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Original Research Article

Road safety and the community: an awareness survey among the coastal population of Karnataka

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ABSTRACT

Background: Road traffic accidents (RTAs) pose a significant burden on the health care system in India with high out of pocket medical expenditure. Awareness about this public health problem is necessary to combat it and this study was carried out to assess knowledge and practice towards road safety among the adult population in the coastal region of Udupi taluk in Karnataka.
Methods: A cross-sectional survey was carried out among 381 adults aged 18 years and above residing in the region for more than one year. A semi-structured questionnaire was used to assess their knowledge and practice towards road safety measures.
Results: Most of the participants were in the age bracket of 18-44 years (61.4%), were females (65.1 %) and had up to 10 years of schooling. Overall knowledge was found to be low with only 30% reporting good knowledge. As regards practice, drivers fared better with a good majority (87%) reporting desirable practice. Younger age (OR=0.57, 95% CI, 0.36-0.92), male gender (OR=0.14, 95% CI, 0.08-0.23), higher level of schooling (OR=0.32, 95% CI, 0.20 - 0.50) and knowing to drive (OR=0.04, 95% CI, 0.02-0.07) were found to be significantly associated with a greater level of knowledge regarding road safety measures.
Conclusions: The study showed inadequate knowledge and poor road safety practices among good number of participants. This emphasises the need for a customized community based awareness campaign on road safety measures coupled with stringent legislation measures to bring about the desired change.

Keywords: Road safety, Awareness, Practice, Pedestrians, Drivers

INTRODUCTION

Road traffic accidents (RTA), an emerging public health problem causes millions of deaths per year. As per the Global status report on road safety 2015, 1.25 million road traffic deaths occur every year. Although low- and middle-income countries have only half of the world's vehicles, they contribute to 90% of the world's road traffic deaths, majority of which involves those aged 15-29 years, men, pedestrians, cyclists and motorcyclists.[1]

The report from the Government of India on road traffic accidents (2015) estimates that 10-30% of hospital registrations and 1,46,133 deaths are due to RTAs. They are the most common cause of head injuries (64%) resulting in varying levels of disabilities and death of the victims before reaching a hospital.[2-6] RTAs are a significant burden on the health care system in India and the estimated out of pocket medical and related expenditure is reported to range between 10,518 to 10,905 INR.[7]

Major reasons for the RTAs in India were reported to be drunken driving, not wearing helmets or not using seat belts and low use of child restraints in vehicles.[8] Alcohol was suspected or reported among 17.9% of the patients with RTAs.[9] Results from a study on awareness on Emergency Medical Services showed that these services failed to make significant improvement in the safety of road users.[10]

Road safety is a multi-sectoral and multidimensional issue that needs the integration of various factors such as development and management of road infrastructure, provision of safer vehicles, legislation and law enforcement, affordable health care services, and awareness about road safety measures among the users.

This study was undertaken to assess knowledge and practice towards road safety among the adult population in the coastal region of Udupi taluk. Although there appear to be studies assessing these parameters among school and college students, there is limited data from the community.

METHODS

A community based cross-sectional survey was carried out during the months of March and April 2016 in one of the semi urban coastal region of Udupi taluk. Individuals aged 18 years and older and residing for more than one year in the region were considered eligible for the study. Considering the prevalence of awareness on road safety measures among adults to be 15.7% as observed from literature for an absolute precision of 4% and 95% level of confidence with an anticipated non-response rate of 10%, sample size was estimated to be 340.[11]

The proposal for the study was approved by the Institutional Ethics Committee prior to initiation of the survey (IEC 175/2016). Following this a household survey was carried out, where eligible members were identified and recruited after obtaining a written informed consent. Consenting individuals were administered a pre-tested, semi-structured questionnaire to collect the relevant data. In addition to the socio-demographic details of the participants, the questionnaire assessed the participant's knowledge regarding road safety measures and their practice towards the same. The questions were customised to individually assess the road safety practices of pedestrians and drivers. The questionnaire was translated into the local language (Kannada) and back translated to maintain uniformity across the survey.

The questionnaire assessed knowledge and practice of the study participants with regards to traffic rules to be observed as a pedestrian or a driver. These included questions pertaining to traffic signals, legal age and speed limits for driving, benefits of using safety measures, driving under the influence of alcohol, music and related distractions. Questions pertaining to knowledge and practice were scored as one and zero based on whether the response was correct or incorrect respectively. The overall knowledge score totalled to thirty seven, while the customised practice scores for pedestrians were fourteen and that for drivers were twenty eight. The knowledge scores were further divided into tertiles and the participants were categorised as having poor knowledge (if the score was less than 21), mediocre knowledge (if the score ranged between 21 to 26) and good knowledge (for scores above 26). With regards to road safety practices among the pedestrians, a score under eight indicated poor practice, while a score between 8 to 10 implied not so acceptable practice and greater than 10 was considered as desirable practice. As for the drivers, a score under nine was considered poor practice, 9 to 22 was not so acceptable and greater than 22 was considered as desirable practice. While analysing the association of various factors with knowledge and practice of road safety measures, the mediocre knowledge scores and the not so acceptable practice scores were merged and computed as poor knowledge and poor road safety practice respectively.

The data collected was tabulated and analysed using SPSS version 15.0 and presented as frequencies and proportions. Odds ratio was used to test the strength of association of knowledge and practice levels with different risk factors. A p value of less than 0.05 was considered statistically significant.

RESULTS

A total of 381 participants were recruited into the study. Baseline characteristics of the participants are as shown in table 1. About two thirds (61.4%) of them were in the age group of 18-44 years and were females (65.1%). Majority (88.4%) of the study population had more than 5 years of schooling; however, 11.6% were either school drop outs or illiterate. The most preferred (51.1%) mode of transport for commuting was the public transport system followed by motorized vehicles (47.4%), walking (28.3%) and bicycles (18.3%). Of the nearly 40% participants, who claimed to know driving only 86.6% possessed a valid driving license and of these a little more than half (57%) had attended a driving school. Of the 45% who reported owning a vehicle, majority (84%) possessed a motorised two wheeler.

On assessing the participants' knowledge regarding road safety measures, it was found that only 114 (29.9%) individuals had a good level of knowledge. On querying about practices, desirable pedestrian practice was observed in 58 (54%) of the participants, while 129 (86.6%) of the drivers reported desirable practice.

Table 2 shows factors influencing road safety knowledge among the surveyed population. As illustrated in the table, younger age, male gender, higher level of schooling and knowing to drive were significantly associated with a greater level of knowledge regarding road safety measures.

Table 1: Baseline characteristics of the study participants (n=381).

Variables	Categories	No. (%)
Age group (years)	18-44	234 (61.4)
	45-60	101 (26.5)
	>60	46 (12.1)
Gender	Male	133 (34.9)
	Female	248 (65.1)
Educational status (n=372)	< 5 years of schooling	43(11.6)
	5-10 years of schooling	189(50.8)
	>10 years of schooling	140(37.6)
Participants who reported to know driving	Yes	149 (39.2)
	No	232 (60.8)
Most common mode of transport	Walk	108 (28.3)
	Cycle	70 (18.3)
	Motored two wheeler	130 (34.1)
	Four wheeler	15 (3.9)
	Public transport	195 (51.1)
	Three wheeler	36 (9.4)
Owns a vehicle	Yes	172 (45.1)
	No	209 (54.9)

Table 2: Factors associated with road safety knowledge among the surveyed population N=381.

Characteristics		Knowledge level		OR (95% CI)
		Poor (score ≤26) n (%)	**Good (score >26) n (%)**	
Age group (in years)	<45	154 (65.8)	80 (34.2)	0.57* (0.36-0.92)
	≥45	113 (76.9)	34 (23.1)	
Gender	Male	58 (43.6)	75 (56.4)	0.14* (0.08-0.23)
	Female	209 (84.3)	39 (15.7)	
Years of schooling	≤10	183 (78.9)	49 (21.1)	0.32* (0.20-0.50)
	>10	76 (54.3)	64 (45.7)	
Participants who can drive	Yes	52 (34.9)	97 (65.1)	0.04* (0.02-0.07)
	No	214 (92.6)	17 (7.4)	

*P<0.05.

Table 3: Road safety practices among pedestrians and those driving vehicles.

	Number (%)
A. Pedestrians	
Using a footpath	187 (49.1)
Using the zebra crossing	256 (67.2)
Not using gadgets while walking	278 (73.0)
B. Drivers of vehicles	
Carrying vehicle documents	126 (84.5)
Having a valid driving licence	129 (86.5)
Wears a helmet	139 (95.8)
Wears the seat belt	24 (16.0)
Not using gadgets while driving	116 (77.8)
Abiding speed limits	92 (61.7)
Regular maintenance of the vehicle	122 (81.8)

Figure 1: Traffic signage used for assessing awareness.

On the other hand, with regards to desirable road safety practices only higher levels of schooling (OR=0.48, 95% CI, 0.27–0.85, p<0.001) and knowing to drive (OR=0.134, 95% CI, 0.08–0.20, p<0.001) were significantly associated. On further querying about road safety practices among those who knew driving, higher number of female drivers (93.2%) as compared to males (83.8%) reported the practice of desirable road safety measures. However, this observation was not statistically significant.

Table 3 illustrates road safety practices as reported by the pedestrians and the drivers. It was heartening to know that a good number of the pedestrians refrained from using gadgets like headphones and mobile phones while walking. However, use of footpaths and zebra crossings were markedly less. On the other hand, participants who knew driving appeared to practice road safety measures to a greater extent although it is of concern to note the poor use of seat belts. Reasons quoted for not using seat belts were varied such as seatbelts not being present in the vehicles, no habit of using it, only driver needs to use, uncomfortable and unnecessary gadget, not mandated by law and so on. Drunken driving was reported by 3.3% of the drivers.

Only 11% of the participants could correctly interpret all the seven traffic signage shown in figure 1. It was alarming to note that nearly 32% failed to interpret any of the signage. It was observed that a significantly larger number of female participants were unable to interpret the signage correctly as compared to the males (OR=2.61, 95% CI 2.07-3.29, p<0.001).

Of the surveyed population, 12.6% reported experiencing RTA during their lifetime. Major reasons for RTA as reported by drivers/pillion/co passengers were badly maintained roads (31.5%) followed by overtaking from the wrong side, over speeding and lack of traffic signs (8.3% each). Of the pedestrians who reported an RTA, almost 40% claimed to have been walking by the side of the road. Injury was suffered by 83.3% of those who experienced an RTA and among the injured, 34.2% suffered grievous injury that required hospitalization for a considerable period of time.

DISCUSSION

The present study was conducted to assess the knowledge and practice of road safety measures in the community, whereas most of the published studies from India addressing similar issues were conducted among either school or college going students. Most participants (61.4%) in our study were in the age group of 18-44 years and another 12.1% were over 60 years of age. A similar community based study from Vellore consisted of participants, who were considerably younger (18 to 35 years).[11] Another study carried out in Yerevan, Republic of Armenia reported the mean age of participants to be 38.7 years (SD±15.0).[12]

More than half of the participants in the present study were females (65.1%), which is similar to the study from Yerevan, where 59.5% of the participants were females. In contrast the study carried out among the rural population in Vellore, had a higher proportion of male participants (66.1%).[11,12]

In the present study 62.4% of the participants had 10 or less years of schooling as compared to 45.2% of the population in the study done in Vellore.[11] While nearly 83% of the participants in the Vellore study reported to know driving, only 39.2% of the participants in this study stated the same. These differences could be because of the higher proportion of female participants and a higher age bracket as compared to the Vellore study population.

In the present study, 45.1% of the participants used their own vehicle for transportation, which is in contrast to the findings reported by the studies conducted among college students from Visakhapatnam city (67.3%) and Saudi Arabia (70.0%).[13,14] This difference is expected as our study was carried out in the community. While the study from Yeravan reported walking as the primary mode of commuting among 40% of respondents, this practice was reported considerably lower by our study participants (28.3%).[12]

A substantial number (70%) of participants in this study were observed to have poor level of knowledge regarding road safety measures, which differs from the findings of the Chandigarh (60.0%) and Saudi Arabia (75%) study among school and college students, where the knowledge level was predictably higher.[14,15]

In the present study younger age and male gender were significantly associated with a greater level of knowledge regarding road safety measures. Nevertheless, the study by Hassan et al among powered two wheeler riders in Kerala reported that young male riders take more risk while riding than elders.[16]

The overall knowledge of road safety measures was observed to be higher among males (56.4%) compared to females (15.7%), which is in agreement with the observation from a study conducted among high school children of a rural community in Tamil Nadu, while a study done among school children in Chandigarh showed that knowledge levels were higher among females.[15,17] This gender difference in awareness might be attributed to the study settings; the present study and the one conducted in Tamil Nadu mainly included rural and semi-urban population, while the one conducted in Chandigarh was among participants from an urban background.[11,15] A minority number of participants from the present study (11%) and the Vellore study (15%) correctly interpreted all the traffic signage displayed.[11]

Majority (95%) of the participants in our study reported using helmets most of the time, which is in contrast to the findings from a school based study in Chandigarh, where 57.1% of students informed that they were caught for not wearing helmets.[15] The study from Vellore reported a much lower usage of 38%.[11] The favourable behavior of using helmets in our study was probably a direct outcome of the stringent helmet enforcement drive carried out by the local government during the survey period. As regards mobile use while driving, the Chandigarh study reported 22% usage among its population that corresponds with ours.[15] Sixteen percent of the participants in the Vellore study opined that using mobile phones while driving was not risky.[11] Remarkably, a study from Delhi among those, who were drivers by occupation reported a better level of awareness (77%) regarding usage of mobile phones while driving.[18]

Students in the Chandigarh study appeared to adhere better to speed limits as compared to the adult population in this study.[15] Abysmally small number of participants reported the use of seat belts in our study as well as the Vellore study suggesting that seat belt use is still not a priority among the semi urban and rural population.[11] Likewise, in the interventional study from Yerevan the baseline data showed low use of seat belts with only 24% of the drivers and 21% of the passengers reporting its use. The authors subsequently reported an encouraging improvement in this behavior following the intervention with 81% of the drivers and 69% of the passengers vouching its use.[12] In the study conducted among drivers in Delhi a good number (89%) of them testified using seat belts while driving.[18]

Having been involved in an RTA was reported by 12.6% of the participants in the present study, while more than half of the participants in the study from Saudi Arabia reported the same.[14] Likewise, a study among University students in Malaysia reported that 35.7% of the students had been involved in one or more road traffic accidents.[19] This noticeable difference probably reflects a higher risk taking behaviour among the youth. Our study reports a higher incidence of RTA related injuries (83.3%) as compared to the Saudi Arabian study (22%), which suggests the poor response to RTAs and ill maintained roads in our country in comparison to other more developed parts of the world.[14,20] In the study in Yerevan, one fourth of the study participants had experienced a road traffic accident in their lifetime. Of these 43% at baseline and 39% at follow-up had sustained injuries which incapacitated them for more than two weeks.[12] In comparison to the present study, where the main reported reason for RTA was badly maintained roads (31.5%), the respondents in another study from Chandigarh stated over taking and over speeding as the major reasons.[21]

As the survey in this community based study was primarily carried out on weekdays during working hours, there are relatively lesser number of male participants. This gender difference among recruited participants could have biased certain outcome parameters.

CONCLUSION

As the study shows inadequate knowledge and poor road safety practices among a good number of the participants, it would be prudent to have periodic community based awareness campaigns on road safety measures. As evidenced by the reports of the RTA survivors, poor road infrastructure is a major concern that needs to be addressed on a priority. A customized road safety campaign supported by stringent legal measures may be the way forward.

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