

# Manuscript Details

**Manuscript number** JAD\_2019\_3399\_R1

**Title** Comparing short-term risk of repeat self-harm after psychosocial assessment of patients who self-harm by psychiatrists or psychiatric nurses in a general hospital: cohort study

**Article type** Research Paper

## Abstract

**Background** There is mixed evidence for whether psychosocial assessment following hospital presentation for self-harm reduces self-harm repetition. A possible reason is the differences in professional background of assessors (primarily psychiatrists and psychiatric nurses) due to variability in training and therapist style. **Methods** Using data from the Oxford Monitoring System for Self-harm, we analysed data on patients making their first emergency department (ED) presentation for self-harm between 2000 and 2014, followed-up until 2015. Using logistic regression, we estimated the probability of repeat self-harm within 12 months, comparing: i) patients receiving psychosocial assessment versus none, adjusting for age, gender, self-harm method, past self-harm presentation, and medical admission; and ii) patients assessed by a psychiatric nurse versus those assessed by a psychiatrist, adjusting for age, self-harm method, time and year of presentation. **Results** The 12,652 patients who had an index ED presentation for self-harm during the study period accounted for 24,450 presentations, in 17,303 (71%) of which a psychosocial assessment was conducted; in 9,318 (54%) by a psychiatric nurse and in 7,692 (45%) by a psychiatrist. We found a reduced probability of repeat self-harm presentation among patients receiving psychosocial assessment versus none (adjusted odds ratio [AOR]=0.70; 95% CI=0.65-0.75;  $p<0.001$ ), but no differences between patients assessed by a psychiatric nurse or a psychiatrist (AOR=1.05; 95% CI=0.98-1.13;  $p=0.129$ ). **Limitations** Findings from a single hospital may not be generalizable to other settings. **Conclusions** Short-term risk of repeat self-harm after psychosocial assessment for self-harm may not differ by the assessor's professional background.

**Keywords** self-harm; psychosocial assessment; emergency department; psychiatrist; psychiatric nurse

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**Suggested reviewers** Ian Colman, Paul Moran, Steven Bell, Gerard Leavey

## Submission Files Included in this PDF

### File Name [File Type]

Cover letter Comparing risk of repeat self harm 2020 03 03.docx [Cover Letter]

Response to JAD reviewers 2020 03 03.docx [Response to Reviewers]

Comparing psychiatrists v nurses Highlights.docx [Highlights]

Comparing psychiatrists v nurses abstract.docx [Abstract]

Comparing psychiatrists v nurses title page.docx [Title Page (with Author Details)]

Comparing risk of repeat self-harm 2020 03 03 Track Changes resubmission.docx [Manuscript File]

Table 1 Dr v nurse 2019 12 18.docx [Table]

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Table 3 Dr v nurse 2020 02 11 TC.docx [Table]

Table 4 Dr v nurse 2020 02 11 TC.docx [Table]

Conflict of interests - comparing psychiatrists v nurses.docx [Conflict of Interest]

Comparing psychiatrists v nurses Author statements.docx [Author Statement]

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## Research Data Related to this Submission

There are no linked research data sets for this submission. The following reason is given:  
The authors do not have permission to share data

3 March 2020

Dear Dr Brambilla and Professor Soares,

**Re Comparing short-term risk of repeat self-harm after psychosocial assessment of patients who self-harm by psychiatrists or psychiatric nurses in a general hospital: cohort study**

Thank you for your helpful comments on our manuscript, which we have addressed in the response to reviewers point-by-point. We have thought carefully about potential explanations for the lack of a protective effect of psychosocial assessment when considering first self-harm episodes, based on our clinical experience of conducting psychosocial assessments in the ED, and have presented this in our Clinical Implications session.

We look forward to hearing your views on our resubmitted manuscript. Thank you very much.

Yours sincerely,



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Journal: Journal of Affective Disorders

**Comments from the editors and reviewers:**

**-Reviewer 1**

- Thank you for this extremely well-written paper based on a tightly designed and robust analysis. The findings are clearly described and the conclusions appropriate. The main limitation (e.g. data from a single unit) is also noted.

**-Reviewer 2**

In this paper, the authors report the results of a study testing whether psychosocial assessment following hospital presentation for self-harm reduces risk of repeat self-harm, and whether there are differences in the effect of assessment as a function of the professional background of the assessor. Data were drawn from the Oxford Monitoring System for Self-harm. The sample consisted of 12,652 patients (24,450 hospital presentations). The authors' exposure period was 2000-2014, with a one-year follow-up period in 2015. Results indicated that patients who received a psychosocial assessment were at reduced risk of repeat self-harm. There were no differences between patients assessed via a psychiatric nurse or a psychiatrist. The protective effect of psychosocial assessment was not observed when considering only patients' first presentation for self-harm.

This study has many strengths, including the use of a large and naturalistic sample, a low level of missing data, and incorporation of several relevant sensitivity analyses. This paper also has some modest limitations. I have several suggestions for how to improve the report.

I suggest that the authors re-phrase the header “Variables in the causal pathway” (p. 8), as their analysis cannot confirm causal associations.

We have changed this to the sub-heading Measures.

The authors’ failure to find a protective effect of psychosocial assessment when considering first self-harm episodes is important and under-discussed within the implications section of the manuscript. Indeed, it suggests that providers may be failing to capitalize on this critical prevention opportunity.

We agree that this is an important point, and we have developed this further in the main findings (briefly) and in the clinical implications section. Thus, in the latter section:

“Our finding that psychosocial assessment was not associated with a reduction in self-harm repetition after first hospital presentation merits further discussion. Firstly, this finding refers to patients’ first presentations to the study hospital during the study period; we cannot rule out prior hospital presentations. Nonetheless, whether or not a patient has prior experience of hospital presentation, sophisticated clinical skills are required to engage a patient who presents to hospital having self-harmed, particularly in the sometimes unwelcoming environment of an ED. Given existing qualitative evidence (Saunders et al, 2012) it is possible that the experience of negative attitudes among ED staff might engender mistrust, and that this might hamper engagement with psychiatric professionals when they attend to assess the patient. There is evidence that training in self-harm has an impact on both knowledge and attitudes towards those who self-harm (Saunders et al, 2012). Greater

investment in providing such training to ED staff, and in providing written information for patients, might address some of these factors and enhance the therapeutic effect of a psychosocial assessment. It is also possible that psychosocial assessment of a patient new to services is less comprehensive than that of someone with previous clinical notes, including records of collateral histories from key informants. The time taken to conduct a full history, covering social situation, the motives and precipitants for self-harm, and a full needs assessment, may detract from establishing a therapeutic relationship with the patient, collaborating on a safety plan, and providing tailored information on support sources. Finally, it is also possible that patients new to services are not comfortable accessing the support sources suggested, and that willingness to take up such support is enhanced following further assessment.”

The authors note several important limitations of their analysis. Another consideration is that they may have failed to observe repeat self-harm events during 2015 that either (a) did not result in hospital presentation or (b) resulted in presentation to other hospitals.

This limitation applies not just to data for 2015 data but to all years of data collection. We have provided more detail on this limitation in that section. Thus:

“Our choice of outcome measure did not take into account presentations to hospitals outside Oxford, information on which was not available to us.”

Table 3: The authors identify ‘receiving psychosocial assessment’ as the reference category; however, I believe that no assessment is the reference. The same issue is present for Table 4.

Thank you for pointing out these errors in Tables 3 and 4 – these have been corrected.

# **Comparing short-term risk of repeat self-harm after psychosocial assessment of patients who self-harm by psychiatrists or psychiatric nurses in a general hospital: cohort study**

## **Highlights**

We tested a novel clinical hypothesis regarding differences in professional training.

This was the first large-scale epidemiological study to test this hypothesis.

Self-harm assessments by a psychiatric nurse or a psychiatrist have similar outcomes.

Assessor's professional background appears not to influence outcomes.

Psychosocial assessment after self-harm is protective when considering all episodes.



# Comparing short-term risk of repeat self-harm after psychosocial assessment of patients who self-harm by psychiatrists or psychiatric nurses in a general hospital: cohort study

## Abstract

### Background

There is mixed evidence for whether psychosocial assessment following hospital presentation for self-harm reduces self-harm repetition. A possible reason is the differences in professional background of assessors (primarily psychiatrists and psychiatric nurses) due to variability in training and therapist style.

### Methods

Using data from the Oxford Monitoring System for Self-harm, we analysed data on patients making their first emergency department (ED) presentation for self-harm between 2000 and 2014, followed-up until 2015. Using logistic regression, we estimated the probability of repeat self-harm within 12 months, comparing: i) patients receiving psychosocial assessment *versus* none, adjusting for age, gender, self-harm method, past self-harm presentation, and medical admission; and ii) patients assessed by a psychiatric nurse *versus* those assessed by a psychiatrist, adjusting for age, self-harm method, time and year of presentation.

### Results

The 12,652 patients who had an index ED presentation for self-harm during the study period accounted for 24,450 presentations, in 17,303 (71%) of which a psychosocial assessment was conducted; in 9,318 (54%) by a psychiatric nurse and in 7,692 (45%) by a psychiatrist. We found a reduced probability of repeat self-harm presentation among patients receiving psychosocial assessment *versus* none (adjusted odds ratio [AOR]=0.70; 95% CI=0.65-0.75;

$p < 0.001$ ), but no differences between patients assessed by a psychiatric nurse or a psychiatrist (AOR=1.05; 95% CI=0.98-1.13;  $p=0.129$ ).

### **Limitations**

Findings from a single hospital may not be generalizable to other settings.

### **Conclusions**

Short-term risk of repeat self-harm after psychosocial assessment for self-harm may not differ by the assessor's professional background.

### **Key words**

self-harm; psychosocial assessment; emergency department; psychiatrist; psychiatric nurse

# **Comparing short-term risk of repeat self-harm after psychosocial assessment of patients who self-harm by psychiatrists or psychiatric nurses in a general hospital: cohort study**

Alexandra Pitman<sup>1,2</sup>, Apostolos Tsiachristas<sup>3</sup>, Deborah Casey<sup>4</sup>, Galit Geulayov<sup>4</sup>, Fiona Brand<sup>4,5</sup>, Elizabeth Bale<sup>4</sup> and Keith Hawton<sup>4,5</sup>

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## **Declaration of interest**

KH is a member of the National Suicide Prevention Strategy Advisory Group for England

None of the other authors have conflicts of interest.

# **Comparing short-term risk of repeat self-harm after psychosocial assessment of patients who self-harm by psychiatrists or psychiatric nurses in a general hospital: cohort study**

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## Background

There are approximately 220,000 presentations annually to British emergency departments (EDs) by people who have self-harmed (Hawton et al., 2007) and these patients have an elevated risk of subsequent suicide (Carroll et al., 2014; Geulayov et al., 2019). Psychosocial assessment by a mental health professional is recommended as routine care following an episode of self-harm in guidelines produced by the Royal College of Psychiatrists and the Royal College of Emergency Medicine (Royal College of Psychiatrists, 2010a; Royal College of Psychiatrists, 2013), and the National Institute for Health and Clinical Excellence (NICE) (National Institute for Health and Care Excellence (NICE), 2004). Such assessments are therefore a high-volume activity for psychiatrists and psychiatric nurses, who are expected to formulate a short-term management plan addressing needs and risks (National Institute for Health and Care Excellence (NICE), 2004). However, there is mixed evidence for a reduced risk of repeat self-harm following psychosocial assessment in Britain (Bergen et al., 2010; Carroll et al., 2016; Kapur N et al., 2008; Kapur et al., 2002; Kapur et al., 2013; Steeg et al., 2018). This suggests a need to understand better what the assessment involves and what its active components might be. Guidance on the content and style of the psychosocial assessment is currently minimal, with NICE guidelines on the short-term management of self-harm explaining only that it should be a “therapeutic process to understand and engage the service user” and not solely a comprehensive assessment of needs and risk (National Institute for Health and Care Excellence (NICE), 2004). Guidelines on the longer-term management list the context of the needs to be assessed, including “the need for psychological intervention, social care and support, occupational rehabilitation, and also drug treatment for any associated conditions” (National Institute for Health and Care Excellence (NICE), 2011).

Studies measuring outcomes after psychosocial assessment have found an association with a reduced risk of repetition in some British hospitals (Kapur et al, 2002) or an effect in some hospitals but not others (Kapur et al, 2013), the latter typically being hospitals in more deprived areas. Local resourcing may influence the quality of statutory aftercare services and funding for community resources (Kapur et al, 2008; Kapur et al, 2013), yet evidence suggests that the apparent protective effects of psychosocial assessment are not mediated through referral and follow up arrangements (Kapur et al, 2013). This suggests that factors intrinsic to the assessor, or the patients assessed, may influence outcomes.

In an audit study across different hospital sites in England a median of 58% of ED presentations for self-harm resulted in psychosocial assessment, ranging from 22% to 88% (Cooper et al., 2013). Reasons for patients not being assessed include self-discharge from the ED or because initial triage did not trigger psychiatric referral. Typically, patients who do not get assessed are young, single men (Mullins et al., 2010); historically a high-risk group for suicide (Department of Health, 2002; Department of Health, 2012). Patients are less likely to be assessed if they are unemployed, their self-harm involves self-cutting, they present out of hours (Kapur et al, 2008), have a past history of self-harm, or are perceived as challenging in the ED (Hickey et al., 2001). This clinical risk profile might explain the greater probability of repetition in those who are not assessed (Kapur et al, 2013) compared with those who are, accounting for an apparent protective effect of psychosocial assessment.

It is possible that differences in the training and shift patterns of psychiatric nurses and psychiatrists give rise to heterogeneity in the content and therapeutic style of the intervention delivered, and therefore in outcomes. Research shows that therapeutic alliance is strongly influenced by therapist factors, such as training, professional background, and competence (Elkin, 1999). Psychiatric nurses may be more skilled than doctors at assessing intoxicated



patients, and psychiatric nurses may show a more compassionate approach to patients with a prior history of self-harm (Royal College of Psychiatrists, 2010b; Saunders et al., 2012). Liaison nurses' training develops their familiarity with local community resources, and reinforces a collaborative, personalised approach (Eales et al., 2014). Propensity to utilise wider community resources is also maximised if employed at a permanent site, rather than on a rotational training scheme. Previous research shows that psychiatrists in British ED settings are more likely than psychiatric nurses to admit patients assessed for self-harm, even after controlling for patient characteristics (Murphy et al., 2011), suggesting reduced familiarity with community resources. Such differences in training are borne out in patients' qualitative accounts of their experiences of psychosocial assessment. These tend criticise psychiatrists as rushed or impersonal in their assessments, while experiencing nurses as more collaborative (Hunter et al., 2013; Taylor et al., 2009). Such perspectives emphasise the value placed on opportunities to ventilate and participate in treatment planning (Taylor et al, 2009), and the hope instilled by assessments conducted in an accepting way (Hunter et al, 2013). Finally, concerns have been expressed about the quality of the out-of-hours service provided by junior psychiatrists due to perceived deficits in training and supervision (Pitman et al., 2008; Royal College of Psychiatrists, 2010b).

The current study compares outcomes following psychosocial assessment by the professional background of the assessor, to investigate the possibility that the training differences described above influence outcomes. Using high-quality data from one UK centre, we aimed to first investigate whether the probability of repeat self-harm is reduced after psychosocial assessment *versus* none (to establish its broad effect), and then whether it is reduced after psychosocial assessment by a psychiatric nurse *versus* that by a psychiatrist. We also aimed to explore whether aftercare planning might explain any associations of professional background with repeat self-harm, predicting that nurses would be more likely than

psychiatrists to refer for community-based aftercare arrangements. A methodologically novel aspect of our approach is that while our analyses included all episodes for each individual in the dataset, aggregating outcomes from each independent event for ease of comparability with other analyses using this approach, our sensitivity analysis includes the outcome following a first presentation only, to investigate the effect of a single psychosocial assessment per patient.

## Methods

### Study dataset

We analysed data for presentations to the John Radcliffe Hospital in Oxford following an episode of self-harm over the period 2000 to 2014, with follow-up data until 2015, from the Oxford Monitoring System for Self-harm dataset (Hawton et al., 2015). We regarded all cases as having entered the cohort at their first (index) presentation within the period 2000-2014, and analysed data on all their presentations over this period. Linked patient identifiers allowed us to identify which patients had previously presented to this hospital from dataset inception (1976) and adjust for this in our analysis.

We excluded patients who died in the ED or during an admission associated with the index presentation. We also excluded patients assessed by the Oxford University Hospitals (OUH) liaison team established in 2013, as these tend to be those admitted to a ward (for example after major trauma) and are all assessed by a senior psychiatrist.

### Data collection

Data from the Oxford Monitoring System for Self-harm dataset are collected prospectively on all individuals who present to the John Radcliffe Hospital in Oxford following self-harm. Self-harm is defined as intentional non-fatal self-poisoning or self-injury, irrespective of type

of motivation or degree of suicidal intent, and also regardless of whether patients are admitted to a hospital bed or receive a psychosocial assessment (Hawton et al., 2003).

For every patient who presents having self-harmed, a standardised data collection form is used to record a wide range of sociodemographic and clinical information for research purposes. These include method of self-harm, time of presentation, any previous self-harm, psychiatric diagnosis, and any aftercare arrangements.

For patients who are assessed, this information is collected by general hospital psychiatric services following completion of assessment records. For those who are not assessed by psychiatric teams this is done by research data collectors using searches of ED electronic records. Individual patients are pseudo-anonymised to protect confidentiality, and all their presentations are treated as distinct episodes.

Data are relatively complete for core sociodemographic and self-harm method characteristics in the dataset as whole, with between 0.0% and 0.1 % missing data. For those variables only collected on patients receiving psychosocial assessment, missing values range from 3.3% (current psychiatric treatment) to 11.4% (any previous outpatient treatment).

## Measures ~~Variables in the causal pathway~~

### *Exposures*

We defined exposure for our first set of models as receipt of a psychosocial assessment at presentation *versus* none, and for our second set of models as psychosocial assessment by a psychiatric nurse *versus* that by a psychiatrist.

## Outcomes

To capture short-term risk of self-harm repetition following psychosocial assessment, our outcome was repeat hospital presentation for self-harm within 12 months to the John Radcliffe Hospital.

## Confounders

We defined two sets of *a priori* confounders based on clinical judgement and the research literature. To compare outcomes following receipt of a psychosocial assessment *versus* none we adjusted our multivariable model for gender (Larkin et al., 2014), age at presentation (Hawton et al., 2012; Murphy et al., 2012), method of self-harm (Bergen et al., 2012; Hawton et al, 2012; Kapur et al, 2008), previous presentation for self-harm (Larkin et al, 2014), and general hospital admission to a ward or ED short-stay bed (Beautrais, 2004). We created a variable capturing previous hospital presentation for self-harm derived from patients' self-reports of past self-harm, and data identifying any previous presentations in Oxford.

To compare outcomes following receipt of a psychosocial assessment by a doctor or a nurse, we adjusted our multivariable model *a priori* for age at presentation (Hawton et al, 2012), method of self-harm (Bergen et al, 2012), hour of presentation, and year of presentation. Including hour of presentation captured the differences between those who present during working hours, and out-of-hours (Kapur et al, 2008). Including year of presentation took into account period effects in service organisations (changes in shift arrangements for doctors and nurses; the introduction of four-hour maximum waiting time in EDs in 2004) and the effect of the 2007/8 recession on increases in cutting as a method (Geulayov et al., 2016), as these may influence risk of repeat self-harm.

To explore whether aftercare might explain any associations observed, we added a categorical aftercare variable to final models, defined as: psychiatric admission, NHS

psychiatric community care (day hospital, crisis team, outpatient), non-NHS community-based services, and discharge to general practitioner (GP) care alone (default data entry category).

### Ethical approval

The Oxford Monitoring System for Self-harm has ethical approval from the Berkshire South Central Research Ethics Committee. It has approval under Section 251 of the NHS Act 2006 to collect non-anonymised patient information without explicit patient consent and complies with the requirements of the Data Protection Act 1998.

### Statistical analyses

We present descriptive statistics for the entire study sample, comparing those who had been assessed at index presentation to those who had not, and those assessed by a psychiatric nurse or psychiatrist at index presentation.

We used logistic regression to estimate the probability of a repeat hospital presentation for self-harm within 12 months after receiving psychosocial assessment *versus* no assessment at presentation, after adjusting for confounders (gender, age at presentation, method of self-harm, previous presentation for self-harm, and general hospital admission), presenting the findings as odds ratios (OR) and 95% confidence intervals (CI).

We then restricted our sample to patients who had received psychosocial assessment from a psychiatrist or a psychiatric nurse (excluding those assessed by a social worker), and used logistic regression to estimate the probability of repeat presentation for self-harm after receiving psychosocial assessment from a psychiatrist *versus* psychiatric nurse, after adjusting for confounders (age at first presentation during this period, method of self-harm, hour of presentation, and year of presentation). We then added aftercare to final models as a putative mediator of any associations observed with professional background of the assessor.

We were unable to use a cluster variable to model the effects of repeated psychosocial assessments by different assessors as this was clinically meaningless, given the different permutations in trajectories of repeat presentations (not assessed, assessed by nurse, assessed by doctor).

All analyses were conducted using Stata IC version 15.1 (StataCorp, etc). We used complete case analysis, and a threshold for statistical significance of  $p=0.05$  throughout.

### Sensitivity analyses

To assess the effect of missing data on estimates we repeated the analyses imputing best-case and worst-case values for missing data on two of the three variables with missing data: general hospital admission, and hour of presentation. For hour of presentation, we imputed midnight as worst case and midday as best case, based on clinical judgement. For the binary variable admission we imputed 0 as best case, and 1 as worst case. For age, the third variable with missing data, we used conditional mean imputation (Barzi et al., 2004) to cross-classify the study population by gender, imputing for individuals with missing data on age the observed mean age within that person's gender.

Whilst our main analysis was adjusted for previous presentation to this or other hospitals prior to 2000, we also repeated our analysis restricted to patients who had never made a previous presentation for self-harm in Oxford since data collection started in 1976, and therefore were more likely to be assessment-naïve.

Finally, we repeated our analyses comparing outcomes after the first presentation in the dataset only, to assess the effect of an individual psychosocial assessment early in a patient's trajectory. This allowed us to compare these findings with those of our main analysis and with other studies assessing outcomes after psychosocial assessment *versus* none, which have assessed the aggregated effect of all presentations over a study period (Kapur et al, 2013).

## Results

### Sample characteristics

Our inclusion criteria defined a group of 12,652 patients making their first ED presentation for self-harm during the period 2000-2014, together accounting for 24,450 presentations (including 164 first repeat presentations in 2015). Over a third of this sample (9,090; 37%) presented only once. The remaining 15,360 made between 1 (3,704; 29%) and 214 repeat presentations (median=3; interquartile range=1-3). A psychosocial assessment was conducted in 17,303 (71%) of the 24,450 presentations. Of these, 9,318 (54%) were assessed by a psychiatric nurse, 7,692 (45%) by a psychiatrist, and 293 (2%) by a social worker. When considering only the first presentation in this dataset, a psychosocial assessment was conducted in 9,777/12,652 (77%), of which 5,485 (56%) were assessed by a psychiatric nurse, 4,159 (43%) by a psychiatrist, and 133 (1%) by a social worker.

The socio-demographic and clinical characteristics of the 12,652 patients at their first presentation for self-harm during the period 2000-2014 are provided in **Table 1**. Those who received a psychosocial assessment were significantly more likely to be female, and older than those who were not assessed. There were no differences by ethnicity, with 6% overall self-identifying as non-white. Patients who had a prior history of self-harm or a history of previous presentation for self-harm were less likely to receive a psychosocial assessment.

The socio-demographic and clinical characteristics of the 9,644 patients assessed by a psychiatric nurse or psychiatrist at their first presentation over this period are provided in **Table 2**. Patients assessed by a psychiatric nurse were significantly more likely to be female, white, single, students, to have alcohol problems, to have self-poisoned, and to have a prior history of self-harm or a history of previous presentation for self-harm. They were also less likely to be under the care of mental health services. No age differences were observed.

### *Aftercare arrangements*

Patients assessed by a psychiatrist were more likely to be admitted for psychiatric inpatient care than those assessed by nurses, and this was the case whether they were existing psychiatric patients or not. Patients assessed by a psychiatric nurse were more likely to be referred for secondary out-patient care, but were just as likely as those assessed by a psychiatrist to be referred for non-NHS community aftercare.

### *Missing data*

For key covariates, we had no missing data for the majority of putative confounders: gender, method of self-harm, year of presentation, or previous presentation for self-harm. There were low levels of missing data for age (<1%), general hospital admission (<1%), and hour of presentation (3.6%).

### *Risk of repeat self-harm after psychosocial assessment versus none*

For all presentations in the dataset, contributing independently, those who received a psychosocial assessment had a substantially reduced probability of repeat self-harm presentation in the next 12 months. This was the case in both unadjusted (OR=0.54; 95% CI=0.51-0.57;  $p<0.001$ ) and adjusted (OR=0.70; 95% CI=0.65-0.75;  $p<0.001$ ) models (**Table 3**).

### *Risk of repeat self-harm after psychosocial assessment by profession of assessor*

For all presentations assessed by a psychiatric nurse or a psychiatrist, there was no difference in repeat self-harm by profession of assessor, whether in unadjusted (OR=1.06; 95% CI=0.99-1.13;  $p=0.081$ ) or adjusted (OR=1.05; 95% CI=0.98-1.13;  $p=0.129$ ) models (**Table 4**). Adding aftercare to the adjusted model (OR=1.06; 95% CI=0.99-1.14;  $p=0.079$ ) provided similar results.



## Sensitivity analyses

When restricting our sample to those who had not presented in Oxford with self-harm since data collection started in 1976 ( $n=11,332$ ), and considering all their subsequent presentations, the protective effect of psychosocial assessment remained apparent ( $AOR=0.73$ ; 95%  $CI=0.68-0.79$ ;  $p<0.001$ ). As in the main analysis, there was no difference in repeat self-harm by profession of assessor ( $AOR=1.07$ ; 95%  $CI=0.99-1.16$ ;  $p=0.096$ ), including when adding aftercare to the adjusted model ( $AOR=1.08$ ; 95%  $CI=0.99-1.17$ ;  $p=0.054$ ).

When analyses were confined to patients' first presentation in 2000-2014 (**Tables 3 and 4**), we found no differences in outcomes between those receiving and not receiving psychosocial assessment, whether in unadjusted ( $OR=0.95$ ; 95%  $CI=0.85-1.07$ ;  $p=0.395$ ) or adjusted models ( $OR=0.96$ ; 95%  $CI=0.85-1.09$ ;  $p=0.516$ ). For patients assessed by a psychiatric nurse or a psychiatrist at their first presentation in this period, there were also no differences in outcomes in unadjusted ( $OR=0.98$ ; 95%  $CI=0.88-1.10$ ;  $p=0.733$ ) or adjusted models ( $OR=1.01$ ; 95%  $CI=0.90-1.13$ ;  $p=0.873$ ). Adding aftercare to the adjusted model provided similar results ( $OR=1.02$ ; 95%  $CI=0.91-1.15$ ;  $p=0.718$ ).

Our main findings, both when considering outcomes after all presentations in the dataset and outcomes after the first presentation, were unchanged by imputing best-case and worst-case values or conditional mean imputation to simulate the biases introduced by missing data.

## Discussion

### Main findings

We found a protective effect of psychosocial assessment on probability of repeat self-harm when taking into account all presentations by individuals in this dataset. However, contrary to our predictions, we found no differences in outcomes whether patients received psychosocial

assessment from a psychiatrist or a psychiatric nurse. We also found no differences between psychiatrists and psychiatric nurses in their use of community resources, although confirmed that psychiatrists were more likely to arrange psychiatric inpatient admission, and that nurses are more likely to refer for NHS secondary outpatient care. Whilst it is possible that nurses have greater experience in developing collaborative care plans and utilising appropriate community resources, this was not manifested in a reduced probability of repeat self-harm presentation among patients they assessed. We therefore conclude that even when taking into account potential confounders, the background and training of the assessor does not differentially influence the therapeutic effect of the psychosocial assessment.

The protective effect we identified of psychosocial assessment *per se* was not apparent in our sensitivity analysis where we only considered outcomes following the index presentation for self-harm during this period (rather than aggregating the independent effects of all presentations). This is a novel analytic approach, not previously investigated. A first psychosocial assessment represents a critical first opportunity for psychiatric professionals to engage patients who self-harm. It seems that a protective effect is not observed for patients who have generally not had previous ED contact for self-harm. This is concerning as it suggests that the providers may be failing to capitalise on this critical prevention opportunity. It is also possible that the benefits of psychosocial assessment are cumulative through repeated assessments, regardless of whether performed by a psychiatrist or a psychiatric nurse, or that they have a delayed effect.

### Results in the context of other studies

To our knowledge this is the only large-scale epidemiological study that has compared outcomes after psychosocial assessment for self-harm by the professional background of assessor. Two early British studies comparing mental health professionals in their use of

psychosocial assessment adopted a case-note review approach. One compared psychosocial assessments of patients who had attempted suicide and been admitted to a medical ward, with each patient assessed separately by a social worker and a psychiatrist. A research psychiatrist judged their assessments and care plans to be comparable in quality, although social workers were felt to be more cautious (Newson-Smith et al., 1979). The second study compared the quality of eight psychosocial assessments conducted by psychiatrists for patients who had presented following self-poisoning to eight conducted by psychiatric nurses. Judges' blinded ratings of the quality of the assessments and aftercare plans indicated no group differences (Catalan et al., 1980). At that time the majority of psychosocial assessments following self-harm were conducted by psychiatrists, and the findings prompted a shift towards assessments being shared between psychiatrists and psychiatric nurses. A previous comparison of the predictive value of risk assessments for self-harm conducted by psychiatrists and psychiatric nurses in ED settings found no differences (Murphy et al, 2011). As in the current study, psychiatrists were more likely to admit such patients to in-patient units, even after controlling for patient characteristics (Murphy et al, 2011), suggesting reduced familiarity with community resources.

The protective effect we identified of psychosocial assessment *per se* is in keeping with the findings of other similar studies using British data from single hospital sites (Kapur et al, 2002) and multiple hospital sites (Bergen et al, 2010), in which outcomes after all presentations in the dataset were included in the analysis. Previous work had found psychosocial assessment to reduce the probability of repeat self-harm presentation only at hospitals in less deprived areas (Kapur et al, 2013), and the present study was conducted in an area of relatively low deprivation.. It is of note that in the multicentre study, the unadjusted analyses showed no effect of psychosocial assessment on repeat self-harm in any of the centres (Kapur et al, 2013), whereas benefits of psychosocial assessment were apparent in

two out of three sites only after adjusting for gender, age, ethnicity, self-harm method, drugs used in overdose, previous self-harm, previous psychiatric treatment, and current psychiatric treatment, using multiple imputation to address the greater proportion of missing data than in the Oxford dataset. Our own episode-level analysis, adjusted for fewer covariates, found psychosocial assessment to reduce risk of self-harm in both unadjusted and adjusted analyses.

### Strengths and limitations

We used a large, naturalistic sample of all patients presenting to a major teaching hospital over a 14 year period, and assessed short-term risk of repeat presentation. Our dataset had a high level of complete data for a detailed set of clinically relevant variables, with 4% or fewer missing values for covariates used in our models. Our research team included those with extensive experience in ED psychosocial assessment, and we considered *a priori* selection of potential confounders carefully. Use of data on Oxford hospital presentations for self-harm minimised the potential for confounding by indication because rota patterns over the study period meant that specialist liaison nurses primarily conducted the assessments in working hours, with some done by psychiatrists, but all out-of-hours assessments conducted by psychiatrists. This reduced the chances that patients judged to be highest-risk at ED triage would be referred to doctors rather than nurses. Our use of best-case and worst-case scenarios to model the biases introduced by missing data suggested that such biases were minimal. By comparing our main analysis considering all presentations to our sensitivity analysis considering the first presentation only, we provided a valuable methodological perspective on the association between psychosocial assessment and self-harm outcomes. We acknowledge that findings from one hospital, in a relatively affluent county, may not be generalizable to other settings. Our variable describing past self-harm presentations may have under-recorded presentations to other hospitals where these were subject to patients' recall bias. [Our choice](#)

of outcome measure did not take into account presentations to hospitals outside Oxford, information on which was not available to us.

### **Clinical, policy and research implications**

Our findings provide no basis on which to change the current clinical practice of either psychiatric nurses ~~and-or~~ psychiatrists conducting psychosocial assessments following self-harm. Our finding that psychosocial assessment was not associated with a reduction in self-harm repetition after first hospital presentation for self-harm merits further discussion. Firstly, this finding refers to patients' first presentations to the study hospital during the study period; we cannot rule out prior hospital presentations. Nonetheless, whether or not a patient has prior experience of hospital presentation, sophisticated clinical skills are required to engage a patient who presents to hospital having self-harmed, particularly in the sometimes unwelcoming environment of an ED. Given existing qualitative evidence (Saunders et al, 2012) it is possible that the experience of negative attitudes among ED staff might engender mistrust, and that this might hamper engagement with psychiatric professionals when they attend to assess the patient. ~~in the context of~~ There is evidence that training in self-harm has an impact on both knowledge and attitudes towards those who self-harm (Saunders et al, 2012). Greater investment in providing such training to ED staff, and in providing written information for patients, might address some of these factors and enhance the therapeutic effect of a psychosocial assessment. It is also possible that psychosocial assessment of a patient new to services is less comprehensive than that of someone with previous clinical notes, including records of collateral histories from key informants. The time taken to conduct a full history, covering social situation, the motives and precipitants for self-harm, and a full needs assessment, may detract from establishing a therapeutic relationship with the patient, collaborating on a safety plan, and providing tailored information on support sources. Finally, it is also possible that patients new to services are not comfortable accessing the

support sources suggested, and that willingness to take up such support is enhanced following further assessment.

~~Nevertheless, they~~ These findings highlight how little we know about the actual practice of psychosocial assessment in ED settings; an intervention incorporating not just information-gathering, processing and care-planning, but also influenced by communication style, approach to collaboration, and aftercare resourcing. Detailed studies of assessments as recorded in electronic health records would provide one means of assessing the content of an assessment and care plan. Analysis of audio/video recordings of psychosocial assessments would assess the quality of the interaction, particularly where complemented by patients' views on the interaction. For a high-volume activity we know little about which aspects of psychosocial assessment are particularly therapeutic and which might reduce risk of future self-harm. Once we clarify this, we will be in a position to improve training and improve the experience of psychosocial assessment for patients. This will also meet the perceived need amongst psychiatrists for better training in how to undertake psychosocial assessments of risk and needs with people who have self-harmed (Royal College of Psychiatrists, 2010b). ~~in the context of evidence that training in self-harm has an impact on attitudes towards those who self-harm (Saunders et al, 2012).~~ Pending further evidence from trials or observational studies, clinicians conducting psychosocial assessments should consider new guidance produced by the National Collaborating Centre for Mental Health, emphasising the therapeutic value of collaborative needs-based care planning with patients who self-harm, and the importance of responding to the emotional content of what the patient describes (Health Education England et al, 2018).

## Conclusion

The professional background of the mental health professional conducting a psychosocial assessment does not appear to influence risk of repeat self-harm after an ED presentation for self-harm. Although our findings provide no basis on which to change the current clinical practice of psychiatric nurses or psychiatrists in EDs conducting psychosocial assessments following self-harm, they do identify a need to explore further the content and therapeutic value of assessments as conducted by people with differing professional backgrounds, and their longer-term impact. Current efforts to train health professionals to meet specific competencies in responding to self-harm are likely to give rise to improvements in clinical care, but require evaluation to identify the active ingredients of a psychosocial assessment in reducing risk of repeat self-harm.

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**Table 1: Characteristics of patients by whether or not they received psychosocial assessment after self-harm by any mental health professional (n=12,652)**

	no psychosocial assessment (n= 2,875)	received psychosocial assessment (n=9,777)	Total presenting (n=12,652)	p-value *
<b>Socio-demographic characteristics</b>				
<b>gender †</b>				
male n (%)	1322 (26)	3796 (74)	5,118	<0.001
female n (%)	1553 (21)	5981 (79)	7,534	
missing n (%)	0 (0)	0 (0)	0	
<b>age at index presentation (years) †</b>	mean (SD)	31.6 (15.4)	12,652	<0.001
<b>self-defined ethnicity <sup>a, b</sup></b>				
white n (%)	701 (9)	7,438 (91)	8,139	0.219
non-white n (%)	79 (10)	719 (90)	798	
missing n (%)	2,095 (56)	1,620 (44)	3,715	
<b>employment status <sup>a</sup></b>				
employed n (%)	349 (8)	3,855 (92)	4,204	<0.001
unemployed / retired / sick leave / carer / other n (%)	346 (14)	2,090 (86)	2,436	
missing n (%)	1,764 (82)	397 (18)	2,161	
<b>Clinical characteristics</b>				
<b>past history of self-harm (presenting &amp; non-presenting)</b>				
No n (%)	183 (4)	4,245 (96)	4,428	<0.001
Yes n (%)	563 (11)	4,771 (90)	5,334	
missing n (%)	2,129 (74)	761 (26)	2,890	
<b>previous hospital presentation to Oxford for self-harm (1976-1999) †</b>				
No n (%)	2,541 (22)	8,791 (78)	11,332	0.018
Yes n (%)	334 (25)	986 (75)	1,320	
<b>currently under the care of mental health services <sup>a</sup></b>				
No n (%)	427 (5)	7,663 (95)	8,090	<0.001
psychiatric inpatient n (%)	232 (89)	30 (11)	262	
psychiatric out-patient/day patient n (%)	273 (13)	1,799 (87)	2,072	
missing n (%)	1,943 (87)	285 (13)	2,228	
<b>Characteristics relating to self-harm episode</b>				
<b>method of self-harm at index presentation †</b>				
self-poisoning only n (%)	1,907 (19)	8,002 (81)	9,909	<0.001
self-cutting n (%)	698 (50)	708 (50)	1,406	
other self-injury n (%)	138 (28)	361 (72)	499	
mixed methods of self-harm n (%)	132 (16)	706 (84)	838	
missing n (%)	0 (0)	0 (0)	0	
<b>admission to general hospital medical ward †</b>				
no n (%)	1,228 (61)	771 (39)	1,999	<0.001
admitted to medical assessment unit n (%)	1,636 (16)	8,789 (84)	10,425	
admitted to other medical ward n (%)	11 (5)	215 (95)	226	
missing n (%)	0 (0)	2 (100)	2	

† = pre-specified confounding variable used in adjusted model comparing assessed *versus* not assessed

\* p-values for group comparisons excluding missing values, using a 2-sided significance threshold of p=0.05

<sup>a</sup> data only collected for those who receive an assessment

<sup>b</sup> ethnicity data were missing for all patients who presented in 2000 (n=1,567)

**Table 2: Characteristics of patients receiving psychosocial assessment by a psychiatrist or psychiatric nurse after self-harm presentation (n=9,644)**

	assessed by psychiatric nurse (n=5,485)	assessed by psychiatrist (n=4,159)	Total assessed by psychiatric nurse or psychiatrist (n=9,644)	p-value *
<b>Socio-demographic characteristics</b>				
<b>gender</b>				
male n (%)	1,998 (53)	1,760 (46)	3,758	<b>&lt;0.001</b>
female n (%)	3,487 (59)	2,399 (41)	5,886	
missing n (%)	0 (0)	0 (0)	0 (0)	
age at presentation (years) mean (SD)	30.3 (15.1)	33.3 (15.5)		0.080
<b>self-defined ethnicity <sup>a</sup></b>				
white n (%)	4,203 (58)	3,121 (42)	7,324	<b>0.036</b>
non-white n (%)	379 (53)	332 (47)	711	
missing n (%)	903 (56)	706 (44)	1,609	
<b>employment status</b>				
employed n (%)	2,156 (56)	1,658 (43)	3,814	0.075
unemployed / retired / sick leave / carer / other n (%)	3,179 (58)	2,266 (42)	5,445	
missing n (%)	150 (39)	235 (61)	385	
<b>Clinical characteristics</b>				
<b>past history of self-harm (presenting &amp; non-presenting)</b>				
No n (%)	2,505 (60)	1,683 (40)	4,188	<b>0.011</b>
Yes n (%)	2,693 (57)	2,020 (43)	4,713	
missing n (%)	287 (39)	456 (61)	743	
<b>previous hospital presentation for self-harm (1976-1999)</b>				
No n (%)	4,891 (56)	3,773 (44)	8,664	<b>0.013</b>
Yes n (%)	594 (61)	386 (39)	980	
missing n (%)	0 (0)	0 (0)	0	
<b>Characteristics relating to self-harm episode</b>				
<b>method of self-harm at index presentation <sup>†</sup></b>				
self-poisoning only n (%)	4,691 (59)	3,196 (41)	7,887	<b>&lt;0.001</b>
self-cutting n (%)	288 (41)	417 (59)	705	
other self-injury n (%)	126 (35)	231 (65)	357	
mixed methods of self-harm n (%)	380 (55)	315 (45)	695	
missing n (%)	0 (0)	0 (0)		
<b>admission to general hospital ward</b>				
no n (%)	240 (31)	523 (69)	763	<b>&lt;0.001</b>
admitted to medical assessment unit n (%)	5,095 (59)	3,581 (41)	8,676	
admitted to other general ward n (%)	150 (74)	53 (26)	203	
missing n (%)	0 (0)	2 (100)	2	
<b>hour of index presentation <sup>†b</sup></b>				<b>&lt;0.001</b>
working hours (9am to 5pm) n (%)	3,964 (61)	2,577 (39)	6,541	
out of hours (5pm to 9am) n (%)	1,325 (49)	1,400 (51)	2,725	
missing n (%)	196 (52)	182 (48)	378	
<b>year of index presentation <sup>†b</sup></b>				<b>&lt;0.001</b>
2000 to 2007 n (%)	3,693 (64)	2,059 (36)	5,752	
2008 to 2014 n (%)	1,792 (46)	2,100 (54)	3,892	
missing n (%)	0 (0)	0 (0)	0	

aftercare plans				
psychiatric admission n (%)	245 (36)	434 (64)	679	<b>&lt;0.001</b>
NHS psychiatric outpatient appointment n (%)	2,831 (64)	1,613 (36)	4,444	
non-NHS community aftercare n (%)	1,521 (49)	1,604 (51)	3,125	
discharge to GP (default) n (%)	888 (63)	508 (36)	1,396	

† = pre-specified confounding variable used in adjusted model of assessed by psychiatrist *versus* assessed by psychiatric nurse

\* p-values for group comparisons excluding missing values, using a 2-sided significance threshold of  $p=0.05$

<sup>a</sup> ethnicity data were missing for all patients who presented in 2000

<sup>b</sup> hour/year of presentation used as continuous measures in models, but presented here as categorical measures for descriptive purposes



**Table 3: Association between receiving psychosocial assessment (~~reference category~~) *versus* none (reference category) and probability of repeat self-harm presentation within 12 months**

Exposure	Psychosocial assessment <i>versus</i> none							
Level of analysis	Total patients n (%)	Total episodes n (%)	Episodes not assessed n (%)	Episodes assessed n (%)	Unadjusted odds ratio (95% CI)	<i>p</i> value*	Adjusted odds ratio <sup>a</sup> (95% CI)	<i>p</i> value*
All presentations by each individual	12,652	24,450	7,147 (29)	17,303 (71)	0.54 (0.51-0.57)	<0.001	0.70 (0.65-0.75)	<0.001
<b>Sensitivity analysis</b>								
Index presentation only	12,652	12,652	2,875 (23)	9,777 (77)	0.95 (0.85-1.07)	0.395	0.96 (0.85-1.09)	0.516

\* *p*-values for group comparisons excluding missing values, using a 2-sided significance threshold of  $p=0.05$

**Table 4: Association between psychosocial assessment by a psychiatric nurse (~~reference category~~) versus by a psychiatrist (reference category) and probability of repeat self-harm presentation within 12 months**

Exposure	Psychosocial assessment by psychiatric nurse <i>versus</i> psychiatrist							
Level of analysis	Total patients assessed by doctor or nurse n (%)	Total episodes assessed n (%)	Episodes assessed by doctor n (%)	Episodes assessed by nurse n (%)	Unadjusted odds ratio (95% CI)	p value*	Adjusted odds ratio <sup>b</sup> (95% CI)	p value*
Index and all subsequent presentations assessed by doctor or nurse	9,644	17,010	7,692 (45)	9,318 (55)	1.06 (0.99-1.13)	0.081	1.05 (0.98-1.13)	0.129
adding aftercare to above model	9,644	17,010	7,692 (45)	9,318 (55)	/	/	1.06 (0.99-1.14)	0.079
<b>Sensitivity analysis</b>								
Index assessed presentation only	9,644	9,644	5,485 (57)	4,149 (43)	0.98 (0.88-1.10)	0.733	1.01 (0.90-1.13)	0.873
adding aftercare to above model	9,644	17,010	7,692 (45)	9,318 (55)	/	/	1.02 (0.91-1.15)	0.718

\* p-values for group comparisons excluding missing values, using a 2-sided significance threshold of  $p=0.05$

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**Declaration of interest**

KH is a member of the National Suicide Prevention Strategy Advisory Group for England

None of the other authors have conflicts of interest.

# **Comparing short-term risk of repeat self-harm after psychosocial assessment of patients who self-harm by psychiatrists or psychiatric nurses in a general hospital: cohort study**

## **Author statements**

## **Contributions**

AP developed the hypothesis and designed the protocol with KH, GG, DC, FB, and AT. EB and FB collected and processed data. DC cleaned and coded data. AP developed the statistical analysis plan with KH, GG, DC, FB, and AT. AP conducted the statistical analysis with input from AT, KH, GG, and DC. AP managed the literature searches, with input from KH, and wrote the first draft of the manuscript. All authors contributed to and have approved the final manuscript.

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