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Original Research Article

Preventing accidents in India-can educational intervention to medical students work? Outcomes of a quasi-experimental study

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ABSTRACT

Background: As per world health organization (WHO) report an accident-related deaths are known to be the eighth leading cause of death and first largest cause of death among children aged 5-14 years and adults aged 15-29 years. As most of the deaths due to road traffic accidents (RTA) were among younger people. So, prevention of RTAs is very crucial by creating awareness and taking proper measures toward road safety in young adults like medical students. The aim of the study was therefore to explore the knowledge, attitude and practices regarding the road safety regulations among medical college students of private medical college in Meerut.
Methods: Study setting was in private medical college in Meerut, study population was 150 medical students, study unit was 150 undergraduate medical students of Batch 2021 and 2022, study design used was: Ani experimental study sample size: complete enumeration sampling technique (purposive sampling) inclusion criteria included all those who are present at the time of data collection. Data analysis was done by structured questionnaire on google form MS excel with appropriate test.
Results: For all informative, warning and imperative signs the knowledge, attitude, and practice (KAP) were significantly improved ($p<0.05$ in each case) after giving educational intervention on road safety signs.
Conclusions: There was significant improvement in the knowledge attitude, practices of medical students after educational intervention on road safety regulations, so this approach can help in reduction of RTA incidents in India, which can be studied also in future studies.

Keywords: Prevention, Accident, Road traffic, Medical students, Education

INTRODUCTION

Road transport is one the most frequently used mode of transport for movement in India. Industrialization and urbanization have enormously increased the number of vehicles on the roads. Road traffic continues to be a major developmental issue and is an emerging public health concern. There is a need of the hour to create proper awareness and educate youngsters regarding the road safety measures- as they are the future emerging population. As most of the deaths due to RTA were among younger people.

An accident is defined as an unexpected, unplanned occurrence which may involve injury.[1] Accidents are one of the major epidemics of noncommunicable diseases in current era. Road accidents are multicausal and are often the result of various factors such as human error, road environment, and vehicle condition. They involve high human suffering and monetary costs in terms of deaths,

injuries, and loss of potential income.[2] Hence, prevention of RTAs is very crucial by creating awareness and taking proper measures toward road safety.[2] the Road accidents in India kills almost 1.5 lakh people annually which translate on an average into 1130 accidents and 422 death every day or 47 accidents and 18 deaths every hour.[3]

Objectives

They were to assess the knowledge, attitude and practices on road safety regulations among medical students of private medical college in Meerut, to communicate and influence their attitude and awareness towards road safety through educational intervention and discussion and to estimate the percentage change in KAP after educational intervention. With this background, the present study was undertaken among the students of private medical college in Meerut.

METHODS

AIM of study was to assess the knowledge, attitude and practices of medical students of a private medical college in Meerut (UP) and educate them regarding road safety regulations if found deficiency in above.

Research question

What is the knowledge, attitude and practices of medical students on road safety regulations among and assess the change in their knowledge after the educational intervention?

Material and methods used

This experimental study was done from 1st January 2023 to 31st December 2023 in private medical college in district Meerut of state Uttar Pradesh. First institutional ethical permission was taken from dean of college. Informed consent was taken from all the participants.

Pre-designed semi structured questionnaire was used as a study tool.

Study population was 150 medical students, study unit was 150 undergraduate medical students of Batch 2021 and 2022, sample size: complete enumeration sampling technique (Purposive sampling).

Inclusion criteria

All those who are present at the time of data collection were included.

Data analysis was done by structured questionnaire on google form MS excel with appropriate test. Data was collected both pre and post educational intervention. The collected data was analyzed using appropriate statistical tests. After complete analysis and observation results were obtained and percentage change was evaluated.

RESULTS

Participants in this study includes both males and females. The age group which participated in our study is mainly above 18 years (97.3%), followed by below 18 years (3.4%). Among the participants 24.8% don't drive, 61.1% drive scooty, 28.9% drive bike and 28.9% drive car. Majority of the participants have a driving licence (58.4%) and others don't have a driving licence (43.6%). Among them majority has taken a professional training for the same (70.5%).

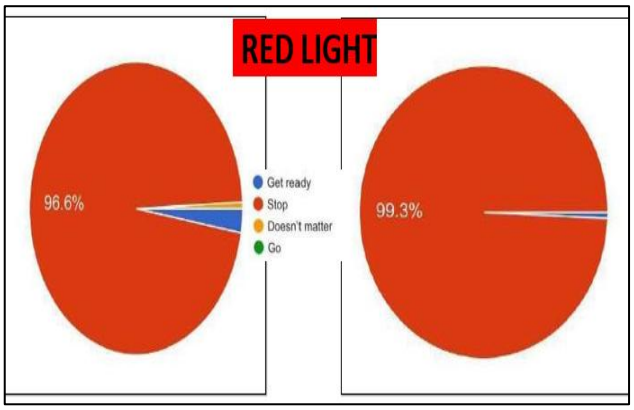

Figure 1: Change in knowledge of traffic signs.

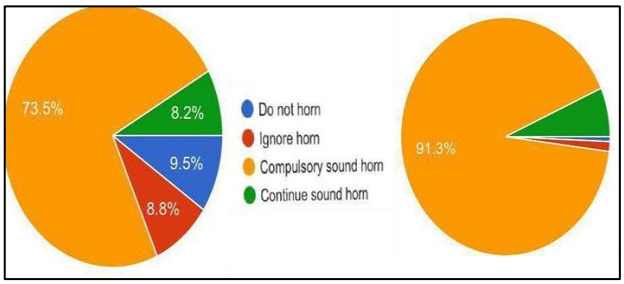

Figure 2: Compulsory sound horn.

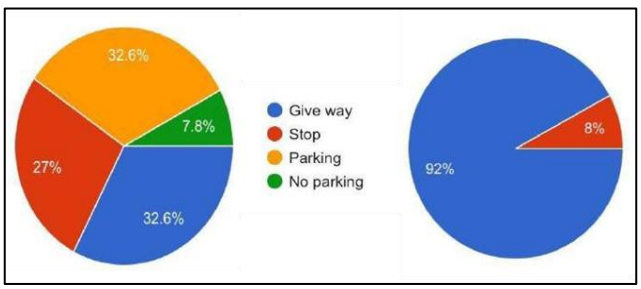

Figure 3: Give way to others.

Imperative signs

Imperative signs shown in the Figure 1-3.

Red light

Pre-intervention: Only 96.6% knew about red light sign.

Post-intervention: 99.3% knew about red light sign the data was statically significant.

Yellow light

Pre-intervention: Only 96.7% knew about yellow light sign.

Post-intervention: 98% knew about yellow light sign. The data was statically significant.

Green light

Pre-intervention: Only 93.2% knew about green light sign.

Post-intervention: 99.3% knew about green light sign. The data was statically significant.

Compulsory sound horn

Pre-intervention: Only 73.5% knew about Compulsory sound horn sign.

Post-intervention: 91.3% knew about compulsory sound horn sign. The data was statically significant.

Give way

Pre-intervention: Only 32.6% knew about give way sign.

Post-intervention: 92% knew about give way sign. The data was statically significant.

Turn left and go ahead

Pre-intervention: Only 30.2% knew about turn left and go ahead sign.

Post-intervention: 80.7% knew about Turn left and go ahead sign. The data was statically significant.

No vehicle in both direction

Pre-intervention: Only 46.9% knew about no vehicle in both direction sign.

Post-intervention: 97.3% knew about no vehicle in both direction sign. The data was statically significant.

No vehicle

Height limit

Pre-intervention: Only 67.4% knew about height limit sign.

Post-intervention: 96% knew about height limit sign The data was statically significant.

Weight limit

Pre-intervention: Only 55.9% knew about weight limit sign.

Post-intervention: 96.7% knew about Weight limit sign. The data was statically significant.

Warning signs

Warning signs shown in Figure 1-3.

Slippery road

Pre intervention: Only 60.1% knew about slippery road sign.

Post intervention: 95.3% knew about slippery road sign. The result was statically significant.

Barrier ahead

Pre intervention: Only 49.6% knew about barrier ahead sign.

Post intervention: 90% knew about barrier ahead sign. The result was statically significant.

Narrow bridge

Pre intervention: Only 64.1% knew about narrow bridge sign.

Post intervention: The 94% knew about narrow bridge sign. The result was statically significant.

Y intersection

Pre intervention: Only 58.5% knew about Y intersection sign.

Post intervention: 95.3% knew about y-intersection sign. The result was statically significant.

Guarded level crossings

Pre intervention: Only 58.5% knew about Y intersection sign.

Post intervention: 95.3% knew about y-intersection sign. The result was statically significant.

Parking both side

Pre intervention: Only 89.2% knew about parking both side sign.

Post intervention: 92% knew about parking both side sign. The result was statically significant.

Informative signs

Informative signs shown in Figure 1-3.

Rest room

Pre-intervention: Only 71.3% knew about rest room sign.

Post-intervention: The 98% knew about rest room sign. The result was statically significant.

Analysis of attitude of students while driving

Do you wear helmet while driving?

Pre-intervention: Only 37.8% knew about wore helmet while driving.

Post-intervention: The 92.7% started wearing helmet while driving.

Do you use mobile phones while driving?

Pre intervention: Only 45.9% did not uses mobile phones while driving.

Post intervention: 87.3% will not use mobile phones while driving.

Do you drive under the influence of alcohol or drugs?

Pre intervention: The 64.2% did not drive under the influence of alcohol.

Post intervention: The 88.7% won't drive under the influence of alcohol

Do you wear seat belt while driving?

Pre-intervention: Only 46.9% wore seatbelt while driving.

Post-intervention: 90.7% will wear seatbelt now

Do you use wrong lane when in hurry?

Pre-intervention: 30% used wrong lane in hurry while driving.

Post-intervention: Now only 4.7% will use wrong lane while driving.

Analysis of change in KAP towards-traffic signs, road safety rules

For imperative signs

Almost all of them knew about meaning of red/ yellow/ green light. Least knowledge was for the sign turn. Left and go ahead (32.6% vs 80.7%); followed by give way (32.6% vs 92% after intervention).

For warning signs

Most known sign was parking both sides (89.2%) and least known was barrier ahead sign (50%) pre intervention (<0.05).

Attitude for road safety

Assessed for using helmet (37% vs 92.7%); taking wrong lane (30% vs 4.7%), use mobile phone while driving (45.9% vs 87.3%) which showed significant change in the attitude ($p<0.05$).

Post intervention findings

90.7% students agree on wearing seat belt while driving. The 92.7% agreed on wearing helmet while driving. The 87.3% choose not to use phone while driving. The 88.7% participants thought that not to drive under the influence of alcohol or drugs (Figure 1-5).

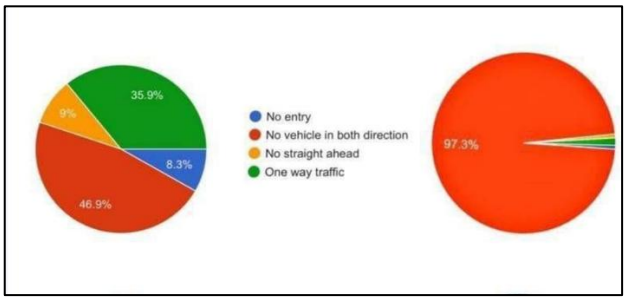

Figure 4: No vehicle in both directions.

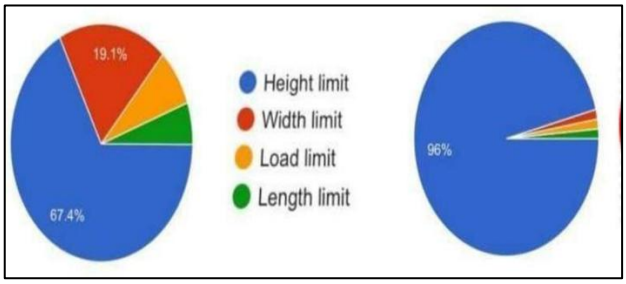

Figure 5: Limits in any direction.

DISCUSSION

As per WHO accident-related deaths are known to be the eighth leading cause of death and first largest cause of death among children aged 5-14years and adults aged 15-29 years.[4] According to road safety report of India (2021), 2 wheelers have accounted for maximum fatal road accidents contributing 44.5% of total road accidental death followed by cars (15.1%) and truck (9.4%).[5] Over-speeding, drink-driving, not using helmets and seatbelts

while driving, distracted driving using mobile phones while driving, etc., are some of the major risk factors of these RTAs.

Every year, the national road safety week is celebrated in India from January 11 to 17 which is organised by the ministry of road transport and highways, the week intends to spread awareness around road safety, which is a major concern for authorities as well as the government. The motor vehicles act (MVA), 2019 aims to improve road safety, strengthen rural transport, public transport and last-mile connectivity through automation, computerization, and online services and provide an efficient, safe, and corruption-free transport system in the country. Despite the presence of MVA (2019) increased the penalties in respect of offenses such as juvenile driving, drunken driving, driving without license, not wearing helmets, over-speeding, and overloading.[5] but it's actual impact on reduction on RTA needs to be seen. RTA are a significant burden on the health care system in India and is more prevalent among youngsters. The young MBBS students form a large and most prone population to RTA according to various studies worldwide. Their knowledge and attitude towards road safety regulations is reportedly diverse.

Keeping in view of above background this study was conducted to assess the level of knowledge, attitude and practices regarding road safety regulations among 150 medical students in Meerut and to see whether there will be any change in the knowledge, attitude and practices of students after educating them regarding the same.

This study first planned to assess the preexisting knowledge of the students regarding road safety regulations, educate them regarding the same and raise awareness among college students on the importance of road safety regulations. This study keeping in view of above regulations provided an opportunity to assess and educate the students in order to decrease the knowledge–practice gap and persuade them toward following road safety measures despite presence of few studies in literature on RTA.

Our study results were in unison with study by Rajasekaran et al which revealed that RTA account for a significant proportion of mortality and morbidity worldwide, especially the developing countries.[6] 'Hidden pandemics' such as deaths due to RTA often receive minimal attention globally. If not addressed adequately, the forecast looks bleak, especially for the developing countries in the coming decades. This study also emphasized that healthcare professionals have an important role in advocating measures to reduce injuries following RTA and, along with like-minded social individuals, can act as a powerful lobby to implement change. So, results of our study justify this issue

Moreover, study by Garg et al also reiterated that road traffic injuries are a significant burden on the health care system in India.[7] The most commonly affected group is young males. Pedestrians constitute a large majority of the victims and there is high early mortality in most cases. Study by Kulkarni et al also found that the overall awareness and practice of road safety measures was low among medical students.[8] Medical students are considered as an asset to a community and the services they ought to provide include not only clinical but also educating the community about practices that can improve the health and lives of people. Joshi et al the RTA victims were maximal in the age group of 18-45 years.[11] The causes of RTA were most common (69.5%) due to drivers' fault including speeding, drunk driving, not wearing seat belt, careless driving, alcohol use while driving, inexperience, poor visibility, loss of control, use of cell phones and failing to judge other person paths/speed. The results of our study were also similar to this study.

Study by Vijayakrishnan et al found that the mean age of the students was 21.4 (standard deviation=1.7) years.[9] About 30.4% of students suffered from RTAs in the past 2 years. Practice of drunken driving and mobile phone usage showed significant association with RTA occurrence ($p<0.001$). Multiple logistic regression revealed that students crossing speed limits and jumping signals had 3.19 and 2.04 times more risk of sustaining RTAs. Seventy-five percent of students had good knowledge on road traffic rules. The results of our study were also similar to this study. Study Vijayakrishnan et al also states that the practice of drunken driving and mobile phone usage showed significant association with RTA occurrence ($p<0.001$).[9] Our study showed that before intervention only (64 2%) and (45.9%) of participants didn't drive under the influence of alcohol and didn't use mobile phone while driving respectively. This attitude increases the risk of RTA among the population. Gopalakrishnan summed up in their study that the road traffic injury prevention can be achieved by avoiding over speeding and following speed limits Avoiding drunken driving. The results of our study were also similar to this study.[10]

Use of helmets by two-wheeler drivers use of seat belts and child restraints in cars Improving visibility, appropriate headlights and road lightings obeying traffic rules. In our study we addressed these points and educated the participants regarding road traffic signs, road safety rules and regulations. After educating them a significant change was seen in their attitude. Post intervention: 90.7% students agree on wearing seat belt while driving. 92.7% agreed on wearing helmet while driving. The 87.3% choose not to use phone while driving. The 88.7% participants think that driving under the influence of alcohol or drugs. Thus, providing education regarding road safety regulations and signs becomes very important. The results of our study were also similar to this study.

Study of Gopalakrishnan also found that the health sector is an important partner in the process of prevention and

control of RTA.[10] But the role of the medical professionals in advocacy for the prevention and control of RTA is always under-rated. The role of health sector is to provide appropriate prehospital and hospital care and rehabilitation for victims, improve data collection, contribute to policies, develop prevention activities, conduct advocacy, and contribute to the implementation and evaluation of interventions. The results of our study were also similar to this study.

Study by Joshi et al also stated in their study that the RTA victims were maximal in the age group of 18-45 years.[11] The causes of RTA most common (69.5%) due to drivers' fault including speeding, drunk driving, not wearing seat belt, careless driving, alcohol use while driving, inexperience, poor visibility, loss of control, use of cell phones and failing to judge other person's path/speed. Study was thus conducted on young students as they are considered to be risk-taking population and awareness among them plays an important role in enhancing their knowledge and preventing RTAs among community. The results of our study were also similar to this study.

The key results of our study such as significant increase in the knowledge was seen among the students after educating them regarding the road safety signs and regulations. The change can be very well appreciated and analysed in the observation. Similarly, we also observed a significant change in the attitude of the participants regarding road safety and regulations in our study. A positive change was seen in the attitude of the students post intervention. Education and awareness towards road safety regulations has shown significant impact in the knowledge and attitude of the participants.

We can say that use of information and communication technology; engagement of community and civil society and other stakeholders can improve prevention strategies in public health as found in study by Lahariya.[11]

Moreover, few studies like Kumar also reveal similar aspects in India where alone, unintentional injuries contribute to 9.1 deaths per 100,000 population, while transport injuries account for 2.8 deaths per 100,000 population.[12] Study by Lakham et al also reveal on issues such as targeted interventions and educational programmes which are essential, addressing demographic disparities and promoting affordability, accessibility and cultural acceptance.[13]

Public heath relevance of our study

The road traffic injury prevention can be achieved by avoiding over speeding and following speed limits avoiding drunken driving use of helmets by two-wheeler drivers use of seat belts and child restraints in cars improving visibility, appropriate headlights and road lightings. Our study finding corroborates with many studies on this aspect by Lahariya et al which endorse many lessons learnt on community may be applicable to other countries in South-East Asia, as well as to most low- and middle-income countries such as India.[14,15] Our study also suggests that proper awareness about road safety regulations among the community may help significantly in reduction of RTA incidents in lower middle income countries such as India for achieving universal health coverage. Thus, providing education regarding road safety regulations and signs becomes very important.

Limitations

Despite being a quasi-experimental study, the result of our study is difficult to generalize due to small sample size and sampling method in this study.

CONCLUSION

This study provided an opportunity to assess and educate the students in order to decrease the knowledge–practice gap and persuade them toward following road safety measures for preventing accidents in India. In our study, after educating MBBS students a significant change was seen in their knowledge, attitude and practices. It also suggests from our study that proper awareness about road safety regulations among MBBS Students may help significantly in reduction of road traffic-accidents.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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