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A Study to Assess the Effectiveness of Structured Education Programme on Knowledge regarding the Prevention of Road Traffic Accidents among Adolescents in the Selected School of Moradabad

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Abstract: ***Road traffic accidents (RTAs) are one of the leading causes of injury, disability, and death among adolescents worldwide. Adolescents are more vulnerable to road traffic accidents due to increasing independence, inadequate knowledge of road safety measures, risk-taking behaviour, distraction while using mobile phones, non-compliance with traffic rules, and improper use of protective equipment such as helmets and seat belts. In India, the growing number of vehicles, heavy traffic, and lack of awareness regarding road safety have further increased the burden of road traffic accidents. Many of these accidents can be prevented through timely education and the adoption of safe road practices. Schools provide an ideal environment for educating adolescents, as health education delivered during this stage can influence lifelong attitudes and behaviours. Therefore, improving knowledge regarding the prevention of road traffic accidents among school adolescents is an important step towards reducing avoidable injuries and promoting community safety.***

Keywords: Road Traffic Accident, Audiovisual aids, World Health Organisation, Structured Teaching Program.

1. Introduction

Background of the Study

"Obey traffic police; follow traffic rules to avoid accidents."

Road traffic accidents (RTAs) are a major public health concern worldwide, contributing to significant morbidity and mortality. Road traffic crashes result in the deaths of approximately 1.19 million people around the world each year and leave between 20 and 50 million people with non-fatal injuries. More than half of all road traffic deaths occur among vulnerable road users, such as pedestrians, cyclists and motorcyclists.

Road traffic injuries are the leading cause of death for children and young adults aged 5–29. Yet two-thirds of road traffic fatalities occur among people of working age (18–59 years). Adolescents, in particular, are at high risk due to factors such as lack of awareness, risk-taking behaviour, and non-compliance with road safety rules. Nine in 10 fatalities on the roads occur in low- and middle-income countries, even though these countries have around 60% of the world's vehicles.

Need for the study

An accident has been defined as an unexpected, unplanned occurrence which may involve injury. Accidents represent a major epidemic of noncommunicable diseases in the present era. Industrialization and urbanization have enormously increased the number of vehicles on the roads. Road traffic continues to be a major developmental issue and a public health concern. Road accidents are multicausal and are often the result of various factors such as human error, road environment, and vehicle condition. They involve high human suffering and monetary costs in terms of deaths, injuries, loss of potential income. Prevention of road traffic accidents is very crucial to creating awareness and taking proper measures toward road safety.

Road accidents are one of the leading causes of death globally and mainly occur in the age group of 15 to 49 years. During the calendar year 2022, road crashes in India claimed about 1.68 lakh lives and caused injuries to more than 4.4 lakh people. Road accidents are the result of the interplay of multiple factors, and multipronged measures are needed to reduce the number of accidents and fatalities. The number of road accidents in 2022 increased by 11.9 per cent compared to the previous year 2021.

Objectives

1) To assess the pre-intervention level of knowledge regarding the prevention of road traffic accidents among adolescents in the selected school.
2) To develop and implement a structured education program on road traffic accident prevention.
3) To evaluate the effectiveness of the structured education program by comparing pre-and post-intervention knowledge scores.
4) To determine the association between pre-intervention knowledge levels and selected demographic variables of the adolescents.

Hypothesis

H_1: There has been a significant improvement in the knowledge regarding the prevention of road traffic accidents

among adolescents since the implementation of the structured education program.

H_2: There is a significant association between the pre-intervention knowledge level of adolescents and their selected demographic variables (e.g., age, gender, educational background, previous exposure to road safety education).

H_3: The structured education program significantly enhances the awareness of adolescents regarding specific aspects of road safety, such as traffic rules, pedestrian safety, and accident prevention measures.

2. Research Methodology

The research design adopted for the present study was Quasi-experimental (one-group pre-test-post-test) design.

Research Approach
Quantitative research is the approach which is dealing with numbers and anything that is measurable in a systematic way of investigation of phenomena and their relationship.

Research Design
The research design adopted for the present study was Quasi-experimental (one-group pre-test-post-test) design.

Variables under study
- **Independent Variable:** It is a presumed cause/stimulus or activity that is manipulated by the researcher to create and see the effect on the dependent variables.
  In this study independent variable refers to the structured teaching programmed regarding prevention of road traffic accidents among the adolescents of Moradabad.
- **Dependent Variable:** It is a presumed effect of the independent variable in which the researcher wants to predict or explain.
  In this study, the effect of structured teaching programme (independent variable) on prevention of road traffic accidents (dependent variable) among the adolescents of Moradabad.
- **Demographic Variables:** The demographic variables include age of samples (in years), Gender, Education of the participants, residence, religion, occupation of parents, & family type.

Setting of the Study
In the present, the study was conducted in the selected schools of Moradabad. The selection of the study setting was done on the basis of feasibility and availability of sample.

Population
The population for this study consisted of adolescents of selected schools of Moradabad.

Sampling

Sample Size:
The sample size for this study consists of 60 adolescents students.

Sampling Technique:
Sampling is the process of selecting representative units (e.g., people, organization) from an entire population of a study of the population.

In this study, stratified random sampling technique was used to select the sample from the different grades/classes.

Criteria for Selecting the Sample

The following criteria were set for selection of sample.

Inclusion Criteria
- Adolescents aged 13–19 years.
- Students willing to participate in the study.
- Students are available during data collection.

Exclusion Criteria
- Students who had already attended any formal training on road safety.
- Students with any cognitive impairment affecting their ability to comprehend the educational program.

Selection and Development of the Tool
A tool is a written device that researcher uses to collect the data. T tool selected in the research should be as far as possible the vehicle which would be the best of up telling the data to draw conclusion pertaining to the study.

Description of the Final Tool
In this study the investigator used 2 tools.
Part A: Demographic data consists of 10 questions
Part B: Knowledge items consists of 30 questions

Reliability of the Tool
To ensure reliability, test-retest method was used. The structured questionnaire was tested among 6 adolescent students who were not included in main study.

After 5 days, same tool was administered without any manipulation to the same adolescent students. The relative score position of the subjects was almost the same. The co-efficient of correlation was found 0.85 which indicated high degree of reliability of the questionnaire.

Pilot Study:
After taking administrative approval on 14/10/2025, pilot study was conducted in selected schools of Moradabad from 14/10/2025 to 20/10/2025. 10% of total sample size would be taken for pilot study. After obtaining informed consent the tool was administering to the adolescents who fulfilling the inclusion criteria.

The study results shows that in pre-test, majority of adolescents 03(50%) had inadequate knowledge, 02(34%) had moderate knowledge and 01(16%) had adequate knowledge regarding prevention of road traffic accidents. In post-test majority of the adolescents students 04(84%) had adequate and moderate knowledge whereas 01(16%) had moderate knowledge regarding prevention of road traffic accidents.

Method of Data Collection

- The study was conducted in selected school of Moradabad.
- The period of data collection was 25/11/2025 to 02/12/2025.
- Prior to data collection, permission was obtained from concerned authorities.
- Adolescents who fulfilled the criteria was selected as the sample. The researcher introduced herself to the participants and established rapport with them.
- The purpose of the study was explained to the participants.
- The researcher assured that the participants for the confidentiality of their responses.
- Oral consent was obtained from each participants of the study before the data collection.
- The pre-test was conducted with the help of questionnaire.
- Structured teaching intervention on prevention of road traffic accidents was conducted for adolescents. All the adolescents took active participation in data collection.
- The post-test was conducted with the same questionnaire.

At the end of successful data collection, the researcher conveyed thanks to participants.

Plan for Data Analysis

Based on the objectives data analysis will be done using descriptive and inferential Statistics.

- **Descriptive statistics**: frequency, percentage, mean, and standard deviation will be used to describe the knowledge, attitude and socio-demographic variables.
- **Inferential statistics**: A paired T-test will be used to assess the effectiveness of the program. The chi-square test will be used to find the association of knowledge of adolescents on the prevention of road traffic accidents with their demographic variables.

3. Result

These results were computed using descriptive and inferential statistics based on the objectives of the study as given below:

1) To assess the pre-intervention level of knowledge regarding the prevention of road traffic accidents among adolescents in the selected school.
2) To develop and implement a structured education program on road traffic accident prevention.
3) To evaluate the effectiveness of the structured education program by comparing pre-and post-intervention knowledge scores.
4) To determine the association between pre-intervention knowledge levels and selected demographic variables of the adolescents.

Hhypotheses

H_1: There has been a significant improvement in the knowledge regarding the prevention of road traffic accidents among adolescents since the implementation of the structured education program.

H_2: There was significant association between the pre-intervention knowledge level of adolescents and their selected demographic variables.

H_3: The structured education program significantly enhances the awareness of adolescents regarding specific aspects of road safety, such as traffic rules, pedestrian safety and accident prevention measures.

4. Presentation of the data analysis

The data was entered in a master sheet for tabulation and statistical processing. In order to find the relationship, the data was tabulated, analyzed and interpreted using descriptive and inferential statistical methods. The data was analyzed and inferences were drawn. The level of significance chosen was at $p \leq 0.05$.

Section- B: Analysis based on the objectives

Objective 1: To assess the pre-intervention level of knowledge regarding the prevention of road traffic accidents among adolescents in the selected school.

Table 2: Frequency & percentage distribution of pre-intervention & post-intervention level of knowledge regarding prevention of road traffic accident, N=60

Level of Knowledge	Scores	Pre- test		Post- test	
		Frequency	%	Frequency	%
Poor knowledge	0-7	32	53.3	00	00
Moderate knowledge	8-14	18	30	22	36.7
Good knowledge	15-20	10	16.7	38	63.3

Maximum score=20

Table no. 2 shows frequency & percentage distribution of pre-intervention & post-intervention level of knowledge regarding prevention of road traffic accidents among adolescents & it depicts that in pre-intervention score majority of adolescents 32(53.3%) had poor knowledge and 18(30%) had moderate level of knowledge regarding prevention of road traffic accidents. In post-intervention score, most of the adolescents 38(63.3%) had good knowledge and 22(36.7%) had moderate level of knowledge regarding prevention of road traffic accidents.

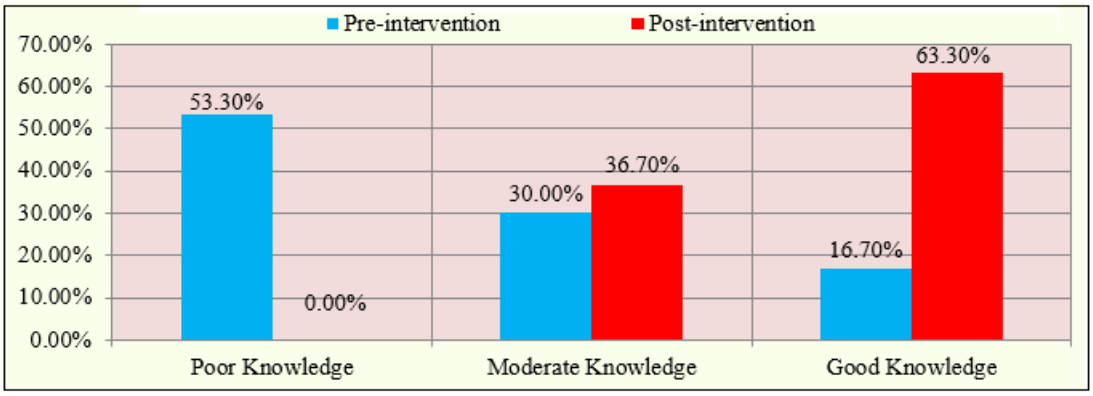


Figure 15: Rectangular diagram showing the percentage distribution of pre and post interventional level of knowledge regarding prevention of road traffic accident among adolescents

Objective 3: To evaluate the effectiveness of the structured education program by comparing pre and post-intervention knowledge scores

H_1: There has been a significant improvement in the knowledge regarding the prevention of road traffic accidents among adolescents since the implementation of the structured education program.

Table 3: Comparison of mean and SD of pre and post-intervention knowledge score of adolescents regarding prevention of road traffic accidents, N=60

Level of Knowledge	Mean	SD	df	Paired 't' value	p-value
Pre-intervention	8.03	3.565	59	17.641	0.0001
Post intervention	15.13	2.528			

Dependent t- test
t_{59}= 1.984 at p<0.05 level of significance, *significant

Table no. 3 shows comparison of pre and post-interventional knowledge score of adolescents regarding the prevention of road traffic accidents & it depicts that the mean knowledge score and SD was 8.03 ± 3.565 in pre-test whereas 15.13 ± 2.528 in post-test.

Dependent 't'-test was performed to compare the knowledge score within pre-intervention and post-intervention. The obtained t & p value was t = 17.641, p =0.0001. The t-test revealed that there was significant difference within pre intervention and post-intervention scores. Hence the research hypothesis was accepted and null hypothesis was rejected.

Objective 4: To determine the association between pre-intervention knowledge levels and selected demographic variables of the adolescents.

H_2- There would be significant association between the pre-intervention knowledge level of adolescents and their selected demographic variables.

Table 4: Association between pre-intervention level of knowledge of adolescents regarding prevention of road traffic accidents with their selected demographic variables, N= 60

S. No	Demographic variables	Level of knowledge			Chi-square	df	p-value
		Good	Moderate	Poor			
1	**Age**						
	a) 12-13 years	5	12	13	6.756	4	0.15
	b) 14-15 years	2	3	15			
	c) 16-17 years	3	3	4			
	d) 18-19 years	0	0	0			
2	**Gender**						
	a) Male	2	6	10	0.595	2	0.806
	b) Female	8	12	22			
	c) Other	0	0	0			
3	**Class/Grade**						
	a) 6^{th}	4	5	6	5.694	6	0.487
	b) 7^{th}	1	7	7			
	c) 8^{th}	2	3	10			
	d) 9^{th}	3	3	9			
4	**Area of Residence**						
	a) Urban	1	9	10	24.675	4	**0.0001**
	b) Rural	3	9	20			
	c) Semi-urban	6	0	2			
5	**Mode of Travel**						
	a) Walking	0	0	4	4.86	6	0.591
	b) Bicycle	4	8	10			
	c) Two-wheeler	3	3	6			
	d) Other	3	7	12			

6	**Type of family**						
	a) Nuclear family	4	12	20	3.356	4	0.51
	b) Joint family	5	6	11			
	c) Extended family	1	0	1			
	d) Single parent family	0	0	0			
7	**Educational status of mother**						
	a) No formal education	0	0	0	3.501	4	0.498
	b) Primary education	0	2	6			
	c) Secondary education	4	9	15			
	d) Graduation & above	6	7	11			
8	**Educational status of Father**						
	e) No formal education	0	0	0	3.616	4	0.482
	a) Primary education	2	2	6			
	b) Secondary education	0	5	7			
	c) Graduation & above	8	11	19			
9	**Occupational status of mother**						
	a) Government employee	4	2	2	8.542	4	0.073
	b) Private employee	3	8	11			
	c) Homemaker	3	8	19			
	d) Unemployed	0	0	0			
10	**Occupational status of father**						
	a) Government employee	7	7	4	12.963	2	**0.002**
	b) Private employee	3	11	28			
	c) Homemaker	0	0	0			
	d) Unemployed	0	0	0			
11	**What was your age when you got your first vehicle?**						
	a) Below 11 years	3	4	1	7.93	4	0.094
	b) 11-13 years	2	4	14			
	c) 14-16 years	5	10	17			
	d) 17-19 years	0	0	0			
12	**Do you have previous knowledge about prevention of road traffic accidents?**						
	a) Yes	7	9	6	10.586	2	**0.004**
	b) No	3	9	26			
13	**Sources of knowledge regarding prevention of road traffic accidents?**						
	a) Parents	4	2	2	18.934	8	**0.013**
	b) Teachers	1	2	1			
	c) Television	2	2	0			
	d) Books	0	3	3			
	e) No information	3	9	26			

df_2=5.99, df_4 =9.48, df_6 =12.59, df_8 =15.50 at $p<0.05$ level of significance

Table no. 4 depicts the description about association between pre-interventional level of knowledge and demographic variables among adolescents regarding prevention of road traffic accidents. Chi square test was performed to find the association on knowledge of adolescents regarding prevention of road traffic accidents with their selected demographic variables. And it shows that there was no significant association between age (χ^2 =6.756; p=0.150), Gender (χ^2 =0.595; p=0.806), class/grade (χ^2 =5.694; p=0.487), mode of travel (χ^2 =4.860; p=0.591), type of family (χ^2 =3.356; p=0.510), educational status of mother (χ^2 =3.501; p=0.498), educational status of father (χ^2 =3.616; p=0.482), occupational status of mother (χ^2 =8.542; p=0.073) and age when you got your first vehicle (χ^2 =7.930; p=0.094). Whereas there was significant association shows in area of residence (χ^2 =24.675; p=0.0001), occupational status of father (χ^2 =12.963; p=0.002), previous knowledge about prevention of road traffic accidents (χ^2 =10.586; p=0.004) and source of knowledge regarding prevention of road traffic accidents (χ^2 =18.934; p=0.013).

Hence the null hypothesis was rejected and research hypothesis was accepted. Thus, it interprets that demographic variables did not have any influence on knowledge of adolescents regarding prevention of road traffic accidents except area of residence, occupational status of father, previous knowledge about prevention of road traffic accidents and source of knowledge regarding prevention of road traffic accidents.

5. Discussion

The researcher informed the sample about the purpose of the study and requested for co-operation of the adolescent students of selected schools during the study.

Consent was taken from the subjects and confidentiality was assured. Ater that, Data was collected from the subjects. The time schedule was planned from 1 pm to 2 pm according to the availability of the sample without creating any disturbance of the regular lectures of students. Totally, 60 adolescent students were selected from the selected school of Moradabad. Participation of the sample was fully depending on the basis of random stratified sampling technique.
It ensured that lectures of the samples would not be disturbed. The researcher distributed the structured knowledge questionnaire and time was given to the subjects

for filling the questionnaires. Main study was conducted after ensuring a desirable reliability of the pilot study.

Pre-test was performed in the group by using a questionnaire, which was validated by experts. Most of the respondents took about 20-25 min to answer the questions. The intervention was provided soon after the pre-test and post-test was conducted after 5 days of intervention. The data was analyzed by using descriptive and inferential statistics.

The frequency and percentage distribution of the samples according to their socio-demographic variables show that –

It depicts that age shows majority of the adolescents 30(50%) were 12-13 years of age.

Most of the adolescents 42(70%) were female whereas equal number of adolescents 25(50%) were from 6^{th}, 7^{th}, 8^{th} and 9^{th} class.

Majority of the adolescents 32(53.3%) were from rural area whereas maximum of the adolescents 22(36.7%) had bicycle and other as mode of travel.

Majority of the adolscents 36(60%) were from nuclear family whereas 28(46.7%) adolscents mother's had secondary education.

Majority of the adolscents father's 38(63.3%) had graduation & above as education.

Majority of the adolscents mother's 30(50%) were homemaker whereas adolscents father's 42(70%) were private employee.

Maximum of the adolscents 32(53.4%) got their first vehicle at 14-16 years of age whereas majority of the adolscents 38(63.3%) had no previous knowledge about prevention of road traffic accidents.

- The results show that the ffrequency & percentage distribution of pre-intervention & post-intervention level of knowledge regarding prevention of road traffic accidents among adolescents & it depicts that in pre-intervention score majority of adolescents 32(53.3%) had poor knowledge and 18(30%) had moderate level of knowledge regarding prevention of road traffic accidents. In post-intervention score, most of the adolescents 38(63.3%) had good knowledge and 22(36.7%) had moderate level of knowledge regarding prevention of road traffic accidents.
- The results show that the during comparison of pre and post-interventional knowledge score of adolescents regarding the prevention of road traffic accidents, it depicts that the mean knowledge score and SD was 8.03 ± 3.565 in pretest whereas 15.13 ± 2.528 in post-test.

Dependent 't'-test was performed to compare the knowledge score within pre-intervention and post-intervention. The obtained t & p value was t = 17.641, p =0.0001. The t-test revealed that there was significant difference within pre intervention and post-intervention scores. Hence the research hypothesis was accepted and null hypothesis was rejected.

The results shows that the association between pre-interventional level of knowledge and demographic variables among adolescents regarding prevention of road traffic accidents. Chi square test was performed to find the association on knowledge of adolescents regarding prevention of road traffic accidents with their selected demographic variables. And it shows that there was no significant association between age (χ^2 =6.756; p=0.150), Gender (χ^2 =0.595; p=0.806), class/grade (χ^2 =5.694; p=0.487), mode of travel (χ^2 =4.860; p=0.591), type of family (χ^2 =3.356; p=0.510), educational status of mother (χ^2 =3.501; p=0.498), educational status of father (χ^2 =3.616; p=0.482), occupational status of mother (χ^2 =8.542; p=0.073) and age when you got your first vehicle (χ^2 =7.930; p=0.094). Whereas there was significant association shows in area of residence (χ^2 =24.675; p=0.0001), occupational status of father (χ^2 =12.963; p=0.002), previous knowledge about prevention of road traffic accidents (χ^2 =10.586; p=0.004) and source of knowledge regarding prevention of road traffic accidents (χ^2 =18.934; p=0.013).

Hence the null hypothesis was rejected and research hypothesis was accepted. Thus, it interprets that demographic variables did not have any influence on knowledge of adolescents regarding prevention of road traffic accidents except area of residence, occupational status of father, previous knowledge about prevention of road traffic accidents and source of knowledge regarding prevention of road traffic accidents.

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