HHS Public Access

Author manuscript

Inj Prev. Author manuscript; available in PMC 2020 July 16.

Published in final edited form as:

Inj Prev. 2020 February ; 26(1): 18–23. doi:10.1136/injuryprev-2018-042989.

Safety seat and seat belt use among child motor vehicle occupants, Cluj-Napoca, Romania

Diana Dulf[1], **Corinne Peek-Asa**[2], **Florin Jurchiș**[1], **Erika-Andrada Bărăgan**[1]

[1]Department of Public Health, College of Political, Administrative and Communication Sciences, Babes-Bolyai University, Cluj-Napoca, Romania

[2]Department of Occupational and Environmental Health, College of Public Health, University of Iowa, Iowa City, Iowa, USA

Abstract

Background—Use of seat belts and car seats for children are among the most effective interventions to reduce injury severity when a crash occurs. The use should be enforced in order to have an increase in wearing these restraints. Romania has the lowest rate of using seatbelts in the backseat, 16%. The purpose of the study is to describe the use of child safety restraints and compare it with existing standards of good practice.

Methods—An observational study on child safety restraint was conducted in Cluj-Napoca, Romania, between 2013 and 2014. Observational sites included 38 schools and kindergartens and three commercial areas, where drivers (n=768) and child passengers (n=892) were observed. Observations were conducted as vehicles parked or pulled to a stop and were followed by driver surveys on knowledge and attitudes towards restraint legislation and child safety behaviour as car occupants.

Results—The proportion of observed child motor vehicle occupants wearing some type of restraint was 67.4% (n=601). The majority of children (82.6%) were in the back seat, and 14.2% of infants were in a rear-facing child seat. The proportion of restrained children declined with age, with children 5 years old or younger being almost five times more likely to be properly restrained (OR 4.87, 95% CI 2.93 to 8.07) when compared with older children.

Conclusions—Although minimum legal requirements of child motor vehicle occupant safety were in place in Romania at the time of the study, the rates of using children restraints was low compared with other middle-income and high-income countries.

INTRODUCTION

Each year, around 10 million children worldwide are killed or disabled as a result of a traffic crash.[1] More than 90% of paediatric road deaths occur in low-income and middle-income

Correspondence to Mrs Diana Dulf, Department of Public Health, College of Political, Administrative and Communication Sciences, Babes-Bolyai University, Cluj-Napoca 400084, Romania; diana.dulf@publichealth.ro.

Competing interests None declared.

Patient consent for publication Not required.

Provenance and peer review Not commissioned; externally peer reviewed.

countries,[2] where the continuous increase in motorization due to economic development contributes to the rising number of children who suffer from traffic injuries.[23] Increased motorization in low-income and middle-income countries also leads to an increase in the number of children travelling as motor vehicle occupants. In 2008, WHO reported that among 36 European countries, car occupants accounted for 36% of road traffic fatalities in people under 17 years of age.[1] In Romania, this proportion was estimated at 31%.[4]

Motor vehicle occupant protection including seat belts and car seats for children are among the most effective interventions to reduce injury severity when a crash occurs.[56] The correct use of age-appropriate and size-appropriate restraint systems and seatbelt can reduce the risk of death and serious injury by 71% for infants, by 54% for toddlers and up to 50% for older children.[78] Policies and legislation are commonly used to increase the use of occupant protection. In European Union, seatbelts have been mandatory for both drivers and passengers since 2006,[9] with average use reported as 85% in the front seat and 60% in the rear seat.[10] This European directive on seatbelts sets only minimum standards, and member countries have some flexibility to implement policies on child occupant restraint. In line with the European Union regulations and following this study, the Romanian Traffic Code was changed in September 2014 to include penalties for drivers who do not secure underage passengers with seatbelt or child safety restraints. Further modifications were enacted in 2015, requiring that children under the age of 3 or whose height does not exceed 135 cm should travel in a child safety seat, while older children should use seatbelts.[11]

Romania currently has limited data to document use of child occupant protection and compliance to existing laws. The aim of this study was to describe the use of child safety restraints prior to enacting these changes and to compare the use of child safety restraints and compare it with existing standards of good practice.

METHODS

Study design and participants

An observation of child safety restraint and driver seatbelt use, followed by a driver survey, was conducted in Cluj-Napoca, Romania using a methodology previously developed and implemented by University of Iowa, Injury Prevention Research Center in Iowa City and in Shantou, China.[1213] Cluj-Napoca is the second largest city in Romania,[14] with a population estimated at 309 136 people, out of which children, 0–19 years, represent 17.18%, according to the 2011 Census. Cluj-Napoca experienced an increase in registered passenger cars, of 17% from 2010 to 2014 in Cluj-Napoca,[15] which is still on the rise.

The study was conducted from October 2013 to May 2014 and represents the first observational study of child motor vehicle occupant safety in Romania. These were baseline data collected to represent trends prior to the anticipated new laws, and the observation was repeated after the implementation of the law. Observations were collected at three types of locations to represent children of all ages. A stratified sample of 41 sites was selected to represent all neighbourhoods in Cluj-Napoca. The sites included 24 kindergartens and day care centres, 14 schools and 3 commercial areas. The sites covered the central-downtown

area of the city, main neighbourhoods of the city and popular commercial areas that represent the metropolitan area of the city (figure 1).

Observers conducted the observations in the morning between 7:00 and 10:00 and in the afternoon between 15:00 and 17:00 to coincide with the time parents drop off or pick up their children. The afternoon time period was recommended by observers in the commercial areas. One to four trained observers were located at each site, depending on the number of vehicles. Observers were trained until more than 95% agreement was reached, and each observer had pictures of the observed types of child seats for reference during data collection period.

Study protocol

Information was collected through both observation and a brief driver survey. Passenger cars that had at least one child occupant were eligible for participation in both the observation and the driver survey. Vehicles were observed when they came to a stop at the site. Observers first noted if the vehicle contained a child passenger and if so, conducted the observation described below. A total of 892 child passengers and 768 drivers (since some vehicles had multiple child passengers) were observed. Next, the observers asked the driver if they were willing to participate in the driver survey; the willingness to respond was considered consent to participate, as no personal identification information was collected for the study. A total of 235 (30.6%) drivers declined to answer the survey, yielding a sample of 533 parents and a response rate of 69.4% to the driver survey, which represented 616 child passengers. The most common reason reported for declining survey participation was being in a hurry. A total of 24 parents did not respond to the questions regarding knowledge and attitudes, so results on these questions include 509 parent responses. Information about child age, height and weight was missing for 21 children which led to sample of 571 children with results on these questions. Drivers who responded to the survey were not statistically different from the overall sample based on observed driver gender, child restraint and seating position. The study protocol was reviewed by the Human Subject Board of the University of Medicine and Pharmacy Iuliu Haţieganu, Cluj-Napoca.

Data collection

Study instruments—The study instruments included one observation checklist and one driver survey. The study instruments were first translated from English to Romanian and pilot tested prior to implementation. The observation checklist included information about time and location of the observation, type of car, driver’s gender, driver’s seatbelt use, child safety restraint use, restraint type (child seat (including infant seat), booster seat and seat belt), child position in the car and orientation of the child seat.

The survey asked drivers about children’s age, weight and height. These variables from the driver survey, to which we added the facing position of the seat, were used to create a variable describing whether or not the child was properly restrained in order to assess if the restraint used was appropriate for the child in our sample population. Proper restraint was defined as using the type of restraint (child seat, booster seat or seatbelt) appropriately for their age and stature, based on the CDC criteria for children safe riding in the car.[78]

Therefore, all children under the age of 2 who were in a rear-facing car seat, and all children between the age of 2 and 5 who were in forward-facing car seat were considered properly restrained. In addition, children between the ages of 5 and 8, sitting in a booster seat, below 36 kg or had less than 145 cm height have been considered properly restrained. Improper restraint was defined as children who were using some type of restraint but did not comply with best practices for their age and stature, for example, children moved too soon to forward-facing positions, booster seats or seatbelts. Since the Romanian requirements for child occupant protection during the time of this survey only required that children under the age of 3 or under 150 cm be placed in a safety seat, with no further specifications, we did not assess compliance to the law. One limitation of the observation section was that it had no category for registering if only the lap portion of the belt was used or if the child seat was not correctly fastened. However, observers were trained to differentiate between being restrained or not and received pictures about the correct usage of child seats, booster seats and seat belts. If the safety equipment was not correctly used (eg, the child was in the seat but the seatbelts were not used or the child was seating next to the seat), the child was considered unrestrained for the observation checklist (table 1).

In the drivers' survey, drivers were also asked about driver's relationship to the child, child age and gender, and provided information on the drivers' education level, knowledge and attitudes regarding child safety restraints, reasons to use and not use child safety restraints, intentions to use a child safety restraint if required by law or offered free without charge in order to describe the use and identify possible strategies to increase the correct use of child safety restraints.

Statistical analysis—The collected data were entered into Qualtrics and descriptive and statistical analyses were run using SPSS software V.19.0. Descriptive statistics were used to examine the distributions of type of restraint used (eg, child safety seats, baby booster seats or seat belts) and child seating position. Differences were compared between the age groups and gender of child passengers using contingency table analysis. Logistic regression was used to identify characteristics associated with properly used safety restraint and improper use, both compared with no use at all. Models controlled for age and gender.

RESULTS

Observation

A total of 892 children and 768 drivers were observed in 41 sites in Cluj-Napoca to document the use of child safety restraint (table 1). Of the 768 drivers, 513 (66.8%) were wearing a seat belt, while a total of 601 (67.4%) children were wearing some type of restraint (table 1). Among all children, 305 (34.2%) were restrained in a child safety seat, 87 (9.8%) were restrained in a booster seat and 209 (23.4%) wore a seatbelt. Of the children in a car seat, 85.2% were forward-facing and 14.8% were backward-facing (table 1).

Survey

More than two-thirds of the 533 drivers with complete survey data (n=348, 68.4%) were aware of the existence of child safety restraint regulations in Romania and 13.1% indicated

that they were unaware (table 2). When asked about the safety of riding in an adult's lap, the majority of parents (n=389; 76.4%) indicated that it is not safe, 89 (17.5%) indicated that it is safe and 31 (6.1%) drivers did not know. When asked up to what age children should ride in a car seat, 47.7% responded that children should be in a car seat up to the age of 6, 20.4% responded up to the age of 3 and 20.0% responded up to the age of 12, with 10.2% reporting that they did not know. The same question was asked about booster seats. One-third of the parents (n=193, 37.9%) indicated that children up to the age of 6 should ride in a booster seat, while another third (n=176, 34.6%) indicated that children up to the age of 12 should ride in a booster seat (table 2).

The proportion of children who were using child safety restraints were different by age groups. Infants and toddlers have higher rates of restraints, 90.6%, while preschool children and primary school students have lower rates, 76.0% and 63.6%, respectively (table 3). The proportion of children having properly fastened restraints compared with improperly fastened restraints is similar, when compared by the CDC criteria used for this paper: 38.3% of children were properly restrained while 39.7% of children were improperly restrained. In the infants and toddlers' category, almost half of the children were properly restrained (n=60; 49.6%), and in the preschool children category, more children were improperly restrained (43.7%) than being properly restrained (37.5%) (table 3).

Compared with unrestrained children, children younger than 5 were almost five times more likely to be properly restrained compared with children older than 5 (OR 4.87, 95% CI 2.93 to 8.07) (table 4). Parent use of a seatbelt was associated with higher odds of properly fitting a child in a safety device (OR 3.84, 95% CI 2.10 to 7.05). In terms of parents' characteristics, parents having more education were more likely to restrain their children when travelling for both groups: properly used safety restraint (OR 1.81, 95% CI 1.10 to 2.98) and improperly used safety restraint (OR 1.26, 95% CI 0.77 to 2.06), while the gender of the driver and the relationship with the child were not associated with the use of child safety restraint (table 4).

Drivers who were using child safety restraints responded that they used it because of its safety and prevention features (n=290; 86.3%), it is a mandatory requirement of the law (n=23; 6.9%) or answered with a combination of the two mentioned reasons (n=17; 5.1%) (table 5). Among those who did not use a child safety restraint, low use was attributed to lack of awareness and knowledge (n=66; 41.8%) followed by being aware but choosing not to (n=44, 27.9%), financial reasons (n=20; 12.7%) and the safety seat being in a different vehicle (n=16, 10.1%) (table 5). They were also asked to give examples of what would motivate them to use child restraints for their children and 26.6% indicated that a better law would increase the use.

DISCUSSION

This study is the first to report proportions of child occupant restraint use and also the first to measure knowledge in Romania about safety restraints. Correctly restraining children is important in reducing injury severity; therefore, in this study the focus was on identifying

the use of child safety restraint in Cluj-Napoca, Romania and to describe parents' knowledge and attitudes towards safety restraints.

Observations of vehicles with child passengers indicate that 66.8% of drivers were wearing their seat belt and that 67.4% of the child occupants had some type of restraint. The proportion of parents who used a safety restraint for their children was much lower than reported in most high-income countries. For example, in Australia and the USA, the proportion of child occupants in restraints is reported as 90% and 86%,[16] respectively, while in Austria, in 2014, the child restraint use rate was almost 99%.[17] These high rates of compliance with child occupant restraints laws was not obtained by legislation alone but with a combination of educational campaigns and community-wide programmes,[18] programmes to make safety seats available, and enforcement.[19]

Our survey data showed that in the preschool (4–6 years) and school-aged children category (7–12 years), more children were improperly restrained than being properly restrained. An emergency room study showed that children between the ages of 4 and 8 were inappropriately restrained because they were moved too early to a seatbelt-only restraint; this study found that older children accounted for 77% of inappropriately restrained children.[20] Although our study was performed in another type of setting, our results reinforce the issue that older children travel unsafe as car passengers, children under 5 being almost five times more likely to be appropriately restrained than older children.

Another possible factor for child restraint use could be gender of the driver. Recent studies have shown an association between the gender of the driver and child safety restraint use, with women more likely to always restrain children under 150 cm.[20] Our study shows that gender was not a factor in using child safety restraint, and the best predictor in our data was drivers' seatbelt use. Children whose parents were wearing a seatbelt when driving were almost four times more likely to properly use restraints. These findings indicate that parents could play an important role in increasing the use of restraining systems in children but also that an increase in the enforcement of seatbelt use laws for drivers could have a positive increase in child safety restraining as well, inefficient law enforcement being one of the attributed risks of non-compliance with safety laws.[21]

Among the barriers to using child safety restraints, parents mentioned lack of awareness and knowledge, which have been noted in similar studies,[22–24] followed by knowing but choosing not to use. Similar knowledge gaps were shown in a study that surveyed parents in Turkey. Almost a third of parents were not aware what a car safety seat was, and of the 20% of parents who reported using one, only 10% of them were using it correctly.[25] These findings bring the attention that future prevention actions should be targeted using different theories of change models as parents are at different stages of change. In our observational study, costs (financial reasons) was identified as a barrier in not using child safety restraints (12%) and free availability of car seats (11%) was recommended as a strategy to increase the use of child safety restraints. Although these barriers were mentioned by a small sample of the study population, these findings could be used to develop prevention programmes that include giveaway for parents with low socioeconomic status.

Some European Union countries struggle with implementing and enforcing effective road safety policy to protect children as car occupants. An overall positive attitude towards seatbelt enforcement was observed in a European level study conducted in 17 countries, but differences still exist between age groups and gender, women and older adults stating that the law should be more severe.[19] In our study, 26.6% of parents admitted that a better law will determine them to use child safety restraint for their children, although only 6.9% of the drivers who were using child safety restraint felt motivated by the law, the majority, 86.3%, being driven by safety and prevention.

Although there is not an ongoing injury surveillance system implemented in Romania, pilot data can show the magnitude of the problem and calls for independent road safety policy for children. A study after new legislation would also be valuable in showing whether or not legislation in Romania is sufficient to cause behaviour change.

Acknowledgments

Funding Funding was provided by the NIH-Fogarty International Trauma Training Program at the University of Iowa (5D43TW007261).

REFERENCES

1. Sethi D, Towner E, Vincenten J. European report on child injury prevention. Copenhagen: WHO Regional Office of Europe 2008 Available: http://www.who.int/violence_injury_prevention/child/injury/world_report/European_report.pdf [Accessed 12 Dec 2016].
2. Peden M, Oyegbite K, Ozanne-Smith J. World Report on Child Injury Prevention. Geneva: World Health Organization 2008 Available: http://www.who.int/violence_injury_prevention/child/injury/world_report/en/ [Accessed 12 Dec 2016].
3. Krug E, Pearce A, Ward D, et al. Seat-belts and child restraints—a road safety manual for decision-makers and practitioners. London: FIA Foundation for the Automobile and Society, 2009.
4. European Road Safety Observatory. Traffic Safety Basic Facts. European Road Safety Observatory. 2012 Available: https://ec.europa.eu/transport/road_safety/sites/roadsafety/files/pdf/statistics/dacota/bfs2012-dacota-ntua-single_vehicle_accident.pdf [Accessed 12 Dec 2016].
5. Kahane C An evaluation of child passenger safety. The effectiveness and benefits of safety seats. NHTSA Technical Report: DOT HD 807 890, National Highway Traffic Safety Administration, Office of Standards Evaluation, Washington 1986 Available: https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/806890 [Accessed 17 Aug 2018].
6. Elliott MR, Kallan MJ, Durbin DR, et al. Effectiveness of child safety seats vs seat belts in reducing risk for death in children in passenger vehicle crashes. Arch Pediatr Adolesc Med 2006;160:617–21. [PubMed: 16754824]
7. Centers for Disease Control and Prevention. Injury prevention and control: motor vehicle safety. Available: http://www.cdc.gov/motorvehiclesafety/child_passenger_safety/cps-factsheet.html [Accessed 8 Aug 2016].
8. Durbin DR. Technical report—child passenger safety. Pediatrics 2011;127:e1050–66. [PubMed: 21422094]
9. Directive 2003/20/EC of the European Parliament and of the Council of 8 April 2003 amending Council Directive 91/671/EEC on the approximation of the laws of the Member States relating to the compulsory use of safety belts in vehicles of less than 3.5 tonnes. Official Journal:63–7.
10. European Commission. Road Safety Vademecum—Road safety trends, statistics and challenges in the EU 2010–2013. European Commission DG for Mobility and Transport Unit C.4—Road Safety. 2014 Available: https://ec.europa.eu/transport/road_safety/sites/roadsafety/files/pdf/vademecum_2014.pdf [Accessed 17 Aug 2018].

11. Romanian Governmental Decision HG 11/2015 for the modification of the Implementation of OUG 195/2002 regarding driving on public roads, approved by HG 1391/2006. The Official Journal of Romania Part 1/no 35 2015.
12. Chen X, Yang J, Peek-Asa C, et al. Parents' knowledge, attitude, and use of child restraints, Shantou, China. Am J Prev Med 2014;46:85–8. [PubMed: 24355676]
13. Yang JZ, Li LP, Wu HQ, et al. A comparative analysis of child passenger restraint use in China and the United States. World J Pediatr 2017;13:593–8. [PubMed: 28752389]
14. Rotariu T The Population of Cluj-Napoca Municipality. A brief analysis (RO: Populaţia Municipiului Cluj-Napoca O analiză succintă). Centrul de Studiere a Populaţiei 2013.
15. Cityhall C-N. Sustainable Urban Mobility Plan for Cluj-Napoca. Final Project Report, Cluj-Napoca Cityhall, Cluj-Napoca. 2015 Available: http://www.primariaclujnapoca.ro/userfiles/files/Plan%20mobilitate%20Cluj%20Napoca.pdf [Accessed 25 Oct 2016].
16. Peden M, Scurfield R, Sleet D. World report on road traffic injury prevention. Geneva, Switzerland. 2014 Available: http://www.who.int/violence_injury_prevention/publications/road_traffic/world_report/en/[Accessed 17 Aug 2018].
17. Austrian Road Safety Fund. Road Safety in Austria Anual Report 2014. Anual Report, Federal Ministry for Transport, Innovation and Technology. 2014 Available: https://www.bmvit.gv.at/en/service/publications/transport/downloads/roadsafety_report2014.pdf [Accessed 15 Nov 2016].
18. World Health Organization. Seat-belts and child restraints: a road safety manual. 2014 Available: http://www.who.int/roadsafety/projects/manuals/seatbelt/seat_belt_manual_module_1.pdf [Accessed 15 October 2016].
19. Trotta M, Meesmann U, Torfs K. Seat belt and child restraint systems. ESRA thematic report no. 4. ESRA project (European Survey of Road users' safety Attitudes). Brussels, Belgium: Belgian Road Safety Institute 2017 Available: https://www.esranet.eu/en/deliverables-publications/ [Accessed 17 Aug 2018].
20. Lee KC, Shults RA, Greenspan AI, et al. Child passenger restraint use and emergency department—reported injuries: a special study using the National Electronic Injury Surveillance System—All Injury Program, 2004. J Safety Res 2008;39:25–31. [PubMed: 18325413]
21. Urie Y, Velaga NR, Maji A. Cross-sectional study of road accidents and related law enforcement efficiency for 10 countries: a gap coherence analysis. Traffic Inj Prev 2016;17:686–91. [PubMed: 26889569]
22. Muller VM, Burke RV, Arbogast H, et al. Evaluation of a child passenger safety class in increasing parental knowledge. Accid Anal Prev 2014;63:37–40. [PubMed: 24252556]
23. Tsoumakas K, Mavridi F, Matziou V, et al. Parents' knowledge and attitudes about preventing injuries in motor vehicle accidents in children in Greece. Traffic Inj Prev 2008;9:129–34. [PubMed: 18398776]
24. Simpson EM, Moll EK, Kassam-Adams N, et al. Barriers to booster seat use and strategies to increase their use. Pediatrics 2002;110:729–36. [PubMed: 12359786]
25. Sevketoğlu E, Hatipoğlu S, Esin G, et al. Knowledge and attitude of Turkish parents regarding car safety seats for children. Ulus Travma Acil Cerrahi Derg 2009;15:482–6. [PubMed: 19779990]

What is already known on this subject

- There is room for improvement in the use of child safety restraints.
- Both knowledge interventions, as well as legislation may be able to improve the rates of child safety restraint use.

What this study adds

- This study is able to show that most parents understand the importance of child safety restraints; however, they still may choose not to use them.
- It is also important to ensure that parents are correctly restraining their children, as our study shows that the rates of correct use are low compared tocompared with findings from other studies.

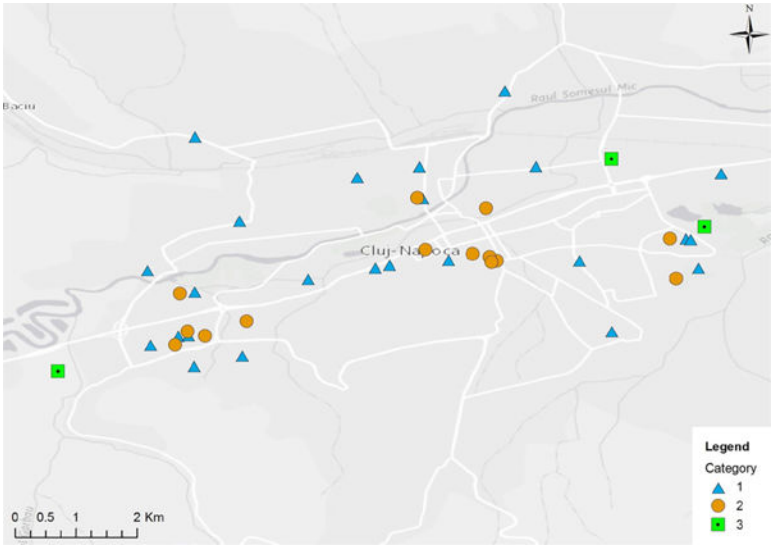

Figure 1.
Observation sites.

Table 1

Observed restraint use and seating position of child passengers and their parents, number and proportion

	N (%)
Total driver observations	**768 (100.0)**
Driver sex	
Male	469 (61.1)
Female	299 (38.9)
Total	768 (100.0)
Seatbelt	
Yes	513 (66.8)
No	160 (20.8)
Don’t know	95 (12.4)
Total	768 (100.0)
Auto type	
Small, medium car	650 (84.6)
SUV and pick-up	108 (14.1)
Other	10 (1.3)
Total	768 (100.0)
Total child occupant observations	892 (100.0)
Restraint used	
Yes	601 (67.4)
No	291 (32.6)
Total	892 (100.0)
Type of restraint used	
Child safety seat	305 (34.2)
Booster	87 (9.8)
Seat belt	209 (23.4)
No restraint	291 (32.6)
Total	892 (100.0)
Seating position	
Front seated	131 (14.7)
Rear seated	737 (82.6)
Adult’s lap	24 (2.7)
Total	892 (100.0)
Orientation of the car seat	
Front	260 (85.2)
Back	45 (14.8)
Total	305 (100.00)

We could not determine if the restraint was used properly for the child because age and height were not available in the observation data. These results are included with the survey data. SUV, sport utility vehicle.

Table 2

Demographic characteristics of parents and their attitudes towards child safety restraint

	N (%)
Total surveys	509 (100.0)
Child safety restraint law awareness in Romania*	
Yes	348 (68.4)
No	67 (13.1)
Don't know	94 (18.5)
Children under 12 can be transported without using a car seat if sitting on adult's lap?*	
Yes	89 (17.5)
No	389 (76.4)
Don't know	31 (6.1)
Children can safely ride in the front seat of a car beginning at what age?*	
3 y/o	3 (0.6)
6 y/o	20 (3.9)
12 y/o	276 (54.2)
14 y/o	120 (23.6)
Don't know	24 (4.7)
Other	66 (13.0)
Up to what age the child should ride in a car seat?*	
3 y/o	104 (20.4)
6 y/o	243 (47.7)
12 y/o	102 (20.0)
Above 12 y/o	8 (1.6)
Don't know/no answer	52 (10.2)
Up to what age your child should ride in a booster seat?*	
3 y/o	29 (5.7)
6 y/o	193 (37.9)
12 y/o	176 (34.6)
Above 12 y/o	10 (2.0)
Don't know/no answer	101 (19.8)
Education level	
Primary/middle school	6 (1.2)
High school	183 (35.9)
College/university	320 (62.9)

Table 3

Surveyed restrai use and seating position of child passengers by age and gender

	Total	Infants and toddlers (ages 0–3)	Preschool children (ages 4–6)	Primary school children (ages 7–12)	Middle school children (ages 13–17)			Boy	Girl		
	N (%)	N (%)	N (%)	N (%)	N (%)	χ^2	P value	N (%)	N (%)	χ^2	P value
Restraint used											
Total	571 (100.0)	128 (100.0)	258 (100.0)	165 (100.0)	20 (100.0)	29.44	<0.001	297 (100.0)	274 (100.0)	0.42	0.51
Yes	430 (75.3)	116 (90.6)	196 (76.0)	105 (63.6)	13 (65.0)			227 (76.4)	203 (74.1)		
No	141 (24.7)	12 (9.4)	62 (24.0)	60 (36.4)	7 (35.0)			70 (23.6)	71 (25.9)		
Type of restraint used											
Total	571 (100.0)	128 (100.0)	258 (100.0)	165 (100.0)	20 (100.0)	189.69	<0.001	297 (100.0)	274 (100.0)	2.94	0.40
Child safety seat	243 (42.6)	106 (82.8)	119 (46.1)	18 (10.9)	0			122 (41.1)	121 (44.2)		
Booster	61 (10.7)	4 (3.1)	34 (13.2)	23 (13.9)	0			31 (10.4)	30 (10.9)		
Seat belt	126 (22.1)	6 (4.7)	43 (16.7)	64 (38.8)	13 (65.0)			74 (24.9)	52 (19.0)		
No restraint	141 (24.7)	12 (9.4)	62 (24.0)	60 (36.4)	7 (35.0)			70 (23.6)	71 (25.9)		
Seating position											
Total	571 (100.0)	128 (100.0)	258 (100.0)	165 (100.0)	20 (100.0)	31.96	<0.001	297 (100.0)	274 (100.0)	0.88	0.64
Front seated	60 (10.5)	5 (3.91)	27 (10.47)	19 (11.52)	9 (45.0)			33 (11.1)	27 (9.8)		
Rear seated	500 (87.6)	121 (94.53)	225 (87.21)	143 (86.67)	11 (55.0)			257 (86.5)	243 (88.7)		
Adult’s lap	11 (1.9)	2 (1.56)	6 (2.23)	3 (1.82)	0			7 (2.4)	4 (1.5)		
Properly used safety restraint*											
Total	499 (100.0)	121 (100.0)	224 (100.0)	143 (100.0)	11 (100.0)	48.33	<0.001	256 (100.0)	243 (100.0)	2.69	0.26
Properly	191 (38.3)	60 (49.6)	84 (37.5)	43 (30.1)	4 (36.4)			95 (37.1)	96 (39.5)		
Improperly	198 (39.7)	52 (43.0)	98 (43.7)	48 (33.6)	0			110 (43.0)	88 (36.2)		
Not at all	110 (22.0)	9 (7.4)	42 (18.8)	52 (36.3)	7 (63.6)			51 (19.9)	59 (24.3)		

*Less than the total due to 72 missing criteria for properly used safety restraint outcome.

Table 4

Association of potential factors on child safety restraint usage

	OR (95% CI)	
	Univariate analysis (1) Properly used safety restraint (N=191) compared with no use (N=110)	**Univariate analysis (2) Improperly used safety restraint (N=198) compared with no use (N=110)**
Age group *		
>5 years	–	–
≤5 years	4.87 (2.93 to 8.07) *	2.65 (1.63 to 4.31) *
Gender *		
Girl	–	–
Boy	1.25 (0.75 to 2.07) *	1.41 (0.87 to 2.27) *
Relationship with driver		
Parent	0.96 (0.43 to 2.16)	0.84 (0.38 to 1.86)
Not parent	–	–
Driver's gender		
Male	0.90 (0.56 to 1.44)	0.98 (0.62 to 1.57)
Female	–	–
Driver's seat belt use		
Yes	3.84 (2.10 to 7.05)	2.68 (1.51 to 4.74)
No	–	–
Driver's education *		
≤College	–	–
>College	1.81 (1.10 to 2.98) **	1.26 (0.77 to 2.06) **

* Age and gender were controlled in the model;

** p<0.001.

Table 5

Motivation to use or not to use child safety restraint

	N (%)
Total questionnaires	**533**
Motivation to use child safety restraint *	
Safety and prevention	290 (86.3)
Law	23 (6.9)
Law and child safety	17 (5.1)
Another	6 (1.7)
Total	336 (100.0)
Motivation NOT to use child safety restraint? **	
Lack of awareness and knowledge	66 (41.8)
Financial reasons	20 (12.7)
Being aware but choosing not to	44 (27.9)
Is in the other car	16 (10.1)
Don’t know	12 (7.5)
Total	158 (100.0)
What will determine you to use child safety restraint? **	
Free availability	18 (11.4)
A better law	42 (26.6)
Both	25 (15.8)
Don’t know	54 (34.9)
Another reason	19 (12.0)
Total	158 (100.0)

* Age and gender were controlled in the model;

** p<0.001.