Original Article

Road Traffic Regulation Awareness, Attitude and Practice among Public Health Students: An Observational Study

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ABSTRACT

Introduction

Road traffic accidents (RTAs) are the leading causes of premature deaths in Low and Middle Income Countries (LMICs). Public health students are the special cadre of human resources for addressing public health issues in the community including RTAs. This study aimed to assess the awareness, attitude, and practice of public health students of Kathmandu Valley regarding road traffic regulations.

Methods

This was a cross-sectional study conducted among 395 undergraduate public health students of Kathmandu Valley using structured self-administered questionnaire via google forms. The study participants were selected through student networking and invitation through emails and phone calls. Descriptive statistics and inferential statistics: Mann-Whitney U test, Kruskall-Wallis H test, and spearman's rank correlation were computed at 5% level of significance.

Results

Majority of the participants had knowledge on causes of RTAs, rule for seat belt and not using mobile phone while driving. However, few knew about the maximum penalty for driving without a license and correct side for pedestrians to walk. The median knowledge score on road traffic regulations was 11 out of 14, attitude score 7 out of 7, practice score for pedestrians 10 out of 12 and for drivers/riders 16 of 18. No significant association was found between knowledge and any socio-demographic variables. Knowledge was weakly correlated with attitude.

Conclusion

Majority of the participants had knowledge scores above average, while the attitude and practice percentages were higher. We found weak correlation of knowledge with attitude, and no correlation with practice. This indicates that there is still gap between knowledge and practice, which needs to be explored further.

Keywords

Knowledge; road safety; public health graduate; road traffic accident; traffic regulation

INTRODUCTION

Road Traffic injuries are the 11th leading causes of death worldwide.[1] About 20-50 million suffer non-fatal injuries with long-term disabilities.[2] Over 90% of the road fatalities occur in LMICs,[2,3] highest in Africa and South-East Asian Region (SEARO).[4] Road traffic crashes death rate in Nepal is 20.7 per 100,000 population.[5] Almost half of the RTAs occur in the Kathmandu valley.[6] The most vulnerable age-group is 18-25 years.[7] The vulnerable road users (pedestrians, cyclists, and motorcyclists) make 50-80% of road traffic deaths in SEARO.[8]

High accident rates in LMICs are contributed by old and overloaded vehicles, and poor road conditions.[9] The risk for vehicle accidents in Nepal is more than 100 times higher than in Japan and 10 times higher than in India due to dangerous road conditions.[5] Drunk driving, and violating lane rules are the major reasons for rising RTAs. Studies show low awareness among road users,[10–12] leading to poor attitudes and driving practices resulting in risk for RTAs.[13]

Road traffic safety reduces harm from vehicle crashes.[14] Unless the drivers themselves become conscious of the risks and traffic rules, such accidents could not be controlled.[15,16] Public health professionals represent the important part of the youth population, and are responsible for encouraging healthy behaviors in the community. Awareness on road safety among them will help spread information among the road users. There is paucity of studies related to road traffic regulations among public health students. This study aimed to identify awareness, attitude, and practice of public health students regarding road traffic regulations.

METHODS

We adopted web-based cross-sectional study among 395 undergraduate public health students of Kathmandu Valley, selected based on accessibility through students networking. We recruited student representatives of the respective colleges for this. The students were invited through emails and phone calls. Written informed consent was obtained from each participant before proceeding data collection. Sample size was calculated by employing t-distribution and considering standard deviation of the mean attitude score of health students on road traffic safety in Uttarakhand, India, which is 3.5,[17] and taking 95% confidence level.[18] The study duration was of seven months from August 2020 to February 2021.

A structured self-administered questionnaire via google forms was used which was prepared based on earlier studies.[7,19–21] It comprises of socio-demographic characteristics which includes age

(continuous variable), sex (male/female), ethnicity (Brahmin/Chhetri, Janajati, Madhesi, Others), marital status (single/married), family type (nuclear/joint or extended); and owning a driving license (yes/no). The outcomes include knowledge, attitude, and practices of participants regarding road traffic regulations which were all measured as the continuous variables. Each correct response for knowledge related questions was given score '1' and incorrect or 'don't know' response was given '0' score. The sum of correct answers yielded the highest attainable score as 14. For attitude scoring, '1' was given for the agreed responses out of 7-item agree/disagree questions, with the maximum score of 7. Practice was measured with a 10-item three point scale, four items for pedestrians and six items for drivers/riders. Every 'always' response was given score '3', sometimes '2', never '1' for positive questions, and scoring was reversed for three negative questions, with maximum total score 12 for pedestrians and 18 for drivers/riders.

The data collected were directly transferred to excel sheet, which were checked for errors and missing, and then were exported to SPSS version-28 for analysis. Descriptive statistics using frequency, percent, median and interquartile range were calculated. Mann-Whitney U test and Kruskall-Wallis H test were employed to find the factors associated with knowledge. Spearman's rank correlation was computed between knowledge, attitude and

Table 1. Socio-demographic characteristics of the study participants (n=395)

Characteristics	Number (%)
Age (in years)	
≤ 20	97 (24.6)
>20	298 (75.4)
Median = 22, IQR = 2	
Sex	
Female	258 (65.3)
Male	137 (34.7)
Ethnicity	
Brahmin/Chhetri	270 (68.4)
Janajatis	63 (15.9)
Madhesis	40 (10.1)
Others	22 (5.6)
Marital status	
Single	374 (94.7)
Married	21 (5.3)
Family type	
Nuclear	308 (78.0)
Joint	87 (22.0)
Have driving license	
Yes	98 (24.8)
No	297 (75.2)

practice regarding road traffic regulation. A p-value <0.05 was considered statistically significant. Ethical clearance was obtained from the Nepal Health Research Council, Ethical Review Board (Reg. number: 580).

RESULTS

The total study participants were 395 excluding duplicate entries and incomplete submission. Of total, 298 (75.4%) belonged to age above 20 years with the median age of 22 years; 65.3% were females; 68.4% were Brahmin/Chhetri and 78% were from nuclear family. Of total participants, 98 (24.8%) had their driving licenses (Table 1).

Out of all participants, 350 (88.6%) expressed pedestrian's lack of awareness on road traffic regulations as the major cause of RTAs, followed by drivers'/riders' lack of awareness (86.3%) and bad road conditions (76.5%). Almost all knew about the rule of wearing a seat belt while driving a car (98.7%) and not using mobile phone while driving (98.2%).

However, only 87 (22.0%) gave right answer about correct side for walking to reduce accidents. The median knowledge score was 11 out of maximum 14. (Table 2) A total of 360 (91.1%) participants believed that receiving phone calls while crossing the roads is unsafe. The median attitude score was 7 out of 7 (Table 3).

About three quarter of the study participants always used footpaths (73.2%) and zebra crossing (75.7%). Majority, that is, 376 (95.2%) always looked at both sides while crossing the roads, while only 6.6% always wore bright colored clothes during night time. The median practice score during walking was 10/12. Four-fifth (88.1%) of those who knew driving (155) reported that they always obeyed road signals, whereas only 63.5% always overtook vehicles from the correct side. Only 94 (59.5%) participants waited for pedestrians to cross the road even with no traffic signals or police around. Nearly half (46.2%) of them sometimes or always used mobile phone while driving/riding. The median practice score of drivers/riders was 16/18 (Table 4).

Table 2. Knowledge of road traffic regulations (n=395)

Knowledge	Number of Correct answers (%)
Causes of RTA*	
Drivers'/riders' lack of awareness	341 (86.3)
Bad road conditions	302 (76.5)
Pedestrians' lack of awareness	350 (88.6)
Mechanical errors	206 (52.2)
Age to get a driving license in Nepal	265 (67.1)
Indication of Traffic lights	369 (93.4)
Maximum penalty for driving without a license	148 (37.5)
Compulsory for seat belt while driving car	390 (98.7)
Use of mobile phone while driving	388 (98.2)
Appropriate side to walk for pedestrians	87 (22.0)
Road signal "Pedestrians prohibited"	378 (95.7)
Road signal "No overtaking"	367 (92.9)
Road signal "Speed limit of 50 kmph"	359 (90.9)
Road signal "No U-turn"	338 (85.6)
Median knowledge score=11, IQR=2	

Table 3. Attitude of road traffic regulations (n=395)

Attitude	Number of Correct answers (%)
Pedestrians and drivers/riders should follow road traffic rules and regulations	392 (99.2)
Receiving phone calls while crossing the roads is unsafe	360 (91.1)
A helmet should be worn while driving in a two-wheeler	391 (99.0)
A seat belt should be worn by everyone in the car	373 (94.4)
It is better to cross the road at the lighted area at night	366 (92.7)
Drunk driving is the risk factor for RTA	395 (100.0)
Exceeding the speed limit increases the risk of RTA	387 (98.0)
Median attitude score=7, IQR=0	

Characteristics	Never n (%)	Sometimes n (%)	Always n (%)
Pedestrians' practice (n=395)			
Use of footpaths	5 (1.3)	101 (25.6)	289 (73.2)
Use of zebra crossing to cross the roads	3 (0.8)	93 (23.5)	299 (75.7)
Look at both sides while crossing the roads	3 (0.8)	16 (4.1)	376 (95.2)
Wear bright colored clothes during night	159 (40.3)	210 (53.2)	26 (6.6)
Median practice score=10, IQR=1			
Drivers'/riders' practice (n=155)			
Obey road signals while driving	4 (2.5)	15 (9.4)	140 (88.1)
Overtake vehicles from the right side	19 (11.9)	39 (24.5)	101 (63.5)
Stop a vehicle for pedestrians to cross the road	5 (3.2)	59 (37.3)	94 (59.5)
Use mobile phone while driving	84 (53.8)	59 (37.8)	13 (8.3)
Held by traffic police for violating traffic rules	116 (73.9)	36 (22.9)	5 (3.2)
Drink and drive	144 (90.6)	14 (8.8)	1 (0.6)
Median practice score=16, IQR=2			

Significant association was not found between knowledge of road traffic regulations and socio-demographic characteristics. The median knowledge score for all the groups was about 11.0 (Table 5).

Weak correlation was found between knowledge and attitude, which was significant (p<0.001), whereas no correlation existed between knowledge and practice (Table 6).

Table 5. Association of knowledge with socio-demographic characteristics

Characteristics	Median knowledge score	p-value
Age (in years)		
≤ 20	11.1	0.72
>20	11.1	
Sex		
Female	11.2	0.49
Male	10.9	
Ethnicity		
Brahmin/Chhetri	11.1	0.08
Janajatis	11.3	
Others	10.7	
Marital status		
Single	11.1	0.88
Married	11.2	
Family type		
Nuclear	11.1	0.54
Joint	11.0	
Have driving license		
Yes	11.0	0.49

DISCUSSION

This study was carried out among 395 undergraduate public health students of Nepal, which found that the median knowledge score on road traffic regulations was 11 out of 14 total scores. Similarly, the median attitude score was 7 out of 7, practice score for pedestrians was 10 out of 12 and that for drivers/riders was 16 out of 18. This showed that all the average scores were about 78% of the maximum scores. None of the socio-demographic variables were found to be significantly associated with knowledge on road traffic regulations. We found only weak correlation between knowledge and attitude on road traffic regulations.

Majority (93.4%) of our study participants knew the indication of traffic lights, which is still lower than a study of India among medical students that showed 100% knowledge.[22] This is surprising since even the primary school students are taught about traffic lights and this is also used in daily practice. Our study showed that majority (86-96%) could recognize all four road signs which is supported by another study conducted in Maldives[7] while contradicted with the studies in India[13,23] which showed lower percentage. Majority of the participants in our study knew about the compulsory rule for seatbelt in a car (98.7%) and should not use mobile phone while driving (98.2%), which was in line with other studies.[19,22] However, only 67.1% were aware about the legal age for driving license unlike a study in India (91.1%),[22] but similar to a study in Nepal.[19] Only over one-thirds (37.5%) knew about the maximum penalty for driving without a license, and about one-fifths (22.0%) had knowledge on appropriate side for walking. These findings are similar to another study of Nepal.[19] This shows comparatively low awareness on the traffic laws which are usually not

		Attitude	Pedestrians' practice	Drivers'/riders' practice
Knowledge	Correlation coefficient	0.175	0.102	0.058
	p value	<0.001	0.04	0.48
	Number	395	395	155

taught in school. Low awareness on correct side of walking might be due to weak traffic laws for pedestrians, so then tend to ignore it. As the study population were public health graduates, they are expected to have more knowledge than the general public.

The attitude score was found higher than knowledge scores in this study. The median attitude score was 100% which shows that majority had good attitude. Participants who believed pedestrians and drivers/riders should always follow road traffic regulations were 99.2%, and 98.0% believed that exceeding the speed limit increases the risk. These findings were supported by other studies.[11,19,24,25]

The median practice scores were higher compared to the knowledge scores. This shows that the practice is not determined solely by knowledge but might also be influenced by other factors possibly peer practice, strict rules etc. However, there is no strong evidence behind this. Three-fourth (75.7%) participants always used zebra crossing, which was higher than a study among secondary school students of Nepal (62.9%).[19] This might be due to different population groups. The undergraduate students are relatively mature than the secondary level students, thus tend to follow traffic rules. Similarly, 88.1% always obeyed road signs and signals while driving which was higher than that practiced by higher secondary students (62.9%).[19] More than half (59.5%) always used to wait for pedestrians to cross the road, this finding was lower than other study in India (76.1%).[13,24] This might be an indication of negligence and concern only with the traffic rules and not on pedestrians' safety. We found that 53.8% never used a mobile phone while driving which was lower than a study in India (67.1%).[17]

We did not find any significant association between knowledge and any of the independent variables. This result was in contrary with the study in India which shows significant association with education.[26] The reason behind the insignificant result might be small sample size or possibly lack of interest in knowing about the traffic regulations since these are not strictly implemented in Nepal, and also there is no stringent rule for the pedestrians.[27]

We found weak correlation of knowledge with attitude and no correlation with practice. The majority of incorrect answers on laws regarding penalty, age of driving and appropriate walking side might have contributed to disparity. Similarly, ignorance towards some traffic laws might be linked to low proportions of those having driving license (24.8%) as these are only studied during license examination.

Being an online-based study, we could not include the students who had no access to the internet. There was a chance of information bias among participants as the self-reported practice is generally related to the knowledge and may not be reliable.

CONCLUSION

Majority of the participants had knowledge score above the average value and the attitude and practice score percentages were higher than the knowledge score. However, there are still large numbers who were unaware about some traffic rules like age for driving license, maximum penalty, correct side of walk etc. We found only weak correlation of knowledge with attitude and no correlation with practice. None of the socio-demographic variables were associated with knowledge. Since we found gap between knowledge and practice, similar studies among large population are recommended to further explore the gaps and their reasons. Inclusion of traffic regulations in the curriculum of public health students can make them knowledgeable and capable to educate the community.

FINANCIAL SUPPORT

CONFLICT OF INTEREST

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