

# Poor Compliance with Child Safety Restraint Use While Travelling

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## Abstract

Road traffic accidents are a leading cause of death of children. It is the law that all children should be appropriately secured when traveling in vehicles. The aim of this study was to evaluate parental conformity with these regulations and to test if advice given at a Paediatric outpatient clinic could improve compliance. Two groups were assigned, an intervention group (parents given an information leaflet and a clear explanation about appropriate restraints for their children) and a non-intervention group (received no information). They were contacted again after 2 months and asked regarding compliance. A total of 394 children from 186 families were initially given the questionnaire. Nearly one third of children (29.2%) were not using any restraint while travelling rising to 35.3% on follow up. This study concluded that once off parental education made negligible difference to an already inconsistent and haphazard approach to compliance with safety regulations.

## Introduction

Motor vehicle collisions are a major cause of childhood mortality. In a car accident at 50km/hr (30 mph) an unrestrained child would be thrown forward with a force 30 to 60 times their body weight<sup>1</sup>. Appropriate child restraints secure the child to their seat preventing them from being thrown around the vehicle and in the event of a crash force is distributed over a larger body area thus reducing the risk of severe injury. A previous Irish study researching child car passenger fatalities in the period of 1996 to 2000 revealed that 77% of child fatalities were found to not have been using a child restraint or seatbelt<sup>2</sup>. Other studies have also shown the lack of appropriate restraint use is common among children who are killed or injured<sup>3,4</sup>. Correctly used safety restraints have been estimated to reduce the risk of fatality by 71% and risk of serious injury by 67%<sup>5</sup>. Improperly fitting seat belts can cause severe injury including lumbar fractures, and head, neck and abdominal injuries<sup>6,8</sup>. The Road Safety authority has issued guidelines on the correct equipment which is based on weight and height of the child (Table 1). The aim of this study was to evaluate appropriate restraint use for children attending the Paediatric outpatients department at Sligo General Hospital and to investigate if parental education regarding restraint use was of value in an intervention group.

## Methods

The study was carried out at the Paediatric outpatient department at Sligo General Hospital. Data was collected for 2 months between 2nd January and 28th February 2007. Parents or guardians of patients from birth to 14 years old were approached by two observers and consented for participation in the study. Two groups were assigned, the intervention group and the non-intervention group. Intervention and non-intervention groups were assigned to alternate weeks and participants were allocated according to the week of the study. All participants completed a questionnaire where information was gathered on the index case with regards to age, weight, height and method of car restraint. Information was also collected for all siblings <14 years old. Those randomized to the intervention group were given a copy of the road safety authority guidelines leaflet and this was read through with the parent / guardian in a standardized manner highlighting specific key points. Then non-intervention group received no information.

Following a two-month interval the participants were contacted and a follow up questionnaire was completed over the telephone enquiring as to their current car restraint use. All phone calls were made by two observers who were blinded as to whether the participants were in the intervention or non-intervention group. Exclusion criteria included children with special needs and those travelling on foot, by taxi or by ambulance. Ethical approval was obtained for this study.

## Results

A total of 394 children from 186 families were included in the study. The number of children for each family (n=186) ranged from 1-5 (Figure 1). Two children was the most common number representing 68 of the families (36.6%), followed by 1 child accounting for 57 families (30.6%). Forty six families had 3 children (24.7%) with 4 and 5 children occurring less frequently at 6.5% and 1.6% respectively. A total of 279 children were placed in restraints while travelling representing 70.8% of children. Almost one third of the children in the study (29.2%) were travelling with no safety restraints. At the beginning of the study the data derived from questionnaire 1 showed that 129 families in the study had more than one child. Of these 63 families were using a mixed approach for different children restraining some and not the other(s). Fifty seven families were compliant for all of their children leaving 9 that were not compliant for any of their children.

Figure 1: Number of children per family initially surveyed (n = 186)

Figure 2: Compliance with restraint use with or without the use of intervention

Figure 2 gives a breakdown of the results. Sixty three children from 27 families were lost to follow up leaving 331 children from 159 families in the final analysis of the intervention versus non intervention groups. The group assigned to intervention included 156 children from 75 families, with 175 children from 84 families in the non-intervention group receiving no advice. The use of intervention was shown to be of no benefit. Overall at the beginning of the study from the intervention group, compliance was seen for 110 children (70.5%), this reduced to 108 (69.2%) on follow up. The non-intervention group had 125 children appropriately restrained (71.4%) which increased to 129 (73.7%) without any intervention. In the follow up questionnaire 2 parents were still using a haphazard and mixed approach for their children. In spite of being compliant for some children they did not appropriately restrain the remaining children in the family. At follow up only 21 families remained fully compliant for all of their children from the non-intervention group and 15 families from the intervention group representing only 36 of the 159 families studied.

A total of 58 children studied were below 1 year of age. Parents were compliant for 51 of these children (88%). At follow up parental compliance for the under 1 year olds decreased from 51 to 44 of the 58 children (76%). In the follow up questionnaire 2 months later parents of 93 children from the intervention group remained compliant and 111 of the non intervention group totalling 214 children. This left a remaining 117 children who were not wearing any restraints in the follow up questionnaire from both groups increasing non-compliance over a period of 2 months from 29.2% to a startling 35.3%.

**Discussion**

The law now states that all children should be securely restrained when travelling in motorized vehicles and guidelines are available for parents to inform them of the appropriate equipment required. This study was completed to evaluate compliance of parents with this regulation. It is imagined that with such a precious cargo parents would conform 100%. However, the results of this survey are worrying. Almost one third of children were not restrained and on re-evaluation this level rose to 35.3%. Our figures are based on the honest response of parents on direct questioning which introduces some bias and may underestimate the rate of non-compliance. The level in other studies ranged from 5%<sup>9</sup> to as high as 45.4%<sup>10</sup>. The lack of consistency for the approach to placing their children in safety restraints while travelling was astounding with some families restraining some children and not others, and changing their practice within a period of 2 months. The lack of compliance of parents with children under the age of one year is appalling and this decreased on follow up. The overall approach is haphazard and careless. This raises the question as to why this is happening and what can be done to promote change.

A once off education session in this survey was shown to be futile. Philbrook and colleagues<sup>11</sup> completed a study based on increasing booster seat knowledge and use in kindergarten-age children. They found that providing information alone was ineffective and that the most effective measure was educating parents in groups combined with teaching children in the classroom and providing an incentive booster seat. Reasons cited by parents for lack of restraint use include lack of knowledge of booster seat and seat belt use for each age group, too many other passengers in the car, difficulty installing or using booster seats, child resistance to using restraints, inconvenience of use and cost<sup>9,11-13</sup>. Younger age groups are more likely to be restrained with the level of restraint use decreasing as the child's age increases.<sup>3,12</sup> Factors influencing restraint use in children have been shown to include child age and number of children in the car<sup>3,10</sup>, driver's gender<sup>10</sup> and seat belt use by the driver<sup>3,10,12</sup>, time of driving and rural versus urban area<sup>3</sup>.

Incentives for use of child restraints are urgently needed. Appropriate restraints could be subsidized to increase ownership. Education of both parents and children alongside such an incentive has been shown to improve compliance. This would be most effective if backed up by strict enforcements by the relevant authorities. A frank add campaign is already being run against driving under the influence of alcohol; such an effective advertisement campaign is needed to increase awareness. This can be raised through publicity campaigns emphasizing the need for appropriate restraints for children of different ages according to their weight. The existing Road Safety Authority guidelines base restraint use on the weight of the child; this may be confusing for parents who are not aware of their child's weight. An appointment at which a child is weighed provides ample opportunity to check for appropriate restraint use.

This study reflected a parent population in Sligo; however it is unlikely that there is significant difference in the remainder of the country. As Paediatricians we see a multitude of children on a daily basis who travel to our clinics, the ward and to accident and emergency department. The question arises if we should enquire regarding the method and appropriateness of the restraint used and provide information to parents to encourage restraint use. Intervention is urgently required as is reflected by this study. A shocking percentage of approximately one third of children are travelling without any safety precautions. This exposes this vulnerable and precious population to severe injury and even death in an accident.

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#### References

1. Child Safety in Cars, A guide to selecting and fitting child restraints. Road Safety Authority (RSA) booklet. 2007.
2. Waters A, Trace F, Nicholson AJ. The "Road to Safety" in Irish children over the past five years. *Ir Med J.* 2006 Jan;99:19-21
3. Agran PF, Anderson CL, Winn DG. Factors associated with restraint use of children in fatal crashes. *Pediatrics.* 1998 Sep;102:E39.
4. From the Centers for Disease Control and Prevention. Motor-vehicle occupant fatalities and restraint use among children aged 4-8 years--United States, 1994-1998. [No authors listed] *JAMA.* 2000; May 3;283:2233-4.
5. Winston FK, Durbin DR, Kallan M, Moll E. The danger of premature graduation to seat belts for younger children. *Pediatrics.* 2000;105;1179-83.
6. Anderson PA, Rivara FP, Maier RV, Drake C. The epidemiology of seatbelt-associated injuries. *J Trauma.* 1991;31;60-67.
7. Kahane CJ. An evaluation of child passenger safety: the effectiveness and benefits of safety seats. Washington: US Department of Transport, National Highway Traffic Safety Administration. 1986. Report number DOT HS 806 890.
8. Sturm PF, Glass RF, Sivit CJ, Eichelberger MR. Lumbar compression fractures secondary to lap-belt use in children. *J Pediatr Orthop.* 1995;15;521-523.
9. Ebel BE, Koepsell, TD, Bennett EE, Rivara FP. Too Small for a Seatbelt: Predictors of Booster Seat Use by Child Passengers. *Pediatrics.* 2003;111;323-327.
10. Ramsey A, Simpson E, Rivara FP. Booster Seat Use and Reasons for Nonuse. *Pediatrics.* 2000 106: E20
11. Oliveira SR, Carvalho MD, Santana RG, Camargo GC, L...ders L, Franzin S. Child safety restraint use among children attending day care centers. *Rev Saude Publica.* 2009 43;761-767.
12. Philbrook JK, Kiragu AW, Geppert JS, Graham PR, Richardson LM, Kriel RL. Pediatric injury prevention: methods of booster seat education. *Pediatr Nurs.* 2009;Jul-Aug;35:215-220.
13. Simpson EM, Moll EK, Kassam-Adams N, Miller GJ, Winston FK. Barriers to Booster Seat Use and Strategies to Increase their use. *Pediatrics.* 2002;110: 729-736.