A Study on the Efficiency of Structured Instruction on Dengue Fever Prevention and Control among People

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Abstract: Dengue fever (DF) is caused by four closely related viruses (DENV 1-4). Dengue fever occurs in most tropical and subtropical Aedes egypti and Albopictus areas. Dengue threatens health and mortality in tropical regions where two-thirds of the world's population lives. From sporadic to global, dengue has spread. This study employed quantitative research. The study took place in Dehradun's Harawala. Accessible study participants are rural residents. A part of the population symbolizes the whole. Samples are taken from a wide population for measurement. This study used non-probability convenient sampling. This survey included 100 rural residents. The study used a structured knowledge questionnaire. This tool was best at eliciting subject answers. After a structured education program, 77 percent had adequate knowledge, 23 percent had moderate understanding, and none had deficient knowledge of dengue fever prevention and control. The 't' test value was significant across all knowledge areas. The combined 't' test value was significant (21.618, P<0.05). This suggests a systematic training program increases knowledge of dengue fever prevention and control.

Keywords: Assess and Effectiveness; Knowledge of Dengue; Dengue Hemorrhagic Fever (DHF); Demographic Variables; Structured Instruction; Global Phenomenon; Sampling Technique.

1. Introduction

Data Communicable illness outbreaks can also cause public anxiety, burden the healthcare system, and cause disruptions to daily life. It's critical to take preventive actions to stop the spread of these diseases and safeguard others, including maintaining proper hygiene, getting vaccinated, and adhering to public health recommendations. Worldwide concerns about infectious diseases impact individuals everywhere. Now, Indeed, everyone has a fundamental right to health. Everyone is entitled to high-quality medical care, preventative measures, and the chance to live a healthy lifestyle. Dengue is one of the most prevalent diseases mosquitoes carry in India and has become a major global health concern [7]. Unlike most mosquitoes, dengue causes a high fever and rash when mosquitoes bite in the early morning and the evening just before dusk. Aedes aegypti causes dengue fever. A virus causes dengue, an acute fever. Dengue fever and dengue hemorrhagic fever are the two types that can be taken. The symptoms of dengue fever include sudden, intense fever, intense headaches, and pain behind the eyes, muscles, and joints. Over the past few decades, dengue has become more commonplace worldwide [8]. According to WHO data, the reported cases rose from 505430 in 2000 to 5.2 million in 2019. Dengue cases are underreported since most cases are asymptomatic or moderate and self-managed. According to one modeling estimate, there are 390 million dengue virus infections annually, of which 96 million result in clinical manifestations. According to a different study on dengue prevalence, 3.9 billion people could contract the dengue virus. 2019 saw the highest number of dengue cases ever recorded worldwide. Out of all the dengue cases reported up to EW 26 of 2023, 1348234 were confirmed in a laboratory, and 3907 cases (0.13%) were considered severe. With 2376522 cases, Brazil had the greatest number of dengue cases. In 2012, an outbreak in India led to 47,029 cases of DF. There

were 242 recorded deaths and three times as many cases as the year before. Tamil Nadu has reported the most instances in the nation, with 9,249, followed by West Bengal, with 6,067 cases [9].

The state of Tamil Nadu reported the largest number of deaths, with 60 individuals succumbing to the infections, and Maharashtra reported 59 deaths from dengue. By 2012–2013, India's dengue incidence had significantly changed. In many Southeast Asian places, dengue has become an annual epidemic, and as the environment changes, the disease's dangers increase [10]. The latest data shows that from January to October of 2022, 110473 dengue cases were reported in India, comparable to the 101192 instances reported in 2018. Many dengue cases, 188401 in 2017, 157315 in 2019, and 193245 in 2021, were reported in prior years. Dengue incidence decreased by 56–60% in 2020 when the COVID-19 wave started in India (44585). The number of months suitable for Aegypti dengue transmission in India grew by 1.69% year to 5.6 months between 1951–1960 and 2012–21. There are currently 112 nations in the globe where dengue fever is prevalent. Around 100 million cases of dengue hemorrhagic fever (DHF) are thought to exist globally. According to WHO, Dengue seriously threatens global public health in tropical and subtropical regions. Between 1960 and 2010, dengue fever surged 30 times more globally. This increase was attributed to several factors, including a faster rate of population expansion, global warming, unplanned urbanization, ineffective mosquito control, frequent air travel, and a lack of healthcare facilities.

The clinical presentation of dengue virus infection varies, making correct diagnosis challenging and necessitating test confirmation. Typically, the illness resolves independently, and currently, no antiviral medication is available. We conclude that more health promotion initiatives are required to raise awareness about dengue prevention by enhancing understanding. Dengue fever is the most prevalent of all the diseases carried by arthropods. Urban and urban areas are affected by this tropical and subtropical disease. The World Health Report, 1999 states that growing urbanization, travel, trade, improper water management, and population growth are the main causes of dengue and dengue hemorrhagic fever. The mosquito sleeps outside in the cool shade, in the nearest and other dark spots, and at home. In addition to encircling houses, schools, and other locations in cities or towns, the female mosquito deposits her eggs in water-filled containers. It takes these eggs roughly ten days to mature, favored incubators and tires, barrels, drums, pots, and tanks. One of the four dengue virus serotypes causes dengue, the viral disease that spreads the fastest in the world and is carried by mosquitoes. The dengue virus has four distinct serotypes: DEN-1, DEN-2, DEN-3, and DEN-4. Dengue fever is contracted via a female Aedes aegypti mosquito carrying one of four types of infections. In rare instances, the Aedes albopictus mosquito can also spread the virus.

A dengue-infected person can spread the virus to a suitable vector for up to 12 days, or 4–5 days at most. Once the virus has incubated for five to ten days, the infected mosquito can spread the infection throughout the remainder of its life, which is between two and one month. Because Aedes albopictus can withstand colder temperatures than Aedes aegypti, it can live and spread viruses in the more temperate parts of Europe and the United States. There are 2.5–3 billion people on the planet who reside in about 112 dengue-endemic nations. Severe dengue is currently a major cause of hospitalization and mortality in several Asian and Latin American nations. According to the WHO, Dengue was one of the top 10 dangers to global health in 2019. Vector control is essential to dengue prevention and management. Dengue and severe dengue have no particular cure, yet the mortality rates from severe dengue are significantly reduced by early discovery and access to quality medical care. The majority of dengue patients experience no symptoms. However, among those that do, a high temperature, headache, body aches, nausea, and rash are the most typical symptoms. Most will heal in one to two weeks as well. Certain individuals experience severe dengue and require hospital care. Dengue can be lethal in severe situations.

2. Statement of the Problem

A study will assess the effectiveness of a structured teaching program on knowledge regarding prevention and control measures related to Dengue fever among the people residing in selected rural areas of Dehradun.

3. Review of Literature

Khan et al. [1], two rounds of this cross-sectional community-based investigation were carried out in 2021, from June to December. The highest percentage of dengue cases (60.0%) were found in the Peshawar district, where the co-circulation of DENV-2 (45.8%) and DENV-3 (50.4%) serotypes was the most common. October (41.8%), September (27.9%), and August (14.4%; $p < 0.001$) saw an increase in instances. The most affected groups were men (63.7%, $p < 0.001$) and those between the ages of 16 and 30 (37.0%, $p < 0.001$). The population most impacted included those with lower education levels (31%), families with a higher population density (>10 people per household), individuals without marriage (71.0%), families earning 10,000-20,000 Pak rupees per month (50.5%), and individuals who experienced power outages lasting more than 7/24 hours (29.0%). The results of a community study on KAP showed that, on average, 74% had good knowledge, 60% had good attitudes, and 43% practised dengue prevention. To better anticipate the burden and seasonality of dengue in the country, our study highlights the need of strengthening vector surveillance, increasing laboratory capacity for better diagnosis and management of dengue cases, and effective and long-term public health education.

In order to determine the Dengue KAP among healthcare personnel in Mazandaran Province, northern Iran, Nikookar et al. [2] performed an analytical cross-sectional study. Researchers used Google Forms to create a structured questionnaire and distributed it via email and social media to gather data from certain populations. The media (32.7 percent) and academic education (25% of the total) were the primary sources of information regarding dengue, which the majority of respondents were already familiar with (83.8 percent). Compared to topics such as transmission (72.2 percent), clinical management (52%), and prevention and control (69%), respondents' understanding of dengue symptoms was significantly lower (52%). (81 percent). With an attitude and level of practise that exceeded the 70% cutoff, the majority of participants (73 percent). There was a notable disparity in the knowledge, attitude, and practise of clinical management among participants based on their occupation, gender, and occupational status (p < 0.05). The results of this study show that healthcare workers are lacking in some areas of KAP; as a result, future training programmes should target improving healthcare workers' knowledge, attitude, and conduct in order to better manage dengue.

Cardozo et al. [3] conducted a cross-sectional descriptive study on a Goan participant sample. Many participants knew enough about the infection's origin and its spreading methods. It was believed that knowledge of symptomatology and therapy was lacking. The non-student individuals knew little about the dengue virus's symptoms and its vector. The results show that the non-student participants knew less about the epidemiology and symptomatology of dengue than the student participants did. Educational and health programs are needed to increase knowledge among the general population, and campaigns specifically targeting the non-student population are required.

Thokchom et al. [4] adopted a quantitative research design for this study. The study was carried out in a particular neighborhood in Pune. A convenient non-probabilistic sampling strategy was applied. The study contained 200 total samples of persons. A standardized instrument evaluated the participants' understanding of dengue fever complications and prevention. It took ten to fifteen minutes to fill the tool. The descriptive frequency and percentage methods were used to analyze the gathered data in statistics. It demonstrates the general public's awareness of dengue fever complications and how to prevent them. The main conclusions show that 83.5% of respondents had average knowledge, 12% had strong knowledge, and 4.5% had a bad understanding. It concludes that most people are somewhat knowledgeable.

Approximately 120 blocks in Oasis were the subjects of a cross-sectional study by Elson et al. [5] that included people aged 18–80. Of the 240 surveys that were sent out, 80% of the respondents were female and 50% identified as housewives. Although 97.9% of people were aware of dengue, only 6.2% had personal experience with the disease. Half of the people polled were aware that mosquitoes are the vectors of dengue fever, and 51.7% were able to properly identify fever together with one additional symptom of dengue. Greater symptom knowledge and preventative knowledge were strongly linked with female sex (OR 2.22, 95 percent CI 1.08 to 4.72). (OR 2.12, 95 percent CI 1.06 to 4.21). A strong correlation between having been or are enrolled in a postsecondary institution and being knowledgeable about symptoms (OR 2.56, 95 percent CI 1.25 to 5.44), as well as transmission, was found (OR 3.46, 95 percent CI 1.69 to 7.57). Implementing measures to reduce mosquito populations was not significantly correlated with Dengue knowledge (OR 1.76, 95 percent CI 0.87 to 3.54). Dengue knowledge was found to be baseline in this population. But since dengue transmission is expected to rise in Lima, it is crucial to think about public health in terms of how to raise awareness about the disease and then turn that into appropriate community action.

In a randomised controlled trial, adults from Sengkang, Singapore, who volunteered at a primary care clinic in the region took part. Four hundred people were given either information on how to avoid dengue fever by visiting a dengue prevention website (control) or by playing a serious game (intervention). One hundred fifty-seven people (or 78.5% of the intervention group) made it through the challenging game. From the beginning, the KAP scores of both groups had increased. The serious gaming group nevertheless had a larger mean difference in score (SD) when assessing the participants' dengue prevention measures on a daily basis compared to the control group (1.0 (2.8) vs. 0.3 (1.9), p =.009). A positive association (rho = 0.275) was found between the maximum achievement inside the serious game and the mean change in KAP score (p =.001). Those who took part in the serious game had an average SUS (SD) of 61.8 (19.2). At the outset, 84.2% of the participants were open to be vaccinated against dengue. When it comes to encouraging adults to take precautions against dengue and express their intention to get vaccinated, serious games are on par with more traditional forms of online education. They could be seen as a practical substitute for digitally engaging locals [6].

This analysis was based on a cross-sectional study that was carried out in Fortaleza, Brazil, between November 2019 and February 2020. A composite KAP score was calculated from a questionnaire to determine if a family had low, moderate, or high dengue knowledge, attitudes, and behaviours; these factors constituted the major exposure. Primary results from the Panbio Dengue IgG indirect ELISA (enzyme-linked immunosorbent assays) test, which is based on dried blood spots, indicate the presence of dengue immunoglobulin G (IgG) antibodies. The estimated crude dengue seroprevalence was 25.1% among the 483 youths that took part. Out of a total of 271 families, or 69%, obtained scores between 50% and 75% for KAP, while 101 homes achieved scores of 75% or higher. Twenty out of a total of 5,000 households only managed a score of 75% or higher [11].

From January 1, 2018, to December 31, 2018, a cross-sectional investigation was carried out by Jayawickreme et al. [12] on all DF cases registered in the affiliated group of Hospitals of Medical College, Jodhpur. The Viral Research Diagnostic Laboratory (VRDL) of the Department of Microbiology, Dr. S.N. Medical College, utilised rapid immuno-chromatographic card testing and the MAC ELISA test method to identify dengue immunoglobulin M (IgM) antibodies and dengue non-structural protein 1 (NS1) antigen, respectively, in order to validate the diagnosis. There were 541 patients out of 2,701 who tested positive for DF serologically (NS1, IgM). October 2018 saw the highest recorded number of suspected cases (1061), with 228 of those cases being confirmed. Between September and December, during and after the monsoon, there is a spike in reported cases. Dengue can cause serious illness and even death, but there are steps that individuals and governments can do to lessen the impact.

4. Materials & Methods

The research approach used for this study was the quantitative approach. A pre-experimental one-group pre-test and post-test design were selected to evaluate the effectiveness of a structured teaching program on the level of knowledge regarding prevention and control measures related to dengue fever among people residing in Rural areas. The study was conducted at the Harawala, Dehradun. The target population for the study is all people residing in Harawala, Dehradun. The sampling technique is a group of people, objects, or items taken from a large population for measurement. The sampling technique adopted for the present study was the non-probability convenient sampling technique. The sample size for the present study was 100 people residing in Rural areas. A structured knowledge questionnaire was selected for the study. A structured teaching program was implemented through demonstration and lecture cum discussion. The evaluation was done by conducting a post-test after 7 days of implementation of structured teaching. The post-test was conducted using the same questionnaire as the pre-test.

5. Results and Interpretation

5.1. Section 1

Part 1: Description of the Socio-demographic variables of the subjects deals with demographic data, which consists of 11 items to collect the sample characteristics, which comprises Age, Gender, religion, Marital status, Education, Total family income, Type of family, Number of family members, Occupation, source of drinking water, and Water stores at home.

Table 1: Distribution of people according to demographic characteristics (N=100)

Demographic Variables	Frequency	Percentage (%)
Age in years		
20-30 years	47	47%
31-40 years	26	26%
41-50 years	27	27%
Total	**100**	**100%**
- **Gender**		
- Male	68	68%
Female	32	32%
Total	**100**	**100%**
- **Religion**		
- Hindu	41	41%
Christian	30	30%
Muslim	20	20%
Others	09	09%
Total	**100**	**100%**
- **Marital Status**		
- Married	69	69%
- Unmarried	21	21%
Divorced	10	10%
Total	**100**	**100%**
- **Education**		
- Illiterate	21	21%
- primary education (up to 4th class)	38	38%
secondary education (10th-12th)	27	27%
Graduated	14	14%

Total	**100**	**100%**
Total family income		
Less than 20,000	20	20%
20,000-30,000	25	25%
30,000-50,000	40	40%
Above 50,000	15	15%
Total	**100**	**100%**
Type of family		
Joint family	53	53%
Nuclear family	47	47%
Total	**100**	**100%**
Number of family members		
3-4	09	09%
5-7	48	48%
More than 7	43	43%
Total	**100**	**100%**
Occupation		
Unemployment	17	17%
Employment	83	83%
Total	**100**	**100%**
- **Source of drinking water**		
- Handpump	18	18%
Tap water	82	82%
Total	**100**	**100%**
Water stores at home		
Present and covered	63	63%
Present and not covered	15	15%
Not present	22	22%
Total	**100**	**100%**

Table 1 shows the distribution of demographic data, which reveals that according to age majority, 47 (47%) people were in the age group of 20-30 years, followed by 26 (26%) were in the age group of 31-40 years and 27 (27%) were in the age group of 41-50 years (Figure 1).
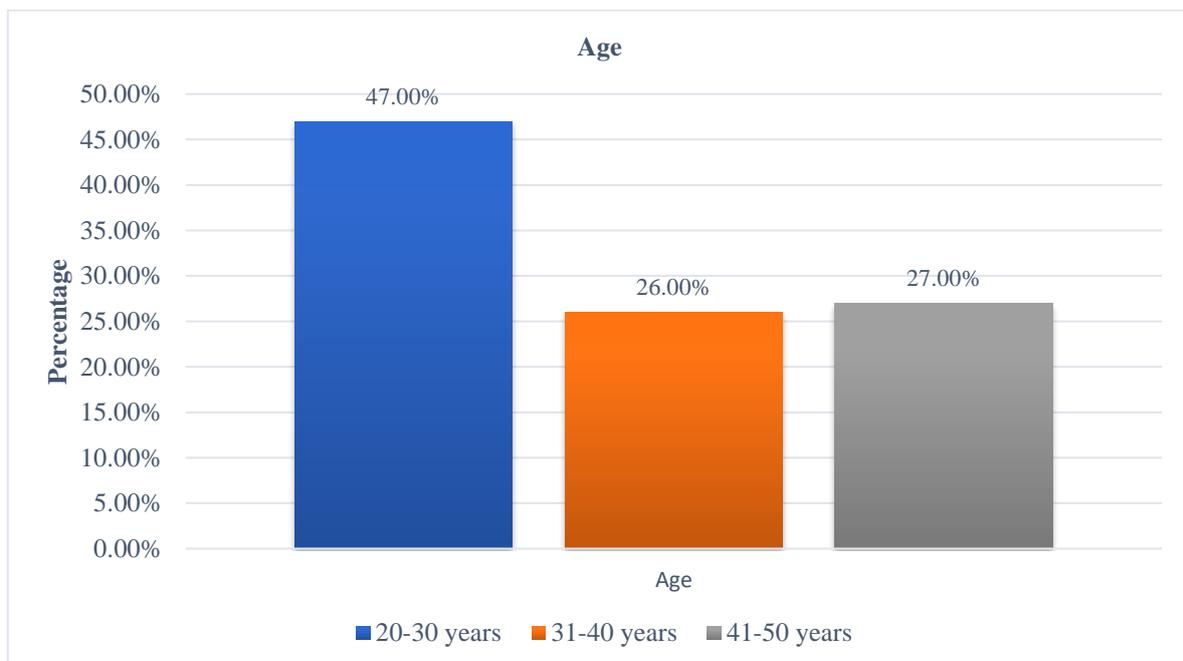

Figure 1: Distribution of people by age

According to gender, the data revealed that 68 (68%) people were males and 32 (32%) were females. According to religion, the majority, 41 (41%) people were Hindus, followed by 30 (30%) people Christian, 20 (20%) people were Muslim, and 09 (09%) people belonging to other religions. According to marital status, 69(69%) people were married, 21(21%) were unmarried, and 10 (10%) were divorced (Figure 2).
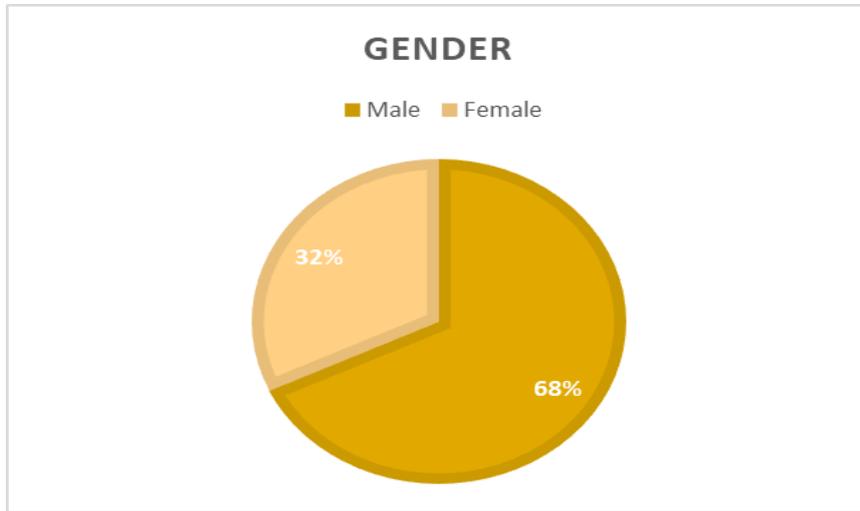

Figure 2: Distribution of people by gender

According to education status, Most of the people 38(38%) had completed primary education (up to 4th class) followed by 27 (27%) people with secondary education (10th -12th), 21 (21%) people were illiterate, and only 14(14%) were graduated, According to total family income majority 40 (40%) people had a total family income 0f 30,000-50,000, followed by 25 (25%) people with income of 20,000-30,000, 20 (20%) people had income less than20,000 and only 15 (15%) people had family income above 50,000. According to the type of family, the majority, 53 (53%) people, belong to a joint family, and 47 (47%) people belong to a nuclear family (Figure 3).
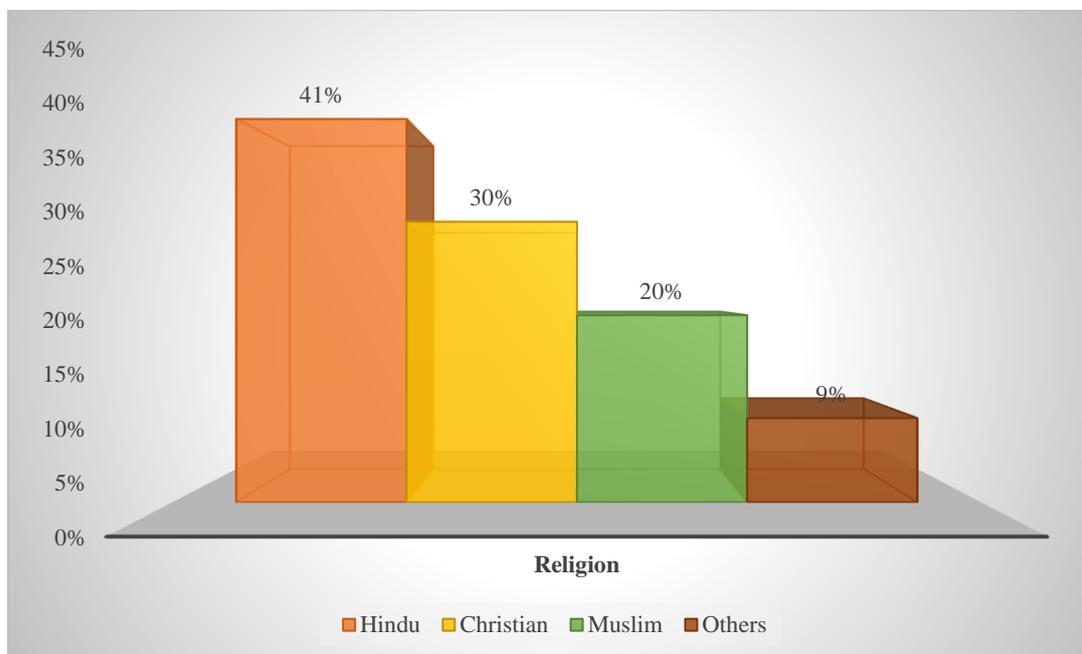

Figure 3: Distribution of people by religion

According to several family members, the majority, 48 (48%), had 5-7 members in their family, followed by 43 (43%) had more than 7 members in their family, and only 09 (09 %) had 3-4 members in their family. According to the occupation majority, 83 (83%) people were employed, and only 17 (17%) were unemployed. According to the source of drinking water Majority,

82 (82%) people's drinking water was tap water, and the remaining 18 (18%) people's water source was the hand pump (Figure 4).
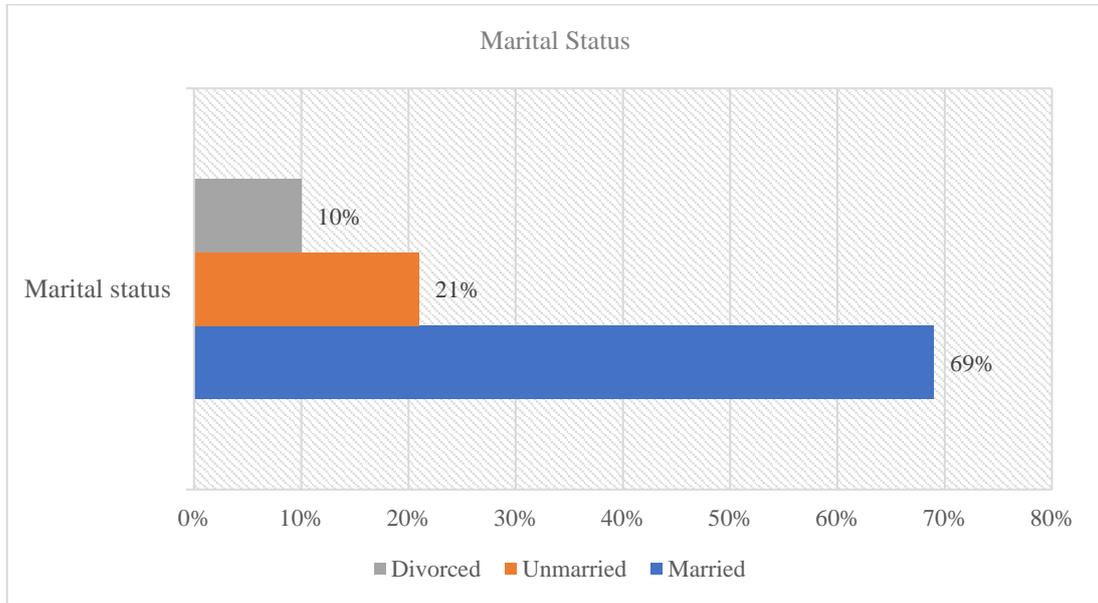

Figure 4: Distribution of people by marital status

According to the status of water stores at home, the majority, 63 (63%), water stores at home were present and covered, followed by 22 (22%) water stores at home that were not present and only 15 (15%) people had water stores at home present and not covered (Figures 5 to 11).
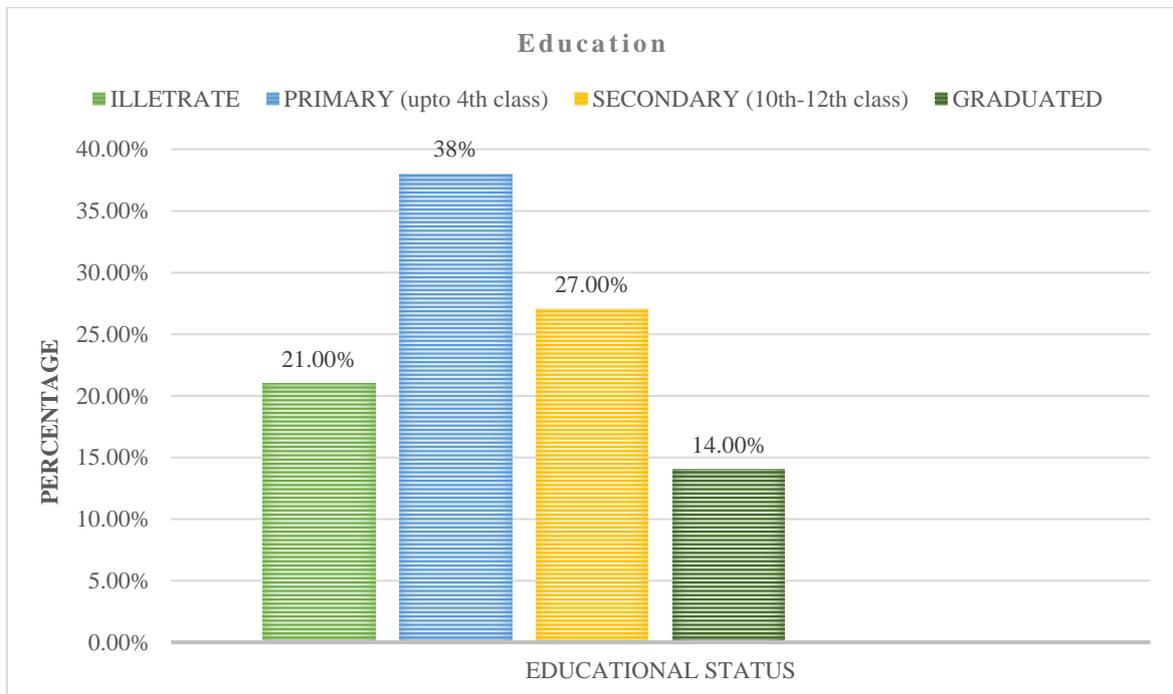

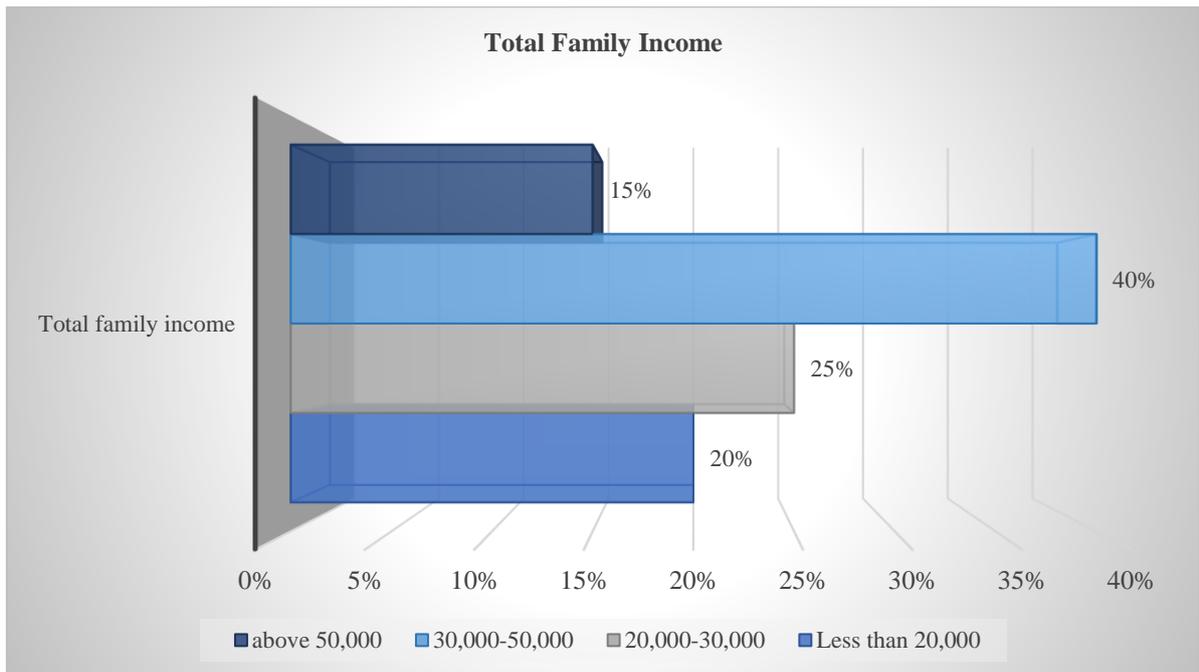**Figure 5:** Distribution of people by education

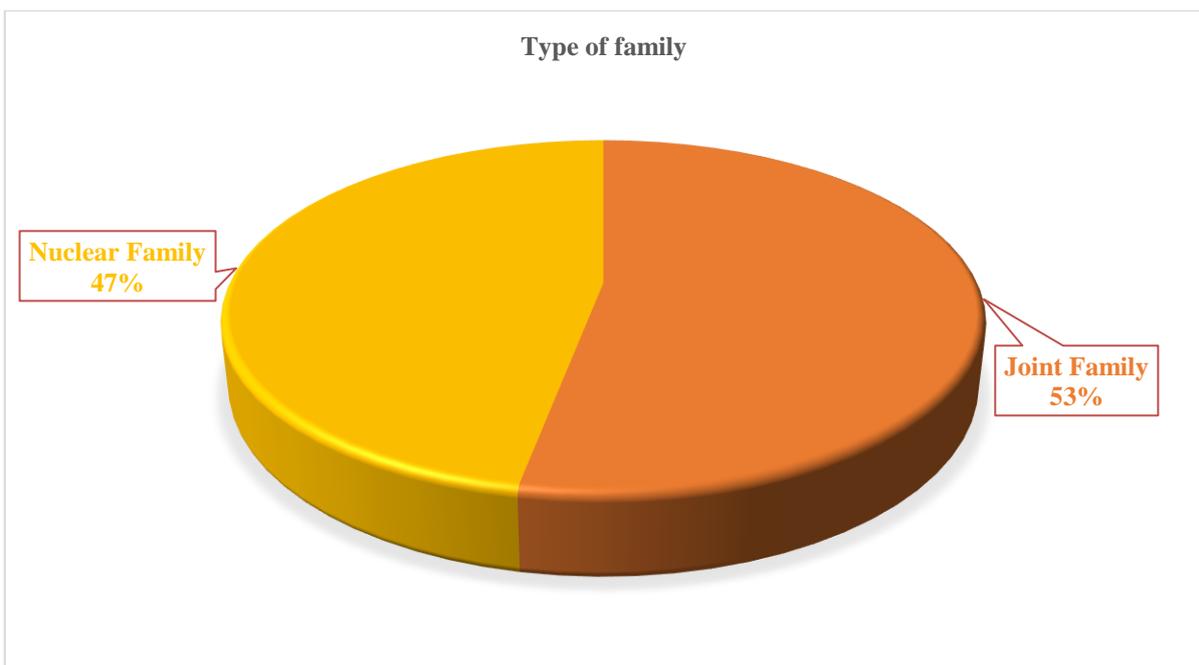**Figure 6:** Distribution of people by Total family income

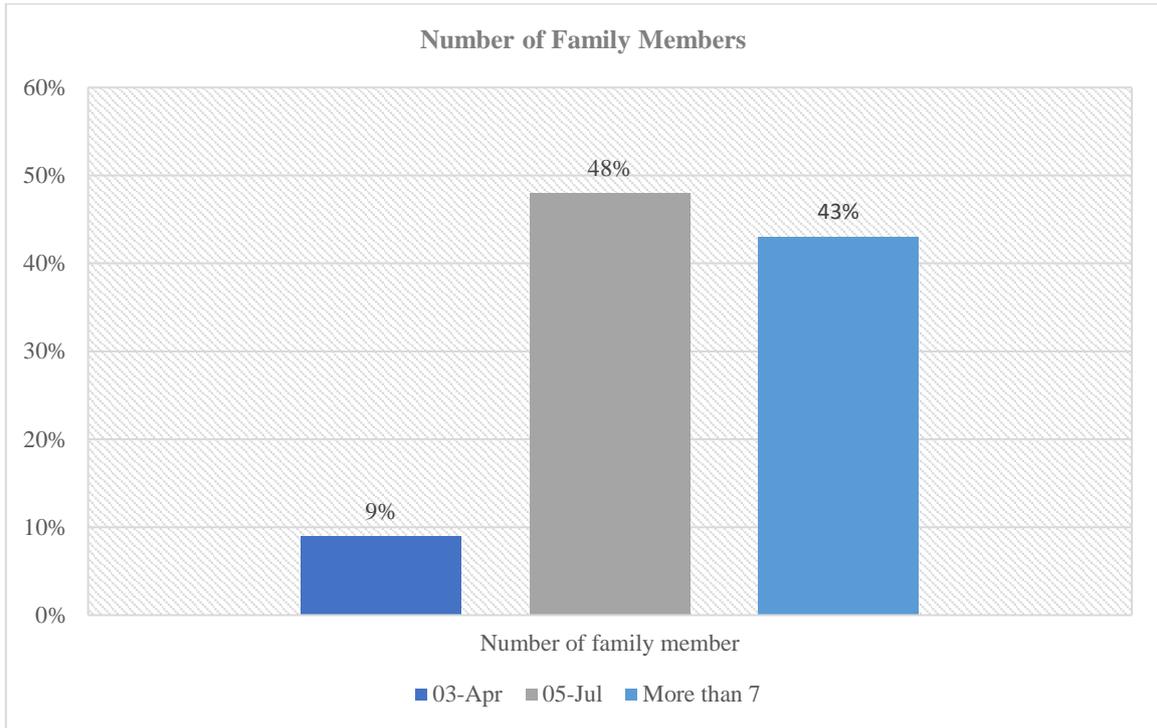**Figure 7:** Distribution of people by type of family

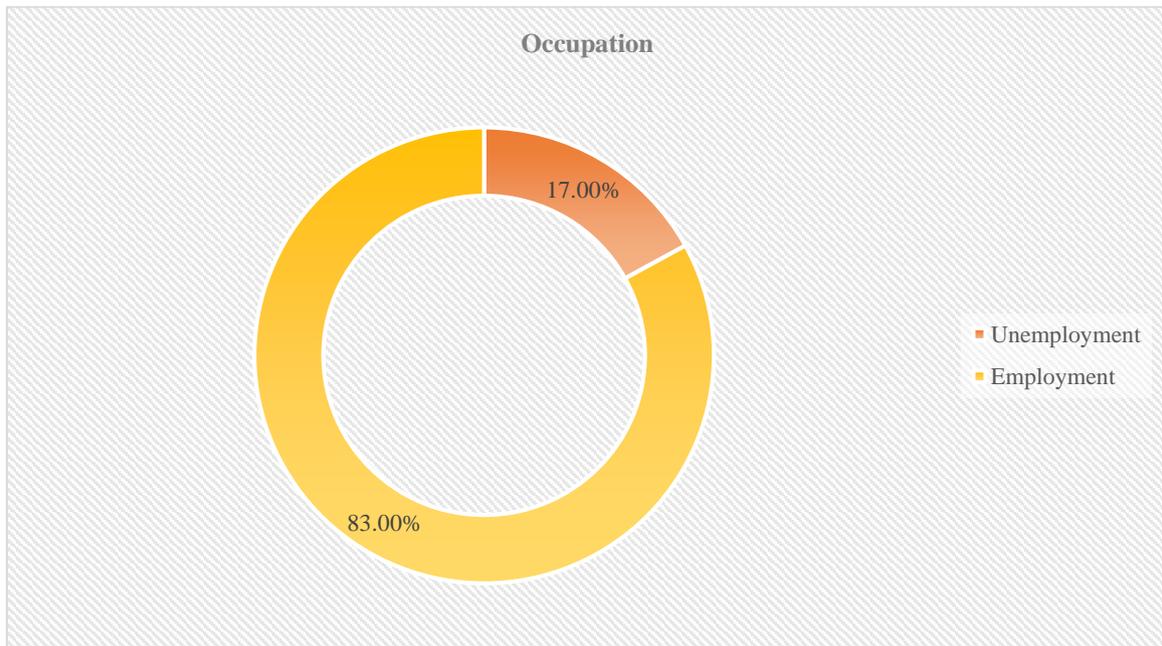**Figure 8:** Distribution of people by number of family members

Figure 9: Distribution of people by Occupation
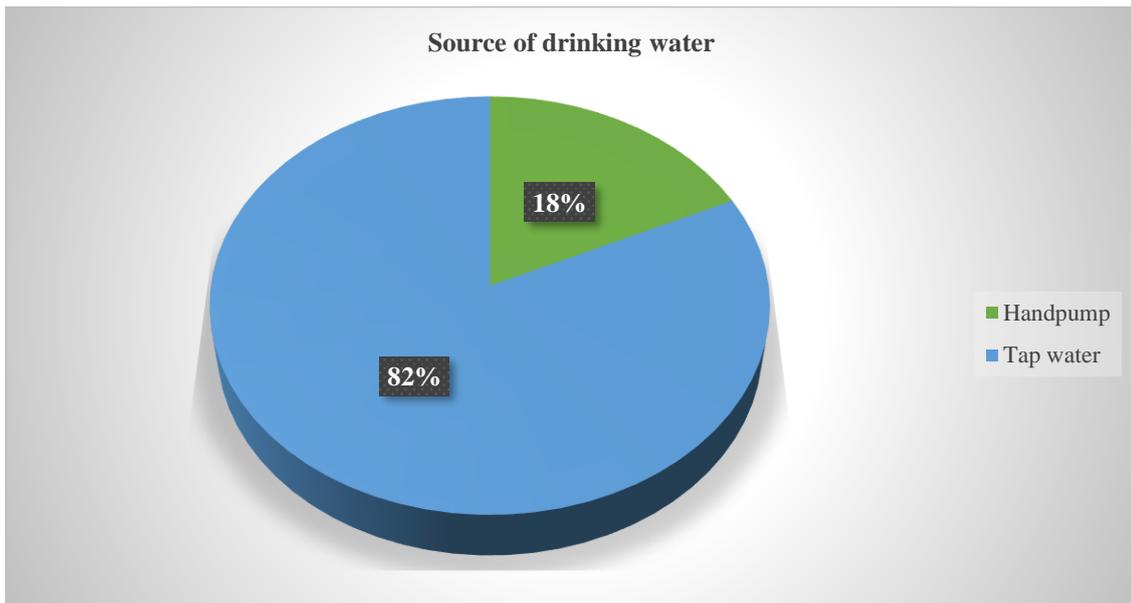
Figure 10: Distribution of people by source of drinking water
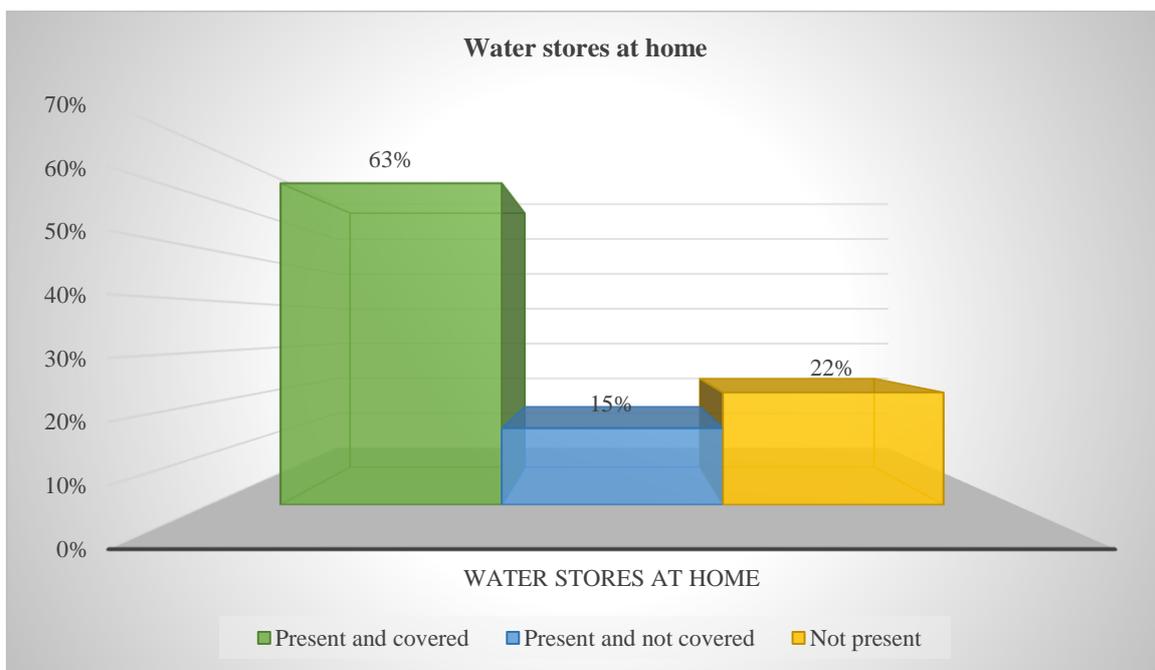
Figure 11: Distribution of people by water stores at home

5.2. Section 2

Part 1: Findings related to pre-test and post-test knowledge regarding prevention and control measures related to dengue among people.

Table 2: Finding related to Knowledge level (N=100)

Sl. No	Knowledge Level	Score	Pre-test		Post-test	
			F	%	F	%
1.	Inadequate	<12	62	62%	00	00%
2.	Moderate	12-18	38	38%	23	23%

3.	Adequate	>18	00	00%	77	77%
Total			**100**	**100%**	**100**	**100**

Table 2 depicts that the majority, 62 (62%) of the people, had inadequate knowledge, 38 (38%) of the people had moderate knowledge, and 00 (00%) of them had adequate knowledge regarding prevention and control measures related to dengue fever in pre-test knowledge. After intervention with a structured teaching program, the majority, 77 (77%) of the people, had adequate knowledge, 23 (23%) had moderate knowledge, and none had inadequate knowledge regarding prevention and control measures related to dengue fever in post-test knowledge (Figure 12).
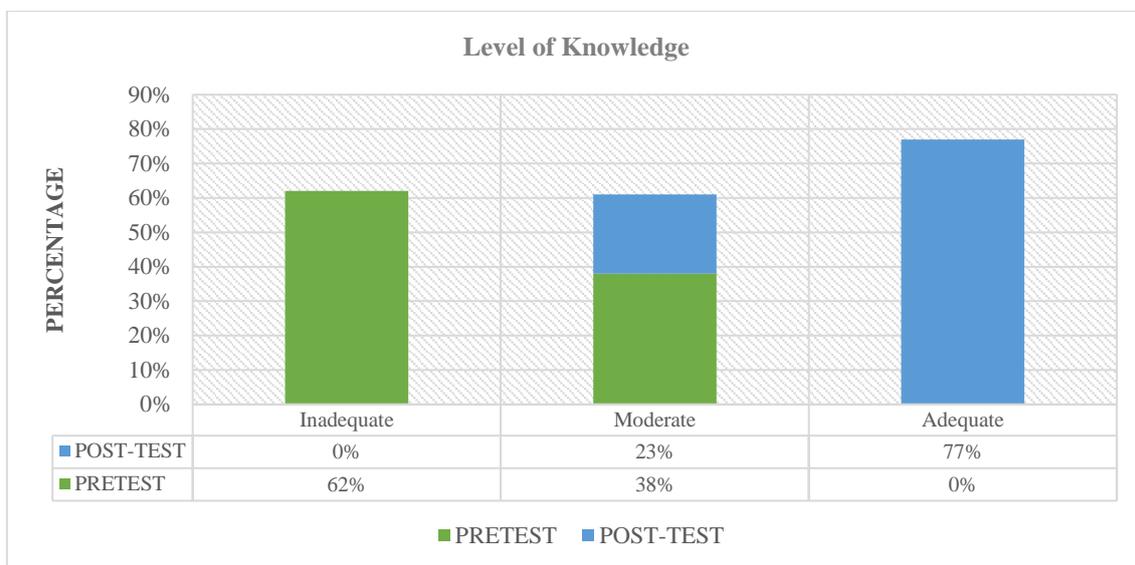

Figure 12: Findings related to Knowledge level.

5.3. Section 3

Part 1: Findings show the effectiveness of a structured teaching program on knowledge regarding prevention and control measures related to dengue among people.

Table 3: Effectiveness of structured teaching program on knowledge of people regarding prevention and control measures related to dengue among people (N=100)

	Group	Mean	Standard deviation	't 'value
Overall	Pre-test	12.09	3.042	21.618 (P value - 0.000)
	Post-test	19.10	2.468	

*- Significant at 0.05 level

Table 3 represents the mean score of knowledge level among people regarding prevention and control measures related to dengue fever. The results show that during the pre-test, the mean knowledge score was 12.09, which, after the administration of a structured teaching program, increased to 19.10. The 't' test value was observed and showed significance in all the aspects of the knowledge area. The combined 't' test value was significant, i.e., 21.618 at $P<0.05$ level, indicating that a structured teaching program effectively improves people's knowledge regarding prevention and control measures related to dengue fever.

5.4. Section 4

Part 1 deals with the association between selected demographic variables and pre-test knowledge of prevention and control measures related to dengue among people.

Table 4: Association between selected demographic variables with pre-test knowledge level (N=100)

Demographic variables	Inadequate	Moderate	Chi-square value Df	P value	Inference
Age in years					
20-30 years	31	16	6.263 Df-2	0.044	S
31-40 years	11	15			
41-50 years	20	07			
Total	**62**	**38**			
Gender					
Male	39	29	1.948 Df=1	0.163	NS
Female	23	09			
Total	**62**	**38**			
Religion					
Hindu	**27**	**14**	5.265 Df=3	0.153	NS
Christian	21	09			
Muslim	08	12			
Others	06	03			
Total	**62**	**38**			
Marital Status					
Married	41	28	0.661 Df=2	0.719	NS
Unmarried	14	07			
Divorced	07	03			
Total	**62**	**38**			
Education					
Illiterate	15	06	4.757 Df=3	0.190	NS
primary education (up to 4th class)	19	19			
secondary education (10th-12th)	17	10			
Graduated	11	03			
Total	**62**	**38**			
Total family income					
Less than 20,000	12	08	0.962 Df=3	0.810	NS
20,000-30,000	15	10			
30,000-50,000	24	16			
Above 50,000	11	04			
Total	**62**	**38**			
Type of family					
Joint family	32	21	0.126 Df=1	0.723	NS
Nuclear family	30	17			
Total	**62**	**38**			
Number of family members					
3-4	06	03	0.131 Df=2	0.936	NS
5-7	30	18			
More than 7	26	17			
Total	**62**	**38**			
Occupation					
Unemployment	13	04	1.820 Df=1	0.177	NS
Employment	49	34			
Total	**62**	**38**			
Source of drinking water					
Handpump	09	09	1.342 Df=1	0.247	NS
Tap water	53	29			
Total	**62**	**38**			
Water store at home					

Present and covered	40	23	0.164 Df=2	0.921	NS
Present and not covered	09	06			
Not present	13	09			
Total	**62**	**38**			

Significant at 0.05 level, S = Significant, NS = Not – Significant.

Table 4 shows that the obtained chi-square value for age ($\chi^2 = 6.263$, p<0.05), gender ($\chi^2 = 1.948$, p>0.05), religion ($\chi^2 = 5.265$, p>0.05), Marital status ($\chi^2 = 0.661$, p>0.05), education ($\chi^2 = 4.757$, p>0.05), Total family income ($\chi^2 = 0.962$, p>0.05), Type of family ($\chi^2 = 0.126$, p>0.05), Number of family member ($\chi^2 = 0.131$, p>0.05), occupation ($\chi^2 = 1.820$, p>0.05), source of drinking water ($\chi^2 = 1.342$, p>0.05), Water stores at home ($\chi^2 = 0.164$, p>0.05). The obtained p-value for these variables is less than 0.05 except for one demographic variable, age, which indicates no significant association between people's pre-test knowledge regarding prevention and control measures related to dengue fever with selected socio-demographic variables. Hence, the research Hypothesis H2 stated there would be no significant association between the pre-test level of knowledge regarding prevention and control measures related to dengue fever among the people residing in selected rural areas of Dehradun.

6. Discussion

The study's main concept was to assess the effectiveness of a structured teaching program on knowledge regarding prevention and control measures related to dengue fever among people.

6.1. Major findings

Demographic characteristics of participants

- The majority, 47(47%), were in the age group of 20-30 years.
- Majority, 68(68%) people, were males.
- Majority 41(41%) people were Hindus.
- Most of the 69(69%) people were married
- Most people, 38(38%), had completed primary education (up to 4th class).
- The majority 40 (40%) of people had a family income of 30,000-50,000.
- Majority of 53 (53%) people belong to a joint family.
- Majority, 48 (48%), had 5-7members in their family.
- Majority of 83 (83%) people were employed.
- Majority of 82 (82%) people's source of drinking water was tap water.

Frequency and percentage of pre-test and post-test knowledge regarding prevention and control measures related to dengue among people. The majority, 62 (62%) of the people, had inadequate knowledge, 38 (38%) of the people had moderate knowledge, and 00(00%) of them had adequate knowledge regarding prevention and control measures related to dengue fever in pre-test knowledge. After intervention with a structured teaching program, the majority, 77 (77%) of the people had adequate knowledge, 23 (23%) had moderate knowledge, and none had inadequate knowledge regarding prevention and control measures related to dengue fever in post-test knowledge.

Effectiveness of structured teaching program on knowledge of people regarding prevention and control measures related to dengue among people. The mean score of knowledge level among people regarding prevention and control measures related to dengue fever. The results show that the mean knowledge score was 12.09 during the pre-test, which, after administering a structured teaching program, enhanced to 19.10. The 't' test value was observed and showed significance in all the aspects of the knowledge area. The combined 't' test value was significant, i.e., 21.618 at P<0.05. This indicates that a structured teaching program effectively improves people's knowledge regarding prevention and control measures related to dengue fever.

Association between selected demographic variables with pre-test knowledge level: The obtained p-value for these variables is less than 0.05 except for one demographic variable, age, which indicates that there is no significant association between pre-test level of knowledge of people regarding prevention and control measures related to dengue fever with selected socio-demographic variables. Hence, the research Hypothesis H2 stated there would be no significant association between the pre-test level of knowledge regarding prevention and control measures related to dengue fever among the people residing in selected rural areas of Dehradun. The objective of the current study was to investigate whether structured teaching programs on knowledge regarding prevention and control measures related to dengue fever among people residing in a rural area. Findings are discussed based on different literature reviews concerning the study findings. The discussion is prepared under the following subsequent headings:

Objective 1: to assess the level of knowledge regarding prevention and control measures related to dengue among the people residing in selected rural areas of Dehradun. According to the findings of this survey, the assessment of the level of knowledge regarding prevention and control related to dengue depicts that during the pre-test, 62 (62%) of the people had inadequate knowledge, 38 (38%) of the people had moderate knowledge, and 00 (00%) of them had adequate knowledge regarding prevention and control measures related to dengue fever in pre-test knowledge. After intervention with a structured teaching program, the majority, 77 (77%) of the people had adequate knowledge, 23 (23%) had moderate knowledge, and none had inadequate knowledge regarding prevention and control measures related to dengue fever in post-test knowledge. Kusuma et al. [13] surveyed to gauge persons living in rural areas' awareness and understanding of dengue fever prevention. Of the 100 respondents, most were women, and the minority were men. Regarding dengue fever prevention, the majority of samples had moderate knowledge, the minority had adequate knowledge, and the minimal samples had no awareness at all. According to the survey, none of the respondents had heard of dengue. Education, outreach, and informational campaigns must identify obstacles and offer effective dengue prevention measures.

Objective 2: to evaluate the effectiveness of a structured teaching program regarding prevention and control measures related to dengue among the people residing in selected rural areas of Dehradun. According to the findings of this survey, the mean and standard deviation of the level of knowledge regarding prevention and control related to dengue where the mean knowledge score was 12.09, which, after administration of a structured teaching program, an enhancement to 19.10. The 't' test value was observed and showed significance in all the aspects of the knowledge area. The combined test value was significant, i.e., 21.618 at $P<0.05$. Truong et al. [14] the study aimed to evaluate the intern GNM students' understanding of tuberculosis prevention and control. The study's overall mean percentages for the pre-test and post-test are 52.73% and 81.05%, respectively, indicating a rise in participants' post-test knowledge compared to their pre-test knowledge scores. According to the study's findings, structured training programs are useful for increasing internship GNM students' understanding of tuberculosis prevention and control.

Objective 3: to find out the association between the level of knowledge with selected demographic variables regarding prevention and control measures related to dengue among the people residing in a selected rural area of Dehradun. According to the findings of this survey, the assessment of the level of knowledge regarding prevention and control related to dengue, the obtained p-value for these variables is less than 0.05 except for one demographic variable, age, which indicates that there is no significant association between pre-test level of knowledge of people regarding prevention and control measures related to dengue fever with selected socio-demographic variables. Herbuela et al. [15] employed a cross-sectional descriptive survey in this investigation. Schoolchildren were chosen using basic random sampling based on likelihood. A standardized questionnaire that had been pre-tested was used to gather the data. The pre-test ended with the administration of the planned teaching program. Seven days later, the post-test was administered using the same instrument as the pre-test. The study involved sixty high school students in all.

The pre-test knowledge score, according to data analysis, was 28.25%. Considering high school student's knowledge level, a planned teaching program was administered. The knowledge score following the test was 70.83%. Hence, the comparison between the pre-test knowledge score and the post-test percentage of dengue and its prevention was approximately 42.58%. A significant association between age and post-test knowledge was found. The study's goal was to see how helpful a structured teaching program on knowledge regarding prevention and control measures related to dengue fever is among people residing in rural areas. The Independent variable was a structured teaching program, and the dependent variable was knowledge regarding prevention and control measures. The study adopted a quantitative research approach with a pre-experimental design (one group pre-test post-test design). The investigation was undertaken in a rural area, Hrrawala, Dehradun. The calculated sample size in the current study was 100 samples collected. The researcher used the non-probability convenient sampling technique to choose the samples for the population. The Independent variable was a structured teaching program, and the dependent variable was knowledge regarding prevention and control measures. The study adopted a quantitative research approach with a pre-experimental design (one group pre-test post-test design). The investigation was undertaken in a rural area, Hrrawala, Dehradun. The calculated sample size in the current study was 100 samples collected. The researcher used the non-probability convenient sampling technique to choose the samples for the population. For the development of tools, the following steps are included such as:

- •   Review of literature
- •   Consultation with experts
- •   Blueprint development for knowledge questionnaire
- •   Content Organization
- •   Tool's construction

The tools used for the data collection were:

- Baseline data of people residing in rural areas.
- A structured questionnaire will assess knowledge regarding prevention and control measures related to dengue fever.

The tools' content validity was determined by submitting them to five specialists from Community Health Nursing for their feedback and ideas on the tool's items. The selection of expert was done based on their experience and clinical expertise. They were requested to give their opinions on the criterion checklist regarding adequacy, relevance, appropriateness, and organization of the items in the tools. The necessary modification was made per the expert's suggestions concerning the adequacy of the content. The validated tools were given to language experts for translation, and language validity was determined by retranslation. Reliability is the ability of the data-gathering devices to obtain consistent results. All the tools were administered to 10 people. The tool's reliability was established using Karl Pearson's test-retest method; it was found to be 0.85, i.e., reliable. The investigator also developed a lesson plan for a structured teaching program, and five experts validated the script's content. Pre-testing was done on five people. After administering the tool to the first person to fill on their own, the time required for tool administration was 20 minutes. From 15th October 2023 to 16th October 2023, a pilot study was conducted to determine the workability and any major research design problems. It also determined the plan of statistical analysis.

CIMS College of Nursing's ethical committee granted clearance in advance. Administrative permission was obtained from the Head of the rural area, Doiwala, Dehradun. After obtaining the informed consent form, the tools were given to 10 participants. The result showed that the investigation was feasible to conduct. And the outcome proved that the study could be carried out. Data assemblage for the primary investigation was done from 10th November 2023 to 11th November 2023. All the subjects who fulfilled the inclusion criteria were included in the study. Ethical permission was obtained from the concerned authority. Written permission was obtained from the rural area of Dehradun. The selected samples first described the motive of the investigation, and written permission was obtained from the participants who were interested in taking part. Pre-test data was collected from the first day, and an intervention-structured teaching program was administered to the people for two days; after that, on 3rd day, post-test data was collected. Throughout the data collection period, the investigator was present in the setting, and the researcher gave a structured teaching program. The investigator gathered all of the information. The study objectives and hypothesis were used to guide the analysis. A t-test was performed to test the hypothesis. The significance criterion for testing the hypothesis was set at $p<0.05$.

7. Conclusion

The present investigation concludes that a structured teaching program effectively improved knowledge regarding prevention and control measures related to dengue among people residing in rural areas. The study's main concept was to assess the effectiveness of a structured teaching program on knowledge regarding prevention and control measures related to dengue fever among people. The mean score of knowledge level among people regarding prevention and control measures related to dengue fever. The results show that the mean knowledge score was 12.09 during the pre-test, which, after administering a structured teaching program, enhanced to 19.10. The 't' test value was observed and showed significance in all the aspects of the knowledge area. The combined test value was significant, i.e., 21.618 at $P<0.05$. This indicates that a structured teaching program effectively improves people's knowledge regarding prevention and control measures related to dengue fever. Therefore, hypothesis H1 stated there will be a significant difference between the pre-test and post-test levels of knowledge regarding prevention and control measures related to dengue fever among the people residing in selected rural areas of Dehradun, which is accepted. The majority, 62(62%) of the people, had inadequate knowledge, 38(38%) of the people had moderate knowledge, and 00(00%) of them had adequate knowledge regarding prevention and control measures related to dengue fever in pre-test knowledge. After intervention with a structured teaching program, the majority, 77(77%) of the people had adequate knowledge, 23(23%) had moderate knowledge, and none had inadequate knowledge regarding prevention and control measures related to dengue fever in post-test knowledge.

Data Availability Statement: The study sample includes rural areas like Hrrawala and Dehradun. The calculated sample size in the current study was 100 samples collected. The researcher used the non-probability convenient sampling technique to choose the samples for the population That complied with the requirements.

Conflicts of Interest Statement: No conflicts of interest exist, according to the authors, with the publishing of this article.

Ethics and Consent Statement: The tools besides the research statement, objectives, and criteria checklist were submitted to seven validators to secure credibility. Face Validity- the overall appearance of tools was appropriate regarding language, content, and organization. Language- in the context of language tools, they were appropriate and easily understood by experts. Content- The content of the tools was adequate, accurate, and organized as per the instructions of the validators.

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