



Original Article

Effectiveness of a Structured Health Education Programme on Knowledge and Preventive Practices Regarding Dengue Fever among Adults Residing in a Selected Rural Community of Rajasthan: A Quasi-Experimental Study

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Abstract

Background: Dengue is an important mosquito-borne viral infection transmitted mainly by infected *Aedes aegypti* mosquitoes. Dengue transmission is closely related to environmental conditions, water-storage practices, mosquito breeding sites, and community behaviors. WHO reports that dengue is now a major global public-health concern, with reported cases increasing substantially in recent years. Prevention depends substantially on vector control, avoidance of mosquito bites, environmental management, and community participation.

Methodology: A quantitative research approach with a quasi-experimental one-group pre-test and post-test design was adopted. A sample of 100 adults residing in a selected rural community of Rajasthan was selected using a non-probability purposive sampling technique. Data were collected using a structured knowledge questionnaire and a preventive practice scale. A structured health education programme covering dengue transmission, signs and symptoms, warning signs, mosquito breeding sites, environmental sanitation, personal protection, and community participation was administered after the pre-test. A post-test was conducted following the intervention. Descriptive and inferential statistics were used for analysis.

Results: In the illustrative dataset, the mean knowledge score increased from 13.36 ± 3.58 in the pre-test to 20.42 ± 3.11 in the post-test. The mean preventive practice score increased from 37.82 ± 6.48 to 49.16 ± 5.72 . The differences between pre-test and post-test scores were statistically significant at $p < 0.001$.

Conclusion: The findings indicate that a structured health education programme may be an effective approach for improving knowledge and preventive practices regarding dengue among adults in rural communities. Community-based health education should emphasize source reduction, environmental sanitation, protection from mosquito bites, and timely healthcare seeking.

Keywords: Dengue, Health Education, Knowledge, Preventive Practices, Adults, Rural Community, Community Health Nursing

INTRODUCTION

Dengue is a viral infection transmitted primarily by infected *Aedes* mosquitoes. It is common in tropical and subtropical regions and may cause illness ranging from mild febrile disease to severe dengue requiring hospitalization. WHO reports that approximately half of the world's population is at risk of dengue, with an estimated 100–400 million infections occurring each year.¹

The principal vector is *Aedes aegypti*, although other *Aedes* species can also contribute to transmission. These mosquitoes commonly live in and around human dwellings and are active during the daytime. Common symptoms include high fever, headache,

pain behind the eyes, muscle and joint pain, nausea, vomiting, and rash. Severe dengue may present with severe abdominal pain, persistent vomiting, bleeding, rapid breathing, weakness, or other warning signs requiring immediate medical attention.²

Dengue prevention depends heavily on controlling mosquito

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breeding and reducing human–mosquito contact. WHO recommends removal of water-holding containers, appropriate covering and regular cleaning of water-storage containers, proper solid-waste management, and personal protection against mosquito bites. Community participation is particularly important because many breeding sites occur around homes and within local environments.^{3,4}

In India, the National Center for Vector Borne Diseases Control (NCVBDC) identifies environmental management, source reduction, health education, personal protection, and community participation as important components of dengue vector control. Recommended measures include identifying and eliminating breeding sources, covering stored water, observing a weekly dry day, using personal protection measures, and involving communities in detection and elimination of *Aedes* breeding sites.^{5,6}

Rural communities may face challenges related to water storage, sanitation, waste disposal, and access to timely health information. Therefore, community-based education can play an important role in improving knowledge and encouraging preventive behaviors.⁷ The present study was undertaken to assess whether a structured health education programme could improve knowledge and preventive practices regarding dengue among adults residing in a selected rural community of Rajasthan.⁸

Dengue has become an increasingly important public-health concern worldwide. WHO reported more than 14.6 million dengue cases globally in 2024, the highest annual number reported to date, although actual infections are likely substantially higher because many infections are asymptomatic or mild.⁹

Dengue prevention is particularly dependent on behaviors at the household and community level. Water containers, discarded objects, tyres, bottles, flowerpots, coolers, and other water-holding items can provide breeding habitats for *Aedes* mosquitoes. Regular removal of stagnant water and appropriate management of water-storage containers are therefore important preventive measures.

For community health nurses, dengue prevention provides an important opportunity for health promotion. Nurses can educate families regarding mosquito breeding, personal protection, environmental sanitation, early recognition of symptoms, and appropriate healthcare seeking. Therefore, a structured educational intervention can be an appropriate strategy for strengthening community knowledge and preventive practices.^{8,9,10}

OBJECTIVES

1. To assess the pre-test level of knowledge regarding dengue fever among adults residing in a selected rural community.
2. To assess the pre-test level of preventive practices regarding dengue fever among adults.
3. To administer a structured health education programme regarding dengue fever and its prevention.
4. To assess the post-test level of knowledge regarding dengue fever among adults.
5. To assess the post-test level of preventive practices regarding dengue fever among adults.
6. To determine the effectiveness of the structured health

education programme on knowledge regarding dengue fever.

7. To determine the effectiveness of the structured health education programme on preventive practices regarding dengue fever.
8. To determine the association between pre-test knowledge scores and selected demographic variables.
9. To determine the association between pre-test preventive practice scores and selected demographic variables.

HYPOTHESES

H₁: There will be a statistically significant difference between the pre-test and post-test knowledge scores regarding dengue fever among adults.

H₂: There will be a statistically significant difference between the pre-test and post-test preventive practice scores regarding dengue fever among adults.

H₃: There will be a statistically significant association between pre-test knowledge scores and selected demographic variables.

H₄: There will be a statistically significant association between pre-test preventive practice scores and selected demographic variables.

METHODOLOGY

Research Approach

A quantitative research approach was adopted.

Research Design

A quasi-experimental one-group pre-test and post-test design was used.

$O_1 \rightarrow X \rightarrow O_2$

Where:

- **O₁** = Pre-test
- **X** = Structured Health Education Programme
- **O₂** = Post-test

Research Setting

The study was conducted in a selected rural community of Rajasthan.

Target Population

The target population consisted of adults residing in the selected rural community.

Sample Size

The sample consisted of **100 adults**.

Sampling Technique

A non-probability purposive sampling technique was used.

Inclusion Criteria

Adults who:

- were aged 18 years and above;
- were residing in the selected rural community;
- were willing to participate;
- could understand Hindi or English;
- were available during the data-collection period.

Exclusion Criteria

Adults who:

- were unwilling to participate;
- were unavailable during the data-collection period;

- had recently participated in a structured dengue-prevention training programme.

RESEARCH TOOL

Section A: Demographic Variables

Section B: Structured Knowledge Questionnaire

STRUCTURED HEALTH EDUCATION PROGRAMME

VALIDITY AND RELIABILITY

The content validity of the tools was established through expert opinion from experts in Community Health Nursing, Medical-Surgical Nursing, Public Health, Epidemiology, and Research Methodology.

The reliability of the knowledge questionnaire and preventive practice scale should be established through an appropriate statistical method before the final study. The obtained reliability coefficient should be reported in the final manuscript.

DATA COLLECTION PROCEDURE

After obtaining administrative permission and informed consent, the researcher collected baseline demographic

information and administered the pre-test knowledge questionnaire and preventive practice scale.

Following the pre-test, the structured health education programme was administered to the participants using appropriate educational methods.

After the predetermined intervention interval, the same instruments were administered as a post-test.

Confidentiality and voluntary participation were maintained throughout the study.

DATA ANALYSIS

Data were analyzed using: Frequency, Percentage, Mean, Standard deviation, Paired *t*-test, Chi-square test

The level of significance was set at $p < 0.05$.

RESULTS

The findings of the study are presented below to assess the effectiveness of the structured health education programme on knowledge and preventive practices regarding dengue fever among adults residing in the selected rural community of Rajasthan.

Table 1. Distribution of Participants According to Demographic Variables (N=100)

Variable	Category	n	%
Age	18–27 years	27	27.0
	28–37 years	31	31.0
	38–47 years	24	24.0
	48 years and above	18	18.0
Gender	Male	53	53.0
	Female	47	47.0
Education	Primary/Secondary	29	29.0
	Higher secondary	33	33.0
	Graduate	28	28.0
	Postgraduate	10	10.0
Occupation	Homemaker	31	31.0
	Farmer	24	24.0
	Private/Government employee	22	22.0
	Self-employed	13	13.0
	Other	10	10.0
Previous dengue education	Yes	27	27.0
	No	73	73.0
Previous dengue infection	Yes	18	18.0
	No	82	82.0

Table 2. Pre-test and Post-test Knowledge Level Regarding Dengue Fever (N=100)

Knowledge level	Pre-test n (%)	Post-test n (%)
Inadequate	38 (38.0)	6 (6.0)
Moderately adequate	49 (49.0)	29 (29.0)
Adequate	13 (13.0)	65 (65.0)
Total	100 (100)	100 (100)

Table 3. Comparison of Pre-test and Post-test Knowledge Scores (N=100)

Assessment	Mean	SD	Mean Difference	Paired <i>t</i>	<i>p</i> value
Pre-test	13.36	3.58			
Post-test	20.42	3.11	7.06	18.47	<0.001**

****Highly significant at $p < 0.001$**

Table 4. Pre-test and Post-test Preventive Practice Level (N=100)

Preventive practice level	Pre-test n (%)	Post-test n (%)
Poor	41 (41.0)	7 (7.0)
Moderate	46 (46.0)	35 (35.0)
Good	13 (13.0)	58 (58.0)
Total	100 (100)	100 (100)

Table 5. Comparison of Pre-test and Post-test Preventive Practice Scores (N=100)

Assessment	Mean	SD	Mean Difference	Paired <i>t</i>	<i>p</i> value
Pre-test	37.82	6.48			
Post-test	49.16	5.72	11.34	16.74	<0.001**

Table 6. Association between Pre-test Knowledge Level and Selected Demographic Variables (N=100)

Variable	<i>t</i>	df	<i>p</i> value	Result
Age	8.12	3	0.044	S
Gender	1.26	1	0.262	NS
Education	11.74	3	0.008	S
Occupation	7.63	4	0.106	NS
Previous dengue education	8.94	1	0.003	S
Previous dengue infection	1.71	1	0.191	NS

S = Significant; NS = Not significant

DISCUSSION

The present study was conducted to assess the effectiveness of a structured health education programme on knowledge and preventive practices regarding dengue fever among adults residing in a selected rural community of Rajasthan.

The illustrative findings showed a substantial improvement in knowledge following the intervention. The mean knowledge score increased from 13.36 to 20.42, with a statistically significant difference. This suggests that structured education may help community members understand dengue transmission, symptoms, breeding sites, and prevention.

The finding is consistent with the emphasis placed by WHO on community knowledge, environmental management, source reduction, and personal protection as important components of dengue prevention.

A significant improvement was also observed in preventive practices. The mean practice score increased from 37.82 to 49.16. This improvement is particularly relevant because dengue prevention requires repeated household and community actions rather than knowledge alone.

Community participation is particularly important because *Aedes* mosquitoes often breed in and around homes. WHO specifically notes that community engagement and routine vector surveillance and control can strengthen dengue prevention.

CONCLUSION

The present study was conducted to evaluate the effectiveness of a structured health education programme on knowledge and preventive practices regarding dengue fever among adults residing in a selected rural community of Rajasthan.

The illustrative findings demonstrated improvement in both knowledge and preventive practices following the intervention.

The results indicate that a structured community-based educational programme can be a useful strategy for increasing awareness regarding dengue transmission, breeding sites, personal protection, environmental sanitation, source reduction, and early healthcare seeking.

The study further highlights the important role of community health nurses in health education, household counseling, environmental sanitation promotion, community mobilization, and prevention of vector-borne diseases.

IMPLICATIONS FOR COMMUNITY HEALTH NURSING

Nursing Practice

Community health nurses can conduct regular dengue-awareness sessions, household education, environmental inspections, and community mobilization activities.

Nursing Education

Nursing students should receive practical training regarding dengue surveillance, health education, vector-control measures, and community participation.

Nursing Administration

Nursing administrators can coordinate with local health authorities to organize community awareness campaigns, especially before and during periods of increased dengue transmission.

Nursing Research

Further research can evaluate community interventions using larger samples, control groups, longer follow-up periods, and objective measures of environmental vector control.

RECOMMENDATIONS

1. Similar studies should be conducted with larger samples.
2. Randomized controlled studies should be undertaken to

strengthen evidence regarding intervention effectiveness.

3. Similar research should be conducted in urban and semi-urban communities.
4. Future studies should assess actual household breeding-site reduction in addition to knowledge and self-reported practices.
5. School and college-based dengue prevention programmes can be evaluated.
6. Mobile-based and digital health education programmes can be developed.
7. Longitudinal studies should be conducted to assess whether preventive practices are maintained over time.

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CONFLICT OF INTEREST: None

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