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Vulnerability or resilience?

Psycho-social factors associated with deliberate self-harm among adolescents.

Thesis submitted for the degree of
Doctor of Philosophy
to
The National University of Ireland, Cork
by

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DECLARATION

I, Elaine McMahon, confirm that this thesis is my own work and has not been submitted for any other degree, either at University College Cork or elsewhere.

Signed:

Date:

Abstract

Background

Deliberate self-harm (DSH) is common among adolescents in Ireland and internationally. Psychological factors, negative life events and lifestyle factors have been found to be associated with self-harm in this group. However, large scale population-based studies of adolescent self-harm and its correlates have been lacking, and internationally a standardised methodology was needed to facilitate comparative studies. The focus on vulnerability which has been prevalent in this field has meant that research has failed to examine resilient adaptation among at-risk adolescents.

Method

Data were obtained from a cross-sectional school-based study conducted in Ireland and in each of the six other centres which participated in the Child and Adolescent Self-harm in Europe (CASE) study. In Ireland, 3,881 adolescents in 39 schools in completing the anonymous questionnaire, while across all 7 centres, over 30,000 young people participated. Data were gathered on health and lifestyle, self-harm thoughts and behaviour, a wide range of life events, psychological characteristics (anxiety and depressive symptoms, self-esteem, impulsivity and coping style), and support available to young people.

Results

This thesis reports the findings of the Irish CASE centre as well as one international study. The factors associated with DSH among Irish adolescents differed by gender, but among both genders drug use and knowing a friend who had engaged in self-harm were associated with DSH.

Among Irish boys, strong associations were found between bullying and poor mental health and DSH. Among boys who had been bullied, psychological and school factors were associated with DSH, while family support was protective.

Links between stressful life events, psychological characteristics and DSH within the international CASE sample were examined. Increased history of self-harm thoughts and acts was associated with greater depression, anxiety and impulsivity, lower self esteem and an increased prevalence of ten different negative life events, supporting the hypothesis of a "dose-response" relationship between these risk factors and the self-harm process.

Associations between coping style, mental health factors (depressive symptoms, anxiety and self-esteem) and self-harm were examined among Irish adolescents. Emotion-oriented coping was strongly associated with poorer mental health and self-harm thoughts and acts. A mediating effect of emotion-oriented coping on associations between mental health factors and DSH was found for both genders and between problem-oriented coping and mental health factors for girls. Similar mediating effects of coping style were found when risk of self-harm thoughts was examined.

Resilient adaptation among adolescents exposed to suicidal behaviour of others was examined. Self-harm thoughts were common in these adolescents. Among those exposed to suicidal behaviour of others, vulnerability factors were drug use and higher levels of anxiety among boys, while for girls drug use, bullying and abuse were vulnerability factors, while resilience was associated with higher self-esteem and use of problem-oriented coping.

Conclusion

These findings can aid in the identification of young people at risk of self-harm in the school setting and highlight the importance of mental health, peer-related and lifestyle factors in the development of DSH. High-risk groups of young people such as bullying victims and those exposed to suicidal behaviour of others have distinctive profiles of risk factors which differ from those of their peers. Findings relating to the importance of positive coping skills can inform positive mental health programmes, many of which aim to enhance life skills and build

resilience among young people. Knowledge of the factors associated with positive adaptation among at-risk adolescents can inform prevention efforts among this group.

Chapter 1

Introduction

Deliberate self-harm

Deliberate self-harm (DSH) is recognised worldwide as a major public health problem (World Health Organisation, 2002). The term deliberate self-harm is commonly used to describe a wide range of behaviours (for example attempted hanging, self-poisoning, and self-cutting), both with and without suicidal intent and of widely varying levels of medical seriousness. Other terms used internationally with slightly varying meanings include parasuicide, self-injury, self-mutilation and attempted suicide (Skegg, 2005). Recently, the term self-harm is increasingly in use internationally and in this thesis, the terms deliberate self-harm (DSH) and self-harm are used interchangeably. Deliberate self-harm is generally included within the broad category of suicidal behaviour, regardless of suicidal intent. DSH has a devastating social and economic impact and has become an important focus of social policy, professional practice and research interest in Ireland and many other Western societies (Madge *et al.*, 2008).

Deliberate self-harm in adolescents: the extent of the problem

In many Western countries, DSH is rare before puberty, becoming more common through adolescence (Skegg, 2005), with peak rates in many European countries found in adolescence and young adulthood (Schmidtke *et al.*, 1996). The international school-based CASE study (Child and Adolescent Self-harm in Europe), on which this thesis is based, reported lifetime prevalence of DSH in adolescent girls ranging from 5.7% (The Netherlands) to 17% (Australia) compared with 2.4% (The Netherlands) to 6.5% (Belgium) in adolescent boys (Madge *et al.*, 2008). In the Ireland, the CASE study reported 9.1% of Irish adolescents (13.9% of girls and 4.3% of boys) surveyed had harmed themselves at some point, of whom 45.9% reported repeated episodes (Morey *et al.*, 2008). This was a higher prevalence than reported by smaller scale school-based studies (Lynch *et al.*, 2006, O'Sullivan and Fitzgerald, 1998). Self-harm was

approximately four times more common among girls than boys. Self-cutting and overdose were the most common DSH methods (Morey *et al.*, 2008).

Incidence rates of hospital-treated DSH in Ireland show that the highest rates of hospital-treated DSH in females are among 15–19 year-old girls, at 639 per 100,000, highlighting the severity of the problem in young people. Among men, the highest rates are in the 20-24 age-group, at 626 per 100,000 (National Suicide Research Foundation, 2011). However, rates among younger men are also high, with 443 per 100,000 within the 15-19 age-group presenting to hospital with DSH. Large increases in incidence rates in both genders have been reported in recent years, as well as the finding that the gap between male and female rates is getting smaller (National Suicide Research Foundation, 2011).

Less than one fifth of adolescent self-harm comes to the attention of the health services, with approximately one third seeking help from their social circle only, and around half not seeking help at all (Ystgaard *et al.*, 2009). The private nature of much self-harm has been described (Sakinofsky, 2000, Spandler, 1996) and underlines the importance of population-based approaches to the study of adolescent DSH and the importance of appropriate methodology which assure participant anonymity and confidentiality.

The development of more comprehensive understanding of DSH in the community is particularly important as a history of self-harm is a major risk factor for repeated self-harm and subsequent suicide (Gunnell *et al.*, 2008, Tidemalm *et al.*, 2008). A retrospective study of young people who died by suicide found that almost half had a known history of DSH (Hawton *et al.*, 1999). Suicide is the leading cause of death in men aged 15-34 years in Ireland, and suicide rates among young people aged 15-19 in Ireland are the third highest in the European Union (Eurostat, 2009).

Factors associated with vulnerability to deliberate self-harm

A growing number of population-based studies have examined various factors potentially associated with vulnerability to self-harm among young people, and factors which are protective against DSH (Evans *et al.*, 2004). There is considerable evidence for associations between psychological characteristics such as depressive symptoms (Fergusson *et al.*, 2003, Spirito *et al.*, 1996), anxiety (Foley *et al.*, 2006), self-esteem (Wild *et al.*, 2004) and impulsivity (Conner *et al.*, 2004) and self-harm among adolescents. However, further research is needed to investigate the mediating roles played by other factors on the associations between mental health difficulties and DSH (Sandin *et al.*, 1998). A variety of psycho-social factors have been found to be associated with DSH, including negative life events (Evans *et al.*, 2004, Gould *et al.*, 1996) and knowing others who have harmed themselves (Bearman and Moody, 2004). Lifestyle factors such as substance use (Brent, 1995, Murphy, 2000) and alcohol abuse (Hufford, 2001) have also been associated with self-harm.

Risk and protective factors can sometimes be considered as interchangeable ways of describing the presence or absence of a particular factor (for example social support may be protective and its absence may be a risk factor for DSH), or high and low levels of a continuous psychological variable (high levels of impulsivity may be a risk factor, low levels protective) (Fergusson *et al.*, 2003).

Life-course model of risk

Collectively, the evidence for a wide variety of risk and protective factors suggests a life-course model of the development of deliberate self-harm in which an individual's risk may be determined by accumulative exposure to social and family difficulties, lifestyle, childhood adversity, personality, current mental health, and exposure to negative life events (Fergusson et al., 2000). This approach synthesises varying views of the aetiology of adolescent suicidal behaviour which focus on the universal stresses of adolescence or, by contrast, which focus on the primary importance of psychiatric disorder in the development of suicidal behaviours

(Garland and Zigler, 1993). The design of the study reported here, through its broad scope and through the inclusion of lifetime history of many risk factors, as well as assessment of mental health factors using validated instruments, allows for the examination of the individual's exposure to risk and protective factors from various domains across the lifespan, within the constraints of a cross-sectional design. A life-course model of the development of suicidal behaviour is therefore inherent in the study design, and in the approach taken to the research questions addressed.

Prior to the study described here, there had been no large-scale study of DSH and associated factors in Irish adolescents, nor had there been an international study employing a consistent methodology to enable international comparisons in terms of DSH and associated factors. Previous research has been hampered by the broad range of definitions of self-harm employed, differing populations studied and different methods of data collection which have led to conflicting findings. Enhanced knowledge of the factors associated with self-harm is essential for the development of appropriate education, prevention and screening programmes, which have been identified as important components of suicide prevention policies (Evans *et al.*, 2004, Garland and Zigler, 1993, Scott *et al.*, 2009).

Resilience and vulnerability

Resilience can be conceptualised as existing along a continuum with vulnerability (Ingram and Price, 2001). The concept of resilience is one which has rarely been explicitly examined in studies of adolescent self-harm, despite its importance to developmental researchers. Research in the field of resilience involves a shift away from maladjustment to consider competence as well (thus implicitly emphasizing prevention) (Luthar *et al.*, 2000).

There has been a wide variance in how resilience has been operationalised in research, but it should be emphasised that resilience is a process or phenomenon of positive adaptation despite adversity, and not a personal characteristic of the individual (Luthar *et al.*, 2000). Individuals

who can be described using the concept of resilience include those exposed to adverse conditions yet not displaying the negative outcome under examination (von Eye and Schuster, 2000). The two pivotal constructs of exposure to adversity and positive adjustment outcomes have specific operational definitions in contemporary research, with adversity including negative life events and other circumstances that are known to be statistically associated with adjustment difficulties, and positive adaptation defined in terms of behaviourally manifested social competence, success at meeting developmental tasks or the absence of emotional or behavioural maladjustment (Luthar *et al.*, 2000).

There are few examples of studies examining positive outcomes in terms of DSH. Fergusson (2003) took a resilience/vulnerability approach to the study of DSH as an outcome in the presence and in the absence of the adversity factor of major depression (Fergusson *et al.*, 2003). The identification of vulnerability and protective factors is already central to much research in the field of self-harm, and has driven the focus of the design of the instrument used in this study. However, taking an explicit resilience approach by examining those individuals displaying positive outcomes despite the presence of risk factors can further enhance our knowledge. The identification of important factors which distinguish the resilient individual can inform prevention efforts for high risk groups of young people.

The Child and Adolescent Self-harm in Europe (CASE) study

The Child and Adolescent Self-harm in Europe (CASE) study sought to address the issue of the lack of reliable information on the prevalence of deliberate self-harm among adolescents and the need for comparative data which would enable international comparisons. The CASE Schools Survey was a cross-sectional study which aimed to include approximately 4,000 school pupils, mainly aged 15 and 16 years, in each of the seven participating centres; Australia, Belgium, England, Hungary, Ireland, the Netherlands, and Norway. The study methodology was later replicated in Scotland also.

The Lifestyle and Coping questionnaire was developed in English, piloted and then administered anonymously to school pupils in each participating country. It included items on health and lifestyle, self-harm thoughts and behaviour, a wide range of negative life events, psychological characteristics (anxiety and depressive symptoms, self-esteem, impulsivity and coping style), attitudes towards self-harm among young people and support available to young people (See Appendix 1 for the full text of the Lifestyle and Coping Survey).

Target sample sizes were calculated to provide sufficient power to conduct analyses separately by gender. Schools were sampled to be as locally and nationally representative as possible. Response rates were generally high (Australia 92%; Belgium 93%; England 81%; Hungary 93%; Ireland 85%; the Netherlands 96%; and Norway 91%). Non-responders were either absent, opted out or returned spoiled questionnaires. A total of 30,477 young people were included in the international dataset. Overall, 51.3% of the sample was male and 48.7% female (Madge *et al.*, 2008).

In the Irish centre, 3,881 adolescents aged 15–17 years participated in the survey. Data were gathered in 39 schools in the Health Service Executive (HSE) Southern area between January 2003 and March 2004. Power calculations indicated that a minimum of 3,000 students were required to return a 95% confidence interval of 9.0–11.0% for a postulated prevalence of 10%, the approximate prevalence figure previously reported by the English CASE centre (Hawton *et al.*, 2002). Using a random selection from the total list of all secondary schools in counties Cork and Kerry, 54 schools were invited to take part and 39 schools participated in the survey. Of the 4,583 students who were invited to take part, 3,881 participated in the survey (a response rate of 85%). Fifty one questionnaires (1.3%) were excluded from data analysis as they did not fit the age criteria (n = 25) or were not filled in seriously (n = 26). Further questionnaires were excluded from particular analyses reported here if sections of the survey central to a particular research question were not completed. The response rate varied by school, with 7 schools having a response rate lower than 75%, while 8 schools had a response rate of at least 95%.

Over 90% of the non-responding young people were absent on the day of the survey. Those absent due to illness or deliberately not coming to school are thought to have a health and social profile that would be associated with a higher prevalence of DSH than those in attendance. However, many students were also absent from school because of activities such as day trips and tours (students were in transition year and therefore out-of-school activities were common) and students absent for these reasons would be likely to have a similar prevalence of DSH to those in school at the time of the survey. With regard to the participating and non-participating schools, single-sex girls' schools were slightly overrepresented among participating schools but no differences were found in terms of rural/urban location.

Procedure

Ethical approval was granted by The Clinical Research Ethics Committee of the Cork Teaching Hospitals. School principals and teaching staff were informed of the procedure in advance and an information sheet and opt-out form were sent to parents. Students were also given the opportunity to opt out on the day of the survey. The questionnaire was administered with a member of the research team present and completed by students in the classroom. An introduction explained the anonymity and confidential nature of the data along with the voluntary nature of students' participation. It was clarified to the students that they were free to choose whether to complete any or all of the questionnaire and that their choice had no bearing on their schoolwork. Completion of the questionnaire took 20–30 minutes. After participants had completed the survey there was a general discussion about the help and support available for young people in their local communities and each participant received a resource pack, which included a list of services in their local area.

Assessment of DSH

A distinctive characteristic of this study was that participants were asked to describe in their own words, the method(s) they had used to harm themselves. This description was then coded

according to a standardised definition of deliberate self-harm. The definition of deliberate self-harm was as follows:

"An act with a non-fatal outcome in which an individual deliberately did one or more of the following:

• Initiated behaviour (for example, self cutting, jumping from a height), which they intended to cause self-harm.

• Ingested a substance in excess of the prescribed or generally recognisable therapeutic dose.

• Ingested a recreational or illicit drug that was an act that the person regarded as self-harm.

• Ingested a non-ingestible substance or object."

This definition includes acts that are interrupted before self-harm is inflicted, for example, a person removed from a bridge before jumping off or interrupted attempts of hanging, but excludes episodes of self-harm by individuals who do not understand the meaning or the outcome of their act, for example due to a learning disability. The following questions were used to identify deliberate self-harm:

"Have you ever deliberately taken an overdose (e.g. pills or other medication) or tried to harm yourself in some other way (such as cut yourself)?" with response options: *No/ Yes, once/ Yes, more than once*.

For those who confirmed having engaged in DSH, the questionnaire included further questions about the timing of the last act of DSH *(less than a month ago/between a month and a year ago/more than a year ago)*, and participants were asked to describe details of the self-harm act, for example the name of the drug taken in an overdose. Episodes of deliberate self-harm were then classified as a 'yes', 'no' or 'no information given' by three independent raters using the standardised criteria (Cohen's Kappa = 0.77). In cases where ratings were inconsistent, decisions were made based on majority rating. For those who indicated they had harmed themselves, the questionnaire included a series of questions relating to motives, methods and help-seeking behaviour. Self-harm thoughts were assessed using the following question:

"Have you during the past month or the past year seriously thought about taking an overdose or trying to harm yourself but not actually done so?" with response options: *No/ Yes, the last*

time was in the past month/ Yes, the last time was over a month ago, but less than a year ago. For those who reported self-harm thoughts, the questionnaire included further questions related to help-seeking behaviour.

To date the eight CASE centres have published a broad range of studies arising from the survey. In addition to the publications included in this thesis, publications have included descriptions of rates of DSH and associated factors (De Leo and Heller, 2004, Hawton *et al.*, 2002, Morey *et al.*, 2008, O'Connor *et al.*, 2009b, Ystgaard *et al.*, 2003), help seeking amongst those who have harmed themselves (Ystgaard et al., 2008), cross-national studies examining the role of alcohol in DSH (Rossow et al., 2007), comparing prevalence and risk factors in different centres (Portzky *et al.*, 2007), help-seeking and communication (Evans *et al.*, 2005), reasons for self-harm (Rodham *et al.*, 2004), comparative findings on prevalence (Madge *et al.*, 2008) and associated factors (Madge *et al.*, 2011), and a prospective study of factors associated with DSH (O'Connor *et al.*, 2009a).

Objectives

The central aim of this thesis is to identify and describe the factors associated with vulnerability and resilience to deliberate self-harm among adolescents. The focus on resilience and positive outcomes is novel in this type of study.

In chapter 2 the first study is presented, which investigates the factors associated with self-harm in this population, drawing on the domains of psychological factors (depressive symptoms, anxiety, impulsivity and self-esteem), negative life events and lifestyle factors. The objective was to develop a comprehensive gender-specific profile of those young people who are vulnerable to self-harm by including a broad range of domains of risk. This chapter serves as an overview and was the impetus for the subsequent examination in greater depth of various aspects of self harm and associated factors.

Chapter 3 examines in depth one of the factors reported in Chapter 2 to be strongly associated with self-harm among boys in particular: school bullying victimisation. The importance of bullying experiences was a uniquely Irish finding and the potential for victimisation to be addressed at school level made it of particular interest. The main objectives were to examine associations between bullying and mental health factors and self-harm and to identify and compare the factors associated with vulnerability and resilience to deliberate self-harm among boys with a history of victimisation and those without. Both chapters 2 and 3 report findings of the Irish CASE centre.

In chapter 4 we explore links between some important factors identified in Chapter 2 as having associations with self harm: psychological/mental health factors and life events, using the large international CASE dataset. The large pooled dataset allowed for powerful analyses, and the potential for international comparisons was also important. Comparative international findings based on the data of the 7 centres are reported, prepared in collaboration with the international CASE co-ordinator, Professor Nicola Madge. In particular, we examine the dose-response hypothesis that increasing adversity, in terms of psychological characteristics and life events, is associated with increasing level and frequency of self-harm history. The large sample size allows for in-depth examination of this question.

Chapters 5 and 6 report the results of two studies utilising the Irish data. In chapter 5 we examine coping style and its associations with vulnerability or resilience to DSH. Previous work by the CASE centres had not examined coping style and its associations with self-harm among adolescents. Therefore, there was an opportunity for a novel examination of the topic. The aims of this study were to investigate associations between coping style, mental health factors and self-harm thoughts and acts among Irish adolescents. An innovative aspect of this study was the investigation of whether coping style mediates associations between mental health factors (depression, anxiety and self-esteem) and self-harm.

In chapter 6 the focus on resilience is developed further, with the examination of a resilient sub-group of adolescents who display positive adaptation despite having been exposed to the DSH or suicide of others. Although previous chapters and the broader literature had examined positive and protective factors, such a resilience approach had not been taken previously in the study of adolescent self-harm. A central aim was to identify the factors associated with vulnerability and resilience to self-harm in the high-risk group of young people who have been exposed to suicidal behaviour of others.

This work is presented in the format of a collated thesis, comprised of a series of publications, with each chapter appearing as submitted to or as published by the relevant peer-reviewed academic journal, as well as an Introduction and Discussion chapter. Chapters 2, 3 and 4 have been published, while Chapters 5 and 6 have been submitted to journals for peer review at the time of printing of the thesis. My work on this thesis began in 2006, after data collection had been completed. In the case of the studies reported in chapters 2,3,5 and 6 I was the lead author and carried out all of the tasks involved in formulating of the research questions, literature review, data examination, data re-coding, data analysis (with statistical support when required) and writing of the manuscript. In the case of chapter 4, I collaborated with Professor Nicola Madge, international co-ordinator of the CASE study and co-authors, and was involved in formulation of research questions, carrying out data analysis contributing to writing of the manuscript.

Statistical Analyses

A range of standard data analysis techniques were used throughout the work reported in this thesis, which, in the case of chapters 2,3,5 and 6 were applied by me with statistical support provided by co-authors where necessary. In the case of chapter 4, I was involved in analysis in collaboration with co-authors.

Chi-square tests were used to investigate the associations between pairs of categorical variables, for example between life events/demographics/lifestyle factors and history of self-harm. Mann-Whitney U-test was used to compare two groups in relation to a non-normally distributed continuous variable. One-way analysis of variance was used to compare more than two groups in relation to continuous measures, for example when examining scores on coping scales across four self-harm sub-groups. Pearson's correlation coefficient, *r,* was used to assess the strength of the linear association between continuous measures (depressive symptoms, anxiety, self-esteem, coping style). In chapter 4, the coefficient of determination, r^2, was used to measure the information in one measure that could be explained statistically by another. To investigate associations between gender and coping style (Chapter 5), boys and girls were compared using t-tests. Cronbach's alpha was used to assess the internal consistency for our sample of the validated psychological scales used (depression, anxiety, impulsivity, self esteem), and was reported for both the Irish sample (chapter 2) and the international sample (chapter 4).

Many of the objectives within the studies were addressed using uni-variate and multi-variate analyses of associations between a range of factors and lifetime history of DSH. Crude odds ratios and 95% confidence intervals were calculated. Multi-variate logistic regression was employed in order to address research questions in chapters 2,3,4 and 6 and allowed for the identification of factors independently associated with DSH. To check the consistency of the resulting model, in general a second approach was also taken; for example a forward method to check the consistency of the backward method used, and vice versa. In chapter 4, multinomial logistic regression was used to assess the associations between gender, age, country, psychological characteristics and reported stressful life event categories and self-harm history in the past year with a view to identifying which factors distinguished between adolescents reporting no self-harm, self-harm thoughts only, a single self-harm episode and multiple self-harm episodes. Associations were reported as odds ratios with 95% confidence intervals. Nagelkerke's r^2 was used as the estimate of the proportion of variance explained by the derived

regression model. Wald tests were carried out to identify the factors distinguishing adolescents with a single self-harm episode from those with self-harm thoughts only and factors distinguishing between multiple and single episode self-harmers.

In Chapter 5 we examined coping style, which was assessed using an eight-item scale which had not previously been validated. Principal component analysis using varimax rotation was used to investigate the number of factors represented by the 8 items of the coping scale. Cronbach alphas and inter-item correlations were reported for the two components identified.

As our large sample provided adequate power and a large number of statistically significant associations, effect size was measured and reported in the case of various analyses. Partial Eta^2 and Phi were used to guide the reader as to whether associations could be considered weak, moderate or strong (Cohen, 1988), making the reporting of significant findings more informative.

In chapter 4, the mediating effect of coping style on associations between psychological factors and DSH was tested in accordance with the four-step approach advocated by Baron and Kenny (Baron and Kenny, 1986). Firstly, the independent variable (in this case level psychological factors) should predict change in the outcome (eg DSH). Secondly, the independent variable (psychological factor) should predict change in the proposed mediator (coping style). Thirdly, change in the mediator should be significantly associated with change in the outcome. Finally, the effect of the independent variable on change in the outcome should be attenuated when change in the mediator is statistically controlled As there was evidence for partial mediation, Hayes' mediation analysis was used to test the significance of mediation, as this method allows for dichotomous dependent variables (Preacher and Hayes, 2008). This provided an estimate of the indirect effect of the independent variable on the dependent variable via the mediator and its standard error based on re-sampling. We referred the quotient of these (i.e. indirect effect

coefficient divided by standard error) to the standard Normal distribution to estimate its statistical significance which we reported.

The data were analysed using the statistical software package SPSS 16 (SPSS Inc., Chicago, Il, USA).

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Chapter 2

Factors associated with deliberate self-harm among Irish adolescents

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ABSTRACT

Background. Deliberate self-harm (DSH) is a major public health problem, with young people most at risk. Lifetime prevalence of DSH in Irish adolescents is between 8% and 12%, and it is three times more prevalent among girls than boys. The aim of the study was to identify the psychological, lifestyle and life event factors associated with self-harm in Irish adolescents.

Method. A cross-sectional study was conducted, with 3,881 adolescents in 39 schools completing an anonymous questionnaire as part of the Child and Adolescent Self-harm in Europe (CASE) study. There was an equal gender balance and 53.1% of students were 16 years old. Information was obtained on history of self-harm life events, and demographic, psychological and lifestyle factors.

Results. Based on multi-variate analyses, important factors associated with DSH among both genders were drug use and knowing a friend who had engaged in self-harm. Among girls, poor self-esteem, forced sexual activity, self-harm of a family member, fights with parents and problems with friendships also remained in the final model. For boys, experiencing bullying, problems with schoolwork, impulsivity, and anxiety remained.

Conclusions. Distinct profiles of boys and girls who engage in self-harm were identified. Associations between DSH and some lifestyle and life event factors suggest that mental health factors are not the sole indicators of risk of self-harm. The importance of school-related risk factors underline the need to develop gender-specific initiatives in schools to reduce the prevalence of self-harm.

Factors associated with deliberate self-harm among Irish adolescents

INTRODUCTION

Deliberate self-harm (DSH) is recognised worldwide as a major public health problem, with a severe impact on the individual, their family, and the health services (World Health Organisation, 1999). In Ireland, the highest rates of hospital-treated DSH are among 15–19 year-old girls (639 per 100,000) and 20–24 year-old men (433 per 100,000) (National Suicide Research Foundation, 2009). Young Irish men are also over-represented among those who die by suicide, with peak rates among those aged 20-24, unlike most European countries where suicide rates increase with age (National Suicide Research Foundation, 2009). Deliberate self-harm includes a range of behaviours associated with different levels of medical severity and varying levels of suicidal intent.

Population-based studies reveal prevalence of DSH to be much higher than indicated by hospital presentations. The school-based CASE study (Child and Adolescent Self-harm in Europe), on which this study is based, reported that 9.1% of Irish adolescents surveyed had harmed themselves at some point, of whom 45.9% reported repeated episodes (Morey *et al.*, 2008). This was a higher prevalence than previously reported by smaller scale school-based studies (Lynch *et al.*, 2006, O'Sullivan and Fitzgerald, 1998). Self-harm was much more common among girls than boys. Self cutting and overdose were the most common DSH methods (Morey *et al.*, 2008).

International comparisons of the prevalence of DSH have been aided by the development of rigorous methodologies including clear definitions of DSH, such as that used by seven international centres involved in the CASE study, including the present study based on the data of the Irish CASE centre. Lifetime prevalence of DSH in adolescents ranges from 5.7% (the Netherlands) to 17% (Australia) among girls and 2.4% (The Netherlands) to 6.5% (Belgium) among boys (Madge *et al.*, 2008).

Less than one fifth of adolescent self-harm comes to the attention of the health services, with approximately one third seeking help from their social circle only, and around half not seeking help at all (Ystgaard *et al.*, 2009). However, a history of self-harm is a major risk factor for repeated self-harm and subsequent suicide (Gunnell *et al.*, 2008, Tidemalm *et al.*, 2008). A retrospective study of young people who died by suicide found that almost half had a known history of DSH (Hawton *et al.*, 1999). Suicide is the leading cause of death in men aged 15-34 years in Ireland, and suicide rates among young people aged 15-19 in Ireland are the third highest in the European Union (Eurostat, 2009). Enhanced knowledge of the factors associated with self-harm is essential in developing appropriate education, prevention and screening programmes, which have been identified as important components of suicide prevention policies (Evans *et al.*, 2004, Garland and Zigler, 1993, Scott *et al.*, 2009). A growing number of population-based studies has examined various factors potentially associated with self-harm among young people (Evans *et al.*, 2004). Our school-based study aimed to examine a broad range of factors potentially associated with DSH in boys and girls from psychological, lifestyle and life event domains, using the novel and rigorous CASE methodology.

METHOD

Design and participants

The study was conducted using a cross-sectional design. Data were gathered in schools in counties Cork and Kerry in Ireland in late 2003 and early 2004. Power calculations indicated that a minimum of 3,000 students was required to return a 95% confidence interval of 9.0-11.0% for a postulated prevalence of DSH of 10%. A list of all schools within Cork and Kerry was obtained and each school was categorised by region as well as by type of school: co-educational, all boys or all girls. Using a random selection, 54 schools were invited to take part and 39 schools participated in the survey.

Principals and teaching staff were informed about the study procedure in advance. An information sheet and opt-out form was sent to parents. Students were also given the

opportunity to opt out on the day of the survey. Ethical approval for the study was granted by the Clinical Research Ethics Committee of the Cork Teaching Hospitals. The questionnaire was administered with a member of the research team present and completed by students in a class setting. After participants had completed the survey there was a general discussion about the help and support available for young people in their local communities and each participant received a resource kit. Students who wished to ask further questions could approach the facilitators after the session.

Measures

The survey in Ireland was part of the CASE study (Madge *et al.*, 2008). A standardized, internationally validated, anonymous questionnaire was designed by CASE collaborators and used for data collection by each of the seven centres involved in the study (six centres in Europe and one in Australia). The questionnaire comprised a wide range of variables, including demographics, lifestyle factors and questions about deliberate self-harm and self-harm thoughts. The questionnaire also included three validated psychological scales. Depressive symptoms and anxiety were measured using the Hospital Anxiety and Depression Scale (HADS), which has been validated for use with an adolescent population (White *et al.*, 1999). Cronbach's alphas for our sample were 0.71 and 0.79 for the depression and anxiety sub-scales respectively. Impulsivity was measured using six items from the Plutchik impulsivity scale (Plutchik *et al.*, 1989). This scale assesses impulsivity that is independent of aggressive behaviour and has shown good internal consistency and concurrent validity in adolescents (Grosz *et al.*, 1994, Plutchik and Van Praag, 1989). Self esteem was measured using an eight item version of the self concept scale (Robson, 1989). Strong convergent and discriminant validation of the scale has been reported (Addeo *et al.*, 1994). Cronbach's alphas for our sample were 0.71 for the impulsivity scale and 0.91 for the self esteem scale. The selection of variables included in the questionnaire was based on empirical findings of smaller-scale studies conducted previously which showed potential associations between DSH and various factors, as well as the theoretical literature concerning the self-harm process.

A distinctive aspect of this study was that participants who reported self-harm were asked to describe, in their own words, the method(s) they had used to harm themselves. This description was later coded according to a standardised definition of deliberate self-harm: "An act with non-fatal outcome in which an individual deliberately did one or more of the following: initiated behaviour (for example, self cutting, jumping from a height), which they intended to cause self-harm; ingested a substance in excess of the prescribed or generally recognisable therapeutic dose; ingested a recreational or illicit drug that was an act that the person regarded as self-harm; or ingested a non-ingestible substance or object" (Madge *et al.*, 2008). Episodes of deliberate self-harm were classified as a 'yes', 'no' or 'no information given' by three independent raters using the standardised definition above (Cohen's Kappa = 0.77). When participants reported that they had harmed themselves in the past but did not describe the act, they were classified "no information given" and were not included as a DSH case. The definition used allowed for a wide range of motives and levels of suicidal intent. Self-harm thoughts were defined as having thoughts of harming oneself without acting on them on that occasion.

Most questions relating to history of various negative life events were answered by "yes" or "no", and included the timing of the event (more than a year ago or within the past year). Additional questions relating to alcohol consumption included number of drinks consumed in a typical week and number of times drunk. For the purposes of this analysis, respondents were classified into four categories based on alcohol consumption and drunkenness pattern. Heavy drinking was defined as four or more episodes of drunkenness in the past year (Rossow *et al.*, 2007), and heavy drinkers were compared with all other patterns of alcohol consumption (abstainers, light and moderate drinkers). Smoking behaviour was categorised to include all current smokers in one category while non-smokers and ex-smokers formed the second category. Use of illegal drugs was assessed by questions relating to five different categories of illegal drug. Respondents with and without illegal drug use in the past year were included in

two separate categories. Information obtained on living arrangements was re-coded into either living with both parents or any other family structure for the purpose of this analysis.

Sample

Of the 54 schools invited to participate, 39 schools took part in the study. Of the 4,583 students invited to complete the questionnaire, 3,881 participated in the survey (85% response rate). Eighty surveys were then disregarded as these did not fit the age criteria of 15, 16 or 17 years, were not filled in seriously, or gender was missing. Surveys were judged to have not been completed seriously if responses were inconsistent or if they included statements indicating that the questionnaire was not taken seriously. Fifty two percent of the participants were girls and the majority (53.1%) of students were 16 years old.

Statistical analyses

Proportions of boys and girls reporting self-harm and self-harm thoughts were compared by calculating 95% confidence intervals assuming a t-approximation. Chi square tests were performed to investigate the associations between deliberate self-harm and potential associated factors. Because there was clear evidence that associations were modified by gender (i.e. interaction) all analyses were carried out separately for boys and girls. For each potential associated factor, we computed crude age-adjusted odds ratios for lifetime DSH. A multi-variate logistic regression model was constructed. The method used was backward with the usage of likelihood ratios. The probability for stepwise removal was set at 0.01. A low threshold for removal was set due to the large sample size giving adequate power and the fact that a wide range of variables were included with many statistically significant crude associations. All categorical variables entered in this model were dichotomous. To check the consistency of the model a forward approach with a probability of stepwise entry of 0.005 was also used. The data were analysed using the statistical software package SPSS 16.0.2 (SPSS Inc., Chicago, Il, USA).

RESULTS

Prevalence of DSH

More detailed findings on the prevalence of self-harm in our population have been reported elsewhere (Morey *et al.*, 2008). Marked gender differences were evident in prevalence of DSH, with more than three girls for every one boy reporting a lifetime history of DSH, DSH in the previous year and self-harm thoughts (Table 1).

Table 1 Prevalence of self-harm and self-harm thoughts (adapted from Morey *et al*., 2008)

	No of respondents	All	Girls		Boys		p-value
		no (%)	no (%)	99% C.I.	no (%)	99% C.I.	
Lifetime history of self-harm	3620	332 (9.2%)	253 (14.0%)	13.3%-14.7%	79 (4.4%)	4.0%-4.8%	<0.0005
Self-harm in past year	3654	207 (5.7%)	163 (8.9%)	8.3%-9.5%	44 (2.4%)	2.1%-2.7%	<0.0005
Self-harm thoughts in past year	3387	589 (21.6%)	393 (29.8%)	28.7%-30.9%	196 (13.2%)	12.5%-13.9%	<0.0005

Uni-variate analyses: association between lifetime history of DSH and risk factors

Lifetime history of DSH was associated with a range of mental health, psychological, lifestyle and life event factors (Table 2). All four psychological scales/subscales were strongly associated with DSH for both genders. Odds ratios for anxiety, self-esteem and impulsivity and DSH were higher for boys than for girls, with higher odds ratio for increased levels of depressive symptoms among girls than among boys.

Among girls, the factor most strongly associated with self-harm was serious physical abuse (OR: 12.03, 95% CI: 7.53-19.21). Among boys, knowing a friend who engaged in DSH was the factor most strongly associated with DSH (OR: 10.90, CI: 6.78-17.54). Both boys and girls who knew of a family member who engaged in DSH were more likely to report DSH themselves. For both genders, all negative life events examined were associated with DSH at the 0.005 level, with the exception of death of a family member among both girls and boys and death of someone else close among girls. Odds ratios for problems with a boyfriend or girlfriend were higher among boys (OR: 5.31, CI: 3.34-8.42) than among girls (OR: 2.82, CI: 2.12-3.74), as were worries about sexual orientation. Having experienced bullying at school was also more strongly associated with self-harm among boys than girls.

Potential associations between DSH and several lifestyle factors were examined. Those adolescents who had used illegal drugs in the past year reported more DSH than those with no drug use. The association between drug use and DSH was the strongest of all factors examined for both genders. Smoking and heavy drinking (defined by at least four episodes of drunkenness in the past year) were also significantly associated with DSH.

Table 2 Factors associated with lifetime history of self-harm

	Girls only			Boys only		
	Age-adjusted Odds ratio	**95% confidence interval**	**p-value**	**Age-adjusted Odds ratio**	**95% confidence interval**	**p-value**
Depression**	1.27	1.22-1.32	*	1.25	1.18-1.32	*
Self-esteem**	0.81	0.78-0.84	*	0.79	0.74-0.83	*
Anxiety**	1.22	1.18-1.27	*	1.31	1.24-1.39	*
Impulsivity**	1.19	1.13-1.24	*	1.31	1.21-1.41	*
Serious physical abuse	12.03	7.53-19.21	*	7.89	3.84-16.23	*
DSH of family member	7.60	5.61-10.29	*	7.22	4.28-12.18	*
Forced sexual activity	6.62	4.53-9.67	*	7.15	3.50-14.60	*
Fights with parents	5.66	4.20-7.63	*	4.56	2.82-7.35	*
DSH of friend	5.45	4.10-7.25	*	10.90	6.77-17.54	*
Drug taking in past year	5.42	4.10-7.18	*	6.46	3.78-11.05	*
Worries about sexual orientation	5.01	3.46-7.25	*	7.08	4.10-12.23	*
Trouble with the police	4.44	3.17-6.22	*	4.84	3.06-7.67	*
Problems with schoolwork	4.38	3.18-6.03	*	5.24	3.12-8.80	*
Other distressing event	3.83	2.89-5.06	*	3.11	1.87-5.17	*
Smoking	3.80	2.88-5.02	*	3.20	2.01-5.09	*
Fights with friends	3.64	2.71-4.91	*	3.88	2.43-6.18	*
Difficulty making/keeping friends	3.06	2.32-4.04	*	4.29	2.68-6.87	*
Arguments between parents	3.42	2.60-4.50	*	3.16	2.00-5.00	*
Boy/girlfriend problems	2.82	2.12-3.74	*	5.31	3.34-8.42	*
Heavy drinking	2.72	2.06-3.59	*	2.57	1.41-3.60	0.001
Bullied at school	2.61	1.97-3.46	*	4.07	2.57-6.44	*
Friend/family member suicide	2.24	1.62-3.10	*	3.79	2.21-6.48	*
Self/family member serious illness	2.16	1.64-2.83	*	2.14	1.36-3.37	0.001
Parents separated/divorced	2.03	1.43-2.88	*	3.10	1.80-5.33	*
Serious illness of close friend	2.00	1.51-2.65	*	2.00	1.26-3.17	0.003
Not living with both parents	1.71	1.23-2.37	0.001	2.81	1.70-4.64	*
Death of family member	1.33	0.86-2.04	0.198	2.15	1.11-4.17	0.024
Death of someone else close	1.13	0.84-1.53	0.414	2.52	1.46-4.34	0.001

*p<0.0005
** Odds Ratio for one point increase in score

Multi-variate analyses: association between lifetime history of DSH and risk factors

Based on multi-variate analysis, six factors remained associated with DSH among boys and seven factors among girls (Table 3). The only common factors which remained in the final model among both boys and girls were knowing a friend who had engaged in DSH and drug use in the past year. Of the four psychological scales/subscales included in the analysis, only self esteem remained in the final model for girls. For boys, both anxiety and impulsivity remained. For boys, two school-related factors were in the model: problems with keeping up with schoolwork and having experienced bullying at school. For girls, there were two factors in the domain of relationships: problems in making or keeping friends and serious fights with parents. Having been forced to engage in sexual activity against their will remained for girls only, as did knowledge of a family member who had engaged in DSH.

In terms of broad domains of risk factors, psychological and school-related factors featured strongly in the final model for boys, while interpersonal and relationship factors had greater importance for girls. The knowledge of self-harm by friends as well as drug use were common to both sexes.

Table 3 Multi-variate logistic regression for lifetime history of DSH

	Girls				Boys			
	Age-Adjusted OR	**95% CI**	**β**	**p-value**	**Age-adjusted OR**	**95% CI**	**β**	**p-value**
Anxiety					1.18	1.09-1.28	0.165	*
Impulsivity					1.17	1.05-1.30	0.154	0.004
Self esteem	0.88	0.83-0.92	-0.132	*				
DSH of friend	3.05	2.05-4.55	0.682	*	3.7	1.94-7.05	1.308	*
Any drugs in past year	3.92	2.63-5.86	1.367	*	3.1	1.61-5.97	1.131	0.001
DSH of family member	4.32	2.81-6.64	1.463	*				
Forced sexual activity	4.41	2.60-7.49	1.484	*				
Difficulty making/keeping	1.98	1.30-3.00	0.682	0.001				
Fights with parents	2.04	1.34-3.10	0.711	0.001				
Problems with schoolwork					2.54	1.26-5.09	0.930	0.009
Bullied at school					2.83	1.50-5.36	1.040	0.001

*$p<0.0005$

DISCUSSION

This school-based study sought to identify the factors associated with DSH among Irish adolescents. In our large representative sample we found that the factors strongly associated with the reporting of a lifetime history of DSH differed by gender, with each set of factors suggesting a profile of at-risk youth. The specific female profile is one involving low self-esteem, relationship problems (difficulties with parents and friends) and forced sexual activity. The male profile involves anxiety and impulsivity and school problems (bullying and schoolwork difficulties). Additionally, the factors shared by girls and boys relate to drug taking and knowing others who engage in DSH.

Our finding that knowledge of self-harm by a friend was strongly associated with DSH for both genders lends support to previous studies pointing to the contagion of suicidal behaviour (Borowsky *et al.*, 2001, Marusic *et al.*, 2004). The strong association we found between DSH and knowledge of DSH in a friend was also reported by other CASE study centres in Australia (De Leo and Heller, 2004) and the UK (Hawton *et al.*, 2002). The clustering of suicidal behaviour has been found to be a particularly distinctive feature among adolescents only (Gould *et al.*, 1994). Therefore, the school setting may be appropriate for interventions to limit possible "copycat" effects of self-harming behaviour. However, due to the cross-sectional design, investigation of pathways to self-harm was not possible.

Drug use in the past year was associated with DSH for both genders. It is worth noting that the majority of adolescents in this sample reported drug use, making this a relatively commonplace event among those who had not harmed themselves as well as those who had. However, unlike heavy drinking and smoking, use of illegal drugs remained in the multi-variate analysis for both genders. It may be that motives for drug taking and for DSH are similar. The mostly commonly reported motive for self-harm in this group of young people was *"to get relief from a terrible state of mind"* (Morey *et al*, 2008). Self-medication for psychological distress has also been reported to be a central motive in adolescent drug use (Sattar *et al.*, 2007). Therefore, it may be

that young people experiencing distress attempt to relieve these negative feelings through drug use and, in some cases, self-harm.

Consistent associations between depression and suicidal behaviour in adolescents have been reported elsewhere (Evans *et al.*, 2005). Although significantly associated with DSH in our uni-variate analyses, depressive symptoms did not remain in the multi-variate analysis for either gender. This echoes the findings of Harrington *et al* (2006), who reported that the independent contribution of major depression to risk of self-harm among adolescents was not significant (Harrington *et al.*, 2006). The fact that uni-variate analysis revealed strong associations between depressive symptoms and DSH in our sample while multi-variate analysis did not suggests that collinearity between psychological measures may be an issue. Hawton *et al* (2002) reported that, for the English CASE centre, psychological factors were more strongly associated with DSH among girls than boys and that depression, anxiety, impulsivity and self-esteem all remained in the final model for girls. In contrast, we found that mental health/ psychological factors were more important for boys, with the exception of depression. Anxiety and impulsivity remained in the final model for boys, indicating a profile of young male self-harm in Ireland which is distinct in its psychological correlates. The finding that self esteem remained in the final model for girls is in keeping with other studies (Beautrais *et al.*, 1999).

Adolescents who had self-harmed had significantly higher levels of anxiety, depression and impulsivity and lower self-esteem than those who had not, supporting the view that adolescent self-harmers of both sexes form a sub-group with more severe psychopathology (Voros *et al.*, 2005). However, our findings that certain life events, exposure to DSH in others, and drug use have stronger associations with DSH than some mental health factors offer alternative indicators for the identification of at-risk youth.

This study was carried out using a cross-sectional design, which makes it difficult to draw conclusions on causal or temporal relations between risk factors and DSH. The study examined

self-harm episodes reported to have happened at any time in the past, and therefore reported self-harm did not necessarily occur after the various associated factors and events, making it difficult to draw conclusions on causality. The psychological scales and lifestyle items measured current state and lifestyle at one time point only, which may have been up to several years after any reported DSH. Controlled longitudinal studies are recommended in order to examine the direction of the effect and specificity of the risk factors associated with DSH. This study does not examine the severity of self-harming behaviour. Further research should focus on the subgroup of adolescents who report repeated DSH, as these may constitute a group at high risk of further self-harm and suicide. A continuum of severity could be postulated which ranges from no self-harm thoughts or behaviour, through self-harm thoughts only, single episode DSH and repeated DSH. A prospective study has reported that the factors associated with a first act of DSH in adolescence differ from those associated with a repeat act (O'Connor *et al.*, 2009a), underlining the importance of examining different stages of the self-harm process. This study focused on identifying factors associated with risk of self-harm in adolescents. There may also be positive configurations of lifestyle and psychological factors which confer resilience to suicidal behaviour, and which should be the focus of further research due to their relevance to promotion of positive mental health among adolescents.

Despite these methodological limitations, the strengths of our study include the use of multi-variate analysis to describe a range of factors associated with DSH for each gender. The wide range of risk factors identified by the survey supports a life-course model of the aetiology of deliberate self-harm, in which risk of developing suicidal behaviour depends on accumulation of psychological and social factors and a broad variety of negative life events across the lifespan from childhood into adolescence (Fergusson et al., 2000). The associations we have identified between lifetime history of certain life events and DSH may reflect the importance of childhood experiences as well as more age-specific stressors associated with adolescence.

Research examining whether national trends and cross-national differences in prevalence of DSH are mirrored in suicide rates has revealed contradictory findings (O'Connor *et al.*, 2009b, Portzky *et al.*, 2008). However, it is worth noting that a remarkable characteristic of Irish suicide rates in recent years is the sharp increase in suicide among young men since the 1990s (Department of Public Health, 2001). Prospective studies of those treated for DSH have found strong links between DSH and subsequent suicide (Hawton *et al.*, 1993, Tidemalm *et al.*, 2008). The relatively low prevalence of DSH among boys, combined with the high rates of suicide in males in this age group, may indicate that the sub-group of boys who report DSH is a particularly high risk group. It is also a possibility that some boys were reluctant to disclose details of their self-harm, resulting in artificially low prevalence (Keeley, 2008). The profile of the male adolescent self-harmer described here as involved in drug use, with high levels of impulsivity and anxiety and with peers who have also self-harmed bears a close resemblance to the profile of young men who die by suicide (Walinder and Rutzt, 2001). Interestingly, such a profile does not mirror that reported by the English CASE centre, which found anxiety and impulsivity to be most associated with DSH among girls (Hawton *et al.*, 2002).

As well as striking similarities in terms of the importance of factors such as knowledge of DSH in others and drug use, there are some important differences between our findings and those of the English and Scottish CASE studies, nearest geographically to Ireland. Forced sexual activity was associated with DSH among girls in our multi-variate analysis but this was not the case in the English or Scottish studies. This association warrants further examination in terms of prevalence and correlates among the Irish sample. Among boys, the strength of the association between two school-related factors; school bullying and, in particular, problems with schoolwork, was unique among CASE centres. Problems with schoolwork were the most frequently reported of all negative life events for both genders among our sample (Sullivan *et al.*, 2004). The associations between DSH and schoolwork problems and school bullying may reflect the particular social and educational pressures of second-level education in Ireland.

Given the fact that DSH is common among adolescents, schools have an important role to play in its prevention. Our findings also underline the importance of school based risk factors among boys, bringing the focus onto the school as central in preventing self-harm and suicide in boys. This in keeping with the recommendations of the Irish *"Reach Out"* strategy for suicide prevention (Health Service Executive, 2005). Primary prevention strategies should aim to modify factors associated with self-harm through promotion of positive mental health among all students, and through equipping students with the skills to positively manage stress and interpersonal conflict (Sullivan *et al.*, 2004). Our findings also point to the importance of anti-bullying initiatives and drugs education. Secondary prevention strategies could be aimed at individuals who have been identified as at risk of suicidal behaviour. School-based screening has been found to identify suicidal and emotionally troubled adolescents who had not been identified as at-risk by school staff (Scott *et al.*, 2009). Early support and help for young people who have harmed themselves are crucial to prevent further episodes, as environmental influences on suicidal behaviour have been shown to be most pronounced early in the suicidal process, but less so following repeated episodes (Neeleman *et al.*, 2004). School welfare staff are ideally placed to provide this support, and specific training in managing self-harm has been found to increase their confidence and skills (Robinson *et al.*, 2008). The school environment is also a critical arena in which the stigma surrounding mental health problems must be tackled (Health Service Executive, 2005). Knowledge of the gender- and country-specific profile of young people who engage in self-harm can inform prevention strategies and aid identification of those at risk.

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Chapter 3

Bullying victimisation, self-harm and associated factors in Irish adolescent boys.

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ABSTRACT

School bullying victimisation is associated with poor mental health and self-harm. However, little is known about the lifestyle factors and negative life events associated with victimisation, or the factors associated with self-harm among boys who experience bullying. The objectives of the study were to examine the prevalence of bullying in Irish adolescent boys, the association between bullying and a broad range of risk factors among boys, and factors associated with self-harm among bullied boys and their non-bullied peers. Analyses were based on the data of the Irish centre of the Child and Adolescent Self-harm in Europe (CASE) study (boys n=1,870). Information was obtained on demographic factors, school bullying, deliberate self-harm and psychological and lifestyle factors including negative life events. In total 363 boys (19.4 %) reported having been a victim of school bullying at some point in their lives. The odds ratio of lifetime self-harm was four times higher for boys who had been bullied (OR 4.07, 95% CI: 2.57-6.44) than those without this experience. The factors that remained in the multi-variate logistic regression model for lifetime history of bullying victimisation among boys were serious physical abuse (OR 11.22, CI 3.16-39.87) and self esteem (OR 0.81, CI 0.76-0.88 for one point increase in score). Factors associated with self-harm among bullied boys included psychological factors, problems with schoolwork, worries about sexual orientation and physical abuse, while family support was protective against self-harm. Our findings highlight the mental health problems associated with victimisation, underlining the importance of anti-bullying policies in schools. Factors associated with self-harm among boys who have been bullied should be taken into account in the identification of boys at risk of self-harm.

Bullying victimisation, self-harm and associated factors in Irish adolescent boys.

INTRODUCTION

Self-harm is common among adolescents and a wide range of factors, including school bullying victimisation, are associated with self-harm in this group (Evans *et al.*, 2004, Fergusson *et al.*, 2003). Self-harm is a major risk factor for repeated self-harm and subsequent suicide (Gunnell *et al.*, 2008, Tidemalm *et al.*, 2008), and so pathways to self-harm among young men are of particular interest.

Suicide is the leading cause of death in men aged 15-34 years in Ireland, with suicide rates among young men aged 15-19 in Ireland the third highest in the European Union (Eurostat, 2009). A gender paradox in suicidal behaviour has been described whereby suicide mortality is generally higher among men than women in Western cultures, despite lower prevalence of suicidal ideation and non-fatal suicidal behaviour (Canetto and Sakinofsky, 1998). Trends in Irish suicide are somewhat unique as suicide rates peak in young men, unlike most European countries where rates increase with age (Health Service Executive; National Suicide Review Group and Department of Health and Children, 2005). Rates of hospital-treated self-harm also peak in men in the 20-24 years age group and have increased significantly in recent years (National Suicide Research Foundation, 2009). These national trends have led to a media, government and research focus on potential causes and prevention of suicide and self-harm in young men (Department of Public Health, 2001).

The psychological impact of particularly rapid social change in Ireland over the past three decades has been cited as a potential cause of the increase in suicide and self-harm among young men (Cleary and Brannick, 2007, Smyth *et al.*, 2003). In particular, the doubling of suicide rates in the 1980's and 1990's has been associated with the undermining of traditional institutions and the transition to a wealthy, secular and individualist society. Increasing

economic prosperity and personal freedom is generally beneficial, but less so for those with fewer resources at their disposal (Cleary and Brannick, 2007, Eckersley and Dear, 2002).

An Irish study of young men revealed a pessimistic view of life, as 60% believed that "The lot of the average man is getting worse" (Begley *et al.*, 2003). However, few causal links between indicators of change and male suicide have been identified (Cleary, 2005). The fact that men are disproportionately affected by suicide has been attributed to the fact that men are more reluctant than women to seek help for psychological problems (Cleary, 2005) and consequently have lower rates of diagnosis and treatment of depression (Rutz *et al.*, 1995). Canetto & Sakinofsky (1998) also reported evidence for the influence of "cultural scripts" which sometimes make suicide an acceptable course of action for Western men. However, in Ireland attitudes reflecting justification of suicide showed an upward trend in the 1980s and were reversed in the 1990s (Cleary and Brannick, 2007).

Bullying victimisation is a common problem among adolescents of both sexes (Kaltiala-Heino *et al.*, 1999, Nansel *et al.*, 2001, Salmon *et al.*, 1998), with lifetime prevalence of between 10.5% and 29.6% reported in a multi-centre European study (Analitis *et al.*, 2009). An Irish study reported that 15.6% of 12-18 year olds had been bullied at some point (O'Moore *et al.*, 1997). Among adolescents, bullying most often takes place within the school environment (Brunstein Klomek *et al.*, 2007). Boys more often report both bullying others (Juvonen *et al.*, 2003) and being the victim of bullying than girls (Brunstein Klomek *et al.*, 2007, Hazemba *et al.*, 2008, Salmon *et al.*, 1998).

Victims of bullying suffer not only distress but social marginalisation and low status among their peers, while bullies have high social status as rated by their peers and are considered psychologically stronger than victims (Juvonen et al., 2003). Hodges and Perry (1999) described the vicious cycle whereby peer rejection is both an antecedent and a consequence of peer victimisation (Hodges and Perry, 1999). This peer rejection and perceived weakness may

be particularly difficult for boys given the associations of failure in the masculine role, and may contribute to the fact that boys are less likely than girls to seek help when they are victimised (Hunter *et al.*, 2004).

Bullying victimisation warrants attention in the context of self-harm among young men because of its association with suicidal ideation (Rigby and Slee, 1999) and deliberate self-harm (Barker *et al.*, 2008, Cleary, 2000, Kim *et al.*, 2005, Mills *et al.*, 2004) as well as with a wide range of mental health problems, such as depression (Brunstein Klomek *et al.*, 2007, Kaltiala-Heino *et al.*, 1999, Seals and Young, 2003), anxiety (Cleary, 2000), eating disorders (Kaltiala-Heino *et al.*, 2000) and poor self-esteem (Delfabbro *et al.*, 2006). A Danish longitudinal study reported that boys who were bullied at school were at increased risk of being diagnosed with depression between the ages of 31 and 51 compared with those without the experience of school bullying victimisation (Lund *et al.*, 2009).

Such findings suggest that the distress and peer rejection reported as associated with victimisation are precursors of mental health problems and the associated risk of self-harm. On the other hand, Hodges and Perry (1999) reported that pre-existing mental health problems contributed to becoming a victim of bullying, which again increased later symptoms. The direction of causality between bullying and mental health problems such as depression, low self esteem and suicidal behaviour can thus be both ways. Nonetheless, theoretical models of the aetiology of self-harm such as a life-course model which postulates that the risk of developing suicidal behaviour depends on accumulation of a broad variety of psychological and social risk factors across the lifespan from childhood into adolescence (Fergusson *et al.*, 2000) can inform study of bullying and its association with poor mental health and self-harm. Bullying victimisation can be viewed as one of the negative life events which make an independent contribution to the development of self-harm and one which is particularly relevant in childhood and adolescence.

To date, a small number of Irish studies have highlighted the mental health problems associated with bullying victimisation (Mills *et al.*, 2004, O'Moore *et al.*, 1997), but none has looked at a wide range of potential associated risk and protective factors and none has focused specifically on boys. A small-scale cross-sectional Irish study which examined mental health difficulties associated with bullying in adolescents found that those who had been bullied were significantly more likely to be depressed compared to those without this experience. Moreover, they were more likely to report self-harm thoughts, to report serious self-harm acts and referrals to psychiatric services (Mills et al., 2004). Several centres of the Child and Adolescent Self-harm in Europe (CASE) study, of which this study is part, found no significant associations between bullying and self-harm in their multi-variate logistic regression models for history of self-harm (De Leo and Heller, 2004, Hawton *et al.*, 2002, Ystgaard *et al.*, 2003), while a Scottish study found an association for both boys and girls (O'Connor *et al.*, 2009). A strong association between school bullying victimisation and self-harm among boys (but not among girls) was reported by the Irish centre of the CASE study (McMahon *et al.*). Given these findings, potential associations between bullying and self-harm thoughts and acts in Irish adolescent boys require further investigation.

The aims of the present study were: 1) To investigate the prevalence of self-reported school bullying victimisation among boys (hereafter referred to as simply victimisation), 2) To examine associations between bullying and psychological/ mental health factors: depression, anxiety, self esteem and impulsivity, 3) To examine associations between victimisation and a broad range of lifestyle and life event factors among adolescent boys, 4) To compare those boys with and without the experience of victimisation in terms of prevalence of self-harm, 5) To identify and compare the factors associated with deliberate self-harm among boys with a history of victimisation and those without.

METHOD

The study used a cross-sectional design. Data were gathered in schools in the Southern region of the Health Service Executive, Ireland, in 2003/2004. Using random selection, 54 schools were invited to take part and 39 schools participated in the survey. Ethical approval for the study was granted by the Clinical Research Ethics Committee of the Cork Teaching Hospitals. The questionnaire was completed by students in a class setting with a member of the research team present. The methodology of the study has been fully described elsewhere (Morey C, 2008).

Participants

Of the 54 schools invited to participate, 39 schools took part. 4,583 students were invited to complete the questionnaire and 3,881 participated in the survey (85% response rate). The sample was representative of the target population in terms of gender balance, urban/rural school location and school type (single sex or co-educational). Eighty surveys were then disregarded as they did not fit the age criteria of 15, 16 or 17 years, were not filled in seriously, or sex of participant was not stated. Surveys were judged to have not been completed seriously if responses were inconsistent or if they included statements indicating that the questionnaire was not taken seriously. Moreover, 51 surveys were excluded because there was no information regarding bullying. Thus, 3,750 questionnaires were included in this study and 49.8% (n=1,870) of participants were boys. The majority (53.2%) of students were 16 years old.

Variables and measurement

This survey was part of the Child and Adolescent Self-harm in Europe (CASE) study (Madge *et al.*, 2008). A standardized, internationally validated, anonymous questionnaire was designed by CASE study collaborators and used for data collection by each of the 7 centres involved in the study (6 centres in Europe and one in Australia). The questionnaire included items relating to the following: demographics (sex, age and living arrangements), lifestyle (smoking, alcohol and substance use), and social support (can talk to a family member about what really bothers you;

can talk to a teacher about what really bothers you; can talk to a friend about what really bothers you; can talk to a another person about what really bothers you)

Life Events

- Suicidal behavior (deliberate self-harm; self-harm thoughts; suicide of a friend; suicide of a family member; self-harm of a friend; self-harm of a family member)
- Problems with/between parents (serious fights with parents; serious fights between parents; divorce of parents)
- Problems with peers (serious problems with a boyfriend/girlfriend; serious fights with friends; difficulties making or keeping friends)
- Experience of illness or death (death of a family member; death of someone else close; serious illness of the respondent or a family member; serious illness of a friend)
- Experience of abuse (forced sexual activity, serious physical abuse)
- Problems with schoolwork
- Worries about sexual orientation (although worries about sexual orientation were recorded, sexual orientation itself was not included in the demographic section of the questionnaire)
- Other distressing event

All questions relating to life events (including deliberate self-harm and self-harm thoughts) included a further question to elicit the timing of the most recent event; more than a year ago or within the past year. Questions relating to self-harm also included a category for episodes within the past month.

The questionnaire also included three validated psychological scales. Depressive symptoms and anxiety were measured using the Hospital Anxiety and Depression Scale (HADS), which has been validated for use with an adolescent population (White *et al.*, 1999). Cronbach's alphas for our sample were 0.71 and 0.79 for the depression and anxiety sub-scales respectively. Each subscale comprises seven items with total scores ranging from 0 to 21 on each scale. Higher

scores indicate higher levels of anxiety or depressive symptoms. Impulsivity was measured using six items from the Plutchik impulsivity scale with scores ranging from 6 to 24 (Plutchik *et al.*, 1989). Higher scores on this scale indicate higher levels of impulsivity independent of aggressive behavior. Self esteem was measured using an eight item version of the self concept scale with scores ranging between 8 and 32 (Robson, 1989). Cronbach's alphas for our sample were 0.71 for the impulsivity scale and 0.90 for the self esteem scale.

The selection of variables included in the study was based on empirical findings establishing their relevance and importance socially or psychologically in adolescence. We aimed to identify the social, psychological and lifestyle profile of boys who experience bullying, and this motivated the selection of potential associated factors.

The definition of deliberate self-harm used by raters was: "An act with a non-fatal outcome in which an individual deliberately did one or more of the following: initiated behaviour (for example, self cutting, jumping from a height), which they intended to cause self-harm; ingested a substance in excess of the prescribed or generally recognisable therapeutic dose; ingested a recreational or illicit drug that was an act that the person regarded as self-harm or ingested a non-ingestible substance or object."(Madge et al., 2008). The definition used allowed for a wide range of motives and possible suicidal intent was not assessed. Self-harm thoughts were defined as having thoughts of harming oneself without acting on them on that occasion. Self-harm thoughts and deliberate self-harm acts can both be classified as suicidal behaviours, a term which generally describes the spectrum ranging from thoughts of self-harm through to suicide.

The question relating to bullying asked "Have you been bullied at school?" and was answered by "yes" or "no", and included the timing of the event (more than a year ago or within the past year). Questions relating to lifestyle gathered additional data relating to number of drinks consumed in a typical week, number of times drunk, number of cigarettes smoked per week,

and types of drugs taken in past year and month. In the case of drinking alcohol, we classified respondents into four categories based on alcohol consumption and drunkenness pattern for the purposes of this analysis. Heavy drinking was defined as a report of four or more episodes of drunkenness in the last year (Rossow *et al.*, 2007), and heavy drinkers were compared with all other patterns of alcohol consumption (abstainers, light and moderate drinkers). In the case of smoking, all current smokers were included in one category, while non-smokers and ex-smokers formed the second category. In the case of drug-taking, those having taken any illegal drug in the past year formed one category, with those with no drug use in the past year forming the second category. Information given on living arrangement was re-coded into either living with both parents or any other family structure for the purposes of this analysis.

Statistical analyses

Numbers and percentages of boys reporting past year and lifetime history of bullying victimisation were reported by age. Spearman's rho tests were used to investigate potential correlations between age and prevalence of bullying. Mann Whitney U-tests were used to compare boys with and without a history of bullying victimisation in terms of depression, anxiety, impulsivity and self esteem (scores on all scales were not normally distributed, therefore non-parametric tests were used).

We used chi squared tests to investigate the associations between bullying victimisation and demographic, lifestyle, psychological, social support and life event factors among boys. For each potential associated factor, crude age-adjusted odds ratios for lifetime history of bullying were computed. A full multi-variate model was constructed. The method used was forward with the usage of likelihood ratios. The probability for stepwise entry was set at 0.005. A high threshold for entry was set due to the large sample size giving adequate power and the fact that a wide range of variables were included with many statistically significant crude associations. All variables which showed uni-variate associations with victimisation ($p<0.05$) were included in the multi-variate model. All categorical variables entered in this model were dichotomous.

To check the consistency of the model a backward approach with a probability of stepwise removal of 0.01 was also used. Chi square tests were performed to investigate the association between lifetime history of school bullying and self-harm and self-harm thoughts and also to investigate the associations between self-harm and demographic, lifestyle, psychological, social support and life event factors among bullied and non-bullied boys. For each potential associated factor, crude age-adjusted odds ratios for lifetime history of self-harm were computed. Data were analysed using the statistical software package SPSS 16.0.2. (SPSS Inc., Chicago, Il, USA).

RESULTS

Prevalence of school bullying victimisation

Bullying victimisation in the past year was reported by 4.3% of boys (Table 1). There was a correlation between age and prevalence of reporting bullying in the past year, with prevalence decreasing with increasing age (Spearman's rho, p=0.38). Lifetime history of school bullying victimisation was reported by almost one fifth of boys.

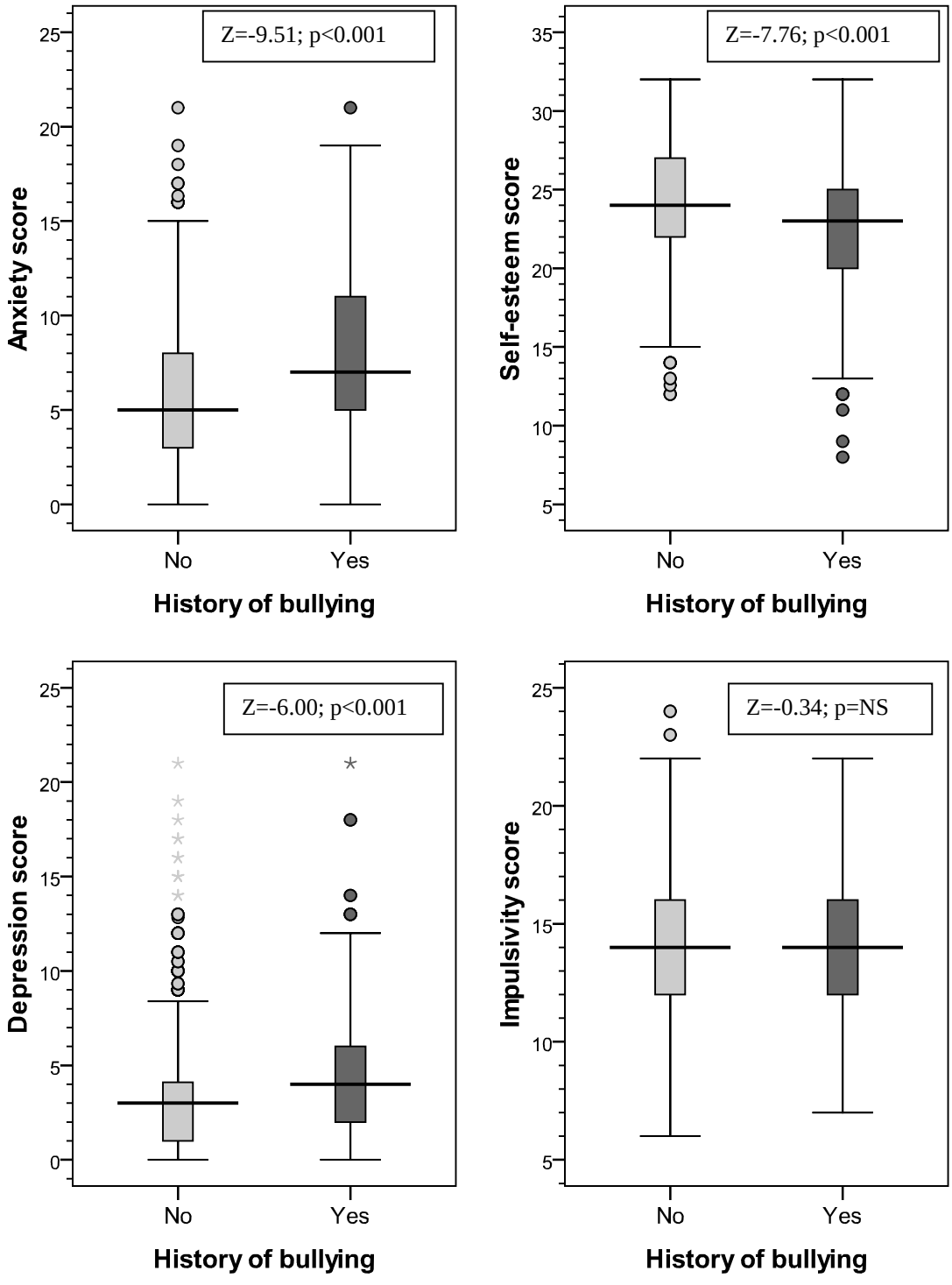
Table 1. Prevalence of school bullying victimisation among boys

	Age	**no. bullied/ n**	**% bullied**
Bullied in the past year	All	80/1870	4.3%
	15-year olds	25/420	6.0%
	16-year-olds	41/996	4.1%
	17-year-olds	14/454	3.1%
Bullied lifetime prevalence	All	363/1870	19.4%
	15-year olds	82/420	19.5%
	16-year-olds	190/996	19.1%
	17-year-olds	91/454	20.0%

Associations between bullying victimisation and psychological factors.

Lifetime history of victimisation was associated with scores indicating poorer mental health on three of the four psychological scales (Figure 1), while no significant effects were found for impulsivity. Boys who had been bullied had significantly higher levels of depression and anxiety and poorer self esteem (Mann Whitney U-test, $p<0.001$ for all three scales) than those without this experience.

Figure 1. Association between lifetime history of school bullying victimisation and psychological factors for boys*



* Higher scores indicate higher levels of depression, impulsivity and anxiety. Higher scores indicate more positive self-esteem.

Associations between victimisation and lifestyle, life event and psychological factors

According to uni-variate analyses, a broad range of factors was associated with lifetime history of victimisation among boys (Table 2). Problems with peers and problems with parents were strongly associated with being a victim of bullying, with the highest odds ratio for difficulty in making or keeping friends (OR 5.64, CI 4.28-7.42). Other relationship problems associated with victimisation were serious arguments or fights with friends, serious fights with parents and problems between parents. Self-harming behaviour was associated with victimisation at different levels. Deliberate self-harm acts and self-harm thoughts in the past year were significantly associated with victimisation. In addition, knowing a friend who had engaged in deliberate self-harm was also significantly associated with the experience of victimisation. Boys who had been bullied had significantly higher levels of depressive symptoms and anxiety, and poorer self-esteem than those without a history of victimisation, while impulsivity was not associated. Worries about sexual orientation were strongly associated with reporting victimisation, as was serious physical abuse and problems with schoolwork. Of the lifestyle factors examined, heavy drinking (four or more episodes of drunkenness in the past year) was negatively associated with being a victim of bullying (OR0.72, CI 0.56-0.93) while smoking and drug taking were not associated with victimisation. Social support from a family member or from a friend were both negatively associated with reported bullying victimisation.

Table 2. Factors associated with lifetime history of school bullying victimisation among boys

	Age-adjusted Odds ratio	95% confidence interval	p-value
Psychological Factors			
Anxiety[a]	1.16	1.13-1.20	<0.001
Depression[a]	1.11	1.07-1.15	<0.001
Self esteem[a]	0.88	0.85-0.91	<0.001
Impulsivity[a]	1.01	0.97-1.05	0.79
Problems with peers			
Difficulty making/keeping friends[‡]	5.64	4.28-7.42	<0.001
Serious fights with friends[‡]	3.00	2.37-3.81	<0.001
Boy/girlfriend problems[‡]	1.48	1.11-1.97	0.007
Problems with/between parents			
Serious arguments between parents[‡]	2.29	1.79-2.94	<0.001
Serious fights with parents[‡]	1.73	1.37-2.20	<0.001
Parents separated/divorced[‡]	1.05	0.71-1.53	0.82
Self-harm			
Deliberate self-harm[‡]	4.07	2.57-6.44	<0.001
Self-harm thoughts in past year	3.33	2.49-4.45	<0.001
Self-harm by friend[‡]	2.26	1.66-3.06	<0.001
Self-harm by family member[‡]	1.74	1.18-2.57	0.006
Friend/family member suicide[‡]	1.61	1.13-2.29	0.008
Social Support			
Can talk to a friend about what bothers you	0.61	0.46-0.79	<0.001
Can talk to family member about what bothers you	0.67	0.51-0.88	0.004
Can talk to teacher about what bothers you	1.40	0.99-1.97	0.06
Can talk to someone else about what really bothers you	0.89	0.68-1.17	0.41
Lifestyle Factors			
Heavy drinking	0.72	0.56-0.93	0.012
Smoking	1.22	0.94-1.59	0.14
Drug taking in past year	0.97	0.76-1.23	0.79
Abuse			
Serious physical abuse[‡]	3.34	1.91-5.82	<0.001
Forced sexual activity[‡]	1.70	0.94-3.08	0.08
Other factors			
Worries about sexual orientation[‡]	4.25	2.86-6.31	<0.001
Other distressing event[‡]	2.13	1.59-2.86	<0.001
Problems with schoolwork[‡]	1.64	1.30-2.06	<0.001
Trouble with the police[‡]	0.88	0.67-1.16	0.37
Not living with both parents	1.01	0.73-1.40	0.94
Experience of illness/death			
Self/family member serious illness[‡]	1.72	1.36-2.17	<0.001
Death of someone else close[‡]	1.66	1.29-2.13	<0.001
Serious illness of close friend[‡]	1.37	1.07-1.76	0.014
Death of family member[‡]	0.89	0.58-1.39	0.61

[a]Odds ratio for one point increase in score
[‡]Lifetime history

Multi-variate logistic regression was carried out in order to identify the factors independently associated with victimisation among boys. Serious physical abuse (OR 11.22, β 2.418, CI 3.16-39.87), and self esteem (OR 0.81, β -.205, CI 0.76-0.88) remained in the multi-variate model.

School bullying victimisation and deliberate self-harm

We examined the associations between having ever experienced victimisation and deliberate self-harm for boys (Table 3). Boys who had experienced victimisation reported more self-harm thoughts (χ^2=70.67, p<0.001), self-harm in the past year (χ^2=27.42, p<0.001), and lifetime history of self-harm (χ^2=40.83, p<0.001) than those without this history. More than one third of those bullied in the past year reported self-harm thoughts in the past year. Nearly one in ten boys who had been bullied reported at least one act of self-harm in the past year, which is more than four times higher than their peers who had not been bullied.

Table 3. School bullying victimisation and deliberate self-harm among boys

	Not bullied group: Percentage with self-harm	**Bullied group: Percentage with self-harm**	**Odds Ratio, 95% Confidence Interval**	**χ^2**	**p-value**
Self-harm thoughts in past year	10.0% (147/1464)	27.1% (94/347)	3.33(2.49-4.45)	70.67	p<0.001
Self-harm lifetime	2.9% (42/1442)	10.8% (37/342)	4.07 (2.57-6.44)	27.42	p<0.001
Self-harm past year	1.5% (22/1451)	6.4% (22/346)	4.43 (2.42-8.10)	40.83	p<0.001

Factors associated with lifetime history of deliberate self-harm among boys with and without a history of bullying victimisation

We examined associations between self-harm and a wide range of psychological, lifestyle and life event factors for boys who had been bullied and those who had not (Table 4). Among boys with a history of victimisation, highest odds ratios for lifetime history of self-harm were problems with schoolwork, serious physical abuse, worries about sexual orientation (OR 5.59, CI 2.63-11.88) and self-harm thoughts in the past year (OR 5.55, CI 2.67-11.56). Among non-

bullied boys, highest odds ratios for self-harm were self-harm by a friend (OR 16.82, CI 8.77-32.24), self-harm by a family member (OR 10.70 , CI 5.41-21.17), self-harm thoughts in the past year (OR 10.01, CI5.17-19.47) and drug taking in the past year (OR 9.35, CI4.11-21.23). Being able to talk to a family member about what bothers you was negatively associated with self-harm (OR 0.21, CI 0.09-0.46) among both bullied and non-bullied boys (OR0.41, CI 0.20-0.83).

All four psychological scales (depression, anxiety, self esteem and impulsivity) were strongly associated with self-harm for both the bullied and the non-bullied groups, with higher odds ratios for self-harm for the bullied group on all four scales.

Table 4. Factors associated with lifetime history of self-harm among boys with and without lifetime history of school bullying victimisation

	Boys with a lifetime history of school bullying			**Boys without a lifetime history of school bullying**		
	Age-adjusted Odds ratio	95% confidence interval	p-value	Age-adjusted Odds ratio	95% confidence interval	p-value
Psychological Factors						
Impulsivity[a]	1.37	1.20-1.55	<0.001	1.27	1.15-1.41	<0.001
Depression[a]	1.34	1.21-1.49	<0.001	1.16	1.07-1.26	<0.001
Self esteem[a]	0.75	0.67-0.83	<0.001	0.86	0.79-0.93	<0.001
Anxiety[a]	1.32	1.20-1.45	<0.001	1.26	1.17-1.36	<0.001
Problems with peers						
Difficulty making/keeping friends[‡]	4.77	2.26-10.07	<0.001	1.60	0.66-3.88	0.295
Boy/girlfriend problems[‡]	3.69	1.81-7.50	<0.001	6.10	3.26-11.40	<0.001
Serious fights with friends[‡]	2.83	1.32-6.07	0.007	3.25	1.75-6.02	<0.001
Problems with/between parents						
Serious fights with parents[‡]	5.00	2.32-10.77	<0.001	3.66	1.94-6.88	<0.001
Serious arguments between parents[‡]	2.93	1.45-5.90	0.003	2.32	1.22-4.43	<0.001
Parents separated/divorced[‡]	3.06	1.26-7.42	0.014	3.44	1.68-7.03	<0.001
Self-harm						
Self-harm thoughts in past year	5.55	2.67-11.56	<0.001	10.01	5.17-19.47	<0.001
Self-harm by friend[‡]	4.53	2.20-9.35	<0.001	16.82	8.77-32.24	<0.001
Self-harm by family member[‡]	3.29	1.40-7.73	0.006	10.70	5.41-21.17	<0.001
Friend/family member suicide[‡]	2.30	0.97-5.49	0.059	4.84	2.40-9.75	<0.001
Social Support						
Can talk to teacher about what bothers you	0.61	0.18-2.09	0.43	0.22	0.03-1.62	0.14
Can talk to family member about what bothers you	0.21	0.09-0.46	<0.001	0.41	0.20-0.83	0.013
Can talk to someone else about what bothers you	0.30	0.09-1.02	0.053	0.96	0.44-2.07	0.91
Can talk to a friend about what bothers you	0.66	0.31-1.44	0.300	1.52	0.59-3.94	0.39
Lifestyle factors						
Drug taking in past year	5.03	2.38-10.60	<0.001	9.35	4.11-21.23	<0.001
Heavy drinking	1.43	0.69-2.95	0.34	4.27	2.13-8.57	<0.001
Smoking	2.15	1.04-4.43	0.04	4.13	2.21-7.75	<0.001
Abuse						
Serious physical abuse[‡]	6.26	2.39-16.42	<0.001	4.81	1.38-16.78	0.014
Forced sexual activity[‡]	4.75	1.48-15.19	0.009	7.99	3.12-20.49	<0.001
Other factors						
Problems with schoolwork[‡]	8.65	3.28-22.84	<0.001	3.40	1.79-6.46	<0.001
Worries about sexual orientation[‡]	5.59	2.63-11.88	<0.001	4.70	1.89-11.71	0.001
Trouble with the police[‡]	3.69	1.81-7.53	<0.001	7.17	3.72-13.79	<0.001
Not living with both parents	2.07	0.91-4.70	0.08	3.69	1.92-7.09	<0.001
Other distressing event[‡]	2.19	1.04-4.60	0.04	2.99	1.45-6.15	0.003
Experience of illness/ death						
Serious illness of close friend[‡]	1.10	0.53-2.25	0.80	2.76	1.48-5.14	0.001
Death of family member[‡]	1.22	0.35-4.33	0.75	3.01	1.34-6.67	0.007
Death of someone else close[‡]	2.07	0.88-4.88	0.10	2.39	1.16-4.89	0.018
Self/family member serious illness[‡]	1.41	0.71-2.83	0.32	1.42	0.71-2.83	0.32

[a]Odds ratio for one point increase in score
[‡]Lifetime history

DISCUSSION

As previous studies have reported, we found that boys who had been bullied at school were more anxious and depressed and had poorer self-esteem than those without a history of bullying victimisation (Analitis *et al.*, 2009, Brunstein Klomek *et al.*, 2007, Ivarsson *et al.*, 2005). Relative risk of lifetime self-harm was four times higher for boys who had been bullied (OR 4.07, 95% CI: 2.57-6.44) than those who had not. As well as the psychological factors most commonly examined in relation to bullying, we also found bullying victimisation among boys to be associated with a broad range of factors from lifestyle, relationship and life event domains. The factors which remained in the multi-variate logistic regression model for boys were self esteem and serious physical abuse. Among boys with a history of victimisation, highest odds ratios for lifetime history of self-harm were problems with schoolwork, serious physical abuse, worries about sexual orientation and self-harm thoughts in the past year.

The prevalence of bullying reported in this study is average in a European context (Analitis et al., 2009) but higher than that found in a previous Irish study (O'Moore et al., 1997). The present study included slightly older adolescents (aged 15-17, as compared with 12-18 in the previous study), which makes the higher prevalence more striking, as bullying is reported to decline with age (Olweus, 1991).

School bullying victimisation was associated with a broad range of mental health factors, peer and family relationship difficulties and negative life events in this study, which is consistent with previous research findings (Analitis *et al.*, 2009, Kaltiala-Heino *et al.*, 1999, Seals and Young, 2003). Both self esteem and serious physical abuse remained in the final explanatory model for boys. Poor self esteem can be viewed as both an antecedent and a consequence of victimisation, and the cross sectional nature of our study means that causality cannot be inferred. The fact that bullying victims are viewed as “weak” by their peers (Juvonen et al., 2003) may contribute to a sense of failure in the role of the “stronger sex” which boys experience when victimized, and may explain the strong association between victimisation and

self esteem. Serious physical abuse also remained in the multi-variate model. This may reflect a characteristic of the bullying experience itself, or may point to a broader pattern of victimisation among those boys who experience school bullying. Controlled longitudinal studies would be required to examine the direction of the effect and the specificity of the risk factors associated with bullying.

One in ten boys who had been bullied reported self-harm, a four times higher prevalence than among boys who had not been bullied. Over a quarter of bullied boys had thought about harming themselves in the past year, three times more than their non-bullied peers. Percentages of bullied boys reporting self-harm thoughts and behaviour are higher than reported in a previous Irish study (Mills et al., 2004), but support other findings of the very strong association between bullying and subsequent self-harm (Sourander *et al.*, 2006).

Among those boys without a history of bullying, factors relating to self-harm in others were most important. Among bullied boys, the highest odds ratios were for problems with schoolwork, physical abuse, and worries about sexual orientation. These findings may indicate a different profile of bullied boys who self-harm.

Although data were not gathered on sexual orientation, the association between sexual orientation worries and self-harm among bullied boys is perhaps unsurprising given the fact that gay, lesbian and bisexual young people have higher prevalence of self-harm (Fergusson *et al.*, 1999) than their heterosexual peers and also report more victimisation (Williams *et al.*, 2003). A previous study reported that the combined effect of gay/lesbian/bisexual status and school bullying victimisation was associated with particularly high levels of suicidality among adolescents (Bontempo and D'Augelli, 2002) and school bullying has also been found to be associated with deliberate self-harm later in life (Warner *et al.*, 2004).

This study was carried out using a cross-sectional design, which makes it impossible to draw conclusions on causal or temporal relations between history of bullying and associated factors, or between self-harm and associated factors among boys who had been bullied. A further limitation of this study was the fact that no definition of bullying was provided in the "Lifestyle and coping" questionnaire, as the original CASE study was not designed to investigate bullying as the main outcome parameter. This may have led to under-reporting of bullying victimisation as respondents were not prompted to consider the different forms bullying may take; not just physical and verbal bullying, but also bullying through exclusion, extortion and even e-bullying. However, it may also have led to over-reporting of bullying as respondents may have assumed all aggressive behaviour to constitute bullying, when in fact bullying is generally characterised by an imbalance of power between the aggressor and the victim (Juvonen et al., 2003). Moreover, Morbitzer et al (2009) found that bullying may be over-reported in self-report studies even when relevant definitions are provided (Morbitzer *et al.*, 2009). The numbers of boys who reported both self-harm and bullying were relatively small (37 boys reported both), which made for reduced power in the analysis of factors associated with self-harm. Also, frequency of bullying was not assessed by the questionnaire. Brunstein-Klomek et al. (2007) pointed to some key differences between those frequently and infrequently victimised in terms of psychological distress and self-harm. We were not in a position to examine such potential differences in our sample.

Many studies have focused not only on the victim of bullying, but also on the bully, and have reported that bullies show higher levels of depression, anxiety, and self-harm (Ivarsson *et al.*, 2005, Nansel *et al.*, 2001, Seals and Young, 2003) than those who are not involved in bullying. Our study focused only on victims, but it is worth noting that this group may have included a sub-group of "bully-victims" who have been found to have distinct personality features (Mynard and Joseph, 1997) and the most severe psychological problems (Brunstein Klomek et al., 2007). Our study did not identify those victims of bullying who are also bullies.

Despite these methodological limitations, the strengths of our study include the use of multi-variate analyses to describe a range of factors associated with bullying and the identification of factors associated with self-harm among bullied boys. As self-harm is a major risk factor for repeated self-harm and subsequent suicide (Gunnell *et al.*, 2008, Tidemalm *et al.*, 2008), study of the pathways to self-harm among a vulnerable group such as those who have been bullied can inform suicide prevention strategies.

Given the associations between school bullying victimisation and poor mental health, schools should prioritise implementation of anti-bullying policies and interventions. When asked for their views on ways to prevent self-harm, adolescents have highlighted the importance of tackling bullying (Fortune *et al.*, 2008). Many interventions have been found to directly reduce bullying, especially those which involve multiple disciplines, a whole-school approach, mentoring programmes and increased social worker involvement in schools (Vreeman and Carroll, 2007). As boys are often reluctant to seek help, openness and help-seeking should be particularly encouraged in this group. Such anti-bullying interventions are in keeping with the recommendations of the Irish *"Reach Out"* strategy for action on suicide prevention which emphasises primary suicide prevention strategies such as those which modify factors associated with self-harm (Health Service Executive; National Suicide Review Group and Department of Health and Children, 2005).

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Chapter 4

Psychological characteristics, stressful life events and deliberate self-harm: findings from the Child & Adolescent Self-harm in Europe (CASE) Study

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ABSTRACT

Background: There is evidence to suggest that both psychological characteristics and stressful life events are contributory factors in deliberate self-harm among young people. These links, and the possibility of a dose-response relationship between self-harm and both psychological health and life events, were investigated in the context of a seven-country school-based study. **Methods:** Over 30,000 mainly 15 and 16 year-olds completed anonymous questionnaires at secondary schools in Belgium, England, Hungary, Ireland, the Netherlands, Norway and Australia. Pupils were asked to report on thoughts and episodes of self-harm, complete scales on depression and anxiety symptoms, impulsivity, and self-esteem, and indicate stressful events in their lives according to ten defined life event categories. Level and frequency of self-harm was judged according to whether they had thought about harming themselves or reported single or multiple self-harm episodes. Multinomial logistic regression assessed the extent to which psychological characteristics and stressful life events distinguished between adolescents with different self-harm histories. **Results:** Increased severity of self-harm history was associated with greater depression, anxiety and impulsivity and lower self esteem and an increased prevalence of all ten life event categories. Female gender, higher impulsivity and experiencing the suicide or self-harm of others, physical or sexual abuse, and worries about sexual orientation independently differentiated single-episode self-harmers from adolescents with self-harm thoughts only. Female gender, higher depression, lower self esteem, experiencing the suicide or self-harm of others, and trouble with the police independently distinguished multiple- from single-episode self-harmers. **Conclusions:** The findings reiterate the importance of psychological characteristics and stressful life events in adolescent self-harm but nonetheless suggest that some factors are more likely than others to be implicated.

Psychological characteristics, stressful life events and deliberate self-harm: findings from the Child & Adolescent Self-harm in Europe (CASE) Study.

BACKGROUND

Deliberate self-harm is a significant problem among the young. Although hard to predict, and often appearing 'out of the blue', there is evidence to suggest that mental health problems, impulsivity, self-esteem, and stress in young people's lives are contributory factors. We examined associations between self-harm and these factors among a large sample of (mainly) 15 and 16 year-olds participating in the Child & Adolescent Self-harm in Europe (CASE) Study, and build on earlier findings from this international research (Madge et al., 2008, Rossow et al., 2007, Ystgaard et al., 2009).

Considerable evidence links psychological characteristics with self-harm thoughts and behaviour in adolescents (Evans et al., 2004). These problems may be state-dependent (e.g. depression or anxiety) or trait-dependent (e.g. impulsivity and self-esteem). Associations with depression are particularly widely reported (Andrews and Lewinsohn, 1992, Kerfoot et al., 1996, Olfson et al., 2005), including longitudinal studies (Fergusson et al., 2005, Steinhausen et al., 2006). Anxiety symptoms also increase risk of self-harm, particularly when associated with depression (Evans et al., 2004, Foley et al., 2006, Ross and Heath, 2003).

Impulsivity has been linked with both self-harm episodes and suicidal ideation (Conner et al., 2004, Hawton et al., 1992, Hull-Blanks, 2004, Kerfoot et al., 1996). Brent and Mann implicate aggressive impulsivity in the interpretation of patterns of suicidal behaviour across generations (Brent and Mann, 2006). Self-esteem (in relation to peers, school, family, sports/athletics, body image and global self-worth) has also been related to suicidal thoughts and attempts (Hull-Blanks, 2004, Wild et al., 2004).

Self-harm shows strong links with stress factors (Hawton and Harriss, 2008), including difficulties in familial relationships (Byrne et al., 2008, Hawton et al., 2003, McDonald et al., 2007), poor relationships with friends and partners (Dimmock et al., 2008, Hawton et al., 2003) and perceptions of poor academic performance (Martin et al., 2005).

In addition, knowing someone who has self-harmed, or made a suicide attempt, contributes to risk (Brent and Mann, 2006, Bridge et al., 2006, Evans et al., 2004, Lieb et al., 2005, Melhem et al., 2004). Gay, lesbian and bisexual young people appear at elevated risk (Bearman and Moodly, 2004, Remafedi et al., 1998), especially when facing family difficulties (Eisenberg and Resnick, 2006). Child abuse, especially sexual abuse, has repeatedly been associated with self-harming and suicidal behaviour (Bensley et al., 1999, Harrington et al., 2006, Ystgaard et al., 2004), and the link appears direct even though self-esteem (Evans et al., 2005) or continued adversity over the life-cycle (Harrington et al., 2006) may play a mediating role. Both being bullied (Coggan et al., 2003) and fear of bullying (Baldry and Winkel, 2003) have been linked to an increase in self-harm.

In this paper we explore links between psychological characteristics, life events and self-harm history among young people within a large international dataset. In particular, we examine the dose-response hypothesis that increasing adversity, in terms of psychological characteristics and life events, is associated with increasing level and frequency of self-harm. Such a relationship between depression and self-harming behaviour has already been suggested for both frequency (Esposito et al., 2003, Harrington et al., 2006, Hawton et al., 1999) and severity (Olfson et al., 2005) of episodes.

METHOD

The CASE Study

This paper draws on data from the CASE Study, an internationally collaborative investigation of self-harm among young people in seven self-selected countries. These comprised six European countries – Belgium, England, Hungary, Ireland, The Netherlands and Norway – and Australia. The study methodology was similar in each participating country and is described in detail elsewhere (Madge et al., 2008). School-based surveys were conducted with a total of 30,477 14-17 year-old adolescents, the majority being 15 or 16 years, who consented to provide anonymous self-report data on self-harm behaviour (e.g. timing, frequency of episodes, methods used, motives, help-seeking before and after the episode, hospitalisation, serious thoughts about self-harm), negative life events, lifestyle and psychological characteristics including symptoms of anxiety, depression, self-esteem and impulsivity. Schools were selected to be as locally and nationally representative as possible, and response rates ranged from 81 to 96 per cent in individual countries.

Measures

Self-harm

To ensure international comparability, strict criteria were adopted to assess self-harm taking account of whether young people said they had harmed themselves as well as descriptions of the last episode. The criterion for self-harm depended on a report of at least one of the following acts deliberately undertaken with non-fatal outcome:

- Initiated behaviour (e.g. self-cutting, jumping from a height), which they intended to cause self-harm;
- Ingested a substance in excess of the prescribed or generally recognised therapeutic dose;

- Ingested a recreational or illicit drug that was an act that the person regarded as self-harm;
- Ingested a non-ingestible substance or object.

Judgements of self-harm were in no way dependent on motives other than that the act in question appeared deliberate. It was not possible to draw a clear distinction between suicidal and non-suicidal self-harm from the survey data. Further information on the assessment of self-harm is provided elsewhere (Madge et al., 2008).

Study participants were divided into four groups: 'no self-harm' comprising all those who reported neither self-harm behaviour meeting the study criteria, nor thoughts of self-harm, in the past year; 'self-harm thoughts only' with self-harm thoughts but no episode of self-harm in the past year; 'single self-harm episode' with one episode in the previous year; and 'multiple self-harm episodes' with an episode in the previous year as well as at least one other earlier episode. Throughout this chapter, when referring to 'severity of self-harm history', we are referring to these four groups, with the assumption that as we move from the group with no thoughts or acts of self-harm through to those with self-harm thoughts, and then to those with single and multiple acts of self-harm, we are moving through increasing levels of severity of self-harm history.

Psychological characteristics

Four psychological scales were included. Anxiety and depression symptoms were measured by the HADS scale (Zigmond and Snaith, 1983), which includes two 7-item subscales for anxiety and depression, each scored between 0 and 21, where higher scores indicated higher levels of anxiety and depression. Self-esteem was measured using an eight-item abbreviated version of the Robson self-concept scale (Robson, 1989), with possible scores between 8 and 32, and higher scores indicating more positive self-esteem. A six-item impulsivity scale (Plutchik and

van Praag, 1986) led to scores between 6 and 24 with higher scores indicating greater impulsivity. Raw scores on these measures are used in the analysis.

Life events

The questionnaire included 20 questions relating to negative life events in the past 12 months and/or more than a year ago. For the purposes of analysis, these were reduced to ten categories of lifetime experience. These were: *'Difficulties with friends and peers'*; '*Problems with or between parents'*; *'Serious illness of family or friend'*; *'Physical or sexual abuse'*; '*Suicide or self-harm of family or friend'*; *'Death of someone close'; 'Worries about sexual orientation'*; *'Trouble with police'*; *'Bullied'*; and *'Problems with schoolwork'*.

Data analysis

All analyses were undertaken for the sample as a whole and some analyses were carried out by gender and by country. Chi-square tests were used to assess the statistical significance of associations between pairs of categorical variables such as self-harm history and gender. The strength of these associations was measured by the Phi statistic. In line with previous recommendations (Cohen 1988), associations were considered very weak if Phi< 0.10, weak if < 0.30, moderate if < 0.50 and strong if 0.50+.

Cronbach's alpha was used to assess the internal consistency of the scales employed to measure the psychological characteristics. These measures (depression, anxiety, impulsivity, self esteem) and the total number of stressful life event categories experienced followed a normal distribution and were summarised by the mean and standard deviation. Pearson's correlation coefficient, r, was used to assess the strength of the linear association between the psychological measures and the coefficient of determination, r^2, was used to measure the information in one measure that could be explained statistically by another.

Between-group comparisons of the psychological measures and the number of reported stressful life event categories were carried out using analysis of variance. The effect size was measured using partial Eta^2 and, following established guidelines (Cohen, 1988), the effect size was considered very small if partial $Eta^2<0.01$, small if <0.06, medium if <0.14 and large if 0.14+. Post hoc pairwise comparisons were based on Tukey's honestly significant difference.

Multinomial logistic regression was used to assess the associations between gender, age, country, psychological characteristics and reported stressful life event categories and self-harm history in the past year with a view to identifying which factors distinguished between adolescents reporting no self-harm, self-harm thoughts only, a single self-harm episode and multiple self-harm episodes. The dependent variable comparison group was those with no self-harm in the past year. Gender, age and country were entered into the regression model as the first block of independent variables. A forward stepwise approach was adopted for the second block of independent variables which contained each reported stressful life event category, the total number of reported life event categories and the psychological characteristics. Associations were reported as odds ratios with 95% confidence intervals. Nagelkerke's r^2 was used as the estimate of the proportion of variance explained by the derived regression model. Wald tests were carried out to identify the factors distinguishing adolescents with a single self-harm episode from those with self-harm thoughts only and factors distinguishing between multiple and single episode self-harmers.

Further multinomial logistic regression models were estimated in which interaction terms (by country, by gender and between the psychological measures) were considered as a third block of factors for entry into the multi-variate regression model described above. Change in Nagelkerke's r^2 was used to quantify the extent to which interaction terms further distinguished between the four self-harm history groups.

RESULTS

Self-harm history in past year

Overall, 79.6% of the young people said they had not experienced thoughts of self-harm in the past year, 14.6% said they had thought about harming themselves but had not done so, 2.6% reported single self-harm episodes in the past year meeting the study criteria, and a further 3.2% reported multiple episodes. Females were at least twice as likely as males to report having thoughts of self-harm, and both single and multiple episodes of self-harm (Table 1). While statistically significant at $p<0.001$, the strength of the association between self-harm history and gender was weak (Phi=0.22).

Table 1. Psychological characteristics, reported stressful life events and self-harm history in past year by gender

		All		Male		Female			Partial
		mean	**(SD)**	**mean**	**(SD)**	**mean**	**(SD)**	**p-value**	**Eta^2**
Psychological characteristics	Depression	4.4	(3.3)	4.4	(3.3)	4.3	(3.3)	Not sig.	<0.01
	Anxiety	6.9	(4.0)	6.1	(3.8)	7.8	(4.1)	<0.001	0.04
	Impulsivity	13.9	(2.9)	13.8	(2.9)	14.1	(2.9)	<0.001	<0.01
	Self esteem	22.4	(3.9)	23.1	(3.8)	21.7	(4.0)	<0.001	0.03
Life event category	Number of life event categories	3.6	(2.1)	3.3	(2.0)	3.9	(2.1)	<0.001	0.02
		n	(%)	n	(%)	n	(%)	p-value	Phi
	Death of someone close	18203	(59.7%)	8776	(56.3%)	9427	(63.4%)	<0.001	0.07
	Problems with or between parents	16895	(55.4%)	7844	(50.2%)	9051	(60.8%)	<0.001	0.11
	Serious illness of family or friend	16753	(55.0%)	8232	(52.8%)	8521	(57.3%)	<0.001	0.05
	Difficulties with friends and peers	16284	(53.3%)	6999	(44.8%)	9285	(62.3%)	<0.001	0.18
	Problems with schoolwork	14414	(47.5%)	6943	(44.7%)	7471	(50.4%)	<0.001	0.06
	Suicide/self-harm of others	9279	(30.4%)	3369	(21.6%)	5910	(39.7%)	<0.001	0.20
	Bullied	6339	(20.9%)	2955	(19.0%)	3384	(22.9%)	<0.001	0.05
	Trouble with the police	5318	(17.5%)	3751	(24.2%)	1567	(10.6%)	<0.001	0.18
	Physical or sexual abuse	3164	(10.4%)	1258	(8.0%)	1906	(12.8%)	<0.001	0.08
	Worries about sexual orientation	1737	(5.7%)	746	(4.8%)	991	(6.7%)	<0.001	0.04
Self-harm history	No self-harm	23038	(79.6%)	13020	(88.1%)	10018	(70.7%)	<0.001	0.22
	Self-harm thoughts only	4237	(14.6%)	1365	(9.2%)	2872	(20.3%)		
	Single self-harm episode	752	(2.6%)	179	(1.2%)	573	(4.0%)		
	Multiple self-harm episodes	912	(3.2%)	212	(1.4%)	700	(4.9%)		

Effect size measured by partial Eta^2 was very small if <0.01, small if <0.06, medium if <0.14 or large if 0.14+

Association measured by Phi was very weak if < 0.10, weak if < 0.30, moderate if < 0.50 and strong if 0.50+

Some differences emerged between countries (see also Madge et al., 2008). The Netherlands, in particular, stood out as having low rates of both thoughts and episodes of self-harm among both males and females. Hungary also showed an interesting pattern in that, compared with other countries, both males and females were less likely to report no thoughts or episodes of self-harm in the previous year, but more likely to report self-harm thoughts only.

Psychological characteristics

The psychological measures had satisfactory levels of internal consistency (Cronbach's alpha: 0.69 for depression, 0.84 for anxiety, 0.75 for impulsivity and 0.90 for self esteem). All inter-correlations between depression, anxiety, impulsivity and self esteem were statistically significant at $p<0.001$. There was only one strong correlation, that between depression and anxiety (Pearson's correlation coefficient, $r = 0.52$; $r^2 = 0.27$). Depression and anxiety were equally negatively correlated with self-esteem ($r = -0.45$; $r^2 = 0.20$). Other correlations were weak, ranging in magnitude from 0.13 to 0.24 ($r^2 = 0.02$ to 0.06). Therefore, there was limited overlap between the psychological measures.

There was no gender difference in relation to depression (Table 1). Female scores were generally higher than male scores on anxiety and impulsivity and lower on self esteem. However, the effect size was small for anxiety and self esteem and very small for impulsivity.

Depression, anxiety, impulsivity and self-esteem differed by country ($p<0.001$ in each case) with partial Eta^2 ranging from 0.03 to 0.04 indicating a small effect of country on psychological measures. Mean scores ranged from 3.6 in Ireland to 5.7 in Hungary for depression, between 6.0 in Norway and 8.0 in England for anxiety, between 13.2 in Belgium and 14.8 in Hungary for impulsivity, and between 21.3 in Hungary and 23.3 in Norway for self-esteem. Overall Hungarian adolescents stood out as displaying the highest levels of psychological difficulties while Norwegian adolescents showed the lowest levels.

Stressful life event categories

The reported stressful life event categories varied widely in prevalence from 59.7% for the death of someone close down to 5.7% for worries about sexual orientation. On average, 3.6 categories were reported with female students reporting a higher number than male students. The prevalence of each life event category differed by gender at $p<0.001$. For all but one stressful life event category (trouble with the police), the prevalence was higher among female students. However, the strength of the association between prevalence of stressful life events and gender was weak or very weak (range of Phi statistic=0.04-0.20). The prevalence of each stressful life event category varied by country (all at $p<0.001$) but the strength of all associations was weak or very weak.

Psychological characteristics and self-harm history in past year

There were highly statistically significant ($p<0.001$) differences between the self-harm history groups with regard to each of the psychological characteristics (Table 2). The effect size was small in relation to impulsivity and medium in relation to depression, anxiety and self esteem. There was evidence of a dose-response or graded relationship whereby the more severe the self-harm history, the higher the levels of depression, anxiety and impulsivity and the lower the level of self esteem. All pairwise comparisons among the four self-harm history groups differed significantly at $p<0.001$ with three exceptions. The self-harm thoughts only group and the single self-harm episode group did not differ significantly in relation to depression ($p=0.131$) and self esteem ($p=0.477$) and only differed marginally in relation to anxiety ($p=0.012$).

Table 2. Psychological characteristics by self-harm history in past year

	No self-harm		Self-harm thoughts only		Single self-harm episode		Multiple self-harm episodes		p-value	Partial Eta^2
	Mean	**(SD)**	**Mean**	**(SD)**	**Mean**	**(SD)**	**Mean**	**(SD)**		
Depression	3.9	(3.0)	5.6	(3.3)	5.9	(3.6)	7.4	(4.2)	<0.001	0.08
Anxiety	6.1	(3.7)	9.5	(3.8)	9.9	(4.1)	11.4	(4.2)	<0.001	0.11
Impulsivity	13.6	(2.8)	14.8	(3.0)	15.3	(3.1)	15.9	(3.2)	<0.001	0.04
Self esteem	23.1	(3.7)	20.3	(3.7)	20.1	(4.0)	18.4	(4.2)	<0.001	0.09

Effect size measured by partial Eta^2 was very small if <0.01, small if <0.06, medium if <0.14 or large if 0.14+

All pairwise comparisons among the four self-harm history groups differed significantly at $p < 0.001$ with the exception of the comparison between the self-harm thoughts only group and the single self-harm episode group in relation to depression (p=0.131), anxiety (p=0.012) and self esteem (p=0.477)

Figure 1 illustrates the consistency of the dose-response association between the four psychological characteristics and self-harm history when examined for each of the seven countries. The stepped increase in depression, anxiety and impulsivity and decrease in self esteem was evident with increasing self-harm history. However, in most countries there was limited or no difference in level of depression, anxiety and self esteem between the adolescents who only thought of self-harming but did not act and those who engaged in a single self-harm episode. There was no evidence of gender modifying the association between the psychological measures and self-harm history.

Figure 1. Mean depression, anxiety, impulsivity and self esteem scores and mean number of stressful life event categories by self-harm history in past year for each country

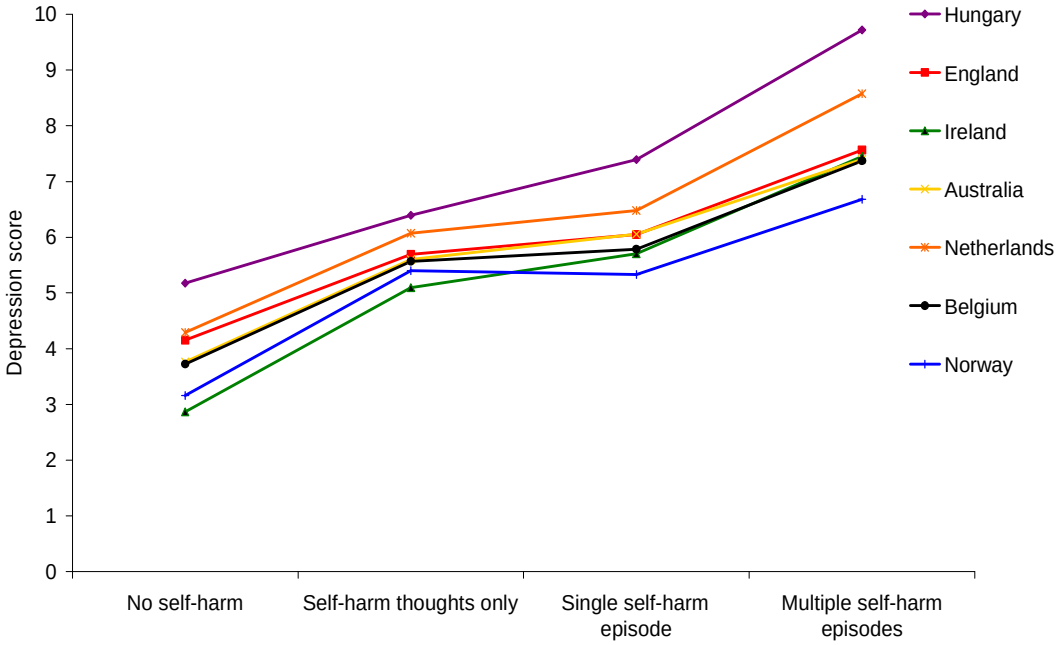

Figure 1(a) Mean depression score by self-harm history in past year for each country

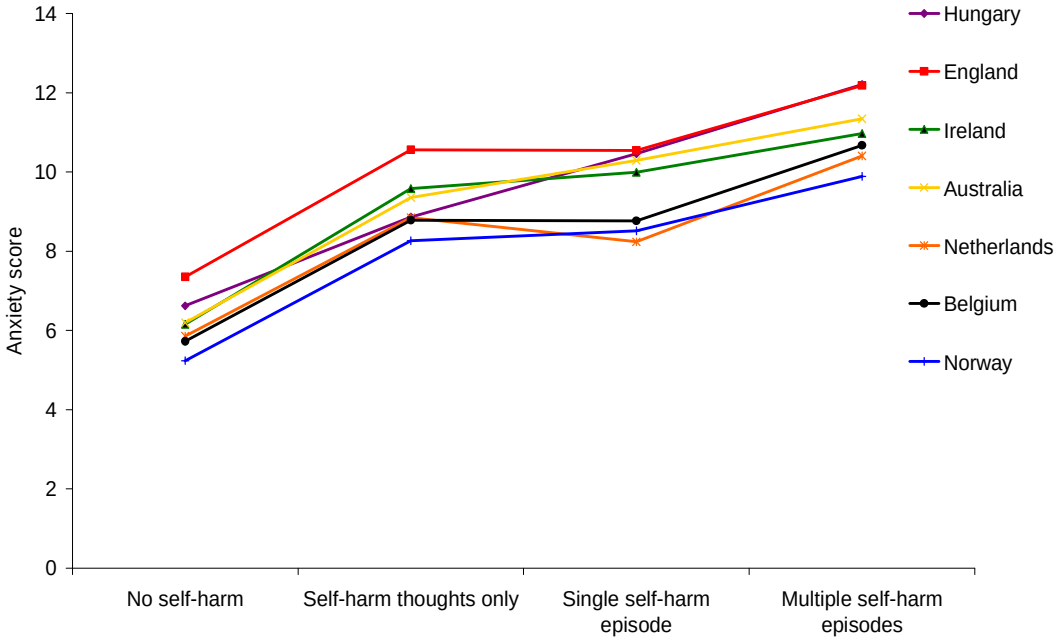

Figure 1(b) Mean anxiety score by self-harm history in past year for each country

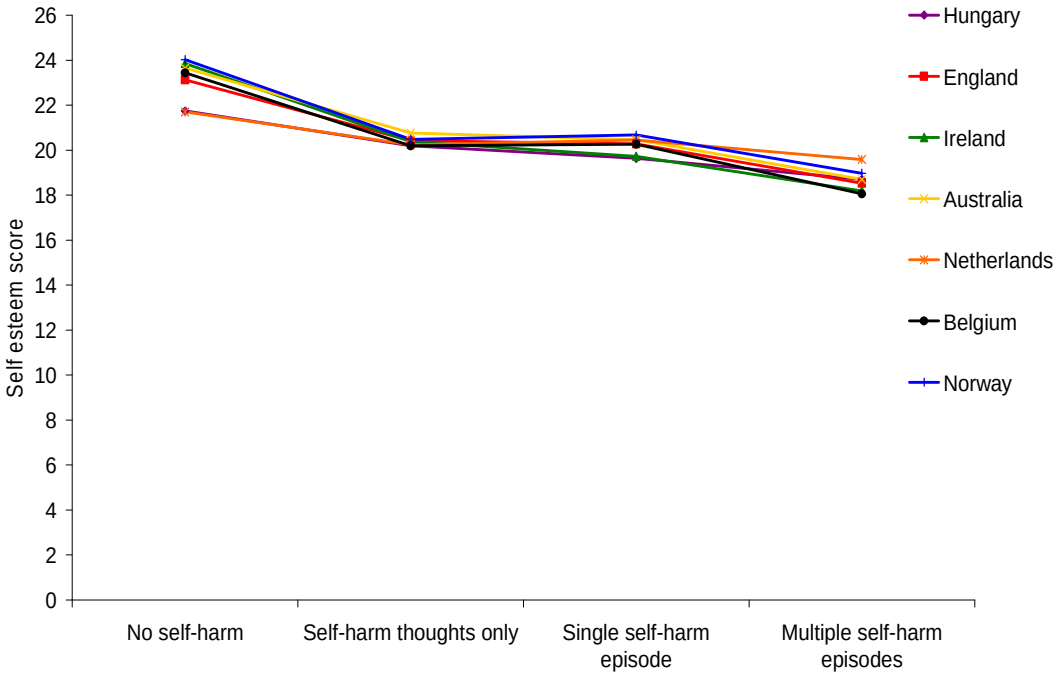

Figure 1(c) Mean self esteem score by self-harm history in past year for each country

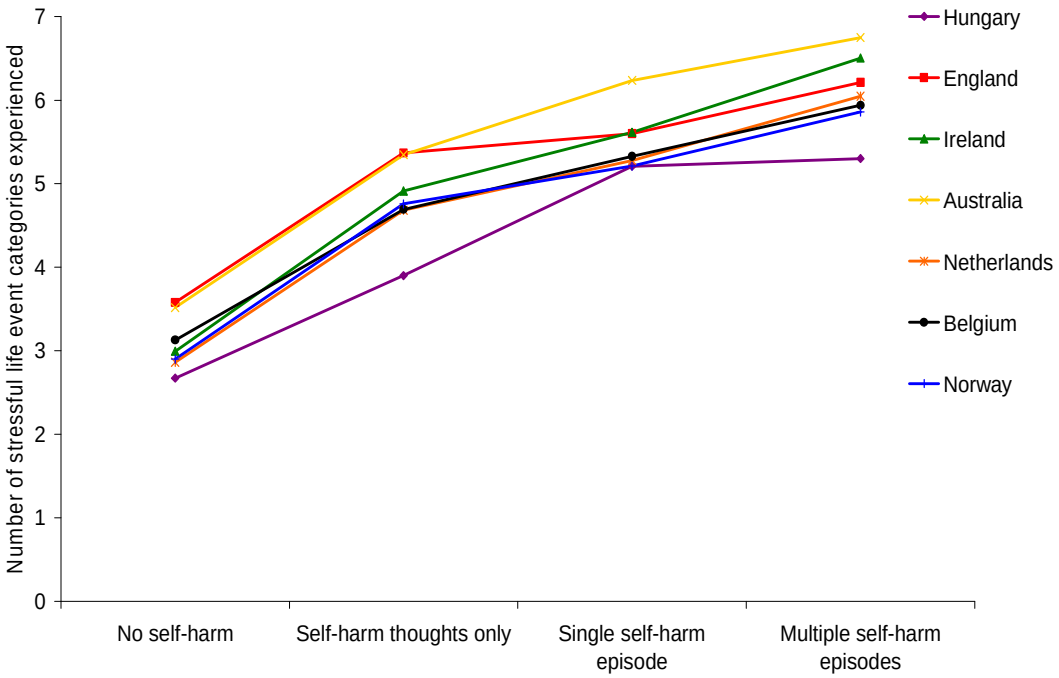

Figure 1(d) Mean number of life events reported by self-harm history in past year for each country

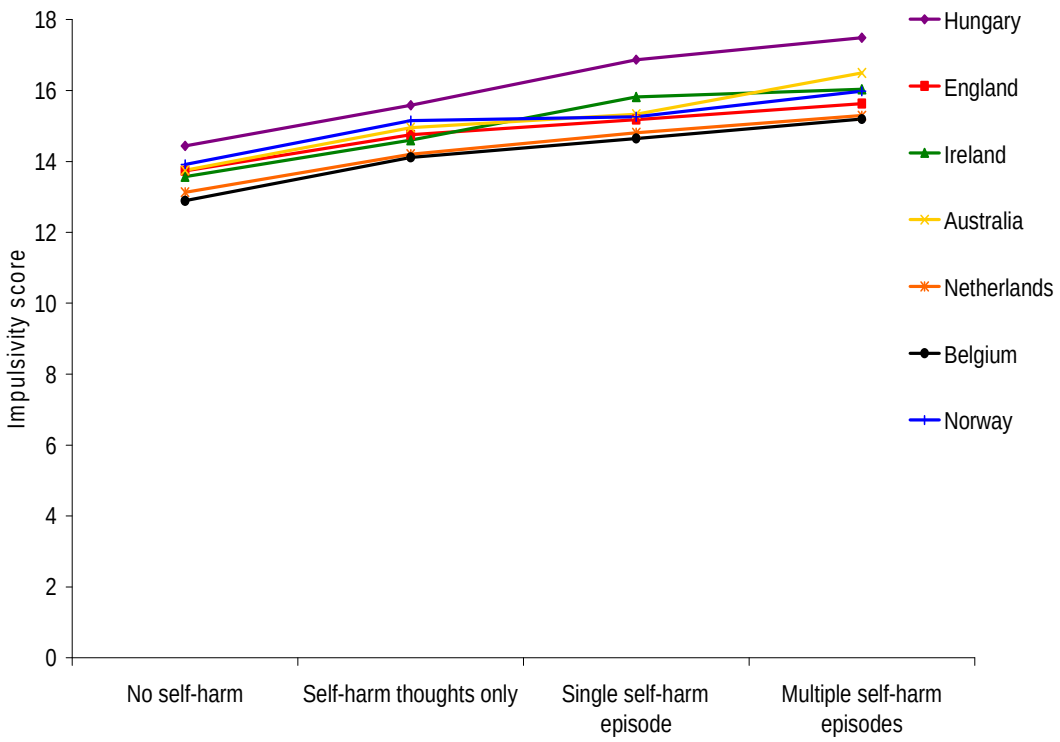

Figure 1(e) Mean impulsivity score by self-harm history in past year for each country

Stressful life event categories and self-harm history in past year

There were highly statistically significant ($p<0.001$) associations between the reporting of each life event category and self-harm history in the past year (Table 3). In every case, the prevalence increased across the groups with increasing self-harm history. The life event category most strongly related to self-harm history was experiencing the suicide or self-harm of others followed by physical or sexual abuse, difficulties with friends or peers and problems with or between parents. There was also evidence of a strong dose-response relationship as the average number of event categories reported varied from 3.1 for adolescents with no self-harm in the past year to 4.8 for those with self-harm thoughts only to 5.5 for those with a single self-harm episode and 6.2 for multiple self-harmers.

Gender modified the association between three of the life event categories (death of someone close ($p=0.001$), bullied ($p=0.013$) and worries about sexual orientation ($p<0.001$)) and self-harm history and country modified the association between six of the life event categories (difficulties with friends and peers ($p=0.002$), problems with schoolwork ($p=0.025$), suicide/self-harm of others ($p<0.001$), bullied ($p<0.001$), physical or sexual abuse ($p<0.001$) and worries about sexual orientation ($p<0.001$)) and self-harm history. However, none of these interaction effects explained more than an additional 0.2% of the variation in self-harm history.

Table 3. Prevalence of stressful life event categories by self-harm history in past year

	No self-harm		Self-harm thoughts only		Single self-harm episode		Multiple self-harm episodes		
	n	(%)	n	(%)	n	(%)	n	(%)	Phi [a]
Death of someone close	13249	(57.5%)	2778	(65.6%)	519	(69.7%)	677	(74.2%)	0.09
Problems with or between parents	11263	(49.0%)	3179	(75.2%)	623	(83.2%)	792	(87.3%)	0.24
Serious illness of family or friend	11716	(51.0%)	2838	(67.1%)	520	(69.8%)	685	(75.5%)	0.15
Difficulties with friends and peers	10739	(46.7%)	3180	(75.1%)	599	(79.7%)	776	(85.2%)	0.25
Problems with schoolwork	9573	(41.8%)	2716	(64.7%)	531	(71.5%)	694	(76.5%)	0.21
Suicide/self-harm of others	5281	(22.9%)	2108	(49.8%)	525	(69.9%)	722	(79.3%)	0.32
Bullied	4059	(17.8%)	1267	(30.2%)	263	(35.3%)	394	(43.9%)	0.16
Trouble with the police	3546	(15.5%)	831	(19.7%)	191	(25.7%)	314	(34.6%)	0.10
Physical or sexual abuse	1474	(6.4%)	808	(19.1%)	233	(31.0%)	352	(38.7%)	0.26
Worries about sexual orientation	882	(3.8%)	428	(10.2%)	120	(16.0%)	182	(20.2%)	0.17
Number of life event categories [b]	3.1	(1.9)	4.8	(1.9)	5.5	(1.9)	6.2	(1.8)	0.16

All associations statistically significant at $p < 0.001$

[a] Association measured by Phi was very weak if < 0.10, weak if < 0.30, moderate if < 0.50 and strong if 0.50+

[b] Mean (standard deviation) reported with partial Eta^2 as the effect size measure. Effect size measured by partial Eta^2 was very small if <0.01, small if <0.06, medium if <0.14 or large if 0.14+. All post hoc pairwise comparisons among the four self-harm history groups were statistically significant at $p < 0.001$.

Independent associations between gender, psychological characteristics and stressful life event categories and self-harm history in past year

Table 4 details the results of the multi-variate multinomial logistic regression analysis carried out to identify the factors independently distinguishing between adolescents in the four self-harm history groups. The derived regression model explained 37.7% of the variation in self-harm history. Some interactions between the psychological measures with gender and with

country reached statistical significance but they contributed very little (0.2-0.8%) to explaining variation in self-harm history.

Female gender strongly distinguished self-harm ideators and single and multiple self-harmers from those with no self-harm history. Female gender also distinguished adolescents with a single self-harm episode from those with self-harm thoughts only ($p<0.001$) but did not distinguish between single and multiple self-harmers ($p=0.523$).

Each of the four psychological characteristics independently contributed to distinguishing between the self-harm groups. Only impulsivity distinguished single episode self-harmers from self-harm ideators ($p=0.005$) whereas self esteem ($p<0.001$) and depression ($p=0.002$) differentiated multiple self-harmers from those with a single episode.

All but one (death of someone close) of the ten stressful life event categories was independently associated with self-harm history (Table 4). Experience of the suicide/self-harm of others strongly distinguished adolescents with a single self-harm episode from those with self-harm thoughts only ($p<0.001$) and also distinguished multiple from single episode self-harmers ($p=0.015$). Physical or sexual abuse ($p<0.001$) and to a lesser extent worries about sexual orientation ($p=0.017$) differentiated between adolescents with a single self-harm episode from those with self-harm thoughts only, while trouble with the police was associated with multiple self-harmers more than it was with single-episode self-harmers ($p=0.019$).

Table 4. Multinomial logistic regression analysis of the independent associations between gender, psychological characteristics and reported stressful life event categories and self-harm history in past year

		Self-harm thoughts only		**Single self-harm episode**		**Multiple self-harm episodes** [a]		**Group differences**[d]
		OR [b]	(95% CI)	OR [b]	(95% CI)	OR [b]	(95% CI)	
Gender	Female (ref. group: Male)	1.94	(1.78-2.11)	2.76	(2.28-3.35)	3.00	(2.48-3.64)	A<B<C=D
Psychological characteristics [c]	Depression	1.02**	(1.01-1.04)	1.04**	(1.01-1.07)	1.10	(1.07-1.13)	A<B=C<D
	Anxiety	1.11	(1.09-1.12)	1.10	(1.07-1.13)	1.13	(1.11-1.16)	A<B=C=D
	Impulsivity	1.06	(1.05-1.08)	1.10	(1.07-1.13)	1.13	(1.10-1.16)	A<B<C=D
	Self esteem	0.89	(0.88-0.90)	0.90	(0.87-0.92)	0.84	(0.82-0.86)	A>B=C>D
Life event category (ref. group: those not reporting an event in the life event category)	Problems with or between parents	1.64	(1.50-1.79)	1.95	(1.58-2.41)	2.12	(1.69-2.65)	A<B=C=D
	Serious illness of family or friend	1.20	(1.10-1.30)	1.11 [ns]	(0.93-1.32)	1.19 [ns]	(0.99-1.42)	A<B
	Difficulties with friends and peers	1.67	(1.53-1.82)	1.54	(1.26-1.88)	1.71	(1.38-2.12)	A<B=C=D
	Problems with schoolwork	1.41	(1.30-1.54)	1.54	(1.29-1.85)	1.45	(1.21-1.74)	A<B=C=D
	Suicide/self-harm of others	1.89	(1.74-2.04)	3.69	(3.09-4.40)	5.00	(4.15-6.02)	A<B<C<D
	Bullied	1.19	(1.08-1.30)	1.25*	(1.05-1.48)	1.41	(1.19-1.66)	A<B=C=D
	Trouble with the police	1.15**	(1.03-1.27)	1.39	(1.15-1.70)	1.86	(1.55-2.23)	A<B=C<D
	Physical or sexual abuse	1.49	(1.33-1.67)	2.30	(1.90-2.78)	2.29	(1.91-2.74)	A<B<C=D
	Worries about sexual orientation	1.40	(1.21-1.62)	1.86	(1.47-2.36)	1.83	(1.46-2.29)	A<B<C=D

[a] No self-harm was the comparison category of the dependent variable

[b] The odds ratios were adjusted for age and country as well as the factors detailed in the table. All associations tabulated were statistically significant at $p < 0.001$ except where indicated (ns=not significant; * $p < 0.05$; ** $p < 0.01$)

[c] These odds ratios represent the effect of a one-point increase in the score of the scale measuring the psychological characteristic

[d] Group differences indicate the extent to which the independent variables distinguish between the self-harm groups (A= no self-harm; B=self-harm thoughts only; C=single episode self-harm; D= multiple episodes of self-harm)

DISCUSSION

An earlier paper from the CASE Study (Madge et al., 2008) addressed socio-demographic and self-harm characteristics for the same school-based sample of adolescents. Here we focus on more in-depth psychological characteristics and stressful life events and, in particular, report evidence for a dose-response relationship whereby increased severity of self-harm history was, in general, associated with higher levels of depression, anxiety and impulsivity and lower levels of self-esteem, as well as stressful life events in more areas of young people's lives. These patterns were consistent across both gender and country.

A particularly interesting finding is that thoughts of self-harm are not always distinguishable from a single self-harm episode in terms of links with psychological characteristics and stressful life events. It emerged, however, that impulsivity and experiencing the suicide or self-harm of others, physical or sexual abuse and worries about sexual orientation were the only factors that independently differentiated single-episode self-harmers from adolescents with self-harm thoughts only. That few factors distinguished between ideators and self-harmers is important for future research and for prevention. The findings are also in line with a recently presented model of suicidal behaviour which maps the relationship between background factors and trigger events, and the development of suicidal ideation/intent through to suicidal behaviour (O'Connor, 2011).

The strong associations between psychological characteristics and self-harm on the one hand, and stressful life events and self-harm on the other, raise the question of the associations between psychological health, stressful life events and self-harm, and whether either set of factors is more significant than the other. Multi-variate models were constructed to investigate this study objective. Despite some specific differences, the effects of psychological characteristics and stressful life events remained significant within the population overall, and continued to remain significant when gender and country were considered separately. Our findings of independent associations between four psychological characteristics and nine life

event categories with self-harm history supports the conclusion of a recent systematic review showing that a wide range of factors is linked with self-harm behaviour (Evans et al., 2004). It also confirms the heterogeneity of young self-harmers among community samples, with differing frequencies of self-harm and varying levels of associated difficulties (Stanford and Jones, 2009).

In any event, it would seem unlikely that a single chain of events links life events, psychological health and deliberate self-harm. On the one hand it is clear that stress can precede mental health difficulties (Pelkonen et al., 2008, Reinherz et al., 2006). On the other, however, it is apparent that depression can trigger psychosocial difficulties through poor interpersonal functioning and impaired relationships (Rossow et al., 2007), and that self-harm or suicidal behaviour may follow life stress in the absence of depression and hopelessness (Baldry and Winkel, 2003, Martin et al., 2004). Furthermore, self-harm itself may act as a trigger for depression (Flisher, 1999).

Some differences between countries were found. There was, for instance, some variation in levels of self-harm behaviour as well as differences in psychological characteristics: in this latter respect Hungarian young people reported the highest rates of difficulty while Norwegians reported the lowest. Despite these differences, however, the dose-response relationships between psychological characteristics, stressful life events and a history of self-harm were maintained in all countries. This suggests the universality of the finding.

These findings underline the complexity involved in specifying the precursors of self-harm among the young. Although both psychological characteristics and negative life events are associated with increased levels of self-harm within the population of young people as a whole, varying constellations of interrelated factors contribute to individual risk. Recent research on identifying sub-groups of young self-harmers (Stanford and Jones, 2009) appears promising, and it is suggested that knowledge on the aetiology of deliberate self-harm may develop best in

the context of further large-scale longitudinal research that can look at distinct groups of young self-harmers over time.

The strengths of this study are its large representative school-based sample, the clear definition of self-harm, and the standardised methodology used across seven countries. Whilst we relied on retrospective self-reported information, and thus were unable to look conclusively at temporal associations, most of our findings have relied on episodes of self-harm reported for the previous year, rather than over the lifetime, to increase accuracy. The cross-sectional nature of the study, nonetheless, implies that the nature of the relationships between self-harm, psychological characteristics, and life events that we have identified cannot necessarily be assumed to be causal. Additionally, there may have been other potentially relevant factors, such as substance or alcohol abuse, that we do not consider. A further limitation of the study is that we cannot guarantee the representative nature of all national samples despite attempts to ensure this was the case. Treatment of life events presents another possible methodological difficulty in that categories of stressful events cannot be equated or added. Nonetheless, the fact that all but one stressful life event category showed statistically significant associations with a history of self-harm increases our confidence in the validity of these measures. Further research exploring the impact of different life events, and taking account of severity, occurrence and timing, could throw more light on this issue.

In clinical terms, the evidence for a dose-response relationship linking both psychological characteristics and negative life events with the frequency of self-harm underlines the need for positive mental health promotion and early identification of adolescents at risk of self-harm (Horowitz and Ballard, 2009, Naylor et al., 2009). Similarities found between adolescents who have merely thought about harming themselves, and those reporting a single episode, suggest the salience of taking intentions as well as behaviour into account.

CONCLUSION

There is no single pattern of self-harm among young people, but both psychological characteristics and stressful life events substantially increase risk. Those developing prevention and intervention programmes must remain ‘open minded’ to patient characteristics and not neglect either those who have only thought of harming themselves or, despite current practice (Storey et al., 2005), those who do not have evident signs of depression or mental illness.

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Chapter 5

Mediating effects of coping style on associations between psychological factors and self-harm among adolescents

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ABSTRACT

There is evidence for an association between suicidal behaviour and coping style among adolescents. The aims of this study were to examine associations between coping style, mental health factors and self-harm thoughts and acts among Irish adolescents, and to investigate whether coping style mediates associations between mental health factors (depression, anxiety and self-esteem) and self-harm.

A cross-sectional school-based survey was carried out. Information was obtained on history of self-harm, life events, demographic, psychological and lifestyle factors.

Emotion-oriented coping was strongly associated with poorer mental health and self-harm thoughts and acts, while problem-oriented coping was associated with better mental health. A mediating effect of emotion-oriented coping on associations between mental health factors and DSH was found for both genders and between problem-oriented coping and mental health factors for girls. Similar mediating effects of coping style were found when risk of self-harm thoughts was examined.

Mediating effects of coping style on associations between psychological factors and self-harm among adolescents

INTRODUCTION

Deliberate self-harm (DSH) is recognised worldwide as a major public health problem, with a wide ranging impact on the individual, their family, and health services. Lifetime prevalence of DSH among adolescent girls ranges from 5.7% (The Netherlands) to 17% (Australia) compared with 2.4% (The Netherlands) to 6.5% (Belgium) among boys (Madge et al., 2008). The school-based CASE study (Child and Adolescent Self-harm in Europe), on which this study is based, reported that 9.1% of Irish adolescents (13.9% of girls and 4.3% of boys) surveyed had harmed themselves at some point, of whom just under half reported repeated episodes (Morey *et al.*, 2008).

A growing number of population-based studies have examined various factors potentially associated with self-harm among young people, including coping style and problem-solving deficits. Coping can be defined as the cognitive and behavioural activities by which a person attempts to manage specific stressful situations, as well as the emotions that they generate (Lazarus and Folkman, 1984). Based on this general definition, problem solving is one type of coping process. For any examination of coping among adolescents, it is important to note that coping methods and resources are specific to the individual's developmental level (Compas *et al.*, 2001) and that changes in coping style over time are a normal part of adolescent development (Oldershaw et al., 2009). However, the development of characteristic ways of coping in childhood and adolescence may be precursors to patterns of coping in adulthood (Compas et al., 2001).

Studies which have examined the relationship between DSH and problem solving or coping among adolescents vary significantly in how they define DSH. Also, a wide range of problem-solving, problem-orientation and coping measures have been used, including process measures

which assess strengths and deficits in problem-solving attitudes and skills and outcome measures which evaluate problem-solving performance (D'Zurilla and Maydeu-Olivares, 1995). However, despite inconsistencies across studies, there is evidence for an association between suicidal behaviour and problem-solving deficits in adolescents (Speckens and Hawton, 2005).

A study of Irish university students reported that those with suicidal thoughts had significantly poorer problem-solving scores than those without (McAuliffe *et al.*, 2003). Reporting findings of the multi-centre CASE study, Portzky et al (2007) found that emotion-oriented coping was associated with deliberate self-harm in a sample of Dutch and Belgian adolescents (Portzky *et al.*, 2007). However, this was not an independent association. An Australian study found that coping by self blame was associated with DSH (De Leo and Heller, 2004), while a Hungarian study reported that ineffective coping strategies were associated with DSH among adolescents (Voros *et al.*, 2005). The English CASE study investigators reported that adolescents with a history of DSH reported more coping methods considered to be "emotion-focused", while those without DSH were more likely to report "problem-focused" approaches (Evans *et al.*, 2005). Problem-focused approaches or active coping strategies, involving seeking help and advice, have been reported to be associated with positive adjustment among adolescents (Schonert-Reichl *et al.*, 1995).

It has been argued that research in this field has not adequately incorporated mediating and moderating variables into pathways linking psycho-social factors and suicidal behaviour (Sandin *et al.*, 1998). A variable may be called a mediator to the extent that it accounts for or explains the relation between the predictor and the criterion. On the other hand, moderators are variables which influence the strength and/or direction of the relation between the predictor and criterion (Baron & Kenny, 1986). Recently, theoretical models of the development of suicidal behaviour in adolescents have explicitly included mediating/moderating variables including problem solving (O'Connor, 2011). Although depression (Hawton *et al.*, 1999) and self-esteem (McAuliffe et al., 2006) have been found to mediate or moderate associations between DSH

and coping style, no studies have specifically examined the mediating effect of coping styles on the established associations between psychological difficulties and self-harm thoughts or acts in adolescents. Adolescents at high risk of suicidal behaviour have been found to hold attitudes that support the use of maladaptive coping strategies in response to depression, suicidal thoughts and behaviours (Gould et al., 2004), but these associations need to be further investigated.

Positive coping skills have been associated with resilience, which can be defined as positive outcomes in the presence of adversity (Campbell-Sills *et al.*, 2006) and which involves a focus on individuals' strengths as well as deficits (Luthar *et al.*, 2000). In the context of coping, resilience can be thought of as the successful outcome of coping processes (Compas et al., 2001). It has been suggested that adolescents' wellbeing can be improved if they are helped to minimize their use of negative avoidant coping strategies and to increase their use of active coping (Frydenberg and Lewis, 2009). Helping young people to adopt more positive coping strategies may also reduce their risk of developing depressive symptoms, which are strongly associated with suicidal thoughts and behaviours (Sawyer *et al.*, 2009). As a wide range of interventions for the treatment and prevention of psychopathology are designed to enhance coping skills of adolescents (Compas et al., 2001), greater knowledge of the coping strategies employed by adolescents can inform these interventions. In order to optimise the teaching of positive coping skills to adolescents in the school setting, it is important first to identify the possible associations between coping style and DSH and related mental health difficulties in this group.

Our school-based study aimed to examine the associations between coping style, mental health factors and self-harm, using a standardised methodology. The objectives were:

1. To examine coping styles in a sample of Irish adolescents, and to compare males' and females' coping styles.

2. To examine associations between coping style and mental health factors, self-harm thoughts and self-harm acts.
3. To examine whether coping style mediates the association between mental health difficulties including depression, anxiety and self-esteem, and self-harm thoughts and DSH.

METHOD

Design and participants

The study was conducted using a cross-sectional design, with data gathered in 39 schools in counties Cork and Kerry in Ireland. The questionnaire was administered and completed by students in a class setting with a member of the research team present. The study design, procedure and sample have been more fully described elsewhere (McMahon *et al.*, 2010, Morey *et al.*, 2008).

Measures

The survey in Ireland was part of the multi-centre CASE study (Madge *et al*, 2008). A standardized, internationally validated, anonymous questionnaire was designed by the CASE collaborators and used for data collection by each of the seven centres involved in the study (six centres in Europe and one in Australia). The questionnaire comprised a wide range of variables, including demographic variables, lifestyle factors and questions about deliberate self-harm and self-harm thoughts.

Coping scale: The brief coping scale used in the CASE survey was designed by the CASE investigators based on existing coping measures (Endler and Parker, 1990) and was formulated to address the relevant research questions related to adolescent mental health. Participants were asked how frequently (never/sometimes/often) they did the following when they were worried

or upset: *(1) talked to someone; (2) blamed themselves for getting into the mess; (3) got angry; (4) stayed in their room; (5) thought about how they had dealt with similar situations; (6) had an alcohol drink; (7) tried not to think about what was worrying them; (8) tried to sort things out.*

The questionnaire also included three validated psychological scales. Depressive symptoms and anxiety were measured using the Hospital Anxiety and Depression Scale (HADS), which has been validated for use with an adolescent population (White *et al.*, 1999). Impulsivity was measured using six items from the Plutchik impulsivity scale (Plutchik *et al.*, 1989). Self-esteem was measured using an eight-item version of the Self-Concept Scale (Robson, 1989). Strong convergent and discriminant validation of the scale has been reported (Addeo *et al.*, 1994). All three scales were found to have high internal consistency in our sample (McMahon et al., 2010).

An important aspect of the study methodology was that participants who reported self-harm were asked to describe, in their own words, the method(s) they had used to harm themselves. This description was later coded according to a standardised definition of deliberate self-harm: *"An act with non-fatal outcome in which an individual deliberately did one or more of the following: initiated behaviour (for example, self cutting, jumping from a height), which was intended to cause self-harm; ingested a substance in excess of the prescribed or generally recognisable therapeutic dose; ingested a recreational or illicit drug that was an act that the person regarded as self-harm; or ingested a non-ingestible substance or object"* (Madge et al., 2008). Episodes of deliberate self-harm were classified as a 'yes', 'no' or 'no information given' by three independent raters using the standardised definition above (Cohen's Kappa = 0.77). When participants reported that they had harmed themselves in the past but did not describe the act, they were classified "no information given" and were not included as a DSH case. The definition used allowed for the inclusion of a wide range of motives and levels of

suicidal intent. Self-harm thoughts were defined as having thoughts of harming oneself without acting on them on that occasion.

Statistical Analyses

Principal component analysis using varimax rotation was used to investigate the number of factors represented by the 8 items of the coping scale. Principal component analysis is a simple, non-parametric method which uses an orthogonal transformation to convert a set of observations of possibly correlated variables into a set of values of uncorrelated variables called principal components. This approach is useful as it allows us to reduce a complex dataset to lower dimensions and reveal a more simplified structure which may underlie it.

To investigate associations between gender and coping style, boys and girls were compared using t-tests. The effect size was measured using partial Eta^2 and, following established guidelines (Cohen, 1988), the effect size was considered very small if partial $Eta^2<0.01$, small if <0.06, medium if <0.14 and large if 0.14+. Analyses were carried out separately for boys and girls.

Pearson's correlation coefficient, *r*, was used to assess the strength of the linear association between the psychological measures (depressive symptoms, anxiety and self-esteem) and coping style measures. Subgroups of adolescents were compared in terms of coping style using one-way ANOVA and post-hoc tests (Tukey's Honestly Significant Difference).

The hypothesis that the associations between psychological factors and self-harm thoughts and DSH would be mediated by coping style was tested in accordance with the approach advocated by Baron and Kenny (Baron and Kenny, 1986), involving four stages. First, the independent variable (in this case level of depressive symptoms, anxiety or self-esteem) should predict change in the outcome (eg DSH). This analysis has been carried out previously on this sample

and significant associations reported (McMahon et al., 2010). Secondly, the independent variable (psychological factor) should predict change in the proposed mediator (coping style) (see Table 3). Thirdly, change in the mediator should be significantly associated with change in the outcome (eg DSH) (see "Associations between self-harm thoughts and acts"). Finally, the effect of the independent variable on change in the outcome should be attenuated when change in the mediator is statistically controlled (Table 5). Regression analyses were used to perform this final step (investigation of potential mediation effects). Odds ratios and 95% confidence intervals were calculated for lifetime history of DSH. Initially, each psychological variable was entered separately as the independent variable with lifetime history of DSH as the dependent variable (method=enter). The regression analyses were replicated with problem-oriented coping score as a covariate and again with emotion-oriented coping as a covariate. Full mediation is said to occur when this latter effect drops to zero, partial mediation is said to occur when the effect diminishes, but remains significant. In the case of partial mediation, a further test was required to establish whether the indirect effect of the independent variable on the dependent variable via the mediator was significant. Because of the dichotomous dependent variable, the stages described above included a mixture of linear and logistic regression analyses which give rise to coefficients on different scales thereby making standard mediation analysis (e.g. Sobel tests) inappropriate. We used Hayes' mediation analysis which allows for dichotomous dependent variables (Preacher and Hayes, 2008). This provides an estimate of the indirect effect of the independent variable on the dependent variable via the mediator and its standard error based on re-sampling. We referred the quotient of these (i.e. indirect effect coefficient divided by standard error) to the standard Normal distribution to estimate its statistical significance which we report. This analysis was repeated with self-harm thoughts as the dependent variable for a subgroup of the sample with no history of DSH. Problems with multi-collinearity were not anticipated as the coping style variables which were correlated with the outcome measure did not show high mutual correlations.

Sample

39 schools took part in the study. Of the 4,583 students invited to complete the questionnaire, 3,881 participated in the survey (85% response rate). 197 questionnaires were disregarded for the purposes of the current study as age criteria were not met, gender was missing, the survey was not completed seriously or questions regarding coping style were not answered in full, giving a total of 3,684 valid surveys. Fifty two percent of the participants were girls and the majority (53.1%) of students were 16 years old.

RESULTS

Principal component analysis

We undertook exploratory data analysis of the eight-item coping scale on the entire sample using principal component analysis. Varimax rotation was used with a cut-off of 0.4, revealing two components (Table 1). One item in the scale did not load on either component and so has been excluded from the analyses. The two components can be referred to as *Emotion-oriented coping* and *Problem-oriented coping*. The first factor, *Emotion- oriented coping,* accounted for 20.6% of the variance explained and the second factor, *Problem-oriented coping*, accounted for 17.8% (38.4% in total). This distinction between Problem-focused and Emotion-focused coping dimensions was supported by the literature on coping in general (Folkman and Lazarus, 1980) and adolescent coping specifically (Compas *et al.*, 1996), and has been employed by other CASE study researchers (Portzky et al., 2007).

Table 1. Principal component analysis: 8-item coping scale

	Component	
	1 Emotion-oriented coping	2 Problem-oriented coping
How often do you blame yourself for getting into the mess?	0.684	
How often do you get angry?	0.682	
How often do you stay in your room?	0.639	
How often do you have an alcoholic drink?	0.437	
How often do you try to sort things out?		0.720
How often do you talk to someone?		0.650
How often do you think about how you have dealt with similar situations?		0.640
How often do you try not to think about what is worrying you?	-	-

Internal consistency of the two sub-scales was examined. Cronbach's alphas for the scales were 0.47 for the *Emotion-oriented* scale and 0.45 for the *Problem-oriented* scale. Low Cronbach's alphas such as these are common in scales with few items (Pallant, 2007), and for this reason we also report inter-item correlations, which were 0.18 for the *Emotion-oriented* scale and 0.22 for the *Problem-oriented* scale. These correlations fall just below and within the recommended optimal range of 0.2-0.4 for scales of this type (Briggs and Cheek, 1986). Subsequent analyses were carried out using the *Emotion-oriented* subscale (scored between a minimum of 4 and maximum of 12) and the *Problem-oriented* subscale (scored between a minimum of 3 and a maximum of 9).

Coping style and gender

Table 2 shows the mean and 95% confidence intervals for scores on both coping scales for girls and boys. Higher scores on the scales indicate more frequent use of each type of coping. Girls reported significantly more frequent use of both coping styles than boys. Gender differences were small but significant for both scales.

Table 2. Scores on coping sub-scales by gender

	Total sample (n=3684)		**Girls (n=1857)**		**Boys (n=1827)**			
	Mean	**95% CI**	**Mean**	**95% CI**	**Mean**	**95% CI**	**Partial Eta^2**	**p-value**
Emotion-oriented coping	7.6	7.50-7.61	7.9	7.81-7.96	7.2	7.14-7.29	0.041*	p<0.001
Problem-oriented coping	6.1	6.07-6.15	6.3	6.21-6.33	5.9	5.89-6.01	0.016*	p<0.001

* Effect size was considered very small if partial Eta^2<0.01, small if <0.06, medium if <0.14 and large if 0.14+(Cohen, 1988)

Associations between coping style and mental health difficulties

Problem-oriented coping was associated with significantly lower levels of depressive symptoms, lower levels of anxiety and higher self-esteem in the total sample (Table 3). *Emotion-oriented coping* was associated with significantly higher levels of depressive symptoms and anxiety and poorer self-esteem. For the total sample, there was a strong positive correlation between *Emotion-oriented coping* and anxiety (r=0.493), a moderately strong positive association between *Emotion-oriented coping* and depressive symptoms (r=0.360) and a strong negative correlation between *Emotion-oriented coping* and self-esteem (r=-0.468). For the total sample, correlations between *Problem-oriented coping* and depression and self-esteem were significant but weak (r=-0.185 and r= 0.201 respectively). The correlation between *Problem-oriented coping* and anxiety was significant among girls but non-significant among boys and among the total sample.

Table 3. Correlations (Pearson's *r*) between scores on coping subscales and levels of depressive symptoms, anxiety and self-esteem[a]

	Problem-oriented coping			**Emotion-oriented coping**		
	Girls	**Boys**	**Total Sample**	**Girls**	**Boys**	**Total Sample**
Depressive symptoms	-0.239*	-0.144*	-0.185*	0.419*	0.290*	0.360*
Anxiety	-0.134*	-0.034[†]	-0.052[††]	0.485*	0.449*	0.493*
Self-esteem	0.286*	0.176*	0.201*	-0.511*	-0.371*	-0.468*

* $p<0.001$

[†] $p=0.114$

[††] $p=0.002$

[a]Correlation is considered small if r=0.1 − 0.23, medium if r = 0.24 − 0.36 and large if r = 0.37 or larger.

Associations between coping style and self-harm thoughts and acts

Those adolescents who reported a lifetime history of DSH differed significantly from those without a history of DSH in terms of both *emotion-oriented coping* and *problem-oriented coping* ($p<0.0005$ for both genders on both coping scales). Those with a history of DSH reported more frequent use of *emotion-oriented coping* and less frequent use of *problem-oriented coping*.

In order to further examine potential associations between coping style and self-harm thoughts and acts, three subgroups of young people were identified within the sample: those who reported no self-harm (lifetime history) and no self-harm thoughts; those who reported self-harm thoughts but no self-harm and those who reported at least one episode of self-harm. There were differences between the three subgroups in terms of scores on both coping subscales (one-way ANOVA, $p<0.0005$ for both scales for both genders). Post hoc tests (Tukey's HSD) were performed to compare the subgroups in terms of both scales (Table 4). There was a trend amongst both girls and boys for higher scores on *emotion-oriented coping* and lower scores on *problem-oriented coping* across the three subgroups in order of increasing severity from no self-harm thoughts or acts to history of self-harm. The largest differences in terms of coping were between those with no thoughts or acts of self-harm and those with self-harm thoughts only ($p<0.0005$ for both coping scales for both genders). The difference between those with self-harm thoughts only and those with acts of self-harm reached statistical significance for girls on both coping scales but was not significant for boys on either scale.

Table 4. Comparison of adolescents with and without self-harm thoughts and acts in terms of scores on coping scales

	Boys					**Girls**				
	1. No self-harm thoughts or acts (n=1471)		**2. Self-harm thoughts only (n=168)**		**3. History of self-harm(n=75)**	**1. No self-harm thoughts or acts (n=1180)**		**2. Self-harm thoughts only (n=334)**		**3. History of self-harm (n=242)**
	Mean [SD]	p-value (group 1/ group 2)	Mean [SD]	p-value (group 2/ group 3)	Mean [SD]	Mean [SD]	p-value (group 1/ group 2)	Mean [SD]	p-value (group 2/ group 3)	Mean [SD]
Emotion-oriented coping	7.00 [1.50]	p<0.001	8.25 [1.81]	p=0.07	8.72 [1.64]	7.36 [1.44]	p<0.001	8.66 [1.47]	p=0.001	9.12 [1.47]
Problem-oriented coping	6.02 [1.24]	p=0.002	5.68 [1.22]	p=0.855	5.59 [1.37]	6.46 [1.21]	p<0.001	6.06 [1.27]	p=0.014	5.77 [1.26]

Mediating effect of coping style on associations between mental health difficulties and DSH

The potential mediating roles of *emotion-oriented* and *problem-oriented* coping on the associations between depression, anxiety and self-esteem and self-harm were investigated. To assess whether the associations between psychological variables and DSH were attenuated when the potential mediators were statistically controlled, we used separate regression analyses to generate odds ratios and 95% confidence intervals for lifetime history of DSH (Table 5). Adjusting for *emotion-oriented coping* resulted in large changes in odds ratios for DSH associated with one unit increase in scores on depression, anxiety and self-esteem scales among both boys and girls. Adjusting for *problem-oriented coping* resulted in smaller changes on all three scales. As the effect of the independent variable on the dependent variable was reduced upon addition of the mediator, there was informal evidence for partial mediation. To test whether these mediation effects reached statistical significance, mediation analysis was carried out (Preacher and Hayes, 2008). Significant mediation effects in the case of *emotion-oriented coping* were observed among both boys and girls for the associations between all psychological variables and DSH. Significant mediation effects of *problem-oriented coping* were observed among girls for the associations between all psychological variables and DSH, but among boys the mediation effect was non-significant in all three cases.

Table 5. Associations between lifetime history of DSH and scores on psychological scales, including adjusting for *Emotion-oriented* and *Problem-oriented coping*

	OR* (95% CI) for DSH	OR* (95% CI) for DSH Adjusting for Emotion-Oriented Coping	Significance of mediation	OR* (95% CI) for DSH Adjusting for Problem-Oriented Coping	Sig. of mediation
Boys					
Depressive symptoms†	1.27 (1.20-1.35)	1.20 (1.12-1.28)	p<0.001	1.26 (1.19-1.34)	p=0.073
Anxiety†	1.32 (1.24-1.39)	1.24 (1.16-1.39)	P<0.001	1.31 (1.24-1.39)	p=0.169
Self-esteem†	0.79 (0.74-0.83)	0.84 (0.79-0.89)	P<0.001	0.79 (0.74-0.84)	p=0.148
Girls					
Depressive symptoms†	1.27 (1.22-1.32)	1.18 (1.13-1.23)	P<0.001	1.25 (1.20-1.30)	p<0.001
Anxiety†	1.22 (1.18-1.27)	1.13 (1.09-1.18)	P<0.001	1.21 (1.17-1.26)	P<0.001
Self-esteem†	0.81 (0.78-0.84)	0.87 (0.84-0.91)	p<0.001	0.82 (0.79-0.86)	P<0.001

* Odds ratio for lifetime history of DSH associated with one unit increase in score on psychological scales.

†p<0.001 in all cases for association between scores on psychological scales and DSH

Mediating effect of coping style on associations between mental health difficulties and self-harm thoughts among adolescents with no history of DSH

Mediation analyses were replicated to investigate possible mediating effects of coping style on risk of self-harm thoughts among those adolescents with no history of self-harm (Table 6). Adjusting for *emotion-oriented coping* resulted in large changes in odds ratios for self-harm thoughts on all scales among both boys and girls, and mediation effects were significant in all cases. Adjusting *for problem-oriented coping* resulted in smaller changes on all three scales and weaker but nonetheless significant mediation effects of *problem-oriented coping* were observed among girls for the associations between all psychological variables and self-harm thoughts. Among boys only the mediating effect of *problem-oriented coping* on associations between depression and self-harm thoughts was significant at the 0.05 level.

Table 6. Subgroup with no history of DSH (n=1632 boys, 1510 girls): Associations between self-harm thoughts and scores on psychological scales, including adjusting for *Emotion-oriented* and *Problem-oriented coping*

	OR* (95% CI) for DSH	OR* (95% CI) For DSH Adjusting for Emotion-Oriented Coping	Significance of mediation	OR* (95% CI) for DSH Adjusting for Problem-Oriented Coping	Significance of mediation
Boys					
Depressive symptoms†	1.24 (1.18-1.31)	1.19 (1.12-1.25)	p<0.001	1.23 (1.17-1.30)	p=0.017
Anxiety†	1.27 (1.21-1.32)	1.20 (1.14-1.26)	p<0.001	1.26 (1.21-1.32)	p=0.184
Self-esteem†	0.80 (0.76-0.84)	0.84 (0.80-0.88)	P<0.001	0.80 (0.76-0.84)	p=0.032
Girls					
Depressive symptoms†	1.31 (1.25-1.38)	1.22 (1.16-1.28)	p<0.001	1.30 (1.24-1.36)	p=0.001
Anxiety†	1.27 (1.22-1.32)	1.19 (1.14-1.24)	p<0.001	1.27 (1.22-1.31)	p=0.001
Self-esteem†	0.78 (0.75-0.81)	0.83 (0.80-0.86)	p<0.001	0.78 (0.76-0.81)	p=0.031

* Odds ratio for self-harm thoughts in past year associated with one unit increase in score on psychological scales.

†p<0.001 in all cases for association between scores on psychological scales and self-harm thoughts

DISCUSSION

In this study we have investigated associations between coping style, mental health factors and self-harm among Irish adolescents. *Emotion-oriented coping*, which includes self-blame, anger, withdrawal and use of alcohol, was strongly associated with poorer mental health. Use of *problem-oriented coping* (attempting to solve problems, seeking social support and reflecting on previous experience) was associated with better mental health, but associations between *problem-oriented coping* and levels of anxiety were not significant among boys. Investigating associations between coping style and self-harm thoughts and acts, we found that higher scores on *emotion-oriented coping* and lower scores on *problem-oriented coping* were associated with greater severity of self-harm history. However, boys with self-harm thoughts did not differ significantly from those with a history of self-harm in terms of coping. We found evidence for a

mediating effect of *emotion-oriented coping* on associations between mental health factors (depressive symptoms, anxiety and self-esteem) and DSH among both genders and between *problem-oriented coping* and all three mental health factors among girls. Similar mediating effects of coping style were found when risk of self-harm thoughts was examined for those young people with no history of self-harm.

We found that girls reported using both types of coping more frequently than boys. This is at odds with some previous research which has found that boys report using negative coping strategies more often than girls (Sawyer et al., 2009). However, the fact that girls report more use of *emotion-oriented coping* reflects the view that girls in particular may use coping strategies which add to malaise and poor mental health (Compas et al., 2001).

The use of *emotion-oriented coping* was associated with poorer mental health on the three scales examined (depressive symptoms, anxiety and self-esteem), while *problem-oriented coping* was associated with scores reflecting more positive mental health. Our findings are in line with previous research which has established a link between coping style and depressive symptoms (Rohde *et al.*, 1990) and self-esteem (Lewinsohn *et al.*, 1994).

Our findings on the associations between coping style and self-harm extend previous research which has shown that adolescents with a history of self-harm report more maladaptive behaviours as ways of coping than their peers (Kirchner *et al.*, 2011, Mikolajczak *et al.*, 2009, Wilson *et al.*, 1995). The comparison of three subgroups of adolescents showed that the greatest difference in terms of coping style is between those with no self-harm thoughts or acts and those with self-harm thoughts but no acts. This highlights the significance of self-harm thoughts as a discrete step in the self-harm process among adolescents, and mirrors earlier findings of the international CASE study (Madge et al., 2011).

We have investigated whether coping methods act as mediators between psychological difficulties and DSH and self-harm thoughts. We found evidence to support the hypothesis that *emotion-oriented coping* accounts to a significant degree for the associations between psychological difficulties (depression, anxiety and low self-esteem) and self-harm among both girls and boys. These findings point to the significance of *emotion-oriented coping* as a maladaptive strategy which contributes to the self-harm process with mental health difficulties as strong associated factors. Our striking findings in terms of the mediating role of *emotion-oriented coping* indicate that self-harm may be understood in many cases as an attempt to manage the negative feelings which are heightened by the use of ineffective emotional coping strategies, as others have previously suggested (Mikolajczak et al., 2009). The mediating effects of *problem-oriented coping* were much smaller than those of *emotion-oriented coping*, and reached statistical significance for girls but not for boys.

Given that adolescents who report self-harm thoughts share a similar profile to those reporting acts of self-harm, we sought to examine the mediating effects of coping style on associations between psychological factors and self-harm thoughts among young people with no history of self-harm. The findings were very similar to those for DSH, with *emotion-oriented coping* playing a significant mediating role in this association, and *problem-oriented coping* playing a smaller role, significant only among girls. Awareness of the importance of coping in mediating associations between mental health problems and self-harm thoughts is important due to the significance of self-harm thoughts as part of the self-harm process.

A limitation of our study was that it examined lifetime history of self-harm, while coping style was assessed at one time point. Previous research has pointed towards changes in coping style as part of adolescent development, and has suggested a possible association between improved decision making and cessation of DSH (Oldershaw et al., 2009). It is possible that changes to coping style over time have made associations with lifetime history of self-harm less valid.

However, as 82% of those who had harmed themselves had done so within the past year (Morey et al., 2008), the associations we have reported may be valid.

As the methodology used was cross-sectional, it is impossible to draw conclusions regarding causal relationships between coping style and associated factors. Causality may be in either direction. Although it is possible that maladaptive coping results from mental health difficulties and contributes to the development of self-harm, previous research has also found problem-solving deficits to be a concomitant, rather than a cause, of depression, hopelessness, and suicide intent (Schotte *et al.*, 1990). The instrument used to assess coping style was brief, and it could be argued that it may not capture the multi-dimensional nature of coping (Compas et al., 2001). The use of a process measure of coping on its own precludes drawing any conclusions about the effectiveness of coping efforts. Also, the labelling of the two coping factors as emotion-oriented and problem-oriented, and the associated assumptions of adaptive and maladaptive approaches, may be considered somewhat arbitrary in the case of some of the items included.

Future research could further address the question of whether the nature and structure of coping as well as associations with mental health change with developmental stage and age, and in response to life stresses. It has been reported that young people with suicidal behaviour report recent histories of more severe life stress, inaccurate appraisal of the extent to which stressful events can be controlled and poorer coping than their non-suicidal peers (Wilson et al. 1995). To further develop an understanding of how coping, mental health problems and self-harm develop, the life situations and stressors with which adolescents cope should be examined as well as their reported coping reactions.

Despite these limitations, this study has employed a rigorous methodology to examine coping style among adolescents. We have built on previous knowledge regarding associations between coping style and self-harm (Evans et al., 2005), specifically through the identification of two

valid coping subscales within the CASE coping measure and through the in-depth examination of associations between coping style, psychological factors and DSH. Our findings on the mediating effect of coping on risk of self-harm thoughts and acts are novel and highlight the important role which adaptive and maladaptive styles of coping play in the self-harm process, with the particular significance of self-harm thoughts as a discrete step in this process.

Our findings suggest that the promotion of positive coping skills and the reduction of emotion-focused approaches may build resilience to self-harm thoughts and acts among those young people who experience mental health problems. The importance of gender-specific approaches to the promotion of effective coping is clear, with a particular focus on the development of problem-oriented coping skills in building resilience among girls. As maladaptive coping is associated with poor mental health and DSH, programmes which aim to teach positive coping skills to adolescents and which reduce use of emotion-oriented coping, for example, by teaching emotion regulation skills, reducing avoidance and reducing use of alcohol or other substances may be effective in tackling the problem of self-harm thoughts and DSH among this group.

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Chapter 6

Resilient adaptation in Irish adolescents exposed to self-harm or suicide of others

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ABSTRACT

Background Deliberate self-harm (DSH) is a major public health problem and there is evidence for the "contagion" of adolescent DSH within peer and family groups. However, many adolescents display resilient adaptation despite being exposed to suicidal behaviour of others. The aims of the study were to examine the characteristics of resilient young people exposed to suicidal behaviour and to compare them with other sub-groups of their peers in terms a broad range of factors from lifestyle, life event and psychological domains.

Method A cross-sectional study was conducted, with 3,881 adolescents completing an anonymous questionnaire as part of the Child and Adolescent Self-harm in Europe (CASE) study. Information was obtained on history of self-harm, life events, and demographic, psychological and lifestyle factors.

Results There were strong associations between exposure to suicidal behaviour of others and reporting own experiences of self-harm (O.R 8.06; CI 6.20-10.47). Resilient individuals shared many of the risk factors of those adolescents reporting DSH, and self-harm thoughts were common in this group. Factors associated with resilience to DSH in those exposed to suicidal behaviour of others were gender-specific and differed from factors associated with resistance to DSH among un-exposed adolescents.

Conclusions Adolescents exposed to suicidal behaviour are particularly burdened. Knowledge of the factors associated with resilience to self-harm in this group can inform school-based intervention programmes promoting positive mental health.

Resilient adaptation in Irish adolescents exposed to self-harm or suicide of others

INTRODUCTION

Deliberate self-harm (DSH) includes a range of behaviours associated with different levels of medical severity and intent (including suicidal intent), and is recognised worldwide as a major public health problem (World Health Organisation, 2002). A history of self-harm is a major risk factor for repeated self-harm and subsequent suicide (Gunnell *et al.*, 2008, Tidemalm *et al.*, 2008). In Ireland, the highest rates of hospital-treated DSH in females are among 15–19 year-old girls (639 per 100,000 annually). Among men, the highest rates are in the 20-24 age group, with rates among younger men also high (443 per 100,000 in the 15-19 age group) and increasing rapidly (National Suicide Research Foundation, 2011).

Population-based studies reveal a higher prevalence of DSH than indicated by hospital presentations. The school-based CASE study (Child and Adolescent Self-harm in Europe), on which this study is based, reported that 9.1% of Irish adolescents surveyed had harmed themselves at some point, of whom 45.9% reported repeated episodes (Morey *et al.*, 2008). This was a higher prevalence than previously reported by smaller scale school-based studies (Lynch *et al.*, 2006, O'Sullivan and Fitzgerald, 1998). Self-harm was much more common among girls than boys, with self-cutting and overdose the most common DSH methods (Morey *et al.*, 2008). Internationally, the seven centres involved in the CASE study reported a lifetime prevalence of DSH in adolescents ranging from 5.7% (the Netherlands) to 17% (Australia) in girls, and 2.4% (The Netherlands) to 6.5% (Belgium) in boys (Madge *et al.*, 2008).

A growing number of population-based studies have examined various factors potentially associated with self-harm among young people (Evans *et al.*, 2004). The contagion of suicidal behaviour among peers and family members is one associated factor which has been the subject of increasing attention (Purington and Whitlock, 2010). Among the international CASE centres which employed a standardised methodology and upon which this study is based, associations

between knowing of DSH of a friend or family member and reporting having engaged in DSH were widely reported. Associations between DSH and knowledge of DSH of a family member (De Leo and Heller, 2004, O'Connor *et al.*, 2009b) and between DSH and DSH of a friend (De Leo and Heller, 2004, Hawton *et al.*, 2002, O'Connor *et al.*, 2009b, Ystgaard *et al.*, 2003) were reported. In a prospective study, family DSH was predictive of repeat DSH (but not first episode) in multi-variate analyses (O'Connor *et al.*, 2009a). In the Irish centre, knowledge of DSH of a friend was associated with DSH in both genders in multi-variate analysis, while knowledge of DSH in a family member was associated for girls only (McMahon *et al.*, 2010).

There is evidence of the clustering and contagion of self-harm (Gould *et al.*, 1994). Clustering refers to the occurrence of cases of self-harm closer together in time and space than expected within a community (Mesoudi, 2009), while contagion is a process through which one person's suicidal or self-harming behaviour may influence another person to engage in similar behaviour (De Leo and Heller, 2008). It has been suggested that a family history of suicide attempt may act as a vulnerability factor that increases risks of suicidal responses in young people (Fergusson *et al.*, 2003). Having had a friend who committed or attempted suicide has been reported to increase the likelihood of suicidal ideation and suicide attempts for both boys and girls (Bearman and Moody, 2004). Consistent evidence for associations between family suicidal behaviour and DSH and also friend suicidal behaviour and DSH have been reported (Evans *et al.*, 2004). Findings in terms of associations with completed suicide in others have been mixed (Evans *et al.*, 2004), possibly reflecting the relative rarity of suicide.

Resilience is a construct which has been studied extensively by developmental researchers but which has received little attention in the psychiatry and psychopathology literature due to a longstanding focus on disease and pathology (Bonanno, 2004). The construct of resilience connotes the maintenance of positive adaptation despite the experience of adversity (Luthar *et al.*, 2000). In investigating resilience, the aim is to identify vulnerability and protective factors that might modify the negative effects of adverse life circumstances and also to identify

underlying mechanisms or processes. Research in the field of resilience involves a shift away from maladjustment to consider competence as well (thus implicitly emphasizing prevention) (Luthar *et al.*, 2000). Examination of factors which contribute to positive development in the face of adversity but may have little or no positive impact in the absence of adversity are also central to the resilience concept (Roosa, 2000).

Resilient individuals can be described as those exposed to adverse conditions yet not displaying the negative outcome under examination (von Eye and Schuster, 2000). There is wide variation in how resilience has been operationalised in research. Adversity can include negative life events and other circumstances that are known to be associated with adjustment difficulties, and positive adaptation can be defined in terms of behaviourally manifested social competence, success at meeting developmental tasks or the absence of emotional or behavioural maladjustment (Luthar *et al.*, 2000). One classic approach to resilience has been the comparison of two groups drawn from the same high-risk sample who have adaptive and maladaptive outcomes (Masten, 2001). Few studies have defined positive outcomes explicitly in terms of the absence of DSH. In one example, a study of vulnerability and resilience to DSH was undertaken with major depression as the adversity factor under examination (Fergusson *et al.*, 2003).

Little is known about the characteristics of resilient young people who have been exposed to suicidal behaviour (DSH and/or suicide) of others. Our objectives were:

1. To examine and compare the prevalence of self-harm among young people exposed to self-harm/suicide of others versus those without this experience.
2. To compare young people who demonstrate resilient adaptation (exposure to DSH/ suicide of others but no DSH themselves) to those with a history of DSH and to those with no exposure to suicidal behaviour of others and no DSH themselves in terms of a broad range of factors from lifestyle, life event and psychological domains.

3. To identify the specific factors associated with resilience among a sub-group of adolescents exposed to suicidal behaviour, and factors associated with resistance to DSH among a sub-group without this exposure.

METHOD

Design and setting

The study was conducted using a cross-sectional design, with data gathered in 39 schools in counties Cork and Kerry in Ireland. The questionnaire was administered and completed by students in a class setting with a member of the research team present. The study design, procedure, measures and sample have been more fully described elsewhere (McMahon *et al.*, 2010).

Measures

The survey in Ireland was part of the multi-centre CASE study (Madge *et al*, 2008). A standardized, internationally validated, anonymous questionnaire was designed by the CASE collaborators and used for data collection by each of the seven centres involved in the study (six centres in Europe and one in Australia). The questionnaire included a wide range of variables, including demographics, lifestyle factors, life events and questions about deliberate self-harm and self-harm thoughts.

The questionnaire also included three validated psychological scales. Depressive symptoms and anxiety were measured using the Hospital Anxiety and Depression Scale (HADS), which has been validated for use with an adolescent population (White *et al.*, 1999). Impulsivity was measured using six items from the Plutchik impulsivity scale (Plutchik *et al.*, 1989). Self-esteem was measured using an eight-item version of the Self-Concept Scale (Robson, 1989). Strong convergent and discriminant validation of the scale has been reported (Addeo *et al.*, 1994). All three scales were found to have high internal consistency in our sample (McMahon *et al.*, 2010). Coping style was assessed using an eight-item measure, which has been shown to

be comprised of two components, *emotion-oriented coping* and *problem-oriented coping*, with adequate inter-item correlations in our sample (McMahon *et al.*, submitted).

An important aspect of the study methodology was that participants who reported self-harm were asked to describe, in their own words, the method(s) they had used to harm themselves. This description was later coded according to a standardised definition of deliberate self-harm: *"An act with non-fatal outcome in which an individual deliberately did one or more of the following: initiated behaviour (for example, self cutting, jumping from a height), which was intended to cause self-harm; ingested a substance in excess of the prescribed or generally recognisable therapeutic dose; ingested a recreational or illicit drug that was an act that the person regarded as self-harm; or ingested a non-ingestible substance or object"* (Madge *et al.*, 2008). Self-harm thoughts were defined as having thoughts of harming oneself without acting on them on that occasion.

Sample

Of the 54 schools invited to participate, 39 schools took part in the study. Of the 4,583 students invited to complete the questionnaire, 3,881 participated in the survey (85% response rate). Eighty surveys were then disregarded as these did not fit the age criteria of 15, 16 or 17 years, were not filled in seriously, or gender was missing. Fifty two percent of the participants were girls and the majority (53.1%) of students were 16 years old.

Statistical analyses

Chi-square tests were used to assess associations between pairs of categorical variables such as self-harm history and knowledge of self-harm by others. Odds ratios and 95% confidence intervals for lifetime history of DSH were calculated and the strength of these associations was measured by the Phi statistic. In line with previous recommendations (Cohen, 1988), associations were considered very weak if Phi< 0.10, weak if < 0.30, moderate if < 0.50 and strong if 0.50+.

Subgroups of adolescents were compared in terms of mean scores on psychological scales (depressive symptoms, anxiety, impulsivity, self-esteem and coping style) using one-way ANOVA and post-hoc tests (Tukey's Honestly Significant Difference). Effect size was measured by partial Eta^2 and was considered very small if <0.01, small if <0.06, medium if <0.14 or large if 0.14+. Sub-groups were compared in terms of categorical variables using chi-square tests and effect sizes measure using the Phi statistic.

In order to investigate the factors associated with resilience to DSH, multi-variate logistic regression models were constructed with lifetime history of DSH as the dependent variable. The method used was backward with the usage of likelihood ratios. The probability for stepwise removal was set at 0.01. A low threshold for removal was set due to the large sample size giving adequate power and the wide range of variables included. All categorical variables entered in this model were dichotomous.

RESULTS

Associations between exposure to suicidal behaviour and history of DSH

We examined associations between having a friend or family member with suicidal behaviour and history of DSH (Table 1). Approximately one third of the total sample reported knowledge of suicidal behaviour of a friend or family member. Knowledge of DSH of a friend was common, reported by 17.3% of those without a history of DSH and 37.6% of those with a history of DSH. Knowledge of DSH of a family member was less common, but was reported by more than one tenth of the total sample (7.8% of those without a history of DSH and 42.2% with a history of DSH). Suicide of a friend or family member was less common, but was nonetheless reported by 429 adolescents in total (10.7% of those without a history of DSH and 25.5% with a history of DSH). All associations with lifetime history of DSH were highly statistically significant ($p<0.0005$ in all cases). There were moderately strong associations

between lifetime history of DSH and knowledge of DSH of a friend or family member. There was a weak association between lifetime history of DSH and the suicide of a friend or family member. Overall, there was an association of moderate strength between reporting knowledge of any suicidal behaviour (DSH or suicide) of a friend or family member and lifetime history of DSH (Odds ratio 8.09; CI 6.20-10.47). Three quarters of young people with a history of DSH themselves also reported knowledge of DSH of others. Reporting DSH without knowledge of DSH of others was particularly rare.

Table 1. Associations between knowledge of DSH or suicide of others and reporting own DSH

		No history of DSH group	Lifetime history of DSH group	Odds ratio for DSH (95% CI)	p-value	Phi
DSH of friend	*Yes*	559 (17.3%)	123 (37.6%)			
	No	2675 (82.7%)	204 (62.4%)	7.94 (6.23-10.10)	<0.0005	0.32
DSH of family member	*Yes*	253 (7.8%)	135 (42.1%)			
	No	2991 (92.2%)	186 (57.9%)	8.58 (6.64-11.09)	<0.0005	0.32
Suicide of friend/family member	*Yes*	347 (10.7%)	82 (25.5%)			
	No	2901 (89.3%)	240 (74.5%)	2.86 (2.17-3.76)	<0.0005	0.13
Any DSH/suicide of someone close	*Yes*	913 (27.8%)	251 (75.6%)			
	No	2375 (72.2%)	81 (24.4%)	8.06 (6.20-10.47)	<0.0005	0.30

A resilient sub-group was identified, comprised of those young people who reported knowledge of suicidal behaviour (suicide and/or DSH) of family or friends, but no self-harm themselves. This sub-group represented over one quarter of the sample (27.8%) (Table 1). Further analyses compare this sub-group with the group of adolescents who report neither DSH nor knowing others with this behaviour ("unaffected by suicidal behaviour" sub-group) and also with those who report a history of self-harm ("maladaptive" group).

Comparison of "resilient" sub-group with "unaffected by suicidal behaviour" and "maladaptive" sub-groups

The resilient sub-group was compared with the other two groups on a range of psychological, life event, lifestyle and social factors (Table 2). There was a clear trend (with a few exceptions) towards the "resilient" sub-group falling in between the "unaffected by suicidal behaviour" group, which had lowest levels of risk factors and highest levels of protective factors, and the "maladaptive" sub-group, with highest levels of risk factors and lowest levels of protective factors.

Psychological characteristics

There was a striking difference between the "unaffected by suicidal behaviour" and "resilient" sub-groups in terms of prevalence of self-harm thoughts, with 28.8% of those in the "resilient" group reporting self-harm thoughts, more than double the prevalence within the "unaffected by suicidal behaviour" sub-group. The "maladaptive" sub-group had highest levels of depressive symptoms, anxiety, impulsivity and emotion-oriented coping, the lowest levels of problem-oriented coping and the lowest self-esteem. The "resilient" sub-group fell in between the "maladaptive" and the "unaffected" sub-groups on all measures except problem-oriented coping, where the "unaffected by suicidal behaviour" and "resilient" subgroups did not differ significantly. Overall, the "resilient" sub-group displayed indicators of poorer mental health than the "unaffected" group, but more positive mental health than the "maladaptive" group. Group differences in terms of depressive symptoms, anxiety, self-esteem and emotion-oriented coping were of medium strength, while the effect sizes for the other comparisons were smaller.

Negative Life Events

With the exception of the experience of death of someone close, the "unaffected by suicidal behaviour" sub-group had the lowest prevalence of lifetime history of all negative life events examined, with the "resilient" sub-group having a higher prevalence than the "unaffected" group, but a lower prevalence than the "maladaptive" group, all group differences being highly statistically significant. The largest group difference was in terms of physical or sexual abuse, with 31.0% of the "maladaptive" group reporting this experience, compared with 8.3% of the "resilient" group and 3.3% of the "unaffected" group (Phi=0.307; moderate effect size). Although effect sizes were weaker, there were also striking differences in prevalence of problems with or between parents (36.8% of "unaffected" group, 58.7% of "resilient" group, 81.6% of "maladaptive" group, Phi=0.293; weak effect size) and also in terms of prevalence of worries about sexual orientation (4.4% "unaffected" group, 7.1% of "resilient" group, 23.4% of "maladaptive" group, Phi=0.215; weak effect size).

Lifestyle Factors

The “resilient” sub-group fell in between the other two groups in terms of prevalence of drug taking, smoking and heavy drinking. The largest differences between the groups were in terms of drug use (25.2% of “unaffected by suicidal behaviour” group, 35.5% of “resilient” group and 62.7% of “maladaptive” group, Phi=0.235; weak effect size) and smoking (17.8% of “unaffected” group, 28.7% of “resilient group and 48.5% of “maladaptive” group, Phi=0.219; weak effect size).

Social Support

We examined the social support available to the young people in the three sub-groups. Again there was a strong trend for lowest levels of support in the “maladaptive” sub-group, intermediate levels in the “resilient” sub-group” and highest levels in the “unaffected” sub-group. A notable exception was in the case of having a friend whom the young person can talk to about what really bothers them. This was reported most by those in the “resilient” sub-group (90.1%), a significantly higher proportion than the “unaffected” group (83.9%) or the “maladaptive” group (81.5%).

Table 2. Comparison between "unaffected by suicidal behaviour", "resilient" and "maladaptive" sub-groups in terms of psychosocial factors

		"Unaffected by suicidal behaviour" sub-group		"Resilient" sub-group		"Maladaptive" sub-group		p-value	Effect size
		Mean	***95% CI***	***Mean***	***95% CI***	***Mean***	***95% CI***		***Partial Eta sq***
Psychological characteristics	Depressive symptoms	3.00	2.90-3.11	3.75	3.55-3.95	5.98	5.52-6.43	*	0.083
	Anxiety	6.23	6.09-6.38	7.77	7.51-8.03	10.56	10.12-11.00	*	0.110
	Impulsivity	13.48	13.37-13.60	14.30	14.10-14.50	15.58	15.21-15.95	*	0.046
	Self-esteem	23.74	23.56-23.90	22.59	22.33-22.85	19.44	18.96-19.92	*	0.091
	Problem-oriented coping	6.66	6.60-6.71	6.73	6.64-6.82	6.11	5.96-6.27	†	0.015
	Emotion-oriented coping	7.19	7.13-7.25	7.86	7.56-7.97	9.02	8.85-9.18	*	0.111
		Yes n (%)	***No n (%)***	***Yes n (%)***	***No n (%)***	***Yes n (%)***	***No n (%)***		***Phi***
	Self-harm thoughts	258 (11.1%)	2069 (88.9%)	259 (28.8%)	641 (71.2%)	N/A	N/A	*	0.246
Negative life events	Death of someone close	1467 (61.8%)	908 (31.2%)	700 (76.7%)	213 (23.3%)	251 (75.6%)	81 (24.4%)	*	0.148
	Problems with or between parents	873 (36.8%)	1502 (63.2%)	536 (58.7%)	377 (41.3%)	271 (81.6%)	61 (18.4%)	*	0.293
	Serious illness of family or friend	1079 (45.4%)	1296 (54.6%)	583 (63.9%)	330 (36.1%)	239 (72.0%)	93 (28.0%)	*	0.200
	Difficulties with friends and peers	1020 (42.9%)	1355 (57.1%)	607 (66.5%)	306 (33.5%)	280 (84.3%)	52 (15.7%)	*	0.285
	Problems with schoolwork	867 (36.8%)	1487 (63.2%)	473 (52.4%)	430 (47.6%)	259 (78.0%)	73 (22.0%)	*	0.253
	Bullied	399 (17.0%)	1948 (83.0%)	225 (25.0%)	674 (75.0%)	138 (42.1%)	190 (57.9%)	*	0.181
	Trouble with the police	306 (13.0%)	2052 (87.0%)	180 (19.8%)	728 (80.2%)	112 (33.9%)	218 (66.1%)	*	0.167
	Physical or sexual abuse	79 (3.3%)	2296 (96.7%)	76 (8.3%)	837 (91.7%)	103 (31.0%)	229 (69.0%)	*	0.307
	Worries about sexual orientation	103 (4.4%)	2237 (95.6%)	63 (7.1%)	830 (92.9%)	77 (23.4%)	252 (76.6%)	*	0.215
Lifestyle								*	
	Smoking	417 (17.8%)	1932 (82.2%)	258 (28.7%)	640 (71.3%)	160 (48.5%)	170 (51.5%)	*	0.219
	Drugs in the past year	599 (25.2%)	1776 (74.8%)	324 (35.5%)	589 (64.5%)	208 (62.7%)	124 (37.3%)	*	0.235
	Living with both parents	2090 (88.2%)	280 (11.8%)	729 (80.1%)	181 (19.9%)	249 (75.5%)	81 (24.5%)	*	0.128
	Heavy drinking	639 (28.6%)	1597 (71.4%)	317 (36.6%)	550 (63.4%)	163 (50.5%)	160 (49.5%)	*	0.142
Social Support								*	
	Able to talk to mother about problems	1590 (69.6%)	693 (30.4%)	535 (61.9%)	329 (38.1%)	109 (37.2%)	184 (62.8%)	*	0.190
	Able to talk to father about problems	1071 (47.6%)	1177 (52.4%)	289 (34.6%)	547 (65.4%)	47 (16.9%)	231 (83.1%)	*	0.189
	Able to talk to sibling about problems	1325 (58.8%)	930 (41.2%)	475 (56.1%)	371 (43.9%)	99 (34.5%)	188 (65.5%)	*	0.134
	Able to talk to another relative about problems	861 (38.7%)	1362 (61.3%)	318 (37.8%)	523 (62.2%)	56 (20.6%)	216 (79.4%)	*	0.102
	Able to talk to teacher about problems	292 (13.3%)	1908 (86.7%)	98 (11.9%)	724 (88.1%)	19 (7.0%)	251 (93.0%)	p=0.012	0.052
	Able to talk to friend about problems	1941 (83.9%)	373 (16.1%)	806 (90.1%)	89 (9.9%)	255 (81.5%)	58 (18.5%)	*	0.082
	Able to talk to someone else about problems	664 (30.7%)	1502 (69.3%)	280 (34.4%)	534 (65.6%)	75 (27.2%)	201 (78.8%)	p=0.044	0.044

*p<0.0005 for all group comparisons

†p=0.394 for comparison of "unaffected by suicidal behaviour" and "resilient" sub-groups

Effect size measured by partial Eta^2 was very small if <0.01, small if <0.06, medium if <0.14 or large if 0.14+

Effect size measured by Phi were very weak if < 0.10, weak if < 0.30, moderate if < 0.50 and strong if 0.50+

Factors independently associated with vulnerability/resilience to DSH

We examined the factors independently associated with vulnerability and resilience to self-harm among two sub-groups of young people; those with and without knowledge of suicidal behaviour of others, regardless of their own history of DSH. For each sub-group separately, a multi-variate logistic regression model was constructed with lifetime history of DSH as the dependent variable (method=backward). All of the psychological, life event, lifestyle and social factors included in Table 2 were included in the model, except the variable *"Able to talk to father about what really bothers you"*, which was excluded from the analysis for the group " girls unexposed to DSH/suicide of others", due to small numbers. The analysis was carried out separately for boys and girls (Table 3). The factors which remained in the multi-variate model for lifetime history of DSH are here described as vulnerability or resilience/resistance factors depending on the simplest explanation of the variable in question.

"Exposed to suicidal behaviour of others" sub-group

The factors which remained in the model for boys for vulnerability to self-harm in the group exposed to suicidal behaviour of others were higher levels of anxiety and drug-taking in the past year. Among girls, the factors associated with resilience were higher self-esteem, less use of emotion-oriented coping, while vulnerability factors were drug use, school bullying, physical or sexual abuse and worries about sexual orientation.

"Unexposed to suicidal behaviour of others" sub-group

We also examined the factors associated with vulnerability/resistance to DSH among those girls and boys without the risk factor of knowledge of suicidal behaviour of someone close. Among boys, being *able to talk to his mother about what really bothers him* was associated with resistance to DSH, with higher levels of depressive symptoms and the experience of bullying associated with vulnerability. Among girls, being *able to talk to a sibling about what really bothers her* was associated with resistance to DSH, while higher levels of depressive symptoms and problems with schoolwork were vulnerability factors.

Table 3. Factors independently associated with vulnerability/resilience to DSH in those exposed and un-exposed to suicidal behaviour of others

	Boys			***Girls***		
	n=423	**Odds ratio (95% CI) for DSH**	**β**	**n=830**	**Odds ratio (95% CI) for DSH**	**β**
Group 1: Exposed to DSH/suicide of others	Drug-taking in past year	4.46 (1.73-11.52)	1.495	Drug-taking in past year	4.13 (2.51-6.79)	1.417
	Anxiety	1.23* (1.12-1.36)	0.209	Emotion-oriented coping	1.34* (1.12-1.60)	0.291
				Self-esteem	0.87* (0.81-0.94)	-0.137
				Bullying	2.40 (1.44-3.97)	0.872
				Physical or sexual abuse	3.91 (2.18-7.01)	1.364
				Worries about sexual orientation	3.10 (1.58-6.10)	1.132
	n=1,429	**Odds ratio (95% CI) for DSH**		**n=1,033**	**Odds ratio (95% CI) for DSH**	
Group 2: Unexposed to DSH/suicide of others	Depressive symptoms	1.37* (1.19-1.59)	0.318	Depressive symptoms	1.28* (1.13-1.45)	0.245
	Able to talk to mother	0.20 (0.05-0.74)	-1.61	Able to talk to sibling	0.19 (0.08-0.49)	-1.649
	Bullying	7.20 (2.48-20.88)	1.974	Problems with schoolwork	3.71 (1.44-9.57)	1.312

*Odds ratio for lifetime history of DSH associated with one unit increase in score

DISCUSSION

In this study we have taken a novel approach to the study of adolescent self-harm by focusing on resilience and positive adaptation. We have examined the extent to which young people exposed to suicidal behaviour of others are at risk of harming themselves, and the factors associated with resistance to the contagion of self-harm in this group. One third of our sample reported having a friend or family member who had engaged in self-harm or who had died by suicide. Significant associations were found between knowing someone who had engaged in suicidal behaviour and reporting own experiences of self-harm. Adolescents reporting knowledge of DSH or suicide by someone close were approximately eight times more likely to report DSH themselves than those without this experience. Factors associated with vulnerability

and resilience to DSH in those exposed to DSH of others were gender-specific and differed from the factors associated with vulnerability/resistance to DSH in the sub-group unexposed to suicidal behaviour. Among those exposed to DSH or suicide of others, vulnerability factors were drug use and higher levels of anxiety among boys, while for girls drug use, bullying and abuse were vulnerability factors, while resilience was associated with higher self-esteem and use of problem-oriented coping.

We identified a resilient sub-group of young people, those with knowledge of DSH or suicide of friends or family members, but without a history of DSH themselves. This group differed significantly from both their "unaffected by suicidal behaviour" and "maladaptive" peers on almost all of the factors examined. This group could be described as having a poorer profile than the "unaffected" group (Luthar *et al.*, 2000) in terms of exposure to negative life events and mental health indicators. This is an important finding suggesting that family and peer groups which include individuals who have self-harmed share a wide range of risk factors from various domains. Resilient individuals within these family and peer groups are those with a less severe risk factor profile. Our findings that a significant minority of the "resilient" sub-group reported self-harm thoughts (more than a two-fold difference compared to the "unaffected" group), supports this view of the resilient group as burdened.

This view of resilient young people as having higher levels of difficulties than their low-risk peers offers an alternative view of resilient individuals, sometimes assumed to display positive outcomes due to particular skills or competence they possess (Luthar *et al.*, 2000). Our finding that the resilient young people were most likely to have a friend to talk to about problems underlines the major importance of perceived social support in resilience processes. Further research could examine the possibility, suggested by these findings, that resilience may be associated with falling short of a certain "threshold" level in terms of a broad range of risk factors.

Multi-variate analyses identified the factors independently associated with vulnerability and resilience among those young people who knew others with DSH or suicide. Among boys, vulnerability to DSH was associated with higher levels of anxiety and drug use. Among girls also, drug use was associated with vulnerability, as were emotion-oriented coping and experiences of bullying or abuse and worries about sexual orientation, while higher self-esteem could be considered a resilience factor. The factors associated with resilience in this group were very different to the factors associated with freedom from DSH in the sub-group of adolescents unexposed to suicidal behaviour of others. Among the "unexposed" group, levels of depressive symptoms, social and school factors (bullying for boys and schoolwork problems for girls) were important. The majority of previous studies with similar populations reporting multi-variate analyses have found that depressive symptoms made a significant and large contribution to the variance in self-harm (Evans *et al.*, 2004, Hawton *et al.*, 2002). Here, we have found this to be the case only among the "un-exposed" sub-group, and in fact depressive symptoms did not remain in the multi-variate model when the entire sample was analysed previously (McMahon *et al.*, 2010). The finding that resilience factors are specific to the at-risk group under examination adds support to the view that it is important to focus on factors which contribute to positive development in the face of particular adversity, but may not be significant when the broader population is examined (Roosa, 2000).

Our finding relating to the central association between drug use and resilience/vulnerability to DSH in the group of young people exposed to suicidal behaviour of others, for example, allows us to focus on this important resilience factor (prevention of drug use), which potentially may contribute to preventing contagious effects of DSH. On the other hand, it is interesting to note the importance of social support and levels of depression among the "un-exposed" group, among whom the development of DSH is rare.

Our findings point to the existence of self harm clusters within peer and family groups. There are many possible ways in which the contagion of self-harm thoughts and behaviours may

come about within peer and family groups. However, clustering may also be the result of shared socio-demographic or other factors which are common to peer and family groups or of the selection by young people with self-harm of friends with a similar history. The family DSH contagion effect is consistent with the familial intergenerational transmission of suicide risk hypothesis (Melhem *et al.*, 2007), while peer associations suggest a possible modelling effect, in line with other evidence on contagion of suicidal behaviour in adolescents (Gould *et al.*, 1994). It has been suggested that contagion may be a particularly important factor among girls who cut themselves (Hawton *et al.*, 2009). A previous study has reported a uniquely distinct relationship between DSH of a friend and DSH without intent to die on one hand and DSH of a family member with DSH with intent to die on the other (Hargus *et al.*, 2009), leading to the suggestion that distinctions should be drawn between familial and non-familial DSH models when designing prevention programs. Our analyses grouped together those with familial and non-familial DSH history, which prevented in-depth analyses of any possible distinctions. Due to small numbers who reported suicide of a friend or family member, it was impossible to look at those with this specific risk factor. However, it may be the case that a unique profile exists for those with a family member who has died by suicide.

Employing the resilience concept implies a focus on individuals' strengths as well as deficits. The questions included in the CASE survey were designed to assess potential risk factors for self-harm, and therefore the focus is on negative life events, without the inclusion of positive events which may be something other than the absence of a particular risk factor. However, the inclusion of the assessment of social support available to young people as well as psychological factors like self-esteem and problem-oriented coping provided an opportunity to look at positive, protective factors. In other cases, positive factors may reasonably be assumed to represent the more positive end of the spectrum in terms of mental health factors such as depressive symptoms and anxiety and the absence of negative events (Fergusson *et al.*, 2003).

This study was carried out using a cross-sectional design, which makes it difficult to draw conclusions on causal or temporal relations between resilience to DSH and associated factors, and which prevents the examination of the dynamic process of resilient adaptation. The study examined self-harm episodes reported to have happened at any time in the past, and therefore reported self-harm did not necessarily occur after the various associated factors and events, making it difficult to draw conclusions on causality. However, as 82% of those who had harmed themselves had done so within the past year (Morey *et al.*, 2008), associations may be valid. The psychological scales and lifestyle items measured current state and lifestyle at one time point only, which may have been after any reported DSH.

Despite these limitations, we have employed the novel and rigorous CASE study methodology to explore resilient adaptation among a large sample of adolescents. We have found that within peer or family groups where suicidal behaviour has occurred, there are resilient individuals who share many of the risk factors of those around them, albeit to a lesser degree. Self-harm thoughts are common in this group and support should be given to these burdened individuals. Knowledge of the factors associated with resilience and vulnerability to self-harm can inform school-based intervention programmes promoting resilience and positive mental health, as these have been found to me most effective when targeted at specific at-risk groups (Calear and Christensen, 2009). Current international longitudinal research aims to identify the most effective school-based programmes for the prevention of suicidal behaviour in this group (Wasserman *et al.*, 2010).

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Chapter 7

Discussion

Summary of main findings

The central aim of this thesis was to investigate the psycho-social factors associated with vulnerability and resilience to deliberate self-harm among adolescents in the community, using the novel and rigorous CASE study methodology. Prior to the CASE study, there had been no comparable large-scale study, making the prevalence and correlates of self-harm among this group difficult to determine, despite the importance to prevention and intervention efforts. The large sample size (3,881 in Ireland and 30,477 in total across the seven centres) and the robust methodology used presented an opportunity for high-quality research which could add significantly to knowledge in this field. The Lifestyle and Coping questionnaire used in all CASE centres included a wide range of variables, with a clear definition of deliberate self-harm and stringent criteria for the inclusion of cases of self-harm.

In Chapter 2, the factors associated with self-harm in young Irish people in the community were examined, which had not previously been done in a large-scale study. Of particular importance for both sexes were drug taking and knowing others who have engaged in DSH, which highlighted the importance of peer-related factors in adolescent self-harm. Among girls, other factors such as low self-esteem, relationship problems and forced sexual activity were also associated with DSH. The male profile differed and involved anxiety and impulsivity as well as school problems. Noteworthy findings, including the associations between bullying and self-harm for boys and the clear indication of the clustering of DSH within peer groups provided interesting similarities and differences with international findings (De Leo and Heller, 2004, Hawton *et al.*, 2002), and were investigated in depth in subsequent chapters. The finding that certain life events, exposure to DSH of others and drug use had more direct associations with DSH than mental health factors offered an alternative focus to more traditional mental health approaches.

As male victims of bullying are at heightened risk of self-harm and suicide, we sought to examine this vulnerable group in depth. In Chapter 3 striking findings relating to the strong associations between bullying victimisation and poor mental health were reported, which supported findings form both the US (Brunstein Klomek *et al.*, 2007) and Europe (Analitis *et al.*, 2009). Relative risk of lifetime self-harm was four times higher for boys who had been bullied than their peers. Among boys with a history of victimisation, DSH was associated with a distinctive range of psycho-social stressors, including problems with schoolwork, serious physical abuse and worries about sexual orientation. These findings can aid identification of boys at greatest risk, and highlight the fact that the correlates of DSH are specific to particular high-risk groups of young people.

Both in Ireland and internationally, we found evidence to support the view that young people with a history of DSH to have significantly poorer mental health than their peers; higher levels of anxiety, depression and impulsivity and lower self-esteem, as previously reported (Conner *et al.*, 2004, Fergusson *et al.*, 2003, Foley *et al.*, 2006, Spirito *et al.*, 1996, Wild *et al.*, 2004). With the unique opportunity to pool the international CASE study data, evidence was found for a "dose-response" relationship whereby higher levels of depression, anxiety and impulsivity and lower levels of self-esteem were associated with increased history of self-harm thoughts and/or acts, which supported previous findings from smaller scale studies (e.g.(Esposito *et al.*, 2003). These patterns were consistent across both gender and country and a similar "dose-response" relationship was found for increasing number of negative life events. A particularly interesting finding was that thoughts of self-harm were not always distinguishable from a single self-harm episode in terms of associated factors. This finding, common across the international centres, that few factors distinguished those with self-harm thoughts from those reporting self-harm, echoes previous findings which pointed to self-harm thoughts as an important indicator of risk (Groleger *et al.*, 2003). These findings are also in line with the "motivational-volitional" model of suicidal behaviour which maps the development of suicidal behaviour from ideation and intent through to acts of self-harm (O'Connor, 2011).

It has been argued that research in this field has not adequately incorporated mediating and moderating variables into pathways linking psycho-social factors and suicidal behaviour (Sandin *et al.*, 1998). In Chapter 5, we examined the importance of coping style, both in terms of its associations with DSH and its potential mediating role in associations between depressive symptoms, anxiety, self-esteem and DSH. Emotion-oriented coping was strongly associated with poorer mental health and with self-harm thoughts and acts, while problem-oriented coping was associated with better mental health. We found evidence for the mediating effect of emotion-oriented coping on associations between mental health factors and DSH, and similar mediating effects of coping style when risk of self-harm thoughts was examined for those adolescents with no history of DSH. These novel findings suggest a pathway by which mental health difficulties lead to thoughts and acts of self-harm and underline the importance of interventions which promote positive coping among this group as central to prevention efforts (Compas et al., 2001).

Resilience to self-harm has rarely been explicitly examined, despite the potential for such analysis to develop our understanding of how DSH may be prevented. I we n Chapter 6 we have reported that resilient individuals who have been exposed to the DSH of others share many of the risk factors of those around them, albeit to a lesser degree. We found that factors associated with resilience and vulnerability to self-harm differed for exposed and un-exposed sub-groups, with factors such as drug-taking significant for the group exposed to suicidal behaviour of others, and depressive symptoms significant for their unexposed peers. These findings can shed some light on the relative importance of various factors among sub-groups of young people and allows for more targeted screening and prevention efforts. The resilience approach can also inform universal positive mental health programmes, which are particularly relevant with the growing international emphasis on positive mental health and wellbeing (World Health Organisation, 2010). In Ireland, school-based positive mental health promotion programmes including the “Mind Yourself” programme have recently been trialled (Arensman,

2009), taking a life skills approach with the aim of enhancing coping skills in young people and building resilience.

The findings reported here support a view of vulnerability and resilience to self-harm as developing due to an accumulation of factors across childhood and adolescence, with mental health, life event and lifestyle domains making independent contributions. The outcomes supporting a "dose-response" relationship between increasing number of negative life events and severity of self-harm history provide evidence for this perspective. Although within a cross-sectional design it is impossible to clearly identify any temporal associations between self-harm and associated factors, it is possible to suggest that some factors may be considered long term vulnerability/resilience factors (for example self-esteem among girls, impulsivity among boys) and others stress factors which are likely to occur immediately before and precipitate DSH (for example forced sexual activity or bullying victimisation). This view is in keeping with the diathesis-stress model of the development of self-harm among psychiatric patients (Mann *et al.*, 1999), which has been applied by others to the factors associated with DSH in adolescent community populations (Evans *et al.*, 2004). Our findings also support the "pathway" model of teenage suicide, which highlights the importance of three domains; individual disposition, trigger factors and social milieu, in adolescent suicidal behaviour (Shaffer, 1994). Findings which may contribute to resilience should not be overlooked and may arise from multiple domains through the lifespan, including social support, coping skills and good mental health.

Limitations

Non-response bias

Non-response bias (when the answers of participants differ from the potential answers of those who did not participate) can be a problem in self-report mental health research, particularly when response rates are low. Response rates were generally high in the CASE study (Australia 92%; Belgium 93%; England 81%; Hungary 93%; Ireland 85%; the Netherlands 96%; and

Norway 91%), so non-response bias may be considered to have been limited. Within the Irish sample, 90.7% of non-responders were absent on the day of the survey. Those absent due to illness or deliberately not coming to school would certainly have a health and social profile that would be associated with a higher prevalence of DSH to those in school. However, students were also absent from school because of out-of school activities such as day trips and tours. Such students would be likely to have a similar prevalence of DSH to those in school at the time of the survey. A small number of adolescents also opted out or returned spoiled questionnaires.

Response bias

Response biases arise when subjects respond to items in research instruments in ways that do not coincide with the intent or content of the instrument (Rogler *et al.*, 2001). Response biases include *Acquiescence response style* (the tendency to respond positively regardless of the content of the question), *Extreme* and *moderacy response styles* (the tendency for subjects to respond consistently using particular sections of the scale when rating scales are used) and *Social desirability bias* (the tendency to answer in such a way as to represent oneself in a favourable light). Such biases can have a contaminating influence on the relationships between variables, including masking and spurious associations. The design of the instrument used included attempts to minimise these sources of bias. In terms of the central aim of assessing history of DSH, detailed information was required when a respondent reported DSH and cases were only included if the individual described their act of self-harm using free text and if their description met study criteria. This rigorous process for classifying cases of DSH led to the "loss" of approximately 25% of potential cases due to incomplete information, but led to a more reliable data set. Response biases such as acquiescence and extreme response styles were minimised throughout the survey through mixture of positively and negatively worded items. The fact that the researchers were independent of the schools meant that social desirability bias was unlikely to have been a significant problem. The psychological scales used in the survey were designed to minimise response bias, had been validated in the literature and had high

internal reliability in our sample. As our study aimed to examine the level of "hidden" self-harm in the adolescent population, a self-report methodology was the most appropriate, despite the potential for systematic biases. It was hoped that the assurance of anonymity may also have led to more valid responses from participants.

Study design

As the study design was cross-sectional, it is impossible to draw conclusions on causal or temporal relations between DSH and associated factors. Where the international sample was used, past year history of self-harm was examined as the large sample gave adequate power. In the case of the Irish sample, lifetime history of self-harm was used due to small numbers of people reporting past year history of DSH. In both cases, reported self-harm did not necessarily occur after the various associated factors and events. Additionally, psychological factors measured current state at the time of the survey, which may have led to an under-estimation of associations between these variables and DSH. It may also be the case that the study samples were not entirely representative of the adolescent populations, within Ireland and internationally. However, methodologically, all efforts were made to achieve a representative sample through the inclusion of a balance of single sex and co-educational schools from urban and rural locations within the regions. As pooling of data from all seven centres could lead to issues if samples were not comparable, data were reported by country where possible when reporting international findings. Although it was beyond the scope of this thesis, further research could develop on these findings through qualitative examination of the elements of the CASE survey which required free text response. This would enhance our understanding of aspects such as the reasons given by young people who had harmed themselves, the way in which they describe their acts of self-harm, and their views on how self-harm could be prevented.

Implications for theory and for further research

Controlled longitudinal studies are needed in order to examine the direction of the effect and specificity of the risk and protective factors found to be associated with DSH. It may be beneficial to focus on distinct sub-groups of young people; those with self-harm thoughts only, single episode self-harm and multiple episodes for example, in order to understand better the self-harm process as it develops. It has been reported that self-harm is associated with different factors at different stages of the self-harm process (Neeleman *et al.*, 2004) and further investigation of these phenomena is required. Our findings relating to the significance of self-harm thoughts as an indicator of risk highlight the fact that self-harm thoughts, although very prevalent, should not be overlooked by researchers in this field. It may also be promising to identify high-risk sub-groups (for example those with peer groups with DSH) whose risk profiles have been found to be distinct. Study design should take in to account the potential importance of protective factors, which are under-examined in comparison to risk factors, but which may be equally important. In tandem with examining the characteristics of young people with maladaptive outcomes, research can benefit from a focus on resilience (positive outcomes in the presence of adversity), as such an approach can inform prevention strategies and shed more light on the competences and supports which are most beneficial to high-risk groups. International studies which facilitate cross-national comparisons in terms of prevalence of self-harm and a wide range of associated factors can help to further develop our knowledge of self-harm in its cultural context.

Implications for prevention

As DSH is common among adolescents, and school-related factors are important correlates of self-harm, schools have an important role to play in prevention. Primary prevention strategies should aim to modify factors associated with self-harm through promotion of positive mental health among all students, which has been found to be beneficial (Wells *et al.*, 2001). Given the established associations between psycho-social stressors and self-harm in this group, interventions which help young people to cope with stress may be particularly beneficial

(O'Connor *et al.*, 2009, Sullivan *et al.*, 2004). A wide range of interventions for the treatment and prevention of psychopathology are designed to enhance coping skills of adolescents (Arensman, 2009, Compas *et al.*, 2001), and our findings relating to the potential benefits of reduction of emotion-oriented coping may inform such programmes. Our findings also point to the importance of anti-bullying initiatives and drugs education.

Secondary prevention strategies could be aimed at individuals who have been identified as at risk of suicidal behaviour. We have identified some specific groups of high-risk young people, for example those with peers who have harmed themselves and those who have been bullied, both experiences associated with greatly increased risk of DSH. School-based screening has been found to identify suicidal and emotionally troubled adolescents who had not been identified as at-risk by school staff (Scott *et al.*, 2009). Adolescents at high risk or who have harmed themselves should then be supported by the school, the family and mental health professionals, as appropriate. Currently, the international SEYLE (Saving and Empowering Young Lives in Europe) trial aims to identify the most effective school-based interventions to reduce suicidal behaviour and promote positive mental health (Wasserman *et al.*, 2010). Interventions examined in the trial include awareness training on mental health promotion for adolescents and screening of at-risk adolescents by health professionals.

Conclusion

Self-harm is common among adolescents and a small minority of those who have harmed themselves have sought help, highlighting the continuing stigma surrounding mental health problems, but also the importance of high-quality epidemiological research into adolescent self-harm. Here we have described the profile of young people who have engaged in self-harm and have investigated the associations between psychological, lifestyle and life event factors and self-harm thoughts and behaviour, as well as examining those resilient young people who are

resistant to the contagious effects of self-harm. These findings can inform prevention strategies and aid identification of those at risk.

What was known about this topic:

- Deliberate self harm in common among adolescents, especially girls.
- Adolescents who engage in deliberate self harm often do not come to the attention of healthcare services.
- Internationally, self harm is associated with poor mental health, negative life events and knowing others with suicidal behaviour.

What this study adds:

- The factors associated with DSH in Irish adolescents are gender-specific and include peer-related and school-related factors as well as mental health factors.
- High risk groups (male victims of bullying and adolescents exposed to suicidal behaviour of others) have specific profiles of factors associated with vulnerability and resilience to DSH which differ from those of their peers
- Coping style mediates associations between mental health problems and self harm thoughts and acts.
- There is a dose-response relationship between levels of psychological difficulties and number of negative life events experienced and severity of self harm history.
- Many adolescents exposed to suicidal behaviour of others display resilient adaptation despite being burdened by a large number of risk factors. Resilience is associated with psychological factors and avoidance of drug use in particular.

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Appendix 1

Lifestyle and coping questionnaire

We hope that you will complete this questionnaire to help us **find out more** about how pupils at school **feel and cope**. Many young people face problems at various times and sometimes have difficulty coping with them. Your answers to the following questions should be useful in helping us **understand more** about young people of your age.

Please answer all questions as honestly as you can. There are **no right or wrong** answers - what you put depends on what you think.

The questionnaire is **anonymous** and anything you say will remain confidential. No information will be passed on to your teachers, parents, friends or **anybody else** you know. Please complete the questionnaire on your own. **Your answers are private** and so are those of your friends.

Please put a ✓ in the boxes that apply to you.
Please check that you give an answer to **each** question.

First, a few questions about YOU.

1. Are you male or female? male female

2. How old are you? 14 years 15 years 16 years 17 years

3. Are you Black Asian White
   Other (please describe).....

4. Who do you live with most days of the week?
   both my mother and my father one parent
   one parent and a step-parent / partner
   other family member other

And next, a few questions about your lifestyle:

5. How often do you eat healthy food?
   - often
   - sometimes
   - almost never

6. How often do you take exercise?
   - often
   - sometimes
   - almost never

7. How many cigarettes do you smoke in a typical week?
   - I never smoke
   - I used to smoke but I have given it up
   - up to 5 cigarettes a week
   - 6 to 20 cigarettes a week
   - 21 to 50 cigarettes a week
   - more than 50 cigarettes a week

8. How many alcoholic drinks do you have in a typical week? (One drink, for example, would be half a pint of beer, lager or cider, a glass of wine or one measure of spirits)
   - I never drink alcohol
   - one drink
   - 2 to 5 drinks
   - 6 to 10 drinks
   - 11 to 20 drinks
   - more than 20 drinks

9. How often, **in the past month** (ie last thirty days), have you had so much to drink that you were really drunk?
   - never
   - once
   - 2 to 3 times
   - 4 to 10 times
   - more than 10 times

10. How often, **in the past year,** have you had so much to drink that you were really drunk?

never

once

2 to 3 times

4 to 10 times

more than 10 times

11. Please tick any of the following types of drugs you have taken during the past month (ie. last thirty days) and the past year.

Hashish/marijuana/cannabis	In the past month	In the past year
Ecstacy	In the past month	In the past year
Heroin, opium, morphine	In the past month	In the past year
Speed, LSD or cocaine	In the past month	In the past year
Other drugs or substances (not including medication)	In the past month	In the past year

Next, could you answer the following questions about things that may have happened to you. If they have, please indicate if this was in the last 12 months and / or more than a year ago

Tick more than one box if you need to:

12	Have you had problems keeping up with schoolwork?	Yes, in the past month	Yes, in the past year	No
13	Have you had difficulty in making or keeping friends?	Yes, in the past month	Yes, in the past year	No
14	Have you had any serious arguments or fights with friends?	Yes, in the past month	Yes, in the past year	No

15	Have you had any serious problems with a boyfriend or girlfriend?	Yes, in the past month	Yes, in the past year	No
16	Have you been bullied at school?	Yes, in the past month	Yes, in the past year	No
17	Have your parents separated or divorced?	Yes, in the past month	Yes, in the past year	No
18	Have you had any serious arguments or fights with either or both of your parents?	Yes, in the past month	Yes, in the past year	No
19	Have your parents had any serious arguments or fights?	Yes, in the past month	Yes, in the past year	No
20	Have you or any of your family had a serious illness or accident?	Yes, in the past month	Yes, in the past year	No
21	Have any close friends had a serious illness or accident?	Yes, in the past month	Yes, in the past year	No
22	Have you been seriously physically abused?	Yes, in the past month	Yes, in the past year	No
23	Have you been in any trouble with the police?	Yes, in the past month	Yes, in the past year	No
24	Has anyone among your immediate family (mother, father, brother or sister) died?	Yes, in the past month	Yes, in the past year	No
25	Has anyone else close to you died?	Yes, in the past month	Yes, in the past year	No
26	Has anyone among your family orclose friends committed suicide?	Yes, in the past month	Yes, in the past year	No
27	Has anyone among your family attempted suicide or deliberately harmed themselves?	Yes, in the past month	Yes, in the past year	No

28	Has anyone among your close friends attempted suicide or deliberately harmed themselves?	Yes, in the past month	Yes, in the past year	No
29	Have you had worries about your sexual orientation (ie that you might be lesbian, gay or bisexual)?	Yes, in the past month	Yes, in the past year	No
30	Has anyone forced you (ie. physically or verbally) to engage in sexual activities against your will?	Yes, in the past month	Yes, in the past year	No
31	Has any other distressing event occurred involving you, your family or close friends?	Yes, in the past month	Yes, in the past year	No

If 'yes' to question 31 please describe.

All young people have problems at some time or another, and sometimes they may try to get help.

32. Have you **in the past year** had any serious personal, emotional, behavioural or mental health problem for which you felt you needed professional help (e.g. a GP, social worker, psychologist, psychiatrist, telephone helpline)?

- Yes, but I did not try to get professional help
- Yes, and I did ask for professional help
- No, I have had few or no problems
- I have had, or now have, serious problems, but have never felt the need for professional help

33. Have you ever deliberately taken an overdose (eg of pills or other medication) or tried to harm yourself in some other way (such as cut yourself)?

Please tick the box which applies to you . . .

No ..... please go to QUESTION 46
Yes, once ..... continue with QUESTION 34 below
Yes, more than once ..... continue with QUESTION 34 below

The following questions are about the LAST TIME you took an overdose or tried to harm yourself

34. When was the **last time** you took an overdose or tried to harm yourself?

less than a month ago
between a month and a year ago
more than a year ago

Describe what you did to yourself **on that occasion**.

Please give as much detail as you can - for example, the name of the drug taken in an overdose.

35. At this time, were you:

at home?	No	Yes
under the influence of alcohol?	No	Yes
under the influence of an illegal drug?	No	Yes

36. Please describe in your own words why you think you took an overdose or tried to harm yourself **on that occasion**.

37. Do any of the following reasons help to explain why you took an overdose or harmed yourself in some other way?

I wanted to show how desperate I was feeling	No	Yes
I wanted to die	No	Yes
I wanted to punish myself	No	Yes
I wanted to frighten someone	No	Yes
I wanted to get my own back on someone	No	Yes
I wanted to get relief from a terrible state of mind	No	Yes
I wanted to find out whether someone really loved me	No	Yes
I wanted to get some attention	No	Yes

38. How long before you took the overdose or tried to harm yourself **on that occasion** had you started to think about doing it?

less than an hour
more than an hour but less than a day
more than a day but less than a week
more than a week but less than a month
a month or more

39. Did you talk or try to get any help beforehand from any of the following people or sources?

someone in your family	No	Yes
a friend	No	Yes
a teacher	No	Yes
a GP (family doctor)	No	Yes
a social worker	No	Yes
a psychologist or psychiatrist	No	Yes
a telephone help line	No	Yes
a drop-in/advice centre	No	Yes
other source (eg internet, book magazine, other person etc)	No	Yes

If yes, please specify: .....

If 'no' to all the above, please say why you didn't try to get any help.

40. Did any of the following people know about what you did **on that occasion**?

mother	No	Yes
father	No	Yes
brother/sister	No	Yes
another relative	No	Yes
a friend	No	Yes
a teacher	No	Yes
a GP (family doctor)	No	Yes
a social worker	No	Yes
a psychologist or psychiatrist	No	Yes

41. Did you try to get any help afterwards for the problems that led you to take an overdose or harm yourself on that occasion? No Yes

If 'no', please say why you didn't try to get any help.

42. Did you go to hospital because of **this** overdose or attempt to harm yourself?

No Yes

43. **On that occasion**, did you receive help from any of the following people or sources?

someone in your family	No	Yes
a friend	No	Yes
a teacher	No	Yes
a GP (family doctor)	No	Yes
a social worker	No	Yes
a psychologist or psychiatrist	No	Yes
a telephone help line	No	Yes
a drop-in/advice centre	No	Yes
other source (eg internet, book magazine, other person etc)	No	Yes

If yes, please specify: .....

44. Have you **ever** gone to hospital because you took an overdose or harmed yourself?

No Yes

45. Have you **ever** seriously wanted to kill yourself when you have taken an overdose or tried to harm yourself in some other way?

No Yes

Now for a few questions for everybody to answer…

46. Have you during the past month or the past year seriously **thought** about taking an overdose or trying to harm yourself but not actually done so?

No

Yes, the last time was in the past month

Yes, the last time was over a month ago, but less than a year ago

47. If 'yes', did you talk to, or try to get help from, any of the following people or sources **on the last occasion**?

someone in your family	No	Yes
a friend	No	Yes
a teacher	No	Yes
a GP (family doctor)	No	Yes
a social worker	No	Yes
a psychologist or psychiatrist	No	Yes
a telephone help line	No	Yes
a drop-in/advice centre	No	Yes
other source (eg internet, book magazine, other person etc)	No	Yes

If yes, please specify: .....

48. Have you ever told someone you were going to harm or kill yourself?

No

Once

A few times

Often

49. If you have ever told someone you were going to harm or kill yourself, have you ever done this without really meaning it?

No

Once

A few times

Often

Please say whether or not you agree with the following statements:

50	Most young people who harm themselves are lonely and depressed	I agree	I don't know	I disagree
51	Most young people who harm themselves do it on the spur of the moment.	I agree	I don't know	I disagree
52	Most young people who harm themselves are feeling suicidal	I agree	I don't know	I disagree
53	Most young people who harm themselves are trying to get attention	I agree	I don't know	I disagree
54	Most young people who harm themselves could have been prevented from doing so.	I agree	I don't know	I disagree

The next questions are about how you have been feeling recently. Please tick the box which best describes your feelings in the past week.

55. I feel tense and 'wound up'

most of the time a lot of the time time to time – occasionally not at all

56. I still enjoy the things I used to enjoy

definitely as much not quite so much only a little hardly at all

57. I get a sort of frightened feeling as if something awful is about to happen

very definitely and quite badly yes, but not too badly a little, but it doesn't worry me not at all

58. Worrying thoughts go through my mind

a great deal of the time a lot of the time from time to time, but not often

only occasionally

59. I can laugh and see the funny side of things

a great deal of the time a lot of the time from time to time, but not often

only occasionally

60. I feel cheerful

not at all not often sometimes most of the time

61. I can sit at ease and feel relaxed

Definitely usually not often not at all

62. I feel as if I am slowed down

nearly all the time very often sometimes not at all

63. I get a sort of frightened feeling like 'butterflies' in the stomach

not at all occasionally quite often very often

64. I have lost interest in my appearance

Definitely I don't take so much care as I should

I may not take quite as much care I take just as much care as ever

65. I feel restless as if I have to be on the move:

very much indeed quite a lot not very much not at all

66. I look forward with enjoyment to things

as much as I ever did rather less than I used to definitely less than I used to

hardly at all

67. I get sudden feelings of panic

very often indeed quite often not very often not at all

68. I can enjoy a good book or radio or TV programme

Often sometimes not often very seldom

Please read each of the following statements and indicate how often you feel or act in this way.

69. I plan ahead

Almost never Sometimes Often

70. I do things on the spur of the moment

Almost never Sometimes Often

71. I say whatever pops into my head

Almost never Sometimes Often

72. I do things impulsively

Almost never Sometimes Often

73. I find it difficult to control my emotions

Almost never Sometimes Often

74. I am cautious

Almost never Sometimes Often

In general, are you able to talk to the following people about things that really bother you?

75. your father / step father

No Yes

76. your mother / step mother

No Yes

77. a brother or sister

No Yes

78. another relative

No Yes

79. a friend

No Yes

80. a teacher

No Yes

81. somebody else No Yes

When you are worried or upset how often do you do any of the following things?

82. talk to someone Never Sometimes Often

83. blame myself for getting into the mess Never Sometimes Often

84. get angry Never Sometimes Often

85. stay in my room Never Sometimes Often

86. think about how I have dealt with similar situations Never Sometimes Often

87. have an alcoholic drink Never Sometimes Often

88. try not to think about what is worrying me Never Sometimes Often

89. try to sort things out Never Sometimes Often

Please indicate how much you agree or disagree with the following statements when thinking about how you feel most of the time

90. I'm glad I'm who I am
Completely disagree Disagree Agree Completely Agree

91. There are lots of things I'd change about myself if I could
Completely disagree Disagree Agree Completely Agree

92. It's pretty tough to be me
Completely disagree Disagree Agree Completely Agree

93. I have a pleasant personality
Completely disagree Disagree Agree Completely Agree

94. I have control over my own life
Completely disagree Disagree Agree Completely Agree

95. Everyone seems much more confident and contented than me
Completely disagree Disagree Agree Completely Agree

96. Even when I quite enjoy myself there doesn't seem much purpose to it all

Completely disagree Disagree Agree Completely Agree

97. I can like myself even when others don't

Completely disagree Disagree Agree Completely Agree

Any other comments?

Please have a look back through the questionnaire to make sure you have filled in boxes for all the questions relevant to you.

If you have completed all the questions could you please spend a short while writing down what you think could be done to help prevent young people from feeling that they want to harm themselves.

If you still have time, please say how you think life could be made better for young people in your neighbourhood.

THANK YOU for your help.