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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.

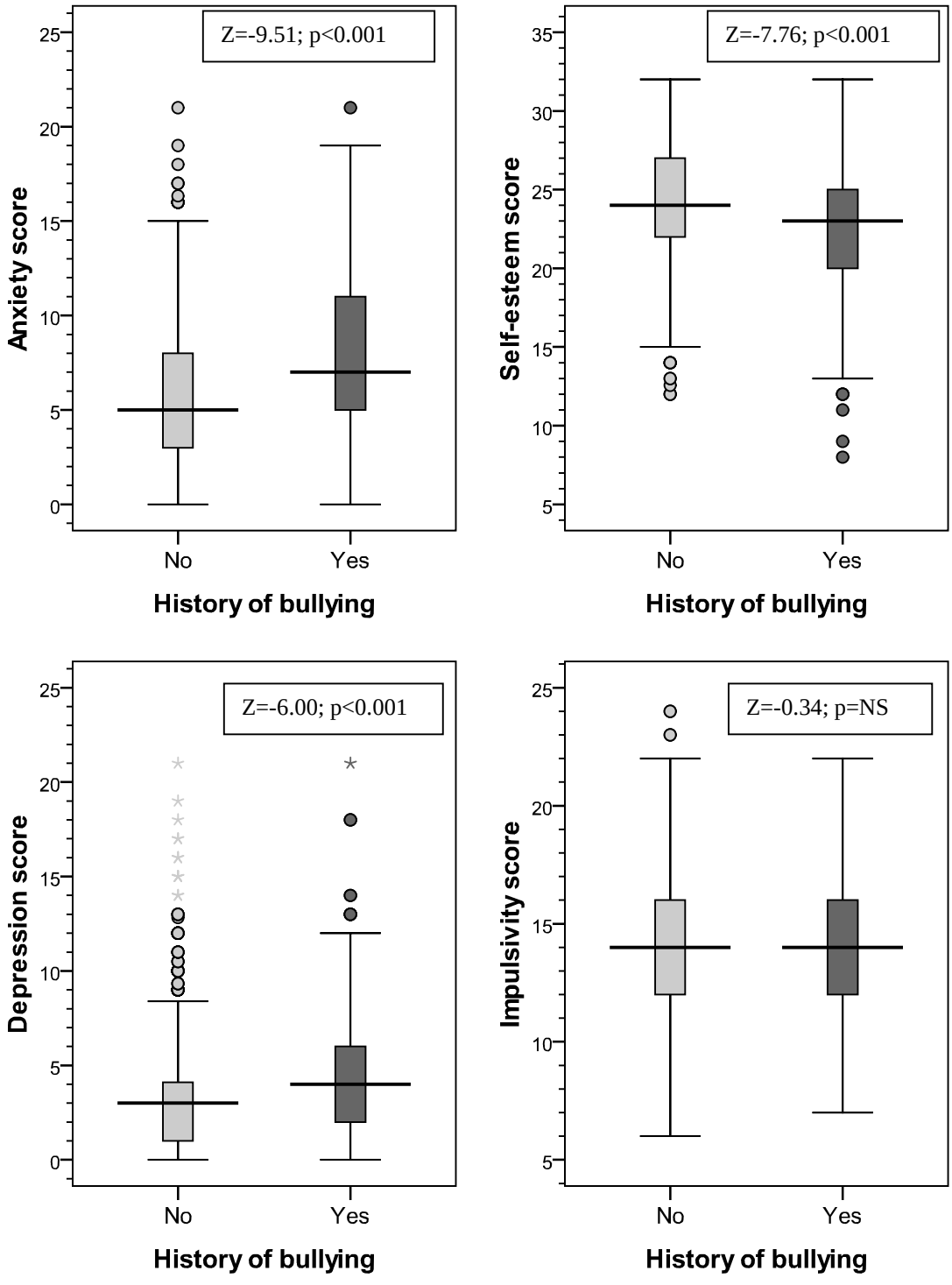
Table 1. Prevalence of school bullying victimisation among boys

	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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