



Original Article

Road Safety Awareness among College Students in a North Indian Town

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Abstract

Background: Road traffic accident (RTA) has been posing an inconceivable public health challenge. RTA related mortalities attained a new apogee that merits attention. Road safety awareness is imperative in averting RTAs. Considering amassing upsurge of RTAs, it was decided to study road safety awareness and its practice among college students, ascertain allied findings if any and suggest preventive measures.

Methods: 200 under-graduate students of a college in a north Indian town were studied during July-August 17. Institutional approval and individual consent were obtained. A pretested structured proforma was introduced including demographic attributes, awareness and knowledge of road traffic safety and practice of traffic regulations. The data obtained was tabulated and statistically analysed.

Result: 76% students were above 20 with mean age of 20.6 ± 1.07 years. 74 to 80% knew the common road safety measures; girls were significantly more knowledgeable. Above 90% girls and 73 % boys identified most of the common traffic signs. Non-compliance of traffic rules varied from 20.76% to 66.98%; it was higher among boys and inexperienced students. Among RTA defaulters, 60.7% overtook wrongly, 85.7% and 82.1% didn't follow speed limit and lane discipline respectively; findings are significant. 32.1% RTA occurred due to 'faulty overtaking' and 25% due to 'use of mobile while driving'. 'High speed skids' and 'collision while changing lane' resulted RTA in 21.4% cases each.

Conclusion: Recapitulation of knowledge to stimulate and motivate students through periodic road safety programs to ensure action according to safety conventions is suggested.

Key Words: RTA, Road safety awareness, College students.

Introduction

The United Nations General Assembly has proclaimed the period 2011-2020 as the decade of action for road safety with a goal to stabilise and reduce the road traffic fatalities around the world.

⁽¹⁾ Globally 1.3 million people are killed due to road traffic accidents (RTA) every year and it constitutes the cardinal cause of mortality and injuries among young adults who represent

physically and economically most active and productive members of the society.⁽²⁾ In India 4.96 lac of road accidents were reported in 2015 of which 35.7% were fatal.⁽³⁾ Determinants like refusal to follow traffic rules, drunken driving, over speeding and use of defective vehicles mostly stand contributory.⁽⁴⁾ There has been a rising tide of motorisation in India with annual vehicular growth of 10% in last decade

concomitantly increasing the risk.⁽⁵⁾ Unless immediate and effective action is initiated to stabilise the present status, fatalities due to RTA is expected to amass up to 2.4 million annually.⁽²⁾ College going students are extremely vulnerable because of their young age, adventurous nature, availability of two wheelers and risky behaviour. Considering the steep surge in RTAs in recent time, it was decided to study road safety awareness and its practice among college students in a north Indian town, inter-alia to ascertain allied findings, if any.

Material and Methods

The study was conducted among the consenting first and second year students of an undergraduate college in a north Indian town during July-August 2017. Nominal roll of the students was obtained from the college authorities after taking necessary permission for the study. Out of 280 students studying in first and second year in various undergraduate streams, only 211 students agreed and consented to participate in the study. Socio-economic status (SES) was determined as per recent scale.⁽⁶⁾ Considering road-safety awareness rate around 85% among college students as documented in recent studies, the sample size was calculated to be 200.⁽⁷⁾ The students were approached in small groups to explain the objective of the study in the background of seriousness of the issue before obtaining consent. A pretested, structured questionnaire was introduced to the students in small group at a time maintaining confidentiality. The questionnaire comprised of three parts i.e. personal particulars including demographic attributes, awareness and knowledge of road traffic safety and the last part contained practice and application of traffic safety regulations. The data obtained was tabulated and statistically analysed. Common statistical tests like Chi-square and Fisher's exact probability test were applied.

Results

Table 1 shows that majority of the students (76%) were above 20 years of age, 57% were male, 4%

had car and 53% had two wheeler. 60.5% belonged to middle income group family, 24% used spectacles, 71% had driving licence and 106 (76.6%) students possessing car or two wheeler were driving regularly of which 71(66.9%) were male and 35(33%) were female. 72.6% were driving less than 10 km daily and 62.2% had driving experience less than 2 years. Those driving, experienced moderate to reasonable traffic accidents (RTA) 21.6% in males and 4.72% in females respectively in last 2 years however, not afflicted with serious or bony injuries. The finding is statistically significant. 22.64% having driving experience less than 2 years met significantly more number of RTAs. Students using glasses (21.69%) were significantly more affected by RTAs.

Table 2 shows that 65.1% girls attended some educational program on road safety as compared to 42.1 % of boys. 74 and 79% students were aware of the importance of using helmet and seat belt respectively. Over 90% of the girls were aware about correct way of overtaking a vehicle, not to use mobile while driving, to follow specified speed limit and driving lanes as compared to 72-80% of boys; the difference is statistically significant. Around 90% of the girls were aware of not to drive after taking alcohol and when sick, to keep the vehicle serviceable and use spectacle while driving as compared to 72-74% boys; the gender difference is significant.

Table 3 shows that above 90% girls were aware about many of the common traffic signs like 'no entry', 'no overtaking', 'no u turn', 'school ahead' and 'no right turn' as compared to 72.8 to 80.7% boys; the gender difference is statistically significant. Many students exhibited poor knowledge about two of the traffic signs like 'narrow bridge' and 'road narrows'; while 65.1 to 66.2% girls knew these signs, only 41 to 42% boys were aware of the same.

Table 4 shows that over 20% students denied using seat-belt and were using mobile phone while driving. 32% and above didn't use helmet and often overtook incorrectly. 64% and above neither followed lane discipline nor maintained any

specified speed limit. Non-compliance of traffic rules was significantly higher among the boys. Only 6(5.66%) male students stated drove under influence of liquor.

Table 5 reveals non-compliance of safety measure in relation to driving experience. 32% didn't use helmet and 20.7 % didn't fasten seat-belt; less experienced students were more defiant. 21.7% used mobile while driving with higher proportion of non-compliers among experienced group. Above 33% stated overtaking vehicles incorrectly and were caught by police; percentage of impudent was more among less experienced. 64 to 66.9% neither followed speed limit nor the lane discipline; the percentage of non-followers was high among less experienced.

Table 6 presents status of non-compliance of safety measures among students involved in RTAs. 25% of RTA offenders didn't use helmet and 35.7% didn't fasten seat-belt. While 60.7% RTA defaulters overtook wrongly, 39.2% of them

used mobile while driving; both the findings are significant when compared to those who didn't experience RTA. 85.7% and 82.1% didn't follow speed limit and lane discipline while driving respectively; the findings are convincingly significant conceding police intervention in 53.7% cases among RTA defaulters.

Table 7 exhibits the association between reasons for RTA and awareness of related road safety factors among those who met accident. Majority of RTA (32.14%) occurred due to 'wrong overtaking' in which 21.43% defaulters knew the implication of the same. Second major reason for RTA was 'use of mobile while driving' (25%) in which 14.3% were aware about the possibilities of such negligent practice. 'High speed skids' and 'collision while changing lane' counted for 21.43% each for the causation of RTA in which 14.3% and 10.7% of the subjects respectively knew about the risk of such casualness.

Table 1: Personal attributes of the students

Personal Attributes	Sub-attributes	Number	Percentage	P value Significant (Sig) Not Significant (NS)
Age (n-200)	Less than 20 years	48	24.00%	
	Above 20 years	152	76.00%	
Gender (n-200)	Male	114	57.00%	
	Female	86	43.00%	
Own a car (n-200)	Yes	08	4.00%	
	No	192	96.00%	
Own a two wheeler (n-200)	Yes	106	53.00%	
	No	94	47.00%	
Family SES (n-200)	Upper middle	52	26.00%	
	Middle	121	60.50%	
	Lower Middle	27	13.50%	
Using Spectacle (n-200)	Yes	48	24.00%	
	No	152	76.00%	
Having driving licence (n-200)	Yes	142	71.00%	
	No	58	29.00%	
Driving regularly (n - 142)	Yes	106	76.64%	
	No	36	25.35%	
Driving regularly (n-106)	Male	71	66.98%	
	Female	35	33.01%	
Driving daily (n-106)	More than 10 km	29	27.36%	
	Less than 10 km	77	72.64%	
Experience of driving (n - 106)	Less than 2 years	66	62.26%	
	More than 2 years	40	37.73%	
Experience of RTA last 2 years (M-71, F-35)	Male	23	21.69%	Chi-sq 3.95, df 1, p - 0.046, Sig
	Female	05	4.72%	
Experience of RTA last 2 years (n ₁ -66, n ₂ -40)	< than 2 years driving	24	22.64%	Chi-sq 8.90, df 1, p - 0.002, Sig
	>than 2 years driving	4	3.77%	Fisher's prob 0.002
Experience of RTA last 2 years (n ₁ -27, n ₂ -79)	Using specs	23	21.69%	Chi-sq 60.38, df 1, p - 0.0001, Sig
	Not using specs	05	4.72%	Fisher's prob 0.0001








76% students were above 20 years of age. Boys having driving experience less than 2 years and using spectacles were mostly involved in RTAs.

Table 2: Awareness on road safety measures

Awareness indices (n-200)	Male(n ₁ -114)		Female(n ₂ -86)		Total No. (%)	P value Significant (Sig) Not Significant (NS)
	No. (%)	No. (%)	No. (%)	No. (%)		
Attended program in road safety	48(42.11)	56(65.12)	104(52.00)			Chi sq 9.5, df 1, p - 0.002, Sig, Cramer's V 0.23
Wearing of helmet	84(73.68)	64(74.41)	148(74.00)			Chi sq 0.01, df 1, p - 0.91, NS
Wearing of seat belt	86(75.44)	72(83.72)	158(79.00)			Chi sq 1.56, df 1, p - 0.21, NS
Overtaking vehicle only from right side	92(80.70)	80(93.02)	172(86.00)			Chi sq 5.2, df 1, p - 0.02, Sig, Cramer's V 0.18
Not to use mobile while driving	84(73.68)	78(90.70)	162(81.00)			Chi sq 8.15, df 1, p - 0.004, Sig, Cramer's V 0.21
Follow speed limit	84(73.68)	80(93.02)	164(82.00)			Chi sq 11.15, df 1, p - 0.0008, Sig, Cramer's V 0.25
Follow driving lane	83(72.81)	80(93.02)	163(81.50)			Chi sq 11.98, df 1, p - 0.0005, Sig, Cramer's V 0.26
Not to drive after taking alcohol	84(73.68)	78(90.70)	162(81.00)			Chi sq 8.15, df 1, p - 0.004, Sig, Cramer's V 0.21
Keep vehicle serviceable while driving	83(72.81)	78(90.70)	161(80.50)			Chi sq 8.89, df 1, p - 0.0029, Sig, Cramer's V 0.22
Not to drive when sick or tired	85(74.56)	78(90.70)	163(81.50)			Chi sq 7.43, df 1, p - 0.006, Sig, Cramer's V 0.20
Use spectacle while driving if vision is subnormal	83(72.81)	77(89.53)	160(80.00)			Chi sq 7.56, df 1, p - 0.006, Sig, Cramer's V 0.21

74 to 80% students knew about common road safety measures. Girls were significantly more knowledgeable.

Table 3: Knowledge of common traffic signs

Traffic signs	Correct answer		Total(200) No. (%)	P value Significant (Sig) Not Significant (NS)
	Male(114) No. (%)	Female(86) No. (%)		
 NO ENTRY	91(79.82)	79(91.86)	170(85.00)	Chi sq 4.67, df 1, p - 0.03, Sig, Cramer's V 0.17
 NO OVERTAKING	92(80.70)	80(93.02)	172(86.00)	Chi sq 5.2, df 1, p - 0.02, Sig, Cramer's V 0.18
 NARROW BRIDGE	47(41.22)	57(66.28)	104(52.00)	Chi sq 11.34, df 1, p - 0.0008, Sig, Cramer's V 0.24
 NO U TURN	85(74.56)	78(90.70)	163(81.50)	Chi sq 7.43, df 1, p - 0.006, Sig, Cramer's V 0.20
 SCHOOL AHEAD	83(72.81)	78(90.70)	161(80.50)	Chi sq 8.89, df 1, p - 0.0029, Sig, Cramer's V 0.22
 ROAD NARROWS	48(42.11)	56(65.12)	104(52.00)	Chi sq 9.5, df 1, p - 0.002, Sig, Cramer's V 0.23
 NO RIGHT TURN	86(75.43)	79(91.86)	165(82.50)	Chi sq 8.05, df 1, p - 0.004, Sig, Cramer's V 0.21

Above 90% of the girls were aware about most of the common traffic signs. The gender difference in knowledge is statistically significant.

Table 4: Non-compliance of road safety measures among students driving regularly

Unsafe behaviours (n-106)	Male(n ¹ -75) No. (%)	Female(n ² -31) No. (%)	Total No. (%)	P Value Significant (Sig) Not Significant (NS)
Not wearing helmet	29(38.67)	5(16.13)	34(32.08)	Chi sq 4.13, df 1, p -0.04, Sig, Cramer's V 0.23
Not using seat belt when driving car	18(24.00)	4(12.90)	22(20.76)	Fisher's Prob 0.292, NS
Overtaking vehicle from wrong side	32(42.67)	4(12.90)	36(33.96)	Fisher's Prob 0.003, Sig.
Using mobile while driving	18(24.00)	5(16.13)	23(21.70)	Chi sq 0.4, df 1, p - 0.52, NS.
Not following speed limits	65(86.67)	6(19.35)	71(66.98)	Chi sq 41.9, df 1, p - 0.0001, Sig, Cramer's V 0.65
Not always following lane discipline	64(85.33)	4(12.90)	68(64.15)	Fisher's Prob 0, Sig.
Driving after taking alcohol	6(8.00)	--	6(5.66)	--
Intercepted by police while driving last 2 years	32(42.67)	3(9.68)	35(33.01)	Fisher's Prob 0.001, Sig.

Non-compliance of traffic rule varied from 20.76% to as high as 66.98%. Non-compliance was significantly

Table 5: Non-compliance of road safety and driving experience

Unsafe behaviours (n-106)	Driving less than 2 years (n ¹ -66)		Driving more than 02 years (n ² -40)		Total No. (%)	P Value Significant (Sig) Not Significant (NS)
	No. (%)	No. (%)	No. (%)	No. (%)		
Not wearing helmet	28(42.42)	6(15.00)	34(32.08)		Chi sq 7.38, df 1, p -0.006, Sig, Cramer's V 0.28	
Not using seat belt when driving car	16(24.24)	6(15.00)	22(20.76)		Chi sq 0.79, df 1, p -0.37, NS.	
Overtaking vehicle from wrong side	25(37.87)	11(27.50)	36(33.96)		Chi sq 1.2, df 1, p - 1.0, NS	
Using mobile while driving	13(19.69)	10(25.00)	23(21.70)		Chi sq 0.16, df 1, p - 0.58, NS.	
Not following speed limits	46(69.69)	25(62.50)	71(66.98)		Chi sq 0.3, df 1, p - 0.46, NS.	
Not always following lane discipline	45(68.18)	23(57.50)	68(64.15)		Chi sq 0.81, df 1, p -0.36, NS.	
Intercepted by police while driving last 2 years	24(36.36)	11(27.50)	35(33.01)		Chi sq 0.53, df 1, p -0.46, NS.	

Non-compliance of helmet use was significantly high among less experienced group.

Table 6: Non-compliance of road safety among students involved in RTA

Unsafe behaviours (n-106)	Experienced RTA (n ¹ -28)		Not Exp RTA (n ² -78)		Total No. (%)	P Value Significant (Sig) Not Significant (NS)
	No. (%)	No. (%)	No. (%)	No. (%)		
Not wearing helmet	7(25.00)	27(34.61)	34(32.08)		Chi sq 0.49, df 1, p -0.48, NS	
Not using seat belt when driving car	10(35.71)	12(15.38)	22(20.76)		Chi sq 4.02, df 1, p -0.04, Sig, Cramer V 0.22	
Overtaking vehicle from wrong side	17(60.71)	19(24.35)	36(33.96)		Chi sq 10.58, df 1, p -0.001, Sig, Cramer's V 0.34	
Using mobile while driving	11(39.28)	12(15.38)	23(21.70)		Chi sq 5.59, df 1, p - 0.018, Sig, Cramer's V 0.25	
Not following speed limits	24(85.71)	47(60.25)	71(66.98)		Chi sq 4.94, df 1, p - 0.026, Sig, Cramer's V 0.24, Fisher's prob 0.02	
Not always following lane discipline	23(82.14)	45(57.69)	68(64.15)		Chi sq 4.35, df 1, p -0.03, Sig, Cramer's V 0.22	
Intercepted by police while driving last 2 years	15(53.57)	20(25.64)	35(33.01)		Chi sq 6.06, df 1, p -0.01, Sig, Cramer's V 0.26	

60.7% RTA defaulters overtook wrongly, 85.7% and 82.1% didn't follow speed limit and lane discipline respectively; the findings are significant.

Table 7: Road safety awareness and reasons for RTA among students involved in accident

Reasons for RTA (n-28)	Aware of related road safety factor No. (%)	Met accident due to non-compliance of particular said safety factor			P value Significant (Sig) Not Significant (NS)
		Aware of said factor & met accident		Total No. (%)	
		No. (%)	Unaware of said factor & met accident No. (%)		
Faulty overtaking	25 (89.28)	06 (21.43)	03 (10.71)	09 (32.14)	Fisher's prob 0.025, Sig
Skidded due to high speed	26 (92.85)	04 (14.29)	2 (7.14)	6 (21.43)	Fisher's prob 0.039, Sig
Mobile fell from hand while driving in crowded street, disbalanced & rammed in to vehicle	25 (89.28)	04 (14.29)	3 (10.71)	7 (25.00)	Fisher's prob 0.01, Sig
While changing lane, got collided with vehicle	24 (85.71)	3 (10.71)	3 (10.71)	6 (21.43)	Fisher's prob 0.02, Sig

Majority of RTA (32.14%) happened due to 'faulty overtaking' followed by 'use of mobile while driving' (25%). 'High speed skids' and 'collision while changing lane' resulted RTA in 21.4% cases each.

Discussion

The study revealed that 76% students were above 20 years with mean age 20.6±1.07 years, 57% were male, 4% had car and 53% had two-wheeler. Similar age, sex and social profile were noted in earlier study among college students.⁽⁷⁾ 60.5% were from middle income group family and 24% used spectacles. 71% had driving licence of which 53% were driving regularly that included 71 (66.9%) male and 35(33.1%) female students. A previous study documented that 69% of students had driving license and 58% owned a vehicle. ⁽⁴⁾ 66% had driving experience of less than 2 years.

26.4% of those who drove experienced moderate RTA; males (21.6%) were significantly more affected than females (4.72%). In a similar study it was noted that 64% subjects had less than 02 years of driving experience and only 4.73% of the subjects met with RTA in past; the latter is considerably less when compared to present study. ⁽⁴⁾ Redhwan and Karim in an allied study documented that 35.7% scholars were involved in one or more RTAs. ⁽⁸⁾ Less experienced (22.64%) and be-spectacled students were significantly more afflicted with RTAs.

52% students attended educational program on road safety; girls significantly more than the boys. An earlier study documented that 54.5% student attained benefit of such program. ⁽⁷⁾ 74% and 79% of the students recognized the importance of wearing helmet and fastening seat belt respectively and the difference in the knowledge between the sexes is marginal. A comparable figure of 74% and 81.5% were noted respectively earlier. ⁽⁷⁾ Over 90% of the girls knew the correct way of overtaking a vehicle, not to use mobile while driving, to follow speed limit and driving lanes as compared to 72-80% of boys; the difference is statistically significant. High percentage of students (81 to 86%) in present study exhibited correct knowledge about these particular factors which is analogous to previous observations. ⁽⁷⁾ Around 90% girls were aware of not to drive 'after taking alcohol' and 'when sick', to keep the vehicle serviceable and use spectacle while driving as compared to 72-74% boys. Authors reported 86% were aware about effects of drunken driving and only 43% believed that serviceability of vehicle was a necessity. ⁽⁴⁾ However, other studies observed that over 63% subjects recognised importance of vehicle maintenance. ^(9,10)

Above 90% girls identified many common traffic signs like 'no entry', 'no overtaking', 'no u turn', 'school ahead' and 'no right turn' as compared to only 72.8 to 80.7% boys; gender difference in knowledge is statistically significant. Overall large percentage (80.5 to 86%) of students knew about these common signs. Earlier study registered that as high as 81.5 to 96% discerned these common signs. ⁽⁷⁾ However, others documented around 50% subjects only could identify these signs correctly. ⁽¹⁰⁾ Present observations could probably be due to effect of formal education and exposure to city environment. Only 52% displayed knowledge about traffic signs like 'narrow bridge' and 'road narrows'. Uncommon nature of these signs could be reason for unfamiliarity.

While studying unsafe behaviour among regular drivers, it was exposed that above 20% students denied using seat-belt and stated using mobile

phone while driving. The boys were more refractory. 32% and above in the present study never used helmet and often overtook incorrectly. The boys were significantly unruly. 64% and above neither followed lane discipline nor maintained any speed limit. Non-compliance was significantly higher among boys. A similar study recorded that 18.5% and 26% didn't use seatbelt and helmet respectively, 14% used mobile, 77% subjects didn't follow speed limit without any gender difference. ⁽⁷⁾ Only 6(5.66%) boys stated drove under influence of liquor; however it appears to be an under-statement. Earlier studies annotated 12% students drove under influence of liquor which included even 2% girls. ^(7,11)

When driving experience was validated with road safety practices, the study revealed that 32% didn't wear helmet and 20.7 % didn't fasten seat-belt. Inexperienced students were more nonchalant. 21.7% were using mobile while driving, more so among experienced group. Above 33% stated overtaking vehicles incorrectly and were caught by the police; percentage of defaulters were more among inexperienced. A very high proportion of students (64 to 66.9%) neither followed speed limit nor lane discipline; percentage was considerably higher among the inexperienced. Association of age, experience of driving and bending of traffic rules was found significant. ⁽⁴⁾ Corresponding study revealed that only fewer students who got involved in RTAs were having more than 2 years of driving experience. ⁽⁸⁾ Yilmaz and Eray also reiterated that the years of experience were significantly associated with exposure to RTA. ⁽¹²⁾

While studying non-compliance of safety measures among RTA defaulters, it was unveiled that 25% didn't use helmet and 35.7% didn't fasten seat-belt. While 60.7% RTA insolvents overtook wrongly, 39.2% used mobile while driving; both findings are significant. 85.7% and 82.1% offender didn't follow speed limit and lane discipline respectively; the findings are remarkably significant yielding intervention by police in 53.7% cases. Unsafe driving practices like high speed, not wearing helmet and using

mobile phone while driving are very common among young adults resulting in higher incidence of RTAs. ⁽⁴⁾ It has been reported that considerably large no. of students exceeded speed limit (62%), flawed lane discipline (73%) and avoided seat belt (92%). ⁽⁴⁾ Practice of exceeding speed limit and non-compliance of lane discipline has been reported by other authors also. ^(5, 9, 10)

In spite of high index of road safety awareness, RTA eventuated significantly among those who knew the importance of related road safety factors. Majority of RTA (32.14%) occurred due to 'wrong overtaking' followed by 'use of mobile while driving' (25%) in which 21.3% and 14.4% offenders respectively knew implication of such careless act. 'High speed skids' and 'collision while changing lane' counted for 21.43% each for causation of RTA in which 14.3% and 10.7% students respectively knew risk of such casualness. Risk indulging behaviour stemming out of display of sensational and thrill seeking attitude is generally preponderant among adventurous adolescents. Many studies have reported that risky attitude remains the most significant in increasing the rate of RTAs. ^(8,13) Positive relationship of RTAs among young, less experienced students in the present study has been complemented by reports of authors from other countries. ^(14, 15)

Conclusion

The study exhibited impressive conglomeration of road safety awareness among the college students. However, most of the students never reaped the benefit of such knowledge and continued bending rules conveniently. Young and inexperienced were significantly more recalcitrant, defied the conventions and met more RTAs. Being a limited study in an urban institution, it is pertinent to mention that the results may not stand enough universally. However, the study has explicated the core contention that knowledge and application don't go hand in gloves without enduring motivation. The study recommends motivating young vulnerable group periodically by organising 'road safety camps' in various institutions to

inspire and inculcate practice of safe and defensive driving to avert RTAs.

Acknowledgements - Nil

Source of support - Nil

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