

Parents' Awareness on Compliance with the Use of Child Restraint System: A Quantitative Pilot Study at Kindergarten and Nursery in Parit Raja, Batu Pahat, Johor

Raha Abd Rahman^{1,*}, Nurshafikah Khalik¹, Lim Wei May¹, Mohd Farid Hassan², Nordiana Mashros³, Jezan Md Diah⁴ & Zamri Bujang⁵

*Corresponding author: raha@uthm.edu.my

¹Department of Civil Engineering, Faculty of Civil Engineering and Built Environment, Universiti Tun Hussien Onn Malaysia, Parit Raja, 86400 Batu Pahat, Johor, Malaysia

¹SDRC, Universiti Tun Hussien Onn Malaysia, Parit Raja, 86400 Batu Pahat, Johor, Malaysia

¹RECESS, Universiti Tun Hussien Onn Malaysia, Parit Raja, 86400 Batu Pahat, Johor, Malaysia

²Pejabat Setiausaha Kerajaan Johor, Bahagian Perumahan, 79503 Iskandar Puteri, Johor, Malaysia

³School of Civil Engineering, Faculty of Engineering, Universiti Teknologi Malaysia, 81310 Skudai, Johor, Malaysia

⁴Malaysia Institute of Transport (MiTRANS), 40450 Shah Alam, Selangor, Malaysia

⁵Civil Engineering Department, Faculty of Engineering, Universiti Malaysia Sarawak, Malaysia

ABSTRACT

It has been reported that children transported in private vehicles are the leading groups of casualties among those aged 1 to 9 years old in Malaysia. Child Restraint System (CRS) is made mandatory on 1 January 2020 to reduce road fatalities among those vulnerable children. However, study found that the use of CRS is still at an unsatisfactory level even though the law has been enforced. Hence, this pilot study was conducted to determine the awareness, usage, and compliance with the use of child restraint system by means of quantitative measures. Questionnaire and observation survey were conducted in 6 participating kindergartens and nurseries in Parit Raja and received a total of 34 respondents. The self-reported survey results show that 97.1% of the respondents are aware of the enforcement on 1 January 2020, only 35.3% of the parents used CRS every time riding in a vehicle. Challenges in complying with the use of CRS are household income, lack of awareness program and knowledge on the importance of CRS. Parents who send their children to government kindergartens by 4-wheel vehicle are observed to not use CRS. In short, parents in this pilot study show that they are aware of the risks of not using CRS, but majority is still unable to comply with CRS usage.

© 2021 Malaysian Institute of Road Safety Research (MIROS). All rights reserved.

ARTICLE INFO

Article History:

Received 8 Mac 2021
Received in revised form
12 Apr 2021
Accepted
28 Apr 2021
Available online
01 May 2021

Keywords:

Child Restraint System
Child Safety Seats
CRS
Awareness
Challenges
Compliance

1. Introduction

World Health Organisation stated that children aged 5 to 14 years old are one of the vulnerable groups to road traffic injury that leads to fatalities in the world. In Malaysia, this age group is the leading group of casualties for children transported in private vehicles as passengers (Ang et al., 2020). Children are more likely to sustain serious injuries in traffic collisions due to their developing and delicate physical bodies (Stewart et al., 2014). Child Restraint System (CRS) is introduced as a proven initiative in significantly protect these vulnerable children travelling in 4-wheel vehicles. CRS ensure children are firmly secured to the passenger sit protecting them from the kinetic force of sudden break or collision by distributing the force through the restraints, prolonging the time of impact by limiting the contact of children with the car interior or being ejected from the

vehicle (Ramli & Yunus, 2020). The proper use of CRS can reduce the chances of death among children to approximately 71%. Children that restrained with adult seatbelts are 3.5 times prone to suffer serious injury and 4 times more likely to experience serious head injury compared to those children had CRS protection.

Malaysian Institute of Road Safety Research (MIROS) produced guidebook for CRS in Malaysia in 2019 to standardise CRS so that right information on CRS can be easily access and understood by the public. The noncompliance of CRS use has been a concerning issue for years, prior survey done by MIROS reported that only 36% of Malaysian parents were aware of the importance of CRS and only 27% usage was reported during travel (Malaysian Institute of Road Safety Research, 2019). Besides, a number of observational studies conducted in Malaysia found that the number of CRS users are still very low. A cross-sectional descriptive study in Selangor by (Lee, 2002) shows only 0.6% used CRS from 535 cars observed; study on

CRS use while travelling to day care centres in Kajang, Selangor by (Ariffin et al., 2014) shows that only 9.5% out of the 537 children observed using CRS. The low level of awareness on the importance of CRS was also reported in Malaysian news. Hence, Malaysia government had made CRS usage mandatory on 1 January 2020 to enforce and increase the use of CRS (Chan, 2020). However, little study has been conducted after the mandatory was announced and Malaysian parents' readiness in this issue is yet to be explored. Thus, this pilot study aims to determine parents' awareness in complying to the use of CRS in kindergarten and nursery by means of quantitative measures.

2. Method

The study design is shown in Figure 1, a quantitative study approach by means of observations and questionnaire survey to explore parents' awareness and compliance with CRS usage. Location selected is in Parit Raja, Batu Pahat. This location is situated at one of the dangerous roads in Johor and the second recorded number of road fatalities after Selangor (Abd Rahman et al., 2019; Abd Rahman et al., 2020). 6 from the 22 kindergarten and nursery located in Parit Raja voluntarily participated in this pilot study.

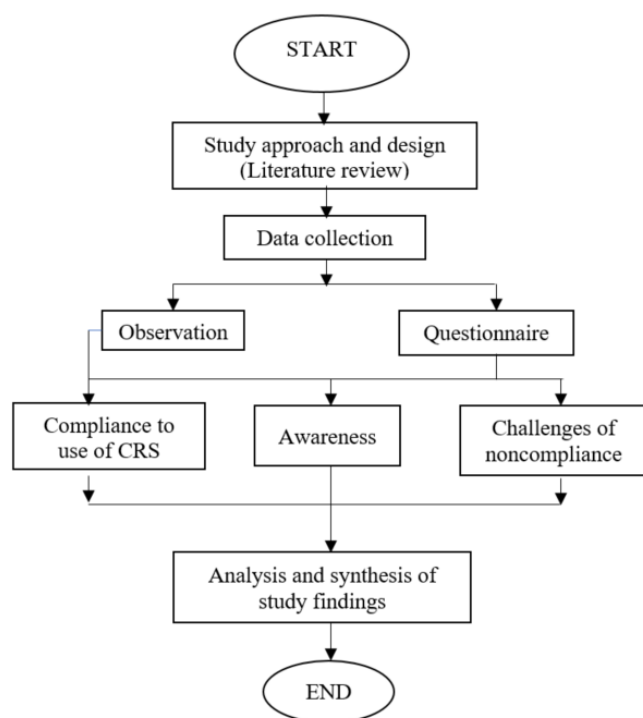


Figure 1: Study design flowchart

2.1. Observational Survey

Observation was carried out at each of the participating kindergarten and nursery. The habitual practice of parents in using CRS on daily basis were observed when they are sending off their children in the morning (7am – 8am) or picking up in the afternoon (12pm – 1pm) in the month of October 2020.

The two indicators collected during the observation are mode of transport either by 4-wheel vehicle or motorcycle and the presence of CRS. Data are collected twice with tally sheet to obtain the average for data validation. Observer did not interact with the parents or gave prior notice to ensure data collected are nonintrusive to their prevalence in complying with CRS usage. Data was calculated manually to determine the total number of vehicles with the use of CRS at respective kindergarten and nursery.

2.2. Questionnaire Survey

The questionnaire was developed based on literature review, discussion with senior lecturers and pretested with a group of 15 parents from the residing location who met the eligibility criteria for this study to ensure validity.

The questionnaire was designed to be a mix of multiple choice and “Yes” or “No” closed-ended questions. The four sections in the questionnaire are (i) demographic, (ii) parents' awareness, (iii) compliance with CRS usage and (iv) challenges in complying with CRS usage.

Criteria of the respondents inclusive of parents who had children attending the 6 participating kindergarten and nursery, and they owned 4 wheel-vehicles that required the use of CRS. Questionnaire are distributed via google form where respondents are self-selected and voluntary in participating the survey. The survey form can be easily self-administrated by the respondent with self-reported answers. No financial incentive was provided, and anonymity was maintained to ensure the confidentiality and reliability of data.

The data was analysed using SPSS for Cronbach Alpha reliability test. 34 respondents who met the criteria are included in results analysis and outliers answers are removed to obtain a Cronbach Alpha coefficient of 0.715 as shown in Table 1 which had achieved a good reliability value for further analysis (Abd Rahman et al., 2021). Percentage calculation was performed to determine parents' awareness, compliance of CRS usages and challenges in complying with CRS usages.

Table 1: Reliability statistics

Cronbach's Alpha	N of Items
0.715	20

3. Results

Results are discussed in terms of (i) observational results, (ii) parents' awareness on CRS, (iii) compliance of CRS usage and (iv) challenges in complying with the use of CRS.

3.1. Observational Results

Observational results are shown in Table 2, a total 298 of vehicle was observed for the period of two days. The vehicles are tabulated in terms of 4 wheel-vehicles with CRS usage or number of parents who transport their children by motorcycle. Results found that parents who had their children attending government kindergarten were observed to not use CRS (100%) and higher number of motorcyclists. While, in private kindergartens and nursery, there is higher number of CRS usage with lower number of parents transporting their children by motorcycle.

Table 2: Observational statistical results

Types	Name	No. of Parents Used CRS	No. of Parents Did Not Use CRS	No. of Motorcycle
Government kindergarten	Tabika Perpaduan	0	5	4
	Taman Maju Baru			
Government kindergarten	Tabika Kemas	0	7	8
	Pintas Sri Puding Taman Melewar			
Private kindergarten	Tadika PASTI Al Uwaeis	4	5	2
	Private kindergarten	Tadika Al Hidayah Bestari Santun	6	4
Private nursery	Taska Asy Syifa	12	8	2
Private nursery	Taska Adik Bestari	5	3	3

3.2. Demographic Results

Total of 34 respondents participated in this study as shown in Table 3, where majority are women (58.8%), aged 31 - 40 years old (50%), household income is M40 (64.7%), working parents (91.2%) and have children below 5 years old (64.7%) and all the respondents are Malays. Parit Raja is a rural area, 22 kilometres from Batu Pahat town, is populated mainly by local residents and those attending the government university situation at the centre of the area. Hence, majority of our respondents are seen to be working parents with middle income household.

Table 3: Respondents' demographic data

Variable	Total
Overall	34
Gender	
Men	14 (41.2%)
Women	20 (58.8%)
Age range	
21 - 30 Years old	15 (44.1%)
31 - 40 Years old	17 (50%)
41 - 50 Years old	2 (5.9%)
Household Income Category	
B40	12 (35.3%)
M40	22 (64.7%)
Employment	
Working	31 (91.2%)
Not working	3 (8.8%)
Children Age	
0 - 2 years old	9 (26.5%)
3 years old	6 (17.6%)
4 years old	7 (20.6%)
5 years old and above	12 (35.3%)

3.3. Parents' Awareness on Child Restraint System

Table 4 tabulated the analysis of parents' awareness on CRS. Results show that all parents (100%) are aware of CRS ability in reducing the impact of accidents on children. 97.1% of the respondents are aware of the presence of enforcements on the use of CRS and it was made mandatory on 1 January 2020. 70.6% of the respondents know the implication of summons to those who do not use CRS. 70.6% of them know the there are many categories of CRS according to age, height and weight of the child. The proper installation of CRS is known by 64.7% of the respondents. Lastly, approximately half of the respondents (55.9%) will make sure proper installation of CRS before travelling.

Table 4: Parent's awareness of CRS

Parents' awareness of CRS	Yes (%)
Child Restraint System (CRS) is able to reduce the impact of accidents on children.	34 (100%)
Did you know that the use of Child Restraints System (CRS) was enforced on 1 January 2020	33 (97.1%)
Aware there are enforcement on the use of Child Restraint System (CRS)	33 (97.1%)
Aware of the summons that will apply if not using a Child Restraint System (CRS)	24 (70.6%)
Did you know that Child Restraints Systems (CRS) have many categories	24 (70.6%)
Do you know the proper installation of Child Restraints System (CRS)	22 (64.7%)
Do you make sure that Child Restraints System (CRS) are properly installed in your vehicle?	19 (55.9%)

3.4. Parental Compliance with Child Restraint System

The survey also explored the usage of CRS and results are tabulated in Table 5. Among the 4 categories standardised in Malaysia, Group one category has the highest percentage of users at 26.5%.

However, the study also found 47.1% of the respondent never or did not use CRS and 20.6% of them use CRS when it feels necessary. Only 35.3% of the parents used of CRS every time riding in a vehicle. 61.8% of parents preferred the position of CRS to be placed at the rear passenger. A total of 41.2% of parents believe that children should use child safety seats up to the age of 12. When asked about the position of the child safety seat rear facing in front of the functioning air bag 17.6% of the parents agreed and most of them preferred the position of the child restraints system to be placed as the rear passenger (61.8.0%).

Table 5: Compliance with CRS usage

Usage of CRS	Yes (%)
Which category type do you use?	
Group 0	4 (11.8%)
Group 1	9 (26.5%)
Group 2	4 (11.8%)
Group 3	1 (2.9%)
I did not use CSR	16 (47.1%)
How often do you use a Child Restraints System (CRS) in your vehicle?	
Every time you ride in a vehicle	12 (35.3%)
When it feels necessary	7 (20.6%)
Never	16 (47.1%)
In your opinion, children should use Child Restraints System (CRS) until age?	
5 years	5 (14.7%)
6 years	11 (32.4%)
10 years	4 (11.8%)
12 years	14 (41.2%)
Where Child Restraints System (CRS) should be placed while in the vehicle?	
Front passenger	6 (17.6%)
Rear passengers	21 (61.8%)
Behind the driver	2 (5.9%)
Not sure	5 (14.7%)

3.5. Challenges of Non-compliance with the use of Child Restraint System

Parents think that the market price of Child Restraints System is unreasonable (44%) and total income is the cause of non-compliance with the use of Child Restraints System (100%). Parents think that awareness programs on child safety seats is important (100%) and programs on how to use Child Restraints System should be disclosed to parents (100%) because according to them knowledge of child safety seats is very important (100%). Hence, this study found three main challenges in complying with the use of CRS as shown in Table 6 which are household income, lack of awareness program, and knowledge on the importance of CRS.

Table 6: Challenges in complying with CRS use

Challenges in complying with the use of CRS	Yes (%)
Market price of Child Restraint Systems (CRS) is not reasonable	21 (61.8%)
Household income	34 (100%)
Child Restraint Systems (CRS) awareness programs	34 (100%)
Knowledge on the importance of Child Restraint System (CRS)	34 (100%)

4. Discussion

This study found that number of CRS among parents who had children attending private kindergarten and nursery are higher compared to government. Further investigation is needed to have conclusive evidence in drawing a line between CRS users in private and government. However, this pilot study observed 27 over 59 (48.2%) of the parents who drive 4-wheel vehicle used CRS which is higher than (Ariffin et al., 2014) who only recorded only 9.5% used

CRS while travelling to day care in Kajang, Malaysia. This study did not analysed relationship between demographic characteristic with the use of CRS due to small sample size and potential bias. Despite that, there is study that shows association of CRS use with demographic characteristic, (Faradila et al., 2016) used crosstabs analysis found that 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.

While all the respondents in this study aware of CRS in protecting their children from impact of accidents, but half of respondents did not use CRS. This is similar to (Ang et al., 2020) associating this to the poor knowledge of CRS safety as parents were found to be underestimate the vulnerability of their children and belief that injuries are not preventable. Bruce, Mundle, Cramm, and Williams (2017) also stated that knowledge of the safety benefits of CRS has been identified as an important factor in influencing parents' use of such devices. This signifies the importance to educate the right use CRS among parents.

Guidebook for the use of CRS by MIROS described the four categories of CRS in Malaysia (Malaysian Institute of Road Safety Research, 2019). Group 0 for age 0 to 18 months, Group 1 for age 15 months to 4 years old, Group 2 for 4 to 7 years old and Group 3 for 6 years old and above. Group 0 should not be placed in front passenger with automated activated air bag system unless there is no air bag in the front passenger seat, or the air bag system is manually activated. This is a proven safety measure as Group 0 can be thrown off by the air bag and hence, is recommended being placed facing backwards in the rear passenger seat (Stewart et al., 2014). While, Group 1 to Group 3 can be placed in front passenger seat with active air bag for extra protection.

Study by Paiman et al. (2018) using face-to-face interviews with selected vehicle owners and intrusive visual inspection with checklist found that only 12.7% children were properly restrained in CRS for their size, with the correct installation and appropriate seating position. The reasons given by respondents for not restraining their children was that the children were perceived as big enough or "grown up" and did not require CRS (23.2%). This was followed by the children's refusal to be restrained (13.9%) where being a "grown up" seem to indicate no longer require CRS when travelling. Such behaviour also raised from the lack of information and knowledge on CRS utilisation and possibly due to lack of CRS awareness campaigns. Others are affordable price and cost of owning CRS due to economic burden to certain income groups that lead to non-compliance. Another study by (Stewart et al., 2014) said that at least 95% of families make a mistake while use of child safety seats and only 5% of parents know the installation of child safety seats correctly. 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 also due to the child had outgrown the CRS and they did not aware of the existing of CRS for older children, namely booster seat. Hence, this various reason supported the findings from this study where income, awareness and knowledge on CRS are the challenges of complying with the use of CRS.

Some of interventions discussed in encouraging the use of CRS are adoption and enforcement of laws that will reshape the perceptions and compliance of CRS as some might comply with CRS when there is presence of police officer (Bhaumik et al., 2020). Bruce et al. (2017) also supported legislation and consistent law enforcement to influence parents' decision in complying with CRS usage by increasing parental knowledge and recognition in the benefits of CRS. Lee (2002) suggested to ensure good compliance rates, stiffer fine and demerit system can be imposed. Furthermore, the low price of CRS rental or incentive should be given to help low-income parents who unable to purchase a safety seat. Automobile industry could also play a role in marketing cars with readily installed child restraints.

5. Limitations

This pilot study shows that it is feasible to determine the awareness, usage and challenges of compliance of CSR by means of

quantitative measures with questionnaire survey and observation. However, this study was conducted during movement restriction period which resulted in limitations in number of participants and restriction for close contact investigation that affected the outcome of findings to draw a significant relationship between variables.

There are several other limitations that needed to be acknowledged. Firstly, the respondents needed to have internet access to participate, which might suggest higher socioeconomic status of the respondents than the overall group. Second, this study is limited by its cross-sectional nature and considering the lockdown situation due to the COVID-19 outbreak, online convenience sampling strategy was adopted that will limit the generalizability of the conclusions. The study also did not find significant effects of movement restriction control on CRS use. Making causal inferences in this case was not possible and the possibility of sampling bias should be considered. Finally, this study relied on self-reported answer which requires further investigation for more detailed parental habits on the compliance with CRS usage.

6. Conclusion and Recommendations

The study provides a substantial understanding on the small portion of population area at Parit Raja. This pilot study will assist future research in developing study design and approach to investigate CRS in a similar manner and purpose. This will be helpful for researcher to plan and adopt appropriate measures from this study for in depth investigation such as on how well CRS are being installed in the vehicles, how parents demographic background affects the use of CRS and what are the possible interventions to increase the use of CRS among parents who have children travelling in 4-wheel vehicles.

This is one of the studies done after the commencement of enforcement after 1 January 2020. This study provides information about CRS parents awareness, compliance and challenges in the use of CRS in Parit Raja, Batu Pahat in hope to provide some insights for concerning parties in implementing appropriate interventions to ensure children safety and potentially to reduce fatalities among children especially those age 5 to 14 years old.

In conclusion, the use of child restraint system still does not reach a satisfactory level after mandating CRS usages in 2020. In order for parents to appreciate the benefits of CRS, awareness, community-based and educational programmes or social media platforms should highlight the importance of CRS and danger of non-compliance to enhance the acceptance of CRS usage, and promote the proper use of CRS, along with the new regulations on mandated CRS use. Besides, various parties such as automobile companies, enforcement or government agencies, road authorities and policy makers should collaborate in encouraging CRS usage among vehicle owners in the country.

Acknowledgements

The authors are grateful for the time and collaboration from the 6 participating kindergarten and nurse as well as the parents who participated as respondents in this study.

References

- Abd Rahman, R., Abdul Khair, M. A., Lim, W. M., Mohd Masirin, M. I., & Hassan, M. F. (2020). The evaluation of accident data by using existing predictive model for Johor and Selangor state. *Journal of Critical Reviews*, 7(16), 708–717. Retrieved from <https://doi.org/10.31838/jcr.07.16.97>
- Abd Rahman, R., Mazle, H. A., Lim, W. M., Mohd Masirin, M. I., & Hassan, M. F. (2021). Road safety awareness among university students: Case study at Universiti Tun Hussein Onn Malaysia, Johor. *Journal of Civil Engineering, Science and Technology*.
- Abd Rahman, R., Mohd Nasiruddin, M. F., Lim, W. M., Mohd Farid, H., Mashros, N., & Jezan, M. D. (2019). The 85th percentile speed the compliance of road users with the 60kmh speed limit at u-turn. *6th International Conference on Business, Science and Technology (ICBST)*

- 2019).
- Ang, J. Y., Lai, J. M., Hss, A. S., Ramalingam, P., Ramasamy, M., Zainuddin, N. S.,...Bahari, N. (2020). Awareness, perception and experience on child restraint system (CRS) and its legislation among Malaysian parents with newborns. *Traffic Injury Prevention*, 21(4), 278 – 282. Retrieved from <https://doi.org/10.1080/15389588.2020.1746773>
- Ariffin, M. Q. M., Soid, N. F. M., Borhan, N., & Sukardi, A. (2014). Child restraints system use among children while travelling to day care centres Kajang, Malaysia. *Journal of Asian Scientific Research*, 4(7), 356 – 363.
- Bhaumik, S., Hunter, K., Matzopoulos, R., Prinsloo, M., Ivers, R. Q., & Peden, M. (2020). Facilitators and barriers to child restraint use in motor vehicles: A qualitative evidence synthesis. *Injury Prevention*, 26(5), 478 – 493. Retrieved from <https://doi.org/10.1136/injuryprev-2020-043655>
- Bruce, B. S., Mundle, K., Cramm, C. F., & Williams, D. P. (2017). Promoting booster seat use for young children: A school-based intervention pilot study. *Paediatrics and Child Health*, 22(2), 89 – 91. Retrieved from <https://doi.org/10.1093/pch/pxx025>
- Chan, D. (2020, December 4). CRS ruling: Govt going for soft approach, no summons until year end. *The New Straits Times*. Retrieved from <https://www.nst.com.my/news/nation/2020/08/616001/crs-ruling-govt-going-soft-approach-no-summons-until-year-end>
- Faradila, P. N., 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. *Malaysian Journal of Public Health Medicine*, 1, 1 – 6.
- Lee, L. K. (2002). A Study on the use of car occupant restraint in Selangor. *Medical Journal of Malaysia*, 57(3), 266 – 277.
- Malaysian Institute of Road Safety Research (2019). *Garis panduan kerusi keselamatan kanak-kanak di Malaysia*. ASEAN Road Safety Centre.
- 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.
- Ramli, R., & Yunus, S. S. M. (2020). Malaysian child restraint issues: A brief narrative review. *International Journal of Environmental Research and Public Health*, 17(6). Retrieved from <https://doi.org/10.3390/ijerph17061922>
- Stewart, C. L., Moscariello, M. A., Hansen, K. W., & Moulton, S. L. (2014). Infant car safety seats and risk of head injury. *Journal of Pediatric Surgery*, 49(1), 193–197. Retrieved from <https://doi.org/10.1016/j.jpedsurg.2013.09.054>