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Cross Sectional Study to Assess Knowledge of Traffic Signs among Post Graduate Student of R D Gardi Medical College, Ujjain

Rashmi Bhujade[1], Tarique Ibrahim[2], Dharampal Singh Chouhan[3], Konika Jain[4]

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Author's Affiliation:
[1]Assistant Professor, Dept of Community Medicine , Index Medical College, Hospital Research Center , Indore;
[2]Assistant Professor, Dept of Community Medicine , Varun Arjun Medical College, Banthara Shahjahanpur (U.P.);
[3]Assistant Professor; [4]PG student , Dept of Community Medicine , RD Gardi Medical College , Ujjain

Correspondence
Dr Rashmi Bhujade
drbhujaderashmi@gmail.com

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ABSTRACT

Background: About 1.25 million people die each year as a result of road traffic crashes.90% road traffic deaths occurs in low and middle income countries. Urgent action is needed to achieve the target halving the global number of deaths and injuries from road traffic crashes by 2020.

Objective: The study conducted to assess the knowledge of traffic signs among the post graduate student; and to find out association of various socio-demographic and other variable with knowledge of traffic signs.

Methods –A cross sectional study was conducted in 2017 on 100 post graduate students. Data was collected using predesigned, semi structured proforma .Data analysis was done by using SPSS version20.

Results –Overall mean score for knowledge of traffic signs was found to be 52, while mean score in mandatory sings, cautionary sign & informatory sign were around 62, 44 & 54 respectively. Knowledge was significantly higher in males and in owner of both two wheeler & four wheeler ($p<0.00$).

Conclusion: Overall knowledge of traffic signs was found not satisfactory in Post graduate students. We have to review our license giving process. Regular sessions on traffic signs & rules should be held for increasing awareness.

Key words –Knowledge, Traffic signs, Post Graduate students, associated variables with knowledge

INTRODUCTION

1.25 million People die each year as a result of road traffic crashes[1]. 90% road traffic deaths occur in low and middle income countries.Road traffic crashes cost most countries 3% of their gross domestic product. Urgent action is needed to achieve the ambitious target for road safety reflected in the newly adopted 2030 agenda for Sustainable Development: halving the global number of deaths and injuries from road traffic crashes by 2020[2] .Without sustained action, road traffic crashes are predicted to become the seventh leading cause of death by 2030. Most of the injuries and death occur because of driver's fault. Some of the risk factors for road traffic accidents are speeding , driving under the influence of alcohol and other psychoactive substances , non-use of motorcycle helmets, seat-belts, and child restraints, distracted driving ,unsafe road infrastructure ,unsafe vehicles, inadequate post-crash care, inadequate low enforcement of traffic laws , lake of knowledge about traffic signs and symbols[3] .Government is taking various measures to deal with ,government made some laws for various risk factors like for drunken driving ,use of helmets and seat belts . Motor vehicles were first introduced in India towards the end of the 19th century, and the 1914 Act "Indian Motor Vehicle Act 1914[4] was the first legislation to regulate their use. It had 18 sections, and gave local governments

the responsibility of registering and licensing vehicles and motorists, and enforcing regulations was amended and revised several times by the Government of India. The thorough knowledge of traffic signs is very essential for the drivers and road users. The proper knowledge of these rules can reduce the number of accident**.** For improving the knowledge about the traffic signs rarely any interventions are planned. First baseline knowledge should be checked about traffic sings and symbol so further intervention can be planned accordingly. Traffic signs are effective only when users clearly understand their meaning. These are symbols with different shapes, colours and sometimes with the assistance of words and labels to regulate road traffic. They give information about the road conditions ahead, provide instructions to be followed at the major crossroads or junctions, warn or guide drivers, and ensure proper functioning of traffic.

A person is supposed to be familiar (get through a written or oral test) with the traffic signs and symbols before acquiring a driving license in India. But actually scenario is not ideal this is not followed very strictly in our country. No study like this is ever conducted on post graduate students in Ujjain region. So the current study was planned with objectives of to assess road traffic signs knowledge among Post graduate students of R. D. Gardi Medical College, to find out association of various socio-demographic and other variable with knowledge of traffic signs

METHODOLOGY

Cross sectional Observational study was conducted in R. D. Gardi Medical College Ujjain, Madhya Pradesh .Post graduate students were selected as study participants because they are most likely vehicle user section of the society. Sample size was calculated on the basis of the prevalence with an approximate 95% confidence level, using the formula: $n= z^2*P*(100-P)/d^2$ (Where, z= 1.96 at 95% confidence interval, P= 81.8 % [5](prevalence in reference study), L=10% relative error of prevalence = 8). n= (1.96*1.96)*81.8*(100-81.8)/8*8, n= 90 participants.Finally it was rounded up to 100, so sample size of 100 was taken. Convenient sampling technique was adopted because of small sampling unit, homogeneous group with little variability. Recruitment of participants of study was done by fixing inclusion & exclusion criteria for selection of participants in design stage.

Inclusion criteria for the current study was participants who gave consent for participating in the study and **Exclusion criteria** was who were absent at the day of data collection .They were called 3 times even after calling who did not turned up were excluded from study. Total Study duration was 3 months. Ethical clearance was obtained from institutional ethical committee. After obtaining written informed consent of participants data was collected with the help of a self administered semi structured proforma.

Questionnaires were about socio-demographic information of participants and signs of traffic for identification to assess the knowledge. The knowledge score was assessed in three categories 1) Mandatory sign/regulatory sign; 2) Cautionary / warning/ precautionary; and 3) Informatory. Lastly overall knowledge score was computed by combining all the category score.knowledge level, measured in terms of percentage of correct responses. Dependent/outcome variable was traffic signs knowledge & Independent variable/ predictor /experimental variable were socio demographic factors, vehicle & driving license related factors Road safety signs are primarily of three types[6] mandatory Signs, cautionary Signs and informatory Signs. Mandatory Signs are used to ensure free movement of traffic and make the road users cognisant of certain laws and regulations, restrictions and prohibitions. Violation of these signs is an offence, as per law. 38 signs were there in mandatory sign category. Cautionary Signs make the road users conscious of hazardous conditions on the road beforehand. The drivers, accordingly, take necessary actions to handle the situation. 40 signs were there in cautionary signs category. Informatory signs guide the road users about destinations, distance, alternative routes, and prominent locations like food joints, public toilets, nearby hospitals. 18 signs were there in informatory sign category.

Information collected in the proforma was coded and entered in statistical package for the social sciences (SPSS Inc. SPSS for windows version 20).The qualitative variables were expressed in proportion & quantitative variables were summarized by mean & median .The difference in proportion was analyzed by applying chi-square test -Alfa error was set at 5% with 95% of confidence level. It was taken as cut off for commenting statistically significant association. Mann -Whitney U test was also applied .For assuring quality control specific inclusion & exclusion criteria were defined at design stage & Self administered proforma was used for data collection .In current study there is possibility of selection bias, recall bias, non response bias and confounders.

OBSERVATIONS & RESULTS

Table 1 shows socio-demographic factors of study participants 65% of participants were males'

.Ninety four percent participants had their own vehicle. Thirty seven percent participants had both two wheeler & four wheeler. Approximately 97% participants had driving licence (among them 94% had permanent licence)

Figure 1 Showing mean overall knowledge score of traffic signs was higher in males as compared to females.

Table 1 Distribution of participants according to independent variables

Characteristics	Participants (%)
Sex (n=100)	
Male	65 (65)
Female	35 (35)
Ownership of Vehicle (n=100)	
Yes	94 (94)
No	6 (6)
Type of Vehicle (n=94)	
Two wheeler	27 (28.7)
Four wheeler	30 (31.9)
Both	37 (39.4)
Having driving licence (n=100)	
Yes	97 (97)
No	3 (3)
Type of driving licence (n=97)	
Permanent	94 (96.9)
Temporary	3 (3.1)
Duration of licence possession (n=97)	
Less than 5 years	16 (16.5)
More than 5 years	81 (83.5)
Driving days per week (n=96)	
<5days per week	89 (92.7)
>5days per week	7 (7.3)
Driving area (n=96)	
City (urban)	27 (28.1)
Both (urban+rural)	69 (71.9)
Refractive errors (n=100)	
Yes	50 (50)
No	50 (50)
Type of refractive error (n=50)	
Myopia	46 (92)
Others	4 (8)

Table 2 Association with between sex of participants with various category knowledge score & overall knowledge score

Categories	Male (n=65)	Female (n=35)	P value
Mandatory Sign			
<= Median Score	31 (47.7)	24 (68.6)	0.036
> Median Score	34 (52.3)	11 (31.4)	
Cautionary sign			
<= Median Score	28 (43.1)	24 (68.6)	0.013
> Median Score	37 (56.9)	11 (31.4)	
Informatory sign			
<= Median Score	34 (52.3)	21 (60)	0.3
> Median Score	31 (47.7)	14 (40)	
Overall knowledge score			
<= Median Score	27 (41.5)	24 (68.6)	0.009
> Median Score	38 (58.5)	11 (31.4)	

Figure in parenthesis indicate percentage.

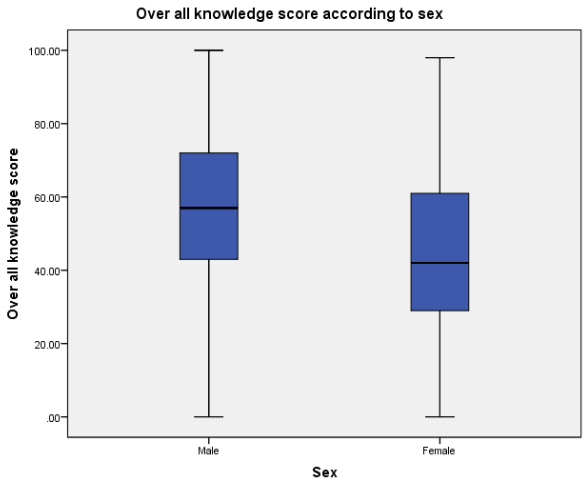
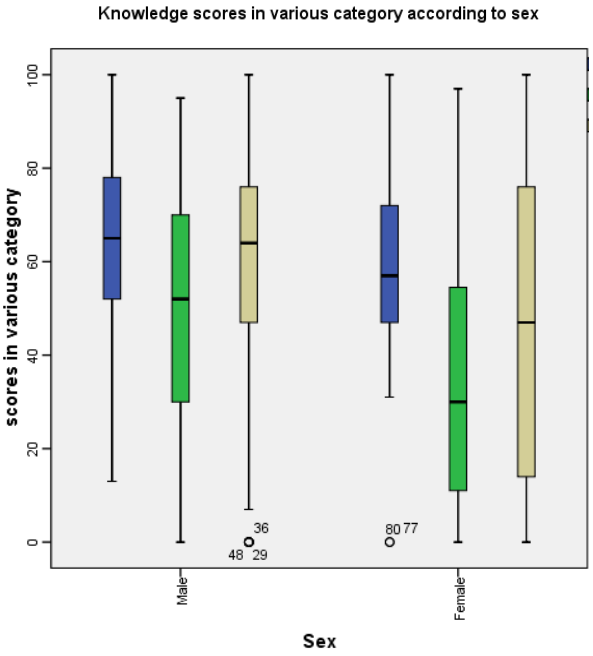


Figure 1 Percentage of Mean overall knowledge score in male and female



Knowledge Score Mandatory Signs
Knowledge Score Cautionary Signs
Knowledge Score Informatory Signs

Figure 2 Distribution of traffic signs knowledge score in various categories according to sex

Table 2 is showing that sex was found to be associated with the knowledge score as individual knowledge score (mandatory, cautionary and informatory knowledge score) and overall knowledge score were found to be more in males than in females. This association was statistically significant as after applying chi square test p value for knowledge score were found to be <0.05.

Figure 2 is showing that knowledge score was higher in males as compared to females in all three categories that are mandatory, cautionary and informatory sign category knowledge score.

Table 3 Association between type of vehicle ownership of participants with various sign category knowledge score and overall knowledge score

Type of vehicle	Cautionary Sign Category		Total	p value
	<= Median (%)	> Median (%)		
2 wheeler	17 (63)	10 (37)	27	0.002
4 wheeler	21 (70)	9 (30)	30	
Both	11 (29.7)	26 (70.3)	37	
	Total score category score			
	<=Median (%)	>Median (%)		
2 wheeler	15 (55.6)	12 (44.6)	27	0.032
4 wheeler	20 (66.7)	10 (33.3)	30	
Both	13 (35.1)	24 (64.9)	37	

As seen in **table 3** that type of vehicle ownership was found to be associated with the knowledge score as better individual knowledge score (mandatory ,cautionary and informatory knowledge score) and better overall knowledge score were found in males than in females. This association was statistically significant as after applying chi square test p value for all knowledge score were found to be <0.05.

Tables 4 is showing after applying Mann Whitney U test the score of all the signs categories were better for males as compared to females as mean knowledge score rank of males was more than females for all individual signs categories knowledge scores and for overall knowledge score .

Test were also applied for other independent variables like type of vehicle ,possession of license ,duration of license possession ,years of driving ,days of driving per week ,kilometers per days ,driving area , presence of refractive error & type of refractive error but not found to be associated with knowledge of participants.

Table 4 Mean knowledge score according to ownership and gender

Ownership	Owner of vehicle (n=94)		Non Owner (n=6)		Mann Whitney p
Score	Mean Rank	Sum of Rank	Mean Rank	Sum of Rank	
Mandatory sign knowledge	50.91	4785.5	44.08	264.5	0.576
Cautionary sign knowledge	50.82	4777	45.5	273	0.663
Informatory sign knowledge	50.81	4752.5	49.58	297.5	0.936
Overall knowledge	50.81	4776	45.58	273.5	0.668
Gender	**Male (n=65)**		**Female (n=35)**		
Score	**Mean Rank**	**Sum of Rank**	**Mean Rank**	**Sum of Rank**	
Mandatory sign knowledge	54.71	3556	42.69	1494	0.048
Cautionary sign knowledge	56.49	3672	39.37	1378	0.005
Informatory sign knowledge	53.21	3458.5	45.47	1591	0.202
Overall knowledge score	56.81	3678	39.2	1372	0.004

DISCUSSION

Current study was planned with the objective of to assess the traffic signs knowledge among the post graduate student of R D Gardi Medical College .The traffic signs knowledge was assessed in 3 categories mandatory signs ,cautionary sign and informatory sign and finally combined in form of overall scores. The overall knowledge level, measured in terms of percentage of correct responses. Main results of present study were the overall knowledge mean score found to be 52%, while in mandatory category mean score was 61.6%,in cautionary category mean score was 44%, in informatory category it was 54%. More knowledge of traffic signs was found to be associated with male sex and ownership of both two wheeler & four wheeler. The knowledge score was more in males it may be because of ,our socio-cultural dynamics offers different opportunities of learning and exposure in males and in females and the other cause may be females have less confidence because of negative stereotype image of female that they are poor in driving .The ownership of both two wheeler and four wheeler was also found associated with better knowledge score it may be because of more vehicle means more exposure , experience & more experience means more knowledge. Knowledge of traffic signs was not found to be associated with type of vehicle, possession of license ,duration of license possession, years of driving ,days of driving per week, kilometers per days ,driving area , presence refractive error & type of refractive error but not found to be associated with knowledge of participants.

Taranga Reang [5]et al. concluded that males had significantly (p=0.035) better knowledge compared to female like the present study. Makinde, O. Oluyemisi, Opeyemi [7], Et al concluded that there is a low understanding of traffic signs by drivers. The average percentages of drivers who correctly understood the warning and prohibitory signs were 67 and 58%, respectively. Age, Education and years of driving experience played prominent roles in drivers' understanding of signs, however marital status and gender had no effect background. A. Razzak and T. Hasan [8] study's results indicated

that the drivers had a very poor level of comprehension of the meaning of the traffic signs. The overall understanding level, measured in terms of percentage of correct responses, was only about 50%. The percentage of drivers who correctly identified the regulatory signs, warning signs and informatory signs were 49%, 52% and 55%, respectively. Dr. A. E. Mary, Dr. A. Chitra, Dr. R. Arunmozhi et al[9] concluded that only 9.4 % participants recognised more than 3 traffic signs correctly. Like the present study this study also concluded that more males having adequate knowledge than females and this is statistically significant.(p=0.015). Humayun mirza, seema daud. [10] revealed by their study that the awareness regarding traffic signs was 52% among males and 51% females. This study was conducted on school going students some of them were be non user or they don't drive. In this study unlike present study concluded that there was no significance difference between knowledge male and female. Johnson OE and Adebayo AM [11] et al concluded that knowledge score was 21% pre-intervention. The knowledge score was low as compared to present study. Indian road safety and welfare trust (IRSWT)[12] conducted a study on 500 drivers in chennai and concluded that 80% bike riders were ignorant of traffic signs and cannot identify mandatory traffic signs. They have assessed the knowledge but only mandatory sign category and did not concluded knowledge in terms of knowledge score percentage as present study. Adesola Olumide & Eme Owoaje[12] conducted a study their study compared knowledge and compliance with traffic signs among young commercial motorcyclists in rural and urban communities in Oyo state .They have computed Aggregate knowledge scores and categorized as good (≥5) and poor (<5) knowledge. Overall, 98.7% rural versus 61.1% urban motorcyclists had poor knowledge of traffic signs ($p < 0.05$). In present study all most all participants were from urban area that's why this difference was not found.

Emmily MK [13] concluded 1% had average knowledge on prevention of Road traffic accidents, 30% had good knowledge and 18% had poor knowledge. V. Kulkarni, T. Kanchan, C. Palanivel et al [14]et al revealed by the study that the participants had a better knowledge about traffic signs and more than half of them identified all the signs correctly. In present study overall score percentage is around 50%.

CONCLUSION

The present study concluded that the knowledge of road traffic signs among the participants were not satisfactory .Knowledge score was more in Males and in owner of both two wheeler and four wheeler. Traffic signs training programme should be planned with more focus on females .There is need to review license issuing process. Regular renewal of the license with test should be there. There should be training sessions on periodic basis and refresher session should also be held. It should also be included in the teaching curriculum of school children.

LIMITATION

Limitation of the present study was small sample size, it affects the generalisability of the result. The other thing is that present study only inquired about the knowledge that too was not satisfactory. The study should also assess the attitude & practice because mare knowledge has no impotence until it is utilised.

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