

## ORIGINAL ARTICLE

# Engagement in safety practices to prevent home injuries in preschool children among white and non-white ethnic minority families

C Mulvaney, D Kendrick

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**Objective:** To examine engagement in home safety practices to prevent injuries in preschool children among white and non-white ethnic minority families.

**Design:** A self completion postal questionnaire assessed sociodemographic characteristics and engagement in home safety practices.

**Setting:** Deprived areas in the city of Nottingham, United Kingdom.

**Subjects:** 3906 caregivers of children aged under 5 years.

**Main outcome measures:** Use of fireguards, stair gates, smoke alarms, window locks and safe storage of medicines, sharp objects, and cleaning products.

**Results:** Of the 3906 families, 3805 gave their ethnic origin of which 16.5% classed themselves as from a non-white ethnic minority. The safety practices most commonly adopted by respondents were safe storage of medicines (87.9%) and use of smoke alarms (72.3%). Respondents from non-white ethnic minorities were significantly less likely to adopt all safety practices except they were less likely than whites to store sharp objects unsafely (odds ratio (OR) 0.68, 95% confidence interval (CI) 0.56 to 0.84). Those from non-white ethnic minorities were significantly more likely to indicate that they “did not know they could get” fireguards (adjusted OR 6.01, 95% CI 2.64 to 13.65), stair gates (adjusted OR 4.47, 95% CI 1.53 to 13.05), and cupboard locks (adjusted OR 3.96, 95% CI 2.77 to 5.66) than whites. They were also significantly more likely to say they would need help fitting fireguards (adjusted OR 1.98, 95% CI 1.03 to 3.81), stair gates (adjusted OR 3.61, 95% CI 2.11 to 6.17), and cupboard locks (adjusted OR 1.88, 95% CI 1.39 to 2.54).

**Conclusions:** Our results support the hypothesis that families from non-white ethnic minorities are less likely to engage in some safety practices and illustrate inequalities in access to information regarding the availability and fitting of safety equipment. Further work is required to examine the association between adoption of safety practices and injury rates in children from non-white ethnic minorities.

See end of article for authors' affiliations

Correspondence to:  
Dr. Caroline Mulvaney,  
Division of Primary Care,  
13th Floor, Tower Building,  
University of Nottingham,  
Nottingham, NG7 2RD,  
UK; Caroline.Mulvaney@  
nottingham.ac.uk

For children under the age of 5 years, 77% of unintentional injuries occur in the home.<sup>1</sup> However, not all children are at equal risk of unintentional injury and children of families who are socioeconomically disadvantaged are at greater risk of unintentional injury than more advantaged children.<sup>2–7</sup>

Inequalities in health among ethnic minorities exist.<sup>8–9</sup> People from ethnic minorities are over-represented among the socioeconomically disadvantaged.<sup>10</sup> The few published studies examining variations in childhood unintentional injury rates by ethnic group in the United Kingdom have found conflicting results. One study found children from ethnic minorities to have a higher risk of pedestrian injury than white children with young children of Asian origin to be twice as likely to be injured as non-Asian children.<sup>11</sup> However, other studies have found no difference in attendance rates at hospital,<sup>6</sup> and more recent larger studies found reduced hospital admission rates among South Asian children,<sup>12</sup> and children from all Asian subgroups reported fewer major and minor injuries than the general population.<sup>13</sup> We have been able to find only one study from the United Kingdom examining engagement in home safety practices to prevent childhood injury by ethnic group.<sup>14</sup> The authors found that families from ethnic minorities had fewer safety practices and fewer items of safety equipment than white families. However, they did not report their findings for specific safety practices. We have, therefore, undertaken this analysis to examine a range of safety practices of white and non-white ethnic minority families living in deprived areas of

Nottingham, United Kingdom while adjusting for socioeconomic disadvantage.

## METHODS

The data used for the analyses presented in this paper are the baseline data collected from 3277 families participating in a randomised controlled trial (RCT) and from 629 who returned a baseline questionnaire but did not wish to participate in the trial. The trial has been described in detail elsewhere.<sup>15</sup> In brief, the aim of the trial was to assess the effectiveness of health visitor safety advice coupled with access to safety equipment on reducing unintentional injuries for families with children under 5 years old and living in deprived areas. All families on the caseloads of health visitors who were working in general practices within Nottingham Health Authority with Townsend scores above zero,<sup>16</sup> were sent the baseline questionnaire and an invitation to participate in the trial. Families were not sent a questionnaire and an invitation if they had one or more children on the child protection register or where there had been a fatal childhood unintentional injury and the health visitor considered that approaching the family may cause distress. Health visitors were asked to identify families who would require help with completing the questionnaire and RCT invitation and 131 families were visited at home by interpreters.

**Abbreviations:** OR, odds ratio; CI, confidence interval; RCT, randomised controlled trial

The questionnaire assessed the possession and safe use of fireguards, window locks, smoke alarms, stair gates, and cupboard locks for the storage of medicines, cleaning products, and sharp objects. The questionnaire has been validated by home observations for a sample of families.<sup>17</sup> For fires, families were categorised as safe if a fireguard was used all the time on every fire in the house. For stairs, families were categorised as safe if they used a stair gate at either the bottom or top of the stairs. Families without stairs were deemed not to need stair gates. Families were categorised as safe for smoke alarms if they were fitted and functional. Families were categorised as safe for window locks if all windows higher than 3 metres from the ground had window locks fitted and were used all the time. For the safe storage of medicines, sharp objects, and cleaning products families had to store the objects in either a locked cupboard or drawer, or at eye level or above. Those who did not store medicines, cleaning products, or sharp objects in a room were coded as safe. Reasons for non-possession of safety equipment were also measured using the questionnaire. The same questions were not asked for all types of equipment as the questionnaire included only the reasons most commonly cited during piloting and some questions were specific to particular items of safety equipment. Sociodemographic characteristics were also measured using this questionnaire. Respondents were asked to indicate to which of the following ethnic groups they belonged to: white, Pakistani, Black-Caribbean, Black-African, Indian, Chinese, or other. For the purposes of this study, respondents not choosing "white" were classed as from a non-white ethnic minority. Postcode taken from the respondent's address was used to identify a Townsend score at enumeration district level as a measure of deprivation.<sup>16</sup> Ethical committee approval was received for this study from the Queen's Medical Centre, Nottingham.

### Analysis

The univariate and multivariable relationships between ethnicity and safety practices were examined using logistic regression. Separate multivariable models were created for (a) each safety practice and (b) for the reasons given for not possessing safety equipment using ethnicity (white *v* non-white ethnic minority) as the main explanatory variable. For each model we adjusted for sociodemographic characteristics that were significantly associated with both ethnicity and (a) the safety practice and (b) reasons for possessing the safety equipment on univariate analysis. The Townsend score was divided into fifths and the fifth representing the least deprived areas was used as the reference category.<sup>16</sup> Collinearity between covariates was assessed from the covariate correlation matrix. Significance was assessed using likelihood ratio tests (5% significance level). Analyses were performed using SPSS version 11.0 for Windows and STATA version 7.

### RESULTS

Of 9909 families invited to participate in the trial, 3906 (39.4%) completed baseline questionnaires, of which 629 did not agree to participate in the trial. The sociodemographic characteristics of families returning the questionnaire are shown in table 1. One hundred and one families did not report their ethnic origin in the questionnaire and so the analyses using ethnicity are based on 3805 families. The sociodemographic characteristics of families returning the questionnaire are shown in table 1. One in six (16.5%) classed themselves as from a non-white ethnic minority and of these, 38.6% classed themselves as of Pakistani origin. The majority of those in the "other" category (61/115) classed themselves as of mixed race.

**Table 1** Sociodemographic characteristics of families returning the questionnaire and reporting their ethnic origin (n = 3805)

|   | No (%) from an ethnic minority (n = 629) | No (%) white (n = 3176) |
|---|--|-------------------------|
| Non-white ethnic minority                                       |  |                         |
| Pakistani   | 243 (38.6)                               |                         |
| Black-Caribbean   | 159 (25.3)                               |                         |
| Indian  | 88 (14.0)                                |                         |
| Black-African   | 12 (1.9)                                 |                         |
| Chinese   | 12 (1.9)                                 |                         |
| Other   | 115 (18.3)                               |                         |
| Townsend score as fifths (range)                                |  |                         |
| Least deprived fifth (-5.98 to -1.17)                           | 97 (15.4)                                | 672 (21.3)              |
| 2nd (-1.17 to 1.80)   | 97 (15.4)                                | 651 (20.6)              |
| 3rd (1.80 to 3.86)  | 89 (14.2)                                | 665 (21.1)              |
| 4th (3.87 to 5.90)  | 183 (29.1)                               | 584 (18.5)              |
| Most deprived fifth (5.90 to 9.29)                              | 162 (25.8)                               | 582 (18.5)              |
| Three or more children aged under 16 living at home             | 203 (32.3)                               | 755 (23.7)              |
| Family employment   |  |                         |
| Both parents unemployed (or one parent if single parent family) | 225 (36.7)                               | 1023 (32.6)             |
| No car  | 184 (30.6)                               | 935 (30.0)              |
| Receives means tested benefits                                  | 354 (62.6)                               | 1431 (46.9)             |
| Had first child aged under 20 years (mothers only)              | 125 (23.5)                               | 699 (23.5)              |
| Living in rented accommodation                                  | 277 (44.5)                               | 1430 (45.2)             |
| Living in overcrowded accommodation                             | 162 (26.5)                               | 298 (9.5)               |

### Safety practices

The prevalence of each of the safety practices by ethnic group is shown in table 2. The safety practices most commonly adopted were safe storage of medicines (87.9%) and use of smoke alarms (72.3%). The majority of families did not store sharp objects safely (64.3%) or have fitted window locks (56.7%).

### Univariate analysis

Univariate analyses indicate that families from non-white ethnic minorities were significantly more likely to be unsafe for each of the practices with the exception of safe storage of sharp objects where they were significantly less likely than whites to be unsafe (odds ratio (OR) 0.68, 95% confidence interval (CI) 0.56 to 0.84) (table 2).

### Multivariable analysis

After adjusting for sociodemographic characteristics significantly associated with each safety practice and ethnicity, ethnicity remained independently associated with all safety practices (table 2). Adjusting for these confounding factors had little effect on the odds ratios for adopting safety practices, suggesting that deprivation and the other confounding factors do not help to explain the relationship between ethnicity and safety practices.

### Reasons for not possessing and using safety equipment

Families from non-white ethnic minorities were significantly more likely to cite many of the reasons for not having safety equipment than white families (table 3). Those from a non-white ethnic minority were significantly more likely to indicate that they did not know they could get all items of safety equipment than whites. They were also significantly more likely to say they would need help fitting fireguards, stair gates, and cupboard locks than whites. There were no significant differences between whites and those from a

**Table 2** Frequencies and unadjusted and adjusted odds ratios for *not* adopting safety practices by ethnic origin

| Safety practice                               | White families (n = 3176): No (% within white origin) | Families from non-white ethnic minorities (n = 629): No (% within ethnic minority) | Unadjusted OR (95% CI) | Adjusted OR (95% CI)  |
|---|---|--|------------------------|-----------------------|
| Does not have fireguards                      | 1705 (53.7)   | 400 (63.6)   | 1.47 (1.22 to 1.77)    | 1.44 (1.19 to 1.74)*  |
| Does not have a fitted stair gate             | 1662 (52.3)   | 448 (71.2)   | 2.15 (1.77 to 2.62)    | 2.00 (1.64 to 2.45)†  |
| Does not have fitted window locks             | 1768 (55.7)   | 392 (62.3)   | 1.32 (1.11 to 1.57)    | 1.38 (1.15 to 1.65)‡  |
| Does not have fitted and working smoke alarms | 740 (23.3)  | 315 (50.1)   | 3.39 (2.81 to 4.09)    | 3.08 (2.53 to 3.75)†  |
| Does not store medicines safely               | 339 (10.9)  | 111 (18.4)   | 1.95 (1.53 to 2.50)    | 1.84 (1.43 to 2.37)¶  |
| Does not store cleaning products safely       | 1541 (54.5)   | 342 (63.9)   | 1.47 (1.20 to 1.80)    | 1.56 (1.26 to 1.92)§  |
| Does not store sharp objects safely           | 1780 (65.6)   | 270 (57.1)   | 0.68 (0.56 to 0.84)    | 0.74 (0.60 to 0.91)** |

\*Adjusted for Townsend score, in receipt of means tested benefits.  
 †Adjusted for Townsend score, in receipt of means tested benefits, family employment and living in overcrowded accommodation.  
 ‡Adjusted for Townsend score.  
 ¶Adjusted for Townsend score, in receipt of means tested benefits and family employment.  
 §Adjusted for in receipt of means tested benefits and living in overcrowded accommodation.  
 \*\*Adjusted for Townsend score and living in overcrowded accommodation.

non-white ethnic minority for any of the reasons for not possessing fitted and working smoke alarms (not shown). Adjusting for confounding factors had little effect on the odds ratios for reasons given for not possessing safety equipment, suggesting that deprivation and other confounding factors do not help to explain the relationship between ethnicity and safety practices.

**DISCUSSION**  
**Principal findings**

The adoption of safety practices in the home to prevent injuries to young children differed significantly according to ethnic origin. Generally, our results indicate that families from a non-white ethnic minority engage in fewer safety practices. Whites were significantly more likely to adopt all safety practices assessed except for the safe storage of sharp objects. Adjusting for confounding variables did not change these relationships suggesting that the differences in safety practices were not accounted for by deprivation based on Townsend score,<sup>16</sup> or the other confounding factors measured within our study. Families from non-white ethnic minorities were significantly more likely to indicate that they did not know they could get and would need help fitting a range of items of equipment than whites.

**Strengths and limitations of the study**

Our study is the largest study in the United Kingdom to date to examine the safety practices of white and non-white ethnic minority families. The questions we used to assess safety practices have since been through a validation process and were found to have a high sensitivity and specificity for

predicting observed safety practices,<sup>17</sup> so reducing the likelihood of over-reporting of safe practices.

One of the potential limitations of the study is that those returning the baseline questionnaire may differ from those not returning the questionnaire, for example, families with fewer items of safety equipment may have been more disposed to return the questionnaire and agree to participate in the trial as free items of equipment were available to trial participants. We therefore compared the baseline safety practices of families returning the questionnaire and wishing to participate in the trial with those not wishing to participate in the trial. There were no significant differences between the participating and non-participating families for six of the safety practices assessed at baseline. However, participating families were significantly more likely to store sharp objects unsafely than non-participating families (65.1% (1813/2787) for participating families v 59.8% (286/478) non-participating families,  $\chi^2 = 4.84$ ,  $p = 0.03$ ). These results suggest that we may have overestimated the prevalence of unsafe storage of sharp objects.

The use of interpreters to help those from non-white ethnic minorities who would have difficulty completing the questionnaire written in English helped reduce possible bias in recruitment to the trial (and hence completion of the baseline questionnaire). The proportion of respondents from non-white ethnic minorities in our study sample (16.5%) compares favourably with the population of Nottingham from the 2001 census (13.7%),<sup>18</sup> suggesting that recruitment bias in terms of ethnic origin did not occur. The majority of our respondents were of a South Asian origin and we had insufficient power to examine safety practices by specific ethnic groups, which may be important as injury rates in the

**Table 3** Adjusted odds ratios for reasons given for *not* possessing safety equipment comparing families from non-white ethnic minorities with white families

| Reasons for not possessing safety equipment | Fireguards OR (95% CI) | Stair gates OR (95% CI) | Window locks OR (95% CI) | Cupboards locks OR (95% CI) |
|---|------------------------|-------------------------|--------------------------|-----------------------------|
| It is hard to carry home                    | 1.05 (0.71 to 3.18)    | 1.75 (0.84 to 3.61)     | N/A                      | N/A                         |
| It costs too much                           | 1.10 (0.75 to 1.62)    | 1.53 (1.09 to 2.14)     | 1.48 (0.94 to 2.34)      | 1.83 (1.34 to 2.50)         |
| I have been too busy                        | 6.34 (2.95 to 13.62)   | 2.49 (1.20 to 5.16)     | 0.67 (0.15 to 2.95)      | 2.12 (1.34 to 3.35)         |
| I keep forgetting                           | 3.23 (1.76 to 5.92)    | 1.65 (0.85 to 3.23)     | 0.47 (0.14 to 1.54)      | 1.41 (0.99 to 2.02)         |
| I would need help to fit it                 | 1.98 (1.03 to 3.81)    | 3.61 (2.11 to 6.17)     | 1.00 (0.65 to 1.53)      | 1.88 (1.39 to 2.54)         |
| I did not know you could get them           | 6.01 (2.64 to 13.65)   | 4.47 (1.53 to 13.05)    | 1.61 (1.07 to 2.42)      | 3.96 (2.77 to 5.66)         |
| I do not want one                           | 1.58 (1.14 to 2.20)    | 1.59 (1.18 to 2.15)     | N/A                      | 0.89 (0.67 to 1.19)         |
| Children know not to go near                | 0.54 (0.34 to 0.85)    | N/A                     | 0.90 (0.63 to 1.28)      | N/A                         |
| Falls from window are not likely to happen  | N/A                    | N/A                     | 1.58 (1.10 to 2.26)      | N/A                         |

N/A, not applicable.

## Key points

- Our results indicate that families from non-white ethnic minority groups engaged in fewer safety practices than whites.
- Measures of deprivation do not explain the relationship between whites and non-white ethnic minorities and safety practices.
- Families from non-white ethnic minority groups were significantly more likely to indicate that they did not know they could get a range of items of safety equipment than whites, suggesting a lack of access to safety equipment information.
- Further work is required to examine the association between exposure to home hazards, supervisory practices, adoption of safety practices, and injury occurrence in children from families of an ethnic minority.

United Kingdom have been found to differ between Asian and African-Caribbean groups.<sup>12–19</sup>

We assessed socioeconomic disadvantage using the Townsend score.<sup>16</sup> While such a measure may be less useful for more mobile populations such as recent immigrants, we were also able to collect data on, and adjust our analyses for, individual measures of disadvantage such as the receipt of means tested benefits and parental employment.

Families sent a safety practices questionnaire and an invitation to participate in the trial were living in deprived areas of Nottingham and thus, our results may not be generalisable to the general population. Furthermore, while the results of our study are based on a large sample and we were able to compare the safety practices of those wishing to participate in the trial with those not wishing to participate, we do not have information on the safety practices of those not returning the questionnaire which may limit the generalisability of our results.

### How our study compares to previous studies

Few studies have examined the rate of adoption of safety practices by ethnic origin. The only study in the United Kingdom to date found that families of an ethnic minority group possessed fewer items of safety equipment and adopted fewer safe practices, but this study did not examine variations in specific items of safety equipment by ethnic group.<sup>14</sup> Several studies from the United States have found that black families are less likely to adopt a range of safety practices than white families,<sup>20–22</sup> but it is difficult to compare these results with ours as they dichotomously coded race into white and black and the ethnic origins of those classed as black are unknown. These studies do, however, lend support to our findings that families from ethnic minorities are likely to adopt fewer safety practices than white families.

### Implications for research and practice

The results from this and previous studies indicate that families from non-white ethnic minorities adopt fewer safe practices. The two largest studies from the United Kingdom examining the relationship between ethnicity and unintentional injury in childhood have found lower injury rates among families from ethnic minority groups.<sup>12–13</sup> This is particularly interesting in the light of our findings of a lower prevalence of safety practices among these families. It is therefore possible that children from ethnic minorities may be exposed to fewer hazards within the home or that families

from ethnic minorities may find other ways of keeping their children safe, such as different supervisory practices, safety rules, or cultural differences in child play and activities. Further work is required to examine the association between exposure to home hazards, supervisory practices, safety rules, child play and activities, adoption of safety practices, and injury occurrence in children from ethnic minorities.

This study has provided some evidence of a lack of access to information regarding safety equipment, as families from non-white ethnic minority groups were less likely to be aware of the existence of several items of safety equipment and more likely to say they needed help with fitting equipment. This highlights the need for health professionals to ensure that families from ethnic minorities are made aware of items of safety equipment and are helped to access and fit such equipment.

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### Authors' affiliations

C Mulvaney, D Kendrick, Division of Primary Care, University of Nottingham, UK

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