Original Article

Knowledge Regarding Pedestrian Injury Prevention among Secondary School Going Children Of Karachi, Pakistan

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Abstract

Introduction: Pedestrian injuries are a major public health problem, especially among children, in developing countries. In Pakistan, however, children's knowledge regarding this issue has not been addressed. The objective of the study was to determine the magnitude of knowledge regarding pedestrian injury prevention among children studying in secondary schools of Karachi.

Materials and Methods: It was a cross-sectional study, conducted in six secondary schools of Karachi, for a period of six months from October 2012 to March 2013. A total of 470 secondary school children (classes 8-10), were selected through a two-stage stratified random sampling, across 6 schools in, Karachi. A pilot-tested questionnaire developed on published literature and road safety rules, assessed children's knowledge about safe road crossing, walking and playing on roads. Data were analyzed using SPSS version 19, applying logistic regression analysis.

Results: There were 46.8% boys and 53.2% girls, majority 12 to 15 years of age (69.1%). Overall knowledge was adequate (68.9% versus 31.1%), boys (52.2%) versus girls (47.8%). 16.6% of children had inadequate knowledge about road crossing, 33.6% about walking and 8.7% about playing on roads. Factors significantly associated with inadequate knowledge were younger age (OR=2.8, 95%CI=0.8-5.1, p value=0.04), male gender (OR=2.08, 95% CI=1.35-3.21) and walking to school (OR=7.5, 95%CI=2.6-32.8).

Conclusion: This study indicates that 31% of children have inadequate knowledge regarding pedestrian injury prevention, a significant proportion of a vulnerable population. However, due to the limited sample size, not addressing temporality, larger studies assessing road behaviors of children are required.

Keywords: Knowledge, Pedestrian injury, Children.

Introduction

The World Health Organization (WHO) Global Burden of Disease study estimated that worldwide unintentional injuries were responsible for more than 3.9 million deaths in 2004.[1] This staggering figure depicts only a part of the burden, as these unintentional injuries are responsible for a significant proportion of non-fatal injuries as well. According to the WHO biennial report of 2006-2007, the five leading causes of death, among the top fifteen were found to be road traffic injuries (RTIs), drowning, burns, poisoning, and falls,[2] RTIs being the most common amongst these. These unintentional injuries are a leading cause of death among children and adolescents.[1,3] Globally there is an increasing incidence of motor vehicle accidents in recent years with automobile-related death being the most common cause of mortality from unintentional injury among all age groups, including children, adolescents, and young adults.[4-6]

Pedestrian related road traffic injuries are a significant problem, causing increased morbidity and mortality.[7] In 2003, in a study conducted in Karachi, motor vehicle crashes were found to be the most frequent form of unintentional injuries, with child pedestrian accidents being the most commonly observed at 26%.[8] Therefore, reinforcing the burden of this preventable cause of death and disability.

Several international studies have observed an increase in the incidence of road traffic injuries, more so in the developing countries, with child pedestrian fatalities being the most common.[3,9] Although various factors have been implicated for being responsible for contributing to these injuries, the basic road safety knowledge among children is an important modifiable factor.[10] Since schools play a major role in character building and behavioral modification of children this study has addressed the baseline knowledge among school-going children.

The objective of this study was to determine the knowledge of school-going children of Pakistan, regarding pedestrian injury prevention, of Pakistan, a developing country.

Materials and Methods

A cross-sectional study in which data were collected in 6 months from October 2012 to March 2013, from 6 schools of Saddar Town of Karachi, Pakistan. The sample size was calculated using the WHO software, based on the least proportion of the knowledge responses obtained. From the already existing literature, we found that only 23% of children were aware that it is unsafe to play on roads/sidewalks.[10] This assumption was then used to calculate the level of knowledge of children, regarding pedestrian injury prevention. The total sample size was calculated to be 426, bound on the error of 4% and a confidence interval of 95%. After the addition of 10% for non-responders, the final sample size was 470 study participants.

A two-stage stratified random sampling technique was used. In the first stage of sampling, three public sector and three private sector schools in Saddar Town were selected, after obtaining a list of schools from the Board Office. This was a computer-generated selection. In the second step, a systematic list of students of secondary classes in the selected school was obtained from the school principal after permission. We identified at least 80 students from each school (80*6=470). In each school, an equal proportion of students were selected from each class, i.e., class 8, 9 and 10, which was 27 students from each class.

Written permission was first taken from the District Education Officer (DEO) of Saddar Town and then from the principals of participating schools, followed by an assent filled by the students. All school-going boys and girls, from classes 8 to 10, as selected by simple random sampling and giving verbal and written assent, from the participating schools were included in the study. Students who were not available at the school on the day of the surveyor who did not give consent were excluded. Participating students were asked to fill a pilot-tested questionnaire, administered both in Urdu and English. The questionnaire was developed based on existing literature[8] and road safety rules, as recommended by the national and international traffic police departments.

Results

A total of 470 school going children currently attending secondary classes were enrolled in the study. Fifty-three percent of the total number of students were boys while forty-seven percent were girls, thus ensuring a sufficient representation of both genders. From each school the children were selected from classes 8 to 10, so that a total of 37% (n=164) were from class 8, 33% (n=157) from class 9 and 30% (n=149) from class 10 (n=470). The results showed that

the age range varied from 12 years to greater than 16 years, in children attending classes 8 to 10. Fifty-four percent of the children were from public schools while 46% were those attending private schools. (Figure 1)

Table 1: Relationship Of Demographic Factors With Knowledge Of Secondary School Going Children Regarding Pedestrian Injury Prevention

Variable		*Inadequate Knowledge N(%)*	*Adequate Knowledge N(%)*	*P-Value*
Age (in years)	*12*	7 (4.8%)	26 (8%)	*0.044
	13	26 (17.8%)	37 (11.4%)	
	14	28 (19.2%)	61 (18.8%)	
	15	33 (22.6%)	107 (33%)	
	16 & above	52 (35.6%)	93 (28.7%)	
Gender	*Boy*	51 (34.9)	169 (52.2%)	*0.001
	Girl	95 (65.1%)	155 (47.8%)	
Class	*8*	50 (34.2%)	107 (33%)	0.964
	9	50 (34.2%)	114 (35.2%)	
	10	46 (31.5%)	103 (31.8%)	
Distance of school from home	*Up to 10 min*	95 (65.1%)	51 (34.9%)	0.735
	More than 10 min	51 (34.9%)	108 (33.3%)	
Means of travel to school	*Car*	12 (8.2%)	7 (2.2%)	*0.003
	Van	19 (13%)	50 (15.4%)	
	Walking	109 (74.7%)	235 (72.5%)	
	Motorbike	6 (4.1%)	32 (9.9%)	

The primary outcome of interest was knowledge regarding pedestrian injury prevention among children. As shown in Figure 1, out of the total study population 68.9% (n=324) participants were found to have adequate knowledge regarding pedestrian injury prevention which is our study's main outcome measure. It also presents that children attending private schools had a higher percentage of adequate knowledge as compared to children going to public schools (51.2% versus 48.8%).

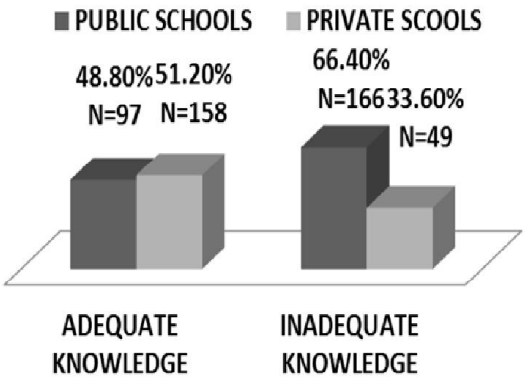

Figure 1: Univariate analysis of knowledge with age, gender, means of travelling to school, class, and distance of the school from home shows age, gender, and means of travelling to school to be statistically significant.

Table 2: Univariate Analysis Of Knowledge With Age, Gender, Means Of Travelling To School, Class And Distance Of School From Home

Variable		*Adjusted OR*	*CI*	*P value*
Age (in years)	*12*	2.79	1.09-7.14	*0.03
	13	1.10	0.58-2.09	
	14	1.65	0.91-2.99	
	15	1.99	1.17-3.39	
Gender	*Boy*	2.08	1.35-3.21	*0.001
	Girl			
Means of travel to school	*Car*	4.69	1.56-14.14	*0.006
	Van	3.40	1.27-9.16	
	Walking	7.49	2.02-27.79	

Similarly, the multivariate analysis also shows age, gender, and means of travelling to school to be statistically significant, thus showing relation with the inadequacy of knowledge. (Table 3) As expressed in the table, the lesser the age, the greater the chances of a child having inadequate knowledge (p=0.007, (OR=2.79, 95% CI=1.09-7.14). Similarly, boys are twice as likely to have inadequate knowledge as compared to girls (OR=2.08, 95% CI=1.35-3.21).

Table 3: Multivariate Analysis Of Knowledge With Age, Gender, And Means Of Travel To School

Variable		*OR*	*CI*	*P-value*
Age (in years)	*12*	2.077	0.84-5.11	*0.04
	13	0.796	0.43-1.46	
	14	1.218	0.69-2.14	
	15	1.813	1.08-3.04	
Gender	*Boy*	2.03	1.36-3.04	*0.001
	Girl	Ref		
Travel to school by	*Car*	4.51	1.55-13.17	*0.007
	Van	3.69	1.42-9.65	
	Walking	9.14	2.55-32.77	
Class	*8*	1.07	0.66-1.71	0.96
	9	1.05	0.65-1.69	
Distance of school from home	*Up to 10 min*	1.07	0.71-1.62	0.74
	More than 10 min	Ref		

The multivariate analysis also showed that among all the means of travelling to school, those children who were walking to school were eight times more likely to have inadequate knowledge about pedestrian safety (OR=7.49, 95% CI=2.02-27.79).

Fifty-two percent (n=245) of the children answered that it is safe to run and cross the road if a car is approaching slowly. This, again, poses a dual risk as the child may slip and fall on the road being an easy target for an oncoming car. Secondly, due to the fact that the car may speed up unexpectedly, therefore, increasing the chances of hitting the child in its way.

Furthermore, nearly 74% of the children were not aware that even along one-way roads they must look both ways before crossing over.

As evident from the results of this study, most children (88.3%) were aware that it is unsafe to play on roads/ sidewalks and that they should not play near parked cars (93.2%).

Discussion

The purpose of this study was to find out the magnitude of knowledge of secondary school children regarding pedestrian injury prevention in one of the most populous towns of Karachi (Saddar). As it has already been seen from previous studies, pedestrian injuries are a major public health problem, throughout the world, but especially among developing countries like Pakistan. The reason that has been postulated for it is the absence of pedestrian facilities and unruly traffic on roads.[10] A study conducted in England reported that 230 of the total child deaths are attributed to pedestrian and vehicle collisions, while in New Zealand 24% are due to pedestrian accidents.[11] The figure is much higher in Pakistan, where 63% of the total road traffic fatalities have been reported to be among pedestrians, which is greater than in the developed world.[7,8,12]

Our result differs from the studies conducted before as a greater number of children were found to have adequate knowledge, however, the number of children having inadequate knowledge is still a significant proportion of this vulnerable population, as these children are at risk due to deficiencies in their awareness. The significance of this result can be better understood in the light of a study conducted in Guangzhou, China which also assessed the behaviors demonstrated by children while crossing roads and reported that children having a low and medium level of knowledge were 1.5 to 3 times greater odds of injury compared to children with high knowledge.[13] In 2007, a study conducted among Nepalese students reported a dearth of knowledge, with only 26% of children being aware of Zebra crossings while only 23% knew that it is unsafe to play on roads or sidewalks. Of the total 1557 students, only 35% had received road safety education.[10] In our study, 33.6% (n=158) of the children were not aware of road safety while walking roads, 16.6% (n=78) did not know about safe road crossing and 8.7% (n=41) did not know that it is unsafe to play on roads/ sidewalks.

Furthermore, our study showed that the younger the age of the child, the lesser the knowledge they possess, that is younger children were found to be three times more likely to have inadequate knowledge. Similar results were found among children of Guangzhou, China.[13] Another significant association was of the male gender with the inadequacy of knowledge. Boys

were twice as likely to have inadequate knowledge. This finding is, again, consistent with a study conducted in China among school-going children which reported similar results.[13]

Since our study also considered the different school types, i.e., public and private it was seen that there was a difference in knowledge between children of the two school types. A greater percentage of children attending public schools had inadequate knowledge (66.4%, n=166) when compared with private schools (33.6%, n=49). This could be due to some deficiency in imparting this knowledge in public schools as it is not a part of the routine curriculum. This also important as nearly 27% of children reported schools to be their source of information.

Among the means of travelling, children walking to school were found to have eight times greater chances of having inadequate knowledge. These results have more importance with regards to the socioeconomic trends in Pakistan where walking is an important way of travelling. A greater number of children walk to school, thus, putting them at risk for injuries.

Although a significant number of children reported that they knew it is unsafe to play on roads/ near parked cars, in practice a lot of children are still seen to be playing at these high-risk areas. This can, perhaps, be explained by the fact that there is a severe shortage of safe and secure playing grounds. Since there is no designated play area for children, in most parts of the city, children are forced to play wherever they find convenient.

Conclusion

This study shows that schools have an important role to play in increasing road safety knowledge and if children are provided road safety education at school level it may go a long way in decreasing road traffic accidents.

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