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## Research Report

# Prevalence of Used Child Restraint System in Malaysian Market



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**M.I.R.O.S**

MALAYSIAN INSTITUTE OF ROAD SAFETY RESEARCH

ASEAN ROAD SAFETY CENTRE

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## Contents

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	<b>Page</b>
<b>List of Tables</b>	<b>v</b>
<b>List of Figures</b>	<b>vi</b>
<b>Acknowledgements</b>	<b>vii</b>
<b>Abstract</b>	<b>ix</b>
<b>1. Introduction</b>	<b>1</b>
1.1 Scope and Objectives of the Study	3
<b>2. Literature Review</b>	<b>4</b>
2.1 Prevalence of CRS Usage in Malaysia and ASEAN Region	4
2.2 Characteristics of Child Restraint System	5
2.3 Willingness to Pay	7
<b>3. Methodology</b>	<b>9</b>
3.1 Procedures	9
3.2 Instruments	10
3.3 Data Analysis	10
<b>4. Result</b>	<b>11</b>
4.1 Interview Survey: Respondents' Demographic Data	11
4.2 Respondents' Willingness to Pay on CRS	12
4.3 Availability of Used CRS in the Market	13
4.4 Range Price of CRS in the Market	14
4.5 Relationship between Respondents' Demographic with WTP	15
<b>5. Discussion</b>	<b>18</b>

**Prevalence of Used Child Restraint System in Malaysian Market**

<b>6. Conclusion</b>	<b>19</b>
<b>References</b>	<b>20</b>

## List of Tables

		<b>Page</b>
Table 1	Characteristics of CRS (Weber, 2000)	5
Table 2	Demographic data of CRS WTP study respondents	11
Table 3	Price range of CRS parents' willingness to pay	13
Table 4	Characteristics of observed CRS in the market	13
Table 5	Recorded price range difference between new and used CRS	14
Table 6	Price range of CRS according to the CRS type	15
Table 7	Relationship of respondents' demographics data with their being/ not being willing to pay for CRS in logistic regression model	16

## List of Figures

	<b>Page</b>
Figure 1    Integration between child safety system (Weber, 2000)	2
Figure 2    CRS components	7
Figure 3    Type of CRS installation	7

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## Abstract

Children are much more likely than adults to get serious injuries in car crashes. Child restraint system (CRS) has been proven to reduce injury and prevent fatality in the event of a crash. Mostly, the barrier for parents to buckle their children in the 'best-fit' CRS is the price to buy different type of CRS for different age of children. This study investigated the availability of alternative markets for cheaper CRS, availability of the used CRS selling online or in physical stores in Malaysia and the conditions of the used CRS. It was found that second-hand CRS are widely sold online in various platforms as compared to a physical store and the prices of used CRS do not differ that much as compared to the new products. This shows that consumers have alternative markets to purchase CRS for their children at reasonable prices. Thus, it is recommended for consumers to check the quality of the used CRS before deciding to purchase.

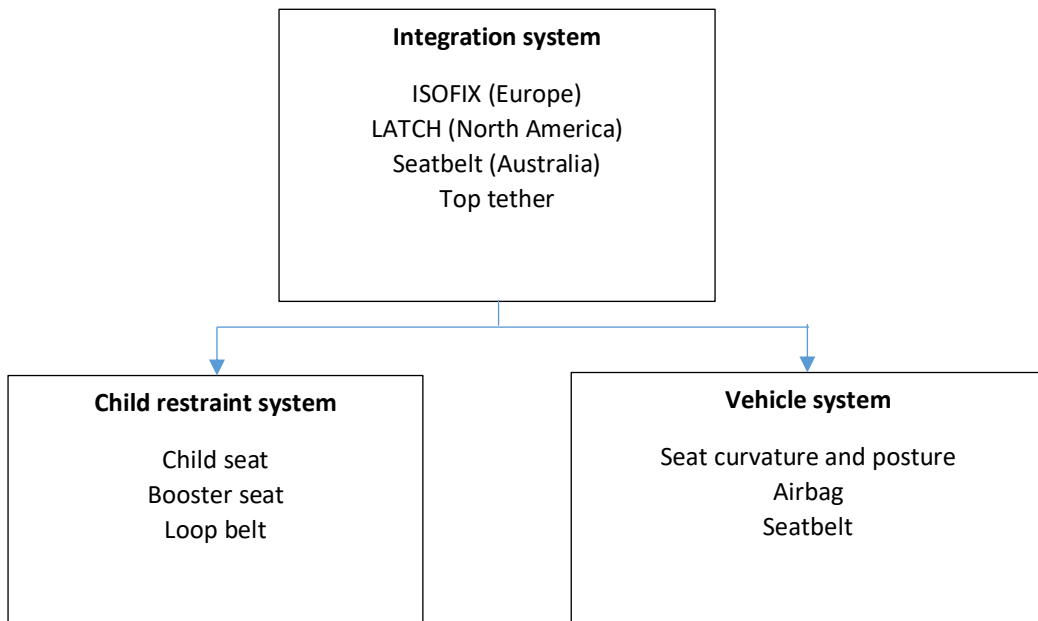


## 1. Introduction

Child restraint system (CRS) has been proven to be effective in protecting children in an event of a traffic crash (Zaza et al., 2001). CRS, also known as child safety seats are the most effective way to protect young children involved in motor vehicle accidents (MVA) from serious injury as well as reduce the risk of death. It was estimated that proper usage of CRS may reduce the chance of death in an MVA by 71% (Starnes & Eigen, 2002). On the other hand, unrestrained 0 – 3 years old children have a 1.6 to 5.4 times greater risk of fatal injury than those restrained in a CRS (Starnes, 2005). Moreover, children 2 to 5 years' old who is restraint in the adult seatbelt are three and half times more likely to suffer a serious injury and more than four times more likely to suffer a serious head injury, than children on the same age who use CRS (Winston, 2000).

Child safety system consists of two (2) sub-systems; child restraint system and vehicle seat system as shown in Figure 1. These systems need to be integrated in order to provide adequate protection to the child. The CRS is securely attached to the vehicle seat using the vehicle seat belt or the lower attachments, at the same time that the child is properly secured in the CRS with a separate harness and/or other restraining surfaces. These two (2) links between the vehicle and the child are critical in reducing injuries or death in the event of a vehicle crash (Weber, 2000).

## Prevalence of Used Child Restraint System in Malaysian Market



**Figure 1** Integration between child safety system (Weber, 2000)

MIROS have conducted numerous studies towards the implementation of CRS law, namely; status quo, parents' readiness and perceptions and CRS market survey. It was found that the rate of CRS usage is still below par, in which less than 50% usage was recorded for each observation phases (Noor Faradila et al., 2016). Many have provided their youngest child with either the rear facing or front facing CRS, many neglected the need for their elder children to be buckled using booster seats (Paiman et al., 2018). Mostly, the huge barrier of parents to buckle their children in the 'best-fit' CRS is the price to buy different type of CRS for different age of children (Low et al., 2016).

This study was initiated to discuss on the Malaysian parents' willingness to pay (WTP) towards providing better protection of their children as car occupants and further investigate the availability of the alternative markets for cheaper CRS, availability of the used CRS selling online or in physical stores in Malaysia and the conditions of the used CRS.

## 1.1 Scope and Objectives of the Study

Recently, there is much news reported of infant, children being thrown out of the vehicle during a traffic accident. By understanding public readiness towards CRS usage, it would influence for effective countermeasures and new interventions prior to implementing the new regulation. Scope of this study is used CRS in the market; either online e-commerce marketplace that allows the public to sell their used product such as Mudah.my, Carousell and many more to be discovered during the study process, or physical second-hand shop situated in Klang Valley and Malacca.

The specific objectives of this study are:

- i. To determine parents' willingness to pay on buying or having CRS for their children.
- ii. To determine the availability of used CRS in the Malaysian market.
- iii. To assess the compliance level of used CRS with regards to regulation UN R44; and,
- iv. To identify the type of attachment system among the available used CRS.

## 2. Literature Review

Child restraint systems (CRS) are designed to greatly reduce the risk of a child being injured or killed in a car accident. The seats, suitable for children usually up to 10 years of age, are fitted in the car and used with existing adult seat belts or ISOFIX system. When children are not properly restrained, they are more likely to suffer serious injuries and may increase the risk of fatality in car accidents. Prior to study on the prevalence of used CRS, this section will explain further on the importance of CRS, characteristics of CRS and explanation on parents' willingness to pay.

### 2.1 Prevalence of CRS Usage in Malaysia and the ASEAN Region

CRS reduce the risk of injury and death in a car accident by preventing contact between the child and the car's interior, protecting the child from impact and spreading any impact force onto stronger parts of the body. Child restraint system could lower the risk of death to infants (aged <1 year) by 71%; and to toddlers (aged 1 – 4 years) by 54% in a car accident (Hertz, 1996; Durbin, 2011).

In the ASEAN region, only three (3) countries have specific laws requiring the use of CRS, namely Brunei, Cambodia and Singapore. However, there is limited information on the rate of CRS usage in these countries. Only Brunei has some insight on the CRS usage in their country. In 2013, The Brunei Times reported that CRS is still uncommon in Brunei despite having the mandatory CRS law in place (The Brunei Times, 2013). The reason of low usage of CRS in Brunei was reported due to low traffic enforcement activity and low availability of CRS in the market.

CRS law is yet to be implemented in Malaysia. According to Muammar et al. (2014) observation study conducted in 2012 recorded a very low rate of CRS usage in Kajang district of Malaysia. Out of the 537 children observed, only 9.5% were using CRS. 13% of

children seated in front passenger seats were restrained, compared to only 5% for those seated at the rear. As compared to developed countries, the prevalence of CRS usage in Malaysia could be categorised as very low.

## 2.2 Characteristics of Child Restraint System

Child restraint system designs vary according to the size of the child they are designed to restrain, the direction the child should face, the type of internal restraining system, and the method of installation. CRS is designed for coupling the CRS securely to the vehicle seat using the vehicle safety belt (SB) or ISOFIX system if available; properly securing the child in the CRS with an attached harness. Securing these two links between the vehicle and the child is critical in reducing injuries or death to a child in the event of a vehicle crash (Weber, 2000). There are four basic types of CRS in current use; infant seats, forward-facing only seats, booster seats, and integrated (built-in) seats. Characteristics of these CRS are described in Table 1. CRS are divided into categories according to the weight of the children for whom there are suitable. These correspond broadly to different age group, but it is the weight of the children that are most important when deciding what type of CRS to use.

**Table 1** Characteristics of CRS (Weber, 2000)

Type of CRS & age/weight	Characteristics
Infant safety seat <b>Age:</b> Birth – up to 1-year-old <b>Weight:</b> Up to 9 kg	<ul style="list-style-type: none"> <li>• A rear-facing installation seat.</li> <li>• The child is secured in the CRS with a harness.</li> <li>• The top of the child’s head should be well contained within the seat’s shell.</li> <li>• Harness slots should be at or below shoulder level.</li> <li>• The angle of these seats should never be more than 45 degrees from the vertical position.</li> <li>• Must be installed in the back seat with a seat belt or an ISOFIX.</li> </ul>





## Prevalence of Used Child Restraint System in Malaysian Market

Forward-facing safety seat  
**Age:** 9 months – 4 years old  
**Weight:** 9 – 18 kg



- A forward-facing seat.
- The harness systems are either five-point harnesses or overhead shield restraints.
- The height of the shoulder strap is usually above the child's shoulders to effectively limit head excursion
- The height of the seat back should be above the child's ear to protect against rearward bending.
- Must be installed in the back seat with a seatbelt or an ISOFIX.

Booster seat  
**Age:** 4 – 11 years old  
**Weight:** 15 – 36 kg



- Booster seats provide the transition from child seats with internal harness to vehicle lap/shoulder belts.
- These seats are anchored in place with a vehicle's safety belt system.
- The booster seat is specially designed as a positioning device for children so that the adult seatbelt can fit across their chest and hips safely.
- There are three types of booster seats: belt-positioning; high-back belt-positioning; and shield booster.

Adult seatbelt  
**Age:** 8 years – Adult  
**Weight:** 36 kg+ or at least 145 cm tall

- The seatbelt must fit across their chest and hips safely.
- Children should sit in the back seat until age 12.

Figure 2 shows the important components of CRS. Users have to understand all these components, especially the routing of the harness to ensure perfect fitment on the child body. It is also crucial to understand on the type of CRS attachment to the vehicle seat, either by seatbelt only, by ISOFIX base or ISOFIX without base, or by top tether as shown in Figure 3.

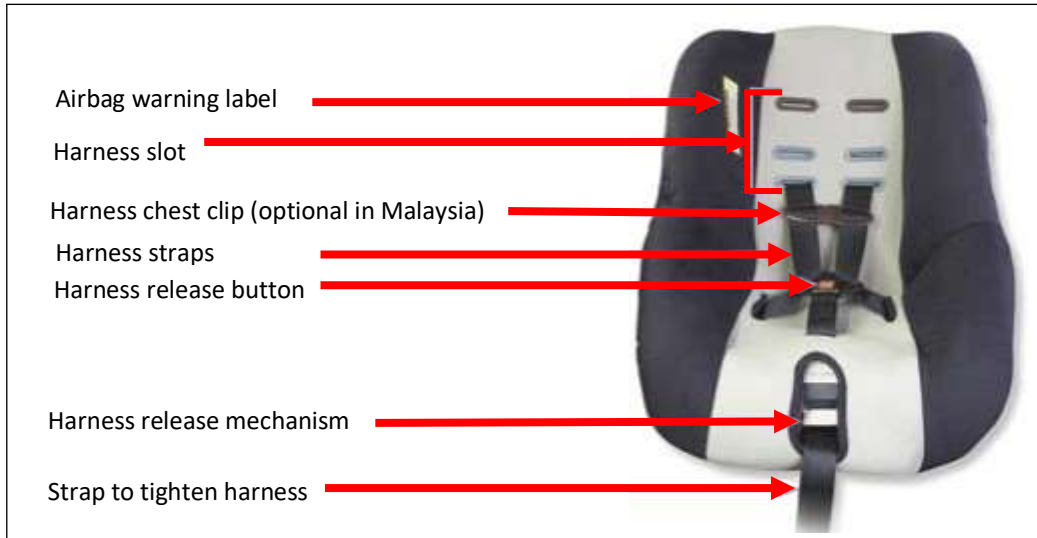


Figure 2 CRS components



Figure 3 Type of CRS installation

### 2.3 Willingness to Pay

The cost to purchase and install CRS is also one of the factors that result in some parents choosing not to restrain their children. According to a study by Mora et al. (2012), some parents said that the cost of installation and purchasing CRS is quite expensive and this

## Prevalence of Used Child Restraint System in Malaysian Market

made parent hesitant to buy CRS. Result of the study conducted by Rivara et al. (2001) also found that the issue of cost and pricing can become a deterrent in the use of CRS. Moreover, if the vehicle is of older model that are not equipped with lap-shoulder belts, the parent has to spend more money to install CRS.

Winston et al. (2006) and Gielen et al. (2007) reported that household income also influences restraint use, presumably because the cost of seats is an impediment to those with a lower income. A significant proportion of Australian children aged 4 – 5 years have used seatbelts rather than booster seats (Brown et al., 2010), so the use of the 'right seat for age' may require purchasing a new seat for many families. In agreement with other commentators, Winston et al. (2006) stated that there is a need for access to low-cost child restraints and booster seats to facilitate uptake by families for whom the cost is prohibitive. On the other hand, parental education and family income are also stated as major barriers to child restraint use as reported by Macy et al. (2014). Racial disparity is also a factor leading to non-use of CRS in which the proportion of non-white parents who prematurely transitioned their children to booster seats and seat belts almost triple those of white parents (Macy et al., 2014).

A study by Rivara et al. (2001) also states the population in rural areas are seeing the cost and price as major barriers to CRS use compared to the population in urban areas. This is perhaps due to the income gap between urban and rural dwellers. Johnston et al. (2009) also found that a lack of knowledge regarding CRS was a problem among minorities in the US.

In Malaysia, there are limited numbers of study discussing parents' willingness to have or pay for the CRS. Many had studied on the WTP of helmet among motorcyclist (Fauzi et al., 2004) or vehicle safety purchasing decision (Kassim et al., 2016) and safety equipment related to occupational health (Afroz et al., 2013).

## 3. Methodology

### 3.1 Procedures

This study employed two (2) methods, interview survey and market survey. The first part of this study, a cross-sectional study was performed in the state of Selangor and Malacca among parents and guardians who have children aged 11 years old and below. The survey was taken place at selected shopping malls and supermarkets involving 500 respondents selected using non-probability sampling technique as the sample needed were selected based on the criteria of having children aged below 12 years old during. After obtaining verbal informed consent, a questionnaire was given to the respondents for the assessment of the parents' socioeconomic status and their willingness to pay for having the CRS for their children.

The second part of this study was a market survey conducted via an online survey and on-site visit. Both methods are further explained below.

#### **Online Market Survey**

Identification of the web-based online marketplace portal such as Mudah.my, Carousell and many more are also analysed. The prevalence of second-hand CRS was counted and analysed. All the information provided in the online portal including CRS type, weight, date of purchase, etc. will be recorded. If the information provided by the online seller was insufficient, the research assistant will contact the seller for more info.

#### **On-site Market Survey**

Initially, identification of the physical second-hand shop in Klang Valley and Malacca was conducted by the desktop survey. The identified second-hand shop was contacted to certify that they are selling CRS in their store. Their address and locations are recorded and visited.

## Prevalence of Used Child Restraint System in Malaysian Market

Prior to the data collection and field observation activity, the team was briefed by the lead researcher on the type of CRS, CRS selection, CRS installation type and UNECE marking.

### 3.2 Instruments

For the interview survey, the self-administered semi-structured questionnaire was developed based on literature (Siddiqui et al., 2014; Stewart & Lenn, 2007; Ainy, 2014) followed by face & content validity and pilot test. The survey questions addressed parents'/guardians' knowledge about the child restraints system available on the market and the range of price they are willing to spend on CRS for their children.

For the market survey, the variety of brands offered were identified together with the type of child restraint system. The type of CRS are categorised according to these groups:

- i. Baby cot
- ii. Rear facing
- iii. Front facing
- iv. Convertible CRS
- v. Booster seats
- vi. Booster seats with back support
- vii. Child safety harness

CRS is assessed on the level of compliance to the ECE R44 and other regulations. In addition, the weight and price range are recorded during the survey. The attachment system of the CRS is examined and recorded.

### 3.3 Data Analysis

Data were analysed by using IBM SPSS version 20.0 software. Hypotheses tests were done by T or Man Whitney test, Kruskal Wallis test, Pearson correlation test and  $\chi^2$  test accordingly.

## 4. Result

This study has gathered 281 interviewed respondents and observed in a total of 803 units of CRS. The observed CRS were categorised into three (3) groups, 200 units of new-online market CRS, 531 units of used CRS selling in the online market and 72 units of used CRS observed at the second-hand physical store. In this result section, section 4.1 elaborates the findings on the interviewed survey and WTP among respondents. Meanwhile, section 4.2 discussed the characteristics of the used CRS as compared to the new CRS in the market and their prices.

### 4.1 Interview Survey: Respondents' Demographic Data

A total of 281 parents and guardians who have children age 11 years old and below had contributed in the survey. Mean age of the respondents was 36.5, with the youngest was 18 years old and the oldest was 60 years old (mode = 40 YO). As shown in table 2, more than half of the respondents (58.4%) were female. Around 43% of the respondents were caring for just one child under 12 years old. A further 28.5% cared for two children of this age, and the remaining 28% had three (3) or more children in their care. The majority of the respondents reported household incomes in the lower-income groups.

**Table 2** Demographic data of CRS WTP study respondents

Variables	Frequency	Percentage, %
Parents/Guardians age		
<=25	28	10.0
26 – 35	106	37.7
36 – 45	103	36.7
>45	44	15.7
Parents/Guardians gender		

## Prevalence of Used Child Restraint System in Malaysian Market

Male	117	41.6
Female	164	58.4
Relationship with the children		
Mother	129	45.9
Father	89	31.7
Guardian	63	22.4
No of children stay together		
1	121	43.1
2	80	28.5
3	53	18.9
4	27	9.6
Education level		
Primary school	10	3.5
High school	98	34.9
Diploma/Certificate	105	37.4
Degree holder	68	24.2
Household income		
<RM3,000	88	31.3
RM3,001 – RM5,000	118	42.0
RM5,001 – RM10,000	59	21.0
>RM10,000	16	5.7
Occupation		
Unemployed	67	23.8
Supporting staff	79	28.1
Management & professional	92	32.7
Self-employed	43	15.3

## 4.2 Respondents' Willingness to Pay on CRS

Table 3 shows the range of CRS price that the respondents are willing to spend for their children. Majority of them are willing to spend less than RM200.

**Table 3** Price range of CRS parents' willingness to pay

Price range	Frequency	Percentage, %
<RM200	206	73.3
RM200 – RM499	67	23.8
RM500 – RM999	6	2.1
>RM1000	2	0.7

### 4.3 Availability of Used CRS in the Market

From the market survey that was conducted, this research collected in a total of 803 for both online and offline market as shown in Table 4. All CRS types, age and weight range, are available in both online and second-hand physical store. However, the offline physical second-hand store was a bit difficult to find selling CRS. The proportion of the CRS type is a bit spread with the booster seat seems less likely to be found.

On the UN R44 certification and approval, sellers of used CRS usually do not specify on the approval of the standards' certification. 77% of the used CRS sell in the online shop did not mention any approval of UN R44. Public or buyer needs to be aware of this before making any purchase as this is the important features to look for on CRS.

Majority of the CRS sold in this market survey has the attachment type of seatbelt only, new 85%, used online 88% and used offline 95%.

**Table 4** Characteristics of observed CRS in the market

Variables	New, n=200	Used-online, n=531	Used-offline, n=72
CRS type			
Rear facing	48 (24.0)	168 (31.6)	12 (16.7)
Front facing	58 (29.0)	198 (37.3)	12 (16.7)
Convertible seat	76 (38.0)	120 (22.6)	30 (41.7)
Booster seat	26 (13.0)	45 (8.5)	18 (25.0)
Age range			
0 – 12 m	65 (32.5)	147 (27.7)	18 (25.0)



## Prevalence of Used Child Restraint System in Malaysian Market

0 – 4 y	65 (32.5)	81 (15.3)	0
12 m – 4y	35 (17.5)	153 (28.8)	36 (50.0)
4 y – 12 y	5 (2.5)	87 (16.4)	18 (25.0)
9 y – 12 y	30 (15.0)	63 (11.8)	0
<b>Weight range</b>			
0 – 13 kg	60 (30.0)	171 (32.2)	12 (16.7)
0 – 18 kg	85 (42.5)	129 (24.3)	12 (16.7)
9 – 18 kg	5 (2.5)	153 (28.8)	24 (33.3)
9 – 36 kg	40 (20.0)	27 (5.1)	0
18 – 36 kg	10 (5.0)	51 (9.6)	24 (33.3)
<b>UN R44</b>			
Yes	65 (32.5)	79 (15.3)	12 (50.0)
No	125 (62.5)	42 (7.9)	12 (50.0)
Unknown	10 (5.0)	408 (76.8)	0
<b>Attachment type</b>			
Seatbelt only	170 (85.0)	568 (88.1)	69 (95.8)
ISOFIX	10 (5.0)	63 (11.9)	3 (4.2)
Unknown	20 (10.0)	0	0

## 4.4 Range Price of CRS in the Market

The price of the selected CRS is recorded and compared as shown in Table 5. The proportion pattern of the price range between these three groups differs. It could be seen from the table that for the new CRS, the price of CRS is slightly higher, mostly in between RM500 to RM1000. Meanwhile, for used-online CRS, majority of them are in group RM200 to RM500. For used-physical store, the price is cheaper towards group lower than RM200.

**Table 5** Recorded price range difference between new and used CRS

Variables	New, n=200	Used-online, n=531	Used-offline, n=72
<b>Price range (RM)</b>			
<=200	24 (12.0)	168 (31.6)	45 (62.5)

### Prevalence of Used Child Restraint System in Malaysian Market

201 – 500	60 (30.0)	303 (57.1)	21 (29.2)
501 – 1000	78 (39.0)	57 (10.7)	6 (8.3)
>1000	38 (19.0)	3 (0.6)	0

When we compare the price according to the type of CRS as shown in Table 6, convertible CRS is towards the higher price for new CRS.

**Table 6** Price range of CRS according to the CRS type

Price range (RM)	0 – 200	201 – 500	501 – 1000	>1000	Total
<b>New</b>					
Rear facing	12 (30.0)	6 (15.0)	18 (45.0)	4 (10.0)	48
Front facing	10 (17.3)	26 (44.8)	22 (37.9)	0	58
Convertible seat	-	20 (27)	26 (35.1)	30 (37.8)	76
Booster seat	2 (7.7)	8 (30.8)	12 (46.2)	4 (15.4)	26
<b>Used-online</b>					
Rear facing	69 (41.1)	84 (50)	12 (7.1)	3 (1.8)	168
Front facing	45 (22.7)	126 (63.6)	27 (13.6)	0	198
Convertible seat	36 (30.0)	69 (57.5)	15 (12.5)	0	120
Booster seat	18 (40.0)	24 (53.33)	3 (6.67)	0	45
<b>Used-offline</b>					
Rear facing	3 (25.0)	9 (75.0)	0	0	12
Front facing	9 (75.0)	3 (25.0)	0	0	12
Convertible seat	27 (90.0)	0	3 (10.0)	0	30
Booster seat	6 (33.3)	9 (50.0)	3 (16.7)	0	18

## 4.5 Relationship between Respondents' Demographic with WTP

Logistic regression was used to see the relationship between the respondents' demographic variables with the willingness to pay. Looking at the price of CRS online, the price of CRS is at least RM200. Thus, WTP was transformed into a dichotomous categorical variable this variable was coded zero for WTP less than the minimum amount of money enough to obtain a CRS in Malaysia (<RM200) and 1 for WTP enough to buy a

## Prevalence of Used Child Restraint System in Malaysian Market

CRS ( $\geq$ RM200). Logistic regression was used to develop the econometric method using IBM SPSS software version 20. A P value less than 0.05 was considered statistically significant. Table 7 shows the details of logistic regression model with odds ratios, confidence intervals and significance levels.

**Table 7** Relationship of respondents' demographics data with their being/not being willing to pay for CRS in logistic regression model

Variable	Categories	Frequency	Odds ratio	95% confidence interval	P value
Household income	<RM3,000	88	0.074	0.019 – 0.284	<0.001*
	RM3,001 – RM5,000	118	0.087	0.025 – 0.306	<0.001*
	RM5,001 – RM10,000	59	0.201	0.058 – 0.700	0.012*
	>RM10,000	16	Baseline	-	0.001*
Occupation	Unemployed	67	1.652	0.515 – 5.297	0.398
	Supporting staff	79	3.738	1.276 – 10.951	0.016*
	Management & professional	92	2.254	0.786 – 6.462	0.130
	Self-employed	43	Baseline	-	0.073
No. of children stay together	1	121	1.531	0.466 – 5.032	0.483
	2	80	1.389	0.407 – 4.745	0.600
	3	53	1.787	0.497 – 6.421	0.374
	4	27	Baseline	-	0.833
Relationship with the children	Mother	129	0.918	0.419 – 2.012	0.830
	Father	89	0.279	0.097 – 0.805	0.018*
	Guardian	63	Baseline	-	0.058
Gender	Male	117	1.552	0.593 – 4.063	0.371
	Female	164	Baseline	-	
Parents/guardian age	$\leq$ 35	134	1.224	0.643 – 2.331	0.539
	>35	147	Baseline	-	-
Education level	Up to high school	108	0.636	0.315 – 1.284	0.207
	Diploma and above	173	Baseline	-	

### Prevalence of Used Child Restraint System in Malaysian Market

WTP was also treated as a categorical variable with 94% of the study population not being willing to pay enough for a CRS, after considering the real CRS price in the Malaysian market. Household income group ( $P < 0.001$ ), occupational of the respondents (Supporting staff  $P = 0.016$ ) and has a relationship as a father to the children ( $P = 0.018$ ) were significantly associated with being/not being to pay for CRS.

## 5. Discussion

Many factors contribute to the usage of CRS among parents namely, parent's gender, parents' income level, their knowledge and belief in CRS and also their willingness to pay (Noor Faradila et al., 2018, Low et al., 2016, Snowdown et al., 2006). Many researchers agreed that parental income level is the most prominent reason to prohibit them from restraining their children (Rivera et al., 2001, Mora et al., 2012, Winston et al., 2006). Thus, this study is aimed to gauge the availability of used CRS in the market and comparing them in terms of price with the new CRS.

The finding of this observation shows the availability of CRS in the online and offline market. It was found that the proportion of available used CRS in the market is similar to the new CRS. In the survey, a variety of CRS type of used CRS is similar to the new CRS. It could be deduced that all type of used CRS is available in the market.

However, in terms of UNECE Regulation, only a few sellers have mentioned that their products have the UN R44 approval. In recent years, the Malaysian government has been focusing on improving the regulation standards of the CRS and car components to ensure the fitment of both items could be integrated. The UN R44 regulation has long been introduced and used as a standard for the approval of the CRS. It has been used for over 30 years worldwide and was adopted by Road Transport Department Malaysia since 2013. Thus, the user needs to look at these approval marking when purchasing the CRS.

Moreover, it was found that in terms of price, there is not much different, the price of used CRS as compared to the new CRS. Most of the CRS sold online are in the group of price range RM200 – RM500. Thus, it is recommended for the consumer to check the quality of the used CRS before deciding to purchase.

## 6. Conclusion

Parents are the decision-maker for their children in all matters related to their child up until certain ages. In safety and protection, parents also play the role of a decision-maker. They should make the right choice for their children's safety and be responsible for their decision. Thus, it is recommended for the consumer to check the quality of the used CRS before deciding to purchase.

## References

- Afroz, R., Masud, M. M., Akhtar, R., & Duasa, J. B. (2013). Survey and analysis of public knowledge, awareness and willingness to pay in Kuala Lumpur, Malaysia – A case study on household WEEE management. *Journal of Cleaner Production*, *52*, 185 – 193.
- Brown, J., Hatfield, J., Du, W., Finch, C. F., & Bilston, L. E. (2010). The characteristics of incorrect restraint use among children traveling in cars in New South Wales, Australia. *Traffic Inj. Prev*, *11*(4), 391 – 398.
- Durbin D. R. (2011). Technical report – Child passenger safety. *Pediatrics*, vol. 127, pp. e1050-e1066.
- Fauzi, M. Y. M., Ghani, M. N. N., Umar, R. S. R., & Hariza, H. A. (2004). The value of life and accident costing. *Applied Health Economics and Health Policy*, *3*(1), 5 – 8.
- Gielen, A. C., McKenzie, L. B., McDonald, E. M., Shields, W. C., Wang, M. C., Cheng, Y. J., ... & Walker, A. R. (2007). Using a computer kiosk to promote child safety: Results of a randomized, controlled trial in an urban pediatric emergency department. *Pediatrics*, *120*(2), 330 – 339.
- Hertz, E. (1996). Revised estimates of child restraint effectiveness. NHTSA Research Note, National Highway Traffic Safety Administration (NHTSA), Washington, DC.
- Johnston, B. D., Bennett, E., Quan, L., Gonzalez-Walker, D., Crispin, B., & Ebel, B. (2009). Factors influencing booster seat use in a multiethnic community: Lessons for program implementation. *Health Promotion Practice*, *10*(3), 411 – 418.

- Kassim, K. A. A., Isa, M. H. M., Ahmad, Y., Osman, I., & Arokiasamy, L. (2016). Consumer behavior towards safer car purchasing decisions. *Journal of Engineering and Technological Sciences*, 48(3), 359 – 366.
- Low, S. F., Nurulhana B., Sharina S., & Siti, H. I. (2016). *Impediments to the use of child restraint system in Selangor* (MRR No. 182). Kajang: Malaysian Institute of Road Safety Research.
- Macy, M. L., Cunningham, R. M., Resnicow, K., & Freed, G. L. (2014). Disparities in age-appropriate child passenger restraint use among children aged 1 to 12 years. *Pediatrics*, peds-2013.
- Muammar Quadaffi Mohd Ariffin, Nurulhana Borhan, Nor Fadilah Mohd Soid, & Abdullah Sukardi. (2014). Child restraints system use among children while travelling to day care centres Kajang, Malaysia. *Journal of Asian Scientific Research, Special Issue: International Conference on Emerging Trends in Scientific Research*, 4(7), 356 – 363.
- Mora, K., Rive, G., & Thomas, J. (2012, October). An exploratory study of barriers to child restraint use in New Zealand. In *Australasian Road Safety Research Policing Education Conference, 2012, Wellington, New Zealand*.
- Noor Faradila, P., Baba, M. D., Aqbal Hafeez, A., Azhar, H., Rohayu, S., Akmalia, S., & Mohd Syazwan, S. (2016). A survey among guardians on child restraint system (CRS) usage in central peninsular Malaysia. *Education*, 5(12), 2 – 6.
- Paiman, N. F., Deros, B. M., Hamzah, A., Kak, D. W., Solah, M. S., Ahmad, Y. (2018). A study on the use and misuse of child restraint system (CRS) in Malaysia. *Journal of the Society of Automotive Engineers Malaysia*, 2(1), 5 – 13.
- Rivara, F. P., Bennett, E., Crispin, B., Kruger, K., Ebel, B., & Sarewitz, A. (2001). Booster seats for child passengers: Lessons for increasing their use. *Injury Prevention*, 7(3), 210 – 213.



## Prevalence of Used Child Restraint System in Malaysian Market

- Snowdon, A. W., Polgar, J., Patrick, L., & Stamler, L. (2006). Parents' knowledge about and use of child safety systems. *CJNR (Canadian Journal of Nursing Research)*, 38(2), 98 – 114.
- Starnes, M., & Eigen, A. M. (2002). *Fatalities and injuries to 0 – 8 year old passenger vehicle occupants based on impact attributes* (No. HS-809 410).
- Starnes M. (2005). Child passenger fatalities and injuries, based on restraint use, vehicle type, seat position, and number of vehicles in the crash. NHTSA Technical Report. DOT HS 809 784. Washington DC.
- The Brunei Times. (2013). Many parents ignore the child car seat safety, section talk about. Retrieved 30 May 2016 from <http://www.bt.com.bn/bookmarks/2013/09/02/parents-ignore-child-car-seat-safety>
- Webber, K. (2000). Crash protection for child passenger: A review of best practice. *UMTRI Research Review*, Vol 31, 3.
- Winston, F. K., Chen, I. G., Smith, R., & Elliott, M. R. (2006). Parent driver characteristics associated with sub-optimal restraint of child passengers. *Traffic Injury Prevention*, 7(4), 373 – 380.
- Winston, F. K. (2000). The danger of premature graduation to seat belts for young children. *Pediatrics*. 105, 1179 – 1183.
- Zaza, S., Sleet, D. A., Thompson, R. S., Sosin, D. M., & Bolen, J. C. (2001). Reviews of evidence regarding interventions to increase use of child safety seats. *American Journal of Preventive Medicine*, 21, 31 – 47.



## Research Report

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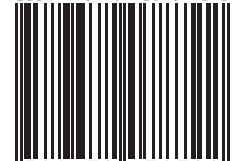
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