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Factors influencing the use of booster seats: A state-wide survey of parents

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Abstract

This study used telephone interview data on booster seat use from a state-wide probability sample of parents with children ages 4–8-years-old who were living in Michigan. Interviews were completed with parents of children in 350 households. Analyses examined the entire sample, and three sub-groups: always users, part-time booster seat users, and booster seat non-users. Results indicated that booster seat legislation was a key determinant of the level of use and the motivation to use booster seats. Nearly 70% of part-time users said that they used booster seats because they believed it was the law. Similarly, 60% of part-time and non-booster seat users said that they would be more likely to use booster seats if use were mandated by law, with non-users being 3.5 times more likely than part-time users to agree that a law would increase their booster seat use. Finally, over 90% of part-time and non-booster seat users said it would be easier for them to use booster seats if a law required it, and non-users were almost six times more likely than part-time users to agree that a law would make use easier. The need for booster seat laws, issues of social equity, and implications for intervention were discussed.

Keywords: Booster seats; Child restraints; Probability sample; 4–8-Year old; Parents

1. Introduction

1.1. Background

It is widely recognized in injury prevention and transportation safety that motor vehicle crashes (crashes) are the leading cause of morbidity and mortality among children ages 4–8 (Subramanian, 2005). Although crash-related injuries have recently declined (National Highway Traffic Safety Administration (NHTSA), 2003a), child restraint non-use remains common in this age group, contributing significantly to crash-related injury. Booster seats effectively protect young children from crash-related injury, decreasing injury risk by as much as 59% (Durbin et al., 2003a,b,c; Nance et al., 2004).

Children who outgrow infant and toddler seats are still too small to be fully protected by a safety belt designed for an adult, and are often either not placed in booster seats, placed inappropriately in a safety belt, or left unrestrained. More than 50% of children killed in crashes in 2003 were completely unrestrained, and 50–95% of booster-seat-aged children were inappropriately placed in safety belts (Decimal and Kneel, 1997; Durbin et al., 2003a,b,c; Eby et al., 2000; NHTSA, 2003b).

Rather than provide protection from injury during a crash, 4–8-year-old passengers who are improperly restrained in safety belts are at two times the risk of injury compared to those seated in booster seats. Children restrained with safety belts are 3.5 times more likely than children placed in booster seats to be injured and 4.2 times more likely to experience head trauma (Durbin et al., 2005; Winston et al., 2000). Adult safety belts are designed to fit individuals of typical adult stature. When children are restrained in safety belts the lap belt tends to cross their abdomen, and contribute to severe internal injuries in a crash. Children who are 4–8-years-old tend to be too short for the shoulder belt, resulting in the shoulder belt being positioned across the neck or lower face rather than across the chest and clavicle. This improper positioning contributes to neck and face

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crash-related injuries. The improper positioning of the shoulder belt is also uncomfortable; hence children (or their parents) will place the shoulder belt under the arm or behind the back. In this case a crash causes the child's body to bend sharply at the waist; the head often contacting the knees and causing head injury. Safety-belt-positioning booster seats compensate for children's small body sizes by raising them up relative to the safety belt so that both lap and shoulder belts fit child passengers' hips, chests, and necks. Given the unquestionable safety benefits, NHTSA (2005) recommends placing children in booster seats when they out-grow child safety seats. Nevertheless, rates of booster seat use remain low (Durbin et al., 2003a,b,c; Decimal and Kneel, 1997; Ebel et al., 2003; Ramsey et al., 2000; Taft et al., 1999). In order to design effective programs promoting booster seat use, an understanding of the barriers to booster seat use, and the factors that promote use is essential. Such knowledge is currently lacking.

In a nationwide telephone survey, over 80% of parents of booster-seat-age children were aware of and/or owned booster seats (NHTSA, 2004), but fewer than 50% knew that children weighing 40–60 pounds should be placed in booster seats, and less than two-thirds understood their state's child safety restraint laws. Thus, one factor affecting booster seat use may be the lack of accurate information. A few studies have investigated factors influencing parents' use of booster seats (Ebel et al., 2003; NHTSA, 2004; Ramsey et al., 2000; Vaca et al., 2002). Collectively, these studies found that child safety is the primary motivation parents give for using booster seats. Other reasons included increased child comfort and ability to see outside the car. Commonly cited barriers to booster seat use were children's dislike for booster seats, parent's belief adult safety belts protected their child, unavailability of booster seats, difficulty placing the seat in a particular vehicle, and the belief that booster seats increase injury risk.

1.2. Study purpose

This study further investigated factors that influence booster seat use and non-use in a state-wide probability sample of parents residing in Michigan with children ages 4–8. This study was the first to examine factors related to booster seat use in a state-wide probability sample, and was unique from previous research on child restraint use because it: examined data from a state-wide probability sample, examined booster seat knowledge, evaluated parents' reasons for use and non-use, and asked parents to identify factors that would increase their booster seat use. The information from this unique study will contribute to a greater understanding of booster seat use, and provide important information to guide the development and implementation of programs and policies to increase booster seat use.

2. Methods

2.1. Sample

A random sample, stratified by Metropolitan Statistical Areas (MSAs), of 350 parents of children 4–8-years-old was recruited by calling telephone numbers from a state-wide household listing. The MSAs included city centers; MSAs outside city centers; suburban counties; and areas not in an MSA. When the interviews were conducted, MSAs without a city center did not occur in Michigan. The final sample distribution across MSA strata was 27% from city centers, 47% from outside city centers, 8% from suburban counties, and 18% from areas not in an MSA. Telephone interviews were conducted using a computer automated telephone interviewing system. Participant eligibility was assessed by asking how many 4–8-year-old children lived in the household. Parents with at least one target-aged child were eligible to participate.

Participants in the telephone survey were 33% male ($n = 115$), 65% mothers, 33% fathers, 0.3% step-mothers, 0.3% step-fathers and 1.4% other adult caregivers. Forty percent of the sample graduated college and 42% completed less than a 4-year college degree. The majority of participants were married (92%) and white (93%), with only 3% African American. Thirty-six percent of women and 97% of men were employed full-time, and 23% of women were employed part-time, 25% of the respondents had household incomes between $35 000 and $49 999, and 42% reported incomes greater than $50 000.

Demographic characteristics of the sample were compared with the National Household Travel Survey (NHTS) to determine how closely it matched the Michigan population of eligible households. U.S. Census data could not be used because public data have been collapsed across the age-group of interest. NHTS data weighted to represent a 100% sample showed that 79% of eligible households in Michigan were white, 15% African American, and less than 1% were Asian, Hispanic/Latino, or multiracial. Other demographic characteristics were highly similar between the NHTS and the sample for this study.

In an attempt to correct for under representation of African Americans in the sample, post-stratification weights were calculated from the NHTS data to adjust for differences between the racial distribution of the sample for this study and that for the NHTS. This was achieved using the following calculation:

$$w_{ij} = \frac{S_j}{p_j}$$

where w_{ij} is the weighted value for case i in group j, S is the proportion of the population in group j, and p is the sample proportion in group j. This weight was used to estimate weighted and unweighted cross-tabulation and logistic models. The conclusions based on the two sets of results were identical; hence, the unweighted results are reported here.

2.2. Measures

The survey measures were developed by the authors with assistance from certified child passenger safety inspectors and instructors, Michigan Child Safety Coalition members, law enforcement officers, and child safety experts from the Michigan Department of Community Health.