2287: Presenting with DSH (46%)	10 emergency departments, 5 psychiatric hospitals & 3 prisons in Ireland	<2	Records	Records	4
Keeley et al.(2003)	All	All	511: Presenting with DSH	Emergency dept of Edinburgh Royal Infirmary	1	Records and self-report	Interview with patient and independent informant while hospitalised	3.5
Kessel & McCulloch (1966)	All	All	2813: Admitted for DSH (42%)	Emergency dept of Edinburgh Royal Infirmary	<1	Records	Records	4
Kreitman & Foster (1991)	All	All	587: Admitted following a suicide attempt, aged <18 years, 27% male	General/emergency paediatric wards, paedopsychiatry, clinical toxicology services at University Hospital of Grenoble, France	Mean 5.3	Survey patients & GP (48%)	Records	2
Laurent et al.(1998)	SA?	All	59: Admitted following a suicide attempt, aged > 60 years (41%)	Hospital psychiatric service, Clermont Ferrand, France	3-10	Letter and phone call to attending physician; (86%)	Records	3.5
Lebret et al.(2006)	Confirmed/ apparent intent	All	145: suicide attempts (32%)	Medical centre, Taiwan	1	Interview	Interview	
Lee et al (2012)	All	All	7344: Presenting with DSH (44%)	All six EDs in Oxford, Manchester and Leeds	<1.5	Records	Records	3
Lilley et al.(2008)	Confirmed	All	Presenting with ideation (18%) or attempt ()	Inpatient psychiatric service and a short-stay crisis stabilization unit,	0.5	Interview	Interview	3.5

				Toronto, Canada				
Links et al (2012)	All	Self-poisoning and overdose	3733: Presenting with intentional self-poisoning (36%)	Emergency department of Glasgow Western Infirmary	1	Records	Records	1.5
Mackay (1979)			111: Admitted for drug overdose	New York	>1	Interview (87.4%)	Interview	1
Mayo (1974)	All	All	152: Presenting with DSH (38%)	One emergency department in Cork Ireland	1	Hospital records	Interview, usually within 2 days	3.5
McAuliffe et al.(2008)	All	Self-poisoning and overdose	705: Admitted for intentional self-poisoning	Charing Cross Hospital, London	<4	Records	Records	2.5
McEvedy (1997)	Unclear	All plus ideation only (36.6%)	186: Admitted following suicide attempt/overwhelming suicidal ideation, aged 16-21 years (20%)	Two university hospitals' EDs, Lausanne and Geneva	0.5 & 1.5	Self-report (79.6%)	Interview	3
Méan et al.(2005)	All	All	911: Admitted with suicide attempt (34.8%)	Aker University Hospital	<10	Records	Proforma	4
Mehlum et al.(2010)	Confirmed intent	All	273: Admitted with suicide attempt	Psychiatric emergency units of University Hospital of Besançon & Hospital of Dole, France	2	Records	Proforma	4
Monnin et al (2012)	All	All	279: Presenting with DSH (37%)	Bristol Royal Infirmary Emergency Department	1-2,	Self-report (73%), relative-report, health/com	Interview	3.5

						munity worker report, & hospital notes (97%)		
Morgan et al.(1976)	All	All	691: Admitted with DSH, economically active males only	Regional Poisoning Treatment Centre, Edinburgh	1	Records	Records	3.5
Morton (1993)	All	All	1177: Presented with DSH, aged 60+ (44%)	Six general hospitals in Oxford, Manchester & Derby	1	Records	Records	3.5
Murphy et al (2012)	All	All	365: Admitted with DSH (39.5%)	Accident dept of North Staffordshire Hospital Centre	1	Records	Records	3
Myers et al.(1988)	All	All	351: Presenting after suicide attempt, aged 18-45 years, (30.5%)	Copenhagen Suicide Prevention Centre	1	National Patient Register	Interview	2.5
Nordentoft & Branner (2008)	All	Self-poisoning and overdose	79: Admitted after intentional self-poisoning (42%)	Medical intensive care unit, University hospital Lund	1	Interview (74.7%)	Interview	1.5
Öjehagen et al.(1992)	All	Self-poisoning and overdose	992: Presenting with intentional self-poisoning (40%)	Emergency department, Nottingham, England	1	Records	Records	2.5
Owens et al.(1994)	All	Self-poisoning and overdose	50891: Admitted with intentional self-poisoning (43%)	All Scottish hospitals	2	Records	Records	3.5

Payne et al.(2009)	All	All	48,206: presented with DSH	All emergency departments in Ireland	<7	Records	Records	
Perry et al (2012)	Unclear	All plus ideation only	616: Presenting with suicidal behaviour and ideation, (52.4%)	University of Massachusetts Emergency Mental Health Service	<1	Records	Records	3
Peterson & Bongar (1990)	All	All	150: Admitted with DSH	Large New Zealand general hospital	0.5	Postal questionnaire (76%) and records	Computer interview in hospital	4
Petrie & Brook,(1992)	All	All	67: Attempted suicide, (27%)	Three general hospitals in New Zealand	0.5	Postal questionnaire (69%)	Survey in hospital	3
Petrie et al.(1988)	All	Overdose	100: Intentional overdose (31%)	Clinical toxicology unit, Munich	6	Interview (66%)	Interview	1.5
Pino et al. (1979)	All	All plus ideation only (55.5%)	157: Presented with self-harm or suicidal ideation (55.5% ideation only) (51.1% male)	2 EDs in Edmonton, Canada	0.25	Phonecall (82%) and records	Structured interview and chart review	4
Randall et al (2012)	All	All	138: Suicide attempts	Osuna Hospital, Seville, Spain.	Not spec	Records	Records	2.5
Ruiz-Doblado (2001)	All	All	228: Presenting with DSH (35%)	Four major general hospitals in Hamilton, Canada	0.25	Self-report (82%)	Interviewed within 3 days or post-detoxification	4
Sakinofsky & Roberts (1990)	All	All	34: Presented with self-harm, 15-24 years of age (17.7%)	Emergency department in Coimbra, Portugal	0.75	Self-report	Interviewed a week after presentation	0.5

Santos et al (2009)	All	All	354: Attempted suicide for first time	One general hospital, Madras, India	1	Self-report (76%)	Unclear	4
Sathianathan & Sadowski (1996)	All	All	874: Presenting with DSH (34%)	Emergency department of University Hospital Ghent	5	Interview (41.3%)	Interview	3.5
Scoliers et al, (2009)	All	Overdose	43: Admitted with intentional self-poisoning, with a score of least 1 on the Buglass and Horton scale and no reported previous DSH (27.2%)	Newcastle-upon-Tyne	0.25	Records	Interview	2
Scott et al. (1997)	All	Self-poisoning and overdose	3034: Admitted for intentional self-poisoning, aged 12-20 years (29%)	General hospitals in Oxford region	1-6	Records	Records	2.5
Sellar et al.(1990)	Unclear	All	55: Admitted for attempted suicide	Ege University Medical Emergency Department, Turkey	5.4	Interview (78%)	Interview	3
Sertöz (2010)	All	All	147: First-ever admitted for DSH	Psychiatric university clinic of Verona	1	Self-report (91.2%)	Hospital interview	2.5
Siani et al. (1979)	All	Overdose	66: Admitted following intentional drug overdose, “High-risk” patients (5 or more of 11 items in Kreitman and Foster’s scale) (55%)	Emergency Department of North Manchester General Hospital	<1	Hospital records and self-report	Interview mean 3.1 days	3.5
Sidley et al.(1999)	All	All	150: Presented with DSH (38%)	General hospital in Oxford	6	Self-report (67%) & hospital	Interview, majority within a week	2.5

						records		
Sinclair et al.(2010)	All	All	150: Presented with DSH (29%)	General hospital in Oxford	7	Interview (48.7%): only "recent" repetition	Interview, 69% within a week	3
Sinclair et al.(2007)	Confirmed/ apparent intent	All	165: Admitted after suicide attempt (22%)	Medical & psychiatric wards at Sahlgrenska University Hospital, Göteborg, Sweden	3	Records	Within a week	3.5
Sjöström et al (2012)	Confirmed/ apparent intent	All	165: Admitted after suicide attempt (22%)	Medical & psychiatric wards at Sahlgrenska University Hospital, Göteborg, Sweden	2	Records	Within a week	3.5
Sjöström et al.(2009)	All	All	64: Admitted after parasuicide (37%)	Somatic & psychiatric wards, Umeå University Hospital, Sweden	Mean 7.5	Interview (79.7%)	Interview	3.5
Söderberg et al.(2004)	All	All	62: Presented with act they described as suicide attempt, regardless of lethality	Regional trauma centre emergency department in Rhode Island	0.25	Telephone questionnaire with parents & participants (79.5%)	Questionnaires in emergency dept	2.5
Spirito et al.(1994)	All	All	29571 episodes: Presented with DSH (40.6%)	Six general hospitals in Oxford, Manchester & Derby	0.5	Records	Records	4
Steeg et al (2012)	All	All	72: Admitted following suicide attempt (35%)	Dept of Psychiatry, Odense University Hospital, Denmark	1	Records	Interview, majority within a week	3
Stenager et	All	All	92: Presenting with DSH	General hospital in	<2	Records	Interview	2.5

al.(1994)			(14.1%)	Kuwait		and interview (89.1% retention)		
Suleiman et al.(1989)	All	Overdose	381: Presenting with intentional overdose (32.8%)	Emergency dept of Geelong Hospital, Victoria, Australia	<2	Records	Records	2.5
Taylor et al.(1998)	All	All	150: Admitted after suicidal act (44%)	Psychiatric Department of Santa Cruz y San Pablo Hospital, Barcelona, Spain	Mean 10	Self-report (97%)	Interview	3.5
Tejedor et al.(1999)	Confirmed	All	61: Admitted after suicide attempt, with intent to die	Research ward, Sweden	1	Unclear	Interview avg 16 days after admission	2
Träskman-Bendz et al.(1992)	Confirmed	All	112: Admitted after intentional harm with some wish to end life, aged 13-20 (32%)	Emergency department at Royal Prince Alfred Hospital, New South Wales, Australia	1	Records	Records	3
Vajda & Steinbeck (2000)	Confirmed	Violent self-injury	118: Admitted with violent suicide attempt, serious intent to die (83%)	Dept of Surgery, Vanderbilt University Medical Centre, Tennessee	1-6	Self-report/family-report (88%)	Records and retrospective self-report about conditions around index episode	2
van Aalst et al.(1992)	Unclear	All	158: Admitted after “suicide attempt”, Aged >20 years, female only	University hospitals of Leiden & Utrecht	1	Self-report (80%)	Interview within 8 wks of discharge	2
van Egmond et al.(1993)	Unclear	All	106: Presenting after “attempting suicide” with history of at least one previous suicide attempt	Emergency departments of Leiden & Rotterdam University Hospitals	1	Unclear	Interview, majority within two weeks	3

			(39%)					
Verkes et al.(1997)	Confirmed/ apparent intent		165: Admitted after suicide attempt (22%)	Emergency wards at Sahlgrenska University Hospital, Göteborg, Sweden	3	Records	Interview, majority within 3 days	3.5
Waern et al.(2010)	All	All	125: Presenting with DSH (46% male)	Emergency department, Faroe Islands	20-41	Records	Records	3.5
Wang & Mortensen (2006)	Unclear	All	99: Admitted with suicide attempt (52%)	Dept of Psychiatry, Odense	<3.4	Records	Interview	3.5
Wang et al.(1985)	Confirmed/ apparent intent	All	101: Admitted with suicide attempt, aged 70 yrs+ (45%)	Emergency departments at five hospitals in western Sweden	1	Records & self-report	Interview (within median 11 days)	2.5
Wiktorsson et al. (2011)	All	All	1376: Admitted with DSH (38.5%)	Edinburgh Regional Poisoning Treatment Centre	1-2	Records	Records	3
Wilkinson & Smeeton (1987)	All	All	178: Presenting with DSH (38%)	Emergency dept, Royal Hallamshire Hospital, Sheffield	0.5	Records	Records	2.5
Yeo & Yeo (1993)	All	All	90: Presenting with DSH (29%)	Pamela Youde Nethersole Eastern Hospital, Hong Kong	0.5	Records	Records	2.5
Yip et al (2011)	All	All	11583: Presenting with DSH (40%)	General hospital in Oxford	Avg 11.4	Records	Records	2

+ A suicide attempt was defined as “a situation in which a person has performed an actual or seemingly life-threatening behavior with the intent of jeopardizing his life, or to give the appearance of such an intent, but which has not resulted in death” (Beck et al., 1972).

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Appendix 2: Ethics approval for interview studies

UCC
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COISTE EITICE UM THAIGHDE CLINICIÚIL
Clinical Research Ethics Committee
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Cork,
Ireland.

ECM 4 (f) 02/02/10

21st January 2010

Dr Ella Arensman
Director of Research
National Suicide Research Foundation
Department of Epidemiology & Public Health
University College Cork

Re: Risk Factors for repetition of deliberate self-harm: A prospective study of Emergency Department presentations.

Dear Dr Arensman

Expedited approval is granted to carry out the above study in:

- Cork University Hospital
- Mercy University Hospital
- South Infirmary/Victoria Hospital

The following documents were approved:

- Application Form
- Research Protocol version 1 dated 15th October 2009
- Insurance Certificate
- Letter of Invitation version 1 dated 15th January 2010
- Baseline Semi-Structured Interview Schedule (including Consent form), version 1 dated 15th January 2010
- Semi-Structured Interview Schedule (Follow-Up)
- Qualitative Interview Schedule (Baseline)

We note that the co-investigators involved in this study will be:

- Dr Zelda Di Blasi and Ms Celine Larkin.

Yours sincerely

Dr Michael Hyland
Chairman
Clinical Research Ethics Committee
of the Cork Teaching Hospitals

Appendix 3: Master table of themes and subthemes for qualitative study including sample excerpts

Theme: Enduring adversity

Familial conflict

P33: They're both alcoholics, am, my father used to beat the absolute shit out of my mother on a daily basis
P55: With my mother, amm, I won't say things have improved but I suppose things are possibly on the way to improving, with stuff kind of that happened years and years and years ago kind of coming out now
P38: We clash on *everything,* we've never, we don't see eye-to-eye on a thing like
P70: [Family crises] would set off it would set off really

Long-term suicidal ideation/behaviour

P55: I already knew I suppose that I was depressed and I was thinking about it for a long time
P33: I used to go around day in day out I'd be thinking about hurting myself two or three times a day
P38: I always wanted to jump off a bridge
P70: yeah I had em constant up and down really…going to through and then yeah it and it they got more serious then like the downs came with harming then

Recurrent patterns of suicidality

P33: I honestly don't know how it's progressed to this like, it just seems with every time it gets worse and worse
P70: that's basically how the cycle started and it continued on to this day

Theme: Self-harm as contextual

Context of loss/powerlessness

P38: I broke up with my boyfriend after two years [*break*] a lot of work went into it so it was kind of a waste like of time
P70: my grandmother's [suicide] been the been the a huge effect factor as well
P55: I was like "What the hell am I doing *sitting* here, while he's *dumping* me?"

Social defeat as trigger

P55: it was just shows that I… have…issues with abandonment like or being neglected, and I feel then that my only option is to, to kill myself
P33: if I feel like I've been let down by someone or just ups-or if I've just been upset or I've been wronged in any way d'y'know what I mean I just, do it

P70: sometimes I'd do it just because I'd just be so upset over something that might have happened, like y'know Jesus I'd a fight with a best friend

Breaking point

P55: it like pushed me over some kind of a level that I couldn't take it any more like it just…I I felt like there really was no other option, that this was the final straw
P70: it basically came to a stage where I'd had enough of trying to get myself out of it every time I went down em so I basically took an overdose then
P33: I was just so fed up and so tired of everything I just…I didn't care what happened

Overwhelming negative emotion

P33: Very angry, upset, ahm ya, very peed off
P38: I was really angry, very very very angry
P55: I've a kind of a problem talking about our relationship and kind of triggered me off to feeling crap, even crapper
P70: Got in a fierce depressive state

Alcohol as facilitator

P33: I would never I never I've never done it sober, never
P70: You kind of get involved in going out and drinking then like so and obviously that adds fuel for the fire and they'd get worse and I'd do more harm
P55: I was drunk when I did it [*break*] I used to drink a lot, didn't do anything for the fact that I had depression
P38: I think if you're depressed and you're on the dole and you're just drinking six nights a week with a group of people who are also doing the same, that you don't see a way out

Theme: Agency through self-harm

"Just doing it"

P55: while I was in that state I just saw the razor blade and I was thinking "Oh yeah I should cut myself
P33: I literally came in the door, went to the kitchen, got a glass, went upstairs, opened the window, smashed the wind—glass off the wall and cut myself
P38: just felt like the time to take them d'y'know that way, it just felt like now would be a nice time
P70: once I left work I was like right, it was the first thing that came into my head to do

Planning

P55: I was kinda thinking that you know, if my boyfriend could be downstairs for half an hour cooking so, in that space of time you know
P38: You can look up in five seconds like how many pills you need to take to

overdose on something
P70: I proceeded to go to a couple of different shops and buy em couple of packets well about five or six packets of paracetamol em with the intentions obviously to take them all

Concealing self-harm and evading assistance

P55: pretended that everything was fine and I was reassuring my boyfriend [*break*] and I was only conning him to g- leave so that I could take the overdose
P70: It was more control like that I had over being able to do this but being able to y'know hide it
P33: swallowed around over a hundred tablets and ahm ya I just went downstairs to get a glass of water to take more went back upstairs and my mother caught me so I fleed

Conviction/ambivalence in decision

P55: I was very calm, because I had just decided that this was what I was gonna do
P70: I was adamant to go through with what I was going through
P33: I didn't care what happened, to be honest I didn't care
P38: A part of me knew I wasn't going to die cos I didn't feel sick but then another part of me realised that maybe I could be dying d'y'know and I didn't feel bad about either of them

Desiring effective execution of plan

P55: I just wanted something *bad* to happen like. I wanted you know, my heart to stop or whatever you know I just wanted me I wanted to die
P70: Didn't want to bring the paracetamol back up because I knew then that they wouldn't work, that I wouldn't really succeed in killing myself
P38: I wouldn't] want to be in the middle like, that was my plan, I was either going to die like or I was going to just realise that like I'm too stressed now

Physical consequences as unpleasant

P55: when I looked in the mirror I was like [gasps] "Huhh, my God look at my eyes, I'm like a lizard or something" it *freaked* me out
P70: They had to flush whatever through me so I was on a drip and some stuff that made you violently sick
P38: they had to check my urine and stuff like that because it makes your kidneys fail as well but eh I was vomiting the whole night like blood and everything
P33: it's just awful cos you're going out then like you're constantly like this like [pulling down sleeves] trying to hide them [*scars*] and it's just horrible like

Evaluation of performance

P55: I used to think "Oh, I'm a failure at everything and I've even failed at that [*self-cutting*]"
P70: I couldn't even I couldn't even fucking manage to do this properly

Dynamism within/between acts

P33: smashed the pint glass and ya cut myself well I didn't really cu-it was more stabbing than cutting
P55: I was like cutting my wrists and banging my head off the wall and banging my arms and my legs and flinging myself off anything that would make me break something
P38: I think once you take the first few tablets you're on a roll then
P70: I would start doing it on my arms again and then I'd get y'know carried away

Theme: Self(-harm) as socially aberrant

Labelling as "crazy": own and perceived others'

P55: I was turning into a crazy lady
P38: I get very upset like I'm constantly *thinking* like, but you can't change any of those things like so it's kind of stupid
P33: I shouldn't be reacting to situations in this way hurting myself
P33: People would treat you differently, like maybe like a basketcase
P55: I think maybe a lot of my friends probably were thinking "Jesus Christ", you know, "this girl is a lunatic"
P70: People might have this idea that people who self-harm are completely screwed like up like in the head
P38: I didn't want to be put in a bracket of crazy people

Negative social response

P38: She was bawling crying, she was really upset
P70: They were so upset, I could see my mom had been crying, my dad had been crying
P55: He saw all the cuts and things and he was just like more or less like *giving out* to me like *mad* P33: people treat you differently like, it's almost like they treat you like a child

Self(-harm) as burdensome

P33: it's not fair putting people through that either
P38: you think that they're better off without you
P70: they're dealing with overcrowding and they're dealing with budget cuts and you're coming in here after doing something, it's self-inflicted

Self-harm as shameful

P33: you're constantly like this like [pulling down sleeves] trying to hide them
P70: I just felt like a *huge* disappointment [*break*] I just couldn't bring myself to look at them really

Health service as disempowering

P70: I wasn't being very cooperative and she was pretty busy so she was like "*why* are you here? Tell me *now*"
P55: She said "Oh and why would a pretty girl like you do such a thing?"
P33: no-one would tell me what was going on
P38: they're not going to do anything for you anyway so what's the point like?

Desiring solitude after self-harm

P55: I kind of wanted to ignore everything that was going on like, to pretend like I was on my own or something
P33: didn't want to be there, I just wanted to be home, curled up in bed [laughs] away from everyone
P70: I just kind of let it kind of go over my head like y'know I just I was so kind of I dunno in a world of my own

Theme: Road to recovery

Striving for recovery

P33: I just knew I needed to stop like, there was not that's not a way to be living your life
P70: I gotta hit this head-on now like and literally bulldoze my way through it

Self-harm as positive turning point

P33: I'm grateful because once it happened things have changed so much
P70: if this overdose hadn't happened [sigh] em I think I'd still be just plodding along like and denying that I have anything, any issues
P38: I'd rather like either give myself a wake-up call or *actually* die

Lessons to self/others

P55: People probably finally understand that things that happened in the past have affected me so much
P33: Having everyone around me worrying and everything it's just not fair on any of them and like it's no way to live your life
P38: A lot didn't come from it but at the same time it taught me a lot
P70: It's kind of put things into perspective for me really like that I *do* need help

Communication as protective

P55: it's probably, I suppose maybe made me realise the importance of communication
P33: Counselling really really helped, I'd say that's what saved me like
P70: it's [*self-harm is*] em something that I dunno needs to be addressed head-on