Deliberate self harm in adolescents: self report survey in schools in England

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Abstract

Objective To determine the prevalence of deliberate self harm in adolescents and the factors associated with it.

Design Cross sectional survey using anonymous self report questionnaire.

Setting 41 schools in England.

Participants 6020 pupils aged 15 and 16 years.

Main outcome measure Deliberate self harm.

Results 398 (6.9%) participants reported an act of deliberate self harm in the previous year that met study criteria. Only 12.6% of episodes had resulted in presentation to hospital. Deliberate self harm was more common in females than it was in males (11.2% *v* 3.2%; odds ratio 3.9, 95% confidence interval 3.1 to 4.9). In females the factors included in a multivariate logistic regression for deliberate self harm were recent self harm by friends, self harm by family members, drug misuse, depression, anxiety, impulsivity, and low self esteem. In males the factors were suicidal behaviour in friends and family members, drug use, and low self esteem.

Conclusions Deliberate self harm is common in adolescents, especially females. School based mental health initiatives are needed. These could include approaches aimed at educating school pupils about mental health problems and screening for those at risk.

Introduction

Deliberate self harm (self poisoning or self injury) is common in adolescents, with an estimated 25 000 presentations to general hospitals annually in England and Wales.[1] In other countries many adolescents who engage in deliberate self harm do not present to hospitals.[2 3] Those who do often report previous episodes without hospital presentation.[4] Clinically untreated deliberate self harm may precede suicide.[5]

Deliberate self harm in adolescents in the community in the United Kingdom has received little attention until recently.[6] In previous studies in other countries higher rates have been obtained from anonymous self report than from non-anonymous or interview based surveys.[7] No effort has been made to obtain adolescents' descriptions of the acts they thought were self harm to determine whether they met predetermined criteria for deliberate self harm. Accurate information is required on the extent of deliberate self harm and suicidal thinking in adolescents, and associated factors, to assist in the recognition of those at risk, the development of explanatory models, and the design of prevention programmes. We aimed to determine the prevalence of deliberate self harm in adolescents in schools in England and the factors associated with it.

Methods

We approached schools in Oxfordshire, Northamptonshire, and Birmingham. We chose them to ensure a representative range of school types for sex, size, status (state, grammar, and independent), single sex and coeducational, ethnic minorities, educational attainment (school performance in GCSEs), and socioeconomic deprivation (proportions of pupils entitled to free school meals). We selected the first appropriate school from the local list. When a school declined to participate we approached the next matched school on the list. Overall, 41 schools were included in our study, which took place in the autumn and spring terms of 2000 and 2001. The pupils were in classes in which at least 90% were aged 15 and 16 years.

Procedure

We explained the purpose of our study to the teachers. Parents were informed of the project by letter and asked to notify the researchers if they objected to their child participating. Our study was explained to the pupils by the researchers or teachers about two weeks in advance and again by researchers on the survey day. Pupils were given the choice of participation.

Our study design was in keeping with the guidelines of the British Educational Research Association.[8] It was approved by the Oxfordshire Psychiatric Research Ethics Committee.

Assessment of participants

Our survey comprised a self report, anonymous questionnaire, taking between 20 and 30 minutes to complete. We developed this with colleagues with extensive experience of school based studies. Substantial piloting was undertaken, including testing an earlier version of the questionnaire in two comprehensive schools and an adolescent psychiatric unit.

The questionnaire included items on personal information (sex, age, ethnicity) and questions about lifestyle and problems and items on deliberate self harm and suicidal ideation. Participants who reported deliberate self harm were asked to provide a description of the act (the most recent one for multiple episodes) and its consequences. They were also asked what they had hoped would happen and specifically if they had wanted to die. Classification of the episodes as deliberate self harm or otherwise was based on independent ratings by three of the researchers using an agreed definition (see box) and specific detailed criteria (available from the authors). Other items in the questionnaire were depression and anxiety (hospital anxiety and depression scale[9]), impulsivity (six items from the Plutchick impulsivity scale[10]), and self esteem (an eight item version of the self concept scale[11]).

Sample size

We chose a target sample size of 5000 pupils on the basis of a postulated prevalence of deliberate self harm of 4%, which was a conservative estimate on the basis of

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Definition of deliberate self harm

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 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

previous studies.[2 12] This could have been detected accurately (with power at 80% and significance at 5%) with a 95% confidence interval of 3.5% to 4.6%.[13] This sample size would allow detection with 80% power and 5% significance of associated factors with a prevalence of, for example, 17% in participants with deliberate self harm compared with 10% in the remainder.[14] The pupil sample size determined the number of schools to be included.

Analyses

We used the χ^2 and Mann Whitney tests to investigate the associations between deliberate self harm and potential associated factors. We used logistic regression to estimate the crude odds ratios and 95% confidence intervals. We obtained adjusted odds ratios by multiple logistic regression. We used backward selection to determine a subset of risk factors, for each of which $P<0.005$.

We chose two approaches to investigate whether there was school based clustering of results: the multiple logistic model was fitted again, specifying robust estimates and clustering on school and a two level multilevel model was fitted, with school identity used to define the second level. The results for both these analyses were almost identical to the analyses ignoring clustering, indicating no important clustering effect. We analysed the data with SPSS, Stata 7.0, and MlwiN version 2.1a.[13 15 16]

Results

The 41 participating schools comprised 35 comprehensive, 4 independent, and 2 grammar schools: nine were single sex (4 male, 5 female). Figure 1 shows the number of eligible and actual participants and the reasons for non-inclusion. Overall, 6020 pupils took part in the study. They recorded their ethnic status as white (4956 pupils), black (169), Asian (671), and other (157); 67 were not known.

Prevalence of deliberate self harm and suicidal ideation

A lifetime history of deliberate self harm was reported by 784 of 5923 (13.2%) pupils. Deliberate self harm in the previous year was reported by 509 (8.6%) pupils, of whom 398 (6.9%) had carried out an act of deliberate self harm meeting study criteria in the previous year (table 1). The remainder of the results on deliberate self harm are based on this latter group. In 50 (12.6%) cases self harm had resulted in presentation to hospital. In 179 (45.0%) cases the participants said they had wanted to die. The main methods used for deliberate self harm were cutting (257; 64.6%) and poisoning (122; 30.7%). Hospital referral occurred more often for overdoses (27 of 118; 22.9%) than for cutting (16 of 252; 6.3%; $\chi^2=21.39$, $P<0.001$). Multiple acts of deliberate self harm were reported by 218 of 398 (54.8%) participants who self harmed.

Suicidal ideation (without deliberate self harm) in the past year was reported by 863 of 5737 (15.0%) pupils (table 1). This was more common in females than males (odds ratio 3.1, 95% confidence interval 2.6 to 3.6).

Table 1 Prevalence of deliberate self harm, based on descriptions provided by adolescents, and suicidal ideation in previous year

	No of respondents	No (%)
Deliberate self harm:		
Males	3078	98 (3.2)
Females	2703	299 (11.2)
All*	5801	398 (6.9)
Suicidal ideation (no self harm):		
Males	3025	258 (8.5)
Females	2692	602 (22.4)
All*	5737	863 (15.0)
No self-harm or suicidal thoughts:		
Males	3025	2669 (88.2)
Females	2692	1791 (66.5)
All*	5737	4476 (78.0)

*Twenty people did not indicate sex.

Factors associated with deliberate self harm

Deliberate self harm within the previous year was far more common in females than it was in males (11.2% *v* 3.2%; odds ratio 3.9, 3.1 to 4.9). Because of interactions of some variables with sex, factors associated with deliberate self harm were analysed separately for males and for females (table 2).

Deliberate self harm was less common in Asian than white females. Females living with one parent (whether or not with a step parent) had higher rates of deliberate self harm. For both sexes there was an incremental increase in deliberate self harm with increasing consumption of cigarettes or alcohol and number of times drunk (especially in females). A higher frequency of self harm was associated with all

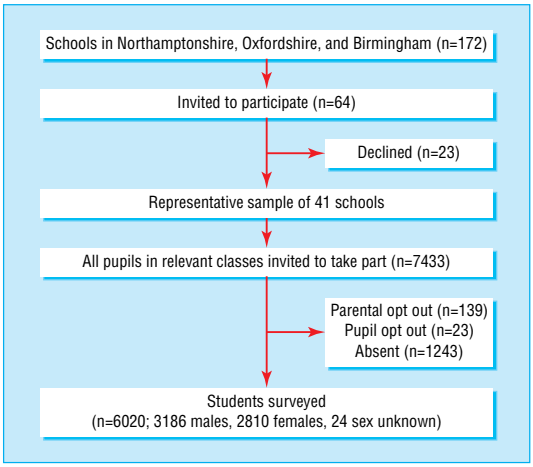

Fig 1 Selection of pupil sample

categories of drug use (data not presented). Self harm was more common in pupils who had been bullied and was strongly associated with physical and sexual abuse in both sexes. Although more males than females had been in trouble with the police, an association with deliberate self harm was stronger in females. Awareness of recent self harm by peers was reported more often by females than by males but was associated with self harm in both sexes. A similar association was found with self harm by family members. Pupils of either sex who had recently been worried about their sexual orientation had relatively higher rates of self harm. Levels of depression, anxiety, impulsivity, and self esteem were all associated with self harm in both sexes.

Multivariate analysis

In multiple logistic regression, factors significantly associated with deliberate self harm in the previous year in females were: having friends who had recently self harmed, self harm by family members, drug use, depression, anxiety, impulsivity, and low self esteem (table 3). In males, factors associated with deliberate self harm in the previous year were: having friends who had recently self harmed, self harm by family members, drug use, and low self esteem. For both sexes, awareness of peers who had self harmed was the strongest binary factor in the final explanatory model. Figure 2 shows a strong association between being a pupil in a coeducational school who has self harmed and being aware of self harm in peers (r=0.80,

Table 2 Association of deliberate self harm with other variables. Values are numbers (percentages) of patients who self harmed unless stated otherwise

	Males					Females				
	No	No (%) who self harmed	Odds ratio	95% CI	P value	No	No (%) who self harmed	Odds ratio	95% CI	P value
Ethnicity:										
White	2536	83 (3.3)	1.00			2272	264 (11.6)	1.00		
Asian	371	10 (2.7)	0.82	0.42 to 1.58		254	17 (6.7)	0.55	0.33 to 0.91	
Black	68	0 (0)	—	—		89	6 (6.7)	0.55	0.24 to 1.27	
Other	74	5 (6.8)	2.14	0.84 to 5.85	0.133	72	10 (13.9)	1.23	0.62 to 2.42	0.048
Living situation:										
Both parents	2184	62 (2.8)	1.00			1870	183 (9.8)	1.00		
One parent	438	19 (4.3)	1.55	0.92 to 2.26		426	58 (13.6)	1.45	1.06 to 1.99	
One parent and step parent	350	12 (3.4)	1.22	0.65 to 2.28		328	48 (14.6)	1.58	1.12 to 2.22	
Other family member	36	3 (8.3)	3.11	0.93 to 10.42		27	4 (14.8)	1.60	0.55 to 4.69	
Other	62	2 (3.2)	1.14	0.27 to 4.77	0.208	42	5 (11.9)	1.25	0.48 to 3.21	0.032
Divorced parents*:										
No	2270	63 (2.8)	1.00			1928	181 (9.4)	1.00		
Yes	782	34 (4.3)	1.59	1.04 to 2.44	0.031	760	112 (14.7)	1.67	1.30 to 2.15	<0.0005
Smoking†:										
Never	2099	42 (2.0)	1.00			1597	94 (5.9)	1.00		
Given up	317	10 (3.2)	1.60	0.79 to 3.21		411	61 (14.8)	2.79	1.98 to 3.93	
⩽5	128	10 (7.8)	4.15	2.03 to 8.48		138	26 (18.8)	3.71	2.30 to 5.97	
6-20	193	12 (6.2)	3.25	1.68 to 6.28		246	54 (22.0)	4.50	3.12 to 6.49	
21-50	184	12 (6.5)	3.42	1.77 to 6.61		217	44 (20.3)	4.07	2.75 to 6.01	
>50	147	10 (6.8)	3.57	1.76 to 7.28	<0.0005	80	18 (22.5)	4.64	2.64 to 8.16	<0.0005
Alcohol use‡:										
Never	783	11 (1.4)	1.00			679	36 (5.3)	1.00		
1	651	21 (3.2)	2.34	1.12 to 4.89		834	78 (9.4)	1.84	1.22 to 2.77	
2-5	844	23 (2.7)	1.95	0.95 to 4.04		748	112 (15.0)	3.15	2.13 to 4.65	
6-10	209	20 (9.6)	3.51	1.66 to 7.40		303	50 (16.5)	3.53	2.25 to 5.55	
11-20	223	9 (4.0)	2.95	1.21 to 7.22		79	13 (16.5)	3.52	1.78 to 6.96	
>20	124	13 (10.5)	8.22	3.59 to 18.8	<0.0005	33	9 (27.3)	6.70	2.90 to 15.46	<0.0005
No of times drunk§:										
Never	1028	21 (2.0)	1.00			927	45 (4.9)	1.00		
Once	432	7 (1.6)	0.79	0.33 to 1.87		349	40 (11.5)	2.54	1.63 to 3.96	
2 or 3	585	23 (3.9)	1.96	1.08 to 3.58		584	66 (11.3)	2.50	1.68 to 3.70	
4-10	459	14 (3.1)	1.51	0.76 to 2.99		439	72 (16.4)	3.85	2.60 to 5.69	
>10	559	33 (5.9)	3.01	1.72 to 5.25	<0.0005	391	76 (19.4)	4.73	3.20 to 6.99	<0.0005
Any drug use§:										
No	1990	32 (1.6)	1.00			1927	131 (6.8)	1.00		
Yes	1086	66 (6.1)	3.96	2.58 to 6.08	<0.0005	774	168 (21.7)	3.80	2.97 to 4.86	<0.0005
Bullying§:										
No	2836	79 (2.8)	1.00			2477	254 (10.3)	1.00		
Yes	218	18 (8.3)	3.14	1.85 to 5.34	<0.0005	215	44 (20.5)	2.25	1.58 to 3.21	<0.0005
Physical abuse*:										
No	2923	81 (2.8)	1.00			2501	230 (9.2)	1.00		
Yes	131	16 (12.2)	4.88	2.77 to 8.61	<0.0005	181	62 (34.3)	5.14	3.68 to 7.20	<0.0005
Sexual abuse*:										
No	2982	90 (3.0)	1.00			2448	227 (9.3)	1.00		
Yes	71	7 (9.9)	3.51	1.57 to 7.88	0.001	239	71 (29.7)	4.13	3.04 to 5.63	<0.0005

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Table 2 Association of deliberate self harm with other variables. Values are numbers (percentages) of patients who self harmed unless stated otherwise—*continued from previous page*

	Males					Females				
	No	No (%) who self harmed	Odds ratio	95% CI	P value	No	No (%) who self harmed	Odds ratio	95% CI	P value
Sexual orientation worries§:										
No	2973	88 (3.0)	1.00			2590	272 (10.5)	1.00		
Yes	82	9 (11.0)	4.04	1.96 to 8.34	<0.0005	101	24 (23.8)	2.66	1.65 to 4.27	<0.0005
Trouble with police§:										
No	2598	72 (2.8)	1.00			2509	245 (9.8)	1.00		
Yes	463	25 (5.4)	2.00	1.26 to 3.19	0.003	185	52 (28.1)	3.61	2.55 to 5.11	<0.0005
Self harm by friends§:										
No	2800	62 (2.2)	1.00			2035	135 (6.6)	1.00		
Yes	256	35 (13.7)	6.99	4.52 to 10.82	<0.0005	654	160 (24.5)	4.56	3.55 to 5.85	<0.0005
Self harm in family*:										
No	2807	63 (2.2)	1.00			2237	164 (7.3)	1.00		
Yes	251	34 (13.5)	6.82	4.40 to 10.59	<0.0005	451	131 (29.0)	5.17	4.00 to 6.70	<0.0005
Mean (SD) depression¶										
No history of deliberate self harm	2937	4.72 (3.1)	1.00			2390	5.09 (3.0)	1.0		
History of deliberate self harm	83	7.39 (4.1)	1.23	1.17 to 1.29	<0.0005	296	7.91 (3.7)	1.27	1.23 to 1.32	<0.0005
Mean (SD) anxiety¶										
No history of deliberate self harm	2946	6.42 (3.3)	1.00			2390	7.96 (3.4)	1.0		
History of deliberate self harm	93	9.21 (4.2)	1.22	1.16 to 1.29	<0.0005	297	10.79 (3.8)	1.25	1.20 to 1.29	<0.0005
Mean (SD) impulsivity¶										
No history of deliberate self harm	2911	13.73 (2.8)	1.00			2374	13.99 (2.7)	1.0		
History of deliberate self harm	91	15.41 (3.1)	1.22	1.14 to 1.31	<0.0005	291	15.40 (2.9)	1.20	1.15 to 1.25	<0.0005
Mean (SD) self esteem**										
No history of deliberate self harm	2881	23.32 (3.7)	1.00			2363	22.09 (3.9)	1.0		
History of deliberate self harm	89	20.01 (4.3)	0.81	0.77 to 0.85	<0.0005	289	18.90 (4.0)	0.81	0.79 to 0.84	<0.0005

*Lifetime prevalence.
†Number of cigarettes smoked in typical week.
‡Number of alcoholic drinks in typical week.
§Past year prevalence.
¶Higher scores indicate higher depression, anxiety, or impulsivity. Odds ratio for 1 point increase in score.
**Lower scores indicate poorer self esteem. Odds ratio for 1 point increase in score.

P<0.0001), but only in females (r=0.67, P<0.0001; males: r=0.20, P=0.28).

Discussion

Deliberate self harm is common in adolescents, especially females. We studied 15 and 16 year olds at school because this is the age at which deliberate self harm is known to be relatively common and because a school based study would include most of those at risk.[1] Overall, 80% of the target sample took part in our study. Absenteeism was the main reason for non-inclusion of potential pupils. We do not know the potential effect of this on the prevalence of deliberate self harm, but the act is more common among those who regularly play truant.[12]

Deliberate self harm is clearly more common in adolescents than is indicated by presentations to hospital because only 12.6% of participants presented to hospital.[1] This was partly due to the high prevalence of self cutting, for which medical attention was rarely sought.

The 6.9% prevalence of deliberate self harm was based on applying strict criteria to the adolescents' descriptions of their acts. This approach has not been

Table 3 Multivariate logistic regression for deliberate self harm in previous year for 88 of 2861 males and 276 of 2308 females

	Males			Females		
	Odds ratio	95% CI	P value	Odds ratio	95% CI	P value
Self harm by friends*:						
No	1.00			1.00		
Yes	4.88	2.94 to 7.84	<0.001	3.13	2.35 to 4.17	<0.001
Self harm in family†:						
No	1.00			1.00		
Yes	3.26	1.93 to 5.50	<0.001	2.86	2.11 to 3.87	<0.001
Any drug use*:						
No	1.00			1.00		
Yes	2.72	1.69 to 4.40	<0.001	2.57	1.92 to 3.45	<0.001
Depression‡				1.09	1.03 to 1.15	0.002
Anxiety‡				1.08	1.02 to 1.14	0.006
Impulsivity‡				1.10	1.04 to 1.16	<0.001
Self esteem§	0.84	0.80 to 0.89	<0.001	0.90	0.86 to 0.94	<0.001

*Past year prevalence.
†Lifetime prevalence.
‡Higher scores indicate higher depression, anxiety, or impulsivity. Odds ratio for 1 point increase in score.
§Lower scores indicate poorer self esteem. Odds ratio for 1 point increase in score.

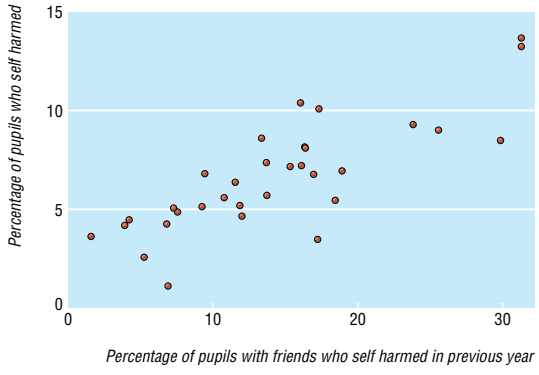

Fig 2 Association between pupils who had deliberately self harmed in previous year and friends who had self harmed; for coeducational schools only

What is already known on this topic

Deliberate self harm is a common reason for presentation of adolescents to hospital

Community studies from outside the United Kingdom have shown much greater prevalence of self harm in adolescents than hospital based studies

What this study adds

Deliberate self harm defined according to strict criteria is common in adolescents, especially females

Associated factors include recent awareness of self harm in peers, self harm by family members, drug misuse, depression, anxiety, impulsivity, and low self esteem

used in previous studies. It would have slightly underestimated the true prevalence as some adolescents did not supply a description. The prevalences for deliberate self harm of 8.6% (past year) and 13.2% (lifetime) before applying the criteria are similar to those from the largest equivalent study in the United States.[17] The lifetime prevalence is far higher than the 6.6% found in a recent study in England based on interviews with adolescents and their parents.[6] The 15.0% past year prevalence of suicidal ideas without self harm indicates that these progress to actual behaviour in a minority of cases. Repeated deliberate self harm is common.

The nearly fourfold greater rate of deliberate self harm in females than in males is not dissimilar to the sex difference in hospital based rates in this age group.[1] Although associations with deliberate self harm from a cross sectional study cannot be interpreted as necessarily indicating risk factors, the multivariate analysis indicates specific factors that are independently associated with deliberate self harm. The association with awareness of recent self harm by others suggests a possible modelling effect, in accord with other evidence on contagion of suicidal behaviour in adolescents.[18] The independent association with family history of suicidal behaviour is in keeping with studies of adolescents who have committed suicide.[19] Drug misuse is another associated factor. As in hospital based studies and investigation of adolescent suicides, depression and anxiety were associated with deliberate self harm, but more noticeably in females.[20–22] Finally adolescents who were more impulsive and had negative self regard also seemed to be more at risk of self harm, although impulsivity was not an independent factor in males.

In many cases self harming behaviour represents a transient period of distress; in others it is an important indicator of mental health problems and risk of suicide.[21] Our findings support the need for development and evaluation of school based programmes for the promotion of mental health. Our results suggest targets for such programmes, including self esteem issues, depression, anxiety, and impulsivity. The programmes might need different emphasis for the two sexes. Further potential approaches include routine screening of adolescents to identify those at risk and helping teachers recognise such pupils.[23] Promotion of helplines, use of self referral agencies, and school counselling services are other potential actions. Evaluation of such initiatives should be a priority in education. The potential influence of friends' self harm indicates that how suicidal behaviour is managed in schools may also be important.[24]

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