Self-harm among children and adolescents by ethnic group: An observational cohort study of hospital presentations, characteristics, and outcomes from the Multicentre Study of Self-Harm in England

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Abstract

Background

Studies report an increasing incidence of self-harm among children and adolescents, but the extent to which this is seen in different ethnic groups is unclear. We investigated rates of emergency department presentations for self-harm in children and adolescents by ethnicity, and examined their demographic, clinical characteristics, and outcomes.

Methods

Data on hospital emergency department presentations for self-harm from the Multicentre Study of Self-harm in England on children and adolescents aged 10-19 years, from 2000-2016 were used. Mortality follow-up was available through linkage with Office for National Statistics (ONS) mortality records. Rates of self-harm over time, characteristics, and self-harm methods were investigated by ethnic group. Risk of self-harm repetition and mortality following an index (first recorded) presentation for self-harm was compared by ethnic group using Kaplan-Meier curves and Cox proportional hazards models.

Findings

There were 10,211 white, 344 Black, 619 South Asian and 732 Other non-white children and adolescents who presented for self-harm. Rates were highest among white groups but increased over time in all ethnicities. Mean annual rates per 100,000 population were 574 for white, 225 for Black, 260 for South Asian, and 344 for Other non-white groups. Increases over time appeared slightly greater among Black (incidence rate ratio 1.07, 95% confidence interval 1.03-1.11), South Asian (1.05, 1.01-1.09), and Other non-white groups (1.11, 1.06-1.16) compared to white groups (1.02, 1.00-1.03). Those from an ethnic minority background were more likely to live in areas of higher deprivation and were less likely to receive a specialist psychosocial assessment. They were also less likely to repeat self-harm, however there were no differences in suicide mortality by ethnic group, although numbers were small.

Interpretation

Ethnic minority children and adolescents accounted for an increased proportion of self-harm episodes over time, they tended to be socioeconomically disadvantaged and were less likely to receive a psychosocial assessment. Socio-economic disparities need to be addressed as well as ensuring equitable access to a culturally sensitive comprehensive psychosocial assessment.

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Introduction

Self-harm among children and adolescents is a major health and societal issue.[1] Rates of self-harm during adolescence are increasing and estimates suggest each year in England 200,000 adolescents aged 12-17 self-harm and do not come to the attention of clinical services, and a further 21,000 present to hospital following self-harm.[1–3]

Self-harm is a key area for action in the National Suicide Prevention Strategy for England. [4] All-cause mortality following hospital presentation for self-harm among 10-18 year olds is 1.4%, and 12-month incidence of suicide is 30 times higher than in the general population in England.[5] Approximately 27% of 10-18 year olds that present to hospital for self-harm present again at some point, and 17.7% of 10-19 year olds repeat within 12-months.[6,7]

Self-harm is an indicator of distress with functions beyond those linked to suicidal intent. It is used as a coping mechanism, a strategy of emotion regulation, self-punishment or a cry for help.[8] Self-harm is associated with poor educational attainment and employment prospects, mental health problems, and increased risk of substance misuse in early adulthood.[9] [10]

There is little research on the needs of young people from ethnic minority groups who self-harm. Socioeconomic disadvantage, parental unemployment, low-income and single-parent households are more common in young people from ethnic minority backgrounds; factors known to increase risk of self-harm in children and adolescents. [1,11,12] A report on child poverty in England showed that more children of Mixed, Black or 'Other' (Arab, and other ethnicities) backgrounds were living in low-income households than the national average, and children of Asian ethnicity were over two times more likely to live in persistent-low income households and deprived neighbourhoods.[11,13] Deprivation is strongly associated with self-harm in young people. [1]

Rates of self-harm and all-cause mortality among some ethnic minority adults are lower than those of white ethnicity.[14,15] Different ethnic and cultural identities, practices, beliefs, and senses of belonging may influence the meaning of self-harm and attitudes towards help-seeking.[15,16] Additionally, the levels of social support and community might vary between different cultural groups, as could stigma around seeking help from services and its impact on social status.[17]

Previous work on ethnicity and self-harm has largely been limited to adults and is dated.[14] The Covid-19 pandemic has shed light on ethnic inequalities in health and there is increasing emphasis on equity of access to mental health services, and for further self-harm research to understand the needs of key marginalized groups for suicide and self-harm prevention. [18] Those who present to hospital following self-harm may have more severe physical or psychological health needs and because of their proximity to services, may be the group who are most amenable to intervention.[19] Further work is needed to understand how those from ethnic minority backgrounds differ in characteristics and outcomes following self-harm, to identify needs, and to inform service provision.

We aimed to investigate self-harm in children and adolescents from ethnic minority groups compared to those of white ethnicity, and to:

(i) investigate rates of emergency department presentations for self-harm over time,
(ii) identify differences in clinical, demographic characteristics, deprivation, self-harm methods and problems precipitating self-harm,
(iii) investigate self-harm repetition and mortality.

Method

Data source and study population

The study included children and adolescents aged 10-19 years who presented to emergency departments following self-harm from 1st January 2000 to 31st December 2016, using data from the Multicentre Study of Self-harm in England. This prospective study collects data on all hospital emergency department presentations for self-harm in five general hospitals in Manchester, Oxford, and Derby. Self-harm is defined as any act of intentional self-injury or self-poisoning, regardless of intent. Self-poisoning included overdoses involving more than the prescribed amount of any drug, recreational drugs, non-ingestible substances, and cases of severe alcohol intoxication where medical staff considered it an act of self-harm. Self-injury involved any type of intentional self-inflicted injury regardless of medical severity.

Children and adolescents were defined as aged 10 to 19 years, in line with the World Health Organisation definition (World Health Organisation. Adolescent health. https://www.who.int/southeastasia/health-topics/adolescent-health). They were divided into three

age bands based on periods of physical and psychological change; 10-13 (adjustment to secondary school and onset of self-harm), 14-16 years (sharp increase in self-harm), and ages 17-19 years (leaving school and transition into University or employment). [1,20]

The Multicentre Study is approved under Section 251 of the National Health Service Act (2006) to collect patient-identifiable information without patient consent, and is compliant with the Data Protection Act (2018). The monitoring systems in Oxford and Derby have approval from local health research ethics committees. Self-harm monitoring in Manchester is part of a clinical audit system ratified by the local research ethics committee.

Data collection and measures

Information on method of self-harm, sex, age, and ethnicity are collected for all self-harm presentations from emergency department databases and clinical hospital records. Detailed data (previous self-harm, current and previous psychiatric care, problems precipitating self-harm, and aftercare offered to patients) are collected for those who receive a specialist psychosocial assessment by psychiatry liaison staff (or an emergency department assessment in Manchester).

Ethnic groups were based on information recorded in hospital records, the level of detail for specific ethnic groups differed across study sites and over time, therefore groups were aggregated into broad categories: White (British, Welsh, Irish, Scottish, any other White background), Black (African, Caribbean, any other Black background), South Asian (Indian, Pakistani, Bangladeshi, any other South Asian background), and Other non-white (Arab, Chinese, mixed-ethnicity and any other ethnic background). Previous psychiatric care was defined as any care from secondary mental health services, current psychiatric care encompassed current inpatient or outpatient care. Previous history of self-harm and problems precipitating self-harm were self-reported.

Census data from 2011 showed the largest ethnic minority group in the study areas (City of Manchester, Oxford City, Derby Unitary Area) was South Asian (12%), followed by Other non-white (8%) and Black (6%) groups; proportions were slightly higher compared to England overall (South Asian: 7%; Other non-white: 4%; Black: 3%). Manchester had higher proportions of ethnic minorities (South Asian: 14%; Other non-white: 10%; Black: 9%) compared to Oxford (South Asian: 10%; Other non-white: 8%; Black: 5%) and Derby (South Asian: 12%; Other non-white: 5%; Black: 3%).

Index of Multiple Deprivation (IMD) scores were calculated using patients' postcodes. IMD measures small-area deprivation based on seven domains (income deprivation, employment deprivation,

education, skills and training deprivation, health deprivation and disability, crime, barriers to housing and services, and living environment deprivation). [21] Areas in England are ranked from the most deprived to the least deprived, based on the average level of deprivation scores of neighborhood within an area. IMD scores were aggregated into quintiles ranked from the least deprived in quintile 1 (IMD score ≤8.49) to the most deprived in quintile 5 (IMD score ≥34.18) (https://tools.npeu.ox.ac.uk/imd/). Where no post code was recorded, IMD scores were treated as missing. Manchester is the 6th most deprived local authority in England, Derby is ranked 67th and Oxford ranked 182nd.

Mortality follow-up

Individuals were followed up for mortality through linkage with ONS mortality records (via NHS Digital). Patient details such as name, date of birth, postcode, NHS number, and unique record IDs were used to link mortality data with the study self-harm dataset. Details for mortality linkage were taken from the first recorded self-harm presentation on the study database. Follow-up was to 31st December 2019, enabling a minimum of 3 years and a maximum of 20 years follow-up. Underlying cause of death was based on ICD-10 codes. Suicide included intentional self-harm (X60–X84) or death due to undetermined intent (Y10–Y34). [22] Other causes included accidental deaths (V01-X59) and all other causes (natural deaths, codes R99 ill-defined or unspecified, and mental and behavioural disorders due to psychoactive substance use F10-F19).

Statistical analysis

Analyses were conducted in STATA/IC 15.1 (StataCorp LP, USA).

Rates of self-harm over time by ethnic group (white, Black, South Asian, Other non-white) and sex were calculated using first presentation for self-harm for each individual within each calendar year. Annual population estimates by ethnic group and single year of age were not available, therefore data from the 2011 census were used to obtain population estimates for the study catchment areas by ethnic group. The study hospitals fall within the catchment areas of Oxford City, City of Manchester and Derby Unitary Area. Data on ethnicity prior to 2009 were less complete (ethnicity missing for 28% of individuals), therefore rates were calculated for 2009-2016. Ethnicity data were available for 88% of individuals during this period. Poisson and Negative Binomial regression models (exact 95% confidence intervals [CI]) were used to examine trends over time in rates. Pearson's goodness-of-fit

tests assessed over-dispersion. Year (exposure) was entered as continuous variable in the Poisson model, and the rate of self-harm (per 100,000 population) was the dependent variable.

Pearson's chi-squared tests were used to investigate differences between ethnic groups in demographic and clinical characteristics, methods of self-harm, and problems precipitating self-harm at patients' index presentation for self-harm. Comparison of demographic characteristics (age, sex, deprivation) and method of self-harm included all patients, whilst comparison of clinical characteristics (history of previous self-harm, current and previous psychiatric care, alcohol use at the time of self-harm) and problems precipitating self-harm were restricted to those that received a specialist psychosocial assessment (or an emergency department assessment in Manchester) at their index presentation. Only valid responses (yes/no) were included for each variable; cases with missing information for specific factors were excluded from analyses of those variables.

Twelve-month rates of self-harm repetition were calculated based on re-presentation to study hospitals within twelve-months of a first recorded presentation. Pearson's chi-squared tests examined differences between the ethnic groups. Rates were calculated for individuals presenting up to 31st December 2015 to allow for 12-month follow-up.

Kaplan-Meier curves (95% CIs) were plotted to compare time to first repeat self-harm presentation (from index presentation) within 12 months between ethnic groups, and log-rank tests were used for comparison of group differences. Cox proportional hazards models generated hazard ratios with 95% CIs to investigate the association between ethnicity and repetition of self-harm. An unadjusted model using the complete sample examined risk of 12-month repetition of self-harm between white (reference group) and Black, South Asian, and Other non-white groups. An adjusted model (restricted to cases with a specialist psychosocial assessment or an emergency department assessment in Manchester) included multiple risk factors associated with repetition of self-harm: age, sex, deprivation, history of self-harm, and method of self-harm. [7]

Differences between ethnic groups in cause of death were compared using log-rank tests. Cox proportional hazards models generated hazards ratios to compare risk of all-cause mortality (from the index presentation) between white (reference group) and Black, South Asian and Other non-white groups. Schoenfeld residuals and log-log plots of survival tested proportional hazards assumptions.

Sensitivity analyses used data from 2009-2016 due to the higher proportion of missing ethnicity data from 2000-2008, and to investigate any changes in demographic, clinical characteristics, and repetition of self-harm, when excluding data prior to 2009.

244

245 **Role of funding source**

246 The funding body had no role in study design; in the collection, analysis, and interpretation of data; in
247 the writing of the report; and in the decision to submit the paper for publication. The corresponding
248 author had full access to all the data in the study and accepts responsibility to submit for publication.

249

250 **Results**

251 There were 22,128 hospital presentations for self-harm by 14,894 individuals aged 10-19 years
252 between 1st January 2000 and 31st December 2016. Three quarters of presentations were by girls
253 (75.7%, n=14,189), and over half were aged 17-19 (59.5%, n=11,154). Data on ethnicity were
254 available for 18,734 presentations (84.7%), and 11,906 individuals (79.9%). Children and adolescents
255 of any ethnic minority background accounted for 12.3% (n=2,306) of presentations within the study
256 sample, 19.7% (n=454) of these presentations were by those of Black ethnicity, 36.8% (n=849) were
257 by South Asians and 43.5% (n=1,003) were by Other non-white groups.

258

259 Rates of self-harm were higher among the white ethnic group across the study period (Figure 1).
260 Increases were observed from 2009-2016 among all ethnic groups. The increase appeared slightly
261 greater in Black (IRR 1.07, 95% CI 1.03-1.11, p=0.0005), South Asian (IRR 1.05, 95% CI 1.01-1.09,
262 p=0.026), and Other non-white groups (IRR 1.11, 95% CI 1.06-1.16, p<0.0001), compared to those of
263 white ethnicity (IRR 1.02, 95% CI 1.00-1.03, p=0.012). The models suggested an annual increase of
264 2% in the rates of self-harm among the white ethnic group, 7% among those of Black ethnicity, 5%
265 among South Asians, and 11% among those of Other non-white ethnicity. Greater increases in rates
266 of self-harm were observed from 2014 onwards among Other non-white, Black, and South Asian
267 ethnic groups, although rates of self-harm in the ethnic minority groups were based on smaller
268 numbers of presentations relative to rates calculated for those of white ethnicity.

269

270 Mean annual rates per 100,000 population (2009-2016) were 574 for white, 225 for Black, 260 for
271 South Asian, and 344 for Other non-white groups. Mean annual rates for boys were 304 among
272 white groups, 97 among Black groups, 85 among South Asians, and 182 among Other non-white
273 ethnicities. Rates were higher in girls across all ethnicities, in the white group the rate was 848, 353
274 among Black groups, 369 among South Asians, and 659 among Other non-white girls.

275

276 A higher proportion of girls than boys presented with self-harm across all ethnic groups (Table 1). This
277 proportion was slightly higher in the South Asian group (80.3%) than in the white ethnic group (72.5%).

Black, South Asian, and Other non-white ethnic groups were more likely to live in areas of higher deprivation. The proportion of Black children and adolescents in the most deprived quintile was higher than all other groups.

History of self-harm was more common among those from Other non-white (55.8%) and white (55.3%) ethnic groups compared to Black (46.5%), and South Asian children and adolescents (44.6%) ($p<0.0001$). White and Other non-white ethnic groups were more often in receipt of current psychiatric care. Black (52.0%), South Asian (53.3%) and Other non-white (55.3%) children and adolescents were less likely to receive a specialist psychosocial assessment compared to their white counterparts (65.4%; $p<0.0001$). Details of a post-hoc analysis of the differences in assessments between those aged 10-15 years and 16-19 years are in the appendix (pp 1).

Self-poisoning was the most common method of self-harm across all groups (Table 1). Almost a quarter of individuals from Black (24.3%) and Other non-white (26.7%) groups, and 34.5% from white groups consumed alcohol at the time of self-harm. This was far less common among South Asians (11.0%).

Relationship problems with family was the most commonly reported precipitant of self-harm among all ethnicities, however a larger proportion of South Asian (52.9%) and Black (53.5%) children and adolescents reported relationship problems with family (Table 2). Those of white ethnicity more often reported relationship problems with a boyfriend/girlfriend (32.6%). Black children and adolescents more often reported housing (11.2%) and financial problems (7.3%), whilst Other non-white children and adolescents more often reported mental health problems (20.4%). White (15.1%) and Black (13.2%) children and adolescents more often reported problems with drugs and alcohol compared to other groups. Abuse (physical, sexual, emotional) was a commonly reported precipitant among all ethnic groups (10.0%).

Of the 10,933 children and adolescents with a complete 12-month follow-up, 1,980 (18.1%) repeated self-harm within 12-months. Repetition was highest in those of white ethnicity (n=1,763, 18.8%), than in Black (n=46, 14.6%), South Asian (n=78; 13.7%), and Other non-white ethnic groups (n=93, 14.3%) ($p=0.0002$). Log-rank tests of the Kaplan-Meier curves showed time to repeat was significantly different ($p=0.0002$), with white groups repeating self-harm more rapidly (Figure 2).

Results from an unadjusted Cox proportional hazards model showed lower risk of repetition among Black (HR 0.73, 95% CI 0.54-0.97, p=0.028), South Asian (HR 0.69, 95% CI 0.56-0.87, p=0.0011) and Other non-white groups (HR 0.72, 95% CI 0.59-0.88, p=0.0013) compared to those of white ethnicity (Table 3). In an adjusted Cox proportional hazards model of 7,497 individuals, only lower risk of repetition among the Black ethnic group maintained significance (HR 0.64, 95% CI 0.42-0.97, p=0.034). In the full adjusted model (supplementary table S2, pp 2), history of previous self-harm was associated with a two-fold increase in risk of repetition, and higher deprivation was also associated with increased risk.

Mortality follow-up was available for 11,108 (93.3%) individuals; 10,753 (96.8%) were alive, 192 (1.7%) had died, and 163 (1.5%) had emigrated and their status was not known. There were 178 (1.9%) deaths in the white group, 4 (1.4%) among the Black group, 6 (1.1%) among South Asians, and 4 (0.6%) in the Other non-white ethnic group.

Among those who died, 77 (40.1%) died by suicide, 51 (26.7%) were accidental deaths and 64 (33.3%) died from other causes (natural, ill-defined or unspecified, and mental and behavioural disorders due to psychoactive substance use). 72 (40.4%) deaths among the white group, and 5 (35.7%) deaths among Black, South Asian and Other non-white groups were by suicide (figures by ethnic group omitted due to small numbers). Log-rank tests showed no significant differences in all-cause (p=0.14), accidental (p=0.72) or suicide (p=0.32) mortality between ethnic groups. In unadjusted Cox regression models, there were no statistically significant differences in hazard ratios for all-cause mortality in Black (HR 0.70, 95% CI 0.26-1.87, p=0.47), South Asian (HR 0.58, 95% CI 0.26-1.31, p=0.19), and Other non-white groups (HR 0.40, 95% CI 0.15-1.09, p=0.073) compared to their white counterparts. In a post-hoc analysis, comparison of white vs all ethnic minority groups showed a lower risk of mortality among the ethnic minority groups combined (HR 0.54, 95% CI 0.31-0.93, p=0.026).

Sensitivity analyses using data for 2009-2016 showed that the associations between ethnic group and demographic and clinical characteristics, methods of self-harm, problems precipitating self-harm, and rates of self-harm repetition were broadly similar to those based on the full sample. However, the difference in the 12-month risk of self-harm repetition between white and Black ethnic groups in the Cox proportional hazards models was no longer significant, perhaps due to the relatively small size of the Black group.

Discussion

This study investigated hospital-presenting self-harm, repetition, and mortality in children and adolescents from ethnic minority groups using a large multisite dataset. Rates of self-harm were higher in white children and adolescents; however increases over time appeared to be somewhat greater in Black, South Asian and Other non-white groups. There were proportionately more girls than boys in ethnic minority groups than in white groups, especially among those of South Asian ethnicity. Those of Black ethnicity accounted for the largest proportion of those living in the most deprived areas.

South Asian and Black groups were less likely to report a history of self-harm or to be in receipt of psychiatric care, and more often reported relationship problems with family. Alcohol use at the time of self-harm was less common among South Asians. Abuse was reported as precipitating self-harm by around 10% of children and adolescents in all groups.

Black, South Asian and Other non-white groups were less likely to receive a specialist psychosocial assessment compared to their white counterparts. They also had lower rates of self-harm repetition, however this association was attenuated after adjusting for known risk factors. There was no difference between ethnic groups in suicide mortality, however numbers were small and should be interpreted with caution.

Increases in rates of self-harm over time is consistent with previous work on presentations for self-harm to general practice and to hospital emergency departments. [1,23] Greater increases in self-harm among ethnic minority groups may partly be explained by improved recording of ethnicity over time. However, while there was a trend towards increased recording of ethnicity across the study period, completion was relatively stable from 2009 onward and this is unlikely to account for the rapid increase in rates.

Increases in self-harm across ethnic groups may reflect the emergence of mental health problems during adolescence and increasing mental health distress, perhaps driven by increased distress and internalizing of symptoms among girls found in more recent cohorts in England. [24–26] Rapid social change over the last decade may also have played a role, including in the prevalence of social media use, cyber-bullying, negative body image, and low self-esteem, alongside increases in depressive symptoms. [27–29] Increases in help seeking for self-harm may also contribute to the observed increase. [30] Rises post-2011 may be associated with deprivation, poverty, and cuts to young people's mental

health services as a consequence of austerity measures following the 2008 economic recession – these changes affected those living in poorer communities, which include a disproportionate number of ethnic minority people. [31]

Ethnic minority children and adolescents in this study were socioeconomically disadvantaged. The highest proportion in the most socioeconomically deprived quintile were of Black ethnicity. They were less likely to receive a specialist psychosocial assessment, to be in receipt of mental health care, or to report a history of self-harm.[14] Lower proportions of Black and South Asians in receipt of mental health care may reflect the underrepresentation and lower service utilization rates of ethnic minority groups in Child and Adolescent Mental Health Services. [1,32] Ethnic and cultural differences in help-seeking, self-reliance and the relevance of mainstream services in meeting the needs of minorities may also explain the disparities in mental health care.[17]

The lower risk of 12-month self-harm repetition among ethnic minority groups is consistent with findings from ethnic minority adults. [7,16] History of self-harm was associated with a two-fold increase in repetition. [7] Higher deprivation was also associated with an increase in repetition in the fully-adjusted Cox regression model. Those from socioeconomically deprived areas are less likely to receive follow-up care and subsequently may have poorer outcomes. [1] In contrast to previous work that found a lower risk of suicide among Black and South Asian adults compared to white people, there was no difference in suicide mortality in this study. [15]

A large dataset and long period of follow-up is a strength of this study, allowing for exploration of trends over time. Due to unavailability of annual population-level data on ethnicity, data from the 2011 census were used as the denominator for rates and may not reflect changes in ethnic minority populations due to migration or other causes. If ethnic minority populations in the study areas increased more rapidly than whites in recent years, using 2011 census data as the denominator for these later years would artificially inflate calculated rates for these ethnic groups. The size of ethnic minority groups (especially the Black ethnic groups) were also small relative to those of white ethnicity therefore rates need to be interpreted with caution. The data are limited to three largely urban areas, we were not able to examine differences in self-harm between urban and rural areas. Therefore, findings may not be representative of ethnic minority groups in rural areas in England.

Analyses of clinical characteristics and problems precipitating self-harm were based on assessed individuals. Those that did not receive a specialist psychosocial assessment may differ in their

characteristics and outcomes. Repeat presentations for self-harm made to hospitals outside the study areas could not captured, therefore rates and risk of repetition may be underestimated. However, previous audits have found we have complete coverage and capture the majority of emergency department presentations for self-harm by residents in the study areas.

Aggregated categories of ethnicity were used, and important differences in characteristics and outcomes among each ethnic minority sub-group could not be explored. However, it was not possible to disaggregate these groups in this study due to differences in recording across study sites. Cultural factors that influence self-harm and help-seeking could not be examined. People from diverse ethnic groups may respond to distress in different ways and attitudes to help-seeking are influenced by their beliefs about self-harm.[17]

This study is based on hospital presentations for self-harm. Self-harm trends, characteristics and outcomes among ethnic minority children and adolescents in community settings may differ. However self-harm in community settings was beyond the scope of this study.

Self-harm in children and adolescents has become a major public health concern in recent years and ethnic minority groups appeared to account for an increasing proportion of self-harm episodes. Further understanding of the psychosocial factors behind this increase is required, and we need to ensure preventive measures reach all ethnic groups.

Those from a minority background were from deprived communities and more often reported relationship problems with family. Other non-white groups more often reported a history of self-harm and were more likely to have been in receipt of psychiatric care. There were some factors – for example adverse experiences related to abuse - that were reported by all ethnic groups. Integral to prevention of self-harm is promotion of positive mental health, and integration of accessible support from health and social care services, families, and schools, to address underlying mental health and social problems as well as major trauma such as abuse.

Services designed for ethnic minority people delivered in community settings and schools are feasible, known to have better engagement, and improve mental health outcomes. [33] Culturally-adapted resources and psychoeducation on mental health and self-harm for parents and carers to increase knowledge and reduce stigma, and outreach programmes in local community health centres to

support socioeconomically disadvantaged families may be helpful. Further research on the efficacy of culturally-adapted interventions for children and adolescents is needed.

Approximately 200,000 children and adolescents self-harm in the community, therefore specific prevention and intervention is important to reduce the burden of self-harm outside hospital settings.[2] Promotion of positive mental health and wellbeing, with a focus on family and relationships, and psychosocial functioning are also essential to prevention of self-harm and poor mental health outcomes. School-based suicide prevention programmes aimed at raising mental health awareness and developing coping skills have been effective at reducing suicide attempts and ideation. [34]

Presentation to hospital is an opportunity for intervention and equitable access to services should be prioritized. Clinical guidance recommends all those that present to hospital for self-harm should receive a comprehensive psychosocial assessment. [35] However, those from a minority background were less likely to receive an assessment. Examination of psychosocial assessment by age group (under 16 vs 16-19) showed ethnic minorities across both age groups were less likely to be assessed. The difference in rates of assessment may have been even larger in younger age groups, though this needs further exploration. Whilst easily accessible and culturally-sensitive mental health services are central to ensuring equity in service provision for ethnic minority communities, we also need to ensure that services are fit for purpose when young people do present. Bias among staff– unconscious or conscious, and discriminatory practices within services also need to be identified and addressed to ensure effective management of self-harm in line with clinical guidance. Training and support for psychiatric liaison staff on cultural competence and ethnic diversity also needs to be ensured.

Contributors

BF, CC and NK were responsible for study conception and design. BF is guarantor of the study and was responsible for data analysis and writing of the initial draft, CC and NK were responsible for review and editing. All authors had access to the data (CC and GG verified the data), and were involved in interpretation of the results, critically reviewed the manuscript, and approved the final draft.

Declaration of interests

LA chairs the National Suicide Prevention Strategy Advisory Group of the UK Department of Health and Social Care, which NK and KH are members of. NK reports grants from Department of Health and Social Care, National Institute of Health Research, National Institute of Health and Care Excellence, Healthcare Quality and Improvement Partnership, outside the submitted work. NK has chaired the National Institute for Health and Care Excellence (NICE) guidelines for the longer-term management

of self-harm, and is the clinical topic adviser for the new NICE self-harm guidelines, and also chairs the guideline committee for the management of depression, and the NICE Topic Expert Group, which developed the quality standards for self-harm services. KW is executive director for STORM UK suicide prevention training. All other authors declare no competing interests.

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Data sharing

Individual patient-level will not be available due to confidentiality and data-sharing agreements in place. The study protocol, statistical analysis plan, and analytic code is available on request from the corresponding author.

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Figure 1: Self-harm over time among white, Black, South Asian and Other non-white groups, incidence rates per 100,000 and 95% confidence intervals

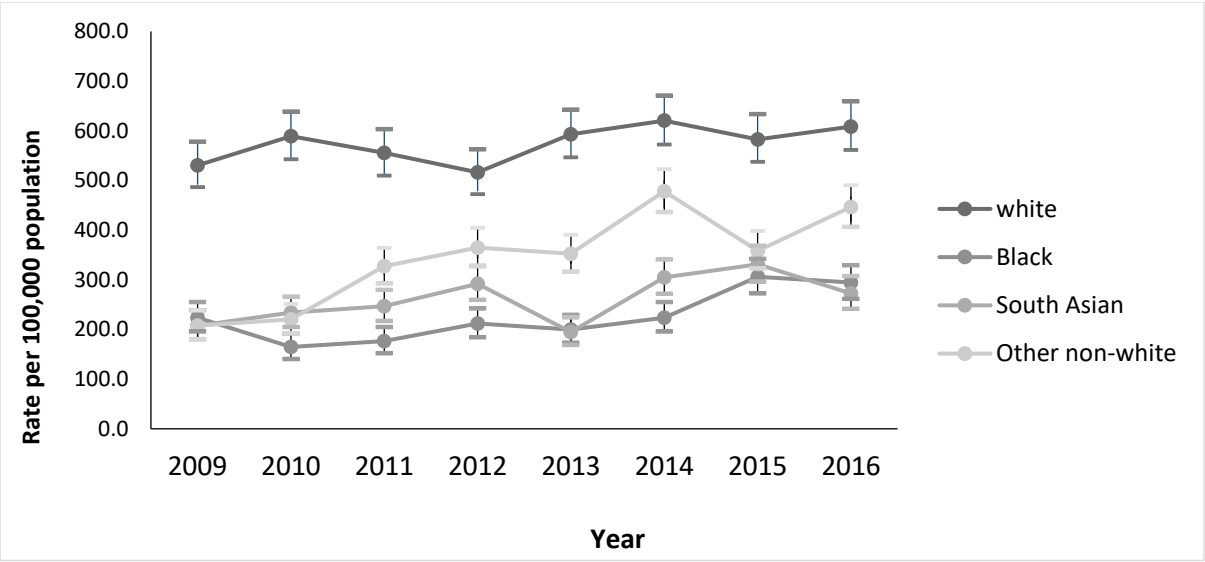

Table 1: Comparison of demographic and clinical characteristics between ethnic groups.

Variable (missing data n; %)	White n=10,211 (valid %)	Black n=344 (valid %)	South Asian n=619 (valid %)	Other non-white n=732 (valid %)	Total n=11,906 (valid %)	X^2 test*
Sex (n=2; 0.02)						
Boys	2,813 (27.6)	69 (20.1)	122 (19.7)	179 (24.5)	3,183 (26.7)	
Girls	7,396 (72.5)	275 (79.9)	497 (80.3)	553 (75.6)	8,721 (73.3)	X^2=28.87; p<0.0001
Age group						
10 to 13 years	670 (6.6)	29 (8.4)	39 (6.3)	58 (7.9)	796 (6.7)	
14 to 16 years	3,694 (36.2)	126 (36.6)	215 (34.7)	275 (37.6)	4,310 (36.2)	
17 to 19 years	5,847 (57.3)	189 (54.9)	365 (59.0)	399 (54.5)	6,800 (57.1)	X^2=5.95; p=0.43
Deprivation (n=664; 5.6)						
Quintile 1 (IMD score ≤8.49: least deprived)	1,659 (17.2)	14 (4.3)	43 (7.5)	78 (11.2)	1,794 (16.0)	
Quintile 2 (IMD score 8.5- 13.79)	1,220 (12.7)	11 (3.4)	36 (6.3)	43 (6.2)	1,310 (11.7)	
Quintile 3 (IMD score 13.8-21.35)	1,400 (14.5)	28 (8.6)	75 (13.0)	102 (14.6)	1,605 (14.3)	
Quintile 4 (IMD score 21.36-34.17)	1,659 (17.2)	44 (13.5)	127 (22.1)	141 (20.2)	1,971 (17.5)	
Quintile 5 (IMD score ≥34.18 : most deprived)	3,705 (38.4)	229 (70.3)	294 (51.1)	334 (47.9)	4,562 (40.6)	X^2=261.28; p<0.0001
Clinical characteristics						
Method of self-harm						
Self-poisoning alone	7,457 (73.0)	293 (85.2)	512 (82.7)	532 (72.7)	8,794 (73.9)	
Self-injury alone	2,082 (20.4)	43 (12.5)	88 (14.2)	158 (21.6)	2,371 (19.9)	

Both self-poisoning and self-injury	672 (6.6)	8 (2.3)	19 (3.1)	42 (5.7)	741 (6.2)	X^2=56.06; p<0.0001
Specialist psychosocial assessment	6,679 (65.4)	179 (52.0)	330 (53.3)	405 (55.3)	7,593 (63.8)	X^2=84.57; p<0.0001
Restricted to those that were assessed only (specialist psychosocial assessment and/or an emergency department assessment in Manchester)						
Variable	White n=7,863 (valid %)	Black n=250 (valid %)	South Asian n=436 (valid %)	Other non-white n=471 (valid %)	Total n= 9,020 (valid %)	X^2 test
Previous self-harm						
History of previous self-harm (n= 1,117; 12.4%)	3,800 (55.2)	106 (46.5)	176 (44.6)	225 (55.8)	4,307 (54.5)	X^2=23.52; p<0.0001
Psychiatric care						
Previous psychiatric care (n=736; 8.2%)	2,776 (38.4)	63 (26.7)	91 (23.1)	154 (35.6)	3,084 (37.2)	X^2=49.95; p<0.0001
Current psychiatric care (n=657; 7.5)	1,289 (18.2)	22 (9.9)	42 (10.6)	71 (17.0)	1,424 (17.5)	X^2=24.34; p<0.0001
Alcohol involved at the time of self-harm (n= 1,137; 12.6)	2,378 (34.5)	53 (24.3)	40 (11.0)	106 (26.7)	2,577 (32.7)	X^2=101.47; p<0.0001
*χ^2 test for overall association of multicategorical variables						

Table 2: Comparison of problems precipitating self-harm between ethnic groups.

Variable	White n=7,863 (valid %)	Black n=250 (valid %)	South Asian n=436 (valid %)	Other non-white n=471 (valid %)	X^2 test
Relationship problems with a partner	2,461 (32.6)	50 (21.7)	120 (29.3)	116 (25.6)	X^2=22.47; p<0.0001
Relationship problems with family	3,258 (43.1)	124 (53.5)	217 (52.9)	214 (47.0)	X^2=25.97; p<0.0001
Relationship problems with others	1,335 (17.7)	34 (14.7)	55 (13.4)	84 (18.5)	X^2=6.45; p=0.092
Employment/study problems	1,760 (23.3)	58 (25.0)	102 (24.9)	128 (28.1)	X^2=6.22; p=0.101
Financial problems	512 (6.8)	17 (7.3)	13 (3.2)	30 (6.6)	X^2=8.38; p=0.039
Housing problems	606 (8.0)	26 (11.2)	14 (3.4)	38 (8.4)	X^2=15.09; p=0.0017
Legal problems	172 (2.3)	7 (3.0)	10 (2.4)	16 (3.5)	X^2=3.31; p=0.35

Drug/alcohol problems	901 (15.1)	21 (13.2)	13 (4.4)	33 (8.9)	X^2=36.51; p<0.0001
Physical health problems	317 (4.2)	10 (4.3)	13 (3.2)	24 (5.3)	X^2=2.39; p=0.49
Mental health problems	1,366 (18.1)	33 (14.2)	51 (12.4)	93 (20.4)	X^2=12.61; p=0.0056
Bereavement	571 (7.7)	15 (6.5)	12 (3.0)	34 (7.6)	X^2=12.68; p=0.0054
Abuse (physical, sexual, emotional)	802 (10.3)	21 (9.1)	38 (9.3)	52 (11.4)	X^2=1.64; p=0.65
Any other problem	1,591 (21.2)	43 (18.6)	85 (20.7)	115 (25.4)	X^2=5.80; p=0.12

Figure 2: Kaplan-meier curve for risk of 12-month repetition of self-harm by ethnic group

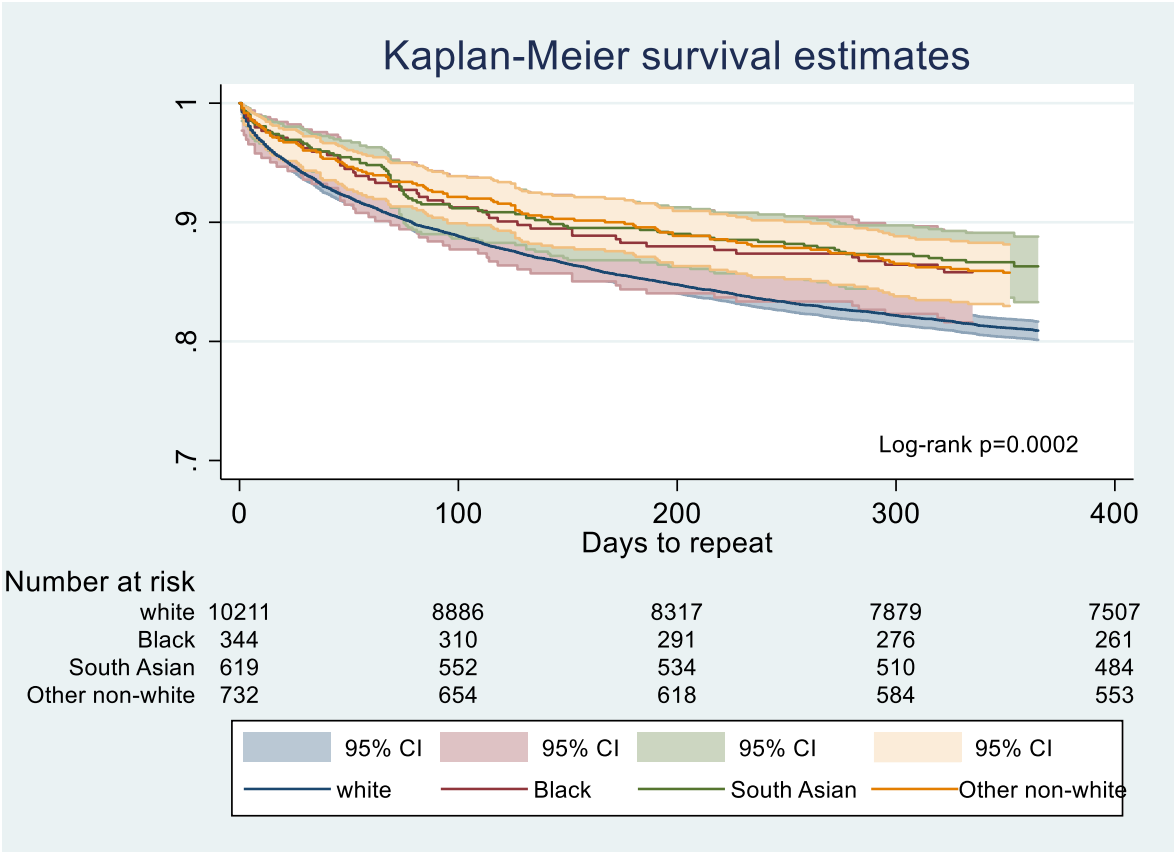

Table 3: Twelve-month repetition of self-harm and Cox proportional hazards model for risk of repetition.

Ethnic group	Repeat self-harm n=1,980 (valid %)	Crude HR (95% CI)	p value	Adjusted HR (95% CI)	p value
White (reference group)	1,763 (18.8)	.	.	.	.
Black	46 (14.6)	0.73 (0.54-0.97)	0.028	0.64 (0.42-0.97)*	0.034
South Asian	78 (13.7)	0.69 (0.56-0.87)	0.0011	0.85 (0.63-1.14)*	0.28
Other non-white	93 (14.3)	0.72 (0.59-0.88)	0.0013	0.82 (0.62-1.08)*	0.15
* Restricted to assessed presentations and adjusted for age, sex, level of deprivation, previous self-harm, method of self-harm					

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