ORIGINAL ARTICLE

A SURVEY AMONG GUARDIANS ON CHILD RESTRAINT SYSTEM (CRS) USAGE IN CENTRAL PENINSULAR MALAYSIA

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ABSTRACT

Children are much more likely than adults to get serious injuries in car crashes due to their softer bones, weaker neck muscle and fragile bodies. Child restraint system (CRS) can help in reduce injury and prevent fatality in the event of a crash. Thus the aim of this paper is to gauge the prevalence of CRS usage among guardians of children age below 11 years old. A survey to addressed guardians knowledge on CRS usage, practice and their views on fitting child restraints system to their vehicles were carried out among parents and carers who are caring children aged 11 years old and below. Seventy-four percent (74%) out of 500 respondents cited they have used CRS, however only 40% of them is currently using CRS with their children. Respondent in Kuala Lumpur and younger guardians reported twice likely to use CRS. In addition, graduate respondents are 1.5 times more likely to use CRS for their children. In conclusion, high incorrect usage rate and understanding of the CRS could promote additional injury towards the children in a car crash. Many initiatives could be introduced before the implementation of the CRS law in Malaysia such as awareness, community-based programs and CRS clinics that aim to guide guardians on the correct and effective way of installing the CRS device in their car.

Keywords: *child restraint system, child safety, vehicle safety, traffic safety*

INTRODUCTION

Children are considerably more likely than adults to get serious injuries in auto collisions due to their weaker neck muscle, softer bones and delicate bodies. Child restraint system (CRS) can help in diminish injury and prevent casualty. In the case of an accident, an unrestraint youngster gets to resemble a rocket that is tossed with incredible power. As indicated by Automobile Association Malaysia (AAM), an unsecured baby weighing 7kg an accident velocity of only 50km/h will be tossed forward at a force that is proportionate to an adult tumbling from a five-story building[1].

As reported by the World Health Organisation (WHO) on Child Injury Prevention, road traffic injury is the second major reason that caused casualty among 5 to 14 year olds[2]. Road casualty rates are higher in low and middle-income countries involving children aged 14 and underneath[2]. In Malaysia, children aged 1 to 4 are the leading group of casualties among young private vehicle passengers, which mostly occur within the residential areas[3]. Thus the aim of this paper is to gauge the prevalence of CRS usage among guardians of children age below 11 years old.

METHODS

A prospective self-administered survey was carried out among guardians who have children aged 11 years old and below. The study was held at selected shopping malls and supermarkets around Selangor and Malacca. After obtaining verbal informed consent, a questionnaire was given to the respondents for the assessment of the guardians' socioeconomic status, and their knowledge relating to the CRS. The CRS are inclusive of rear facing, forward-facing, and booster seat as shown in figure 1.

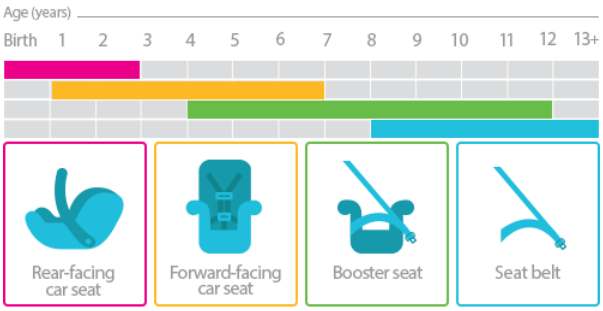

Figure 1 - CRS type according to child age.

The self-administered semi-structured questionnaire was developed based on the literatures[4,5,6], followed by face & content validity and pilot test. The survey questions addressed guardians' usage and practice of installing and utilisation of child restraints system. This study also investigated on the types of restraints used and with what age of the child. Hence, data was also collected with respect to each child age, type of CRS used, and usual location of the CRS within the vehicle for each child 11 years or below.

The study area consists of two states in Central Peninsular Malaysia, namely Selangor and Malacca. Both states were selected to revisit observation study conducted by Muammar et al and Kulanthayan et al, whereby they had observed CRS usage rate in 2010 and 2004 respectively[7,8]. Response data were analysed by using Statistical Package for the Social Sciences (SPSS) version 17.0 software. Logistic regression technique was used to estimate the relative risks by approach of odds ratios (OR) at 95% confidence intervals (CI). An OR value that is greater than 1 indicates higher risk to the concerned attribute and vice versa.

RESULTS

This section will tabulate the result of the survey from sociodemographic, CRS usage and installation, and guardians' knowledge.

Sociodemographic profile

A total of 500 guardians who have children age 11 years old and below had contributed in the survey. The average age of the respondents was 35.49 years, the youngest was 18 years old and the oldest was 60 years old (mode = 30 YO, S.D. = 8.18). As shown in Table 1, more than half of the respondents (57.4%) were female. Around 46.2% of the respondents were caring only one child, 25.6% cared for two children and the remaining 28.6% cared for three or more children under 12 years old. The majority of the respondents reported household incomes in the lower incomes group. Lastly, a very high majority of the respondents (95.6%) are drivers.

Table 1 - Sociodemographic data of CRS study respondents

Variables	Frequency	Percentage, %
Guardians Age		
<=25	43	8.6
26-35	237	47.4
36-45	160	32.0
>45	60	12.0
Guardians Gender		
Male	213	42.6
Female	287	57.4
Relationship with the children		
Mother	236	47.2
Father	171	34.2
Guardian	93	18.6
No of children stay together		
1	231	46.2
2	128	25.6
3	98	19.6
4	30	6.0
>=5	12	2.6
Education level		
Never go to school	10	2.0
UPSR	13	2.6
PMR-lower high school	12	2.4
SPM-upper high school	133	26.6
Diploma/Certificate	176	35.2
Degree Holder	156	31.2
Household income		
<RM3,000	147	29.4
RM3,001-RM5,000	197	39.4
RM5,001-RM10,000	124	24.8
>RM10,000	32	6.4

CRS Usage

Table 2 shows the relationship between CRS usage with respondents' demographic variables such as location, age, gender, education level and incomes. Reported CRS usage is rather low, with over 41.8% indicating they use CRS while travelling. CRS usage difference between the location of data collection found that Klang Valley area recorded a higher rate of usage (51%) compared to Melaka (32%). From the table, it could be seen that study location, guardians' age and education level show a significant difference with P-value less than <0.001, <0.001 and 0.002 respectively.

Further analysis was carried out among the variables that showed a significant difference in CRS usage as depicted in Table 3 to gauge the odd ratio. Kuala Lumpur population and younger guardians, aged 35 years old and lower, are twice likely to use CRS. In addition, graduated respondents are 1.5 times more likely to use CRS for their children.

Table 2 - Crosstabs analysis of gender, age, education level and household income with CRS usage

Variables	CRS Usage		Total	Chi-square, p-value
	Yes (%)	No (%)		
Overall	209 (41.8)	291 (58.2)	500	-
State				
KL	128 (51.2)	122 (48.8)	250	18.16, <0.001
Melaka	81 (32.4)	169(67.6)	250	
Guardians Gender				
Male	93 (44.5)	120 (41.2)	213	0.59, 0.467
Female	116 (55.5)	171 (58.8)	287	
Guardians Age				
<=25	28 (65.1)	15 (34.9)	43	23.734, <0.001
26-35	112 (47.3)	125 (52.7)	237	
36-45	106 (66.2)	54 (33.8)	160	
>45	45 (75.0)	15 (25.0)	60	
Education level				
Never go to school	2 (20.0)	8 (80.0)	10	19.254, 0.002
UPSR	9 (69.2)	4 (30.8)	13	
PMR-lower high school	9 (75.0)	3 (25.0)	12	
SPM-upper high school	89 (66.9)	44 (33.1)	133	
Diploma/Certificate	107 (60.8)	69 (39.1)	176	
Degree Holder	75 (48.1)	81 (51.9)	156	
Household income				
<RM3,000	91 (61.9)	56 (38.1)	147	4.06, 0.255
RM3,001-RM5,000	119 (60.4)	78 (39.6)	197	
RM5,001-RM10,000	63 (50.8)	61 (49.2)	124	
>RM10,000	18 (56.2)	14 (43.8)	32	

Table 3 - Odd ratio of the significant variables

Variables	CRS Usage		Odd Ratio
	Yes (%)	No (%)	
State			
KL	128 (51.2)	122 (48.8)	0.457
Melaka	81 (32.4)	169(67.6)	
Guardians Age			
18-35	140 (50.0)	140 (50.0)	0.457
36-60	69 (31.4)	151 (68.6)	
Education level			
Up to high school	59 (35.1)	109 (64.9)	1.523
Certificate and degree holder	150 (45.2)	182 (54.8)	

CRS Usage Practice

Table 4 shows CRS practice among guardians who are currently using the CRS for their children. Among the initial 500 respondents, only 209 guardians answered this section of the questionnaire as they are using CRS currently. 80% of them believe that the rear seat is safer as compared to other seat location to place CRS and their child. Most of them (74.5%) are using seatbelt only to attach the CRS to the car. 79.9% indicated that they always buckle the CRS harness system. When tested their knowledge on the correct harness system shoulder adjustment level, 77% of them answered correctly. Harness

system should be set on the same level of the children shoulder when the children sit on the CRS. The majority of them (92%) bought their own CRS. Only 1 person rent the CRS. 79.4% read the user manual provided by the CRS manufacturer. Guardians also indicated that they get information about CRS by electronic and printed media (35.9%) such as TV and magazines, self-learning (34.9%) and by other road users (23.4%) such as friends, family and colleague. When they were asked about factor influence their choice of CRS, 36.8% indicated that they choose due to affordable price, 34% chose due to their children age and 13.9% choose it due to design and brand.

Among those who did not use CRS for their children, 291 respondents, 34.7 % indicated that their child has outgrown the CRS. However, when they were asked to specify the child's age, they are only 4 to 8 years old.

DISCUSSION

This study evaluated the prevalence of CRS usage in central Peninsular Malaysia. The result of this self-reported study recorded a high national CRS usage compared to real-world national observation studies[7,8,9]. However, it is considered low usage compared to other high-income countries.

In Malaysia, there are no particular rules on CRS usage in a passenger vehicle. Additionally, in ASEAN nations, just three countries that have specific laws requiring the usage of CRS, to be particular Brunei, Cambodia and Singapore. It is about time to introduce child restraint system regulation in Malaysia as the number of children involving in road traffic accidents are increasing yearly[3,9]. CRS has been shown to be highly effective in reducing child fatality in road traffic accidents. Age- and size-appropriate CRS has been reported can reduce the risk of death up to 54% for toddles and 71% for infants[10].

The finding of low rates of child restraint system use represents a dispute to preventive medicine in Malaysia, requiring consideration and attention to promote it across the board use. In order to accelerate the widespread of CRS usage, a comprehensive promotion of awareness activities should be conducted both among children and their guardians with regards to the safety benefits that can associate with correct and appropriate CRS use and seating position. A combination of enforcement and education program in the community was proven successful in increasing the usage of CRS from the baseline of 61% to 71%[11].

From the result, it shows that most guardians are not aware of CRS type especially for older children aged around 5 to 8 years old. Most of them stated the main reason for not wearing CRS for their children are due to the child had outgrown the CRS. It could be said that they did not aware of the existing of CRS for older children, namely booster seat. The Early graduation from CRS into adult seatbelt may increase the severity of injury during car accidents due to delicate children body structure[12]. Thus, education on CRS type and how to choose the correct CRS are very crucial at this stage[11,13,14].

CONCLUSION

Child restraint use was associated with location, guardian age and guardians' educational level. The low usage of CRS might be due to low exposure on the importance of CRS. Thus, awareness and education on the benefits of CRS are crucial especially in choosing the correct types of CRS with consideration of child age and sizes.

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Table 2 - CRS usage practice

Variables		Overall, n (%)	KL, n (%)	Melaka, n (%)
Safer seat location for children	Rear seat	169 (80.9)	108 (84.4)	61 (75.3)
	Front seat	38 (3.8)	20 (15.4)	18 (22.2)
	No difference	2 (1.0)	0	2 (2.5)
Type of CRS attachment	Seatbelt only	156 (74.6)	93 (72.7)	63 (77.8)
	ISOFIX only	8 (3.8)	5 (3.9)	3 (3.7)
	ISOFIX and seatbelt	40 (19.1)	27 (21.1)	13 (16.0)
	ISOFIX and base	3 (1.4)	2 (1.6)	1 (1.2)
	ISOFIX and top tether	2 (1.0)	1 (0.8)	1 (1.2)
Harness system	Always buckle	167 (79.9)	104 (81.3)	63 (77.8)
	Sometimes buckle	33 (15.8)	19 (14.8)	14 (17.3)
	Seldom buckle	5 (2.4)	2 (1.6)	3 (3.7)
	Did not buckle	4 (1.9)	3 (2.3)	1 (1.2)
Harness adjustment	Highest	8 (3.8)	4 (3.1)	4 (4.9)
	Lowest	14 (6.7)	10 (7.8)	4 (4.9)
	Shoulder level	161 (77.0)	102 (79.7)	59 (72.8)
	Head level	7 (3.3)	3 (2.3)	4 (4.9)
	I don't know	19 (9.1)	9 (7.0)	10 (12.3)
How do u get the CRS	Borrow	9 (4.3)	6 (4.7)	3 (3.7)
	Rental	1 (0.5)	1 (0.8)	0
	Buy	193 (92.3)	117 (91.4)	76 (93.8)
	Others	6 (2.9)	4 (3.1)	2 (2.5)
Read user manual provided by manufacturer	Yes	166 (79.4)	103 (80.5)	63 (77.8)
	No	43 (20.6)	25 (19.5)	18 (22.2)
How do u get info on CRS	Own research/Self-learning	73 (34.9)	49 (38.3)	24 (29.6)
	Other road users	49 (23.4)	24 (18.8)	25 (30.9)
	Media electronic and printed	75 (35.9)	48 (37.5)	27 (33.3)
	Medical doctor/nurses	5 (2.4)	3 (2.3)	2 (2.5)
	Others	7 (3.3)	4 (3.1)	3 (3.7)
Choosing CRS	Affordable price	77 (36.8)	47 (36.7)	30 (37.0)
	Children's weight	20 (9.6)	9 (7.0)	11 (13.6)
	Children age	71 (34.0)	41 (32.0)	30 (37.0)
	Children height	12 (5.7)	8 (6.3)	4 (4.9)
	Design and brand	29 (13.9)	23 (18.0)	6 (7.4)
Reason of not using CRS (n=291)	High in price	45 (15.5)		
	Not important/not needed	18 (6.2)		
	Limited number of CRS	5 (1.7)	-	-
	The number of passengers exceeded the seat available	36 (12.4)		
	Short distance travel	17 (5.8)		
	Children protest and cry	52 (17.9)	-	-
	Children had grown up	101 (34.7)		
	Others	17 (5.8)		

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