



Effectiveness of a Planned Teaching Programme on Knowledge Regarding Tobacco-Related Health Hazards and Its Prevention among Adolescents in Selected Senior Secondary Schools of Rural Udaipur District, Rajasthan

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ABSTRACT :

Background: Tobacco use is a major public health concern, with increasing experimentation among adolescents. Limited awareness regarding the harmful effects and prevention contributes to early initiation. Educating adolescents through structured teaching programmes may significantly improve their knowledge and health-related behaviors.

Objectives:

1. To assess the pre-test and post-test knowledge scores regarding tobacco-related health hazards and its prevention among adolescents.
2. To evaluate the effectiveness of the Planned Teaching Programme (PTP).
3. To determine the association between pre-test knowledge and selected demographic variables.

Methods:

A pre-experimental one-group pre-test post-test design was adopted among 240 adolescents selected through simple random sampling from senior secondary schools of rural Udaipur district. A structured knowledge questionnaire was used. Data were analyzed using descriptive and inferential statistics.

Results:

Mean pre-test knowledge score was 9.6 ± 2.5 (38.4%), which increased to 16.52 ± 2.34 (66.1%) after the intervention. The mean difference (6.92) was statistically significant ($t = 31.55$, $p < 0.001$), indicating high effectiveness of the teaching programme. Significant associations were found between knowledge scores and variables such as age, class of study, type of family, father's education, father's occupation, mother's occupation, monthly income, and family member consuming tobacco ($p < 0.05$). Gender, religion, and mother's education showed no significant association.

Conclusion:

The Planned Teaching Programme was highly effective in enhancing adolescents' knowledge regarding tobacco-related health hazards and prevention. Strengthening school-based health education can play a critical role in reducing early initiation of tobacco use.

Keywords: Adolescents, Tobacco hazards, Health education, Planned Teaching Programme, Knowledge, Prevention.

INTRODUCTION

“It is easier to prevent a person from ever using tobacco than to get them to quit once they have begun.” Health is a precious gift and an essential component of a productive life. However, many individuals adopt unhealthy behaviors

such as tobacco use in search of temporary pleasure. Tobacco use is one of the leading causes of preventable morbidity and mortality worldwide. Tobacco smoke contains more than 7,000 chemicals, many of which are toxic and carcinogenic. There is no safe level of exposure to tobacco in any form.

Globally, tobacco use is considered a major public health problem, with a higher burden in developing countries. India is among the largest producers and consumers of tobacco, with widespread use of both smoking and smokeless forms. Adolescence is a vulnerable phase during which experimentation with tobacco often begins. Early initiation significantly increases the risk of long-term addiction and premature death.

Nicotine, the primary addictive substance in tobacco, rapidly enters the bloodstream and stimulates the central nervous system, leading to dependence. Adolescents develop nicotine addiction at lower levels of exposure than adults. Tobacco use during adolescence leads to immediate health problems such as respiratory symptoms, reduced lung function, and impaired physical fitness. Long-term use contributes to chronic diseases including cancer, cardiovascular diseases, and chronic obstructive pulmonary disease.

Smokeless tobacco products are commonly perceived as safer, though they cause serious oral, dental, and systemic health problems. Exposure to second-hand smoke further increases health risks among children and adolescents. Peer pressure, easy availability, media influence, and lack of awareness are major factors contributing to tobacco use among adolescents.

Despite national tobacco control laws and programs, enforcement and awareness remain inadequate. Many adolescents lack correct knowledge regarding tobacco-related health hazards and prevention. School-based and community-based education programs have shown effectiveness in preventing tobacco initiation. Health professionals, especially nurses, play a vital role in health education and prevention. Early and sustained awareness programs are essential to reduce the future burden of tobacco-related diseases and promote a healthy generation.

Research Statement

“Evaluate the effectiveness of planned teaching programme on knowledge regarding tobacco related health hazards and its prevention among adolescents in selected senior secondary schools in rural areas of Udaipur District, Rajasthan”

Objectives of the study

- To assess the pre-test and post-test knowledge score regarding tobacco related health hazards and its prevention among adolescents in selected senior secondary schools in rural areas of Udaipur District, Rajasthan.
- To evaluate the effectiveness of planned teaching programme regarding tobacco related health hazards and its prevention among adolescents in selected senior secondary schools in rural areas of Udaipur District, Rajasthan.
- To find out the association between pre-test knowledge scores with selected socio-demographic variables of adolescents in selected senior secondary schools in rural areas of Udaipur District, Rajasthan.

Hypothesis

- **H₀₁**: There is no significant difference between pre-test and post-test knowledge score regarding tobacco related health hazards and its prevention among adolescents in selected senior secondary schools in rural areas of Udaipur District, Rajasthan.
- **H₀₂**: There is no significant association between pre-test knowledge score and selected socio demographic variables.

Conceptual Framework

The conceptual framework of the present study is based on Ludwig von Bertalanffy's General System Theory, which views a system as an organized whole consisting of input, throughput (process), output, and feedback. In this study, input includes the assessment of adolescents' baseline knowledge regarding tobacco-related health hazards and their prevention through a structured pre-test questionnaire, along with selected demographic variables such as age, gender, class, and family background, and the planned teaching programme as an external stimulus. Throughput represents the implementation of the planned teaching programme using lecture-cum-discussion, visual aids, and handouts, during which adolescents actively participate and internalize the information provided. Output refers to the improvement in knowledge regarding tobacco-related health hazards and their prevention, measured by post-test scores and comparison with pre-test results. Feedback involves evaluation of the effectiveness of the planned teaching programme based on the observed change in knowledge levels, which helps in strengthening future school-based health education and preventive interventions.

Materials and Methods:

Research Approach and Design

A quantitative pre-experimental research approach with a one-group pre-test post-test design was adopted to evaluate the effectiveness of a planned teaching programme on knowledge regarding tobacco-related health hazards and their prevention among adolescents in rural Udaipur District, Rajasthan. This design enabled assessment of changes in knowledge levels before and after the intervention.

Research Setting

The study was conducted in two rural senior secondary schools—Rajasthan Bal Vidhya Mandir Senior Secondary School and Indus Public Senior Secondary School, Jhadol, Udaipur District, Rajasthan. The schools were selected based on feasibility, geographic accessibility, and availability of adequate sample.

Variables

The independent variable was the planned teaching programme on tobacco-related health hazards and prevention. The dependent variable was adolescents' knowledge regarding tobacco-related health hazards and their prevention. Socio-demographic variables included age, gender, religion, class of study, type of family, parental education and occupation, monthly family income, and family history of tobacco use.

Population and Sample

The population comprised adolescents studying in classes 9th to 12th in rural senior secondary schools of Udaipur District. The sample consisted of 240 adolescents selected from the two schools.

Sampling Technique

A multistage sampling technique was employed. One rural block was selected using simple random sampling, followed by random selection of two senior secondary schools. Proportionate stratified random sampling was used to select students from classes 9th to 12th, and final selection was done using the lottery method.

Sample Selection Criteria

Adolescents studying in classes 9th to 12th and willing to participate were included. Students unwilling to participate were excluded.

Tool Development

Data were collected using a structured tool developed by the investigator based on study objectives and review of literature. The tool consisted of two sections: Section A included socio-demographic variables. Section B comprised a structured knowledge questionnaire with 25 items covering tobacco-related health hazards, prevention strategies, and support systems. Each correct response carried one mark, with a maximum score of 25. The same questionnaire was used for pre-test and post-test assessment. Content validity was ensured through expert review, literature support, and preparation of a blueprint.

Reliability of the Tool

The structured knowledge questionnaire was tested for reliability. Stability was assessed using the test-retest method, and internal consistency was measured with Cronbach's alpha, yielding a reliability coefficient of 0.80, indicating that the tool was reliable and suitable for the study.

Data Collection Procedure

The study was conducted from 1st to 10th July 2025 at Rajasthan Bal Vidhya Mandir and Indus Public Senior Secondary Schools, Jhadol, Udaipur. Written permission was obtained from school principals, and parental consent was secured via assent forms. Pre-tests were administered using the structured knowledge questionnaire on 2nd July at Rajasthan Bal Vidhya Mandir and on 3rd July at Indus Public School, immediately followed by the Planned Teaching Programme (40–45 minutes). Post-tests were conducted after seven days—on 9th July at Rajasthan Bal Vidhya Mandir and 10th July at Indus Public School—to assess the effectiveness of the intervention. The tool was clear and easily comprehended by participants.

Data Analysis

Data were analyzed based on the study objectives using descriptive and inferential statistics. A master data sheet was prepared with participants' responses.

- **Descriptive Statistics:** Demographic characteristics of adolescents were summarized. Pre-test and post-test knowledge scores were described using mean, median, standard deviation (SD), and mean percentage.
- **Inferential Statistics:** Paired *t*-test was applied to assess the effectiveness of the Planned Teaching Programme by comparing pre- and post-test scores. Chi-square test was used to examine associations between pre-test knowledge scores and selected socio-demographic variables.

Result:**1. Effectiveness of Planned Teaching Programme on knowledge regarding tobacco-related health hazards and its prevention.**

Test	Mean	Mean%	SD	Mean difference	t-value	df	p-value	Inference
Pre-test	9.6	38.40	2.5	6.92	31.55	239	<0.001	S*
Post-test	16.52	66.00	2.34					

S* - Significant at p <0.001 level of significant

The paired 't' test was computed to determine the effectiveness of the planned teaching programme on knowledge regarding tobacco-related health hazards and its prevention among adolescents.

The following research hypothesis was stated:

H₀₁: There is no significant difference between pre-test and post-test knowledge scores regarding tobacco-related health hazards and its prevention among adolescents in selected senior secondary schools in rural areas of Udaipur District, Rajasthan.

The mean post-test knowledge score (16.52) was greater than the mean pre-test knowledge score (9.6). The mean difference between the pre-test and post-test scores was 6.92. The obtained 't' value was 31.55, which was significant at p < 0.001 level with df = 239.

Hence, the research hypothesis **H₀₁** was rejected. This indicates that the planned teaching programme was effective in increasing the knowledge of adolescents regarding tobacco-related health hazards and its prevention.

2. Distribution of Participants by overall level of knowledge scores.

N=240

Level of Knowledge	Score	Pre-test		Post-test	
		Frequency	Percentage	Frequency	Percentage
Adequate (75-100%)	19-25	0	0	44	18.3
Moderate (51-75%)	13-18	11	4.6	175	72.9
Inadequate (0-50%)	0-12	229	95.4	21	8.8
Total		240	100	240	100

The findings show a clear improvement in participants' knowledge after the planned teaching programme. In the pre-test, 95.4% had inadequate knowledge and 4.6% had a moderate level, with none achieving adequate knowledge. After the intervention, inadequate knowledge decreased to 8.8%, moderate knowledge rose to 72.9%, and 18.3% achieved an adequate level. This indicates that the planned teaching programme was effective in significantly improving participants' knowledge regarding tobacco-related health hazards and their prevention.

3. Findings related to Association between pre-test knowledge scores and selected socio-demographic variables.

Socio demographic variables	Below median	Above median	Total	df	Chi square	Chi square table value	P value	Inference
Age in year								
14 Years	14	15	29	3	9.61	7.81	0.01	S
15 Years	23	23	46					
16 Years	30	37	67					
17 Years	50	48	98					
Total	117	123	240					
Gender								
Male	60	53	113	2	4.37	5.99	0.24	NS
Female	60	67	127					
Other____	0	0	0					
Total	120	120	240					
Religion								
Hindu	110	116	226	4	8.01	9.48	0.116	NS
Muslim	1	0	1					
Sikh	0	0	0					
Christian	0	0	0					
Other____	9	4	13					
Total	120	120	240					
Class of study								
9th	15	19	34	3	10.33	7.81	0.01	S
10th	25	19	44					
11th	36	36	72					
12th	45	45	90					
Total	121	119	240					
Type of family								
Nuclear	25	22	47	4	12.04	9.48	0.001	S
Joint	100	93	193					
Extended	0	0	0					
Single-parent	0	0	0					
Other: _____	0	0	0					
Total	125	115	240					
Education of father								
Non formal education	8	6	13	4	13.65	9.48	0.001	S
Primary	25	30	55					
Secondary	20	25	45					
Higher secondary	0	5	5					
Graduate and above	65	57	122					
Total	118	122	240					
Education of Mother								
Non formal education	45	52	97	4	7.16	9.48	0.19	NS
Primary	15	5	20					
Secondary	15	11	26					
Higher secondary	30	30	60					
Graduate and above	15	22	37					
Total	120	120	240					
Occupation of father								
Govt. Service	15	14	29	4	13.99	9.48	0.01	S
Private Job	30	24	54					

Business	15	24	39					
Farmer	43	30	73					
Other_____	20	25	45					
Total	123	117	240					
Occupation of mother								
Govt. Service	10	12	22					
Private Job	5	6	11					
Business	0	0	0	4	14.62	9.48	0.01	S
Farmer	60	58	118					
Other_____	40	49	89					
Total	115	125	240					
Monthly family income (in rupees)								
Less than 10,000	57	60	117					
10,001 – 20,000	30	35	65	3	11.68	7.81	0.01	S
20,001 - 30,000	5	7	12					
More than 30,000	26	20	46					
Total	118	122	240					
Is there a family member who consumes any form of tobacco?								
No, no one use tobacco	80	75	155					
Yes, smoked form	10	18	28					
Yes, smokeless form	17	17	34	3	12.22	7.81	0.01	S
Yes, both smoked and smokeless form	13	10	23					
Total	120	120	240					

S-Significant, NS- Non Significant

H₀₂ - There is no significant association between pre-test knowledge scores with selected socio-demographic variables.

The chi-square test was carried out to determine the association between pre-test knowledge scores of adolescents and their selected socio-demographic variables. The overall statistical findings revealed that the variables such as **age in years ($\chi^2 = 9.61$, $p = 0.01$)**, **class of study ($\chi^2 = 10.33$, $p = 0.01$)**, **type of family ($\chi^2 = 12.04$, $p = 0.001$)**, **education of father ($\chi^2 = 13.65$, $p = 0.001$)**, **occupation of father ($\chi^2 = 13.99$, $p = 0.01$)**, **occupation of mother ($\chi^2 = 14.62$, $p = 0.01$)**, **monthly family income ($\chi^2 = 11.68$, $p = 0.01$)**, and **family member consuming tobacco ($\chi^2 = 12.22$, $p = 0.01$)** were found to be statistically significant.

On the other hand, the variables such as **gender ($\chi^2 = 4.37$, $p = 0.24$)**, **religion ($\chi^2 = 8.01$, $p = 0.116$)**, and **education of mother ($\chi^2 = 7.16$, $p = 0.19$)** were found to be statistically non-significant.

Thus, it can be concluded that there is a **partial association** between pre-test knowledge scores and selected socio-demographic variables. Hence, the research hypothesis **H₀₂ was partially accepted**, indicating that some socio-demographic variables have a significant influence on the pre-test knowledge scores of adolescents regarding tobacco-related health hazards and its prevention.

Conclusion

The study revealed that most adolescents were 17 years old, with slightly more males than females, and predominantly from joint families. Fathers were generally better educated than mothers, farming was the common occupation, and nearly half of the families had a monthly income below ₹10,000. About one-third of participants reported tobacco use within their families, indicating household exposure. Pre-test results showed inadequate knowledge regarding tobacco-related health hazards and prevention, particularly about support systems. Post-test scores demonstrated significant improvement across all content areas, with overall knowledge increasing from a mean of 9.60 (38.4%) to 16.52 (66.1%), confirming the effectiveness of the Planned Teaching Programme. Selected socio-demographic variables—including age, class, type of family, father's education, parental occupation, monthly income, and family tobacco use—significantly influenced knowledge levels, whereas gender, religion, and mother's education did not. These findings highlight the programme's effectiveness as a school-based health promotion intervention for adolescents.

Limitations

The study was conducted among adolescents from selected rural senior secondary schools in Udaipur District, limiting generalizability to all adolescents. Only knowledge was assessed; attitudes and actual tobacco-related practices were not evaluated. Responses were self-reported and may have been influenced by social desirability bias, potentially affecting accuracy.

Suggestions

Based on the study findings, the following suggestions are proposed:

1. Conduct similar studies with larger, multi-district samples to enhance generalizability.
2. Undertake longitudinal studies to evaluate the sustained impact of teaching programmes on knowledge retention and behavioral changes.
3. Explore attitudes and practices regarding tobacco use along with knowledge to gain a comprehensive understanding.
4. School health nurses should develop interactive teaching modules, protocols, and IEC materials to strengthen tobacco prevention among adolescents.
5. Implement community-based interventions involving parents, teachers, and health workers to create supportive environments.
6. Integrate tobacco prevention programmes into routine school health activities to reinforce knowledge and prevent early initiation of tobacco use.

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