ORIGINAL ARTICLE

Evaluation of Safe Kids Week 2004: Age 4 to 9? It's Booster Seat Time!

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Objective: To assess the effectiveness of a national one week media campaign promoting booster seat use.
Design: Pre-test, post-test design based on nationally representative random digit dialing telephone survey, with control for exposure to campaign.

Setting: Canada.

Subjects: Parents of children aged 4–9 years.

Interventions: During a one week campaign in May 2004, information on booster seat use was distributed via a national media campaign, retail stores, medical clinics, and community events. Information included pamphlets with guidelines for booster seat use, as well as a growth chart (designed by Safe Kids Canada) to assist parents in determining if their child should be using a booster seat. Assessing seat belt fit was described in detail on the growth chart.

Main outcome measures: Knowledge, attitudes, and self-reported behaviors regarding booster seat use.

Results: Respondents in the group exposed to the campaign were twice as likely to report using a booster seat with lap and shoulder belt for their child (47%), compared to those in the pre-test (24%) and the unexposed (23%) groups ($p < 0.001$). However, only small differences in general knowledge regarding booster seat use were found between the groups.

Conclusions: A one week national media campaign substantially increased self-reported use of booster seats. Parents did not remember details of the campaign content, but did remember implications for their own child.

For children aged 4–9 years, booster seats are effective in reducing injury rates in motor vehicle collisions, compared with lap and shoulder belts.^{1,2} Booster seat use, however, is low, and the majority of children prematurely graduate from forward facing child safety seats to adult seat belts.^{3,4} In 1997 it was found that in Canada, only 4.5% of children aged 5–9 years were restrained using booster seats.⁵ Barriers to booster seat use include cost, child acceptance, and parental misinformation.^{3,4,6,7} The objective of this study was to evaluate the effectiveness of a national public awareness campaign in increasing knowledge and use of booster seats in children 4–9 years old in Canada.

METHODS

During a one week campaign in May 2004, information on booster seat use was distributed via a national media campaign, retail stores, medical clinics, and community events run by partner organizations. Information included pamphlets with guidelines for booster seat use, as well as a growth chart (designed by Safe Kids Canada) to assist parents in determining if their child should be using a booster seat. Assessing seat belt fit was described in detail on the growth chart. The target population for the campaign was parents of children between the ages of 4 and 9 years. The campaign was fully implemented in both official languages—English and French. Key messages of the media campaign were: (1) take our seat belt test to see if your child is big enough to use one and (2) if your child is too small for the seat belt, use a booster seat on every ride. An important point is that sufficient information was provided to allow parents to decide then and there, when seeing the campaign message, whether their child needed a booster seat. This was reinforced by distribution of almost 1 million growth charts depicting correct automobile restraints by height.

Approximately one week before the campaign, a nationally representative random digit dialing telephone survey was conducted to assess knowledge, attitudes, and behaviors regarding booster seat use. The criteria for respondent inclusion in the study were: over the age of 18 years; French or English speaking; the parent or legal guardian of at least one child between the ages of 4 and 9 years; and informed consent. If respondents had more than one child in this age group, they were asked to answer questions relating to the child whose birthday was approaching next. A child was considered appropriate for booster seat use if their height was 57 inches or less and their weight was 40–80 pounds. To minimize non-response error, each telephone number was called at least six times (daytime, evenings, and weekends) in an attempt to achieve contact before a substitution number was used.

Approximately one week after the campaign a repeat survey using the same methodology was conducted to evaluate the effectiveness of the campaign. Parents were asked to name three criteria they use to decide if a seat belt fits their child correctly (open ended), whether they would support a booster seat law (yes/no), what automobile restraint device their child currently used (select from list, list presented in random order), and the age and height at which using seat belts for children is appropriate. Respondents were also asked to provide details regarding their child's gender, age, weight, and height. Questions concerning campaign exposure were asked at the end of the interview. Exposure to the campaign was defined as "seeing, hearing or reading anything about a child safety campaign called Safe Kids Week" in the previous two weeks, or recalling/picking up a growth chart. All interviews were conducted by trained interviewers using a standardized questionnaire.

Table 1 Automobile restraint use in children meeting criteria for booster seats

	Pre-test	Post-test		p Value
	n (%)	Exposed, n (%)	Unexposed, n (%)	
Booster seat with lap and shoulder belt	45 (24%)	33 (47%)	27 (23%)	0.0005
Lap and shoulder belt	77 (41%)	20 (29%)	48 (41%)	
Child safety seat with harness straps	9 (5%)	3 (4%)	4 (3%)	
Other*	55	13	37	
Total who met criteria for booster seat	186	69	116	

*Includes lap seat belt only, lap portion of shoulder belt, booster seat with lap belt only, nothing, other, and don't know.

Chi-square analyses were conducted to determine the associations between the study variables and the three groups of respondents (pre-test, post-test exposed, and post-test unexposed). Ethical approval for the study was received from the research ethics review board at the Hospital for Sick Children.

RESULTS

Media campaign

As mentioned above, the key messages of the media campaign were (1) take our seat belt test to see if your child is big enough to use one and (2) if your child is too small for the seat belt, use a booster seat on every ride. Three hundred and eighty nine community partner organizations participated in the campaign and of these, 228 partner organizations reported reaching over 100 000 parents, caregivers, and children through their activities. Of these, 238 partner organizations ran a car seat clinic or booster seat fitting station, and almost 3900 car seats were checked during Safe Kids Week. Partner organizations ordered 493 200 (English and French) growth charts; retailers distributed another 500 000 copies. (The growth chart proved so popular that by the end of August 2004, demand depleted the remaining 108 500 English growth charts to partners and parents.) Forty nine million media impressions (newspaper, television, and radio) with on-point messaging were reported by Environics Consulting, the media relations firm coordinating the campaign.

Survey participants

A total of 265 and 260 respondents met the study inclusion criteria and completed interviews at the pre-test and post-test, respectively (the total numbers of dialed calls were 40 717 for the pre-test and 25 890 for the post test, with 2118 and 2014 respondents completing a larger (unrelated) survey, of whom 265 and 260 had children in the correct age group). At post-test, 97 respondents (37%), reported having been exposed to the Safe Kids Week booster seat campaign. Of these 97 respondents, 68 (26.5%) recalled the campaign, 52 (20.2%) recalled the growth chart, and 33 (14.5%) actually

picked up a growth chart. Of children aged 4–9 years, 78 (80%) required a booster seat by reported height and/or weight, 12 (13%) were too small, and 7 (7%) were too big for a booster seat.

Knowledge

Respondents' general knowledge of booster seat use in the three groups is shown in table 2. Small proportions in all three groups correctly identified age 8 or 9 years as the age children would be ready for a seat belt (approximately 25%–30%), and 57 inches and above as being the correct height for seat belts (approximately 8%–9%). Respondents in the exposed group, however, were significantly more likely than those in the pre-test or unexposed groups to correctly identify at least one correct criterion for proper seat belt fit (22% v 14% and 18% respectively, $p = 0.033$). The criterion identified most frequently by all three groups was that the seat belt should fit across the shoulder and not lay across the chest.

Attitudes

The majority (88%) of respondents reported that they would support a law requiring children to use a booster seat until they were ready for a seat belt, with no significant differences between the three groups.

Behavior

There were significant differences in self-reported use of booster seats (in children who met the criteria for booster seat use) between the three groups (table 1). Respondents in the group exposed to the campaign were twice as likely to report using a booster seat with lap and shoulder belt for their child (47%), compared to those in the pre-test (24%) and the unexposed (23%) groups ($p < 0.001$).

Respondents at pre-test did not differ from those at post-test in terms of age, sex (43% male), language, marital status, employment status, household income, or region of residence. There were also no significant differences in child characteristics such as age, sex, weight, and height at pre and post-test. None of these factors differed between exposed and non-exposed parents in the post-test either, except language

Table 2 Number of respondents who identified proper seat belt fit criteria

	Pre-test	Post-test		p Value
	n (%)	Exposed, n (%)	Unexposed, n (%)	
Seat belt fits across the shoulder	50 (9.7)	30 (14.0)	36 (12.3)	0.213
Over specified height for booster seats?	12 (2.3)	11 (5.1)	12 (4.1)	0.127
Seat belt fits lap properly	9 (1.8)	5 (2.3)	4 (1.4)	0.717
At least one correct criterion	71 (13.8)	46 (21.5)	52 (17.8)	0.033
Total number of respondents	513	214	292

Booster seat for children aged 4–9 years.

which was English for 85% of those exposed to the campaign, compared with 65% of those unexposed ($p < 0.01$, χ^2). Campaign material was all available and promoted in both official languages (English and French).

DISCUSSION

A significant increase in self-reported booster seat use was noted among respondents exposed to a one week national booster seat campaign, compared with respondents before the campaign, and those unexposed to the campaign. The most common type of restraint reported used by those exposed to the campaign was a booster seat with a lap and shoulder belt (47%), whereas for those in the pre-test and no exposure groups the most common restraint reported was lap and shoulder belt (approximately 41%). There were insignificant changes in general knowledge regarding the age and height parents felt children would be ready for a seat belt between respondents at pretest and those exposed and unexposed to the campaign. The only significant difference was more respondents exposed to the campaign were able to correctly identify at least one criterion for proper seat belt fit.

There is a small body of literature looking at the effectiveness of specific interventions in increasing booster seat use. A recent meta-analysis of five studies which evaluated the effectiveness of interventions to increase acquisition and use of booster seats among 4–8 year olds, found that interventions are effective when combining incentives with education.⁸ Although many of these interventions have reported “success”, it has been noted that the rates of booster seat use in eligible populations continue to be low after the intervention. In a small study looking at a combination of an educational program with a booster seat giveaway, 66% of children still rode inappropriately restrained after the giveaway.⁹ Another study which evaluated a much larger 15 month multifaceted community booster seat campaign, found that almost three fifths of the children were still not using booster seats at the study’s conclusion.¹⁰ Therefore, it may be important to use a variety of concurrent intervention strategies, including community education, primary care physician and parent/caregiver education, giveaway and discount programs, media

Key points

- Booster seats are highly effective at preventing child passenger injury.
- Booster seat use rates are low among 4–9 year olds.
- A one week national media campaign substantially increased self-reported use of booster seats.
- Parents did not remember details of the campaign content, but did remember implications for their own child.

campaigns as well as legislation and enforcement to achieve higher rates of booster seat use.

The present study resulted in a somewhat higher proportion of reported use of booster seats at 47%. This may be related to self-report rather than direct observation of booster seat use. Another limitation of the present study was that the post-test was done immediately after the intervention, so it is unknown whether the changed behavior (that is, increased booster seat use), was maintained over time.

The highest proportion of positive responses at 88% was support for appropriate booster seat legislation. Advocacy is a second component of this and other Safe Kids campaigns, and two Canadian provinces (Ontario and Nova Scotia) have mandated booster seat use since the campaign.

Large, significant differences in self-reported behavior despite only small differences in knowledge seems paradoxical but probably is not. Our interpretation is that parents process the campaign message specifically for their own children. As a result, they may not memorize the criteria and be unable to recall them later, but they do realize, and remember, that their own child should be in a booster seat. If this is true it has several implications for such campaigns. The message must be complete, concise, credible, comprehensible, and self-contained so that parents can draw appropriate conclusions for their children at the time they see it. Further, the message must be repeated at developmentally appropriate stages for the child, rather than relying on parental learning or memory. From a public health perspective, it is important to recognize that a community education program to increase booster seat use may be effective for a specific cohort of children, but that the effects of the educational program may likely diminish over time when younger siblings reach booster seat age. Broad campaigns are only part of the solution to booster seat non-use.

Implications for prevention

What this paper adds is that large, intensive, brief national media campaigns do change parent’s self-reported behavior of booster seat use, but that the information behind this behavior change is not well retained by parents, so probably needs to be made available repeatedly.

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LACUNAE

Why does this house not seem safe? Contributed by Vicky Scott, B C Injury Research & Prevention Unit, and Ministry of Health, Victoria, British Columbia, Canada.