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Short Communication

Prevalence of motorcycle helmet use in Sri Lanka: An observational study

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In Sri Lanka, helmet use is mandatory by law. This study was conducted to determine the prevalence of motorcycle helmet use in Sri Lanka. An observational study was conducted in four locations: two locations entering and leaving the city of Kandy, a rural area in the Kandy district, and the high way (A1) leading to Colombo from Kandy. All the motorcyclists that passed the observation locations were observed. Of all the 1254 motorcycle users, 1140 subjects used helmets (90.1%), as follows: 863 'riders' (97.7%), 275 'pillion riders' (second passengers) (84.1%), two 'third passengers' (5.4%) and none of the 'fourth passengers'(0.0%). Out of 106 observed child passengers, only 25 (23.5%) wore helmets. The significant finding of this study was that majority of adult motorcycle users used helmets while majority of children did not. Motorcycle helmet laws need to be strictly implemented against non-use of helmets by children in Sri Lanka. A further qualitative study is needed to examine the reasons for non-use of helmets among children.

Key words: Helmet, motor cycles, motor vehicle crashes, Sri Lanka, vulnerable road users.

INTRODUCTION

Vulnerable road users (pedestrians, motorcyclists and cyclists) make up almost three quarters of road traffic deaths in the South East Asia region (WHO, 2008). In Sri Lanka, 51% of the total vehicles involved in road traffic collisions (RTCs) are motorcycles (WHO, 2009). The number and the percentage of motorcycles, out of the total vehicle population, have increased from 834,586 (48%) in the year 2000 to 1,422,140 (56%) by the year 2005, which is a 70% increase (Department of Motor Traffic, 2012). Consequent to this increase, Sri Lanka is facing the problem of rapidly rising motorized two wheeler crashes. It is estimated that 35% of fatal RTCs in Colombo, in 2002 occurred from motorized two-wheeler crashes (Sri Lanka Police, 2012).

A large proportion of deaths and severe injuries due to motorcycle crashes results from injury to the head (WHO, 2006; Servadei et al., 2003; Nixon et al., 1987; Norvel and Cummings, 2002). Usage of standard helmets is an effective way of preventing head injuries (WHO, 2009). It has been revealed that motorized two-wheeler users without wearing helmets are three times more likely to sustain head injuries than those who are wearing helmets (Norvel and Cummings, 2002). The motorcycle helmet use reduces the likelihood of crash fatality by 40% and is

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Table 1. Distribution of helmet use.

Helmet use	Rider (%)	Pillion rider (%)	Third passenger (%)	Forth passenger (%)	Total
Helmet used	863 (97.7)	275 (84.1)	2 (5.4)	0 (0.0)	1140 (100.0)
Without helmets	20 (2.3)	52 (15.9)	35 (94.6)	7 (100.0)	114 (100.0)
Total	883 (100.0)	327 (100.0)	37 (100.0)	7 (100.0)	1254 (100.0)

Table 2. Distribution of helmet use among pillion riders.

User	Sex	Helmet (+)	Helmet (-)	Total
Adults	Male	112 (96.5)	4 (3.5)	116 (100)
	Female	141 (94.0)	9 (6.0)	150 (100)
Children	-	42 (68.9)	19 (31.1)	61 (100)

Table 3. Distribution of helmet use by area.

Helmet use	Urban	Rural	A1 High way	Total
Helmet+	334(88.6)	46 (80.7)	760 (92.7)	1140 (90.9)
Helmet-	43 (11.4)	11 (19.3)	60 (7.3)	114 (9.1)
Total	377 (100.0)	57 (100.0)	820 (100.0)	1254 (100.0)

70% effective in preventing severe head injuries (Liu et al., 2008).

Mandatory helmet laws reduce head injuries among motorcyclists significantly (Pitaktong et al., 2004). Motorcycle helmet wearing rates can be increased up to 90% when helmet laws are enforced effectively (Kraus, 1995). In Sri Lanka, both the drivers and the passengers of motorized two-wheelers are required by law to wear helmets except children in school uniform. A WHO survey has placed Sri Lanka at point seven in a 0 to 10 scale of mandatory helmet law enforcement (WHO, 2009). However, to date, there is no information on the prevalence of helmet wearing among motorcycle users in Sri Lanka. Therefore, the aim of the present study was to determine the prevalence of motorcycle helmet use in Kandy, Sri Lanka.

MATERIALS AND METHODS

Study design

This is an observational study conducted in Kandy, Sri Lanka in March, 2009. This study was conducted in three locations; Kandy city, a rural area in the Kandy district and the high way that connects Kandy to country capital, Colombo (A1 high way). Ethical approval for the study was obtained from the Ethical Review Committee, Faculty of Medicine, University of Peradeniya.

Data collection

In March 2009, all the motorcycles entering and leaving the city of Kandy were observed in two locations for an hour from 9 March (Monday) to 13 March (Friday). The two locations were: the main entrance to the Kandy city and a randomly selected rural area in Kandy (Katugastota). All the motorcycles were observed entering and leaving that area for an hour during the five days of the week mentioned previously. Then, we travelled 110 km along the main highway from Kandy to Colombo (A1 highway), which was a 4 h journey, and observed all the motorcyclists who travelled on A1 for the use of helmets. This journey covered the seven main cities other than Colombo and Kandy.

All the authors except the second author were involved in data collection. The data on helmet use of the motorcycle users (rider, pillion rider and other passengers) were collected along with their age (whether adult or child) and sex on a structured data sheet by the first author. Those who were apparently less than 12 years were categorized as children and whether the helmets met the minimum apparent standards was also ascertained. Data was entered into a Microsoft Excel data sheet and was analyzed using Statistical Package for Social Sciences (SPSS) statistical software.

RESULTS

In this study, 883 motorcycles and 1,254 users were observed. Out of the 1,254 users, 1,140 (90.9%) used helmets. Except for 6 (0.5%), all the others used standard helmets. Out of the 883 riders, 863 (97.7%) used helmets. Table 1 depicts the helmet wearing rates among the motorcycle riders and passengers.

Of the 883 observed motorcycles, 74 (8.6%) carried a third passenger and 14 (1.6%) carried a fourth passenger as well. All the 3rd and the 4th passengers were children. Among all the 1,254 passengers, 106 (8.5%) were children; of them, only 25 (23.5%) were wearing a helmet at the time of observation. Table 2 shows the helmet wearing rates of motorcycle passengers. Out of 883 riders, only 2 (0.2%) were females. Those two female riders were wearing a helmet at the time of observation.

Table 3 shows helmet use among motorcyclists according to the area. The helmet use was 88.6, 80.8, and 92.7% in Kandy city (urban area), rural area, and the highway, respectively. Helmet use was more prevalent when the users were on the highways.

DISCUSSION

Majority of the riders (97.7%) used helmets, which is very close to helmet wearing rates of United States of America which is 99% (Kraus et al., 1995). Several other high-income, low- and middle-income countries have achieved

helmet wearing rates over 90% upon enforcement of helmet laws (WHO, 2006).

Most significant finding of this study was that, 76.5% of the children were not using helmets indicating the unprotected nature of child passengers as compared to adults. An important reason for low helmet use among children may be because they were exempted from the mandatory helmet law when they are in school uniform (WHO, 2009). This is not scientifically acceptable and the policy makers need to amend the mandatory helmet law including children of all ages and children in school uniforms. More exploratory studies are needed to examine the reasons for low child helmet wearing rates.

The prevalence of helmet use in the rural area was lower than the urban area and on the A1 high way, which could be due to the absence of traffic police officers in rural areas (Fernando, 2012). Police stations in rural areas might be under staffed and having traffic police officers frequently on the road might not be practically possible. Policy makers should consider placing more traffic police officers on the rural roads to improve helmet use on rural roads.

It is a disturbing incidental finding that 8.6% of motorcycles were carrying a third passenger and 1.4% carrying a fourth passenger. Also, the usage of helmet was low when it comes to other riders e.g. pillion rider, 3rd and 4th passengers. In fact, none of the 4th passengers wore helmets at the time of observation. Although, only two people are permitted to ride on a motorcycle, police does not enforce this law in Sri Lanka especially if the third or the fourth passenger is a child. This might place the 3rd and the 4th passengers at an additional risk. Hence, police need to be advised and sensitized on this issue and requested to strictly enforce the mandatory helmet use law and the laws on number of passengers to travel on motorcycles.

A recently published multicenter study revealed that the widespread use of non-standard helmets in low- and middle-income countries may limit the potential gain of the motorcycle helmet use programs (Ackaah et al., 2012). The present study suggests that most helmet users in Sri Lanka apparently use standard helmets. Though, that is an encouraging finding, one limitation of this study is that only the helmet was observed, and did not examine them. Hence, this finding needs to be confirmed by future research that should physically examine the helmets to see whether they meet the required standards.

Another limitation of the study is that the age of child riders by observation were assessed. Hence, our estimations of the age of those children might not be accurate in some instances. Similarly, because this was an observational study, the sex of the motorcycle users could be inaccurate in some instances (WHO, 2006).

However, the strength of this study was its possible generalizability to Sri Lanka. This study was conducted in Kandy, Sri Lanka. Kandy is one of the 24 districts in Sri Lanka and has several similar characteristics and road conditions to the other 23 districts. Also, the A1 highway that runs through the four districts was covered. Hence, our findings might be generalized to Sri Lanka.

In conclusion, the prevalence of helmet use by children motor cycle riders in Sri Lanka is not satisfactory. Hence, the policy makers should amend the mandatory helmet law including children of all ages and children in school uniforms. Police should strictly enforce helmet laws for all the people riding motorcycle, including the pillion riders irrespective of their age. Third and fourth passengers riding on motorcycles should be stopped. Future studies are required to examine in detail helmet usage in Sri Lanka. In order to produce more reliable results, further qualitative studies on helmet use in Sri Lanka were recommended. These studies need to examine the ages of children who ride motorcycles, the reason for non-use of helmets and the physical quality of the used helmets.

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