

A pre-experimental study to evaluate the effectiveness of a structured teaching program on knowledge regarding prevention of Dengue Fever among residents of a selected rural area in Prayagraj

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Abstract

This study aimed to assess the impact of a Structured Teaching Program (STP) on people's awareness of dengue fever prevention in a rural area Akbarpur Prayagraj. **Methods:** A pre-experimental study with one group pre-test and post-test design was conducted in Akbarpur Prayagraj. A total 60 samples were selected using convenience sampling. A structured knowledge questionnaire was used to assess the knowledge before and after the intervention. The structured teaching program focuses on introduction, causes, prevalence rate, risk factor, prevention of dengue fever. **Results:** The results of the study reveal that the increase knowledge of Akbarpur population improved after the intervention. In the pre-test mean score was 15.983 ± 3.961 , which dropped to 17.283 ± 4.877 post-intervention. This decrease was statistically highly significant, as confirmed by the p value pre-test (007016) and post-test (004301), Indicating a significant improvement in overall knowledge.

Keywords: pre-experimental study, Assess, effectiveness, structured teaching method knowledge, prevention, dengue fever, among residents, selected rural area.

1. Introduction

In recent years, Dengue Fever has shown a rising trend, posing serious health risks in developing countries including India. Dengue fever is a mosquito-borne viral disease primarily transmitted by infected Aedes Mosquito and remains a persistent public health challenge in India and other tropical regions. The disease

is characterized by periodic outbreaks and an increasing incidence rate. Despite the availability of various control strategies, low levels of community awareness and inadequate knowledge regarding dengue prevention often hinder efforts to reduce its spread. Therefore, adequate community knowledge regarding dengue transmission, symptoms, and preventive measures is essential for effective disease control, particularly in areas with limited access to health resources.

The increasing burden of Dengue Fever is supported by global health data from the World Health Organization, which identifies dengue as one of the fastest-spreading mosquito-borne diseases worldwide. Over the past five decades, its incidence has risen significantly, with an estimated 50–100 million infections occurring annually and nearly half of the global population living in endemic areas. The Asia-Pacific region carries a major share of this risk, where dengue outbreaks lead to considerable human suffering, strain on healthcare systems, and economic losses.¹

Neeti et al. (2025) conducted a community-based cross-sectional descriptive study to assess the *knowledge, attitude, and practices (KAP)* related to dengue prevention among 632 adults aged 18–60 years living in eight rural villages of Gautam Buddha Nagar district, Uttar Pradesh. A pre-tested semi-structured interview schedule covering socio-demographic characteristics, knowledge about dengue transmission and symptoms, attitudes toward disease risk, and preventive practices was administered through face-to-face interviews. The study revealed substantial gaps in awareness and practices: only 53.3 % of respondents agreed that dengue is a preventable disease, and 50.2 % would delay seeking medical care for more than 24 hours after symptom onset, indicating delayed health-seeking behavior. While a majority (88 %) reported using mosquito nets during the day, other comprehensive preventive measures such as repellents, protective clothing, and consistent environmental control were less frequently adopted. The research also identified illiteracy, low income, and lack of prior dengue-related information as independent predictors of poor knowledge, negative attitudes, and inadequate preventive practices through logistic regression analysis.¹⁰

Dayananda and Rajrani et.al. (2024) conducted a pre-experimental one-group pre-test–post-test study to assess the effectiveness of a structured teaching program (STP) on *mothers' knowledge regarding prevention of dengue fever in children* in paediatrics wards at a hospital in Tumkur, India. A convenient sample of 60 participants was selected, and data were collected using a structured interview schedule with 30 items. After administering a pre-test, researchers delivered the STP and reassessed knowledge after a 7-day interval. The findings revealed that the mean post-test knowledge score (77.78 %) was substantially higher than the mean pre-test score (59.61 %), and the calculated *t* value (6.59) was greater than the tabulated value ($t_{59} = 2.02$ at $p < 0.05$), indicating a statistically significant improvement in knowledge following the intervention. Additionally, chi-square analysis showed significant associations between post-test knowledge and variables such as place of residence and father's education.¹⁵

Shara Nuzila Ramadhani et.al. (2020) Dengue Hemorrhagic Fever (DHF) is a zoonotic disease that is most wary because the cases reported by WHO increased quite drastically from 2.4 million cases to 5.2 million cases in 2010-2019 globally. In 2020, the DHF rate increased by 953,476, and the majority occurred in tropical countries. In response to this, WHO emphasized that climate and weather variables can play an important role in predicting the DHF outbreak. This article was written to find out the impact of climate change on the incidence of DHF. Amount 11 articles related to the title have been selected as literacy materials.³³

MS Pedrosa et. al. (2017) The focus on oral manifestations of dengue fever (DF) is not common in the scientific literature and the patient affected can present signs and symptoms that may not be noticed by dental professionals. This systematic review article was conducted to identify and discuss the oral manifestations related to DF. The electronic databases PubMed, Latin American and Caribbean Literature in Sciences (LILACS), Web of Science and Scopus were searched from November to December 2016 by two authors, simultaneously, using the search terms ‘dengue and oral manifestation’ combined. We included complete original articles, clinical trials and clinical case reports published in Portuguese, Spanish and English. No limits were applied to the year of publication. Review articles and those with no health outcomes were removed. A limited number of studies aimed to investigate the oral manifestations of DF (N = 25). In conclusion, oral manifestations may represent a relevant contributory factor to identify DF disease among patients undergoing dental procedures in general practice.³⁵

With a sharp rise in occurrence in recent decades, dengue fever remains a major global public health concern. Dengue fever remains one of the most pressing global public health challenges, with its incidence rising sharply in recent decades. The World Health Organization (WHO, 23 April 2023) reports that while most infected individuals experience mild symptoms or recover within 1–2 weeks, severe cases can be life-threatening, causing persistent vomiting, abdominal pain, rapid breathing, bleeding, and extreme fatigue. In 2024, over 14.6 million cases and more than 12,000 deaths were reported worldwide, though actual numbers are likely higher due to under-reporting and asymptomatic infections.⁶

The disease is primarily transmitted by *Aedes aegypti* mosquitoes, which breed in urban and peri-urban environments, particularly in man-made containers. These mosquitoes bite multiple people during feeding periods, mainly in early morning and late afternoon, and infected humans serve as sources for further virus transmission. Urbanization, climate change, and increased human mobility have expanded the mosquito’s range, heightening the risk of dengue outbreaks in both urban and rural communities.⁷

Successful dengue control depends not only on medical management but also on active community involvement. The National Centre for Vector Borne Diseases Control (NCVBDC), Ministry of Health & Family Welfare, India, emphasizes that sustainable prevention requires local participation in environmental management, elimination of breeding sites, personal protection measures, and timely healthcare-seeking behaviours. Persistent knowledge gaps and low preventive practices in rural areas limit the effectiveness of control programs.⁸

OBJECTIVES

1. To assess the knowledge regarding dengue fever among residents of a selected rural areas in Prayagraj.
2. To develop and implement a structured teaching program on dengue fever among residents of a selected rural area in Prayagraj
3. To evaluate the effectiveness of the structured teaching program in improving knowledge about dengue fever among residents of a selected rural areas in Prayagraj.
4. To compare the pre-test and post knowledge scores regarding prevention of dengue fever among residents of a selected rural area in Prayagraj.

HYPOTHESIS:

H₀: There will be no significant score of is pre - test and post - test knowledge regarding prevention of dengue fever.

H₁: There will be a significant difference between the pre-test and post-test scores on the knowledge regarding prevention of dengue fever.

H₂: There will be a significant association between the pre-test and post-test scores knowledge regarding prevention of dengue fever among residents of a selected rural area in Prayagraj.

VARIABLES UNDER STUDY

“According to pilot and Hungler (1999) a variable is a quality or characteristic of a group, organization, or situation that can take different values”

INDEPENDENT VARIABLES

The independent variables are the condition or characteristic that the structured teaching program regarding the prevention of dengue fever among residents of a selected rural area Akbarpur, Prayagraj.

In the present study the independent variables was a **structured teaching program**

- This is the variable that (the researcher group) apply in the study
- It refers to the planned educational intervention given into the selected population to improve their knowledge.

DEPENDENT VARIABLES

The dependent variable or the condition or characteristic that appear this appear or change as the experimenter introduce remove or changes the independent variables.

In the present study, the dependent variable was **knowledge regarding the prevention of dengue fever.**

- This is the outcome or result **measure.**
- It refers to the level of understanding or awareness the population have about a dengue fever and its impact on health before and after the structured teaching program.

DEMOGRAPHIC VARIABLES: There are an age, gender, religion, family type, education, occupation, marital status, housing condition, water source, sanitation, mosquito preventive measures and environmental condition.

SAMPLING CRITERIA

The following criteria are set to selected samples

INCLUSION CRITERIA

The inclusion criteria for the present study were as follows:

- Residents of Akbarpur, Prayagraj who were available during the period of data collection.

- Residents who were willing to participate in the study.
- Residents aged 18 years and + above.
- Residents who were able to understand and respond to the structured questionnaire.
- Residents who were present at the time of pre-test, structured teaching programme, and post-test.
- Residents who could communicate in Hindi/English.

EXCLUSION CRITERIA:

The exclusion criteria for the present study were as follows:

- Residents who were not available at the time of data collection.
- Residents who were not willing to participate in the study.
- Residents who had previously attended any structured teaching programme or formal training related to prevention of dengue fever.

METHODOLOGY

In this study the researcher has used quantitative research approach. A quantitative research approach is used to find out the effectiveness of a structured teaching program on knowledge regarding prevention of dengue fever among residents of Akbarpur Prayagraj. **non-probability convenience sampling technique** was used. The residents who fulfilled the inclusion criteria and were easily available at the time of data collection were selected for the study.

ORGANISATION OF THE FINDINGS:

This chapter dealt with the interpretation of data collection, description of sample and objectives of the study. The collected data are represented as below. The data collection was organized under the following sections:

- **Section A:** association between the pretest level of knowledge and demographic variables.
- **Section B:** Chi-Square Analysis Showing the Association Between Pre -Test and Post- Test Level of Knowledge Score Showing The Effectiveness of the Structured Teaching Program

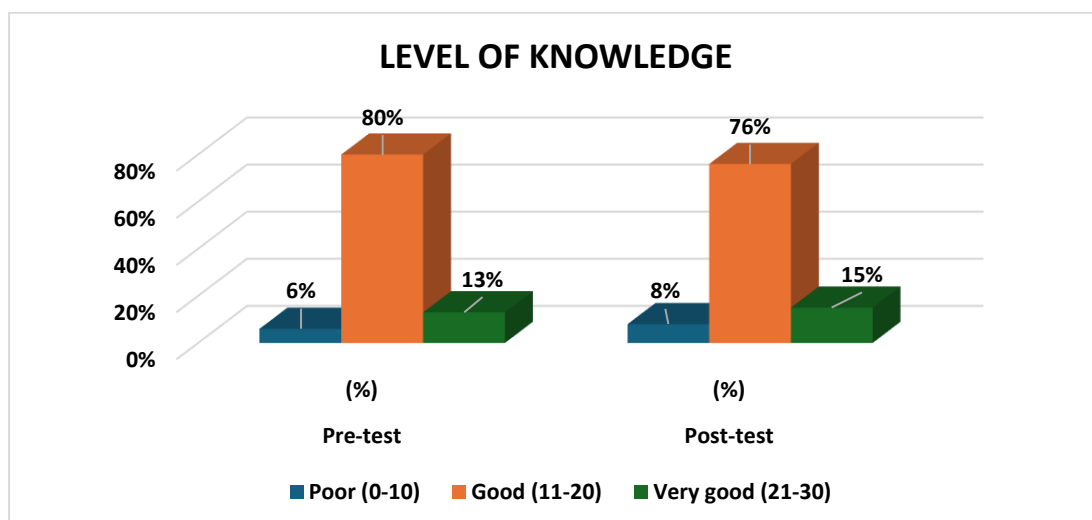
SECTION- A

Association between the pretest level of Knowledge and Demographic Variables

Level of Knowledge	Pre-test Frequency(n=60)	Pre-test (%)	Post-test Frequency (%)	Post-test (%)
Poor (0-10)	4	6%	5	8%
Good (11-20)	48	80%	46	76%
Very good (21-30)	8	13%	9	15%
Total	60	100%	60	100%

Distribution and frequency of samples based on pre-test and post-test level of knowledge regarding prevention of dengue fever rural area Akbarpur Prayagraj.

3-D Clustered column Chart showing the frequency of and percentage of samples based on pre-test and post-test level of knowledge regarding prevention of dengue fever rural area Akbarpur Prayagraj. Out of 60 samples, pre – test assessment revealed the highest proportion with poor knowledge (6%, n=4), Good knowledge (80%, n=48), and very good knowledge (13%, n=8). Post - test results demonstrated the level of knowledge about dengue fever, poor knowledge (8%, n=5), good knowledge (76%, n=46) and very good knowledge (15%, n=9).



S.NO.	Test phase	Mean score	Standard Deviation	P Value
1	Pre-test	15.983	3.961	007016
2	Post-test	17.283	4.877	004301

Comparison of Mean Pre-Test and Post-Test Score

Comparison of Mean Pre-Test and Post-Test Scores(N=60) Among the 60 samples, pre-test knowledge of Dengue Fever levels did not show any significant association with age ($\chi^2=1.609$, P=951), gender ($\chi^2=9.919$, P=007016), Religion($\chi^2=0.01$, P=985),Family type($\chi^2=0.002$, P=989),Education($\chi^2=0.496$, P=997), occupation($\chi^2=7.867$, P=446), or marital status ($\chi^2=0.366$, P=999109), indicating that sociodemographic factors did not influence initial prevention of dengue fever .

SECTION- B

Chi-Square Analysis of pre and post-test for association between pre-test and post-test knowledge scores with their selected demographic variables

Chi-square analysis of pre-test

S.n.	Sociodemographic Variables	Percentage	Poor	good	Very good	Chi-square	DF	Inference
1 Age in year								
	a)18-25	20%	4	8	0	1.609	6	NS
	b)26-35	20%	0	9	3			
	c)36-45	30%	0	14	4			
	d)46-60 +Above	30%	1	16	1			
2 Gender								
	a) male	31.67%	3	12	4	9.919	2	S
	b) Female	68.33%	2	35	4			
3Religion								
	a) Hindu	90%	5	45	7	0.01	6	NS
	b) Muslim	6%	0	5	1			

	c)Sikh	0%	0	0	0			
	d)Christian	0%	0	0	0			
4 Family								
	a) joined	73.34%	3	35	6	0.002	2	NS
	b) nuclear	26.67%	2	12	2			
5 Education								
	a) Uneducated	0%	0	0	0	0.496	6	NS
	b) Primary education	43.34%	3	2S8	5			
	c) Middle education	30%	1	15	2			
	d) d)Graduate	10%	2	3	1			
6 Occupation								
	Farmer	48.34%	1	23	5	7.867	8	NS
	Labour	6.67%	0	8	2			
	Businessman	6.67%	1	3	0			
	Student	18.34%	3	7	1			
	Government employee	10%	0	5	0			
7 Marital Status								
	Married	60%	2	28	6	0.366	6	NS
	Unmarried	18.34%	4	6	1			
	Widower	16.67%	0	9	1			
	Divorcee	5%	0	3	0			

The tables reveal that socio-demographic variables of the respondents and their association with the level of outcome categorized as poor, good, and very good. The data were analyzed using descriptive statistics and the Chi-square test to determine the association between socio-demographic variables and the outcome. A p-value less than 0.05 was considered statistically significant.

1. The age of the respondents was categorized into four groups: 18–25 years, 26–35 years, 36–45 years, and 46–60 years and above. 20% of respondents belonged to the age group of 18–25 years, 20% were

in the age group of 26–35 years, 30% were between 36–45 years, 30% were 46–60 years and above. Most respondents in all age groups showed good to very good outcomes, with very few reporting poor outcomes. The calculated chi-square value was 1.609 with 6 degrees of freedom, which was not statistically significant (NS). There was no significant association between age and the level of outcome.

2. Gender distribution showed that. 31.67% were males, 68.33% were females, among males, a small number reported poor outcomes, while the majority had good or very good outcomes. Among females, a significantly larger proportion demonstrated good outcomes. The chi-square value was 9.919 with 2 degrees of freedom, which was found to be statistically significant (S). There was a significant association between gender and the level of outcome, indicating that gender influenced the outcome.
3. The respondents were categorized according to religion, Hindu – 90%, Muslim – 6%, Sikh – 0%, Christian (Isai) – 0%. Most respondents belonged to the Hindu religion and showed predominantly good outcomes. Very few Muslims were included, and none from Sikh or Christian communities. The chi-square value was 0.01 with 6 degrees of freedom, which was not statistically significant. Religion had no significant association with the level of outcome.
4. Based on family type: 73.34% belonged to joint families, 26.67% belonged to nuclear families. Both groups showed similar distributions in poor, good, and very good outcomes. The chi-square value was 0.002 with 2 degrees of freedom, which was not significant. There was no significant association between type of family and the level of outcome.
5. The educational status of respondents was classified as: Uneducated – 0%, Primary education – 43.34%, Middle education – 30%, Graduate – 10%. Most respondents had primary or middle education and showed good outcomes. Graduates were fewer in number and showed mixed outcomes. The chi-square value was 0.496 with 6 degrees of freedom, which was not statistically significant. Educational status did not show a significant association with the level of outcome.
6. The occupational distribution was as follows: Farmer – 48.34%, Labour – 6.67%, Businessman – 6.67%, Student – 18.34%, Government employee – 10%. Farmers formed the majority and mostly had good outcomes. Other occupational groups showed varied results. The chi-square value was 7.867 with 8 degrees of freedom, which was not statistically significant. Occupation was not significantly associated with the level of outcome.
7. Marital status of respondents showed: Married – 60%, Unmarried – 18.34%, Widower – 16.67%, Divorcee – 5%. Married respondents predominantly showed good outcomes. Other categories had smaller sample sizes with mixed outcomes. The chi-square value was 0.366 with 6 degrees of freedom, which was not statistically significant. There was no significant association between marital status and the level of outcome.

Chi-square Analysis of post test

S.no.	Sociodemographic Variables	Percentage	poor	good	Very good	Chi-square	DF	Inference
1	Age in year					0.426	6	NS
	18-25	20%	2	7	3			
	26-35	20%	2	8	2			
	36-45	30%	0	17	1			
	46-60 +Above	30%	1	15	2			
2Gender								
	Male	31.67%	2	10	7	10.898	2	S
	Female	68.33%	3	37	1			
3 Religion								
	Hindu	90%	5	43	6	2.64	6	NS
	Muslim	6%	0	4	2			
	Sikh	0%	0	0	0			
	Christian	0%	0	0	0			
4 Family								
	Joined	73.34%	4	38	2	0.217	2	NS
	Nuclear	26.67%	1	9	6			
5 Education								
	Uneducated	0%	0	0	0	0.494	6	NS
	Primary education	43.34%	3	30	3			
	Middle education	30%	2	12	4			
	Graduate	10%	0	5	1			
6 Occupation								
	Farmer	48.34%	2	22	5	15.847	8	S
	Labour	6.67%	1	8	1			
	Businessman	6.67%	2	2	0			

	Student	18.34%	0	9	2			
	Government Employee	10%	0	6	0			
7 Marital Status								
	Married	60%	4	28	4	0.224	6	NS
	Unmarried	18.34%	0	9	2			
	Widower	16.67%	1	7	2			
	Divorcee	5%	0	3	0			

Chi-square Analysis of post test

This table depicts the association between selected socio-demographic variables and the level of outcome categorized as poor, good, and very good. The association was tested using the Chi-square test, and the findings are interpreted as statistically significant (S) or not significant (NS).

1. The respondents were divided into four age groups: 18–25, 26–35, 36–45, and 46–60 years and above. 20% of respondents were in the age group of 18–25 years, 20% belonged to 26–35 years, 30% were in the age group of 36–45 years, 30% were aged 46–60 years and above. Most respondents across all age groups showed good outcomes, with very few reporting poor outcomes. The calculated chi-square value was 0.426 with 6 degrees of freedom, which was not statistically significant. There was no significant association between age and the level of outcome.
2. Gender Regarding distribution: 31.67% were males, 68.33% were females, among males, a higher proportion showed very good outcomes, while females predominantly showed good outcomes. The chi-square value was 10.898 with 2 degrees of freedom, which was found to be statistically significant. There was a significant association between gender and the level of outcome.
3. The religious distribution of respondents was: Hindu – 90%, Muslim – 6%, Sikh – 0%, Isai – 0%. The majority of Hindu respondents showed good outcomes. Muslim respondents also demonstrated good to very good outcomes. No respondents were recorded under Sikh and Isai categories. The chi-square value was 2.64 with 6 degrees of freedom, which was not statistically significant. Religion had no significant association with the level of outcome.
4. Based on family type: 73.34% belonged to joint families, 26.67% belonged to nuclear families. Respondents from both joint and nuclear families showed predominantly good outcomes. The chi-square value was 0.217 with 2 degrees of freedom, which was not statistically significant. There was no significant association between type of family and the level of outcome.
5. Educational status was categorized as: Uneducated – 0%, Primary education – 43.34%, Middle education – 30%, Graduate – 10%. Most respondents had primary or middle education and

demonstrated good outcomes. Graduates showed good to very good outcomes. The chi-square value was 0.494 with 6 degrees of freedom, which was not statistically significant. Educational status did not show a significant association with the level of outcome.

6. The occupational distribution was as follows: Farmer – 48.34%, Labour – 6.67%, Businessman – 6.67%, Student – 18.34%, Government employee – 10%, Farmers constituted the majority and showed predominantly good outcomes. Other occupational groups showed varying levels of outcomes. The chi-square value was 15.847 with 8 degrees of freedom, which was statistically significant. There was a significant association between occupation and the level of outcome.
7. The marital status of respondents included: Married – 60%, Unmarried – 18.34%, Widower – 16.67%, Divorcee – 5%, Married respondents formed the majority and showed good outcomes. Other groups showed mixed outcomes. The chi-square value was 0.224 with 6 degrees of freedom, which was not statistically significant. Marital status had no significant association with the level of outcome.

RECOMMENDATIONS

1. Conduct similar studies in other communities to strengthen evidence regarding teaching program effectiveness.
2. Use larger sample sizes to improve generalizability of results.
3. Plan follow-up interventions to assess long-term retention of knowledge and behavioural change.
4. Incorporate time-series or longitudinal designs to evaluate sustained impact of structured teaching programs.
5. Combine educational interventions with community-based vector control measures for maximum impact.

Conclusion

Dengue fever continues to be a major public health challenge due to its rapid transmission by *Aedes* mosquitoes and its potential to cause severe complications. Inadequate awareness regarding the causes, preventive measures, and early management of dengue increases the vulnerability of community residents to infection and related health risks.

The present study demonstrated that a structured teaching program was effective in improving knowledge and awareness regarding dengue fever prevention among residents of Akbarpur, Prayagraj.

The major findings of the study are as follows:

1. Pre-test knowledge among residents regarding dengue fever prevention was generally inadequate.
2. Post-test knowledge scores showed significant improvement following the implementation of the structured teaching program.

3. The findings emphasise the importance of community-based educational interventions in preventing dengue fever.
4. Structured teaching programs enhance awareness, promote preventive practices, and may contribute to reducing the incidence of dengue fever within the community.

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