

Original Research Article

A study to determine the awareness and behavioral patterns/practice about road safety measures among undergraduate medical students, Bangalore, India-cross sectional study

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ABSTRACT

Background: Road traffic accident's (RTA's) is an important global public health problem causing 20 to 50 million non-fatal injuries and 1.25 million deaths annually, currently the 8th leading cause of death globally and predicted to become the 5th leading cause of death by 2030. RTA is one of the leading cause of death among the most productive age group (15-29 years) costing billions of dollars to deal with its consequences. The present study is aimed to determine the awareness and behavioral patterns about road safety measures among undergraduate medical students, Bangalore.

Methods: A cross-sectional study was conducted among 540 undergraduate medical students in a medical college, Bangalore from August to October, 2015 by universal sampling technique using a semi-structured, pre-tested questionnaire.

Results: Majority of the study participants were aware of traffic signal rules 99.2% and helmets usage 98.8%. 87.7% knew that alcohol consumption is dangerous while driving/riding, 67% were aware of seat belts usage and only 64.8% were aware of usage of hands free devices while driving/riding. Among the 392 two wheeler and 188 four wheeler users, 36.2% and 50% regularly used helmets/seatbelts respectively and 70% followed lane rule. The risky behaviours like jumping traffic signals, riding hands free, drag racing and drunken driving were noted.

Conclusions: In order to restrict the epidemic of RTA's undertaking proper road safety measures are the best available interventions. The overall knowledge and practice of road safety measures was high except in certain areas the practice levels were not desirable which has to be strengthened.

Keywords: Awareness, Behavioral patterns, Medical students, Road safety measures

INTRODUCTION

Road travel has become an integral part of all of us and cannot be avoided in our day to day life. With increasing economy and population, there has been an immense increase in the traffic on the roads over a period of time. On one hand it has made things convenient for us but on the other hand it also increases our concerns for road safety. Road traffic accidents (RTAs) are considered as

one of the important public health problems around the world. Road traffic injuries are the eighth leading cause of death globally, and the current trends suggest that by 2030 road traffic deaths will become the fifth leading cause of death unless urgent action is taken.¹ An accident is defined as an unfortunate incident that happens unexpectedly and unintentionally, typically resulting in damage or injury. A crash is defined as a road traffic collision that resulted in an injury or fatality.² Injury

refers to non-fatal cases from a road traffic crash. Death is defined as a road traffic crash in which one or more persons involved in the crash died immediately or within 30 days of the crash.¹

Globally, road traffic injuries claim more than 1.25 million lives each year on the world's roads and have a huge impact on health and development.³ In response to this growing epidemic, in 2010 the UN General Assembly adopted Resolution to establish the Decade of Action for Road Safety (2011–2020), the goal of which is to stabilize and reduce predicted levels of road traffic fatalities around the world.¹ In September 2015 the United Nations launched the 2030 Agenda for Sustainable Development for Road safety, Sustainable Development Goal 3 (SDG) relates to halve the number of global deaths and injuries from road traffic crashes by 2020, SDG11 relates to providing access to sustainable transport systems for all, improving road safety and expanding public transport.⁴ In WHO's South East Asia Region road traffic injuries kill approximately 316 000 people each year. These deaths account for 25% of the global total of road traffic deaths. The South-East Asia region has a road traffic death rate of 17.0 per 100 000 population, compared to the global rate of 17.4. Rates of road traffic deaths are higher in middle-income countries in comparison to low-income countries.⁵

India has been identified by WHO as the worldwide leader in road deaths. Although India has-National speed limit law, National drink-driving law, National motorcycle helmet law, National seat-belt law, National law on mobile phone use while driving, National drug-driving law, the reported road traffic fatalities in 2010 accounted to 137572 (85% Males, 15% Females) as per Transport Research Wing (TRW), Ministry of Road Transport and Highways.⁵ In India WHO estimated road traffic fatalities accounted to 16.6 per 100 000 population.⁶ Road accidents cost the economy of the country in many respects like infrastructural cost, spending on health care services, compensation as well as rehabilitation of the victims, loss of household services as the economy loses out on the taxes of the earnings of the deceased victims and there is a loss of income for the survivors of the victim's family. RTA's are the leading cause of death for young people aged 15-29.

More than a million people die each year on the world's roads and the cost of dealing with the consequences of these road traffic crashes runs to billions of dollars.¹ Prevention of RTAs thus, becomes very crucial in order to improve the longevity and the quality of life of the individuals concerned. Simple measures such as awareness and practice of road safety measures can effectively reduce the impact of RTAs on the people's lives. The present study is aimed to determine the awareness and behavioral patterns/practice about road safety measures among undergraduate medical students, Bangalore. Objectives of present study are

- To assess the awareness about road safety measures among undergraduate medical students using 2 or 4wheeler vehicles.
- To determine the behavioral patterns/practice of road safety measures among undergraduate medical students using 2 or 4wheeler vehicles.

METHODS

The present cross-sectional study was conducted among undergraduate medical students of a medical college Bengaluru, during the period of August 2015 to October 2015. Data collection was done after obtaining clearance from the institutional Ethics Committee.

By Universal sampling technique among the all undergraduate medical students from first to final year, only those who knew driving (2 wheeler and/or 4-wheeler vehicle) and consented to take part in the study were included. Sick and not available students during data collection were excluded from the study hence constituting about 540 students in total. After obtaining written informed consent, a pre-tested semi-structured questionnaire was administered to the students. The questionnaire included the general information related to the participants, knowledge and behavioural patterns/practice on road safety measures. The information collected was analyzed using Microsoft Excel, SPSS software.

RESULTS

A total of 540 participants were included in the study. Among them 312 (57.77%) were males and 228 (42.22%) were females.

Most of the study participants 352 (65.18%) used only two wheelers, followed by those who used only four wheelers 148 (27.4%), a few participants used both two wheelers and four wheelers 40 (7.4%) as shown in Figure 1. This accounted to a total of 392 two-wheeler users, 188 four-wheeler users.

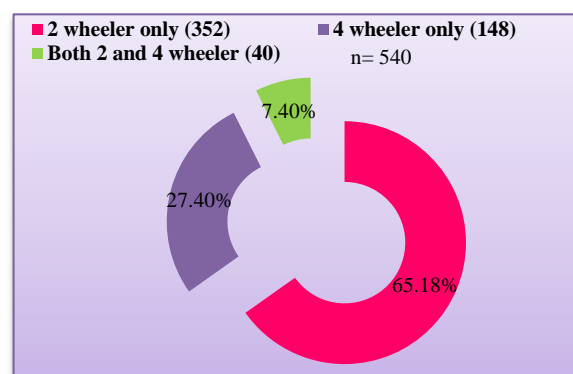


Figure 1: Distribution of participants based on vehicles used for riding/driving.

Among the study participants following awareness levels were noticed which was found to be highest for following traffic signal rules 536 (99.2%), followed by for wearing helmets 534 (98.8%) while driving, 504 (93.33%) for giving way to an ambulance (with flashing light), 490 (90.7%) for following lane rules-that overtaking should be done from the right hand lane side only, Alcohol consumption is dangerous while driving/riding 474

(87.7%), 469 (86.85%) for waiting for the pedestrians while crossing, 466 (86.2%) for usage of hand signals and blinkers while taking turns, lower levels of awareness was found for usage of seat belts while driving a car 362 (67%) and lowest for using hands free devices as safest way to use mobile phone while driving 350 (64.8%) as depicted in the Table1.

Table 1: Awareness about road safety measures while driving/riding.

Awareness	No. of participants (540)	%
One should follow traffic signal rules on roads	536	99.2
Helmets should be worn while riding a motorised 2 wheeler	534	98.8
One should give way to an ambulance (ambulance with a flashing light)	504	93.3
One should follow lane rules by overtaking from the right-hand lane only	490	90.7
Driving after consuming alcohol is dangerous	474	87.7
One should give way/wait for the pedestrians while crossing the zebra line	469	86.8
One should use hand signals and blinkers while taking turns	466	86.2
Seat belts should be worn while driving a car	362	67.0
Safest way to use mobile phone while driving is use of hands free devices	350	64.8

Out of the 540 participants during the past one month the following behavioral patterns/ practices were observed - among the 392 two-wheeler users, 142 (36.2%) regularly use, 226 (57.6%) occasionally do not use and 24 (6.1%) never used helmets while riding and among the 188 four-wheeler users 94 (50%) regularly use, 42 (22.3%) occasionally do not use and 52 (27.6%) never wear seatbelts while driving as shown in Figure 2.

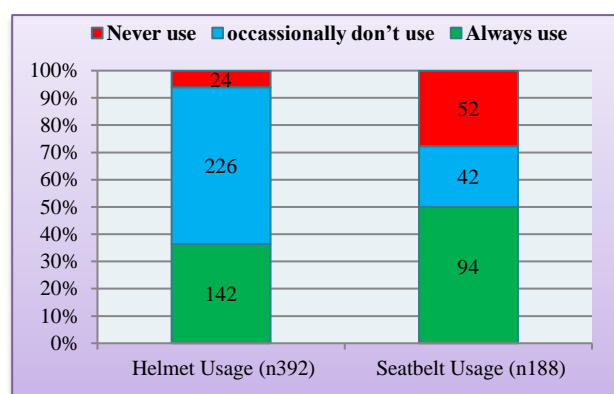


Figure 2: Distribution of participants based on use of helmets and seat belts.

Among the 540 participants 196 (36.29%) did not attend mobile calls while driving/riding, while 344 (63.69%) attend to the mobile calls as follows - 224 by stopping on the roadside, 82 by using hands free devices while driving /riding, while rest of the 38 participants attend to the mobile calls without stopping or without using any hands-free devices as shown in Figure 3. Table 2 depicts the following behavioural patterns/ practices among the

participants, were highest number of participants 249 (46.11%) have jumped traffic signals on multiple occasions, followed by 146 (27.0%) who have tried riding hands free, 49 (9.07%) have met with an RTA, about 54 (10%) of them have participated in drag racing and 13 (2.4%) have drunken driving in the past one year indicating risky practices.

Few of the participants were also fined, 3 (0.55%) for drunken driving and 60 (11.11%) for not carrying driving license in the last one year.

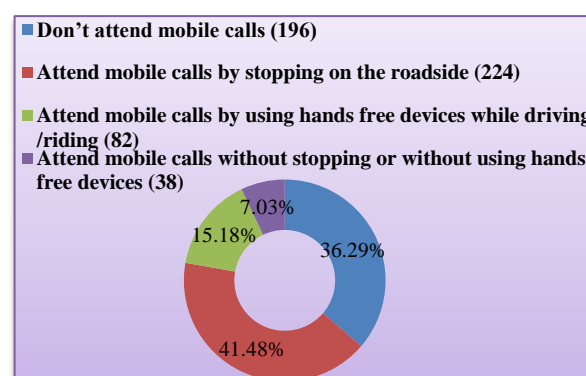


Figure 3: Distribution of participants based on use of mobile phones while driving/ riding (540).

Among the 540 participants the highest number of the participants 462 (85.58%) participants use hand signals/blinkers while taking turns, 491 (90.92%) give way for ambulance and relatively low numbers 458 (84.80%) gave way for pedestrians and only 379

(70.18%) follow lane rules by overtaking on the right hand side only as shown in the Figure 4.

Table 2: Distribution of participants based on risky behavioural pattern's/practice.

Risky Behavioural Pattern's/Practice	Number of participants	%
Have jumped Traffic Signal	249	46.1
Have tried riding hands free	146	27.0
Have met with an RTA	49	9.07
Participated in Drag racing	54	10.0
Drunk and Drive	13	2.40

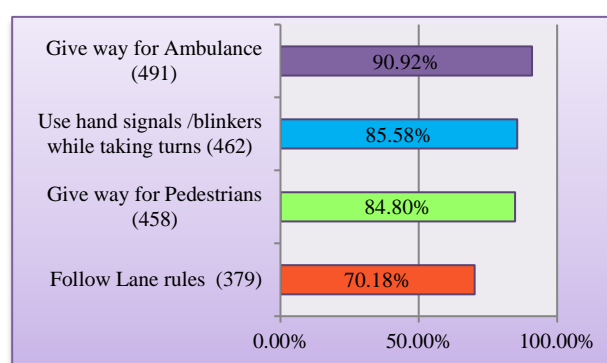


Figure 4: Distribution of participants based on various driving/riding practices.

DISCUSSION

The present study was conducted to assess the awareness and behavioural patterns/ practice of road safety measures among undergraduate medical students (n=540). More than half of the participants included in the study were male's. Majority of the participants used two wheelers.

In our study 504 (93.33%) participants were aware of giving way to an ambulance (with flashing light) of which only 491 (90.92%) participants followed it. In a study by Reang T et al about 88.1% were aware of giving way to ambulance.⁷ In our study 469 (86.85%) participants were aware of giving way for the pedestrians while crossing the road of which only 458 (84.80%) participants practiced the same. In a study by Jogdand K et.al 47% were aware of giving way for the pedestrians.⁸

In the present study about 466 (86.2%) study participants were aware of usage of hand signals and blinkers while taking turns among them only 462 (85.58%) participants practised this. High awareness and practice of the above-mentioned components/categories could be due to the frequent exposure to the IEC activities shown and displayed in various setting towards the same.

Among the 540-participant's awareness for traffic signal rules was found among 536 (99.2%) participants of whom only 291 (53.88%) followed them and the rest 249

(46.11%) of the participants have jumped traffic signals on multiple occasions, the reasons stated were urgency and missed identification of signals. In a study by Jogdand K et al. 58% of the participants were aware of the traffic signal rules.⁸ The above patterns noticed in our study indicate good awareness which could be due to good exposure to IEC materials. In spite of high awareness levels risky behavioral patterns/practices of jumping signals was found in about nearly half of the participants indicating a need to change this behavioral patterns/ practices. In the present study 534 (98.8%) participants were aware of wearing helmets while riding of whom 392 were two-wheeler users, among them following helmets usage patterns were observed -142 (36.2%) used regularly, 226 (57.6%) occasionally did not use and 24 (6.1%) never used helmets while riding in the past one month. In a study by Jogdand K et.al 39% of participants were driving without helmets.⁸ In our study the main reasons stated for not preferring helmets usage was humid climate and short distance travels. The above patterns indicate good awareness further may be due to good exposure to IEC materials on helmet usage. The variable levels of helmet usage indicates a need to change this behavioural patterns/ practices.

Among the 540 study participants, 362 (67%) were aware of usage of seat belts and among the 188 four-wheeler users 94 (50%) regularly use, 42 (22.3%) occasionally don't use and 52 (27.6%) never use seatbelts while driving. In a study by Reang T et al about 96.1% were aware that seat belt to be worn by everyone in the car.⁷ Furthermore, knowledge regarding use of seat belts was low among our study participants which might be related to the low number of 4-wheeler users, hence low and variable usage of seat belts as seen above can be addressed through proper awareness generation programs.

In the present study 490 (90.7%) participants were aware of the lane rules that overtaking should be done from the right side only and about 379 (70.18%) participants followed the same. In a study by Reang T et al about 80.6% were aware that over taking should be done in the right only.⁷ Following lane rules is one of the most cost effective way to prevent RTA related morbidity and mortality, participant's poor behavioural patterns/practices regarding the same raises concern and should be addressed.

In the present study among the 540 participants 350 (64.8%) participants were aware of using hands free devices as the safest way to use mobile phone while driving. 196 (36.29%) did not attend mobile calls while driving /riding, while 344 (63.69%) attend to the mobile calls as follows - 224 (41.48%) by stopping on the roadside, 82 (15.18%) of them used hands free devices and about 38 (7.03%) participants attended to the mobile calls without stopping or without using any hands-free devices. In a study by Reang T et al about 83.9% were aware that use of hand free devices was safe while

driving.⁷ In a study by Jogdand K et al. 32% were using mobile phone while driving.⁸ Use of mobile phones without hands free devices while driving is a well-known risk factor for RTA related fatalities which can be addressed through proper educative and legislative measures. Efforts on increasing the awareness on safe use of mobile phones through sign boards - surging road users to avoid mobile usage while driving needs to be strengthened.

Among the study participants 474 (87.7%) were aware that alcohol consumption is dangerous while driving/riding of which only 13 (2.4%) of them had practiced drunken driving and among them 3 (0.55%) were fined for the same in the last one year. In a study by Reang T et al 92.9% were aware that alcohol consumption is dangerous while driving.⁷ In a study by Jogdand K et al 83% were aware of the same.⁸ In a study by Kulkarni V et al 25.2 of the study participants had practised drunken driving.⁹ In the present study this indicates a good level of awareness and also a dangerous risky practice among the participants. Alcohol and driving is a well-known notorious combination responsible for an increased morbidity and mortality associated with RTAs. Even though very small number of respondent did drunken driving and drag racing, about one fourth of the participants have tried riding hands free and these high risks taking behaviours are alarming.

Limitations

The limitations of our study include lack of coverage of some important aspects and practices such as over-speeding while driving and knowledge regarding road traffic signs. The study is limited to one medical college only hence could not be generalized.

CONCLUSION

In order to restrict the epidemic of road traffic accidents, undertaking proper road safety measures are the best available interventions. The overall awareness and behavioral patterns/practice of road safety measures was variable as discussed:

- High awareness and practice levels were noted for giving way to ambulance, for hand signals and blinkers usage while taking turns and for giving way for pedestrians on roads.
- Awareness was high but the practice levels for following traffic signals, usage of helmets and seatbelts and following lane rules was low.
- Low awareness and practice levels were noted for usage of hands free devices.
- High risk behaviors like riding hands free, drag racing and drunken driving were also noticed.

The overall knowledge of road safety measures was marginally higher. Better exposure to media sources and day-to-day exposure to traffic in cities might be the

reasons for the better awareness. Medical students are ought to provide clinical services and educate the community about practices that can improve the health and lives of people hence awareness generation and orientation towards road safety issues among the medical students can be done through periodic trainings. Practices relating to road safety should be encouraged to curtail the high risk behaviours for RTAs among students/young adults in particular.

Recommendations

Simple measures in particular for the medical students includes

- Awareness generation and orientation towards good behavioral patterns/ practices by periodic re-orientation training towards road safety issues.
- Strict parental vigilance and guidance for usage of vehicles to avoid the risky behaviours.

General measures such as

- Continuous efforts to increase road safety measures through IEC activities, using signboards, posters, mass media involvement in order to create awareness regarding safe road practices has to be further strengthened to reduce the morbidity and mortality in relation to road traffic accidents.
- Behaviour change communication talks/ pictures representing safe road practices in order to overcome the risky practices among the younger population can be conducted at the school, colleges and other institutions.
- Stringent enforcement of rules and regulations especially for the risky behaviors.

Correct information through media, urging drivers to avoid mobile usage and safe use of mobile phones while driving is essential. Further research needs to be conducted to assess the existing situation regarding road safety measures across various sub-groups of the population.

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