



Psychosocial influences on prisoner suicide: A case-control study of near-lethal self-harm in women prisoners

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ABSTRACT

We examined the psychosocial influences on female prisoner suicide by carrying out a study of near-lethal self-harm. We interviewed 60 women prisoners who had recently engaged in near-lethal self-harm (cases) and 60 others who had never carried out near-lethal acts in prison (controls) from all closed female prison establishments in England and Wales, using mixed quantitative and qualitative methods. We gathered information on socio-demographic and criminological variables, life events and childhood trauma, exposure to suicidal behaviour, contributory and precipitating factors for near-lethal self-harm, social support and psychological characteristics. While socio-demographic factors were only modestly associated with near-lethal self-harm, being on remand, in single cell accommodation, and reporting negative experiences of imprisonment were strong correlates. Recent life events and past trauma, including different forms of childhood abuse, were also significantly associated with near-lethal self-harm, as were a family history of suicide and high scores on measures of depression, aggression, impulsivity and hostility, and low levels of self-esteem and social support. Our findings underline the importance of both individual and prison-related factors for suicide in custody, and hence the need for a comprehensive approach to suicide prevention in women's prisons. Given the multiple needs of female prisoners at-risk of self-harm and suicide, complex psychosocial interventions are likely to be required, including interventions for abused and bereaved women, and initiatives to improve staff–prisoner relationships and reduce bullying. The findings of this research may provide insights into factors leading to suicidal behaviour in other forensic and institutional settings, such as detention centres and psychiatric hospitals, and may assist in developing suicide prevention policies for prisoners and other at-risk populations.

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Introduction

Internationally, suicide rates in prisoners are considerably higher than in the general population. In a recent study of 12 countries, rates of prison suicide were above 100 per 100,000 prisoners in the majority of countries, compared to an average general population suicide rate of 21 per 100,000 (Fazel, Grann, Kling, & Hawton, 2010). Although this problem has been traditionally associated with male prisoners, who worldwide represent on average 95% of the prison population (Walmsley, 2009), there is evidence that rates of suicide may be as high, or even higher amongst female prisoners (Charles, Abram, McClelland, & Teplin, 2003; Mackenzie, Oram, & Borrill, 2003; Ministry of Justice, 2010), despite women's lower risk of suicide in the community (WHO, 2002). In England and Wales, between 1978 and 2004, female prisoners were twenty times more

likely to die by suicide than women of the same age in the general population, a proportional excess greater than for male prisoners (Fazel & Benning, 2009).

Theoretical models of prison suicide, and suicidality more generally, suggest that suicidal behaviour is rarely the consequence of a single cause or stressor, but rather depends on several state and trait-dependent factors (Hawton & Van Heeringen, 2009; Jenkins et al., 2005; Liebling & Krarup, 1993). Understanding these factors, the ways in which they interact, and their role in the disproportionately high rates of suicide in prison might assist in developing models of prevention policy in custody and in institutions in general, including detention centres and psychiatric hospitals. However, much of the research in this area has focused on a relatively narrow range of variables (Fazel, Cartwright, Norman-Nott, & Hawton, 2008). Previous research has tended to study these factors within two relatively isolated bodies of literature. On the one hand, psychiatric and psychological studies focussing on the "imported vulnerability" of at-risk prisoners; on the other, sociological analyses of the role of imprisonment itself in precipitating self-harm.

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More recently, developments in the field have led to the view that “prisons expose already vulnerable populations to additional risk” (Liebling, Durie, Stiles, & Tait, 2005, p. 210), and thus that prison suicide is best understood as a complex phenomenon resulting from the dynamic interactions between individuals and their surroundings. Related attempts to bridge situational and dispositional models of prisoner suicide are consistent with wider theoretical models of suicide as a process within the individual and in interaction with their environment, involving an underlying vulnerability (mostly defined in terms of biological and psychological trait characteristics) which becomes heightened under the influence of specific stressors (Van Heeringen, 2001). Research findings support a life-course model of the aetiology of suicidal behaviour in which risk depends on cumulative exposure to social, environmental, social, personality and mental health factors (Mann, Waternaux, Haas, & Malone, 1999). Personality characteristics, especially hopelessness and low self-esteem (Van Heeringen, Hawton, & Williams, 2000), as well as environmental/contextual factors, and social circumstances, for example recent adverse events, social isolation and institutional bullying, have been highlighted (Blaauw, Winkel, & Kerkhof, 2001; Leese, Thomas, & Snow, 2006; Rojas & Stenberg, 2010; Shiner, Scourfield, Fincham, & Langer, 2009).

Despite repeated calls for a comprehensive approach to understanding and addressing the problem (see e.g. McHugh & Snow, 2002), few studies have examined both individual and environmental factors related to prisoner suicide. With much of the previous research on prisoner suicide being in male-only and predominantly male samples (Fazel, Cartwright et al., 2008), risk factors and indicators of vulnerability for suicide in female prisoners are little understood. An important exception is a study by the Office for National Statistics (ONS) (Jenkins et al., 2005; Meltzer, Jenkins, Singleton, Charlton, & Yar, 1999; Singleton, Meltzer, & Gatward, 1998), in which demographic, social and psychiatric correlates of suicidal behaviour in prisons were explored in a large sample of male and female prisoners. However, this study did not include direct assessment of psychological states or traits, which may provide important insight into the pathways leading to suicidal behaviour. In addition, no qualitative data about triggers and motivations for suicidal behaviour were collected. These may complement and triangulate quantitative analyses of the relationship between particular risk factors and suicidal behaviour, and thus provide a potentially richer and more complex understanding of the meaning and significance of different associations. A further limitation of the ONS study is its focus on lifetime and previous suicidality (based on self-reported intent) in prisoners, rather than suicide in prison. To further theoretical understanding of this problem and develop appropriate intervention strategies, it is potentially more useful to investigate the social and environmental influences on suicidal behaviour occurring (exclusively) during incarceration. Also, although self-harm and attempted suicide have previously been used as proxies for suicide (Marzano, Rivlin, Fazel, & Hawton, 2009), there is evidence that physically dangerous and medically severe self-harm acts provide a better approximation of actual suicide than other forms of self-harming behaviour or suicide attempts more generally. Medically serious suicide attempters are epidemiologically very similar to individuals who die by suicide (Douglas et al., 2004; Moscicki, 1995), and twice as likely as other suicide attempters to kill themselves (Rosen, 1976).

As means to self-harm are restricted in prison and therefore fatal and near-fatal injuries are more likely to result from behaviour that had not been motivated by suicidal intentions, individuals who have been involved in a ‘near-lethal’ act (based on severity of method and/or injuries) provide a useful focus for analysis (Marzano, Rivlin et al., 2009). In women’s prisons, where self-harming and suicidal behaviours are widespread (Daigle & Côté, 2006; Völlm & Dolan,

2009), near-lethal self-harm is an important problem in its own right, as well as a valid proxy for suicide. We report findings of a case-control study of women who had recently engaged in a near-lethal act in prison, utilising experiences gained from an earlier pilot study (Borrill, Snow, Medlicott, Teers, & Paton, 2005). We aimed to identify socio-demographic, criminological and psychological variables associated with near-lethal self-harm in order to provide further understanding of this behaviour and inform preventive initiatives. We have elsewhere reported on psychiatric disorders (Marzano, Fazel, Rivlin, & Hawton, 2010).

Method

Sample and selection criteria

Semi-structured face-to-face interviews were conducted with 60 female prisoners over the age of 18 years who had carried out near-lethal suicide acts and 60 control prisoners who had no history of engaging in near-lethal self-harm in prison. This study received ethical approval from the Central Office for Research Ethics Committees (Ethics number 06/MRE12/83), and the Prison Service (Reference PG 2006 063).

Participants were selected from all ten ‘closed’ female prison establishments in England and Wales. ‘Open’ establishments, which have lesser security levels and restrictions, were excluded from the study due to their low rates of suicide and suicide attempts. Between November 2007 and October 2008 each establishment was visited every four to six weeks to identify prisoners who had engaged in potentially lethal methods of self-harm. Suicidal intent was deliberately not a criterion for inclusion in the study, so not to exclude prisoners whose self-harm may have very nearly caused death but not have been motivated by suicidal intentions. This also ensured consistency with prison service definitions of self-harm and self-inflicted death, neither of which relies on assessment of suicidal intent. To reduce the risk of sampling biases we developed detailed criteria to assist prison officers to refer suitable cases (see Marzano, Fazel et al., 2010, for details of criteria), held meetings with staff to discuss the correct referral procedure and, where possible, had direct access to the establishment’s monthly self-harm reports to verify whether any incident fitting our criteria had occurred in the previous four weeks.

All prisoners who had carried out a near-lethal act within the past month were approached and invited to participate. Twenty-six potentially suitable prisoners were excluded from the study, due to unwillingness, and concerns about their psychological well-being. There were no significant differences between the excluded and participating prisoners in relation to socio-demographic and criminological characteristics (data available on request from the authors).

Control prisoners were from prisons of the same security category (but not the same prison) and within five years of the cases. Members of the control group were randomly selected by the Ministry of Justice from the Prison Service’s daily list of prisoners.

Interviews and measures

Interviews were carried out in a private room with prisoners’ written informed consent, and lasted between 30 and 90 min. A combination of quantitative and qualitative methods was used to collect data in the following areas:

Details of the near-lethal act

We recorded information about method (or methods) used for self-harm, and incident location, date and time. Although not an inclusion criterion for the study, we also measured suicidality at the

time of the near-lethal act using the Beck Suicide Intent Scale, a 15-item measure of severity of suicidal intent (Beck et al., 1974).

Socio-demographic variables

A structured questionnaire, adapted from the Oxford Monitoring System for Attempted Suicide (Hawton, Harriss et al., 2003), was used to gather information about participants' socio-demographic profile.

Criminological and prison-related factors

Questions about criminal history, status, index offence and adverse experiences during the current custodial term were adapted from the ONS study of psychiatric morbidity amongst prisoners in England and Wales (Singleton et al., 1998). We also asked participants about their experiences of being in prison and relationships with other prisoners and staff.

Life events and childhood trauma

The *Life Events and Prison Experiences Questionnaire* (LEPEQ) was used to assess whether and when participants had ever experienced a range of adverse events, drawn from the List of Stressful Life Events used in the ONS study (Singleton et al., 1998).

A modified 28-item version of the *Childhood Trauma Questionnaire* (CTQ) (Bernstein, Ahluvalia, Pogge, & Handelsman, 1997) yielding scores for childhood emotional, physical and sexual abuse, emotional and physical neglect, and a weighted total score. We used three response categories (often, sometimes and never).

Social support and social networks

Perceived social support was measured using the *Social Support Scale* (SSS), a 7-item instrument that has been adapted for use both in the general community and in prison (Harvey, 2005; Singleton et al., 1998). Participants were also asked about the extent (number of external contacts via letters, phone calls and visits since being in prison) and quality (number of close friends and relatives outside prison) of their social networks.

Exposure to suicidal behaviour and suicidal process

Using a semi-structured interview schedule, we gathered information about participants' exposure to suicidal and self-harming behaviour (including amongst friends, family and other prisoners). Prisoners who engaged in near-lethal self-harm were also asked about the circumstances surrounding their act, including motivations, social influences and trigger events. Whilst full discussion of the suicidal process will be reported separately, some of these data are presented here to illustrate prisoners' views concerning the role of specific psychosocial factors in their self-harm.

Psychological characteristics

The following self-report measures, with standardised instructions, were completed by participants or given in interview format if they had literacy problems:

- *Plutchik Impulsivity Scale* (Plutchik & van Praag, 1986), a 15-item trait measure of impulsivity;
- Two subscales of the *Buss-Durkee Hostility Inventory* (Buss & Durkee, 1957), a trait measure of hostility: assault (physical violence towards others) and irritability (readiness to explode with negative affect at the slightest provocation);
- A shortened version of *Robson's Self Concept Scale* (Robson, 1989), for assessment of self-esteem, containing 12 items derived from an unpublished factor analysis (personal communication with Philip Robson, October 2006), using a 4-point Likert response (Morgan & Hawton, 2004);

- A modified version of the *Brown-Goodwin Assessment for Lifetime History of Aggression Questionnaire* (Brown, Goodwin, Ballenger, Goyer, & Major, 1979). We excluded two of the original nine items as they relate specifically to military issues, but retained the original scoring;
- The *Beck Depression Inventory* (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), a 21-item scale assessing presence and severity of depressive symptoms, including hopelessness (item 2), over the preceding two weeks.

Data analyses

All quantitative data analyses were conducted using SPSS 15.0. A 95% ($p < 0.05$) significance level was adopted. Differences between cases and controls were assessed using χ^2 tests for categorical variables, and t and Mann–Whitney U tests for continuous ones. We also compared the socio-demographic and criminological characteristics of cases to those of female prisoners who died by suicide between 1995 and 2009, and those of controls to the general female prison population at the time of data collection (see Appendices 1 and 2).

To determine which factors were independently predictive of near-lethal self-harm, we undertook logistic regression analyses. Specifically, within the criminological and life events domains, we identified which variables were associated univariately with near-lethal self-harm at a 90% significance level ($p < 0.1$), and present in at least ten near-lethal cases and ten control participants. To reduce the risk of over-adjustment, collinear variables were dropped. We entered these variables simultaneously into a logistic regression model. We then conducted sensitivity and specificity analyses to test the predictive power of these factors.

Finally, we tested associations among psychological variables, and within scores on the childhood trauma scale and subscales, using Pearson's r (for normally distributed data) and Spearman's rho correlations (for non-normal distributions).

Thematic and content analyses

Qualitative data regarding participants' experiences of imprisonments and suicidal processes were taped, transcribed and anonymised. Transcripts were read at least twice, summarised, and major themes recorded. Based on prisoners' accounts, factors identified as having had a role in their acts were classified as 'primary' (when described as underlying reasons for engaging in near-lethal self-harm), 'additional' (when contributing to the decision to self-harm, but of secondary importance compared to primary factors), 'triggering' (events and feelings said to have precipitated the act, often described as a 'last straw', rather than an underlying reason) and 'preventive' (factors which could have prevented their near-lethal self-harm).

A coding frame was developed to facilitate coding of interview transcripts using NVIVO 8. Final identification of themes was based on consensus discussion between two members of the research team (LM and AR). Subsequently, and where appropriate, some of the thematic categories originally constructed were further collapsed so to allow for statistical comparison between cases and controls, and for quantitative analyses of content.

Results

Near-lethal self-harm episodes

The near-lethal incidents included in the study involved hanging (28, 47%), ligaturing (15, 25%), severe cuts and lacerations (9, 15%), overdosing (7, 12%), and one self-induced diabetic coma (2%). Most acts were carried out with suicidal intent (only three prisoners

stated not being suicidal at the time of their self-harm). The mean suicide intent score was relatively high (18.9, SD = 5.5) compared with an average score of 9.2 (SD = 6.2) in females presenting to a general hospital in England following a self-harm act (Harriss, Hawton, & Zahl, 2005).

Socio-demographic factors

The majority of prisoners who had engaged in near-lethal self-harm were white, single and under 30 years of age (38, 63%). These and other socio-demographic features did not differ significantly between cases and controls, except that more cases had no educational qualifications (Table 1) (see Appendix 1 for comparisons of cases and female self-inflicted deaths, and controls and the general female prison population).

Criminological factors

Prisoners who had engaged in near-lethal self-harm were more likely than controls to be on remand, to have had a previous sentence, to have been in their current prison less than 30 days, and to be in single and 'safe' cell accommodation (Table 2). Near-lethal self-harm was also significantly associated with not being on normal wing location (vs. segregation, healthcare or intensive residential unit) (13, 22% vs. 1, 2%; OR = 16.3, 95% CI 2.1–129.3, $p = 0.001$). In contrast, cases and controls did not differ significantly in terms of age at first conviction (case median = 16, control median = 17, $z = -1.56$, $p = 0.12$), having two or more previous sentences ($n = 26$, 43% vs. $n = 21$, 35%; OR = 1.42, 95% CI 0.68–2.97, $p = 0.350$), offences, sentence type and length of sentence. However, the control group differed from the general female prison population in having a greater proportion of prisoners remanded or convicted for violence (see Appendix 2 for comparisons on criminological variables of cases and female self-inflicted deaths, and controls and the general female prison population).

In a multifactorial analysis, having had a prior prison spell, serving a sentence longer than 18 months and being in single cell accommodation were entered simultaneously in a logistic regression model. Prior prison spell (adjusted OR = 3.33, 95% CI 1.30–8.56, $p = 0.012$) and single cell status (adjusted OR = 10.5, 95% CI 2.1–52.2, $p = 0.04$) remained significant.

Adverse experiences during current prison term

Despite some prisoners with near-lethal self-harm reporting that they felt safer and more supported in prison than outside (7/59, 12%), the majority described being in prison as difficult

or very difficult (Table 2). Forty cases (67%) reported having experienced at least one stressful event during the current prison term, compared with 28 (47%) controls (OR = 2.29, 95% CI = 1.09–4.78, $p = 0.027$). The most common of these was having had belongings stolen. However, this was also the most prevalent prison experience reported by controls and did not significantly distinguish the two groups. In contrast, being threatened with violence and intimidated to hand over belongings were significantly associated with near-lethal self-harm, and eight (13%) near-lethal cases reported being bullied because of their self-harm. In both cases and controls, a relatively small proportion of prisoners had suffered physical or sexual abuse while in prison.

Social networks in prison

Although there were no significant differences in the size of social networks inside prison between cases and controls (case median = 2, control median = 2, $z = -0.28$, $p = 0.778$), or in the number of cases and controls who had no close staff member and/or prisoner (15, 25% vs. 11, 18%; OR = 1.49, 95% CI 0.62–3.57, $p = 0.375$), those with near-lethal self-harm were more likely to describe their relationship with other prisoners as difficult or very difficult (15/58, 26% vs. 3/58, 5%; OR = 6.40, 95% CI 1.85–21.88, $p = 0.002$), and to speak of all or most staff in negative terms (19/59, 32% vs. 9/58, 16%; OR = 2.59, 95% CI 1.07–6.23, $p = 0.034$). Even those who were positive about staff were often critical of their reactions to self-harm and their inability to address or understand their needs (13/40, 33%), because of being untrained, overstretched or simply "uncaring".

Qualitative analysis of prison-related influences on near-lethal self-harm

Primary factors

Problems with staff were mentioned by several prisoners when asked about their reasons for self-harming (9 cases, 15%):

I just didn't want to be around. I had enough of these [staff] pushing me and everything. I did. (Case 52)

Arguments with other prisoners (8 cases, 13%) were also mentioned by as a reason – or the primary reason – for having self-harmed:

Because I'm on valium-based medication – what everybody wants – I'm on methadone. I kept giving a girl like my methadone all the time. She was bullying me into it. (Case 18)

Other primary factors included medication and detoxification issues (4), feeling let down or discriminated against by the system (3), and spending too much time in their cells (3). Eight prisoners (13%) attributed their acts to anxieties about sentencing, prison transfers or being released:

I'd just been sentenced on the Thursday...and I was due to get shipped out two days after...I hadn't got my head around the fact that my sentence was a lot more than what I thought it would be. (Case 32)

However, prison-related factors were seldom described as the only influences on prisoners' near-lethal self-harm. Indeed, 27 prisoners reported having carried out the acts for reasons unrelated to their being in prison, and most had previously self-harmed (39/59, 66%) and attempted suicide (49/58, 85%) outside prison.

Triggering factors

Factors prisoners said had triggered (rather than caused) near-lethal self-harm were mostly linked to their being in prison. Once

Table 1
Socio-demographic characteristics of female prisoners who engaged in near-lethal self-harm (cases) and those who had not (controls).

	Cases N = 60		Controls N = 60		Odds ratio (95% CI)	p
	n	(%)	n	(%)		
Age, median (years)	25.5		26.0			0.581
White ethnicity v. non-white	52	(87)	50	(83)	1.30 (0.48–3.56)	0.609
Single ^a	40	(67)	32	(53)	1.75 (0.84–3.66)	0.136
Parent/guardian of children	31	(52)	27	(45)	1.31 (0.64–2.68)	0.465
Educational qualifications ^b	30	(50)	41	(68)	0.46 (0.22–0.97)	0.041
Unemployed ^c	36	(60)	32	(53)	1.30 (0.64–2.71)	0.461

^a Including divorced, widowed and separated.

^b Any vs. none.

^c Including sick/disabled and housewives.

Table 2
Criminological characteristics of cases and controls.

	Cases N = 60		Controls N = 60		Odds ratio (95% CI)	p
	n	(%)	n	(%)		
Prior prison spell	34	(57)	22	(37)	2.26 (1.09–4.70)	0.028
Index offence						
Violence	21	(35)	24	(40)		
Sexual	1	(2)	0	(0)		
Robbery	12	(20)	9	(15)		
Burglary	5	(8)	1	(2)		
Other theft	5	(8)	7	(12)		
Fraud and forgery	0	0	4	(7)		
Criminal damage	6	(10)	1	(2)		
Drug offences	4	(7)	11	(18)		
Other	6	(10)	3	(5)		
Violent vs. non-violent offence ^b	34	(57)	33	(55)	1.07 (0.52–2.20)	0.854
Status						
Remand vs. sentenced	21	(35)	4	(7)	7.54 (2.40–23.68)	<0.0001
Sentence type (sentenced prisoners only)						
Indeterminate vs. determinate sentence	12/39	(31)	10/56	(18)	0.49 (0.19–1.28)	0.142
Sentence length						
Less than or equal to 6 months	4/39	(10)	2/56	(4)		
Greater than 6 months to less than a year	1/39	(3)	8/56	(14)		
12 months to less than 4 years	9/39	(23)	21/56	(38)		
4+ years (including indeterminate sentences)	25/39	(64)	25/56	(45)		
18+ months	33/39	(85)	39/56	(70)	2.40 (0.85–6.78)	0.094
Latency						
Less than 1 month since first reception	11	(18)	4	(7)	3.14 (0.94–10.5)	0.053
Less than 1 month in current prison	13	(22)	5	(8)	3.04 (1.01–9.16)	0.041
Single cell accommodation ^c	57	(95)	40	(67)	9.50 (2.64–34.14)	<0.0001
'Safe cell' accommodation ^{c,d}	12	(22)	5	(8)	3.07 (1.01–9.38)	0.042
During current prison term:						
Imprisonment difficult or very difficult ^a	38/59	(64)	11/58	(19)	7.73 (3.34–17.85)	<0.0001
Intimidated to hand over belongings	20	(33)	2	(3)	14.5 (3.2–65.5)	<0.0001
Threatened with violence	23	(38)	12	(20)	2.47 (1.10–5.64)	0.027
Victim of actual abuse	12	(20)	6	(10)	2.25 (0.78–6.46)	0.125
Belongings stolen	26	(43)	17	(28)	1.93 (0.91–4.13)	0.087
Received unwanted sexual attention	11	(18)	10	(17)	1.12 (0.44–2.88)	0.810
Victim of forced sexual attentions	5	(8)	5	(8)	1.0 (0.27–3.65)	1.0

^a Denominators vary because of missing information.

^b Including violence, sexual offences and robbery.

^c At the time of the near-lethal act in cases, and of the interview in controls.

^d 'Safe cells' have reduced ligature points. Two of the cases in safe cell accommodation, together with the five controls in this category, were from HMP Peterborough, where all cells have reduced ligature points.

again, difficulties with prison staff (12, 20%) and fellow prisoners (12, 20%) appeared to be especially prevalent:

There was, there was a bit of an argument I had with somebody [another prisoner] which upset me. (Case 12)

Further precipitating factors for near-lethal self-harm included concerns surrounding trials, sentencing and parole boards (4 cases), as well as prison transfers (4), being denied medication (2) or a visit (1), lacking distractions whilst in cell (1) and having no tobacco (1).

Additional factors

Other factors prisoners said had contributed to, but not necessarily caused or triggered the near-lethal acts, were symptoms of drugs or medication withdrawal (6), missing family and friends outside prison (6), feeling upset after a visit (1), and being disappointed at having to interrupt counselling due to being transferred to another prison (1). Others spoke of finding imprisonment difficult (14), not least because being bullied and exposed to violent offenders evoked memories of their own abuse (2), and due to difficulties in dealing with problems in prison without drugs or alcohol (5), or other coping strategies (4):

I never dealt with losing my son and daughter, outside I covered it up with drink and everything else. (Case 30)

You've got more strategies when you are out. You can do more things, and you can go places and you can...Like when you are in

here you've got a lot of time to think and dwell and things like that...And distraction helps a great deal; it stops you a great deal. (Case 41)

Preventive factors

Prison-related factors also featured prominently in prisoners' accounts of what might have prevented their near-lethal acts. Although a considerable proportion of women (25/57, 44%) reported that their act could not have been prevented, all but two of those who described their self-harm as preventable made reference to prison-related factors. Of these, the most frequently mentioned was being able to talk to someone, be they a member of staff (3), a friend in prison (2), a 'prison listener' (a prisoner trained by the Samaritans to listen in confidence to fellow prisoners in distress) (1), or anyone available (3). Other factors that might have prevented their acts were: being treated better by prison officers and healthcare staff (especially in relation to the administration of medication) (5), not being in prison (2), having more distractions and time out of cell (2), more help with their mental health problems (2), reduced access to means to self-harm (1), being in a shared cell (1), and receiving counselling (1).

Life events and childhood trauma

All cases and controls had experienced at least one of 16 identified adverse life events. Events experienced more commonly

included sexual abuse, having been in local authority care, violence at home, running away runaway from home, and death of a partner or child. Eighteen cases (30% vs. 9 controls, 15%; OR = 2.43, 95% CI 0.99–5.96, $p = 0.049$) reported having a serious physical illness at the time of their near-lethal act, including hepatitis c (6 cases), epilepsy (5), severe asthma (2), diabetes (2), and heart disease (1). Most prisoners had experienced at least five (50/60, 83% vs. 30/59, 51%; OR = 4.83, 95% CI 2.07–11.30, $p < 0.0001$), and a third of the cases reported ten or more adverse events (20/60, 33% vs. 6/59, 10%; OR = 4.42, 95% CI = 1.62–12.01, $p = 0.002$). Cases were significantly more likely to report recent life events, with almost half having suffered an adverse event within the previous six months. When prior sexual abuse, violence in the home, bullying, running away from home, and serious money problems were entered in a logistic regression model, only sexual abuse (adjusted OR = 4.10, 95% CI 1.64–10.21, $p = 0.002$) remained significant.

We analysed the sensitivity and specificity of factors that remained significant in multifactorial analyses, namely, prior prison spell, single cell status and sexual abuse. All three factors were present in 29 cases and 7(59) controls (1 case vs. 6 controls had none of these factors; 7 cases vs. 28 controls had only one; 23 cases vs. 18 controls had two). The model's sensitivity was 0.48, specificity was 0.88.

Compared to controls, cases had significantly greater levels of trauma on the Childhood Trauma Questionnaire (CTQ) and all of its subscales (Fig. 1). Scores on all subscales were significantly inter-correlated at $p < 0.0001$ (Table 3). In childhood, 85% of cases reported having been emotionally abused (51 vs. 21, 35% controls; OR = 10.5, 95% CI 4.3–25.5, $p < 0.0001$), three quarters had been sexually abused (44, 73% vs. 19, 32%; OR = 5.93, 95% CI 2.70–13.07, $p < 0.0001$) and almost as many had been physically abused (43, 72% vs. 16, 27%; OR = 6.96, 95% CI 3.12–15.51, $p < 0.0001$) Table 3. Most prisoners in the near-lethal group reported having suffered all three forms of abuse as children (38, 63% vs. 11, 18%; OR = 7.69, 95% CI 3.33–17.80, $p < 0.0001$).

Qualitative analysis of life events and childhood trauma as contributing to near-lethal self-harm

Primary factors

The strong associations between near-lethal self-harm and adverse life events were further supported by qualitative data

Table 3

Correlation matrix of scores on the childhood trauma scale and subscales in cases and controls ($N = 119$).

	Childhood trauma	Sexual abuse	Emotional abuse	Physical abuse	Emotional neglect	Physical neglect
Childhood trauma	1.00					
Sexual abuse	0.76*	1.00				
Emotional abuse	0.90*	0.57*	1.00			
Physical abuse	0.88*	0.55*	0.80*	1.00		
Emotional neglect	0.85*	0.46*	0.78*	0.70*	1.00	
Physical neglect	0.86*	0.55*	0.71*	0.75*	0.80*	1.00

* $p < 0.0001$.

All correlation coefficients were calculated using Spearman's rho.

about prisoners' primary reasons for self-harming. Indeed, adverse childhood and adulthood experiences were amongst the factors most frequently perceived as causal by the prisoners, particularly bereavement, sexual abuse and family-related problems.

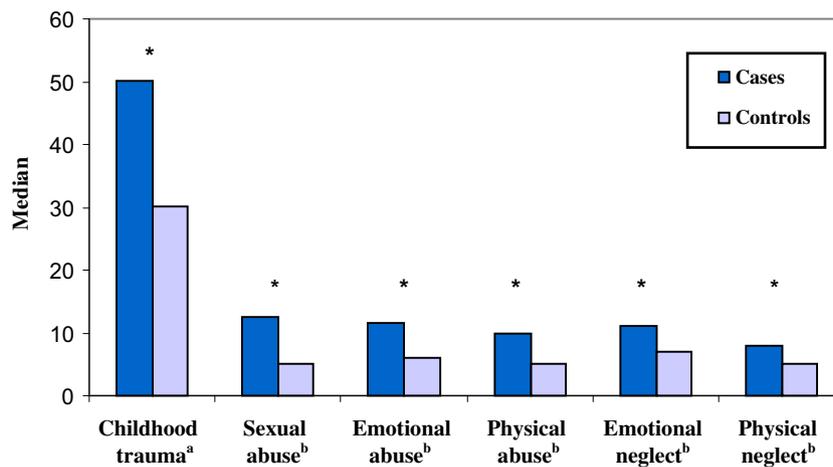
Just over a quarter of cases (16, 27%) said they had self-harmed because they were mourning the loss of a loved one (in three cases by suicide, in six cases of their own child) and wished to end their pain or be reunited with the person they had lost. In most cases (12/16, 75%), the death or deaths being mourned had occurred more than six months prior to the prisoner's near-lethal act:

I was just thinking about my [late] brother and I just wanted to be with my brother, so I took some tablets. That was it. I just didn't want to be here. (Case 40)

Almost a fifth of prisoners (11, 18%) explained their near-lethal act in relation to previous sexual abuse, and associated images, flashbacks, voices and negative feelings. In all but two cases, the abuse had taken place at least six months before the near-lethal act, including six instances of childhood sexual abuse:

I had the thoughts as well running around in my head, and going through the pain as well like of when I was abused. So I felt...I just felt like I didn't want to live anymore. I felt dirty. And worthless (Case 5)

I'd convinced myself that he [my rapist] had killed himself in jail and he was coming into my room as a ghost...and it just, it was horrible. It was horrible...I was just getting lower and lower and I just... that's when I thought, you know, I just want to die. I just seriously want to die. Because it's not ever going to get any better. (Case 57)



* $p < 0.0001$

^a Scores can range from 25 to 75, with higher scores indicating greater levels of trauma.

^b Scores can range from 5 to 15, with higher scores indicating greater levels of trauma.

Fig. 1. Childhood trauma in cases and controls.

Further primary factors in prisoners' near-lethal self-harm included serious illness and chronic pain (2), severe money problems (1), and concerns about families and children, particularly in relation to a partner or relative's illness or problem (3), the break-up of a relationship (1), having difficult rapport and poor contact with family (4), and struggling to deal with a child or children being adopted (in 2 cases shortly before the act, and in a further 2 instances over six months before):

I found out my husband didn't want to be with me – and my, I've got my two kids that I mentioned, they are both adopted. So I felt that my husband was all I had left. And I woke up in the morning and I was in so much pain and I wanted it all to go away. And I just really really did want to die. (Case 30)

Triggering factors

Even when not identified as primary factors in the near-lethal acts, life events, mostly recent ones, were sometimes said to have triggered near-lethal self-harm (10, 17%). For example, seven prisoners (12%) reported that their behaviours had been precipitated by distressing news from outside prison:

...my mum had said that there was some form I needed to fill in to, to a creditor. So that, that just flummoxed me and I couldn't cope. (Case 48)

I found out that my partner – now ex – wrote a statement against me, saying basically a lot of lies. And that really hurt me quite deeply. (Case 53)

Social networks and social support

The difficult family relationships which some prisoners identified as playing an important role in their self-harm act were reflected in cases' social networks and social support scores. Prisoners who had engaged in near-lethal self-harm were significantly more likely than controls to report having no close friends outside prison. More also reported having no relatives to whom they felt close, although this difference was not statistically significant (Table 4). In the previous three months, cases had received fewer visits and phone calls from close friends and relatives, but were as likely as controls to have received letters from people outside prison.

In addition, prisoners who had engaged in near-lethal self-harm had significantly lower scores on the *Social Support Scale* (case median = 19, control median = 20, $z = -2.31$, $p = 0.021$), indicating lower levels of perceived social support (in prison or outside).

Exposure to suicidal and self-harming behaviour

Prisoners who had engaged in near-lethal self-harm were significantly more likely than controls to have lost a family member to suicide (Table 4). However, cases were no more likely than controls to report a family history of attempted suicide and self-harm, or to have been exposed to friends' or other prisoners' suicidal and self-harming behaviours.

Psychological characteristics and influences

All psychological variables were significantly intercorrelated (Table 5). Near-lethal cases had lower self-esteem than controls, and scored more highly on the measures of hostility, impulsivity, aggression and depression. Scores on the Beck Depression Inventory (BDI) indicated that all prisoners who had engaged in near-lethal self-harm had symptoms of depression (vs. 34/59, 57.6% controls, $p < 0.0001$), with most having severe symptoms

(BDI score ≥ 30 : 44/60, 73.3% vs. 6/59, 10.2%; OR = 24.3, 95% CI 8.8–67.4, $p < 0.0001$) and a considerable proportion reporting symptoms of severe hopelessness (24/60, 40% vs. 5/60, 8%; OR = 7.33, 95% CI 2.56–20.98, $p < 0.0001$).

Many prisoners who had engaged in near-lethal self-harm described their acts as impulsive (28/56, 50%), with only a fifth (11/56, 20%) having made a detailed plan and just over a third (22/56, 39%) having contemplated their act for more than three hours.

Primary factors

The important role of psychological variables in prisoners' near-lethal self-harm was further corroborated by participants' accounts of their reasons for their acts. Over a quarter of participants (16, 27%) reported having been primarily motivated by intense feelings of depression and hopelessness:

I was really depressed. And I just wanted to kill myself, so I tied a ligature and I don't remember much else... I was just really low and really depressed. You know, I couldn't see no future. (Case 22)

Anger and frustration were also cited as common reasons for engaging in near-lethal self-harm (13, 22%), sometimes alongside depression:

It was just mixed feelings, like. I was angry, upset, it was ... I don't know. I just didn't want to feel like shit anymore and that. And I didn't want to have the thoughts and that anymore. (Case 27)

Feeling worthless (4), guilty (2), paranoid (2) and desiring to be at peace (temporarily or permanently) (6) were also perceived as causal by some prisoners, together with hearing voices (6) and experiencing flashbacks of past trauma (5).

Triggers and additional factors

Distressing flashbacks and internal voices were not always identified as primary reasons for near-lethal self-harm, with some prisoners describing them as triggers (12) or additional factors (5):

I was being visited by my grandma and she was telling me that I was going to hell with her. Sort of getting a lot of hallucinations, and a lot of voices. (Case 1)

Discussion

We found that environmental and prison factors had strong associations with near-lethal self-harm, in particular remand status, prior incarceration, single cell accommodation and negative experiences of imprisonment. In addition, social support, recent life events and past trauma, especially sexual abuse, were strongly correlated with near-lethal self-harm. These factors appeared to be of greater importance than criminal history and socio-demographic factors, which were modestly associated with near-lethal self-harm.

Most women in the near-lethal group were white and from low socio-economic backgrounds. However, unlike in previous studies in the community (Hawton & Van Heeringen, 2009) and in mixed gender (Jenkins et al., 2005) and predominantly male prisoner samples (Fazel, Cartwright et al., 2008), these variables did not significantly discriminate between cases and controls, with the exception of educational status. The socio-demographic profile of near-lethal cases was similar to that of female prisoners who have died by suicide in England and Wales (see Appendix 1).

In addition, our data suggest that the day-to-day prison experiences of the cases differed from those of controls. When they carried out their self-harm acts, cases were more likely to be in single cell and safe cell accommodation, and to be housed on a hospital, segregation or special unit, rather than on normal wing

Table 4
Social networks and exposure to suicidal and self-harming behaviour of cases and controls.

	Cases N = 60 ^a		Controls N = 60 ^a		Odds ratio (95% CI)	p
	n	(%)	n	(%)		
Relatives to whom close						
None vs. any	18	(30)	10	(17)	2.14 (0.83–5.14)	0.084
Close friends outside prison						
None vs. any	28	(47)	6	(10)	7.88 (2.94–21.1)	<0.0001
No close friends or relatives outside prison	12	(20)	0	(0)		<0.0001
Contact with friends/family in past 3 months						
Any letters	54	(90)	58	(97)	0.31 (0.06–1.60)	0.143
Any phone calls	46	(77)	58	(97)	0.11 (0.03–0.52)	0.001
Any visits	32	(53)	48	(80)	0.29 (0.13–0.64)	0.002
Any contact (letters/calls/visits)	55	(92)	60	(100)	0.92 (0.89–0.99)	0.022
Family members:						
Died by suicide	14/53	(26)	4/60	(7)	5.03 (1.54–16.42)	0.004
Attempted suicide	11/50	(22)	8/59	(14)	1.80 (0.66–4.90)	0.247
Self-harmed	7/50	(14)	4/59	(7)	2.24 (0.62–8.15)	0.212
Friends:						
Died by suicide	12/50	(24)	8/59	(14)	2.01 (0.75–5.41)	0.161
Attempted suicide	5/51	(10)	10/59	(17)	0.53 (0.17–1.68)	0.276
Self-harmed	8/51	(16)	12/59	(20)	0.73 (0.27–1.95)	0.528
Know other prisoners who:						
Died by suicide	20/39	(51)	21/49	(43)	1.40 (0.60–3.27)	0.431
Attempted suicide	25/35	(71)	39/53	(74)	0.90 (0.65–2.33)	0.824
Self-harmed ^b	51/59	(86)	57/58	(98)		

^a Denominators vary because of missing information.

^b Test not conducted due to lack of statistical power.

location (the latter finding being consistent with Meltzer et al.'s (1999) study of non-fatal suicidal behaviour in women prisoners). At the time of the interviews, they more frequently described prison life as difficult or very difficult. Although there were no differences in the number of staff and prisoners they felt close to, cases appeared to have more problematic relationships with other prisoners and staff, as reported in previous studies (Blaauw, Winkel et al., 2001; Liebling & Krarup, 1993). Indeed, cases were more likely than controls to have been threatened with violence and intimidated to hand over their belongings, and often stated that these episodes contributed to their self-harm – as triggers more often than as primary reasons. Their more sporadic contact with people outside prison, and significantly lower levels of social support, may have also contributed to a more negative experience of prison, whilst the greater likelihood of their being on remand and in the early stages of their sentence may have increased feelings of uncertainty and anxiety.

We found that prior prison spells and being in a single cell were the criminal history and environmental factors independently associated

with near-lethal self-harm. With the caveat that power was limited, these data suggest that prior criminality may be a powerful predictor of severe self-harm as part of any screening for suicide risk, and that prison systems may consider prioritizing joint accommodation as part of suicide prevention strategies.

We also found that, compared with controls, cases scored more highly on measures of hostility, impulsivity and aggression, as previously reported in the community (Brezo, Paris, Tremblay et al., 2006; Conner et al., 2001) and in suicidal prisoners, both male and female (Daigle & Côté, 2006; Sarchiapone, Jovanović et al., 2009). These psychological characteristics may be related to a core underlying dimension – possibly neurobiologically determined – which appears to be a key determinant of suicide risk (Mann, 2003; Mann, Waternaux et al., 1999). In addition, near-lethal cases were more likely to report depressive symptoms and lower self-esteem, which is consistent with previous research, both in prisons and in the community (Brezo, Paris, & Turecki, 2006; Morgan & Hawton, 2004; Palmer & Connelly, 2005). Over a quarter of the near-lethal cases we interviewed reported that their feeling depressed and hopeless had been a primary factor in their act. Many more were suffering from mood and anxiety disorders (Marzano, Fazel et al., 2010). Overall, these state and trait-dependent characteristics may influence vulnerability to suicide by affecting an individual's opinion of themselves, perceptions of and adaptations to the environment, and the likelihood of acting on suicidal feelings (Brezo, Paris, & Turecki, 2006; Mann, 2003).

Our findings also confirm the importance of childhood trauma and life problems as potential risk factors for suicide in prison (Blaauw, Kraij, Arensman, Winkel, & Bour, 2002; Clements-Nolle, Wolden, & Bargmann-Losche, 2009; Jenkins et al., 2005), as found in other contexts (Brezo et al., 2008; Haw & Hawton, 2008). Prisoners who had engaged in near-lethal self-harm were significantly more likely than controls to have suffered child sexual, physical, and emotional abuse, with over 60% having experienced all three forms of childhood abuse. Cases were also found to have experienced greater victimisation as adults and reported more, and more recent, adverse life events. Bullying and domestic violence were especially common amongst cases, as were running away from home and the death of close family and friends. This included the

Table 5
Correlation matrix of impulsivity, hostility, self-esteem, aggression and depression scores in cases and controls (N = 120).

	Impulsivity	Hostility	Self-esteem	Aggression	Depression
Impulsivity (15–60)	1.00				
Hostility (0–21)	0.73 ^{a,*}	1.00			
Self-esteem (12–48)	–0.59 ^{b,*}	–0.49 ^{a,*}	1.00		
Aggression (0–28)	0.68 ^{a,*}	0.76 ^{a,*}	–0.33 ^{a,*}	1.00	
Depression (0–63)	0.50 ^{a,c,*}	0.45 ^{a,c,*}	–0.70 ^{a,c,*}	0.38 ^{a,c,*}	1.00
Median or Mean (SD) Cases	40.2* (6.83)	13.5*	27.3* (4.87)	18.0*	36.0*
Median or Mean (SD) Controls	33.5 (6.80)	9.50	33.0 (5.48)	12.0	11.0

*p < 0.0001 for correlations and case-control comparisons.

^a Correlation coefficient calculated using Spearman's rho.

^b Correlation coefficient calculated using Pearson's r.

^c N = 119.

death of a family member by suicide, a finding consistent with community studies (Qin, Agerbo, & Mortensen, 2002) and research in male prisoners (Sarchiapone, Carli et al., 2009) (the apparent lack of association between near-lethal self-harm and exposure to other prisoners' self-harming and suicidal behaviour may reflect the high rates of self-harm and suicide in women's prisons). When adjusting for other life events, sexual abuse was the only variable which significantly predicted the risk of near-lethal self-harm, and was mentioned by almost a fifth of prisoners as a primary factor in their attempt. It is possible that re-enactment of abusive experiences triggers suicidality, and awareness by prison staff may reduce self-harm.

Investigating a broad range of psychosocial factors in near-lethal self-harm allows for the identification of a large number of contributing factors and for inferences to be made about how they interact, thus offering a richer understanding of the significance of associations. Prisoners' accounts of their near-lethal acts confirm that exposure to early trauma, particularly multiple forms of abuse and when also re-experienced in adult life, can contribute to revictimisation and heightened psychological distress in prison (Hooper, 2003). Some researchers have argued that, whilst imprisonment potentially offers a respite from violent relationships, substance misuse and poverty, it may be especially stressful or even re-traumatising for women, because deprivation of privacy and autonomy, and fears of bullying and violence, may be reminiscent of earlier abusive situations (Carlen, 2002). In addition, separation from families and children, often by a considerable distance (women's prisons are fewer and more geographically dispersed than men's), may evoke memories of women's own childhood neglect, exacerbate already strained relationships, and increase feelings of guilt and depression (Hooper, 2003). Dealing with these intense negative emotions may be difficult in prison, where distraction can be limited and habitual coping strategies (including drugs and alcohol) unavailable.

Thus, traumatic experiences, lack of social support and mental health problems may influence – and in turn be influenced by – women's experiences of incarceration, and together contribute to suicidal behaviour. Our sample size was insufficient to determine which factors may be independently associated with suicidal behaviour, or to fully test the interactions of individual and environmental factors. Nevertheless, our findings highlight the co-occurrence of criminological and psychosocial problems associated with the risk of suicide. The multifactorial analyses we conducted suggest that prior prison spell, single cell status and sexual abuse are key factors in this process. Our predictive model was however limited by low sensitivity, which is likely to be partly a consequence of the model not including any psychiatric diagnostic variables. Further research is currently underway to determine whether adding psychiatric variables to this model could improve its predictive power. Future studies could also examine how psychosocial influences on women prisoners' suicidal behaviour interact with biological factors.

Further research is necessary to confirm the role of criminological and environmental factors in prison suicide, as the associations we reported need to be interpreted with caution. Data on control prisoners were provided on a monthly basis and led to oversampling prisoners who were relatively static within the prison system (i.e. less on remand and serving short sentences within the control group, and more convicted for violent and serious offences, and thus serving longer sentences). In turn, this suggests some caution in interpreting the finding that more cases had been in their current prison for a shorter time, and were on remand, although this is a recurrent finding in the literature (e.g. Jenkins et al., 2005). Also, we were not able to examine the impact of institutional factors on near-lethal self-harm as the number of participants recruited from

each establishment was insufficient to carry out this sort of analysis, or to compare public and private prisons. In view of the variability of suicide and self-harm rates in women's prisons in England and Wales (Ministry of Justice, 2010), this could be an important area for exploration in future studies.

To conclude, our findings suggest that suicides in prison should be understood in relation to both individual and environmental factors. Both were found to be statistically associated with near-lethal self-harm, and were identified by prisoners as having contributed to their acts. Long-term vulnerabilities were more often cited as primary reasons for self-harming, whereas prison-related variables were more commonly described as triggering and preventive factors. Both sets of variables could be incorporated alongside psychiatric factors in a screening instrument to assess suicide risk at reception and during incarceration. Our data also suggest that combined health, social and environmental interventions should be considered to reduce the incidence of suicide and severe self-harm in women's prisons. These could include interventions for women who have experienced abuse and bereavement, improved and more regular contact with mental health professionals, as well as initiatives to enhance staff–prisoner relationships and reduce bullying. The role of such interventions in reducing suicide and severe self-harm in other forensic and institutional populations needs additional research.

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Appendix. Supplementary material

Supplementary data related to this article can be found online at doi:10.1016/j.socscimed.2010.12.028.

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