

Original Research Article

Young road users in a district of South India: gender differences in behaviour and perceptions

Pallavi Sarji Uthkarsh^{1*}, Thomos Kraft², Frits Van Merode²

¹Department of Public Health and Centre for Disease Control, Rajiv Gandhi University of Health Sciences, Karnataka, India

²Department of Public Health, Maastricht University, Netherlands

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*Correspondence:

Dr. Pallavi Sarji Uthkarsh,

E-mail: pallavisarji@yahoo.com

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ABSTRACT

Background: Road traffic injuries are the leading cause of death among young people globally, especially in developing countries and burden is more among males compared to females. Human behaviors play a significant role in road traffic Injuries (RTIs), understanding road user behaviors, perception and gender differences in them is very essential to plan strategic road traffic injury prevention programs. The objectives of this study behaviors, risk perception and gender differences in young road users of a district of South India.

Methods: This cross-sectional study was undertaken among 2000 young people in the age group of 18-25 years in a district of South India.

Results: More than half of the youth reported unsafe behaviors as a road user. Risk behaviors such as playing on roads, using mobile while on road, high speed driving, hanging on to the doors of the bus were reported more in male gender. More than 40% perceived not following traffic safety norms as safe without significant gender differences.

Conclusions: Young road users of South Indian district irrespective of gender, do not follow majority of safety norms and they perceived its safe not to follow them.

Keywords: Pedestrian, Two wheelers user, Road user behaviour, Youth India, Safety Perception, Gender difference

INTRODUCTION

Road traffic injuries are the leading cause of death Worldwide. The world health organization (WHO) reports that about 1.24 million people die annually on the world's roads, with 20-50 million sustaining non-fatal injuries.¹ Nearly half of those dying on the world's roads are pedestrians, cyclists, and motorcyclists who form the 'vulnerable road users'.²

In India, pedestrian injuries form 37% of road traffic injuries ³With more than half of the deaths and injuries affecting those aged between 15-29 year, who often are the bread winners for the family, road traffic injuries

have become the second leading cause of death among youth especially among men, who suffer three to five times more fatal and non-fatal road traffic injuries compared to females.^{4,6}

If we want to realise the sustainable development goal of halving road traffic deaths by 2030, understanding a road user behaviour (host) and gender differences in the road user behaviour is very essential.⁷

Hence, the current study was undertaken to study the behaviour, perceptions and gender differences of young road users in a district of South India.

METHODS

Study area

This was a cross-sectional study done at Tumkur district, which is one of the 29 districts of Karnataka, a South Indian state, spread over 10,598 km covering a population of 2.68 million. It's an educational hub with 19-degree colleges, 2 medical and 6 engineering colleges, several diploma and pre-university colleges.⁸

Tumkur has the 9th largest district road network in the state which has reported (in the period of January 2009-2011) 1116 road deaths, with an annual road traffic injury mortality rate of 18.8/1,00,000/year.⁹

Study population included youth studying in different educational institutions such as medical, engineering, diploma, arts and science degree courses in a Tumkuru district, South India. Students of First and second year of the course were included in the study after the informed verbal consent. Students who were absent during the study period were excluded. The sample size was 2000.

Study instrument and data collection

Institutional ethical clearance was obtained from local ethical committee of Shree Siddhartha Medical College, Tumkuru. Vice chancellors of Shree Siddhartha University and Tumkur University, (which are the two big universities offering different courses in Tumkur district) were met and necessary permissions were obtained to conduct study in the selected educational institutions of Tumkur. A meeting was held with the institutional heads and NSS (national service scheme) officers of the respective institutions and schedule for data collection in different institutions was worked out without affecting the routine academic classes. Convenient sample of 2000 youth of different educational institutions were interviewed during January to April 2015 to collect data on sociodemographic details, road usage pattern, road user behaviour, perceptions towards certain road user behaviour, road safety education and attitude towards prevention of road traffic injuries using pre-tested, semi structured questionnaire, which was developed based on published literature.¹⁰⁻¹⁴

Data was collected by a team of two authors after obtaining informed consent from the participants. Each question and options for the questionnaire were read out loud and explained to the study participants by the study supervisor. The participants were asked to choose the frequency of their behaviors and road safety education on a five-points scale ranging from 1 (never) to 5 (always). Perception of youth towards not following safety norms was assessed by asking them to indicate on a three-points scale ranging from 1 (not at all) to 3 (extremely safe). Participants attitude towards the prevention of road traffic injuries was assessed by asking them to mark on a three-points Likert scale 1 (never) to 3 (always).

Statistical analysis

Among 2000 youth who participated in the study nearly 1870 had completed the questionnaire so, analysis was done only for 1870 using a SPSS 20.0 software.

Apart from age, a continuous variable, other exposure variables were categorical data. continuous variable was described using mean and standard deviation while categorical variables were described with frequencies and percentages. For the purpose of analysis, the responses regarding behavior and perception on five point and three points scale were grouped dichotomously as 'safe' and 'unsafe', similarly responses regarding attitude on a three points scale were grouped dichotomously as 'good' and 'bad'. Chi square test is used to study the association between qualitative variables.

RESULTS

Socio demographic characters

Mean age of participants was 18 years and among them 1052 (56.3%) were males and 818 (43.7%) were females. Nearly 928 (49.6%) were studying engineering, 213 (11.4%) were medical, 233 (12.5%) were studying other degree courses and rest were studying diploma. Nearly 50% stayed in hostel and nearly 619 (33.1%) had their place of residence in outskirts of Tumkur.

Table 1: Daily travel pattern of youth.

Travel pattern	Number (n=1870)	%
Average number of trips in a day		
>2	838	44.8
<2	1032	55.2
Average distance of institution		
>3 km	1805	96.5
<3 km	65	3.5
Common mode of transportation to institution		
Two wheelers	325	17.4
Bicycle	91	4.9
Bus	565	30.2
Both by walk and by bus	853	45.6
Others	51	2.7
Usage highway daily to reach college		
Yes	583	31.2
No	1287	68.8

Daily travel pattern of youth

Most common mode of daily travel to the study institutions was by walk (43%), followed by bus (40%) and two wheelers (17%) but all youth reported that they used road as a pedestrian/two wheelers rider or pillion/bus user at least once/twice a day for one other purposes.

Nearly 30% used highway to reach their study institutions. More than 96.5% traveled more than 3 kilometers to their collages and nearly 40% made more than two trips a day (Table 1).

Pedestrian behaviors and gender differences in young road users

Nearly 50% of participants reported that they do not use foot path or zebra cross often while using a road as a pedestrians and cross road at any point and even if they use zebra cross more than 34% cross the zebra cross before pedestrian signal turns green and this behaviour was reported more by females compared to males. Nearly half of them reported of using mobile while crossing/walking on the roads. Compared to female’s unsafe behaviour such as playing on roads and use of mobile while crossing or walking on road was more among males (Table 2).

Bus user behaviors and gender differences

Nearly 50% of participants had reported that very often they did get in/out of moving bus, more females (54.8%) reported of getting down of moving bus whereas more males reported (43.1%) travelling hanging to the doors of buses, and the association between these unsafe behavior and gender was significant (p=0.001) (Table 3).

Two wheelers user behaviors and gender differences

More than 60% youths reported that they never wore helmet and used mobile while riding most of the time and nearly 70% of youth never wore any visible reflectors/clothing during night time. There were no gender differences in two wheelers users except adherence to speed limit, which was more among girls (p=0.0002) (Table 4).

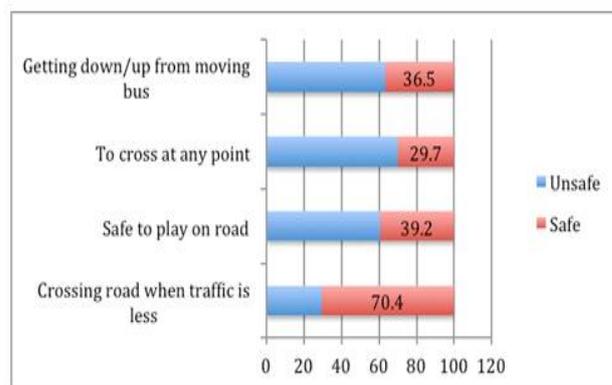


Figure 1: Perception of youth on behaviours as a pedestrian and bus user.

Table 2: Behaviour of youth as a pedestrian and gender difference.

Behaviour n=1870	Safe N (%)	Unsafe			P value
		All N (%)	Male (% calculated for total male) *	Female (% calculated for total female) *	
Use of foot path	953 (51)	917 (49)	503 (47.8)	414 (50.6)	0.23
Using zebra cross	814 (43.5)	1056 (56.5)	563 (53.5)	493 (60.3)	0.03
Looking both ways before crossing	1653 (88.4)	217 (11.6)	90 (8.6)	127 (15.5)	0.00
Crossing when pedestrian signal turns green	1232 (65.9)	638 (34.1)	311 (29.6)	327 (40)	0.00
Playing on road	1439 (77)	431 (23)	250 (23.8)	181 (22.1)	0.00
Using mobile phone while crossing the road /walking	1005 (53.7)	865 (46.3)	526 (50)	339 (41.4)	0.00

*percentages calculated for total male and female.

Table 3: Behaviour of youth as a bus user and gender difference.

Behaviour n=1870	Safe N (%)	Unsafe			P value
		All N (%)	Male (% calculated for total male) *	Female (% calculated for total female) *	
Waiting for bus at designated bus stop	856 (45.8)	1014 (54.2)	564 (53.6)	450 (55)	0.28
Getting down from moving bus	918 (49.1)	952 (50.9)	476 (45.2)	476 (58.2)	0.00
Getting in to moving bus	809 (43.3)	1061 (56.7)	613 (58.3)	448 (54.8)	0.1
Travelling in the bus by hanging to its door	1165 (62.3)	705 (37.7)	453 (43.1)	252 (30.8)	0.00

*percentages calculated for total male and female.

Table 4: Behaviour of youth as a motorised two wheeler user and gender difference (n=1441).

Road safety behaviour	Practice	Male (935) N (%)	Female (506) N (%)	Total N (%)	Chi square value	P value
Following lane discipline	Follow	695 (74.3)	390 (77.1)	1085 (75.3)	1.329	0.299
	Do not follow	240 (25.7)	116 (22.9)	356 (24.7)		
Adherence to speed limit	Follow	543 (58.1)	336 (66.4)	879 (61.0)	9.572	0.002
	Do not follow	392 (41.9)	170 (33.6)	562 (39.0)		
Following traffic signals/rules	Follow	820 (87.7)	429 (84.8)	1249 (86.7)	2.421	0.120
	Do not follow	115 (12.3)	77 (15.2)	192 (13.3)		
No drunken drive	follow	823 (88)	457 (90.3)	1280 (88.8)	1.742	0.187
	Do not follow	112 (12)	49 (9.7)	161 (11.2)		
Not using mobile while riding	Follow	585 (62.6)	358 (70.8)	943 (65.4)	9.724	0.02
	Do not follow	350 (37.4)	148 (29.2)	498 (34.6)		
use of visible stickers/cloths during night time	Follow	233 (24.9)	97 (19.2)	330 (22.9)	6.418	0.013
	Do not follow	702 (75.1)	409 (80.8)	1111 (77.1)		
Use of helmet	Follow	307(32.8)	198(39.1)	505(35)	5.718	0.017
	Do not follow	628 (67.2)	308 (60.9)	936 (65)		
Not riding with more than one pillion	Follow	592 (63.9)	315 (65.50)	907 (64.4)	0.366	0.545
	Do not follow	335 (36.10)	166 (34.5)	501 (35.6)		

Table 5: Gender difference in safety perception of youth as a motorised two wheelers user (n=1441).

Variables	Perception	Male (935) N (%)	Female (506) N (%)	Total N (%)	Chi square value	P value
Travelling without helmet	Unsafe	504 (53.9)	279 (55.1)	783 (54.3)	0.202	0.653
	Safe	431 (46.1)	227 (44.9)	658 (45.7)		
Over speeding	Unsafe	388(41.5)	260(51.4)	648(45.0)	12.967	0.000
	Safe	57 (58.5)	246 (48.6)	793 (55.0)		
Violating traffic signal/rules	Unsafe	310 (33.2)	231 (45.7)	541 (37.5)	21.866	0.000
	Safe	625 (66.8)	275 (54.3)	900 (62.5)		
Riding on highways	Unsafe	447 (47.8)	366 (72.3)	813 (56.4)	80.311	0.000
	Safe	488 (52.2)	140 (27.7)	628 (43.6)		
Drunken driving	Unsafe	427 (45.7)	209 (41.3)	636 (44.1)	02.536	0.111
	Safe	508 (54.3)	297 (58.7)	805 (55.9)		
Riding with more than one pillion	Unsafe	359 (38.4)	244 (48.2)	603 (41.8)	13.025	0.000
	Safe	576 (61.6)	262 (51.8)	838 (58.2)		
Driving before 18	Unsafe	565 (60.4)	321 (63.4)	886 (61.5)	1.257	0.262
	Safe	370 (39.6)	185 (36.6)	555 (38.5)		
Using mobile while riding	Unsafe	572 (61.2)	301 (59.5)	873 (60.6)	0.393	0.531
	Safe	363 (38.8)	205 (40.5)	568 (39.4)		

Gender differences in perception towards certain road user behaviors

Nearly 70% (1326) perceived it’s safe to cross road at any point and more than 30% perceived it is safe to play on the roads and to get down or get in to the moving bus (Figure 1). There was no any significant difference among boys and girls concerned to these perceptions.

Nearly 58% of boys and 48% of girls perceived it’s safe to over speed, 66% of boys and 54% of girls perceived it’s safe to violate traffic signal and 61% of boys and 51% of girls felt riding with more than one pillion is safe and the difference was significant (p=0.000).

Majority of the youth (>60%) without significant gender difference perceived it’s safe to ride without helmet and to violate traffic rules (Table 5), whereas nearly 40% of

youth perceived drunken driving and use of mobile as safe while riding and there was no significant gender difference (Table 5).

DISCUSSION

This study is first of its kind in South India which focussed in understanding behaviour and perception of youth as a pedestrian, two wheelers user, bus-user and gender differences in them. The study is unique with its large sample size and having representation of youth from different educational back ground in its study population compared to other studies, which are most often limited to medical students and limited in studying few aspects of two wheelers behaviour.

Young road users frequently take risks related to road safety by disobeying traffic rules such as darting into the roadway and jaywalking.¹⁵⁻¹⁷ In the current study more than half reported that they did not follow a safe pedestrian behaviour such as using foot path, using zebra cross or crossing the road after the pedestrian signal turns green in most of the occasions. Similar study done in Egypt reported that nearly 20% reported unsafe pedestrian behaviour.¹⁶ Whereas a study from china reports that 19% of adults practice unsafe crossings and a study from Bangladesh reports that nearly 80% of the pedestrians do follow unsafe pedestrian behavior.^{18,19}

Use of mobile results in unsafe road crossing decisions compared to subjects not using mobile devices and increases the risk to injuries.¹² In the current study 34% of youth reported that they use mobile while walking, where as a study from Australia (20) reports that 20% of the sample had high exposure to smart phone use while crossing, another study from China reports higher use of electronic device among teenagers while on road.¹⁸ Nearly 40% perceived as safe to use mobile while on road which is similar to a study from China.²¹

Playing on roads is a commonly seen practice in India. Playing on roads increases the risk of road traffic injuries, a cross sectional study from Peru found that 43% of adolescents who got injured on roads routinely used the streets and sidewalks as play areas, in the current study we found that nearly 23% of the youth do play on roads and nearly 40% perceived safe to play on roads, which increases the risk of road traffic injuries among them.^{22,23}

Unsafe behaviors as a pedestrian except playing on roads and use of mobile was reported more by females compared to males in contrast to other studies.^{24,25}

A study from South India reported that 92 percent of the bus passengers involved in fatal crashes sustained fatal injuries due to a fall while entering or leaving the bus, stressing the importance of safe embarking and disembarking from the bus. In the current study nearly 49% of participants had reported that very often do get out of moving bus and nearly 43% of them reported of

getting in to a moving bus and more than 60% reported of standing hanging to the door(standing on to the foot board/hanging outside the door) of the bus and 43% boarded bus at non designated stops, whereas a study from Pakistan²⁷ reported that nearly 33% disembarked from a moving bus and nearly 38% embarked on to a moving bus, and 73% climbed on the buses filled to their outer foot boards and 83% waited for buses on the street, highlighting the risk behaviors of youth in developing countries while using the public Transport.²⁶

In contrast to a study from Pakistan where males were more likely than females to practice unsafe behaviors as a bus user ,in the current study more females (54.8) reported of getting down of moving bus where as more males reported (43.1) travelling hanging to the doors of buses, and the association between these unsafe behavior and gender was significant ($p=0.001$).²⁷

More than 60% of youth reported that they did not use helmet without significant gender difference, whereas usage of mobile while driving was reported more in girls (37%) compared to boys (30%) showing significant gender difference ($p=0.002$), and 12% of all students did report drunken driving , showing higher risk practice compared to a study done among students of a medical college in India as well as in Iraq.^{28,29} The difference in these studies may be because of heterogeneity in the study population, as the current study represented not only medical students but different educational background also.

Wearing reflective clothing or bright color cloths make the vulnerable road users more conspicuous and helps in reducing crashes due to poor visibility but in the current study majority of youth neither wore any visible clothing nor made preference for white color cloths during night time.³⁰

Majority of the youth (>55%) felt it's safe to ride without helmet and to do drunken driving, in contrast, to a study done in Agartala showed that majority of the participants (98.7%) knew driving after consuming alcohol was dangerous, (92.9%) felt talking while driving distract the driver, whereas according to a study done in Iraq, 80% of participants perceived that driving after a mild to moderate intake as risky and perceived playing loud music (33.3%), a lack of correct knowledge about speed limits in different areas (45.5%) and driving during rush hour (48.3%) as the least risky behaviours.^{28,29}

In the current study, girls reported better adherence to speed limit than boys ($p=0.0002$), which justifies that females are less involved in speed related crashes than males boys perceived safe to violate traffic signals and to ride with more than one million compared to girls and gender difference in these perception was found to be significant ($p=0.000$).³⁰ Whereas no significant gender difference was found in perception towards drunken driving and use of mobile while riding . which is similar

to a study conducted by Frontiers et al, where males reported higher score of traffic rules violation and risky behaviour and higher score of negative attitudes towards traffic rules and speeding whereas female showed higher score of negative attitude towards alcohol.³¹ According to a health belief model, people are likely to adapt healthy behaviors if they perceive a threat or taking preventive measures will be effective but in the current study more than half of the youth perceive safe to violating or not to follow safety norms on roads and have the negative attitude towards preventable nature of accidents, which might be the reason for their unsafe behaviors as a user.³²

CONCLUSION

Majority of young road users of South Indian district irrespective of their gender follow unsafe behaviours as a pedestrian, two wheelers user or a bus user and they even perceive it as safe to do so. This risk behaviour and perception of youth irrespective of gender might increase their susceptibility towards road traffic injuries.

Recommendations

Human behaviour is an important risk factor in road traffic injuries which needs to be addressed with combined action of road safety education, provision of suitable environment and enforcement measures to ensure safe road user behaviour.

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