

ROAD SAFETY: KNOWLEDGE, PRACTICE AND DETERMINANTS AMONG UNDERGRADUATE MEDICAL STUDENTS OF AGARTALA GOVERNMENT MEDICAL COLLEGE & GOVINDA BALLABH PANT HOSPITAL

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ABSTRACT

Background: According to the WHO, road traffic injuries caused an estimated 1.24 million deaths worldwide in the year 2010, down from 1.26 million in 2000. In the South East Asian region of the WHO, India alone accounted for 73% of RTA burden.

Aims & Objective: To assess knowledge and practice of road safety measures among undergraduate medical students.

Materials and Methods: A Cross-sectional study was conducted among 310 Medical students in AGMC campus during month of September to October 2013. The participants were selected by convenient sampling technique and information collected using structured questionnaire. The percentage, χ^2 test etc. had been employed in the analysis of data.

Results: Majority (67.4%) of the participants were in the age group of 20 -25 years and males (53.2%). Majority knew that consumption of alcohol while driving was dangerous, talking while driving distract the driver, cautious drive near school, seat belt to be worn by everyone in the car, loud music in the car distract driver, should drive in the left lane, over taking in the right only, give way to ambulance, use of hand free devices was safe while driving, wait patiently when pedestrians were taking too much time in zebra crossing and correct knowledge of speed limit was essential. Males had significantly ($p=0.035$) better knowledge compared to females.

Conclusion: The overall knowledge and practice of road safety measures was high among the study participants. Continuous efforts should be on to increase road safety measures through IEC activities to reduce the morbidity and mortality regarding RTAs. Further research was recommended among various sub-groups of population.

Key Words: Knowledge; Practice; Road Traffic Accident; Medical Student; Medical College

Introduction

Accident is defined as an unfortunate incident that happens unexpectedly and unintentionally, typically resulting in damage or injury.^[1] According to the World Health Organization, road traffic injuries caused an estimated 1.24 million deaths worldwide in the year 2010, down from 1.26 million in 2000. Half of all road traffic deaths are among pedestrians, cyclists and motorcyclists, and adults aged between 15 and 44 years account for 59% of deaths. 3 out of 4 road deaths are among men.^[2] The average rate was 18 per 100,000 people (down from 20.8 in 2000). 92% occurred in low and middle income countries, with South-East Asia and Africa having the highest rates. In the South East Asian region of the WHO India alone accounted for 73% of RTA burden.^[3] Every hour, 40 people under the age of 25 die in road accidents around the globe. According to the WHO, this is the second most important cause of death for 5 to 29 year olds.^[4]

Road accidents have earned India a dubious distinction. With over 130,000 deaths annually, the country has overtaken China and now has the worst road traffic accident rate worldwide.^[4] Drunken driving and low use

of helmets, seat belts and child restraints in vehicles as the main contributing factors.^[5] In India alone, the death toll rose to 14 per hour in 2009 as opposed to 13 the previous year. During the year 2010, there were around 5 lakh road accidents, which resulted in deaths of 134,513 people and injured more than 5 lakh persons in India. These numbers translate into 1 road accident every minute, and 1 road accident death every four minutes.^[4] Motor vehicle population has grown at a compound annual growth rate of 10 percent during 2000-2009 fuelled by a rising tide of motorization. Concomitantly, traffic risk and exposure have grown. The loss to the Indian economy due to fatalities and accident injuries estimated at 3% of GDP in 1999-2000. 53.1% of road accident victims were in the age group of 25 to 65 years in 2010, with pedestrians, bicyclists and two-wheelers, who comprise the most unprotected road users, accounting for around 40% of all fatalities while peak traffic during the afternoon and evening rush hours is the most dangerous time to be on the roads. Prevention of RTAs thus, becomes very crucial in order to improve the longevity and the quality of life of the individuals concerned.^[6]

In the year 2010, there were 160059 vehicles in Tripura and an accident rate of 5.14% per thousand vehicles. In Tripura alone 218 people were killed and another 1156 people were injured in road traffic accidents.^[7] The studies in relation to road safety measures among young adults are few in North East India. In Tripura the number of deaths and injuries due to road traffic injuries is on the rise. The present study is aimed to assess the knowledge and practice of road safety measures among the students of Agartala Govt. Medical College, so that the lack of knowledge which is responsible for the RTA can be assessed and a better overview of the situation can be made.

Objectives: To assess knowledge, practice and determinants of road safety measures among undergraduate medical students.

Materials and Methods

A Cross-sectional study was conducted among 310 Medical students in AGMC campus during month of September to 30 October 2013. There are two medical colleges in Tripura viz. Agartala Government Medical College & Tripura Medical College. Every year 100 students admitted in each of the two medical colleges of Tripura. Till the end of 9th semester there were approximately 500 students in each of Medical Colleges. Agartala Government Medical College was purposively selected for the study. The participants were selected by convenient sampling technique and information collected using structured questionnaire. Sample size $[N = (1.96)^2 \times PQ / d^2 = 310]$, where $P=50\%$, absolute precision (d) of 6%, $\alpha=0.05$ at 95% confidence with 15% non-response] 310 was calculated. Sick and not available during data collection were excluded from the study. A pre-tested, structured questionnaire were distributed to the selected participants and asked to complete the questionnaire and collected on the same day. The questionnaire had three parts, the first part included the general information related to the participants, and the second part contained the questions related to knowledge and third part related to practice on road safety measures. There were 18 questions related to knowledge and response was binary, recorded as either yes or no. Each item with correct answer was given 1 (one) with maximum of 18 points and wrong answer 0 (zero) with minimum of 0 (zero). The knowledge level had been scored into three categories viz. poor knowledge (0–6); average (7–12), and good (13–18). The participants were asked to complete the questionnaire

without leaving any un-attempted or incomplete questionnaire that was relevant. Permission from the institutional ethics committee was obtained before conducting the study. The verbal oral consent was obtained from the participants and strict confidentiality was maintained. Data were analyzed using Epi-info version 6.0, Microsoft excel 2007 software. The percentage, χ^2 test etc. had been employed in the analysis of data.

Results

In the present study majority (67.4%) of the participants were in the age group of 20 -25 years with a ranged of 18 – 25 years. One hundred sixty five (53.2%) were males and 69.0% were from urban areas. Eighty three (26%) of the respondents were from the first year followed by 23.5%, 20.6%, 20.0% and 9.0% from the 4th, 3rd, 2nd and 5th year respectively. Two hundred sixty seven (86.1%) participants were from nuclear family and more than half of the participants' family income of $\geq ₹ 20,000.00$.

Majority of the participants (98.7%) knew driving after consuming alcohol was dangerous, (92.9%) talking while driving distract the driver, (98.4%) one should drive cautiously near school, (85.8%) safe time for reading map while parking vehicle, (96.1%) seat belt to be worn by everyone in the car, (91.6%) loud music in the car distract driver, (84.8%) should drive in the left lane, (80.6%) over taking in the right only, (88.1%) give way to ambulance, (83.9%) use of hand free devices was safe while driving, (88.7%) wait patiently when pedestrians were taking too much time in zebra crossing and (97.4%) correct knowledge of speed limit was essential. Males had significantly ($p=0.035$) better knowledge (81.8%) compared to females (71.7%).

Majority (88.4%) were not familiar with traffic signs of no stopping, (88.4%) stop before proceeding, (83.9%) give way. Majority of participants were familiar with traffic signs of no U turn (90.6%), dangerous deep (71.3%) and cycle prohibited (91.6%).

It was revealed that 43% of the respondents owned two wheelers, 16% four wheelers and remaining 41% did not have any vehicle.

It was found that 3.3% of the respondents did drunken driving, 8.2% used mobile phones, 27.5% crossed speed limits, 83% did regular maintenance of vehicle, 74.7%

used seat belt, 90.1% used helmet, 90.1% did regular updating document, 26.9% played music, 24.2% gossiped with others in vehicle, 18.7% did frequent overtaking, 15.9% did frequent overtaking on left, 31.3% met an accidents while driving. The present study showed that 13.7% was fined by traffic police due to violation of traffic rules; 8.6% once, 5.5% twice and further 5.5% thrice or more. 14.3% met an accident once, 12.1% twice, 4.9% thrice or more.

Six (6) participants with average, 23 with good knowledge overtaken on left (p=0.002) while driving. There were 11 respondents with average, 15 with good knowledge; 7 with average, 53 with good knowledge and 19 with average, 77 with good knowledge drive vehicles within the speed limit of 20–30 km/h, 30–40 km/h and > 40 km/h respectively (p=0.013) (table 1). Majority of respondents (male 101, female 66) were not using mobile phones while driving (p=0.007). Further, a smaller number of males (42) and females (58) exceeded speed limit while driving (p=0.000) (Table 2). In logistic regression analysis revealed that other than first year medical students had significantly lesser chance to use mobile phones (OR=0.102, CI=0.013–0.820, p=0.032) while driving. Further, with good knowledge score of RTAs among medical students had more chance to use mobile phones while driving (OR=13.445, CI=1.008–179.263, p=0.049).

Table-1: Association of knowledge with practice of vehicle driving

Variables	Response	Knowledge Score, N (%)		P-value
		7-12	13-18	
Drunken driving	Yes	0 (0%)	6 (100.0%)	0.250
	No	37 (21.00)	139 (79.00)	
Use of mobile phone while driving	Yes	4 (36.36)	11 (63.64)	0.111
	No	33 (19.76)	134 (80.24)	
Exceed speed limit while driving	Yes	14 (28.00)	36 (72.00)	0.074
	No	23 (20.54)	109 (79.46)	
Regular maintenance of vehicle	Yes	30 (20.00)	120 (80.00)	0.257
	No	6 (19.35)	25 (80.65)	
Use of seat belt while driving	Yes	31 (22.79)	105 (77.21)	0.203
	No	6 (13.04)	40 (86.96)	
Use of helmet while driving	Yes	33 (20.50)	131 (79.50)	0.853
	No	4 (22.22)	14 (77.78)	
Regular updating documents	Yes	31 (20.12)	133 (79.88)	0.103
	No	6 (33.33)	12 (63.67)	
Playing music while driving	Yes	9 (18.37)	40 (81.63)	0.318
	No	28 (21.05)	105 (78.95)	
Talking with passenger while driving	Yes	6 (13.64)	38 (86.36)	0.107
	No	31 (22.46)	107 (77.54)	
Frequent overtaking	Yes	5 (14.71)	29 (85.29)	0.239
	No	32 (21.62)	116 (78.38)	
Overtaking on left	Yes	6 (20.69)	23 (79.31)	0.002
	No	31 (20.26)	122 (79.74)	
Usual speed limit maintained while driving (km/hr)	20-30	11 (42.31)	15 (57.69)	0.013
	30-40	7 (11.67)	53 (88.33)	
	>40	19 (19.79)	77 (80.21)	

Knowledge score of 0–6 was zero (0) response hence excluded from analysis

Table-2: Distribution of participants regarding practice on motor vehicles

Variables	Response	Gender, N (%)		P value
		Male	Female	
Drunken driving	Yes	6 (100.00)	0 (0.00)	0.064
	No	110 (62.50)	66 (37.50)	
Use of mobile phone while driving	Yes	15 (100.00)	0 (0.00)	0.007
	No	101 (60.20)	66 (39.80)	
Regular maintenance of vehicle	Yes	93 (62.00)	57 (38.00)	0.414
	No	22 (70.97)	9 (29.03)	
Use of seat belt while driving	Yes	84 (61.80)	52 (38.20)	0.540
	No	32 (69.57)	14 (30.43)	
Use of helmet while driving	Yes	104 (63.40)	60 (36.60)	0.406
	No	12 (66.67)	6 (33.33)	
Regular updating documents	Yes	103 (62.80)	61 (37.20)	0.715
	No	13 (72.22)	5 (27.78)	
Playing music while driving	Yes	30 (61.20)	19 (38.80)	0.753
	No	86 (64.66)	47 (35.34)	
Talking with others while driving	Yes	29 (65.90)	16 (34.10)	0.600
	No	87 (63.04)	51 (36.96)	
Frequent overtaking	Yes	26 (76.47)	8 (23.53)	0.193
	No	90 (62.09)	58 (37.91)	
Overtaking on left	Yes	21 (72.40)	8 (27.60)	0.330
	No	95 (62.09)	58 (37.91)	
Exceeding speed limit (≥40 km/hr)	Yes	42 (84.00)	8 (16.00)	0.000
	No	74 (56.06)	58 (43.94)	

Table-3: Predictors of mobile phone use while driving

Variable	N	Practice N (%)	OR (CI)	P value	
Gender	Male	165	15 (9.09)	1	0.346
	Female	145	1 (0.69)	1.53 (0.63-3.71)	
Age (Years)	18-20 years	101	1 (0.99)	1	0.250
	21-25 years	209	14 (6.70)	0.20 (0.01-3.12)	
Phase of the study	1 st year	83	2 (2.41)	1	0.032
	2 nd , 3 rd , 4 th , 5 th	227	14 (6.17)	0.10 (0.01-0.82)	
Location of family	Urban	214	8 (3.94)	1	0.133
	Rural	96	7 (7.29)	2.42 (0.77-7.65)	
Income (₹)	Rs. <20,000/-	123	7 (5.69)	1	0.828
	Rs. ≥20,000/-	187	8 (4.28)	0.88 (0.28-2.81)	
Knowledge score	7-12	71	1 (1.41)	1	0.049
	13-18	239	15 (6.28)	13.45 (1.01-179.26)	

Knowledge score of 0–6 was zero (0) response hence excluded from analysis

Discussion

The present study was conducted to assess the knowledge and practice of road safety measures among under graduate medical students. More than half of the students participated in the study were males. A study in Thailand^[8] reported that 67.3% male and 32.7% female. CKP Raj et al.^[9] reported majority of participants were females.

In the present study 59% of study participants used their own vehicles while moving around. Kulkarni V et al.^[10] reported almost similar results. A study from Saudi Arabia.^[11] reported nearly 70% participants used their own vehicles. Most of the participants belonged to higher family income group and that could be explained by the high vehicle usage rate.^[10]

The present study showed that males had ($p=0.035$) better knowledge compared to females. Raj et al.^[9] reported knowledge levels were higher among males. There were few differences observed between the present and studies done by Swami et al.^[12], Kulkarni V et al.^[10] and Raj et al.^[9] and that could be due to the urban and rural setting. Males had better knowledge that might be due to the habits of going out more frequently than females and more exposed to IEC activities and traffic signs in cities. Majority of the students were aware of the dangers of drunken driving. Knowledge regarding use of seat belts was also high among the participants.

Use of seatbelts was one of the most cost effective way to prevent RTA related morbidity and mortality.^[13,14] The awareness of risks of using mobile phones while driving on roads also appeared to be high. A study from South India reported almost similar results.^[10] Use of mobile phones without hands free devices while driving was a well-known risk factor for RTA related fatalities.^[15,16] Correct information on safe use of mobile phones through media urging drivers to avoid mobile usage while driving was essential. Majorities of the students identified traffic signs correctly. Almost similar findings were reported by Kulkarni V et al.^[10] from South India. Johnson OE et al.^[17] reported that at 3 months post intervention, the 'no u turn' sign was identified by 88 (88%) of respondents in the intervention group compared to 32 (32%) at baseline, while only 23(23%) could identify it in the control group compared to 24 (24%) at baseline.

P Okafor et al.^[18] reported knowledge of traffic sign and speed limit was poor even among commercial bus drivers. The better knowledge of traffic signs among participants might be due to the frequent exposure to the IEC activities shown and displayed in various setting and occasions while moving around.

Regarding the practice of road safety measures, only 6 participants were involved in drunken driving during the past one year. Even though very small number of respondent did drunken driving but such high risk taking behaviour was alarming. Consumption of alcohol and driving was a well-known notorious combination responsible for an increased morbidity and mortality associated with RTAs.^[10] Fifteen (15) participants admitted that they used mobile phones without hands free devices while driving. Furthermore, nearly 50 participants agreed to having exceeded speed limits while driving. Almost similar findings were reported by

Kulkarni V et al.^[10] from South India. U Janlert et al.^[19] also reported 14% of the riders who met accident had drunken driving.

It was further observed that majority had got their vehicles serviced regularly. Almost similar findings were reported by Kulkarni V et al.^[10] from South India. The knowledge regarding RTA was quite high among participants in this study but the way they practiced was not desirable at all. Old and badly maintained vehicles might be among the important reasons for increasing road traffic fatalities in developing countries like India.^[20]

Majority of the respondents did not used mobile phones but a smaller number among them exceeded speed limit while driving. The behaviours concerning mobile usage and over-speeding while driving were not only dangerous to the driver but also to pedestrians. Hence, these behaviour patterns need to be addressed through proper legislative and educative measures.^[10] Híjar M et al.^[21] reported that risk factors for severe injuries were: alcohol intake, non-use of seat belt, age < 25 years, speed > 90 km/h and occurrence at night and comparable with the present study. Ibrahim JM et al.^[22] reported that positive association between road safety education and participants' road crossing behaviours. Other than first year medical students had significantly lesser chance to use mobile phones while driving. The reason might be due to recent away from home for the first year students and kept it as mean for communication in spite of knowing risks. Whereas for the other than first year students were adjusted with the new environment and away from home for quite a long period of time that might not be necessary to use mobile phones frequently. Further, with good knowledge score of RTAs among medical students had more likely to use mobile phones while driving. This finding was contradictory to general belief. This could be explained by the fact that instead of knowing the risk of RTAs they might have neglected it or otherwise, maintained the usual speed limits desirable as per traffic rules specified for this area even though mobile phones while driving was not recommended. Further awareness generation and motivation was required in this group of population.

Híjar-Medina^[23] reported that those who were exposed to intervention on speed limit, use of seat belt, alcohol intake and external cause, showed a protective effect at the highway (OR 0.42, CI 95%, 0.27-0.66).The present study was an attempt to include most of the important

aspects of road safety measures with adequate sample size but limited to one medical college only; hence, could not be generalized.

Conclusion

The overall knowledge and practice of road safety measures was high among the study participants except certain areas the way they practice were not desirable. Development of process of re-orientation training towards road safety issues among the medical students should be done periodically. A continuous effort is required to increase road safety measures through IEC activities to reduce the morbidity and mortality regarding RTAs. Further research is recommended among various sub-groups of population.

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