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Suicide by burning in the South Asian origin population in England and Wales a secondary analysis of a national data set

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ABSTRACT

Objectives: A descriptive analysis of suicide by burning in England and Wales in the general population and in people of South Asian origin.

Design: A cross-sectional secondary analysis of a national data set.

Setting: A population study of all those who died by suicide in England and Wales between 1993 and 2003 inclusive.

Participants: All cases of suicide and undetermined intent identified by the Office for National Statistics for England and Wales. A computer algorithm was used to identify people of the South Asian origin from their names. There were 55 140 suicides in the UK between 1993 and 2003. The ratio of male to female suicides was 3:1. There were 1455 South Asian suicides identified by South Asian Name and Group Recognition Algorithm.

Primary and secondary outcome measures: Death by suicide and undetermined intent, as determined by Coroner's Inquest. ICD9 codes E958.1 and E988.1 and ICD10 codes X76 and Y26.

Results: 1.77% of suicides in the general population and 8.45% of suicides in the South Asian origin population were by burning. The suicide rate by burning was 0.8/100 000 person-years for England and Wales and 2.9/100 000 person-years for the South Asian origin population. The odds of suicide by burning were increased in the South Asian group as a whole (OR 3.06, 95% CI 2.30 to 4.08). Those born in Asia and Africa were at higher risk than those born in the UK (OR 2.69, 95% CI 2.01 to 3.60 and OR 2.10, 95% CI 1.46 to 3.01, respectively). The increased risk was for those aged 25–64 years.

Conclusion: Suicide by burning remains a significant issue in the South Asian origin working-age population in England and Wales. A prevention strategy could target working-age people of South Asian origin born abroad as they are at the highest risk. More in depth research on the reasons for using this method may help to identify possible prevention strategies.

ARTICLE SUMMARY

Article focus

- A descriptive analysis of suicide by burning in the UK.
- A description of suicide by burning in those of South Asian origin in the UK.

Key messages

- Suicide by burning is a significant issue in the South Asian population in England and Wales.
- The working-age population is at particular risk with those born abroad, especially those born in South Asian countries, having the highest odds.
- Though the risk is more elevated in South Asian women when compared with the rest of the population, there are more male suicides using this method overall.

Strengths and limitations of this study

- This study used a contemporary national data set.
- Using name recognition software rather than place of birth allowed better identification of the South Asian population of the UK.
- The data used did not allow for confounders to be taken into account when analysing differences between ethnic groups.
- Because administrative data were used, in-depth information on the reasons for choosing this method of suicide were not available.

Suicide is a leading cause of death.[1] The method that is used depends on availability and socio-cultural acceptability.[2–4] Suicide by burning, the act of self-incineration or setting oneself on fire[5] to end one's life, is a rare method choice. Though it has been reported to be a form of political or religious protest, it is actually usually an act that is undertaken in private.[5–8]

Rates of suicide by burning vary greatly between counties. In Europe and the Americas, it accounts for <2% of all suicides.[8–12] However, this rises to 10%–40% of suicides in some countries in the Middle East and Southern Asia.[8 13–17] Despite the low rates of suicide by burning in Europe, there are consistent reports of high rates in some

immigrant populations, particularly those of South Asian origin.[10 18 19]

The literature discusses the increased risk of suicide by burning in South Asian populations in the context of the cultural, societal and religious traditions of suttee/sati and dowry deaths.[8 14 19–22] However, suicides by burning in Europe are rarely clearly associated with these practices.

England and Wales has an ambitious suicide prevention strategy.[23] It has a significant South Asian population. Despite the multicultural nature of the population and perceived increased risk, there is no clear prevention strategy for suicide by burning in the South Asian groups. Acculturation, changes in social context and changes in the rate of suicide in the South Asian population may mean that such a policy is not required.[24] Accurate data on the rate of suicide by burning and information on whom is at risk would all usefully help planners to make decisions about whether a strategy is needed and whom it should target.

Though some data on suicide by burning are available, studies have either used small data sets or data that may not offer contemporary information.[25 26] An added complication is that place of birth, but not ethnicity, is collected on death certificates, so many studies investigate people who were born in a South Asian country and do not investigate the 50% of people of South Asian origin in the UK who were born in the UK. This may be important because those born in the UK may be less likely to use burning as a method of suicide. Analysis of contemporary data which includes the whole South Asian population may help policy makers develop strategies to target the groups at greatest risk of suicide by burning.

The aim of this study is to offer a descriptive analysis of suicide by burning in the UK using a contemporary national data set, with an emphasis on those of South Asian origin.

METHOD

All cases of suicide and undetermined intent, as determined by Coroner's Inquest, for the years 1993 through to 2003 and, were identified from the Office for National Statistics (ONS) for England and Wales database. Cases of suicide by fire were coded (E958.1 and E988.1 in ICD9[27] and X76 and Y26 in ICD10[28]) and compared with all other suicide methods as a group. Trends were sought over time between each year.

All the cases in the database were analysed using the South Asian Name and Group Recognition Algorithm (SANGRA).[29] The SANGRA identifies South Asian individuals in data sets by matching their names to the names in its directory. The SANGRA also classifies the religious affiliation and language associated to the name. In circumstances where there is conflict between the categories, the SANGRA selects those categories chosen by the first name as the final classifications for religion and language.[29] The SANGRA has been validated using health-related electronic data containing names and self-assigned ethnicity and has been used by other epidemiological studies. Its reported sensitivity is 89%–96% and specificity is 94%–98% for self-assigned ethnicity census categories 'Asian Bangladeshi', 'Asian Indian' or 'Asian Pakistani'. The reported sensitivity of the SANGRA[29] for identifying religious origins is 94%, 90% and 76% for Hindu, Muslim and Sikh religious origins, respectively. The proportion of correct identification increases to 98%, 94% and 84% when a mixed religious category was included. The specificity of the SANGRA in relation to religious origin identification was 91% for Hindu, 91% for Muslim and 99% for Sikh.

The data from the ONS included information on place of birth in string format. The values were coded by continent of birth and also recoded to create a dichotomous variable, UK births and 'other' places of birth.

Before testing for any relationship between religion of those in the South Asian group and the suicide method chosen as well as religion and gender, it was necessary to collapse and recode some of the religion categories due to small frequencies. All suicide cases which were originally coded by the SANGRA[29] into one of the mixed religious affiliations or into Buddhism were recoded as 'other religion'.

Standardised suicide rates

The 1991 and 2001 censuses provided by the ONS were used to generate age-standardised mortality ratios. For these rates, the South Asian origin population included anyone who self-identified themselves on the 1991 census as 'Asian: Bangladeshi, Indian, Pakistani' or on the 2001 census as belonging to 'Asian or Asian British: Bangladeshi, Indian, Pakistan' or 'Mixed Asian and White' but not those individuals who indicated 'Other Asian'. Taking the difference in the population totals between 1991 and the 2001 census, population projections were derived by adding one-tenth of the difference to each year starting in 1992 and ending in 2003 for the following age groups: 10–24, 25–39, 40–64 and 65 years and older. Using the projected population totals and the known number of suicides, age-standardised mortality rates were calculated per 100 000 person-years for the entire study period, 1993–2003. The population structure used for age standardisation was the sum of the yearly population for England and Wales from 1993 to 2003.

Analysis

t Tests were used to compare mean ages of men and women, for South Asians and non-South Asians, in relation to the suicide methods and place of birth (UK vs other). Contingency tables (χ^2) with ORs and 95% CIs were computed to examine the relationships between method of choice (fire or other) and categorical variables: identity (South Asian or other), gender, religion, place of birth and any trends over the period of collection, 1993–2003. We used logistic regression analysis to

control for confounding variables (gender, age, religion, place of birth and year of suicide) and to examine whether South Asian ethnicity predicted use of fire as a means for suicide. These variables were chosen because of their significance in previous research findings.[5–20] The confounders chosen were also a factor of what data are available through Coroner's Inquest reports.

RESULTS

There were 55 140 suicides in the UK between 1993 and 2003. The ratio of male to female suicides was 3:1. There were 1455 South Asian suicides identified by the SANGRA.[29] The ratio of South Asian male suicides to South Asian female suicides was 2.4:1. Forty-six per cent of the South Asian population was born in Asia, a third (32.9%) were born within the UK, 15.8% in Africa and the rest from a variety of other countries including other European Countries, Australia and the Americas.

UNIVARIATE ANALYSES

Suicide by burning

Suicide by burning represented 1.77% (978 cases) of all suicides in England and Wales during the study period. The suicide rate by fire was 0.8/100 000 person-years for England and Wales. The percentage of South Asian suicides attributed to burning was 8.45% (123 cases). The corresponding age-standardised suicide rate by burning for South Asians living in England and Wales was 2.9/100 000 person-years. The South Asian group were more likely than non-South Asians to use burning as a method of suicide (χ^2=383.27, p<0.001).

Gender

The male to female ratio of suicide by burning for non-South Asian was 2.2:1. However, the male to female ratio for South Asians was 1.2:1. The odds that either South Asian women or men would use burning as a method was significantly greater than the non-South Asian group (table 1). South Asian men who died by suicide were less likely than South Asian women to die by burning (χ^2_{MH} = 0.47=0.47, 95% CI = 0.32 to 0.69).

Age

The mean age of South Asians was significantly younger than non-South Asians when looking at all types of suicide (t=16.162, p<0.001) and when suicides by burning were analysed (t=5.159, p<0.001). South Asians who died by suicide by burning (38.12±15.05) were on average younger than non-South Asians (45.70±16.66).

Birthplace

For all suicide methods, the group born outside the UK were on average older (1.16 years, t=−4.395, p<0.001) than those born in the UK. There was no significant difference in mean age between places of birth for those whose method for suicide was fire. The average age was significantly higher for South Asians born outside the UK who used burning as a method of suicide (40.71±15.41 years) than South Asians born in the UK (27.09±6.32) (t=−4.147, p<0.001).

Table 1 Relationships with suicide by burning

	% Suicide by fire	χ^2_{MH} (95% CI)
Ethnicity		
Females		
Non-South Asian	2.0	7.41 (5.45 to 10.05)***
South Asian	12.9	
Males		
Non-South Asian	1.5	4.72 (3.64 to 6.12)***
South Asian	6.6	
South Asian		
Women	12.9	0.47 (0.33 to 0.69)***
Men	6.6	
Birthplace		
UK birthplace		3.28 (2.15 to 5.02)***
Non-South Asian	1.5	
South Asian	4.8	
Immigrants		
Non-South Asian	2.3	4.97 (3.72 to 6.65)***
South Asian	10.3	
South Asian women		
UK birthplace	6.2	2.90 (1.37 to 6.10)**
Other birthplace	16.1	
South Asian men		
UK birthplace	4.2	1.94 (1.06 to 3.55)*
Other birthplace	7.8	
Immigrant South Asians		
Women	16.1	0.44 (0.29 to 0.68)***
Men	7.8	

*p<0.05, **p<0.01, ***p<0.001.

There was a significant association between being born outside the UK and increased odds of suicide by burning (table 1). The association held for both South Asian men (χ^2=4.76, p=0.029) and South Asian women (χ^2=8.43, p=0.004). The odds of the use of burning as a method of suicide were greatest in South Asian women not born in the UK (χ^2_{MH} = 2.90, 95% CI 1.37 to 6.10, p<0.01). The associated odds increase significantly for South Asians born in Asia compared with UK born South Asians (χ^2_{MH} = 3.60, 95% CI 1.28 to 7.67, p=0.001), and while the odds of an association between suicide by burning are greater for African born South Asians compared with UK born South Asians, the association is not significant (χ^2_{MH} = 1.54, 95% CI 0.50 to 4.83, p=0.663). Sample size may be a reason for the finding not reaching standard levels of significance.

Religion

There were no significant associations between religion and suicide by burning in the South Asian group or between religion and the gender of South Asians who died through suicide by fire or non-fire.

Time trends

Suicides by burning did not significantly increase or decrease year on year. However, in South Asian men, the use of non-fire methods increased over the 11-year period,

while in South Asian women, the use of non-fire methods decreased over time (χ^2=19.656, p=0.033, ϕ=0.122).

MULTIVARIATE ANALYSIS

Logistic regression model

After controlling for gender, age, religion, place of birth and year of suicide in a logistic regression model, those with names of South Asian origin had a threefold increased odds (3.066 OR, 95% CI 2.302 to 4.082) of suicide by burning. In the model, increased odds remained significant for female gender, being born in Africa or Asia and being between 25 and 64 years of age (table 2).

DISCUSSION

Less than 2% of suicides in the UK use burning as a method, making it relatively rare. However, in the South Asian population, the proportion is 8.45%. This equates to a standardised mortality rate three times higher than the rest of the UK population. Our study demonstrates that those of South Asian origin born outside the UK were at higher risk than those born inside the UK regardless of age. Numerically, there were more male suicides by burning, though a higher proportion of South Asian women were likely to use this method. There were no differences in the use of this method by religious group.

Previous studies have reported that, in the UK, suicide by burning is much more common in immigrants.[10 18 19] In one study, there was a high standardised mortality ratio for suicide by burning for Caribbean and East African born men and a 10-fold increase for Indian and Pakistani born women.[17] Prosser[10] found that 30% of female suicides by burning and 7% of male suicides by burning were in the South Asian born group (India, Pakistan, Bangladesh or Sri Lanka), and paraffin was used in 50% of these. It has been estimated that 20% of suicides in those who were born in South Asian countries are by burning.[18 19] The current study offers lower estimates. Because our findings use data from more recent years than other studies, the lower estimates could reflect changes in the use of this method of suicide by the South Asian group over time. However, our time trend analysis did not demonstrate significant changes in the rate of suicide by burning over the study period. Our lower rates may also reflect the fact that this study was able to include people of South Asian origin born in the UK as well as those who were born abroad. Those born in the UK had a lower odds of suicide by burning.

The current estimate is lower than previously reported, but it still presents suicide by burning as a major problem in the South Asian population in England and Wales. It comprised nearly 13% of all suicides in women.

There are a number of factors and missing pieces of information which if available could have helped to expand our knowledge on the use of burning as a method of suicide. The use of fire to commit suicide is tied to any number of other social and cultural factors data which were not available for analysis in this current study. For instance, the ONS data set did not have information on whether accelerants were used, this may be important for the development of prevention strategies. The lack of ethnicity data on death certificates meant that, though we were able to identify South Asian origin people from their names, we were not able to identify other ethnic groups which may be of increased risk. Within the South Asian group, despite the fact that the older population (over 65 years) may be considered more likely to keep to traditional practices (and in some parts of India suicide by burning makes up 36% of suicides), it was those between 25 and 64 years who had highest odds of suicide by burning. The reasons for this are unclear. All of this information may be useful in helping to develop prevention strategies. Further studies with more in-depth data, data on other African–American and minority ethnic groups and the use of different methods, for instance qualitative methods, may be useful to investigate this.

There is more information that is needed; however, this study was able to indicate that suicide by burning is still a significant issue in the South Asian origin population. The proportion of suicides by burning in women of South Asian origin is greater than men but there are more male suicides than female suicides overall. Working-age people of South Asian origin, born outside the UK, are at highest risk and may be one target group for the prevention of suicide by fire.

Identifying specific service implications is difficult because there is little information on why decisions to use this form of suicide are made or exactly how these acts are carried out. Getting this information will be important for deciding how best to intervene.

Suicide by fire seems to be a choice made more often by people of South Asian origin regardless of religion or gender. Health and social care staff encountering burns among South Asians might ensure a suicide risk assessment and assessment and treatment for psychiatric problems if present. However, they should also consider assessing the influence of cultural factors as suicide by fire is a complex phenomena perceived to be pervasive in South Asian cultures.

Table 2 Logistic regression predictors of suicide by burning (n=50 654)

Variable	p Value	OR (95% CI)
South Asian	0.001	3.066 (2.302 to 4.082)
Female	0.001	1.513 (1.312 to 1.745)
Ages 25–39	0.001	1.647 (1.277 to 2.125)
Ages 40–64	0.001	1.653 (1.284 to 2.129)
Ages 65+	0.417	1.132 (0.839 to 1.526)
Birthplace: Asia	0.001	2.689 (2.008 to 3.601)
Birthplace: Africa	0.001	2.098 (1.462 to 3.011)

Reference categories: non-South Asian, male, ages 10–24, birthplace: UK χ^2=321.16, df=7, p<0.001.

Involving communities is key both to improving understanding of the phenomenon as well as identifying possible targets for intervention. For instance, if further investigation at a community level indicates that particular accelerants are used, then decreasing access to these may be part of a strategy to decrease risk. Changing the decision to use these means may take efforts at a number of levels from the individual through to public health interventions. Interventions might modify socio-cultural beliefs that influence choice of methods and include health promotion to encourage early help seeking for emotional crises.

Suicide prevention strategies need to accommodate more targeted actions to address the needs of specific populations, such as South Asian, whose presentation and methods of suicide appear to differ from the majority population.

CONCLUSIONS

Despite demographic changes and changes in the rates of suicide in the South Asian population in England and Wales, suicide by burning remains a significant issue. The working-age population is at particular risk with those born abroad, especially those born in South Asian countries having the highest odds. Though women are at higher risk, there are more male suicides using this method overall. This information could be used to target a prevention strategy. However, more in-depth research on the reasons for suicide by burning, perhaps using qualitative research methods, may help to identify possible strategies.

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Competing interests None.

Ethics approval Ethics approval was provided by University College London ethics and Office for National Statistics ethics boards.

Contributors KM, LB and AT were involved in conceptualising, analysing the data, writing and editing of the paper. KN was involved in the data analysis and writing and editing of the paper.

Provenance and peer review Not commissioned; externally peer reviewed.

Data sharing statement The data used were requested from the Office for National Statistics for specific purposes that are limited by a research ethics board agreement. The authors are not able to share the data.

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STROBE 2007 (v4) Statement—Checklist of items that should be included in reports of *cross-sectional studies*

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	2 and 4 and 5
Objectives	3	State specific objectives, including any prespecified hypotheses	5
Methods			
Study design	4	Present key elements of study design early in the paper	5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	5 6
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	5 6
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	6
Bias	9	Describe any efforts to address potential sources of bias	*7*
Study size	10	Explain how the study size was arrived at	6 and 7
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	7 and 8
		(*b*) Describe any methods used to examine subgroups and interactions	7 and 8

		(*c*) Explain how missing data were addressed	A suicide method was available for all in the data set – there is always a method given otherwise it cannot be classed as suicide
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	Not a sample
		(*e*) Describe any sensitivity analyses	No sensitivity analysis
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	8
		(b) Give reasons for non-participation at each stage	Not applicable
		(c) Consider use of a flow diagram	
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	8 and 9 and 10
		(b) Indicate number of participants with missing data for each variable of interest	As above
Outcome data	15*	Report numbers of outcome events or summary measures	Not a case control study
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	9 10 11
		(*b*) Report category boundaries when continuous variables were categorized	n/a
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	n/ a
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	9 10 11
Discussion			
Key results	18	Summarise key results with reference to study objectives	11
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	11 12
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	12 13

Generalisability	21	Discuss the generalisability (external validity) of the study results	13 14
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	3

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.