Original Research Article

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Effectiveness of video-assisted teaching on knowledge regarding road traffic rules among college students, Puducherry

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ABSTRACT

Background: Road traffic accidents are considered a public health problem leading to high mortality and morbidity, especially among adolescents and young adults. We aimed to assess the effectiveness of video-assisted teaching to improve the knowledge of road traffic rules among college students and the factors associated with the difference in knowledge.

Methods: We conducted pre-test post-test study among students from a Government Arts and Science college in Puducherry, South India from August to September 2019. We assessed the knowledge related to road traffic rules like road traffic signs, speed limits and penalties related to violation of traffic rules. A video-assisted health education session was provided to all, and change in knowledge assessed. Factors associated with the difference in scores were assessed using an independent t-test or ANOVA test.

Results: A total of 355 college students were included in the study. Of them, 2 (0.56%) had adequate knowledge, 317 (89.3%) had moderate knowledge and 36 (10.14%) had inadequate knowledge regarding traffic rules in the pre-test. During post-test, 47 (13.24%) had moderate knowledge and 308 (86.7%) had adequate knowledge. Overall mean (SD) knowledge score was increased from 14.7 (2.8) to 23.6 (2.5) (p<0.001). Sociodemographic factors were not significantly associated with a change in knowledge scores.

Conclusions: There was a significant difference in knowledge scores of students after the intervention. Continuous reinforcement and education about safety measures can motivate and bring a positive change among them in strictly following traffic rules.

Keywords: Effectiveness, Knowledge, Video-assisted teaching, Road traffic rules, College students

INTRODUCTION

Road traffic accidents (RTA) are defined as "any occurrence that arises on a way or road open to public traffic causing in one or more persons being wounded or killed, where at least one moving means of transportation is involved" according to the World health organisation (WHO) deaths related to road traffic accidents were estimated at 1.25 million globally. This translates to one person being killed every 25 seconds due to road

accidents. RTA accidents are the most important cause of death among people aged between 15 and 29 years.² In India, every day one person dies every six minutes due to road accidents. By 2020 the rate is expected to be greater than one person every three minutes. Tamil Nadu accounts for 14.5% of total road accidents in the country.³ The united nations general assembly declared 2011-2020 as the Decade of Action for Road safety intending to stabilize and reduce the increasing trend that suggests injuries due to road traffic accidents.⁴ The trends related to injuries and deaths concerning road traffic accidents

are becoming alarming in nations like India. The number of mortalities and ill-health related road accidents is growing progressively and is considered to be an existent public health issue.⁵

Factors related to human, vehicle, and the environment are considered to play an important role before, during, and after the occurrence of any traumatic episode related to road accidents.6 These include conditions of the road, poor knowledge regarding traffic rules, speed of the vehicle, number of people traveling, type of automobile, age of the person who is driving.7 Thus RTA has appeared as an essential public health problem which is to be attempted utilizing multidisciplinary actions. As youngsters are more susceptible, due to their emotional and biological makeup, it is important to generate attentiveness and increase their knowledge related to traffic rules. Education regarding road safety rules aims to enlighten the knowledge and understanding of traffic rules and regulations. It also helps to reinforce the youngsters regarding risk alertness and personal safety.

As more and more women drive in today's society, it is essential to make them known to prevent themselves from road traffic accidents. This in turn would increase awareness among the general public concerning road safety measures. The present study aims to improve the knowledge of college students related to road traffic rules and compare their pre-test and post-test knowledge scores after giving the video-assisted teaching.

METHODS

We conducted a quasi-experimental study among college students using simple random sampling in a selected government arts and science college during August and September 2019 in Puducherry, South India. The study protocol was reviewed and approved by the Institute Ethical Committee of Jawaharlal Institute of Postgraduate Medical Education and Research, Puducherry.

We included female college students studying in sixteen departments in Arts and Science College. Assuming a 10% increase in knowledge due to intervention from the base knowledge of 60%, with80% power and 95% confidence interval the calculated sample size for the study was 355. Information on age, education, residence, mode of transport, valid driving license, insurance of the vehicle, use of helmet, previous exposure to road safety measures and driving experience, and knowledge related to traffic signs, speed limit, and penalties were collected through a questionnaire. The study tool was validated by experts of the Nursing Department, Preventive and Social Medicine Department, and a Motor Vehicle inspector. The suggestions given by a team of experts were incorporated.

The data was collected after getting consent from the students. The classroom environment was conducive and adequate distance was maintained between the students.

The students were instructed not to discuss the questions and the pre-test was given over 30 minutes. The investigator explained the importance of road safety followed by was displayed to the students along with explanations related to rules and regulations of road safety. All doubts regarding were cleared during the sessions. The entire health education session lasted for 40 minutes. Post-test was conducted after one week over 30 minutes and the knowledge measured. Data from paperbased proforma were entered into Microsoft excel sheet and analyzed using Stata version 14. The categorical variables were summarized as percentages. The change in total knowledge scores before and after the intervention was assessed by using the Mc-Nemars test. The association of social demographic factors with the difference in score was assessed using an independent t-test or ANOVA test. A p-value of less than 0.05 was considered statistically significant.

RESULTS

A total of 426 students were eligible, of which 355 were chosen by simple random sampling. Socio demographic variables of the participants are shown in (Table 1). Majority (83%) of the study participants were under 20 years of age. The representation of students was slightly higher from urban areas (59%).

Table 1: Distribution of socio-demographic details among college students, Puducherry (n=355).

Variable	Frequency	Percentage
Age (in years)		
18	143	40.3
19	151	42.5
20	50	14.1
21 and above	11	3.2
Stream opted		
BA Economics	58	16.3
BA English	52	14.6
BSc Psychology	44	12.4
BA Zoology	35	9.9
BSc Botany	32	9.0
BSc Mathematics	31	8.7
B Com	24	6.8
BA Sociology	23	6.5
BA Tamil	23	6.5
BSc Physics	17	4.8
BA Commerce	16	4.5
Residence		
Urban	210	59.2
Rural	145	40.8

Table 2 shows the details of the study participants related to the daily commute and driving experience. Nearly three-fourths of the participants used buses for transportation and recorded no previous exposure to any

educational materials on the topic of traffic rules or driving. Although only around 40% of participants reported owning either a learner's or permanent driving license, over 50% reported having driven vehicles for any duration of time.

Table 2: Distribution of details related to transport among college students, Puducherry (n=355).

Variable	Frequency	Percentage			
Mode of transport					
Bus	261	73.5			
Two-wheeler	55	15.5			
Others	39	11.0			
Status of driving lic	ense				
Does not have a license	215	60.6			
Owns a license	82	23.1			
Owns a learner's license	58	16.3			
Previous exposure to classes on traffic rules					
Present	93	26.2			
Absent	262	73.8			
Driving experience					
None	166	46.8			
Less than a year	108	30.4			
One year or more	81	22.8			

The practices related to road safety among those who regularly used two-wheelers are shown in (Table 3). Among those who commuted by two-wheelers, around 40% did not own a license, 50% did not use helmets and

60% did not own updated insurance papers for the vehicle.

Pre-test and post-test knowledge scores are summarized in Table 4. During the pre-test 0.56% of students had adequate knowledge, 89.3% had moderate knowledge and 36% had inadequate knowledge. After the intervention, 86.8% had adequate knowledge, 13.2% moderate knowledge, and none of them had inadequate knowledge. The overall mean (SD) knowledge score on the pre-test was 14.7 (2.8) and increased significantly (p<0.001) to 23.6 (2.5) after the intervention. There was no significant association for the difference in knowledge scores with socio-demographic variables (Table 5).

Table 3: Practices related to road safety among those who travel by two-wheelers among college students, Puducherry (n=55).

Variable	Frequency	Percentage	
Use of Helmet			
Yes	28	50.9	
No	27	49.1	
Insurance for vehicle			
Yes	22	40.0	
No	33	60.0	
Owns a license			
Yes	33	60.0	
No	22	40.0	

Table 4: Comparison of pre-test and post-test knowledge of the study populationamong college students, Puducherry (n=355).

	Yes		-
Question	Pre-test N (%)	Post-test N (%)	P value
Knowledge regarding overtake a vehicle in front	120 (33.8)	298 (83.9)	< 0.001
The minimum penalty for violation of traffic rules and regulation	149 (42.0)	330 (93.0)	< 0.001
Vehicle preceding from opposite direction should be allowed to pass	203 (57.2)	290 (81.7)	< 0.001
Places to park the vehicle	264 (74.4)	316 (89.0)	< 0.001
The maximum penalty for driving a vehicle without holding a license	104 (29.3)	274 (77.2)	< 0.001
The minimum age for getting a license to drive motorcycle without gear	36 (10.1)	180 (50.7)	< 0.001
The lane to use on expressway	90 (25.3)	146 (41.1)	< 0.001
The cross roads sign	170 (47.9)	279 (78.5)	< 0.001
The sound horn compulsory sign	222 (62.5)	310 (87.3)	< 0.001
The sign to pass the vehicle coming from the left	48 (13.5)	104 (29.3)	< 0.001
The minimum distance to be kept from the vehicle in front	184 (51.8)	270 (76.1)	< 0.001
The indication of yellow light at an intersection	124 (34.9)	215 (60.6)	< 0.001
What to do when a vehicle involved in an accident causing injury to any person	318 (89.6)	346 (97.5)	< 0.001
How to pedestrians should walk on the road without footpath	174 (49.0)	264 (74.4)	< 0.001
The one-way sign	138 (38.9)	296 (83.4)	< 0.001
The penalty for drink and drive cases	92 (25.9)	279 (78.6)	< 0.001
The U-turn prohibited sign	252 (71.0)	319 (89.9)	< 0.001
The give way sign	168 (47.3)	329 (92.7)	< 0.001

Continued.

	Yes		D
Question	Pre-test N (%)	Post-test N (%)	P value
The maximum permissible speed of a two-wheeler near an educational institution	191 (53.8)	315 (88.7)	< 0.001
The penalty for dangerous driving	126 (35.5)	189 (53.2)	< 0.001
The overtaking prohibited sign	272 (76.6)	324 (91.2)	< 0.001
The possibility of cattle on road sign	296 (83.3)	331 (93.2)	< 0.001
The pedestrian crossing sign	318 (89.5)	350 (98.6)	< 0.001
The broken white lines marked on the road	118 (33.2)	185 (52.1)	< 0.001
The narrow road ahead sign	170 (47.9)	260 (73.2)	< 0.001
The hospital sign	258 (72.7)	340 (95.8)	< 0.001
The maximum permissible speed of a motorcycle	207 (58.3)	298 (83.9)	< 0.001
The sign to stop the vehicle coming from the front	313 (88.2)	331 (93.2)	0.002
The compulsory turn left sign	65 (18.3)	225 (63.4)	< 0.001
The penalty for not giving passage to emergency vehicles	81 (22.8)	301 (84.8)	< 0.001
Total Score, mean (SD)	14.7 (2.8)	23.6 (2.5)	< 0.001

 $Table \ 5: Association \ of \ various \ variables \ with \ knowledge \ among \ college \ students, \ Puducherry \ (n=355).$

Variable	Mean (SD)	P value
Age (in years)		
18	8.4 (3.2)	
19	9 (2.8)	0.06
20 and above	8 (2.9)	
Stream opted		
BA Economics	8.4 (2.7)	
BA English	8.3 (3)	
BSc Psychology	8 (3)	
BA Zoology	9.5 (3)	
BSc Botany	8.8 (2.4)	
BSc Mathematics	8.7 (3)	0.07
B Com	9 (3)	0.07
BA Sociology	10.8 (2.6)	
BA Tamil	8 (2.1)	
BSc Physics	7.5 (4.6)	
BA Commerce	8 (2.8)	
Residence		
Urban	8.6 (3.1)	0.78
Rural	8.5 (2.9)	0.78
Mode of transport		
Bus	8.7 (2.8)	
Two-wheeler	8 (3.7)	0.68
Others	8.6 (3.2)	
Driving license		
No license	8.6 (3.1)	
Learner's license	8.3 (2.8)	0.68
Permanent license	8.6 (2.7)	
Insurance		
Yes	8.5 (2.9)	0.46
No	7.7 (4.1)	0.40
Use of helmet		
Yes	9 (2.9)	0.05
No	7.1 (4.1)	0.03
Previous exposure		
Yes	8.8 (2.8)	0.40
No	8.5 (3)	U. + U

Continued.

Variable	Mean (SD)	P value
Driving license		
None	8.6 (2.9)	
Less than a year	8.6 (3.4)	- 0.80
One to two years	8.2 (2.4)	
More than two years	8.4 (2.8)	

DISCUSSION

The present study has been undertaken to assess the effectiveness of video-assisted teaching regarding road traffic rules among college students, Puducherry. Data was collected from 355 college students between the age group of 18 to 23 years old. The baseline knowledge about road traffic rules revealed that 2% had adequate during pre-test and 86.7% had adequate knowledge in the post-test after video-assisted teaching regarding traffic rules. The overall mean score also increased significantly. This difference in the knowledge could be due to our respondents had moderate knowledge regarding road safety in the pre-test and due video-assisted teaching.

The present study was supported by the study conducted by Sujatha et al on the effectiveness of structured teaching program on road safety among 60 adolescent boys age between 13-18 years in a higher secondary school in Vellore which revealed that the overall mean score of knowledge regarding road traffic rules was increased by 7% similar to our study where the mean was increased by 9%. This difference in mean score may be due to a better understanding of older adolescents.8 A similar difference in the mean score of knowledge was found in another one group quasi-experimental study conducted to evaluate the effectiveness of video-assisted teaching on road safety measures among 120 students in Haryana, where the mean score knowledge was increased by 12.6% similar to the present study. This increase in knowledge may be due to video teaching regarding road rules.9

The current study findings are supported by the study conducted on the effectiveness of structured teaching program regarding prevention of accidents among school students between 13-18 years which showed that only 1.61% were having adequate knowledge related to traffic rules and the knowledge was increased to 98.8% after the intervention similar to our study, 0.56% had adequate knowledge during pre-test and was increased to 87% after video teaching.¹⁰

In contrast to our study, a quasi-experimental study was conducted on the effectiveness of road safety education, which revealed that the increase in the mean score knowledge was 38% when compared with the present study. This difference in knowledge could be due to a better experience of drivers compared to our study participants.¹¹

The current study findings are supported by a cross-sectional study on an educational intervention to improve awareness about road safety conducted among 159 school children in Indore. The pre-test and post-test knowledge revealed that about U-turn prohibition, the knowledge was increased by 11% similar to present study result of 18%, concerning one-way sign, it was increased by 22.6% similar to our study result of 23.2% and about horn blow compulsory sign it was increased by 22.7% which showed a similar result to our study result of 24.8%. 12

In contrast to our study, a quasi-experimental study was done on the effect of implementing traffic safety program on driver's knowledge regarding traffic safety practices in Egypt among 40 drivers 2018, revealed that concerning pedestrian crossing, 60% were aware whereas in our study 89.5% were aware, similarly regarding the narrow road ahead sign only 10% were aware but, in our study,, it was 48%. This difference may be due to video teaching being more effective when compared to other interventions. ¹³

The strengths of the current study are that the sample size was adequate and there was no attrition among participants. A limitation was that the sample captures only women.

CONCLUSION

There was a significant difference in knowledge scores of students after the intervention. Continuous reinforcement and educating them about safety measures can motivate and bring a positive change among them in strictly follow the norms of traffic.

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Ethical approval: The study was approved by the

Institutional Ethics Committee

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