Prevalence of Safety Equipment and Helmet Use among School Students Commuting To School in South Selangor, Malaysia

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</table>
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| Keyword:          | Children, Safety, Motorcycles, Malaysia, Observation |

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Manuscripts
Prevalence of Safety Equipment and Helmet Use among School Students Commuting To School in South Selangor, Malaysia

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ABSTRACT:
A cross sectional observation study was conducted on the use of helmets and other safety equipment for child pillion riders while going to a school in Sri Serdang, Selangor, Malaysia. The objective of this study is to analyse the show the proportion of children wearing helmets and other safety equipment whilst riding pillion on motorcycle. The prevalence of helmet use among the students as pillion riders (47.88%) was low compared to the observed adults (75.21%) and this is unsatisfactory. There is a distinct lack of awareness of the benefits of helmet in helping to save lives and reducing injuries. Hence, there is a need for other safety equipment to provide additional safety protection for child pillion riders to counter the lack of safety equipment usage whilst riding pillion. The Malaysian Ministry of Transport could benefit from this study with the information gained for the safety equipment usage among school students.

Keywords: Children, Safety, Motorcycles, Malaysia, Observation, Pillion

INTRODUCTION:
South East Asian countries have seen a massive increase in motorcycle usage (Roehler et al., 2013). In the low to middle income countries, motorcycle’s popularity has grown tremendously over the past decades (Li, Li, & Cai, 2008). However, there is an increase motorcyclist related injuries, deaths and casualties in tandem with the increase of motorcycle use in these countries as motorcycles are the leading mode of transport in these countries (Sheikh Ibrahim, Stevenson, & Hariza, 2006).
Children’s road traffic safety is increasing in importance in the public health arena of most countries due to the increase of child related road traffic injuries year on year (Yu et al., 2012). Motorcycle related injuries and its resulting fatalities is an increasing at an alarming rate in the developing world (Conrad, Bradshaw, Lamsudin, Kasniyah, & Costello, 1996). In Malaysia, transport related accidents were one of the main causes of death in 2017 for the 0-14 and 15-40 year-old population (Department of Statistics Malaysia, 2018). Many studies have shown that helmet saves lives. The motorcyclists’ head is the most vulnerable part of the body susceptible to serious injuries that is the most vulnerable in case of an accident (Yang, Dai, & Zhuang, 2009). Helmets have been proven to reduce the risk of brain and head injury by seventy to eighty percent and facial injury (mid and upper face) by sixty five percent (Pinnoji & Mahajan, 2007).

In Malaysia, children are ferried to school in various ways i.e. either sent by cars, motorcycles or accompanied by foot to school by their parents. Despite the availability of safety equipment like helmets, parents have shown to not using them for their children due to ignorance despite the safety advantages outweighing the non-use (Blomquist, 1991).

OBJECTIVE:

The objective of this study is to analyse the show the proportion of children wearing helmets compared to children not wearing helmets whilst riding pillion on motorcycle in a school going environment where the proportion of children riding pillion is high. Besides the use of helmets, the usage of other forms of child protection equipment such as safety belt (harnesses) and elbow guards will also be noted.
METHODS:

An observational study of school children wearing helmets was conducted. This study was conducted at a National Primary School in Seri Kembangan, Selangor, Malaysia. Our study was limited to the school children who rode as pillion riders. A typical primary school going child would be in the primary school until the age of 12. Primary schools were purposefully chosen due to the vulnerability of children in primary schools (aged 7 to 12) whilst riding pillion on motorcycles. This study’s outcome is intended to show the proportion of children wearing helmets compared to children not wearing helmets whilst riding pillion on motorcycle. This study was conducted over a period of 1 day in the month of September 2014. This observation was conducted from a distance over 3 times on the day of the observation. This is because, this primary school has got one morning session and one afternoon session. The afternoon session would start once the morning session has finished and hence there is an overlap of students entering and leaving the school in the afternoon. The observation times were from 6.45 am to 7.30 am, 11.45 am to 1.30 pm and 6.30 pm to 7.15 pm. The gender of the child pillion rider and the gender of the motorcyclist would also be noted. Besides the use of helmets, the usage of other forms of child protection devices will also be noted. The data was manually recorded utilising a pre-set form and then tabulated in Statistical Package for the Social Sciences (SPSS) software data base. Frequencies were calculated; cross-tabulation was performed and calculated. The prevalence of helmet use for both riders and pillion riders was calculated (Ackaah & Afukaar, 2010; Ariffin, Soid, Borhan, & Sukardi, 2014).

RESULTS:

Children come to school in various modes of transport. Children either walked on foot, ferried on motorcycles, riding their bicycles, sent by school bus or cars.
Our observation was strictly observing the parents who brought their children on motorcycles. From the observation done over the course of one day, it was observed that there was a total of 121 parent/adults who sent and picked up their children by motorcycles. There were also 8 older students (aged above 16 years who are legally allowed to ride motorcycles according to Malaysian law) who sent and picked up children from school. All 8 older students were males. The numbers of male parents/adults were 92 and female parents/adults were 29. The numbers of helmeted students were 41 male and 38 female students. The numbers of helmeted parents were 71 male and 20 female parents. All 8 older students did not wear helmets and their pillion riders also did not wear helmets as well.

The prevalence of helmet use among the students (47.88%) was low compared to the observed adults (75.21%). Pillion riders were less likely to wear helmets compared to the adults that they are riding with. Although, when an older student rides a motorcycle with another student, the observation was that the pillion rider was more likely to follow the fellow student rider in front. There were instances where some parents ferried more than one child as pillions. There were 2 parents who utilised additional safety equipment’s for themselves and their children. This additional equipment was safety belt like harnesses for the child and elbow guards for themselves and the child.

DISCUSSION:

The prevalence of helmet use was very unsatisfactory among parents and students alike. It is very clear that the parents are not taking the safety of their children seriously. The unsatisfactory rate of helmet usage can be partly attributed to the mind-set in place with regards to helmets (Ratanavaraha & Jomnonkwao, 2013). There is a perception that motorcyclists do not really understand the importance of helmets and instead they behave as if the only reason
they are using helmets is to avoid detention or arrest by the police but and not as a form of protection of their lives.

Children are more at risk of suffering head injuries due to their larger head size compared to their body mass. This coupled together with their younger developing brain being susceptible to lasting damage is situation that has to be avoided by the responsible adult. During an accident, children lack the judgement and experience to be able to avoid or reduce the impact on to themselves (Robertson, Lang, & Schaefer, 2014). Hence it should be the responsibility of the adult correctly and properly ensuring the safety of the child in their care whilst on the motorcycle. The parent who does not ensure that their child at least wears an helmet whilst riding a motorcycle is not being responsible and is teaching the child irresponsible behaviour as this child will most likely follow the same example when the child starts riding.

People should feel responsible for the safety of children under their care even when they are in/on motor vehicles such as motorcycles (Zamani-Alavijeh et al., 2009). According to Sabahiah and Sukor (2014), motorcycle safety cannot be tackled by only focusing on certain issues. The combinations of policy, education, inputs from mass media, support from the community and also research that combining the engineering practice and behavioural studies is obviously needed (Sabahiah & Sukor, 2014). The low uptake of the practice of using safety equipment’s in developing countries is a worrying trend and represents a need for a form of intervention. In order to increase the usage of motor vehicles protective devices, one of the three approach strategies are needed. The three approach are 1) education, 2) legislation 3) engineering intervention (Floerchinger-Franks, Machala, Goodale, & Gergerding, 2000). Utilising the engineering intervention approach, a device capable of providing some sort of protection to the child whilst riding pillion should be designed and developed for underbone motorcycle.
CONCLUSION:

The prevalence of helmet usage is low among the students. There is a distinct lack of awareness of the benefits of helmet in helping to save lives and reducing injuries. Children should be taught continuously from a young age on safety and the perils whilst riding motorcycles as pillion. These education programmes should not be just limited to schools but should carry on to colleges and universities so that it will stick with these children till they are adults. The government and relevant agencies should stop the sale and availability of non-standard helmets from the market to encourage the use of only standard helmets especially for children. A possible review of the Malaysian law pertaining suitability of children riding pillion with a set age limit of should be carried out for the benefit of this vulnerable group. Engineering countermeasures should be implemented to create a safer and more ‘crashworthy’ travel environment for child pillion riders. A device capable of providing some sort of protection to the child whilst riding pillion should be designed and developed for underbone motorcycle. The surrounding communities around schools could also help with educating parents on the need for safety equipments especially helmets. They could organise educational programs specific for the parents. Further studies should be carried out on more schools to gauge the prevalence of helmets and safety equipment usage.

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REFERENCES


### Table

**Table 1:** Students being sent by motorcycle to school

<table>
<thead>
<tr>
<th></th>
<th>Male Students</th>
<th>Female Student</th>
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<tbody>
<tr>
<td>Motorcycle Only (Pillion Only)</td>
<td>109</td>
<td>56</td>
<td>165</td>
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**Table 2:** Helmet use among students and parents

<table>
<thead>
<tr>
<th>Rider</th>
<th>N</th>
<th>Helmeted</th>
<th>N</th>
<th>Helmeted</th>
<th>n</th>
<th>Helmeted</th>
</tr>
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<tbody>
<tr>
<td>Students</td>
<td>0</td>
<td>0 (0.00%)</td>
<td>165</td>
<td>79 (47.88%)</td>
<td>165</td>
<td>79 (47.88%)</td>
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<tr>
<td>Other Students</td>
<td>0</td>
<td>0 (0.00%)</td>
<td>0</td>
<td>N/A</td>
<td>0</td>
<td>0 (0.00%)</td>
</tr>
<tr>
<td>Parents</td>
<td>121</td>
<td>91 (75.21%)</td>
<td>0</td>
<td>N/A</td>
<td>121</td>
<td>91 (75.21%)</td>
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**Table 3:** Other protective equipment use among students and parents

<table>
<thead>
<tr>
<th>Rider</th>
<th>N</th>
<th>Other Equipment</th>
<th>N</th>
<th>Other Equipment</th>
<th>n</th>
<th>Other Equipment</th>
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</thead>
<tbody>
<tr>
<td>Students</td>
<td>0</td>
<td>0.0%</td>
<td>165</td>
<td>2 (1.21%)</td>
<td>165</td>
<td>2 (1.21%)</td>
</tr>
<tr>
<td>Other Students</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
<td>N/A</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Parents</td>
<td>121</td>
<td>2 (1.65%)</td>
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<td>N/A</td>
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<td>2 (1.65%)</td>
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