



## Using a Self-Instructional Module to Improve Secondary School Students' Knowledge of Road Traffic Accident Prevention in West Bengal, India

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### Abstract

A pre experimental study was conducted to create knowledge among secondary school children regarding prevention of road traffic accidents by administration of self instructional module (SIM). The study's goals were to compare participants' knowledge of traffic accident prevention before and after a self-educational module were administered. A pre experimental one group pre-test- post-test design with non probability purposive sampling technique was adopted to select 60 school children of class VIII & IX. Semi-structured questionnaire for demographic data & structured knowledge questionnaire on prevention of road traffic accidents were used. The study revealed that the mean post test knowledge score (25.81) was significantly higher than the mean pre test knowledge score (13.47) where 't' value showed the result 33.97 which is statistically significant at 0.05 level of significance df (59). The highest mean percentage of post test score is 93.80 that is in the area of steps to prevention of road traffic accidents where mean percentage of pre test score is 47.85. The lowest mean percentage of post test score is 86.66 that is in the area of mode of transport where mean percentage of pre test score is 56.66. Age and class were shown to be important factors in the pre-test knowledge score. In the context of nursing education, administration, practice and research, the study's results have a wide range of implications.

**Keywords:** Knowledge, Demographic, Road traffic accident

### Introduction

The rapid and unplanned urbanization has resulted in an unexpected development of motor vehicles worldwide & it is a global public health problem. The globally alarming increase in morbidity and mortality to road traffic accidents over the past few decades is a great matter. Road traffic accidents (RTA) are a pandemic health difficulty (Gopalakrishnan, 2012). RTA has been rated ninth by 2004 and is expected to be the fifth biggest cause of mortality by 2030. RTA kills more than 3000 people a day throughout the globe, more than 1.3 million people die a year and more than half of these people are not travelling in car. It is significant burden in low and middle-income countries, account for 90 percent deaths which less than half the world's register deaths and 2 to 5 crore non fatal road traffic injuries . Road traffic accidents are a danger effect in human life. They are physically suffering and socio-economic costs effect in terms of premature deaths, injuries, loss of productivity, and so on.1 Road traffic injuries are the leading cause of death among young people aged 15-29 years and wealthiest countries 1-3% of the gross domestic product (GDP) (Hugar, 2020; WHO 2009).

According to data from the National Crime Records Bureau (NCRB), a total of 4,03,116 road accident cases were reported in 2021, up from 3,54,796 in 2020. Meanwhile, fatalities in road accidents have increased by 16.8% -- from 1,33,201 in 2020 to 1,55,622 in 2021. A total of 3,71,884 people were injured in road accidents last year. The rate of deaths per thousand vehicles in 2021 has also increased from 0.45 in 2020 to 0.53 in 2021. Uttar Pradesh recorded the highest number of road crash deaths (14% of total deaths in 2021) followed by Tamil Nadu (9.88%) and Maharashtra (8.94%). (TIMESOFINDIA.COM. 2022)

According to one research, 83 percent of pre-test respondents had insufficient awareness of traffic laws and regulations, while just 17 percent had somewhat acceptable information. Out of 100 samples, 99 percent of youngsters had sufficient understanding and one percent had intermediate knowledge of road traffic laws and regulations after an organized education programme. Educators, community members, and school children all benefited from the well-thought-out curriculum designed to help students learn how to avoid car accidents. (Chockalingam, 2021)

As the number of vehicles on the road grows, so does the country's economic and demographic growth. There has been a rise in road accidents as a result of the rapid development in motorization and the expansion of the road network. There has been a rise in hospitalizations, fatalities, disability, and socio-economic losses among the young and middle-aged Indian population as a result of traffic accidents according to the World Health Organization (WHO). (Hugar, 2020) Injuries resulting from automobile collisions are also a factor. Pre hospital and acute treatment and rehabilitation for road traffic accidents place a heavy cost on the health care system.

### **Ethical Consideration**

This research work is approved by the Institution of ethical committee of Medical College and Hospital, Kolkata. vide letter number MC/KOL/IEC/NON-SPON/290/02-2016 date 12/03/2016. This study was also approved Medical Education & Ex officio Secretary Govt. of WB Swasthya Bhavan, Salt Lake, KOL-41 vide letter number HCN/CON/MCH/843 date 1/09/2016. This study was also approved Director of Health Services & Ex officio Secretary vide letter number HCN/CON/MCH/842 date 1/09/2016, Joint Director of Health Services (Nursing) vide letter number HCN/CON/MCH/841 date 1/09/2016, Director of Health Services vide letter number HNG/IOP-3-2016/107 date 27.01.2017, Letter granting permission to conduct the pilot study from Head Master Prafulla Kanan Desopriya Vidyamandir Kolkata vide letter number HCN/CON/MCH/846 dated 1/09/2016 &

Letter granting permission to conduct the final study from Head Master Govt. Spons. Multipurpose School (Boys), Taki House, 299/B, A.P.C. Road, Kolkata vide letter number HCN/CON/MCH/845 date 1/09/2016. This study was also approved the principal, College of nursing, Medical college and Hospital, Kolkata on 1/09/2016.

### **Material & Method**

As part of this research, a pre-experimental technique was used in order to determine whether or not the Self-Instructional Module (SIM) had an impact on secondary school students' awareness of road traffic safety measures. Under Pre- experimental approach one group pre test post test design is adopted. Conceptual framework based on Ludwig Von Bertalanffy's System Model. Populations for the present study were comprised of all secondary school students, W.B. Sample consisted of 60 students of class VIII & IX. The sample was chosen using a non-probability, purposive sampling approach. Semi-structured questionnaire for demographic data & structured Knowledge questionnaire on prevention of road traffic accidents. The effectiveness of self instructional module was determined by using paired t- test on knowledge regarding prevention of road traffic accidents, and chi square is computed to find out the association between pre test knowledge score and selected demographic variables.

## Results

**Table 1: Frequency and percentage distribution of demographic variables: Age in year, class, distance from home to school, mode of transport, educational status of parents, type of family, family monthly income& Source of information of secondary school children.**

Demographic Variables	Frequency (f)	Frequency Percentage (f %)
Age In year: 13-14yrs	50	83.33
15-16yrs	10	16.67
Class: Class-viii	32	53.33
Class-ix	18	46.67
Distance from home to school 1-3km	34	56.67
4-6km	11	18.33
7-9km	3	5
9 & above km	12	20
Mode of transport By walking	11	18.34
By bus	35	58.33
By train	14	23.33
Educational status of parents: Father-----Mother	Father----Mother	Father-----Mother
Middle level	8----- 8	13.33      13.33
Secondary	11----- 11	18.33      18.33
Higher secondary	13----- 19	21.67      31.67
Graduate & above	28----- 22	46.67      36.67
Type of family: Nuclear family	34	56.67
Joint family	26	43.33
Family monthly income: Up to Rs<15,000	25	41.67
Rs<30,000	22	36.66
Rs<45,000	13	21.67
Source of information: Parents	6	10
Internet	20	33.33
Newspaper	20	33.33
T.V.	14	23.33

**Table 2: Comparison of pre test & post test knowledge scores with Mean, median, standard deviation (n=60)**

Knowledge	Mean	Median	Standard Deviation
Pre- test	13.47	13	2.29
Post test	25.81	26	1.45

This is seen in table 2 as a higher mean post-test knowledge score (25.81) compared to the mean pre-test knowledge score (13.47). There is a greater difference between the median post-test knowledge score (26) and the median pre-test knowledge score (13). The SD post test knowledge score is 1.45 and the SD pre test knowledge score is 2.29 which show the pre test knowledge score seem to be more dispersed than those of the post test knowledge score.

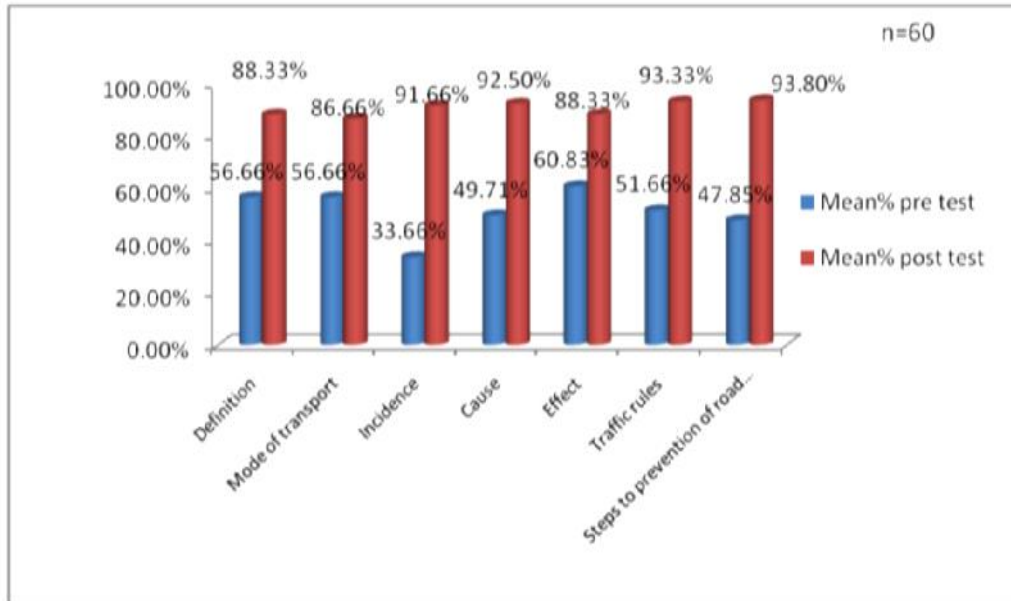


Figure 1: Cylindrical bar diagram showing area wise distribution of mean percentage pre test and post test Knowledge scores.

A greater mean post-test score than a lower mean pre-test score is seen in Figure 1. The highest mean percentage of post test score is 93.80 that is in the area of steps to prevention of road traffic accidents where mean percentage of pre test score is 47.85. The lowest mean percentage of post test score is 86.66 that is in the area of mode of transport where mean percentage of pre test score is 56.66. Therefore these indicate that after the self instructional module the knowledge score is increased in all areas regarding prevention of road traffic accidents.

**Table 3: Mean, median, S<sub>E</sub>MD, standard deviation (SD) and 't' value of Pre-test and post test knowledge score of class VIII and IX secondary school children regarding prevention of road traffic accidents. (n=60)**

Self instructional module	Mean	Mean difference	S <sub>E</sub> MD	SD <sub>D</sub>	't' value
Pre test	13.47	12.34	0.36	2.81	33.97*
Post test	25.81				

Table 3 shows that the mean post test knowledge score 25.81 which is increased the mean pre test knowledge score 13.47 with mean difference of (12.34) which is a true difference not by chance. The pre-test knowledge score is more distributed than the post-test knowledge score, as seen by the SD pre-test knowledge score of 2.81 and the post-test knowledge score of 1.45. SE<sub>MD</sub> 0.36, 't' value showed the result 33.97 which is statistically significant at df (59) at 0.05 level of significance. As a result, the research hypothesis is accepted and the null hypothesis is rejected. Therefore, it can be concluded that the self-instructional module improves secondary school students' post-test knowledge scores regarding the avoidance of traffic accidents.

**Table 4: The correlation between students' pre-test knowledge of road traffic accident prevention and their age in high school (n=60)**

Variable	Pre test knowledge score		χ <sup>2</sup> value
	At and above median	Below Median	
Age in years			
13-14 years	21	29	3.87*
15-16 years	7	3	

df 1= 3.84 p< 0.05 level of significance

The Table 4 consists of data related to demographic factors of secondary school children regarding age in year. Chi square is computed above the demographic factor with pre test knowledge score. Statistical significant association is seen with pre test knowledge with age in year (3.87 at df 1) at 0.05 level of significance. So it is evident that the pre test knowledge is influenced of secondary school children by age in year.

**Table 5: Class of secondary school students' pre-test knowledge of traffic accident prevention and their final exam result (n=60)**

Variable	Pre test knowledge score		χ <sup>2</sup> value
	At& Above median	Below median	
Class			
IX	20	12	6.90*
VIII	8	20	

df 1= 3.84 p< 0.05 level of significance

Data shows in tables 5 that among 32 secondary school children who are reading in class IX 20 score at and above median and 12 score bellow median. Whereas among 28 secondary school children who are reading in class VIII 8 score at and above median and 20 score bellow median. Chi-square value is computed. Table value (3.84) is lower than the obtained value (6.90) at degree of freedom 1. Chi-square is significant at 0.05 levels it is evident that there is association between class and pre test knowledge score of secondary school children regarding prevention of road traffic accidents.

## Discussion

The findings of the present study were based on the objectives of the present study a discussion is held.

### Study related to knowledge and effect of self instructional module among secondary school children regarding prevention of road traffic accidents.

Additionally, the results of this research show that secondary school students had a lack of information about how to avoid road traffic accidents, and that a self-instructional module was successful in boosting their knowledge. Mean pretest knowledge score is 13.47 and median pretest knowledge score is 13. After providing the self instructional module mean post test knowledge score become 25.81 and median pretest knowledge score is 26. The standard deviation of pre and posttest were 2.29, 1.45 respectively. That the indicate mean difference 12.34 with 't' value 33.97 at df (59) is greater than table value of 2.00 at p<0.05 level of significance. The learning package is effective in increasing knowledge among secondary school children regarding prevention of road traffic accidents.

According to the results of the research, adolescents had average pretest knowledge score of 19.840 before STP was implemented. Knowledge scores was 35. 25 respectively, after the STP (Rasshid, 2017).

Sujatha and Muthumari conducted an experimental study to assess the knowledge among adolescence. Sample size was 60 & use of data collection technique - probability randomized sampling. The present study was supported by this study by Post-test mean knowledge score was higher (16.08) than pretest mean knowledge score was (10) & 't' value was 18.96 which statistically significant after giving intervention (Sujatha & Muthumari, 2019).

## Conclusion

The present study concluded that secondary school students are the vulnerable group of population among adolescents. They are interested in gaining knowledge on prevention of Road Traffic accidents, which may helpful in reduce incidence of RTA. The overall knowledge of road traffic safety

measures in the study participants need to continuous reinforcement and reminding can bring the positive changes among students.

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