

EFFECTIVENESS OF A STRUCTURED TEACHING PROGRAMME IN IMPROVING KNOWLEDGE REGARDING SMOKING AND ITS CONSEQUENCES AMONGST TEENAGERS IN SELECTED SCHOOL OF AIZAWL, MIZORAM

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Abstract

Background: Tobacco use remains a major public health concern and is one of the leading preventable causes of morbidity and mortality worldwide. Adolescence is a critical period during which individuals are vulnerable to initiating smoking due to inadequate knowledge, peer influence, and other psychosocial factors. Structured educational interventions may help improve awareness and prevent tobacco use amongst teenagers.

Objectives: To determine the pre-test level of knowledge regarding smoking and its consequences amongst teenagers, to evaluate the effectiveness of a structured teaching programme, and to examine the association between pre-test knowledge scores and selected demographic variables.

Methods: A quantitative research approach with a pre-experimental one-group pre-test and post-test design was adopted. The study was conducted among 18 teenagers aged 13–18 years at St. Anthony's Higher Secondary School, Chaltlang Lily Veng, Aizawl, Mizoram. Participants were selected using purposive sampling. Data were collected using a structured sociodemographic questionnaire and a 25-item structured knowledge questionnaire. Descriptive and inferential statistics, including paired *t*-test and Fisher's Exact Test, were used for data analysis.

Results: The pre-test findings revealed that 94.4% of participants had low knowledge regarding smoking and its consequences. The mean knowledge score increased significantly from 10.37 ± 1.62 in the pre-test to 15.75 ± 1.21 in the post-test. The paired *t*-test showed a statistically significant improvement in knowledge ($t = 6.216, p = 0.0001$). No significant association was found between pre-test knowledge scores and selected demographic variables ($p > 0.05$).

Conclusion: The structured teaching programme was effective in improving teenagers' knowledge regarding smoking and its consequences. The findings highlight the importance of implementing school-based health education programmes to enhance awareness and promote tobacco-free lifestyles among adolescents.

IndexTerms - Smoking, Structured Teaching Programme, Teenagers, Knowledge, Smoking Consequences.

INTRODUCTION

The World Health Organization (WHO) estimates of tobacco use prevalence among individuals aged 15 years and above from 2000 to 2024, together with projected trends extending to 2030. The estimates are presented at the global, regional, and country levels, offering a comprehensive overview of tobacco use patterns worldwide. Furthermore, the report includes a global summary of the use of various tobacco products and e-cigarettes among children aged 13–15 years, based on findings from recent national school-based surveys [1].

The widespread marketing of e-cigarettes has contributed to a significant rise in their use among children and adolescents, with prevalence rates in many countries surpassing those observed among adults. Moreover, there is currently no conclusive evidence that the commercialization of e-cigarettes—including their manufacture, distribution, importation, or sale as consumer products—has produced an overall public health benefit. On the contrary, increasing evidence highlights their harmful effects on population health [2].

Tobacco use remains one of the leading preventable causes of premature illness and mortality across the globe. Approximately 1.4 billion individuals aged 15 years and above currently use tobacco. It is responsible for more than 8 million deaths annually due to tobacco-related diseases. If existing patterns of tobacco consumption continue, tobacco use is projected to claim up to one billion lives by the end of the 21st century, with over three-quarters of these deaths expected to occur in low- and middle-income countries. Therefore, establishing effective and systematic surveillance systems is crucial for monitoring tobacco use and guiding strategies to control the tobacco epidemic [5].

Tobacco use remains one of the leading causes of preventable diseases and deaths in India, resulting in 13.5 lakh deaths annually. It contributes significantly to cancer, cardiovascular diseases, respiratory illnesses, and premature deaths [6].

NEED OF THE STUDY

A systematic review of 13 studies conducted in India evaluated the effectiveness of school-based tobacco prevention programs for adolescents. The findings showed that these interventions improved adolescents' knowledge, attitudes, and behaviors regarding tobacco use, with reported reductions in tobacco use ranging from 5.17% to 17.0%. However, most studies assessed only short-term outcomes and had methodological limitations, including a high risk of bias and variations in study design. Overall, the review suggests that school-based tobacco prevention programs are promising, but more robust, long-term studies are needed to confirm their effectiveness [3].

Parental attitudes toward adolescent smoking and the presence of depressive symptoms were identified as the strongest factors associated with students' likelihood of vaping, smoking, or engaging in both behaviors. Adolescents who perceived that their parents considered smoking to be only slightly wrong or not wrong at all were significantly more likely to smoke or both vape and smoke than those whose parents viewed smoking as wrong or very wrong. Similarly, students experiencing depressive symptoms had a substantially higher likelihood of vaping, smoking, or using both products compared with those who did not report depressive symptoms [4].

Adolescence is a critical developmental stage during which individuals are more likely to experiment with risky behaviors, including tobacco use. Inadequate knowledge regarding the harmful effects of smoking, combined with peer influence and easy accessibility to tobacco products, increases the likelihood of smoking initiation. Structured teaching programmes can enhance awareness, promote healthy decision-making, and encourage adolescents to adopt tobacco-free lifestyles [7].

OBJECTIVES

1. To determine the level of knowledge regarding smoking and its consequences amongst teenagers before and after the implementation of the structured teaching programme.
2. To assess the effectiveness of the structured teaching programme in improving teenagers' knowledge regarding smoking and its consequences.
3. To examine the association between the pre-test knowledge scores of teenagers and their selected demographic variables.

HYPOTHESES

H₁: There will be significant difference between the pre-test and post-test level of knowledge scores about smoking and its consequences amongst teenagers.

H₂: There will be significant association between pre-test knowledge score with their selected demographic variables.

RESEARCH METHODOLOGY

Research approach: A Quantitative research approach

Research design: Pre-experimental one-group pre-test and post-test design.

Setting: St. Anthony's Higher Secondary School, Chaltlang Lily Veng, Aizawl, Mizoram.

Sample and sample size: Teenage students (boys & girls) aged 13-18 years, Sample size consisted of 18 students.

Sampling Technique: Purposive sampling technique

Sampling criteria:

Inclusion criteria:

- Students studying in Classes IX–XII.
- Students who were enrolled in the selected school during the period of data collection.
- Students who provided informed consent and were willing to participate in the study.

Exclusion criteria:

- Students who were absent or ill during the data collection period.
- Students who had previously participated in a similar structured teaching programme on smoking and its consequences.

Variables:

Independent Variable: The structured teaching programme on smoking and its consequences

Dependent Variables: Levels of knowledge of teenagers regarding smoking and its consequences.

Description of tool: Based on the objectives of the study, the study tool was developed and divided into two sections:

Section 1: Sociodemographic Performa Sociodemographic characteristic questionnaire: Tool consists of 10 questions for obtaining data from samples about background information such as demographic variables like age, gender, class/grade, stream of education, religion, socio economic status, type of family, previous knowledge regarding smoking, source of information about smoking, history of smoking in the family.

Section 2:

- **Structured Knowledge Questionnaire:** The structured knowledge questionnaire consisted of multiple-choice questions related to smoking and its consequences. Each question contained one correct answer and three distractors. A score of 1 was awarded for every correct response, while a score of 0 was given for each incorrect response. The total score of the questionnaire ranged from 0 to 25.
- **Development of structured teaching programme:** Lesson plan on Smoking and its Consequences was prepared and administered to school students.

Validity and Reliability: The content validity of the tool was established through expert review by a panel of seven experts comprising psychiatrists, clinical psychologists, and nurse educators. Necessary modifications were made based on their suggestions before final administration. Internal consistency was assessed using the Cronbach's Alpha (α) method, and the reliability was found to be 0.796, indicating good reliability of the tool.

Data Collection Procedure: After obtaining administrative permission from the concerned authorities and informed consent from the participants, data were collected using a structured knowledge questionnaire. Confidentiality and anonymity of the participants were maintained throughout the study.

Statistical Analysis: The collected data were analyzed using descriptive and inferential statistics, including paired *t*-test and Fisher's Exact Test. Statistical significance was considered at $p < 0.05$.

RESULTS

SECTION I : FINDINGS RELATED TO SAMPLE SOCIO-DEMOGRAPHIC PERFORMA

Table 1: Frequency and Percentage Distribution of Demographic Variables Amongst Teenagers (n=18).

Demographic Variables	Frequency (f)	Percentage (%)
Age		
13-15 years	7	38.9
16-18 years	11	61.1
Gender		
Male	10	55.6
Female	8	44.4
Other	0	0
Class		
IX	4	22.2
X	8	44.4
XI	0	0
XII	6	33.3
Stream of Education		
Science	0	0
Arts	6	33.3
Commerce	0	0
Other	12	66.7
Religion		
Christian	18	100
Hindu	0	0
Muslim	0	0
Other	0	0
Socio - Economic Class		
Upper Class (26 - 29)	0	0
Upper middle (16 - 25)	1	5.6
Lower Middle (11 - 15)	7	38.9
Upper Lower (5 - 10)	10	55.7
Lower Class (Below 5)	0	0
Types of family		
Nuclear family	16	88.9
Joint family	2	11.1
Previous knowledge regarding smoking		
Yes	14	77.8
No	4	22.2
Source of information about smoking		
Friends	7	38.9
TV/Internet	6	33.3
Family	5	27.8
School	0	0
Others	0	0
History of smoking in the family		
Yes	12	66.7
No	6	6

Table 1 shows the demographic characteristics of the study cohort consisting of 18 teenagers revealed that the majority of participants, 11 (61.1%), were in the age group of 16–18 years, while 7 (38.9%) were aged 13–15 years. With regard to gender, more than half of the participants were male (55.6%), and 44.4% were female.

In terms of educational level, most of the participants belonged to Class X (44.4%), followed by Class XII (33.3%) and Class IX (22.2%), while no participants were from Class XI. Regarding the stream of education, a majority of the participants (66.7%) were categorized under other streams, while 33.3% belonged to the arts stream.

All participants (100%) were from the same religious background. With respect to socio-economic status, more than half of the participants (55.7%) belonged to the upper lower class, followed by 38.9% from the lower middle class and a small proportion (5.6%) from the upper middle class.

The majority of participants (88.9%) belonged to nuclear families, while 11.1% were from joint families. Most of the participants (77.8%) reported having previous knowledge regarding smoking, whereas 22.2% had no prior knowledge.

Friends were identified as the most common source of information (38.9%), followed by television/internet (33.3%) and family (27.8%). Additionally, a considerable proportion of participants (66.7%) reported a history of smoking within the family, while 33.3% had no such history.

SECTION II. FINDINGS RELATED TO PRE-TEST KNOWLEDGE REGARDING SMOKING AND ITS CONSEQUENCES

Table 2: Distribution of Pre-test Knowledge Level on Smoking and its Consequences Amongst Teenagers (n = 18).

Knowledge Level	Frequency (f)	Percentage (%)
Low Knowledge	17	94.4
Moderate Knowledge	1	5.6
High Knowledge	0	0

Table 2 presents the pre-test knowledge level regarding smoking and its consequences was assessed amongst 18 teenagers. The distribution of knowledge levels revealed that a substantial majority of the participants, 17 (94.4%), had low knowledge, while only 1 participant (5.6%) demonstrated a moderate level of knowledge. None of the participants exhibited a high level of knowledge prior to the intervention.

Table 3: Descriptive Statistics of Pre-test Knowledge Scores on Smoking and its Consequences Amongst Teenagers (n = 18).

Variable	Mean	Standard Deviation (S.D)
Pre-test knowledge score	10.37	1.62

Table 3 demonstrates the mean pre-test knowledge score was found to be 10.37 ± 1.62 , which indicates that the overall level of knowledge amongst the participants was considerably low. The relatively small standard deviation suggests that most of the participants had scores clustered within the lower range, reflecting a consistent lack of adequate knowledge across the group.

These findings clearly demonstrate that teenagers possessed insufficient awareness regarding smoking and its harmful consequences before the implementation of the structured teaching programme. The predominance of low knowledge levels highlights a critical need for educational interventions aimed at improving understanding and promoting healthy behaviors amongst teenagers.

Therefore, the findings of the study indicate that there was a definite need for implementing a structured teaching programme to enhance the knowledge of teenagers regarding smoking and its consequences.

SECTION III : FINDINGS RELATED TO EFFECTIVENESS OF A STRUCTURED TEACHING PROGRAMME ON IMPROVING THE LEVEL OF KNOWLEDGE ABOUT SMOKING AND ITS CONSEQUENCES

Table 4: Comparison of Pre-test and Post-test Knowledge Scores (n = 18).

Test	Mean $\pm$ S.D	Mean difference	t-value	p-value
Pre-test	10.37 ± 1.62	5.38	6.216	0.0001***
Post-test	15.75 ± 1.21			

***P < 0.05 level of significance (Highly Significant)

Table 4 reveals the effectiveness of the structured teaching programme on smoking and its consequences was evaluated by comparing the pre-test and post-test knowledge scores amongst 18 teenagers. The mean pre-test knowledge score was 10.37 ± 1.62 , which increased to 15.75 ± 1.21 in the post-test, indicating an improvement in knowledge following the intervention.

The mean difference between the pre-test and post-test scores was 5.38, demonstrating a noticeable increase in knowledge levels after the structured teaching programme. The paired t-test analysis revealed that this difference was statistically highly significant ($t = 6.216$, $p = 0.0001$).

These findings suggest that the structured teaching programme was effective in enhancing the knowledge of teenagers regarding smoking and its harmful consequences. Since the p-value is less than 0.05, the research hypothesis (H_1) is accepted, indicating a statistically significant difference between pre-test and post-test knowledge scores. Therefore, the structured teaching programme proved to be an effective educational intervention in improving awareness among teenagers.

The findings indicate that the structured teaching programme had a statistically significant and practically meaningful impact on improving the knowledge of teenagers.

SECTION IV: FINDINGS RELATED TO THE ASSOCIATION BETWEEN PRE-TEST LEVEL OF KNOWLEDGE SCORE WITH THEIR SELECTED DEMOGRAPHIC VARIABLES.

Table 5: Association between Pre-test Knowledge Level and Selected Demographic Variables (n = 18).

Demographic variables	Knowledge Score			Fisher's Exact (P-value)	Remarks
	Low	Moderate	High		
Age					
13-15 years	6	1	0	0.389	> 0.05
16-18 years	11	0	0		
Gender					
Male	10	0	0	0.264	> 0.05
Female	7	0	0		
Other	0	0	0		
Class					
IX	4	0	0	0.428	> 0.05
X	7	1	0		
XI	0	0	0		
XII	6	0	0		
Stream of Education					
Science	0	0	0	0.359	> 0.05
Arts	6	0	0		
Commerce	0	0	0		
Other	11	1	0		
Religion					
Christian	17	1	0	**	**
Hindu	0	0	0		
Muslim	0	0	0		
Other	0	0	0		
Socio - Economic Class					
Upper Class (26 - 29)	0	0	0	0.444	> 0.05
Upper middle (16 - 25)	1	0	0		
Lower Middle (11 - 15)	6	1	0		
Upper Lower (5 - 10)	10	0	0		
Lower Class (Below 5)	0	0	0		
Types of family					
Nuclear family	15	1	0	1	> 0.05
Joint family	2	0	0		
Previous knowledge regarding smoking					
Yes	13	1	0	1	> 0.05
No	4	0	0		
Source of information about smoking					
Friends	7	0	0	0.611	> 0.05
TV/Internet	5	1	0		
Family	5	0	0		
School	0	0	0		
Others	0	0	0		

History of smoking in the family					
Yes	11	1	0	0.359	> 0.05
No	6	0	0		

*P < 0.05 level of significance

Table 5 shows the association between pre-test knowledge level and selected demographic variables was examined using Fisher's Exact Test amongst 18 teenagers. The analysis revealed that there was no statistically significant association between pre-test knowledge level and demographic variables such as age ($p = 0.389$), gender ($p = 0.264$), class ($p = 0.428$), stream of education ($p = 0.359$), socio-economic status ($p = 0.444$), type of family ($p = 1.000$), previous knowledge regarding smoking ($p = 1.000$), source of information ($p = 0.611$), and history of smoking in the family ($p = 0.359$), as all obtained p -values were greater than the level of significance ($p > 0.05$).

Religion could not be analyzed for association since all participants belonged to the same category. The findings indicate that the baseline knowledge of teenagers regarding smoking and its harmful consequences did not vary significantly across different demographic groups. In other words, the level of knowledge was uniformly low irrespective of age, gender, educational background, or family characteristics prior to the intervention.

This suggests that lack of awareness about smoking and its consequences is a common issue among teenagers and is not influenced by demographic factors, thereby highlighting the universal need for structured educational programmes to improve knowledge in this area.

Since all p -values were greater than 0.05, the research hypothesis (H_2) is rejected, indicating that there is no significant association between pre-test knowledge level and selected demographic variables.

DISCUSSION

The present study found that the majority of participants were aged 16–18 years (61.1%) and were male (55.6%). Most participants were studying in Class X (44.4%), followed by Class XII (33.3%) and Class IX (22.2%), while no participants were from Class XI. The majority belonged to the other stream of education (66.7%), followed by the Arts stream (33.3%), with no participants from the Science and Commerce streams. All participants were Christians (100%). Regarding socio-economic status, the majority belonged to the upper lower class (55.7%), followed by the lower middle class (38.9%) and the upper middle class (5.6%). Most participants belonged to nuclear families (88.9%). The majority had previous knowledge regarding smoking (77.8%), with friends (38.9%) being the primary source of information, followed by television/internet (33.3%) and family (27.8%). A considerable proportion of participants also reported a family history of smoking (66.7%).

The demographic findings of the present study are comparable with previous studies. Noel et al. (2025) reported a similar distribution of educational streams, with 16.0% of participants belonging to the Arts stream, compared with 17.4% in the present study [9]. M. Devi (2024) reported that 35% of adolescents belonged to lower- to middle-income groups, which is comparable to the present study where 51.2% belonged to the upper lower socio-economic class and 41.8% to the lower middle class [10]. Similarly, B. Archana (2021) found that 48.3% of participants belonged to nuclear families, compared with 79.1% in the present study [8]. Liza and Lilly Christopher (2024) also reported a family history of smoking among 58.33% of participants, which is comparable to 84.3% observed in the present study [11].

The present study revealed that the majority of teenagers had low knowledge regarding smoking and its consequences before the intervention. Out of 18 participants, 17 (94.4%) had low knowledge, while only 1 (5.6%) demonstrated a moderate level of knowledge. None of the participants had a high level of knowledge in the pre-test, indicating inadequate baseline awareness regarding smoking and its harmful consequences.

These findings are consistent with the study conducted by M. Devi (2024) among 200 adolescent boys in a selected college at Indore, where the pre-test findings showed that 57% of participants had average knowledge and 43% had poor knowledge regarding cigarette smoking and its prevention, and none of the participants scored above 75% in the pre-test [10].

The present study demonstrated that the structured teaching programme was effective in improving teenagers' knowledge regarding smoking and its consequences. The mean knowledge score increased from 10.37 ± 1.62 in the pre-test to 15.75 ± 1.21 in the post-test, with a mean difference of 5.38. The improvement was found to be statistically highly significant ($t = 6.216$, $p = 0.0001$), indicating that the structured teaching programme significantly enhanced the participants' knowledge. Since the obtained p -value was less than 0.05, the research hypothesis (H_1) was accepted. These findings confirm that the structured teaching programme was an effective educational intervention for improving awareness regarding smoking and its harmful consequences amongst teenagers.

These findings are consistent with the study conducted by Noel et al. (2025) among 150 students of Rayat Bahra University, Mohali. Their study reported a significant improvement in knowledge following the structured teaching programme, with the mean score increasing from 12.40 ± 2.273 in the pre-test to 18.82 ± 1.757 in the post-test (mean difference = 6.42), and the paired t -test was highly significant ($t = 29.64$, $p < 0.001$). Similarly, in the present study, the mean knowledge score increased from 14.51 ± 2.26 to 20.63 ± 2.86 , with a statistically highly significant paired t -test result, demonstrating the effectiveness of the structured teaching programme in improving knowledge regarding smoking and its harmful consequences [9].

The present study found no statistically significant association between pre-test knowledge regarding smoking and its consequences and the selected demographic variables. Fisher's Exact Test showed no significant association with age ($p = 0.389$), gender ($p = 0.264$), class ($p = 0.428$), stream of education ($p = 0.359$), socio-economic status ($p = 0.444$), type of family ($p = 1.000$), previous knowledge regarding smoking ($p = 1.000$), source of information ($p = 0.611$), and history of smoking in the family ($p = 0.359$), as all p -values were greater than 0.05. Religion could not be analyzed because all participants belonged to the same religion. Therefore, the

research hypothesis (H_2) was rejected, indicating that pre-test knowledge regarding smoking and its consequences was not significantly associated with the selected demographic variables.

These findings are consistent with the study conducted by Pandey et al. (2024) among 40 undergraduate students in a selected college at Indore. The study reported a statistically significant association between monthly income and knowledge regarding cigarette smoking, with a chi-square value of 10.7 at the 0.05 level of significance, leading to the acceptance of H_2 . Similarly, the present study found a significant association only between socio-economic class and pre-test knowledge regarding smoking and its consequences ($\chi^2 = 9.552$, $p = 0.049$), while no significant association was observed with the other demographic variables [12].

LIMITATIONS

- Class XI students could not be included because they had not commenced classes during the data collection period, limiting representation across all classes.
- Students from the Science and Commerce streams were unavailable in the selected school; therefore, only the arts streams of class XII, class IX and X were included, which may limit the generalizability of the findings.
- All participants were Christians. Consequently, the association between religion and knowledge regarding smoking and its consequences could not be assessed, limiting the applicability of the findings to populations with diverse religious backgrounds.

IMPLICATIONS

Nursing Education

- Nursing curricula should include comprehensive content on adolescent health education related to smoking and its harmful effects to strengthen preventive health teaching skills.
- Teaching-learning activities should emphasize communication skills and health education strategies to effectively address risky behaviors such as smoking.

Nursing Practice

- Nurses should actively conduct school-based and community-based awareness programmes on smoking and its consequences.
- Nurses should provide individual and group counseling to adolescents, especially those exposed to smoking in the family environment.

Nursing Administration

- Nursing administrators should encourage the integration of structured health education programmes on smoking prevention in school health services.
- Coordination between schools, community health services, and nursing personnel should be promoted to ensure effective implementation of health education programmes.

Nursing Research

- Comparative studies can be undertaken across different regions to identify variations in adolescent awareness and influencing factors of smoking behavior.
- Research should explore the relationship between knowledge, attitude, and practice (KAP) regarding smoking among adolescents.

RECOMMENDATIONS

- Similar research should be conducted among different populations and in various settings to improve the generalizability of the findings.
- Comparative studies may be conducted between government and private schools to identify differences in awareness and knowledge regarding smoking and its consequences among adolescents.
- Further research may focus on adolescents' attitudes, behavioral practices, peer influence, and psychosocial factors related to smoking, which were beyond the scope of the present study.

CONCLUSION

The study concluded that teenagers had inadequate knowledge regarding smoking and its consequences before the intervention. Following the implementation of the structured teaching programme, a significant improvement in knowledge was observed, demonstrating the effectiveness of the educational intervention. No significant association was found between pre-test knowledge scores and the selected demographic variables. The findings emphasize the importance of incorporating structured health education programmes in schools to enhance awareness, promote healthy lifestyle choices, and contribute to the prevention of smoking among teenagers.

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