

ORIGINAL ARTICLE

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

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Abstract

Background: Risk assessment forms a key component in self-harm management. Among self-harm presentations generally, lethality of an index act is a poor predictor of future non-fatal repetition. However, no study has examined whether severity of an index self-cutting episode is associated with prospective repetition.

Aims: To examine factors associated with severity of self-cutting and in particular the association between severity of self-cutting and prospective repetition of self-harm.

Methods: All index self-cutting presentations to emergency departments in Ireland over 5 years were grouped by treatment received and compared on the basis of demographic and clinical characteristics.

Results: Receiving more extensive medical treatment was associated with male gender, being aged more than 15 years, and not combining self-harm methods. Receiving less extensive treatment conferred a higher risk of prospective 12-month repetition, even after controlling for demographic and clinical characteristics. Repeat self-harm presentations by those with more severe self-cutting in an index act were less prevalent but were more likely to involve high-lethality methods of self-harm.

Discussion: The results indicate that the already-elevated repetition risk among self-cutting patients is further increased for those receiving less extensive wound closure treatment. Severity of self-cutting might also affect suicide risk but such an association has yet to be examined.

Background

In the year following a self-harm presentation to emergency care, 16% of self-harm patients will re-present with another episode of self-harm (Owens et al., 2002). Risk of repetition is an important clinical outcome as it indicates on-going distress and is associated with an increased risk of eventual suicide (Cooper et al., 2005). The assessment of risk of repetition of self-harm, therefore, forms a key part of the emergency department management of self-harm patients (NICE, 2004, 2011). The lethality of an index act has been widely investigated as a risk factor for prospective self-harm repetition in this population, with many cohort studies failing to find any association between lethality and future repeated self-harm (Chandrasekaran & Gnanaselane, 2008; Dieserud et al., 2003; Hjelmeland, 1996; Kapur et al., 2002). However, there is evidence of an association between index self-harm method and prospective repetition: patients presenting with self-cutting to emergency departments appear to form a subgroup at increased risk of prospective fatal and non-fatal

Keywords

Outcome studies, repetition, risk factors, self-cutting, self-harm, severity

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self-harm repetition compared with other self-harm patients (Bergen et al., 2012; Bilén et al., 2010; Lilley et al., 2008).

Patients presenting with self-cutting form a minority within emergency presentations of self-harm (Claassen et al., 2006; Michel et al., 2000; Perry et al., 2012). The act of self-cutting encompasses a wide range of medical severity from superficial damage requiring no treatment to severe damage requiring plastic surgery. In large-scale prospective studies of self-harm, the significance of self-cutting severity is often overlooked: despite the profile of increased risk of further self-harm and suicide among those presenting with self-cutting, no further detailed information is available on subtypes of self-cutting in terms of severity and associated factors. One of the few studies to examine the factors associated with self-cutting severity (Fujioka et al., 2012) found that those presenting with deep cutting were more likely to be male, less likely to have a history of self-cutting, and more likely to have a prior psychiatric history. It appears that medical severity has never been tested as a risk factor for prospective repetition among those presenting with self-cutting. The aim of the current study is to compare self-cutting patients according to the treatment they received with respect to demographic and clinical characteristics, as well as prospective repetition.

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Methods

Data source

The National Registry of Deliberate Self-Harm Ireland is a hospital-based monitoring system for deliberate self-harm covering all 40 hospitals in the country. The Registry uses the WHO/EURO definition of self-harm (Platt et al., 1992), which includes all intentionally initiated drug overdoses, poisoning or self-injurious behaviour, regardless of suicidal intent. Data are collected by Data Registration Officers (DROs) who review emergency departments case notes to identify cases of self-harm through the standardised application of the case definition and inclusion/exclusion criteria (NSRF, 2011; Perry et al., 2012). Audits incorporating crosschecks among DROs showed high levels of agreement on case ascertainment with kappa statistics exceeding 0.9. For the study period 2007 to 2011, the Registry had 100% coverage of all hospital emergency departments in Ireland. For the current analyses, we defined index episodes as the first self-cutting presentation by an individual in the study period.

Variables

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

Ethical approval

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

Analysis

Associations between self-cutting treatment and patient and presentation characteristics were tested using chi square tests. The magnitudes of associations are illustrated using Cramér's V. The same approach was used to examine the association between 12-month repetition of self-harm and demographic and presentation variables. For the repetition analyses, we only included presentations between 1 January 2007 and 31 December 2010 to allow 12 months' follow-up. A multivariate logistic regression (with repetition of self-harm as the dependent variable) was used to examine the effect of self-cutting treatment on repetition risk independently of other factors. Because of the size of the sample, high statistical power allowed for the inclusion of all of the following variables in the logistic regression: gender, age group (<15 years, 15–24 years, 25–34 years, 35–44 years, 45–54 years, >55 years), whether the person lived in a city, living circumstances (no fixed abode, inpatient, prisoner, private

household, or other), whether they were brought in by ambulance, whether they presented between 9 am and 5 pm, whether they presented at the weekend, whether alcohol was involved, whether self-cutting was combined with other method(s) in the index act, and which treatment was received (no treatment/ cleaning, steri-strips, sutures, referral to plastic surgery, unknown). All tests were two-sided with the alpha value set at 0.05. All analyses used SPSS version 16.0 (SPSS Inc., Chicago, IL) for Windows.

Results

Between 2007 and 2011, there were 59 155 emergency presentations of self-harm in Ireland. There were 13 344 presentations of self-cutting, involving 9268 individuals. Information on treatment received for self-cutting was available for 7486 (80.8%) of the 9268 index self-cutting cases. Table 1 shows the characteristics of patients and presentations for the 7486 index self-cutting presentations for which treatment information was available, as well as for the 1782 index self-cutting presentations for which treatment information was not available. The univariate and multivariate associations with repetition are presented in Table 1 using Chi squared values and odds ratios, respectively.

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

Other factors significantly associated with repetition were female gender, young age, homelessness, combining self-harm methods, living in a city, being brought in by ambulance, being an inpatient and presenting on a weekday. The association between less extensive treatment and prospective repetition remained significant in a multivariate logistic regression to predict repetition that included gender, age-group, whether the person lived in a city, living circumstances, whether they were brought in by ambulance, time of presentation, day of presentation, alcohol consumption and whether multiple methods were used in the index act.

Of the 1802 persons who repeated self-harm within a year of an index presentation of self-cutting, 354 persons (19.6%) presented with a repeated episode of high potential lethality (defined as attempted hanging, attempted drowning, self-cutting requiring plastic surgery, or an overdose of more than 80 tablets). The proportion of repeaters engaging in

Table 1. Demographic and presentation characteristics of self-cutting patients by treatment received and likelihood of repetition.

Variable	Total index self-cutting presentations 2007–2011 (n = 9268)		Plastic surgery referral (n = 400)		Treatment unknown (n = 1782)		Cramer's V ^a	Chi squared for trend (df = 1) ^a	p	12-month repetition in presentations 2007–2010 (1802/7250)		Cramer's V	p	Multivariate OR of 12-month repetition (95% CI)
	No treatment/cleaning (n = 1674)	Steri-strips (n = 3498)	Sutures (n = 1914)	Steri-strips (n = 3498)	Sutures (n = 1914)	12-month repetition (1802/7250)				12-month repetition (1802/7250)				
Gender														
Female	4104	1734 (42.3%)	720 (17.5%)	121 (2.9%)	679 (16.5%)	0.13***	<0.001	105.73***	<0.001	866 (27.2%)	0.05***	<0.001	1.22 (1.10–1.37)***	1.00 (ref)
Male	5164	1764 (34.2%)	1194 (23.1%)	279 (5.4%)	1103 (21.4%)					936 (23.0%)				
Age														
<15 yrs	251	113 (45.0%)	18 (7.2%)	2 (0.8%)	36 (14.3%)	0.07***	<0.001	30.63***	<0.001	29 (16.3%)	0.07***	<0.001	0.74 (0.45–1.21)	1.23 (0.91–1.66)
15–24 yrs	3737	1470 (39.3%)	714 (19.1%)	133 (3.6%)	725 (19.4%)					667 (23.1%)				
25–34 yrs	2482	400 (16.1%)	873 (35.2%)	581 (23.4%)	513 (20.7%)					491 (24.9%)				1.37 (1.02–1.86)*
35–44 yrs	1569	267 (17.0%)	599 (38.2%)	363 (23.1%)	274 (17.5%)					378 (30.5%)				1.76 (1.30–2.40)***
45–54 yrs	830	156 (18.5%)	314 (37.8%)	153 (18.4%)	157 (18.9%)					176 (26.9%)				1.45 (1.04–2.01)*
55+ yrs	399	74 (18.5%)	129 (32.3%)	85 (21.3%)	77 (19.3%)					61 (19.6%)				1.00 (ref)
Lives in a city														
Yes	3188	1092 (34.3%)	474 (14.9%)	148 (4.6%)	983 (30.8%)	0.07***	<0.001	0.71	0.40	663 (26.3%)	0.02*	0.04	1.13 (1.01–1.27)*	1.00 (ref)
No	6080	1183 (19.5%)	2406 (39.6%)	1440 (23.7%)	252 (4.1%)					1139 (24.1%)				
Living circumstances														
No fixed abode	280	108 (38.6%)	38 (13.6%)	7 (2.5%)	87 (31.3%)	0.05***	<0.001	2.22	0.014	72 (35.8%)	0.06***	<0.001	1.70 (1.26–2.30)**	1.78 (1.03–3.09)*
Inpatient	67	3 (4.5%)	20 (29.9%)	26 (38.8%)	5 (7.5%)					21 (36.3%)				0.91 (0.39–2.08)
Prisoner	43	4 (9.3%)	6 (14.0%)	21 (48.8%)	2 (4.7%)					7 (18.9%)				1.34 (1.06–1.70)*
Other	412	60 (14.6%)	164 (39.8%)	92 (22.3%)	76 (18.4%)					106 (29.6%)				1.00 (ref)
Private	8466	1567 (18.5%)	3498 (37.7%)	1737 (20.5%)	1596 (18.9%)					1596 (24.2%)				
Brought in by ambulance														
Yes	4454	733 (16.5%)	1698 (38.1%)	1026 (23.0%)	261 (5.9%)	0.10***	<0.001	70.65***	<0.001	925 (26.4%)	0.03**	0.003	1.13 (1.01–1.27)*	1.00 (ref)
No	4814	941 (19.5%)	1800 (37.4%)	888 (18.4%)	139 (2.9%)					877 (23.4%)				
Presented 9 am–5 pm														
Yes	2438	423 (17.4%)	963 (39.5%)	493 (20.2%)	120 (4.9%)	0.03	0.11	1.06	0.30	461 (24.5%)	0.01	0.65	1.00 (ref)	1.02 (0.91–1.15)
No	6830	1251 (18.3%)	2535 (37.1%)	1421 (20.8%)	280 (4.1%)					1341 (25.0%)				
Presented at weekend														
Yes	3006	508 (16.9%)	1105 (36.8%)	662 (22.0%)	131 (4.4%)	0.03*	0.04	6.07*	0.01	537 (23.1%)	0.03*	0.02	0.87 (0.78–0.98)*	1.00 (ref)
No	6262	1116 (18.6%)	2393 (38.2%)	1252 (20.0%)	269 (4.3%)					1265 (25.7%)				
Alcohol involvement														
Yes	3314	683 (20.6%)	1375 (41.5%)	805 (24.3%)	110 (3.3%)	0.06***	<0.001	4.18*	0.04	678 (26.1%)	0.02	0.07	1.03 (0.91–1.15)	1.00 (ref)
No	5954	991 (16.6%)	2123 (35.7%)	1109 (18.6%)	290 (4.9%)					1124 (24.2%)				
Combined with other method(s)														
Yes	2477	644 (26.0%)	1093 (44.1%)	323 (13.0%)	66 (2.7%)	0.18***	<0.001	228.72***	<0.001	563 (28.9%)	0.06***	<0.001	1.24 (1.10–1.40)**	1.00 (ref)
No	6791	1030 (15.2%)	2405 (35.4%)	1591 (23.4%)	334 (4.9%)					1239 (23.4%)				
Self-cutting treatment														
No treatment/cleaning	1178	–	–	–	–	–	–	–	–	318 (27.0%)	0.08***	<0.001	1.00 (ref)	1.04 (0.89–1.22)
Steri-strips	2824	–	–	–	–	–	–	–	–	796 (28.2%)				0.79 (0.66–0.95)*
Sutures	1515	–	–	–	–	–	–	–	–	336 (22.2%)				0.59 (0.43–0.82)**
Referral to plastic surgery	322	–	–	–	–	–	–	–	–	57 (17.7%)				0.71 (0.59–0.86)***
Unknown	1411	–	–	–	–	–	–	–	–	295 (20.9%)				

*p < 0.05.

**p < 0.01.

***p < 0.001.

^aCalculated only for cases where treatment was known.

high-lethality acts differed significantly across treatment groups: 36.8% among those who received referral for plastic surgery, compared to 20.8% among those who received sutures, 16.3% among those who received steri-strips, 20.1% among those who received no treatment, and 23.4% of those whose treatment was unknown ($\chi^2 = 19.2, p < 0.001$).

Discussion

The present study shows significant differences in demographic and presentation characteristics across self-cutting treatment groups. Patients who received less extensive treatment for self-cutting were more likely to repeat self-harm within 12 months, even after controlling for demographic and clinical variables. Repeated presentations among those whose index act of self-cutting required more extensive treatment were more likely to involve high-lethality self-harm. The study used a large database with complete national coverage and adopted a prospective design to test a hitherto unexamined risk factor for repetition of self-harm.

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

Hospital-based risk assessments of self-harm patients are intended to detect those at increased risk of repetition of self-harm. Treatment received for self-cutting represents a useful indicator of repetition risk, because many of the well-researched and consistent predictors of repetition, such as substance misuse (Kapur et al., 2006), psychiatric morbidity (Bergen et al., 2010), and history of sexual abuse (Beautrais, 2004) require self-report or well-maintained information systems. In contrast, the medical severity of a self-cutting episode will be immediately evident to assessors, allowing for the earliest possible identification and intervention for at-risk patients. It appears that “minor” self-cutting should not be considered trivial, as it confers a yet further increased risk of non-fatal repetition among those presenting with self-cutting, a subgroup of self-harm patients already at elevated risk of further self-harm and suicide. It is essential that those conducting risk assessments of self-harm patients in

emergency department settings are aware that self-cutting confers increased risk of repetition and that patients presenting with less severe self-cutting are at even higher risk of repetition. Moreover, despite lower repetition risk overall, those presenting with more severe self-cutting who do subsequently repeat self-harm are significantly more likely to re-present with a high-lethality act than other self-cutting patients who repeat. The medical severity of an index act of self-harm can belie the risk to the patient and should not be used as an indication of how “serious”, deserving, or needy the patient is. Indeed, those who present with self-cutting represent a subgroup of self-harm patient at increased risk of suicide (Bergen et al., 2012).

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

In addition to risk of repetition, we found several patient differences according to the severity of self-cutting. Those requiring more extensive treatment for self-cutting were more likely to be male, aged more than 25 years, less likely to be living in a private residence, more likely to be brought by ambulance, more likely to present at the weekend, less likely to have consumed alcohol, and less likely to present with multiple self-harm methods. A previous study also found that males and those with a psychiatric history were over-represented among those with deeper wounds (Fujioka et al., 2012), but it otherwise seems that factors associated with severity of self-cutting have been relatively neglected within the self-harm research. In terms of other possible groupings of those who self-cut, several studies of self-cutting among adolescents found clinically meaningful subgroupings among those who self-cut (Matsumoto et al., 2004, 2008) based on bodily site and self-reported pain. These findings support the notion that those who present with less severe self-cutting may differ from those engaging in more severe self-cutting on psychiatric and psychological variables, as well as on outcome.

There were several limitations to the current study. Treatment received for self-cutting was not known for almost one-fifth of the presentations included in the analyses because this variable was not always recorded in the case notes. These presentations may have differed from other self-cutting presentations on variables other than those measured. Indeed, treatment was less likely to be known for those who lived in a city and for those who had not consumed alcohol. Such differences suggest that perhaps the sample we obtained was not entirely representative of all self-cutting presentations. However, those whose treatment was unknown appeared to be close to the average values on many of the variables. Previous research on Irish emergency department

injury recording shows similar patterns of non-recording across several data items (Meaney et al., 2012). Another limitation is that the association between repetition and treatment received for self-cutting may be mediated by psychosocial treatment, which is not currently recorded by the Registry. Finally, the Registry does not represent persons who engaged in self-harm without seeking secondary care, in whom the association between self-cutting severity and repetition may differ.

Given that this is the first study to examine the association between severity of self-cutting and risk of subsequent self-harm, it would be of interest to examine the association between injury severity and suicide mortality outcomes of self-cutting patients. In light of the association between less severe self-cutting and repetition, it may be that suicide rates are higher among those engaging in less severe self-cutting, given that repetition is associated with higher risk of suicide (Cooper et al., 2005). Alternatively, it may be that those who engage in severe self-cutting more often progress to highly lethal methods such as hanging, as was the case for non-fatal repetition in the current study. In addition, the significance of other characteristics of self-cutting, such as body site or implement used, in risk of prospective non-fatal and fatal repetition of self-harm have yet to be explored.

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

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