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Knowledge and practices about road safety measures among college going students in an urban area of Chennai in 2019: Cross-sectional descriptive study

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ABSTRACT

Introduction: Road traffic injuries have emerged as one of the major global public health challenges. The current study was done with an objective to assess the knowledge and practices about road safety measures among college going students in Chennai and to study the association between road safety practices and the gender of the study participants.

Methods: A cross-sectional descriptive study for a period of 6 months was conducted between April and October 2019 in a college offering graduation courses in Chennai. Multi-stage random sampling method was employed and based on the findings of an earlier study the sample size was estimated as 170. A semi-structured questionnaire was developed, piloted, and validated and then used to interview the study participants about different study variables. Ethical clearance was obtained from the Institutional Ethics Committee, data entry was done in Microsoft Excel and statistical analysis was done using statistical package for the social sciences version 23.0. Frequency distributions were calculated for all the variables. Chi square test was used for testing the significance of association between road safety practices and gender at *p*-value of 0.05.

Results: The mean age of the study participants was 21 ± 1.2 years and that the majority 64 (37.6%) of the participants were from the 18 to 20 years. It was found that 33 (19.4%) of the study participants had a history of road traffic injury in the last year. Almost 164 (97%), 157 (92.4%), and 141 (85%) of the students were correctly aware about the legal age for driving, use of safety measures, and about the traffic signals, respectively. A total of 84 (53.2%) of the students were not adhering to speed limits, while 127 (74.7%) were either encouraging or participating in riding with more than recommended persons on two wheelers.

Conclusions: In conclusion, the average knowledge about road safety measures among the college students was estimated as 61.4%. However, the practices pertaining to adherence to the speed limits, use of Zebra crossing, utilization of personal protective equipment, and use of mobile phones while driving were found to be quite poor. Furthermore, a statistically significant relationship was observed between the practice of adherence to traffic signals and the distribution of respondents based on their gender.

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Road safety; college; traffic signals; Chennai

Introduction

Road traffic injuries have emerged as one of the major global public health challenges and have been associated with significant financial burden to the affected person, their families, and even the nation [1,2]. The estimated financial loss has been attributed to the expenses incurred for the treatment, reduced productivity, sickness absenteeism,

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and for family members who need to take time off work or school to provide care for the injured person [1]. In-fact, the available estimates suggest that in excess of 1.2 million people die annually due to road traffic accidents, while on an average 35 million people are exposed to non-fatal injuries [2].

In addition, it has been revealed that 9 out of the 10 reported deaths due to road traffic accidents are reported in low- and middle-income nations [1]. Moreover, it has been anticipated that if urgent steps are not taken globally, road traffic crashes will become one of the top 10 leading cause of death by 2030 [1,3]. Acknowledging the magnitude of the event and the associated long-term complications, including deaths, it has been incorporated under the recently adopted Sustainable Development Goals, with a target of reducing the incidence of deaths and injuries by 50% by 2020 [1,2].

It is quite alarming that road traffic injuries have been ranked as the most common cause of death among people within the age-group of 15–29 years of age [1–3]. The youth population group (15–24 years) is extremely vulnerable to road traffic injuries due to the presence of predisposing factors (viz., high risk behavior—over-speeding, non-adherence to the traffic rules, no use of personal protective equipment while driving, using mobile phone while driving, drunk-driving, peer pressure, etc.) [4–6]. Chennai is one among the four metropolitan studies in India and is the leading city in the entire state of Tamil Nadu with regard to the incidence of road traffic accidents and deaths [7]. In-fact, the available estimates for the month of January 2019 revealed that Chennai alone accounted for 689 accidents and 114 deaths, and both these estimates were highest in the entire state [7]. The available review of literature suggest that no such study has been conducted earlier to assess the level of knowledge and practices among college going students about road safety measures in Chennai. Thus, the current study has been planned with an objective to assess the knowledge and practices about road safety measures among college going students of an urban area of Chennai and to study the association between road safety practices and the gender of the study participants.

Methods

Study design and setting

A cross-sectional descriptive study in a college offering graduation courses in Chennai for a period of 6 months was conducted between April and October 2019.

Sample size

The average awareness about traffic safety measures among college-going students in a study done in Visakhapatnam was found to be 48.5% [6]. Considering that estimate as the basis, the sample size for the present study was estimated to be as

$$N = \frac{4 \times P \times Q}{L \times L}$$ [where, P—48.5; Q—51.5, L (Allowable error)—8]

$N = 4 \times 48.5 \times 51.5 / 8 \times 8 = 155$

Assuming a 10% non-response rate, the final sample size is approximated to 170.

Sampling technique

Multi-stage random sampling (Simple random sampling followed by Systematic random sampling) was used.

Inclusion and exclusion criteria

All college-going students of a graduation college, and those who are willing to participate in the study was included.

Data collection instrument

A semi-structured questionnaire was developed based on the earlier studies, which was then piloted among 17 students and subsequently validated. The findings of the pilot testing are not included in the final analysis.

Study variables

Socio-demographic parameters, knowledge about wearing helmet, do not drive after taking alcohol, adherence to speed limits, do not use mobile phones while driving, walking on foot path and on left side of road, road crossing on zebra lines; practices about the same parameters, including checking the condition of the vehicle, driving more than double-seat on two-wheelers, use of personal protective equipments while driving, etc.

Data collection

In the first stage, a line listing of all colleges in the urban area offering various graduation courses was made and then using the random sampling method (lottery method) one college was selected in the Adyar Zone (zone 13) of South Chennai. Permission to conduct the study was obtained from the administrators.

In the second stage, a line listing of all the students (732 students) pursuing their graduation in the col-

Table 1. Socio-demographic distribution of study participants.

Socio-demographic attributes		Number (%)
Age (years)	18–20	64 (37.6%)
	20–22	55 (32.4%)
	22–24	51 (30%)
Gender	Male	101 (59.4%)
	Female	69 (40.6%)
Marital status	Single	127 (74.7%)
	Married	43 (25.3%)
Education status	I year	71 (41.8%)
	II year	59 (34.7%)
	III year	40 (23.5%)
Type of family	Nuclear	142 (83.5%)
	Joint	28 (16.5%)

Table 2. Prevalence of road traffic injuries among study participants.

General information		Number (%)
Own vehicle	2 wheeler	119 (70%)
	4 wheeler	39 (22.9%)
	Both	30 (17.6%)
	None	12 (7.1%)
History of road traffic injury (in last 1 year)	Yes	33 (19.4%)
	No	137 (80.6%)
Mode of injury (n = 33)	While driving vehicle	24 (72.7%)
	While walking on the road	9 (27.3%)
Reason for accident (n = 33)	Non-adherence to traffic rules	21 (63.6%)
	Environmental factors[a]	12 (36.4%)
Consequences of accident (n = 33)	Inability to attend college[b]	29 (87.9%)
	Difficulty in doing daily activities	25 (75.8%)

[a]Environmental factors: Wet roads, No zebra crossing, No footpaths, Traffic signals not working, No traffic signage on roads, etc.
[b]Reasons for Inability to attend college: Disability or impairment due to the accident.

lege was prepared. All the names of the students were entered in the alphabetical order and then systematic random sampling method was employed. The first student was selected randomly using the lottery method, and subsequently every fourth student (732/170) was selected as one of the study participants to reach to the desired sample size of 170.

The selected study participants were explained about the need and the objectives of the study, and written informed consent was obtained from them. The semi-structured questionnaire was administered to the students on a convenient day and they were requested to fill up the same.

Ethical considerations

Ethical clearance was obtained from the Institutional Ethics Committee prior to the start of the study. Written informed consent was obtained from the study participants before obtaining any information from them. Utmost care was taken to maintain privacy and confidentiality and they was ensured that they will not face any consequences because of the information shared by them.

Table 3. Knowledge about road safety measures.

Knowledge parameters	Yes (%)	No (%)
Legal age for driving (≥ 18 years)	164 (96.4%)	6 (3.5%)
Speed limits in school zone (50 km/hour)	22 (12.9%)	148 (87.1%)
Correct place for road crossing (Zebra crossing)	134 (78.8%)	36 (21.2%)
Awareness about traffic signals	141 (84.7%)	29 (15.3%)
Awareness about use of safety measures	157 (92.4%)	13 (7.6%)
Permissible alcohol limits while driving (30 mg of alcohol per 100 ml blood)	14 (8.2%)	156 (91.8%)
Use of mobile impairs judgment during driving (True)	96 (56.5%)	74 (43.5%)

Statistical analysis

Data entry was done in Microsoft Excel. Statistical analysis was done using statistical package for the social sciences version 23.0. Frequency distributions were calculated for all the variables. Chi square test was used for testing the significance of association between road safety practices and gender at p-value of 0.05.

Results

Table 1 depicts about the socio-demographic attributes of the college students. The mean age of the study participants was 21 ± 1.2 years and that the majority 64 (37.6%) of the participants were from the 18–20 years and were of the male 101 (59.4%) gender. All streams of graduation were included in the study and a major proportion of the students were from the first professional year.

Table 2 reflects the information pertaining to owning a vehicle and details about being involved in a road traffic related accident or injury. It was reported that 119 (70%) and 39 (22.9%) of the participants were having a two-wheeler and four-wheeler, respectively. It was found that 33 (19.4%) of the study participants had a history of road traffic injury in the last year, and it was predominantly reported among those who were driving vehicles. Furthermore, it was reported that accident resulted due to the non-adherence to traffic rules and regulations by 21 (64%) college students.

Table 4. Distribution of road safety practices based on gender.

Road safety practices (n = 158)		Male (%)	Female (%)	p value
Driving vehicles after attaining the permitted legal age	Yes	71 (58.7%)	50 (41.3%)	0.007
	No	22 (59.5%)	15 (40.5%)	
Adherence to speed limits	Yes	31 (41.9%)	43 (58.1%)	0.001
	No	62 (73.8%)	22 (26.2%)	
Crossing the roads at Zebra cross (n = 170)	Yes	24 (49%)	25 (51%)	0.03
	No	77 (63.6%)	44 (36.4%)	
Adherence to traffic signals (n = 170)	Yes	78 (54.9%)	64 (45.1%)	0.003
	No	23 (82.1%)	5 (17.9%)	
Adherence to lane discipline	Yes	49 (48%)	53 (52%)	0.001
	No	44 (78.6%)	12 (21.4%)	
Strict adherence to use of safety measures in 2 wheelers (n = 119)	Yes	19 (57.6%)	14 (42.4%)	0.43
	No	48 (55.8%)	38 (44.2%)	
Strict adherence to use of safety measures in 4 wheelers (n = 39)	Yes	11 (57.9%)	8 (42.1%)	0.12
	No	15 (75%)	5 (25%)	
Practicing drink and drive	Yes	20 (87%)	3 (13%)	0.001
	No	81 (55.1%)	66 (44.9%)	
Using mobile phones while driving	Yes	49 (57.6%)	36 (42.4%)	0.36
	No	44 (60.3%)	29 (39.7%)	
Periodic maintenance of vehicle	Yes	41 (59.4%)	28 (40.6%)	0.44
	No	52 (58.4%)	37 (41.6%)	
Encourage or participate in riding with more than recommended persons on 2 wheelers (n = 170)	Yes	79 (62.2%)	48 (37.8%)	0.1
	No	22 (51.2%)	21 (48.8%)	

Table 3 provides information about the road safety measures among the participants. Almost 164 (97%), 157 (92.4%), and 141 (85%) of the students were correctly aware about the legal age for driving, use of safety measures, and about the traffic signals, respectively. However, 148 (87%) students were not aware about the permissible speed limits in school zone and likewise almost 92% of them were not aware about permissible alcohol limits while driving.

Table 4 shows the distribution of road safety practices based on the gender of the study respondents. A total of 84 (53.2%) of the students were not adhering to speed limits, while 121 (71.1%) of the study participants were crossing the road wherever they use to like and not essentially at zebra cross. Furthermore, 89 (56.3%) of students were not maintaining their vehicles, while 127 (74.7%) were either encouraging or participating in riding with more than recommended persons on two wheelers. A statistically significant association was observed between the practice of adherence to traffic signals / lane discipline and the distribution of respondents based on their gender in the present study. Even though no significant statistical association was observed between strict use of safety measures in two wheelers and gender, 86 (72.3%) of the bike riders were not adhering to the standard safety measures.

Discussion

The present study was conducted among the college-going students of a graduation college in Chennai. The majority of the study participants were from the 18 to 20 years of age. In our study, 101 (59.4%) of the study participants were male and similar pattern was observed among a study done among medical students in Kalaburgi [8]. In contrast, in some of the other studies done in South India, close to 60% of the study participants were female [9,10]. In the present study, 158 (93%) were having their own vehicles, and likewise the findings of a study done in Andhra Pradesh indicated that more than 75% of the college students were having their own vehicles [10]. These trends clearly indicate that the prevalence of use of vehicles among college going students is on the rise.

In our study, close to 20% of the study participants responded that they met with a road traffic accident in last one year itself. On a similar note, the findings of a study done in Uttarakhand among health science students also reported that 20% of them had met with a road traffic accident in last year [11]. However, in a study done in Egypt revealed the incidence of accidents in the last year to be as high as 40% [12]. These estimates suggest that the incidence of road traffic accidents among youths is

quite high and it clearly suggest that it is because of the risk taking behavior and due to non-adherence to the traffic rules and regulations.

In the present study, better knowledge among study participants was observed with regard to the legal age of driving [164 (96%)], use of safety measures [157 (92.4%)], and crossing roads at zebra lines [134 (79%)]. However, the findings of an epidemiological study revealed considerably low level of awareness among the students, especially with regard to lack of awareness of safety rules (40%), and crossing roads at zebra lines (56%) [10]. In this study, a surprising finding was that more than 56% of the respondents felt that talking on mobile phones while driving is not a predisposing risk factor for road traffic injuries. However, contrasting results have been obtained in some of the other epidemiological studies, wherein more than 83% of respondents identified it as a risk factor [4,10]. These estimates clearly indicate that there is an immense scope to create awareness among college going students about road safety measures, so that the incidence of accidents and injuries can be significantly reduced.

In this study, a significant knowledge-practice gap was observed with regard to awareness about legal age of driving and the reality about when they actually started driving vehicles. In-fact, even though, 97% subjects were aware that the legal age for driving is after the attainment of 18 years, nevertheless, 23.4% started driving even before the attainment of the same. On a similar note, considerable knowledge-practice gap was observed in the areas of crossing roads and adherence to the use of safety measures while driving. Similar sort of findings were observed in studies done among college going students in Maharashtra, Visakhapatnam, and Malaysia [4,6,13]. The findings of a study done in Egypt revealed that majority of the students were practicing drink and drive, despite being aware about the consequences of the same [14]. These finding clearly reflect that we have failed to strictly implement the existing legal provisions. Furthermore, it emphasizes that the need of the hour is to not only to implement appropriate measures, but even enforce penalty so that unlawful practices can be curbed.

With regard to the road safety practices, the findings of a study done in Rishikesh revealed that 36% were never wearing helmets [11]. On a similar note, risk road practices were observed by the students in studies done in Egypt and Oman [14,15]. These all findings highlight the fact that there is a wide gap between what people know and what they actually practice. In other words, we have to implement behavior change communication strategies or some other innovative methods on an urgent basis to translate the existing knowledge into current practices. The limitation of our study was that it was conducted in a single institution, and thus the findings of the study cannot be generalized. The strength of the study was that it was done in an urban metropolitan city, wherein the incidence of road traffic accidents is quite high and any information obtained from these settings will help the policy makers to take appropriate steps to improve the existing knowledge and practices.

Conclusion

In conclusion, the average knowledge about road safety measures among the college students was estimated as 61.4%. However, the practices pertaining to adherence to the speed limits, use of Zebra crossing, utilization of personal protective equipment, and use of mobile phones while driving were found to be quite poor. In addition, a statistically significant relationship was observed between the practice of adherence to traffic signals and the distribution of respondents based on their gender.

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Conflict of interest

The authors declared that they have no conflict of interest.

References

[1] World Health Organization. Road traffic injuries—key facts, 2018. Available via https://www.who.int/news-room/fact-sheets/detail/road-traffic-injuries (Accessed 20 April 2019).

[2] World Health Organization. Global status report on road safety 2018. WHO press, Geneva, Switzerland, pp 1–26, 2018.

[3] Dhillon MS, Rajasekharan S, Sancheti P. Status of road safety and injury burden: India. J Orthop Trauma 2014; 28(Suppl 1):S43–4.

[4] Nikumb VB, Banerjee A, Singh SK. Behaviour related to safe driving among college youth in an industrial township. Int J Crit Illn Inj Sci 2013; 3(1):96–7.

[5] Jacoby SF, Winston FK, Richmond TS. Road safety perspectives among employees of a multinational corporation in urban India: local context for global injury prevention. Int J Inj Control Saf Promot 2017; 24(4):493–500.

[6] Lalitha D, Naidu SA, Devi BM. A Study on knowledge attitude and practice of road safety measures among college students in Visakhapatnam city. J Evid Based Med Healthc 2015; 2(42):7439–44.
[7] The Hindu. City tops in road accidents, fatalities; 2019. Available via https://www.thehindu.com/news/cities/chennai/city-tops-in-road-accidents-fatalities/article26401488.ece (Accessed 3 March 2020).
[8] Kalbandkeri LR, Boramma G, Ghooli S. A study to assess the knowledge and practice of road safety measures among undergraduate medical students of M.R. Medical College, Kalaburagi. Int J Community Med Public Health 2018; 5(4):1596–601.
[9] Kulkarni V, Kanchan T, Palanivel C, Papanna MK, Kumar N, Unnikrishnan B. Awareness and practice of road safety measures among undergraduate medical students in a South Indian state. J Forensic Leg Med 2013; 20(4):226–9.
[10] Jogdand SK, Yerpude PN, Jogdand SM. A study of awareness and behavioural patterns with regard to road safety among medical students in south India. Int J Biol Med Res 2013; 4(4):3590–2.
[11] Sharma SK, Saini P. Knowledge, attitude and practices towards road traffic safety regulations among health science students in Uttarakhand: a cross-sectional study. Int J Adv Res 2017; 5(3):608–14.
[12] Helal R, El-Khawaga G, El-Gilany AH. Perception and practice of road safety among medical students, Mansoura, Egypt. Osong Public Health Res Perspect 2018; 9(1):25–31.
[13] Redhwan AA, Karim AJ. Knowledge, attitude, and practice towards road traffic regulations among university students, Malaysia. Int Med J Malaysia 2010; 9(2):29–34.
[14] El-Gendy SD, El-Gendy MF, Dawah AY, Eldesouky RS, Abd El-Raof MS. Risky road-use behavior among students at the University of Benha, Egypt. East Mediterr Health J 2015; 21(2):120–8.
[15] Al Reesi H, Al Maniri A, Plankermann K, Al Hinai M, Al Adawi S, Davey J, Freeman J. Risky driving behavior among university students and staff in the Sultanate of Oman. Accid Anal Prev 2013; 58:1–9.