Evaluation of a bicycle helmet give-away programme in the District of Hulu Langat, Selangor

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Abstract

This is part of a quasi-experimental study to determine the usage of bicycle helmet amongst lower secondary school bicyclist in the District of Hulu Langat, Selangor following distribution of free bicycle helmets. It was undertaken in the month of June 1998 and out of 300 bicyclist sampled 292 participated in the project. A bicycle helmet and a diary to record daily helmet usage for a period of one month were distributed to participants. Out of 292 who participated, 208 returned their dairies. There were 156 male and 52 female respondents The overall rate of bicycle helmet usage was 77.0%. The mean bicycle riding days per month was 21.6 days for males and 15.2 days for females. There was a significant difference in the mean number of days bicycle helmet was used amongst male (15.8 days) and female (9.8 days) respondents. The only significant predictor of good rate of bicycle helmet use was gender.

Key Words : *Evaluation; bicycle helmet*

Introduction

It has been estimated that 1,750 to 2,000 cyclist sustained injury or die each year in Malaysia, many of whom occurred amongst children 6 to 15 years of age (Amar, 1994). The Royal Malaysian Police reported that 20% of road deaths amongst children aged 6 to 12 years old in the year 1989 occurred amongst bicyclist and they formed the second largest group of road users in this age-group who sustained serious head injuries leading to death (Krishnan *et al.*, 1994). In the same year bicyclist were again the second largest group of road users aged 13 to 17 years who died from road accidents (Krishnan *et al.*, 1994). Studies have indicated that fatal bicycle injuries were secondary to head trauma and usage of bicycle helmets could reduce the risk of head injury by 85% (Rivara, 1994). Therefore, usage of bicycle helmets while riding should be encouraged amongst bicyclists in Malaysia to prevent severe head injuries. However, even amongst developed countries such as the United Kingdom there was low usage of bicycle helmet amongst bicyclist (Wardle & Iqbal, 1998). This study was undertaken to determine the frequency of use of bicycle helmet and factors influencing its usage amongst lower secondary school students who were bicyclist in the district of Hulu Langat, Selangor following free distribution of bicycle helmets to them.

Materials and Methods

This was part of a quasi-experimental study undertaken in the month of June 1998 amongst lower secondary school students attending government co-educational schools in Hulu Langat, Selangor. Out of 21 co-educational government schools in the district, 4 were randomly selected. All Form Three students who were bicyclist were sampled from class to class in an ascending order until the required sample of 75 respondents from each school was obtained. A bicyclist was defined as a person who rode a bicycle on at least 4 occasions in a month for the past three months. A total of 300 students were sampled and written consents from parents for their children's participation in this project were obtained. A self-completed questionnaire in the form of a diary was developed to collate information on usage of bicycle helmets amongst respondents. A total of 292 parents of the sampled students agreed to allow their children to participate in this project. Bicycle helmets were delivered to the participants in May 1998 together with a diary and pamphlets to describe the proper use of helmets. The participants were also given guidelines on how to fill the diary and were requested to tick in the appropriate columns on their bicycle riding activities, use of bicycle helmets, number of falls and injuries sustained from 1st to 30th. June 1998. Sociodemographic data were also collected from these par-

ticipants. The main outcome measure was rate of helmet use, which was based on the number of days of helmet use divided by the total riding days and expressed as percentage. Respondents with rates of helmet use lower than 50% were categorised as "poor" rate of use of helmet while those 50% and above were considered to have good helmet usage. Parents of respondents with Form Six education and above were categorised as those with high education. Professionals were workers such as executives, managers, lawyers, doctors and engineers in both public and private organisations while the remaining workers were classified as non-professionals. It was hypothesised that respondents whose parents were non-professionals or with low education level had poorer usage of bicycle helmet compared with those whose parents were professionals or with high education level. Boys were postulated to have better usage of helmets compared to girls. The data collected was processed and analysed using SPSS. Odds ratio was calculated to determine the probability of helmet usage in relation to the various socio-demographic variables.

Results

Out of 292 bicyclist who participated in this project, 208 returned their diaries giving a response rate of 71.2%. Out of 156 male respondents, 44 (28.2%) were Chinese, 12 (7.7%) were Indians and 100 (64.1%) were Malays. There were 48 (92.3%) Malays, 3 (5.8%) Chinese and 1 (1.9%) female Indian respondent out of the 52 female respondents. There was a statistically significant difference between the proportion of male and female amongst the 3 ethnic groups ($p < 0.001$).

The overall rate of helmet usage was 77.0%. The average number of riding days per month was 21.6 ± 7.0 and 15.2 ± 7.6 days for males and females respectively. The greater number of riding days per month for boys compared to girls was significantly different ($p < 0.001$). The average number of riding days per month for Malays, Indians and Chinese was 19.9 ± 7.6 days, 23.8 ± 6.3 and 19.2 ± 8.0 days respectively. There was no significant difference in the number of riding days between the three races ($p = 0.152$).

The average number of days male and respondents wore a bicycle helmet was 15.8 ± 8.7 and 9.8 ± 7.7 respectively. There was a significant difference between males and females in the number of days they wore a bicycle helmet ($p < 0.001$). The average number of days of use of bicycle helmet for Malays, Chinese and Indians was 13.7 ± 8.7, 15.0 ± 8.9, and 18.2 ± 9.5 respectively. There was no significant difference ($p = 0.171$) in the mean number of days of use of bicycle helmet amongst the three races.

There was no significant difference ($p = 0.368$) in the number of falls from a bicycle per month between boys and girls. However, there was a significant difference ($p = 0.008$) in the number of falls from a bicycle amongst Malays as compared to other races with Malays experiencing more falls compared to other races. There were no reported injuries sustained during each fall.

There was a significantly ($p < 0.001$) moderate degree of correlation ($r = 0.659$) between the number of days use of bicycle helmet and the number of days of bicycle riding.

Table 1 shows the socio-demographic predictors of helmet use, which include ethnicity, parents' education level and parents' occupation. It could be concluded that gender was the only significant predictor that influenced use of bicycle helmets with boys having a lower probability of obtaining poor rate of helmet use compared to girls.

Discussion

The overall rate of good helmet usage (77%) was similar to that found by Kim *et al.* (1997) in King County, Washington where free helmets were given to children 6 to 12 years of age. In another study by Logan *et al.* (1998) it was found that helmet usage rate increased from 3.0% before a bicycle helmet give-away programme to 38.0%, 7 months following distribution of free helmets. In this study it was also found that good rates of helmet usage were higher amongst boys compared to girls. This was expected since boys are usually more adventurous than girls and may not feel shy wearing a bicycle helmet.

Factors such as parents' education level and occupation did not seem to influence use of bicycle helmets in this study. This was contrary to the findings by Rodgers *et al.* (1996) who found that parents' socio-economic status had an influence on use of bicycle helmets. Although the importance of using bicycle helmets to prevent fatal head injuries cannot be denied, many studies have shown that the rate of use of bicycle helmets was very poor even in developed countries (Bolen, 1998; Farley, 1996). It is not a norm in Malaysia to wear bicycle helmets while cycling and the likelihood of not using a bicycle helmet is high if the participants were not given free bicycle helmets. This bicycle helmet give-away programme was an indirect way of encouraging the community to use bicycle

helmets. Bicycle helmets give-away programmes have been carried out extensively in developed countries such as the United States of America to improve helmet usage (Parkin, 1995). However, despite being given bicycle helmets there were respondents who chose not to wear bicycle helmets while cycling. In developed countries, various measures have been carried out to encourage use of bicycle helmets. In the study by Abularrage *et al.* (1997) promotional campaigns were extensively carried out to encourage use of bicycle helmets. Bicycle helmets were only given free to recipients from the low socio-economic group to encourage ownership and use of bicycle helmets. Likewise in Malaysia, distribution of bicycle helmets could be targeted to recipients who could not afford to buy it. This is to prevent the community from being heavily dependent on government agencies for subsidies of such nature.

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Table 1. Socio-demographic predictors of helmet use amongst respondents

Socio-demographic variables	Use of helmet		Odds ratio	Confidence interval	P value
	Poor	Good			
Ethnic group					
Malay	36(78.3%)	112(69.1%)	1.61	0.70, 3.77	0.3071
Others	10(21.7%)	50(30.9%)			
Sex					
Male	27(58.7%)	129(79.6%)	0.36	0.17, 0.78	0.0069*
Female	19(41.3%)	33(20.4%)			
Mother's education level					
Low	40(87.0%)	149(92.0%)	0.58	0.19, 1.84	0.3820
High	6(13.0%)	13(8.0%)			
Father's educational level					
Low	31(67.4%)	130(80.2%)	0.51	0.23, 1.12	0.1009
High	15(32.6%)	32(19.8%)			
Mother's occupation					
Non-professional	44(95.6%)	155(95.7%)	1.00	0.61, 1.65	0.9038
Professional	2(4.3%)	7(4.3%)			
Father's occupation					
Non-professional	41(89.1%)	144(88.9%)	1.02	0.33, 3.37	0.8256
Professional	5(10.9%)	18(11.1%)			

* Statistically significant

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