# **ORIGINAL PAPER**

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# Deliberate self-harm patients of no fixed abode

# A study of characteristics and subsequent deaths in patients presenting to a general hospital

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**Abstract** Background International studies report high rates of deliberate self-harm (DSH) and suicide in the homeless. Little is known about DSH among homeless people in the UK and their subsequent risk of death from suicide and non-suicidal causes. Method We have carried out a study of no fixed abode (NFA) patients using data collected through the Oxford Monitoring System for Attempted Suicide. We describe the demographic and clinical characteristics of NFA DSH patients and the findings of a mortality follow-up study of a cohort of these patients. Results Between July 1988 and December 2002, 10,346 persons presented following 17,352 DSH episodes. Of these persons, 374 (3.6%) were of NFA. Compared with domiciled DSH patients, NFA patients were more likely to be male, single, unemployed, to have been a recent victim of violence and violent towards others, to have a criminal record and to have a personality disorder. More NFA patients faced problems with drugs and alcohol, social isolation, finances, the law and housing and had received psychiatric treatment within the previous 12 months. Substantially more NFA patients had a past history of DSH and re-presented with a further episode of DSH within 12 months. In the cohort of DSH patients who presented between January 1978 and December 1997 and who were followed up until December 2000, mortality from probable suicide and from all causes was approximately double that of domiciled patients. Conclusions NFA DSH patients are a vulnerable group of patients at high risk of DSH repetition and with increased mortality from all causes. Good liaison between medical and psychiatric services is important. Specialist services may need to be developed to meet the particular needs of this patient group.

**Key words** homeless – no fixed abode – attempted suicide – self-harm

# Introduction

The homeless are a relatively small but particularly vulnerable group of people in society. The numbers of homeless people in major cities in the UK have risen in the last two decades, particularly amongst women and young people [1]. Rough estimates have been made of the numbers of people who are 'absolutely homeless' (people who sleep outdoors, in buildings or vehicles) in North America and some European cities [2]. For example, there are thought to be between 250,000 and 1 million homeless people in the USA. Less is known about the larger number who are 'relatively homeless', that is those whose physical shelter does not meet basic standards of health, safety and security of tenure.

Several national suicide prevention strategies, e.g., [3–5] specifically target the socially excluded and deprived, an important group of which are the homeless. However, there is little information about suicidal behaviour among homeless people in the UK. There are no official statistics on suicide among the homeless and few reports about deliberate self-harm (DSH). In a study of patients presenting to an inner London general hospital following an episode of DSH, 15% of patients were of no fixed abode (NFA) [6]. Of the NFA group, 80% were male, while female NFA patients were significantly younger than domiciled female DSH patients. Among homeless people aged under 22 years presenting to two projects for young homeless people in London, a fifth of respondents

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reported an episode of DSH within the previous year [7].

The international literature suggests that suicidal ideation and suicide attempts are relatively common among homeless people. A review of Australian studies of homeless youths reported a prevalence of suicidal ideation of between 40% and 80% and of suicide attempts of between 23% and 67% [8]. A study from the USA of adolescent runaways reported that 25% of girls and 14% of boys had attempted suicide at least once [9]. In another US study of homeless young people aged 23 years and under, 39% gave a history of attempted suicide and 49% reported self-injurious behaviour [10]. Two Canadian studies of homeless youths reported that 42% and 21%, respectively, had attempted suicide on at least one occasion [11, 12]. An even higher rate of attempted suicide (51%) was reported from a study of homeless people with mental illness [13].

One major reason for the relatively high frequency of DSH in homeless people is the high rate of mental disorder found in this population. In several UK studies of hostels for the homeless, severe mental illness, predominantly schizophrenia, has been found to be common [14, 15, 16]. These studies have also shown high rates of drug and alcohol abuse and personality disorder among homeless people. High rates of depression and anxiety, often with co-morbid substance abuse, have been found in young homeless people in London [7]. International studies have also reported very high rates of drug and alcohol misuse; for example, a large German study of single homeless men reported a one-month prevalence rate for substance misuse disorders of 63% [17]. Affective disorder was also relatively common (16%), and 25% had psychiatric comorbidity, while only 7% had a psychotic disorder. Higher rates of schizophrenia (12%) were found in a study of homeless persons in Los Angeles [18], while in another USA study of men in night shelters 17% had a history of psychosis [19]. It has been suggested that the higher rates of schizophrenia reported in most American as opposed to European studies of homeless people reflects differences in the social and mental health services of the countries concerned [2].

The homeless have increased mortality rates from all causes. Physical ill health is frequent in this population [20, 21]. In an Australian study of a cohort of homeless people referred to psychiatric outreach clinics who were followed up 10 years later, mortality from all causes was more than three times greater than in the general population [22]. The homeless also had an excess of deaths from suicide. Increased mortality from all causes in homeless persons has also been reported from the USA [23, 24], Canada [25], and Israel [26]. In the Canadian study, suicide was a leading cause of death among homeless men aged 18– 24 years in Toronto [26]. The homeless are a difficult population to study, given that they are highly mobile and therefore difficult to trace. The Oxford Monitoring System for Attempted Suicide is a systematically collected database of DSH patients presenting to a general hospital [27, 28]. We have used data from this to conduct a study to describe the distinguishing characteristics of homeless DSH patients. We have also investigated their mortality at follow-up from suicide and other causes.

# Method

The study population consisted of all patients who presented to the general hospital in Oxford following an episode of deliberate selfharm between 1st January 1978 and 31st December 1997, who were aged 16 years and over at their first presentation. The data for the study were obtained through the Oxford Monitoring System for Attempted Suicide [27, 28]. The Monitoring System enables data to be collected on all DSH patients presenting to the general hospital in Oxford. Patients presenting to the general hospital because of DSH come from Oxford City and the surrounding area. Most acts involve self-poisoning, the rest self-injury or both methods. Selfpoisoning is defined as the intentional self-administration of more than the prescribed dose of any drug, whether or not there is evidence that the act was intended to result in death (hence the use of the term 'deliberate self-harm' rather than 'attempted suicide'). This also includes poisoning with non-ingestible substances and gas. Overdoses of recreational drugs and severe alcohol intoxication are only included where the clinical staff consider these are cases of DSH. Self-injury is defined as any injury, which has been deliberately self-inflicted.

The majority of patients undergo detailed psychosocial assessment by a member of the general hospital psychiatric service (usually a psychiatric nurse or junior psychiatrist). Information collected includes: demographic and clinical details, drug and alcohol usage, past history of DSH, problems causing current distress and/or contributing to the episode of DSH, and methods used for DSH. Following this assessment the member of staff records details about the patient and the episode of DSH on a data entry form. Limited clinical and demographic information, derived from case notes and emergency department records, is recorded on those DSH patients who do not undergo assessment by the general hospital psychiatric service. Information from the coded data sheets is then entered into a computerised database. This method of data collection has been demonstrated to be reliable [29].

#### Definition of no fixed abode

Patients who are sleeping rough or are living in lodging houses for the homeless and those without an address who are staying temporarily with friends or relatives are identified as being of NFA. No subgroup analysis was possible on these different types of homeless persons. Those patients for whom it is not known whether or not they have an address are recorded separately as 'address not known'. For the purposes of the study, patients were categorised as being of NFA if they were of NFA at one or more presentations during the study period. Thus, a patient who presented with several episodes of DSH, at only one of which were they of NFA, was for the purposes of the study categorised as being in the NFA group.

The study consisted of two parts: a descriptive study of the demographic and clinical characteristics of NFA patients and a follow-up mortality study of a cohort of NFA patients.

#### Descriptive study

The investigation of characteristics of NFA DSH patients was conducted on patients who presented during the  $14^{1}/_{2}$  year period between 1st July 1988 and 31st December 2002. This period was chosen as, from 1st July 1988, much more detailed information was collected on patients through the Monitoring System. Patients in the NFA group were compared with the remaining patients, forthwith referred to as the domiciled group (excluding those patients who had no information recorded on whether or not they had an address). For the NFA group, we report on the first assessed episode at which they were of NFA. For the domiciled group we report on their first assessed episode. Patients who presented to the general hospital but were not assessed during the study period were excluded from the analysis.

#### Mortality study

This part of the study included patients presenting between 1st January 1978 and 31st December 1997. The follow-up period lasted until 31st December 2000. The maximum possible duration of follow-up was therefore 23 years. Information on deaths was obtained through submission of demographic information (name, gender, and date of birth) on patients to the Office for National Statistics for England and Wales, the Central Services Agency in Northern Ireland, and the General Register Office for Scotland. Tracing revealed whether a patient was alive or deceased as of 31st December 2000. Patients who could not be traced were excluded from the follow-up analyses. Copies of death certificates were obtained for all subjects who had died. The underlying condition recorded on each death certificate as being the primary cause of death was considered to be the cause of death for the purposes of this study. ICD-9 codes (11) were used to categorise cause of death. All codes recorded prior to the introduction of ICD-9 were updated to ICD-9. All deaths that received a coroner's verdict of 'suicide' (ICD-9 code E950-E959), 'undetermined cause' (E980-E989), or 'accidental poisoning' (E850-E869) were combined to form a "suicide" category. This is standard practice in UK suicide studies, as it has been shown that the overall mortality from suicide will be underestimated if the verdict of suicide alone is used [30]. Coroners in the UK have very strict criteria for recording a suicide verdict and the majority of undetermined deaths are very likely to be suicides. We included accidental poisonings in our "suicide" category, as at least in DSH populations the majority are suicides [31]. Patients for whom no follow-up information was available at any time during the follow-up period, usually because of incorrect identifier information, were excluded from the follow-up analyses.

#### Statistical analysis

The data were analysed using SPSS version 11.5 [32] and EpiInfo [33].  $\chi^2$  and Fisher Exact tests were used to compare the NFA and domiciled patient groups. Risk of death, including risk of suicide, during the follow-up period was estimated for the NFA patients compared with the domiciled patients by means of Cox's regression models (assuming proportional hazards). These analyses were conducted using Stata [34].

### Results

# Descriptive study

During the period 1st July 1988–31st December 2002, 10,346 persons presented to the general hospital with 17,352 episodes of DSH. Eighteen persons (and episodes) were excluded from further consideration because their housing status was not known. Of the

remaining 10,328 persons, 374 (3.6%) were of NFA and were responsible for a total of 1,759 (10.1%) presentations. After excluding those patients who did not undergo psychosocial assessment (N = 1,960), the study sample consisted of 8,368 persons who presented with 13,235 episodes of DSH during the study period. Of these persons, 295 (3.5%) were of NFA on one or more occasions (and accounted for 1,047 episodes) and 8073 (96.5%) were domiciled (and accounted for 12,188 episodes). The results are based on a comparison of these two groups of patients.

#### Demographic and personal details

Of the NFA group, 238 (80.7%) were male and 57 (19.3%) female. By comparison, of the domiciled patients 3,310 (41.0%) were male and 4,763 (59.0%) were female. Thus, NFA patients were significantly more likely to be male ( $\chi^{2^{1}}$  = 183.5, *P* < 0.0001). Male NFA patients tended to be older and a greater proportion were aged 25-34 years than the male domiciled patients (see Table 1). There was no significant difference in the age distribution between female NFA and domiciled patients, but a substantial proportion (56.1%) were aged under 25 years. Both male and female NFA patients were more likely to be single and less likely to be married than their domiciled counterparts. They were also very much more likely to be unemployed, and somewhat more likely to be sick and disabled, than the domiciled patients.

#### Method of DSH and use of alcohol

Self-poisoning was by far the most common method of DSH for both NFA and domiciled patients (see Table 1). A somewhat larger proportion of both male and female NFA patients engaged in self-injury than did domiciled patients.

Among male patients, those who were of NFA were more likely to have consumed alcohol within 6 h of the attempt than were those who were domiciled. Both male and female NFA patients were more likely to have consumed alcohol as part of the DSH act than were domiciled patients.

#### Violence and criminal record

Male and female NFA patients were more likely than domiciled patients to have been a recent victim of violence, as well as having been violent towards others (Table 1). Female NFA patients were especially likely to have been recent victims of violence. Both male and female NFA patients were also more likely to have a criminal record. Male NFA patients were more likely than domiciled males to have served a prison sentence (35.4% vs. 11.2%,  $\chi^2 = 74.1$ , P < 0.0001). Meaningful analysis of female patients was not possible due to the

	Male NFA patients, N = 238		Male domiciled patients, N = 3310			Female NFA patients, N = 57		Female domiciled patients, N = 4763		
Variable	N	(%)	N	(%)	$\chi^2$ -test	N (%)		N (%) χ <sup>2</sup>		$\chi^2$ -test
Age in years 16–24 25–34 35–54 55+	65 102 65 6	(27.3) (42.9) (27.3) (2.5)	1241 997 805 267	(37.5) (30.1) (24.3) (8.1)	$\chi^2 = 27.6, df = 3, P < 0.0001$	32 13 11 1	(56.1) (22.8) (19.3) (1.8)	2108 1163 1141 351	(44.3) (24.4) (24.0) (7.4)	$\chi^2 = 4.79, df = 3, P = 0.19$
Marital status Single Married Other (Not known)	164 7 57 (10)	(71.9) (3.1) (25.0)	1925 713 629 (43)	(58.9) (21.8) (19.3)	$\chi^2 = 46.0, df = 2, P < 0.0001$	43 5 7 (2)	(78.2) (9.1) (12.7)	2512 1234 984 (33)	(53.1) (26.1) (20.8)	$\chi^2 = 14.2, df = 2, P < 0.005$
Employment Employed Unemployed Sick/disabled Other (Not known)	23 160 39 3 (13)	(10.2) (71.1) (17.3) (1.3)	1591 840 240 565 (74)	(49.2) (26.0) (7.4) (17.5)	$\chi^2 = 275.9, df = 3, P < 0.0001$	4 32 5 9 (7)	(8.0) (64.0) (10.0) (18.0)	2083 643 229 1708 (100)	(44.7) (13.8) (4.9) (36.6)	$\chi^2 = 109.4, df = 3,$ P < 0.0001
Self-poisoning only Self-injury (some cases also involved self-poisoning) (Not known)	184 54	(77.3) (22.7)	2835 475	(85.6) (14.4)	$\chi^2 = 12.2, df = 1, P < 0.0005$	44 13	(77.2) (22.8)	4343 420	(91.2) (8.8)	$\chi^2 = 13.5, df = 1, P < 0.0005$
Alcohol within 6 hours of DSH act	150	(69.8)	(1)	(53.2)	$\chi^2 = 22.2, df = 1, P < 0.005$	24	(54.5)	1917	(42.3)	$\chi^2 = 2.70, df = 1,$ P = 0.10
Alcohol as part of DSH act	(23) 92	(44.9)	(197) 896	(30.0)	$\chi^2 = 19.1, df = 1,$ P < 0.0001	(13) 25	(56.8)	(220) 1047	(23.8)	$\chi^2 = 9.02, df = 1,$ P < 0.005
(Not known) Criminal record (Not known)	(33) 110 (91)	(74.8)	(322) 743 (782)	(29.4)	$\chi^2 = 132.1, df = 1,$ P < 0.0001	(13) 10 (28)	(34.5)	(356) 178 (840)	(4.5)	$\chi^2 = 57.0, df = 1,$ P < 0.0001

Table 1 Comparison of NFA and domiciled male and female DSH patients on demographic variables and details of index episode of DSH (Findings relate to first assessed DSH episode at which NFA patients were NFA and first assessed episode for domiciled patients)

small number who had served a prison sentence (only two NFA patients had done so).

#### Problems causing distress and/or contributing to DSH

During psychosocial assessment the assessor records whether or not the patient has a problem causing them current distress and/or which contributed the episode of DSH. Table 2 shows the main factors for where there were significant differences between NFA and domiciled patients. Significantly fewer male NFA patients had relationship problems with a partner than did the male domiciled patients. More female NFA than domiciled patients had relationship problems with their families. Social isolation, legal and financial difficulties were more common in the NFA patients of both genders. Unsurprisingly, housing problems faced most of the NFA patients. Problems related to drugs and alcohol were much more common in the NFA patients than in the domiciled patients, with more than a tenfold excess in drug problems in female NFA patients. No differences were found between NFA and domiciled patients with respect to the frequency of problems with: employment, relationships with friends and physical health. For NFA patients, there were no gender differences in the frequency of different types of problems, except that a greater proportion of female than male NFA patients had relationship problems with their families (66.7% vs. 29.3%,  $\chi^2 = 26.2$ , P < 0.0001).

# Psychiatric and personality disorder, past psychiatric history and aftercare offered after DSH

NFA patients were no more likely than domiciled patients to have a psychiatric illness but were significantly more likely to have a personality disorder (see Table 3). Both male and female NFA patients were much more likely than those who were domiciled to have received psychiatric treatment within the previous 12 months. NFA patients were also more likely than domiciled patients to have been admitted to inpatient psychiatric care within the year before DSH (11.1% vs. 1.9%,  $\chi^2 = 95.1$ , P < 0.0001).

The aftercare offered to patients following assessment is shown in Table 3. Male and female NFA patients were no more likely than domiciled patients to be offered inpatient psychiatric treatment but were

	Male NFA patients, N = 238		Male domiciled patients, N = 3310			Female NFA patients, N = 57		Female domiciled patients, N = 4763		
Problem	N	(%)	N	(%)	$\chi^2$ -test	N	(%)	N	(%)	$\chi^2$ -test
Relationship with partner	75	(33.5)	1763	(55.5)	$\chi^2 = 40.7, df = 1,$ P < 0.0001	25	(46.3)	2636	(57.2)	$\chi^2 = 2.6, df = 1,$ P = 0.11
(Not known)	(14)		(131)			(3)		(158)		
Relationship with family	66	(29.3)	1026	(32.2)	$\chi^2 = 0.80, df = 1,$ P = 0.37	36	(66.7)	2070	(44.9)	$\chi^2 = 10.2, df = 1,$ P < 0.005
(Not known)	(13)		(124)			(3)		(149)		
Social isolation	56 (13)	(24.9)	590	(18.5)	$\chi^2 = 5.54, df = 1,$	16	(29.6)	857	(18.6)	$\chi^2 = 4.30, df = 1,$
Financial problem	(13) 94 (12)	(41.8)	905	(28.4)	$\chi^2 = 18.1, df = 1,$	21	(38.9)	940	(20.4)	$\chi^2 = 11.2, df = 1,$
(Not known)	(13)	(1.5.1)	(125)	(0.4)	P < 0.0001	(3)	(42.0)	(150)		P < 0.005
(Not known)	37 (13)	(16.4)	258 (125)	(8.1)	$\chi^2 = 18.5, dt = 1, P < 0.0001$	/ (3)	(13.0)	156 (150)	(3.4)	$\chi^2 = 14.5, \text{ df} = 1,$ P < 0.0001
Housing problem	185 (13)	(82.2)	540 (125)	(17.0)	$\chi^2 = 534.8, df = 1,$ P < 0.0001	40 (3)	(74.1)	688 (150)	(14.9)	$\chi^2 = 141.9, df = 1,$ P < 0.0001
Drug problem (Not known)	82 (13)	(36.4)	332 (125)	(10.4)	$\chi^2 = 133.4, df = 1, P < 0.0001$	24 (3)	(44.4)	(150) 194 (151)	(4.2)	$\chi^2 = 194.0, df = 1, P < 0.0001$
Alcohol problem (Not known)	128 (13)	(56.9)	938 (128)	(29.5)	$\chi^2 = 73.4, df = 1,$ P < 0.0001	26 (3)	(48.1)	824 (150)	(17.9)	$\chi^2 = 32.9, df = 1, P < 0.0001$

Table 2 Comparison of NFA and domiciled male and female DSH patients on problems contributing to the DSH episodes. (Findings relate to first assessed DSH episode at which NFA patients were NFA and first assessed episode for domiciled patients)

less likely to be offered an outpatient appointment. Both male and female NFA patients were somewhat more likely than domiciled patients to have taken their own discharge from the general hospital following presentation for DSH.

#### Past DSH and repetition of DSH within 12 months

Both male and female NFA patients were significantly more likely than domiciled patients were to have a past history of DSH, with approximately four out of five NFA patients having such a history (see Table 3). Both male and female NFA patients were also more likely to re-present to the general hospital with a further episode of DSH within 12 months of their first presentation than were domiciled patients.

# Mortality study

The cohort of NFA patients and the remainder of the patients who presented between the beginning of 1978 and the end of 1997 were followed up until the end of 2000 with regard to mortality or survival. There were 12,825 patients who presented during the study period and were traced, were known to be NFA or domiciled, and for whom follow-up information was available. These 10,825 patients were included in the survival analysis. Tracing was possible for fewer of the NFA patients (79.1%, N = 277/350) than of the domiciled (88.0%, N = 10,548/11,980;patients  $\chi^2 = 25.1$ , P < 0.0001). However, both groups for whom tracing was not possible represented relatively small proportions of the overall cohorts.

NFA patients were more than twice as likely (Hazard Ratio = 2.20, P = 0.003) as their domiciled counterparts to die by suicide (5.4% vs. 2.6%) but when the genders were considered separately the Hazard Ratios were not significantly different due to the small numbers involved (see Table 4). With regard to deaths from all causes, NFA patients were nearly twice as likely (Hazard Ratio = 1.79, P < 0.001) to die than domiciled patients. When the genders were considered separately, the Hazard Ratio for males (1.49) remained significant (P = 0.01) while that for females did not.

The verdicts for those who died by probable suicide in the NFA group were: suicide (five cases: three hanging/suffocation, two poisoning), undetermined causes (three cases: all poisonings) and accidental poisoning (seven cases). Among the patients who died by probable suicide, verdicts of undetermined death or accidental poisoning were more common among the NFA than the domiciled group (10/15, 66.7% vs. 108/279, 38.7%;  $\chi^2 = 4.63$ , P < 0.05).

Of the NFA patients who died from causes other than probable suicide, 8/33 (24.2%) deaths were from drug or alcohol-related causes, for example morphine dependence and alcoholic cirrhosis of the liver.

### Discussion

In this study of DSH patients presenting to a general hospital in the UK we have found that 3.6% of patients were of NFA and 10.1% of presentations were made by NFA patients. The majority of patients who

Table 3 Comparison of NFA and domiciled male and female DSH patients on clinical variables and repetition of DSH within 12 months of index episode (Findings relate to first assessed DSH episode at which NFA patients were NFA and first assessed episode for domiciled patients)

	Male NFA patients, N = 238		Male domicile patients, N = 331	d , 0		Female NFA patient N = 57	s, 7	Female domiciled patients, N = 4763		
Variable	Ν	(%)	Ν	(%)	$\chi^2$ -test	N	(%)	N	(%)	$\chi^2$ -test
Psychiatric illness (Not known)	49 (60)	(27.5)	718 (601)	(26.5)	$\chi^2 = 0.09, df = 1,$ P = 0.77	11 (18)	(28.2)	1216 (783)	(30.6)	$\chi^2 = 0.1, df = 1,$ P = 0.75
Personality disorder (Not known)	81 (102)	(59.6)	329 (992)	(14.2)	$\chi^2 = 190.0, dt = 1,$ P < 0.0001	19 (29)	(67.9)	333 (1245)	(9.5)	$\chi^2 = 105.9, dt = 1,$ P < 0.0001
Any psychiatric care within last year (Not known)	138	(67.0)	988	(32.3)	$\chi^2 = 102.8, df = 1, P < 0.0001$	31 (10)	(66.0)	1611	(35.9)	$\chi^2 = 18.1, df = 1,$ P < 0.0001
(Not known) (Not known) Aftercare offered after DSH	166 (29)	(79.4)	1072 (276)	(35.3)	$\chi^2 = 161.1, df = 1,$ P < 0.0001	41 (8)	(83.7)	1804 (330)	(40.7)	$\chi^2 = 37.0, df = 1, P < 0.0001$
Inpatient Outpatient Other care GP only Took own discharge (Not known)	26 112 34 34 13 (19)	(11.9) (51.1) (15.5) (15.5) (5.9)	329 2113 220 444 57 (147)	(10.4) (66.8) (7.0) (14.0) (1.8)	$\chi^2 = 45.3, df = 4,$ P < 0.0001	5 26 13 8 3 (2)	(9.1) (47.3) (23.6) (14.5) (5.5)	345 3378 246 562 65 (167)	(7.5) (73.5) (5.4) (12.2) (1.4)	$\chi^2 = 44.2, df = 4,$ P < 0.0001
Repetition of DSH within 12 months (Not known)	74 (19)	(33.8)	369 (242)	(12.0)	$\chi^2 = 83.0, df = 1, P < 0.0001$	21 (6)	(41.2)	548 (359)	(12.4)	$\chi^2 = 37.4, df = 1, P < 0.0001$

presented (80.9%) underwent detailed psychosocial assessment. The proportion of NFA patients undergoing psychosocial assessment (78.9%) did not differ significantly from that of the domiciled group (81.0%).

Patients were defined as being of NFA if they were of NFA on at least one presentation during the study period, whereas patients were defined as domiciled if they were not known to be of NFA at any presentation. It is therefore possible that the domiciled group contained some undetected NFA patients. However, the effect of this methodological problem would be to diminish the differences between the NFA and domiciled groups. For NFA patients we studied the first assessed episode at which they were of NFA, unlike the domiciled group where we studied their first assessed episode. This methodology potentially introduces a bias towards the NFA group tending to be older and also more likely to have a history of previous episodes of DSH than the domiciled group. Very few patients were omitted from the study because of information not being recorded on whether or not they had an address (N = 18). Several of the characteristics of our NFA DSH patients are clearly inter-related, for example age, gender and history of DSH. In our statistical analysis we elected not to carry out a multivariate analysis as data were only available for a small number of key variables. We have, however, reported on males and females separately. The important variables, psychiatric and personality disorder were almost certainly under-reported, as psychosocial assessment following DSH uses a problem-orientated approach rather than a medical model.

The NFA patients were predominantly male (80.7%). Most female NFA patients were aged 16–24 years (56.1%), whereas male NFA patients tended to be older, with 70.2% aged between 25 years and 54 years, suggesting that these two groups are somewhat different populations. Similar findings were

Table 4 Hazard ratios for suicide and all deaths amongst male and female DSH patients by NFA status in the 1978–1997 cohort

	Males							Females						Both sexes					
	Total	Deaths	%	Hazard Ratio	95% Cl	Р	Total	Deaths	%	Hazard Ratio	95% Cl	Р	Total	Deaths	%	Hazard Ratio	95% CI	Р	
Suicide	s																		
NFA	230	13	5.7	1.46	0.8–2.7	0.19	47	2	4.3	2.56	0.6–10.4	0.19	277	15	5.4	2.20	1.3–3.7	0.003	
Other	4256	177	4.2	1			6292	101	1.6	1			10548	278	2.6	1			
All dea	ths																		
NFA	230	42	18.3	1.49	1.1-2.0	0.01	47	6	12.8	1.38	0.6-3.1	0.44	277	48	17.3	1.79	1.3-2.4	< 0.001	
Other	4256	578	13.6	1			6292	550	8.7	1			10548	1128	10.7	1			

reported from an earlier UK study of homeless DSH patients [6]. Female NFA who present with DSH appear to be considerably younger than those female homeless persons resident in hostels for the homeless, where the mean age in one UK study was 52 years [15]. Over the past few decades the average age of homeless people in the UK has fallen and the numbers of homeless women have increased [35].

NFA patients differed from their domiciled counterparts in being more likely to be single, unemployed, to have a criminal record and to have been recently violent towards others and also a recent victim of violence (this lattermost finding was particularly marked for female NFA patients). NFA patients were more likely to be socially isolated and to have housing, legal and financial difficulties. They were also more likely to have problems with alcohol and drugs. Drug problems were particularly common among female NFA patients. The association between substance abuse and suicide attempts in homeless persons has been previously found in studies in the USA [13, 19, 36]. In one American study drug and alcohol abuse increased the risk of suicidal ideation and suicide attempts in older but not younger homeless persons [37]. A study of roofless persons in Edinburgh reported not only high rates of substance abuse but also imprisonment and of being a victim of crime [38].

Self-injury as a method of DSH was more likely in NFA than in domiciled patients. Male NFA patients were more likely than male domiciled patients to consume alcohol before the act of DSH and NFA patients of both genders were more likely to consume alcohol as part of the act of DSH. The use of alcohol as part of the act of DSH is particularly worrying, as it increases the medical seriousness and potential lethality of acts of self-poisoning. Repetition of DSH was a common feature of the NFA patients. Thus, they were much more likely than domiciled patients to have a past history of DSH and to present with a further episode of DSH within the next 12 months.

NFA patients had almost double the mortality of domiciled patients during the study period. NFA patients had a higher mortality both from probable suicide as well as from all causes. However, among the probable suicide group, the proportion of undetermined and accidental poisoning verdicts was greater in the NFA than the domiciled group. This raises the possibility that the difference in the rate of probable suicide between the two groups may have been overestimated. A significant proportion of the deaths from other causes were drug and alcohol related.

Based on the findings of this study, NFA DSH patients represent an important sub-group of the DSH patient population. They are a particularly morbid group, with high rates of previous psychiatric treatment and current drug and alcohol abuse. Although psychiatric disorder was no more prevalent in the NFA than in the domiciled group, we were aware that mental illness was under-reported. Personality disorder was more common in the NFA group. Studies of homeless persons in the UK have reported high rates of schizophrenia and other forms of severe mental illness [14–16, 35]. Personality disorder has rarely been reported upon. We found that NFA DSH patients also have high rates of violence and of being a victim of violence, as well as high rates of suicide and an increased mortality from all causes. These findings confirm the need to target homeless people with mental health problems as part of national suicide prevention strategies.

There are obvious difficulties in providing effective aftercare for NFA patients who self-harm, particularly given the difficulty in keeping in touch with people who have no fixed address and move between different catchment areas. Continuity of care between general medical and psychiatric services is necessary to ensure NFA DSH patients are offered appropriate psychiatric aftercare. However, the complex and special needs of homeless mentally ill persons may not be adequately met by conventional psychiatric services. Treatments need to be focused on drug and alcohol problems, as well as other, often severe, psychiatric morbidity and on social issues such as housing, financial and legal problems. Attention to physical health problems is also important and patients may need to be encouraged to register with a local general practitioner, as a significant proportion are not registered [39]. Key factors in the provision of effective services for this group are successful engagement of homeless persons, the availability of a variety of housing options, the need for assertive multidisciplinary input, and treatment of co-morbid substance dependency [1, 21]. In the last decade several specialist mental health teams for the homeless have been set up in the UK [35, 40]. Consideration should be given to the further development of such specialist services to meet the complex needs of homeless persons with mental health problems, including those who self-harm.

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