

ORIGINAL RESEARCH

Knowledge, attitude, and practice of parents regarding children's car safety seat

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ABSTRACT

Background: Motor vehicle accidents can cause life-threatening injuries to children. Use of car safety seats (CSS) is the most reliable way to keep children safe during transportation. The aim of the study was to evaluate the usage of children CSS among visitors of National Guard Primary health care centers and to detect parents' knowledge, attitude, and practice about CSSs.

Methodology: A cross-sectional survey was carried out on parents of 400 children from February 2013 to May 2013 in Pediatric and Family Medicine Clinics of National Guard Primary Healthcare. Descriptive analysis of all variables in the questionnaire was done, along with an exploration of relationships using chi-square and logistic regression.

Results: It was found that 85.3% parents were aware of car seat safety while only 30% used it. Their primary source of knowledge was TV and media. The main reason for not using CSS was considering it unnecessary. The knowledge and use of CSS correlated significantly with the level of education and the income of parents.

Conclusion: The awareness among parents is reasonable; however, the use of CSSs is quite low. Parental knowledge of correct use of CSS is less than optimum. Physicians have a significant role to play in educating parents about the importance of using CSS. Parents value the need for educational programs about CSS. It is necessary to establish laws to mandate using CSS.

Keywords: Car safety seats, parents, children, Saudi Arabia

Introduction

Motor vehicle crashes (MVCs) are the primary cause of injury-related deaths of children worldwide. These constitute 41% of all children injuries using a Web-Based Injury Statistics Query and reporting system [1]. It has been found that 3,554 children were killed in the United States due to MVCs in 2010, 14% of them were under four years of age [2]. Reports of motor vehicle crash in the Middle East are astounding. In 2004, Saudi Arabia had the highest number of deaths among other Arab countries [3]. The 2008 Saudi traffic report shows that the number of deaths related to motor vehicle crashes was 6,458 of which 995 were children [4]. The use of seat belt for drivers and passengers in front seats is mandatory by Saudi law since December 2000. However, the compliance rate is still low [5]. Compared to seat belts, car safety seats (CSS) are far more effective in reducing the risk of death in children resulting from motor vehicle crashes [6,7]. The National Highway Traffic Safety Administration (NHTSA) report shows that the use of CSSs reduces fatal injuries by 71% in infants and 54% in toddlers [8]. In the United States, the use of CSSs is mandatory by law since 1985. In one state, enforcing this law had reduced children injuries from motor vehicle crashes by 25% [9,10]. Children are more prone to severe

injuries by motor vehicle crashes due to their unique anatomy. American Academy of Pediatrics recommends that all children up to the age of 13 should sit in the rear seat. It also suggests placing children of two years of age and younger in the rear-facing CSS and later in a forward-facing CSSs up to the age of 4 [11]. According to NHTSA's report, about 99% of infants and 92% of toddlers were using CSSs in 2008 in the United States [12]. The use of CSS varies among countries. Frequent use was observed in Italy (98%) while in China 64% of children were restrained in CSS irrespective of the fact that no law mandates this practice. Twenty percent of parents in Turkey and Armenia used CSSs; however, in

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Russia, 11% of children were seen through car windows in their safety seats [13-17]. Refuse of child to stay in CSS, inability to afford CSS or choosing to place the child in adult's lap were cited as common reasons for non-use among these countries [13,14]. Throughout the Arabian Gulf, 3.7% of Omani parents use car seats for their children and 65% of United Arab Emirates parents do [18,19]. In a study conducted in Jeddah, Saudi Arabia, 289 parents were screened for their infant safety practices and only 8% of them were found to be using CSS [20]. In Kuwait, 37% of parents knew how infant's car seats look like while 67% knew the toddler's one. A large number of participants agreed that placing the child on the lap of an adult is risky but 41% practised this during driving or putting children in front seat [21]. The center back seat was found to be the best location to fix the CSS reducing the risk of severe injuries by 43% [22]. A study carried out in Ontario, Canada reported that 74.3% of children were seated in proper CSSs for their age and weight but by the period of 9 to 12 months, 78% of them were sitting forward facing. Regarding early transition of children car seats to forward facing, eighty percent of children were found forward facing in their CSS before the age of 2 years in Indiana state, the United States, contrary to the American Academy of Pediatrics 2011 recommendations [23,24]. To date, the use of CSSs among children has not been evaluated thoroughly in Saudi Arabia, and adults' views, knowledge, attitudes, and practices of child restraint devices have not been studied.

Subjects and Methods

The study was carried out at the pediatric and family medicine clinics in National Guard Comprehensive Specialized Clinics (NGCSC) and Health Care Specialty Center (HSCS), Riyadh, KSA. It is a cross-sectional study, including all parents (males and females) attending NGCSC and HSCS clinics visiting with their children (4 years and younger). The sample size is based on Turkey study, in which the knowledge and use of car seat for children was 20%. We calculated our sample size to be 384, for 95% CI and margin of error $\pm 4\%$, adjusted up to 400 for data losses [15]. Parents of children coming to well-baby clinic and pediatrics in the family medicine primary healthcare clinics were given the survey form. Each day, 8 to 10 parents were included in the sample as they visited the clinic irrespective of walk-in or scheduled appointment daily between the period of February 2013 and May 2013. One parent was selected by the nurses every hour in 8-hour working day, by a random number of their choosing. An Arabic structured questionnaire was developed by the researcher based on the previous studies. Some questions were used similar to the Turkish study with permission of the researcher Dr. Esra Şevketoğlu [15].

The data were verified manually entered in a computer, and IBM-Statistical Package for Social Sciences (SPSS) software statistical program version 22.0 was utilized for data entry and analysis. Categorical variables were presented as frequencies and percentages. Chi-square was

used to measure the correlation between two variables. P value of less than 0.05 was considered significant. Kruskal-Wallis test was used to compare medians of more than two groups (ordinal data). Logistic regression for use versus non-use was carried out on selected items in the questionnaire to find the predictors that would influence the use of car seats from demographics, knowledge, and attitude of parents regarding CSS.

Results

The study included 400 parents of Saudi children. The sample was divided equally between NGCSC located in the Northwest of Riyadh city and HCSC located in Southeast. The majority of participants were mothers 83.4%. Their ages varied from 16 to 60 years—mean: 30.92, SD: ± 6.4 . Most of the parents' level of education was high school and above (79%) with family income more than 4,000 Saudi riyals (84%) (Table 1).

Most of the parents knew what CSS was (85.3%) (Figure 1). However, only one third of the parents knew how to use it correctly for children below 2 years and half of the parents knew the correct CSS use for toddlers from 2 to 4 years. About 45% of parents recognized the safest place to install the CSS in the car (Table 2).

Table 1. Participant characteristics (N = 400).

Characteristics	Frequency	Percent
Gender		
Male	65	16.4
Female	332	83.6
Maternal education		
Illiterate	9	2.3
Primary	2	7
Secondary	49	12.3
High school	113	28.3
Diploma	27	6.8
Bachelor and above	174	43.5
Paternal education		
Illiterate	9	2.3
Primary	26	6.5
Secondary	45	11.3
High school	158	39.7
Diploma	39	9.8
Bachelor and above	121	30.4
Family income		
Below 2,000	10	2.5
2,000–4,000	51	12.9
>4,000–7,000	133	33.7
>7,000–10,000	115	29.1
>10,000	86	21.8
Children ages		
(0–1) years	97	36.7
(1.1–2) years	78	29.5
(2.1–3) years	43	16.3
(3.1–4) years	46	17.4

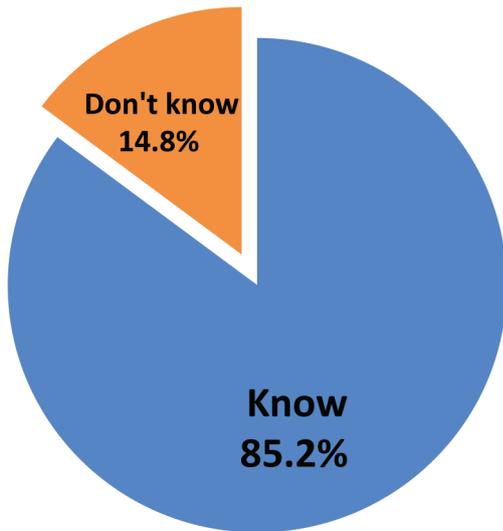


Figure 1. Awareness about children CSS (Knowledge).

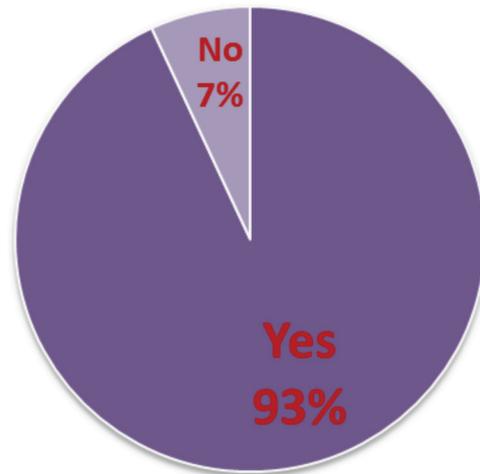


Figure 2. The need for the educational program.

Table 2. Specific knowledge about CSS.

Knowledge item	Frequency	Percent
Know how to use for children below 2 years:		
Don't know	142	36.2
Forward facing	102	26
Rear-facing	148	37.8
Know how to use for children aged 2-4 years:		
Don't know	151	38.8
Forward facing	183	47
Rear-facing	55	14.2
Know the best place for putting CSSs:		
Front seat	11	2.8
Center of back seat	180	45.8
Right or left side of back seat	155	39.4
No difference	47	12

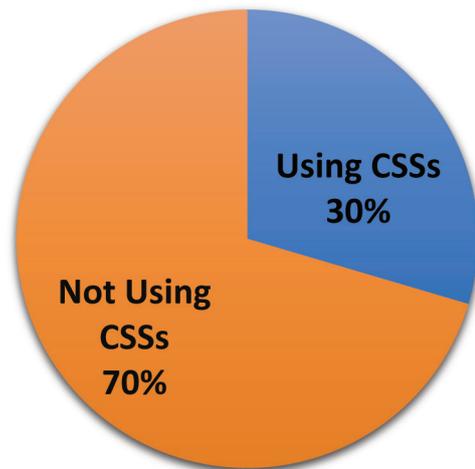


Figure 3. Use of CSS.

Television and media were the primary source of knowledge for 172 parents (45%). Some parents knew about CSS through watching someone else using it (22.5%), from friends and relatives (16.2%), from their research (13.6%), or from the Internet (9.1%).

Most of the parents agreed about the need for an educational program for CSS (93%) (Figure 2).

Thirty percent of parents were using CSSs for their children while the majority of them (70%) were not (Figure 3).

Parent's opinion about CSS varied, 46% thought that it is a good idea to use it while 28% thought that it was not necessary. Among the parents who used CSS, half of them were using it correctly for children from birth

to 2 years of age and most of them used it correctly for children aged 2 to 4 years.

Among the users, almost all (96.5%) were using CSS most of the time during transportation. Among the parents who were not using CSS, the most frequent reasons for non-use believed that it is not necessary (29.9%) and having no space in the car to install it. Because of a large family (27.4%) followed by the child refusing to stay restrained in a car seat (21.2%). The cost of the car seat (13.1%) and using another form of transportation more than the family car (12.8%).

Most of the mothers who were not using CSS put their child in their lap (72.5%) while (41%) put their child at the backseat either alone or carried by their siblings or a maid. Only 3.3% of fathers place the child in their lap while driving.

Table 3. Logistic regression of significant factors for use/non-use of child safety car seat. Cox & Snell R² (0.23) Nagelkerke R² (0.33).

Significant Variables	P Value	OR	95% CI for OR	
			Lower	Upper
Attitude of people around	0.005	2.10	1.25	3.52
Awareness of CSS	0.032	5.17	1.16	23.15
Doctor advice received	0.015	2.49	1.19	5.20
Positive attitude for use	0.004	4.18	1.59	11.02
Correct answer for <2 years old	<0.001	2.85	1.68	4.81
Correct answer for 2-4 years old	<0.001	2.98	1.72	5.16
Intercept	<0.001			

Parents attending NGCSC in the northwest had higher education level than parents visiting HCSC located in the southeast of Riyadh, p value < 0.001. The level of education was high school and above in 83% of parents. Parents attending NGCSC received more advice from their doctor regarding CSS than parents attending HCSC, p-value < 0.023. More knowledge and practice of CSSs were found among parents attending NGCSCs than those attending HCSC, p-value < 0.001.

Following variables were plugged in by a forced-entry method in the logistic regression equation for use versus non-use of the car seat: age, gender, number of children, the age of the oldest child, father and mother's education level, attitude of people around, income, awareness about CSS, receiving doctor's advice, having a positive attitude, and having correct knowledge about the use of CSS for <2 years old. Significant predictors are given in (Table 3), and no interaction terms were used in this analysis.

Discussion

Several studies have shown the importance of CSSs in protecting children during motor vehicle crashes. The risk of death in motor vehicle crashes is three times more in children not using CSS compared to those using it [6]. Compared to using seat belts for children, CSS is more efficient by 79% in avoiding severe injuries during crashes [7]. Enforcement of law mandate the use of CSSs will decrease children's injuries from motor vehicle crashes by 25% [10]. The income and level of education of parents correlated significantly with their knowledge and use of CSS. Comparable results were cited in a study among Turkish parents [15].

Around 85% of parents knew what CSS is, compared to 61% in Armenia, 73% in Turkey and around 66% in Kuwait. Among parents who knew about CSS, approximately 47% of our population were aware of the correct way to use it, which was higher than Turkish parents (15%) [15,16,21]. Television and media were the primary sources of parent's information regarding CSS. That was different from finding of studies done in China and Kuwait where the internet was the primary source of information, while parent's search was the primary source in Turkey, car seat retailers in Italy and pamphlets

or magazines in Canada. Surprisingly doctor's advice was a weak source of information, though it is similar to other studies [13–15,21,23].

It was interesting to find that 30% of parents were using CSS which was higher than the reported finding of a survey in Jeddah in 2000, where only 8% of parents were using CSS [20], this could be due to increasing awareness, education and scholarship abroad to countries with laws mandate CSS use. The rate of use was also higher than some Arabian Gulf and European countries, while it was far below the rate found in Italy, China and United Arab Emirates [13-17,20-22].

The main reason for not using CSS was that parents believed it's not important (29.9%), followed by having a big family with no space in the car for CSS (27.4%) and that the child refuses to stay in it (21.2%). Those were different reasons than other studies where cost, unavailability of CSS and factors related to the child were cited as the main reasons [13,14].

The child, if not in the car seat, usually sits on the lap of the mother in the front seat (72.5%), or in the lap of the father during driving (3.4%). This practice can raise the mortality risk to a double for toddlers and quadruple for an infant compared to children sitting in the back seats [25]. However, seeing children in the front seat of the car is not uncommon, in Kuwait and China, parents admit that they put their child in the front seat (44% and 31%, respectively) [14,21].

Counseling parents in primary healthcare centers about the importance of using CSS to their children increases compliance for short-term and involving education about passenger safety in school education was suggested by the Kuwaiti study [21].

At the level of primary healthcare, more parents used CSS in NGCSC than in HCSC because they are more educated, have higher income, and being from two different regions in Riyadh where each center is located.

Limitations

Information was obtained from parents who filled the questionnaire, not from observing their practice which may not give an accurate result. The study sample was

taken from two National Guard primary health care centers which are not representative of the whole population in the Kingdom of Saudi Arabia. Therefore, generalizability is limited. The questionnaire is susceptible to recall bias by parents and likelihood of desirable answering to avoid possible criticism, which may have resulted in higher than the actual percentage of use of CSS.

Conclusion

CSS for children is underused despite parents being aware of the availability and value of it. Females reportedly are less likely to use CSS than men. Parental education, awareness, the attitude of community, correct knowledge of use, and encouragement from physicians are significant predictors of use of CSS for children by their parents. Several unsafe practices such as putting children on the lap in the front seat and not wearing a seatbelt in the absence of CSS continue. Majority of parents want to have more education about use and benefits of CSS. We need active participation from healthcare providers to advise CSS. Establishing laws to mandate using of CSS is necessary to increase compliance.

Recommendations

The government needs to establish laws that enforce using CSS for children below 4 years and punishment for placing children in the front seat. Newborns should not be discharged from hospital until parents bring CSS. Educational programs that start early from school level should be started. Focus on giving information through media, as it was the primary source of information about CSS in our study. Advice pediatricians and family doctors to educate patients about the importance of CSS.

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List of Abbreviations

CSS	Car safety seat
HCSC	Health Care Specialty Center (located in southeast of Riyadh)
NHTSA's	National Highway Traffic Safety Administration
NGCSC	National Guard Comprehensive Specialized Clinics (located in northwest of Riyadh)
SPSS	Statistical Package for Social Sciences

Conflict of Interest

None

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Consent for publication

Not applicable

Ethical considerations

Permission was obtained from the King Abdullah International Medical Research Center and the Department of Family Medicine Research Committee, National Guard Health Affairs, Riyadh.

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