

A Study to Assess the Effectiveness of Structured Teaching Programme on Knowledge Regarding Prevention of Esophageal Cancer Among Adults in Selected Areas of Aizawl, Mizoram

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Abstract: *Background of the study:* Esophageal cancer is a distinct malignancy of the gastrointestinal tract comprising two major histopathologic types: squamous cell carcinoma and adenocarcinoma. Its occurrence varies globally depending on lifestyle, socioeconomic conditions, and environmental factors. Although the two types share some risk factors, several are unique to each type. *Methodology:* A quantitative study was conducted to assess the effectiveness of a structured teaching programme on knowledge regarding prevention of Esophageal cancer among adults in selected areas of Aizawl, Mizoram. A pre-experimental one-group pre-test post-test design was adopted. Using non-probability purposive sampling, data were collected from 100 adults through a structured questionnaire. *Results:* The mean pre-test knowledge score was 9.86, which increased to 16.86 in the post-test following the intervention. The paired t-test value ($t_{99} = 27.19$) was statistically significant at the 0.05 level, confirming the effectiveness of the structured teaching programme. Pre-test findings showed 74% had good knowledge, 16% poor, and 10% excellent knowledge. After the intervention, all participants (100%) achieved excellent knowledge scores. No significant association was found between pre-test scores and demographic variables except family history of cancer, which showed a significant relationship. *Conclusion:* The structured teaching programme effectively enhanced knowledge on Esophageal cancer prevention, emphasizing the importance of educational interventions.

Keywords: Effectiveness, structured teaching programme, knowledge, prevention, adults

1. Introduction

According to the American Cancer Society, “cancer is a group of diseases characterized by uncontrolled growth and spread of abnormal cells”. Changes in bowel motions, persistent coughing, unexplained weight loss, irregular bleeding, and lumps are all possible indications. These symptoms could be a sign of cancer, but they could also be caused by other conditions. ^[1]

Esophageal cancer is unique among the gastrointestinal tract malignancies because it embodies two distinct histopathologic types: squamous cell carcinoma and adenocarcinoma. Which type of cancer occurs in a given patient or predominates in a given geographic area depends on many variables, including individual lifestyle, socioeconomic pressures, and environmental factors. The epidemiology of esophageal cancer is defined by its substantial variability as a function of histologic type, geographic area, gender, race, and ethnic background. ^[2]

According to GLOBOCAN 2022, Esophageal cancer is the eleventh most commonly diagnosed cancer and is the seventh leading cause of cancer death worldwide. ^[3]

Nearly 80% of all occurrences of this malignant tumor occur in less developed locations, where the burden is notably higher. The incidence of esophageal cancer rises with age, and it is more common in middle-aged and older adults. The

incidence and mortality of esophageal cancer are rising quickly on a global scale due to aging and population expansion, as well as the prevalence of risk factors such as obesity, poor diet, lack of exercise, and alcohol and tobacco use. Esophageal cancer is extremely malignant and prognosis is often poor. ^[4]

1.1. Statement of the Problem

“A study to assess the effectiveness of structured teaching programme on knowledge regarding prevention of Esophageal cancer among adults in selected areas of Aizawl, Mizoram.”

1.2. Objectives of the study

- To assess the knowledge regarding prevention of Esophageal cancer among adults.
- To evaluate the effectiveness of structured teaching programme on knowledge regarding prevention of Esophageal cancer among adults.
- To find out the association between knowledge score and demographic variables among adults.

2. Review of Literature

The review of literature is organized under the following headings:

Studies related to the knowledge regarding Esophageal cancer

Cevik et al. ^[5] (2024) conducted a descriptive cross-sectional study among 688 Turkish undergraduate nursing students to assess their knowledge, risk factors, and preventive behaviors regarding esophageal cancer (EC). Data were collected through an online self-administered questionnaire over four months. The knowledge test demonstrated high reliability (Cronbach's alpha = 0.952). The mean age of participants was 20±1.86 years, and 70.8% were women. Most students reported no alcohol use (88.4%) or smoking (73.1%), and 88.5% maintained oral hygiene. Only 0.4% had a family history of EC, while obesity (10.2%) and vitamin deficiency (19.2%) were reported. Overall knowledge on EC risk factors was low (mean = 14.34±9.53/31). Higher knowledge scores were significantly associated with students who had EC-related complaints, vitamin deficiency, or HPV infection ($p < 0.05$). The study highlighted substantial knowledge gaps among nursing students, recommending curriculum enhancements to improve EC awareness and preventive practices.

Studies related to prevention of Esophageal cancer

Gerayllo et al. ^[6] (2019) conducted an exploratory mixed-method study in Golestan Province, Iran, to examine esophageal cancer prevention behaviors. The research was carried out in three phases: a qualitative phase involving semi-structured interviews with relatives of esophageal cancer patients; a literature review and development of a researcher-made questionnaire based on the Extended Parallel Process Model; and a quantitative quasi-experimental phase to test the effectiveness of a proposed self-care program. The study concluded that tailored educational interventions significantly improve self-care behaviors and access to effective preventive measures for esophageal cancer.

3. Methodology

3.1 Research approach

This study aimed to assess the effectiveness of structured teaching programme on knowledge regarding prevention of Esophageal cancer among adults.

In order to achieve the objectives of the study quantitative research approach was adopted for the study.

3.2 Research design

In this study, in order to meet the objectives of the study, pre-experimental one group pre-test post-test design was adopted in order to find out the effectiveness of structured teaching programme on knowledge regarding prevention of Esophageal cancer among adults.

3.3 Setting of the study

The present study was carried out in Edentharr and Hunthar local council areas of Aizawl, Mizoram, which were selected as the study settings for data collection.

3.4 Population

The study included permanent adult residents of Edentharr and Hunthar local council areas of Aizawl, Mizoram. This population was chosen to obtain relevant data for assessing the knowledge related to the research topic.

3.5 Sample

The sample for this study comprised adults who were 18 years of age and above who attended the Health Teaching Programme.

3.6 Sample size

The sample size for the present study consisted of 100 adults selected from Edentharr and Hunthar local council areas of Aizawl, Mizoram.

3.7 Sampling technique

Samples were selected using a non-probability purposive sampling technique.

3.8 Sampling criteria

The study included the following inclusion and exclusion criteria:

Inclusion criteria:

- Age group of 18 years and above who attended the Health Teaching Programme.
- Who were able to read and write Mizo language.

Exclusion criteria:

- Those who were already diagnosed with Esophageal cancer.

3.9 Variables

- **Independent variable:** Structured teaching programme on prevention of Esophageal cancer.
- **Dependent variable:** Knowledge regarding prevention of Esophageal cancer.
- **Demographic variables:** In this study, demographic variables are age, gender, educational status, occupation, monthly family income, family history of Esophageal cancer, family history of cancer, habits of smoking tobacco and habits of drinking alcohol.

3.10 Development of tool

For the purpose of data collection, a structured questionnaire was developed. The tool consisted of two parts: (i) a demographic proforma to collect personal and (ii) a structured knowledge questionnaire on prevention of Esophageal cancer to assess the participants' level of knowledge.

3.11 Reliability of tool

The reliability of the structured knowledge questionnaire was assessed using the split-half method. Karl Pearson's correlation between the two halves showed excellent internal consistency ($r = 0.9$). After applying the Spearman–Brown correction, the reliability coefficient increased to 0.935, confirming that the full tool is highly reliable for assessment.

3.12 Ethical consideration

The following measures were taken for addressing ethical issues and establishment of ethical considerations:

- Ethical approval from Institutional Ethics Committee, Regional Institute of Paramedical and Nursing Sciences (RIPANS) on 25th February 2025.
- Administrative approval from the respective Senior Chief Medical Officer, Aizawl East and West, Mizoram on 20th August 2025 and 28th August 2025 respectively to conduct the study at Edenthair and Hunthar local council area of Aizawl, Mizoram.
- Written informed consent from each participant.
- Maintaining confidentiality of personal information and anonymity of the participants.

3.13 Data Collection Procedure

Ethical clearance was obtained from the Institutional Ethics Committee of RIPANS, and permission was granted by the Senior Chief Medical Officers of Aizawl East and West. Data collection took place on the 4th, 10th, and 11th of September 2025. Using non-probability purposive sampling, 100 adult participants were selected based on the set criteria. The researcher introduced herself, explained the purpose of the study, and obtained written informed consent from each participant. A pre-test was then administered using a demographic proforma and a structured knowledge questionnaire. Immediately after the pre-test, a structured teaching programme was delivered, followed by a post-test using the same tool to evaluate its effectiveness. The researcher expressed gratitude to the participants at the end of the session.

3.14 Plan for data analysis

The collected data will be analyzed according to the study objectives using both descriptive and inferential statistics. Descriptive statistics such as frequency, percentage, mean, median, and standard deviation will be used to summarize the demographic variables and assess participants' knowledge on prevention of Esophageal cancer. Inferential statistics will include the paired t-test to determine the effectiveness of the structured teaching programme and the chi-square test to identify any association between knowledge scores and selected demographic variables.

4. Results

The collected data were tabulated, analyzed and interpreted by using descriptive and inferential statistics. The data are organized and presented under the following headings:

Section I: Description of frequency and percentage distribution of the demographic variables of adults.

Table 1: Frequency and percentage distribution of the demographic variables

n=100

Sl. No	Demographic Variables	Frequency (f)	Percentage (%)
1	Age (in years): a. 18-28 b. 29-39 c. 40-50 d. 51-60 e. 61-70 f. ≥ 71	20 18 26 17 12 7	20 18 26 17 12 7
2	Gender: a. Male b. Female	23 77	23 77
3	Educational qualification a. Illiterate b. Class 12 and below c. Graduate and above	0 95 5	0 95 5
4	Occupation a. Government job b. Private job c. Self employed d. Unemployed	4 10 19 67	4 10 19 67
5	Monthly family income a. $\leq 10,000$ b. 10,001-30,000 c. 30,001-50,000 d. 50,001-70,000 e. 70,001- 90,000 f. $>90,000$	38 34 10 7 4 7	38 34 10 7 4 7
6	Family history of Esophageal cancer a. Yes b. No	20 80	20 80
7	Family history of cancer a. Yes b. No	41 59	41 59
8	Habits of smoking tobacco a. Yes b. No c. Occasional	37 54 9	37 54 9
9	Habits of drinking alcohol a. Yes b. No c. Occasional	7 89 4	7 89 4

The demographic data in table 1 reveals important characteristics of the study participants. In terms of age distribution, the majority were within the 40–50 years age group (26%), followed by those aged 18–28 years (20%) and

29–39 years (18%), while smaller proportions were aged 51–60 years (17%), 61–70 years (12%), and only 7% were above 71 years. This shows that most respondents were in the middle-aged group, which is considered a vulnerable period for lifestyle-related diseases including cancer. Regarding gender, the sample was predominantly female (77%), with only 23% males, indicating that women formed the larger proportion of the study group. In terms of educational qualification, the majority had education up to class 12 or below (95%), only 5% were graduates and above, and none were illiterate. This suggests that while most had basic education, higher educational attainment was limited.

In terms of occupation, most participants were unemployed (67%), while only 19% were self-employed, 10% worked in private jobs, and a small minority (4%) were in government jobs. This highlights the limited economic activity and dependency on others for livelihood. The income distribution further reflects this, as a large number of families had a monthly income of ≤10,000 (38%) or 10,001–30,000 (34%), whereas fewer participants belonged to higher income categories such as 30,001–50,000 (10%), 50,001–70,000 (7%), 70,001–90,000 (4%), and above 90,000 (7%). Overall, this suggests that most participants came from low socioeconomic backgrounds.

Regarding family history, only 20% reported a family history of Esophageal cancer, while 80% did not. However, 41% had a family history of cancer (other than Esophageal cancer), indicating a significant proportion with genetic or familial predisposition to malignancies. Lifestyle habits revealed that 37% of participants smoked tobacco, 54% did not smoke, and 9% reported occasional smoking. Similarly, regarding alcohol consumption, 7% consumed alcohol regularly, 4% occasionally, while the majority (89%) abstained. This indicates that while the majority avoided high-risk habits, tobacco use still constituted a major concern in over one-third of participants.

In conclusion, the study population consisted mainly of middle-aged, unemployed women with low income and moderate education levels. Although only a small percentage had a direct family history of Esophageal cancer, a notable proportion had a general family history of cancer. Furthermore, the presence of lifestyle risk factors such as tobacco smoking (37%) and alcohol use (11% total) highlights the need for targeted health education and preventive strategies.

Section II: Description of pre-test and post-test knowledge score regarding prevention of Esophageal cancer among adults.

Table 2: Frequency and Percentage Distribution of pre-test and post-test knowledge score regarding prevention of Esophageal cancer among adults

n=100

Range of knowledge score	Level of knowledge	Pre-test		Post-test	
		Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
0-6	Poor	16	16	0	0
7-13	Good	74	74	0	0
14-20	Excellent	10	10	100	100

Table 2 presents the frequency and percentage distribution of knowledge scores regarding prevention of Esophageal cancer among adults. In the pre-test, it was observed that the majority of participants (74%) demonstrated a good level of knowledge, while 16% had poor knowledge and only 10% showed excellent knowledge. However, after the administration of the teaching programme, the post-test

results revealed a remarkable improvement. All participants (100%) achieved an excellent level of knowledge, and none were found in the poor or good categories. This clearly indicates that the teaching programme was highly effective in enhancing the knowledge level of the participants, as evidenced by the significant shift from poor and good categories to excellent in the post-test.

Table 3: Range, mean, median and standard deviation of pre-test and post-test knowledge scores

n=100

Knowledge score	Range	Mean	Median	Standard Deviation
Pre-test	0-14	9.86	11	3.67
Post-test	14-20	16.86	17	1.72

Table 3 displays the statistical improvement in knowledge among participants (n=100) following an educational intervention. In the pre-test, the knowledge scores ranged between 0-14, with a mean score of 9.86, a median of 11, and a standard deviation of 3.67, indicating varied levels of understanding among participants. However, after the intervention, the post-test scores improved considerably, ranging between 14-20, with a higher mean score of 16.86, a median of 17, and a reduced standard deviation of 1.72, showing that participants not only gained knowledge but also had more consistent performance. These findings highlight

both improved knowledge and reduced variability, underscoring the programme's effectiveness.

Section III: Effectiveness of structured teaching programme on knowledge regarding prevention of Esophageal cancer among adults.

In order to find the statistical significance between the mean pre-test and post-test knowledge scores, the research hypothesis was stated at 0.05 levels of significance as:

H₁: There is a significant difference between the mean pre-test knowledge score and the mean post-test knowledge score regarding the prevention of Esophageal cancer.

Table 4: Paired Samples Test of pre-test and post-test knowledge scores on prevention of Esophageal cancer

n=100

Knowledge score	Mean	SD	Mean D	t value	df	p value
Pre-test	9.86	3.67	7.0	27.19	99	<0.001*
Post-test	16.86	1.72				

*p<0.05 level of significance

The data presented in table 4 showed a significant improvement in the knowledge level of participants after the intervention. In the pre-test, the participants obtained a mean knowledge score of 9.86 with a standard deviation (SD) of 3.67, indicating that their baseline knowledge regarding prevention of Esophageal cancer was relatively low and varied among individuals. After the structured teaching programme, the mean post-test knowledge score increased markedly to 16.86, with a standard deviation of 1.72, showing not only an overall gain in knowledge but also a more consistent level of understanding across participants. The mean difference between pre-test and post-test scores was 7.0, reflecting a substantial improvement. The calculated t-value of 27.19 at 99 degrees of freedom yielded a p-value < 0.001, which is well below the 0.05 level of significance. This confirms that the improvement in knowledge scores was not due to chance but was a direct effect of the intervention. Hence, the research hypothesis was accepted and it is concluded that there is a statistically significant difference between the pre-test and post-test knowledge scores.

Therefore, the analysis provides strong statistical evidence that the structured teaching programme was effective in significantly enhancing participants' knowledge about the prevention of Esophageal cancer. The substantial improvement in post-test scores highlights the impact of educational interventions in promoting awareness and preventive health behaviors.

Section IV: Association between the pre-test level of knowledge regarding prevention of Esophageal cancer among adults with demographic variables.

To find the association of pre-test knowledge level on prevention of Esophageal cancer with demographic variables, the research hypothesis was stated at 0.05 levels of significance as:

H₂: There is a significant association between knowledge on prevention of Esophageal cancer and demographic variables among adults.

Table 5: Association between the pre-test level of knowledge regarding prevention of Esophageal cancer among adults with demographic variables

n=100

Demographic variables	Pre-test knowledge			χ^2 value	p value
	Poor	Good	Excellent		
Age (in years)				13.43	0.197 ^{NS}
a. 18-28	1	16	3		
b. 29-39	1	17	0		
c. 40-50	6	15	5		
d. 51-60	3	12	2		
e. 61-70	3	9	0		
f. ≥ 71	2	5	0		
Gender:				0.287	0.866 ^{NS}
a. Male	3	18	2		
b. Female	13	56	8		
Educational qualification				1.394	0.498 ^{NS}
a. Illiterate	0	0	0		
b. Class 12 and below	16	70	9		
c. Graduate and above	0	4	1		
Occupation				5.748	0.452 ^{NS}
a. Government job	1	2	1		
b. Private job	1	7	2		
c. Self employed	2	17	0		
d. Unemployed	12	48	7		
Monthly family income				10.88	0.367 ^{NS}
a. $\leq 10,000$	7	28	3		
b. 10,001-30,000	7	23	4		
c. 30,001-50,000	0	9	1		
d. 50,001-70,000	0	7	0		
e. 70,001- 90,000	0	4	0		
f. $>90,000$	2	3	2		
Family history of Esophageal cancer				2.299	0.317 ^{NS}
a. Yes	1	17	2		
b. No	15	57	8		

Family history of cancer					
a. Yes	3	31	7	6.775	0.034*
b. No	13	43	3		
Habits of smoking tobacco					
a. Yes	5	29	3	2.092	0.719 ^{NS}
b. No	9	38	7		
c. Occasional	2	7	0		
Habits of drinking alcohol					
a. Yes	0	6	1	3.239	0.519 ^{NS}
b. No	16	65	8		
c. Occasional	0	3	1		

* $p < 0.05$ level of significance

NS-Non significance

Table 5 presents the association between demographic variables and pre-test knowledge scores on the prevention of Esophageal cancer, analyzed using the chi-square test. The findings showed that most demographic variables, including age, gender, educational qualification, occupation, monthly family income, family history of Esophageal cancer, smoking, and alcohol habits, had no statistically significant association with knowledge levels, as their p-values were greater than 0.05. This indicates that these factors did not significantly influence baseline knowledge among participants. However, family history of cancer showed a significant association with pre-test knowledge scores ($\chi^2 = 6.775$, $df = 2$, $p = 0.034$), suggesting that participants with a general family history of cancer had higher awareness regarding Esophageal cancer prevention. Therefore, the research hypothesis was accepted for family history of cancer and rejected for all other demographic variables. Overall, the findings emphasize that personal or familial exposure to cancer plays a greater role in shaping awareness than socio-demographic or lifestyle factors.

5. Discussion

The present study revealed a significant statistical improvement in knowledge among participants ($n=100$) following an educational intervention. In the pre-test, most participants (74%) had a good level of knowledge, while 16% showed poor and only 10% had excellent knowledge regarding prevention of Esophageal cancer. After the structured teaching programme, there was a marked improvement, with 100% of participants achieving an excellent level of knowledge. Statistically, the mean score increased from 9.86 to 16.86, the median rose from 11 to 17, and the standard deviation reduced from 3.67 to 1.72, reflecting both improved and more consistent knowledge levels. These results confirm the effectiveness of the teaching programme in significantly enhancing participants' knowledge.

The results of this study are supported by the following research:

Mirzaei et al. [7] (2016) conducted a quasi-experimental study in Salas Babajani, Kermanshah, Iran, to assess the effectiveness of an educational campaign based on the Theory of Planned Behavior (TPB) in reducing hot tea consumption, a risk factor for esophageal squamous cell carcinoma, among 130 primary-school female students. The two-month intervention combined mass media approaches (posters, pamphlets, brochures) with small group and

individual activities, and included five 40-minute instructional sessions for students and one session for parents and teachers. Results showed significant improvements in the intervention group. Attitude scores decreased from 16.46 ± 2.64 to 7.00 ± 4.22 , perceived behavioral control increased from 23.8 ± 5.07 to 30.23 ± 7.82 , behavioral intention rose from 9.90 ± 2.88 to 12.29 ± 2.65 , and hot tea consumption decreased from 2.54 ± 1.03 to 1.80 ± 0.93 . Correlation analysis revealed positive changes in attitude and negative correlations in subjective norms with hot tea consumption, highlighting the influence of social expectations on behavior. The study demonstrates that structured, theory-based educational interventions effectively enhance knowledge, influence attitudes, strengthen intentions, and promote preventive behaviors to reduce esophageal cancer risk.

Gerayllo et al. [8] (2020) designed a theory-based educational intervention to improve knowledge, perceptions, and self-care practices among relatives of esophageal cancer patients in Golestan Province, Iran. The study was conducted in two phases. In the first phase, a researcher-made questionnaire based on the Extended Parallel Process Model (EPPM) was developed using literature review and expert opinions to assess participants' knowledge, perceptions, and practices regarding esophageal cancer. Based on these findings, a comprehensive educational program was created. In the second phase, a pretest–posttest randomized controlled trial was conducted with 100 participants selected by convenience sampling. The intervention group received the educational program, while the control group received no intervention. Findings indicated that the intervention effectively enhanced knowledge, modified perceptions, and improved self-care behaviors. This theory-based, multi-component intervention addresses multiple factors affecting personal self-care, promotes preventive behaviors, and is expected to reduce the incidence and burden of esophageal cancer in the community.

6. Conclusion

The study concluded that the structured teaching programme was highly effective in enhancing adults' knowledge regarding the prevention of Esophageal cancer. While most socio-demographic variables such as age, gender, education, occupation, income, and lifestyle habits showed no significant association with baseline knowledge, personal and familial experiences with cancer significantly influenced participants' awareness. The marked improvement in post-test knowledge scores demonstrates that targeted health education interventions can effectively increase

understanding and promote preventive practices. These findings emphasize the importance of implementing structured health education programmes in the community, particularly for individuals with no prior exposure to cancer, to improve knowledge and encourage proactive preventive behaviors.

7.Recommendations

On the basis of the findings, the following recommendations are suggested:

- The study can be replicated on a larger sample so that the findings can be generalized to a wider population.
- A comparative study can be conducted between different communities within Aizawl and outside Aizawl to assess knowledge regarding the prevention of Esophageal cancer.
- Similar studies can be carried out using other teaching methods such as information booklets, pamphlets, or video-based structured teaching programmes.
- A study can be conducted using a true experimental research design with control and experimental groups to evaluate the effectiveness of structured teaching programmes more rigorously.
- A follow-up study can be conducted to evaluate changes in attitudes, practices, and lifestyle behaviors regarding Esophageal cancer prevention after knowledge enhancement.

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