Effect of Home visits educational program for housewives' knowledge and practice regarding prevention of dengue fever at Qena governorate

Asmaa M. Madkour[(1)], Ragaa Dahi Mohamed [(2)] , Omima Mostafa Abd Elzaher [(3)]

1. Lecturer at Family and Community Health Nursing, Faculty of Nursing, Sohag University
2. Assistant professor at Critical Nursing, Faculty of Nursing, South Valley University.
3. Assistant Professor at Family and Community Health Nursing, Faculty of Nursing, Sohag University

Abstract

Dengue fever has emerged as a global public health concern. Despite the Egyptian government's proactive measures, dengue fever cases continue to rise. Sufficient knowledge, a positive attitude, and effective practices for dengue control are crucial to eradicate the disease. **Aim:** To assess the effectiveness of the home visits educational program for housewives' knowledge and practices regarding preventing dengue fever in Qena governorate. **Design:** The study employed a quasi-experimental research design that included both pre-tests and post-tests. **Setting**: It was placed in Al-Alaikat village, which is located in the Qus region of Qena Governorate. **Subjects: A** sample of 135 housewives was chosen from the prior setting. **Tools of data collection: Tool I: PART 1.** Demographic data of the studied housewives. **PART 2.** Housewives' knowledge regarding dengue fever. **Tool II:** Housewives' reported practices assessment sheet. **Results:** Only 8.9% of housewives possessed a good level of knowledge about dengue fever, while 28.9% demonstrated a satisfactory level of practice in its prevention before the program. However, after the program was introduced, there was a significant improvement in both the knowledge and practices of the housewives. The difference in total knowledge and practice scores regarding dengue fever, before and after the program's implementation, was highly statistically significant ($P<0.001$). **Conclusion:** The home visit educational program improved the knowledge and practices of housewives in preventing dengue fever. **Recommendation:** Continue the health education program in rural areas to control and prevent dengue fever.

Keywords: Home Visits, Health Education, Knowledge, Practice, Housewives, Dengue Fever.

Introduction:

Dengue is spread through the bite of an infected mosquito. The dengue virus (DENV) is among the most common viruses transmitted by mosquitoes and is widespread in many tropical and subtropical regions, especially in Southeast Asia and rural areas. People become infected when an infected female mosquito bites them**(Sandopa etal,2018)**.

The World Health Organization estimates that over 95% of reported cases show severe symptoms such as intense headaches, muscle and joint pain, nausea, vomiting, and skin rashes, lasting 3 to 5 years and leading to epidemics. Approximately 2.5 billion people are at risk, resulting in around 390 million infections, nearly 500,000 hospitalizations, and 25,000 deaths annually (**World Health Organization (WHO, 2023).**

Several factors contribute to the emergence and rapid spread of dengue in the area. These include poor socioeconomic conditions, the increasing prevalence of mosquito vector species, and susceptibility to circulating serotypes. Additionally, a growing human population density, favorable environmental conditions, and unplanned urban development play significant roles. All of these factors affect the reproduction and feeding patterns of mosquitoes, the duration of the dengue virus incubation period, and the absence of proactive control measures **(Jayalath etal., 2018)**.

The World Health Organization (WHO) classifies dengue disease into three categories: dengue shock syndrome (DSS), dengue fever (DF), and dengue hemorrhagic fever. Known as breakbone fever, dengue is transmitted to humans by mosquitoes, primarily in tropical and subtropical regions. Most cases are asymptomatic. The dengue virus is not spread directly between people but through mosquito bites. Dengue has been reported in over 100 countries globally **(WHO, 2021)**.

Most dengue patients recover within one to two weeks with few or no symptoms, and the disease is rarely fatal. However, those infected a second time are more likely to experience severe symptoms. After the fever, common symptoms can include severe abdominal pain, persistent vomiting, rapid breathing, bleeding gums or nose, fatigue, and weakness. There is currently no vaccine for all dengue virus serotypes, and no antiviral treatment exists, so management focuses on symptomatic care (**Diaz-Quijano et., 2018 & Nguyen, 2019)**.

Home visit programs are crucial in enhancing early education for families by providing assistance,

resources, and guidance in their homes. These programs often involve trained professionals, caretakers, or educators visiting families to promote positive outcomes and support housewives. They aim to offer personalized help suited to the individual or families concerned, encouraging favorable outcomes and bolstering families' ability to avoid infectious diseases. Additionally, community involvement is essential in addressing the significant public health problem of dengue fever, which can be addressed through health education programs to raise knowledge and encourage participation in integrated vector control efforts (**Rosli et al.,2019**; **Azzi-Lessing, 2021**; **Foster,2022)**.

A community health nurse has an important role in identifying mosquito breeding sources, promoting habits that prevent their proliferation, and eliminating breeding sites. It is essential to improve education for public health and environmental staff. A report of potential dengue infections has prompted an investigation into the outbreak. Additionally, there is active participation in developing medical treatment protocols for dengue hemorrhagic fever **(Al Jawf et al., 2017).**

A public health nurse has a crucial role in mobilizing both the community and local organizations to provide training for volunteers, neighborhood leaders, and community representatives. These individuals can help guide residents in reducing breeding sources for pests in their areas. As an instructor, I visit families, offices, groups, and community settings to demonstrate how to identify breeding sites and explain the procedures for eliminating them. Housewives will receive training in insecticide application as well as in the proper use of protective clothing and equipment **(Herbuela et al., 2019).**

Significance of the study:

Currently, several research studies have investigated the re-emergence of Aedes aegypti mosquitoes in Egypt, but they have not found substantial evidence of their presence. In October 2017, Egypt's Ministry of Health reported approximately 101 cases of dengue fever in the Qena governorate in Upper Egypt. This was preceded by the first recorded instance of Aedes aegypti and the re-emergence of a dengue outbreak, which accounted for more than 680 cases in the city of Qusair, located in the Red Sea Governorate. **(Abozeid et al. 2018)**

Two sources in the Qus center in Qena Governorate told us that there is a dengue fever outbreak in four villages in the governorate: Hejazia Qibli, Hejazia Bahri, Al-Harragia, and Al-Alaikat, which was confirmed by Dr. Muhammad Badran, the Undersecretary of the Ministry of Health in Qena. The housewife claims that "the health center in the village of Al-Aleiqat, after taking samples of water and sewage and taking samples from patients, announced positive cases of dengue fever, but they did not tell people how to behave, and they only sprayed the village, according to what was said among the people of her village. **(Ministry of Health, 2023)**

People lack awareness about dengue and its prevention strategies. They require additional information to better understand dengue fever and to raise awareness of various preventive methods in rural areas, hence closing the knowledge gap. A home visit education program is required to tackle the issues associated with this condition. (Nguyen **et al.,2019)**

Operational definition:

Home visits are intentional interactions within a home, aimed at promoting and maintaining the health of individuals and families.

Health education refers specifically to established learning experiences that involve a form of communication and are intended to increase health literacy, which includes gaining knowledge and developing life skills that are beneficial to individual and community health.

A housewife refers to a married woman who stays at home and is a responsible member of the family.

Knowledge encompasses the information known by participants regarding the control and prevention of dengue fever, assessed through a structured interview questionnaire.

Practice refers to the activities reported by housewives regarding the control and prevention of dengue fever, as measured through a self-report sheet.

Prevention involves measures taken at the primary, secondary, and tertiary levels to combat dengue fever.

Dengue fever is a highly infectious viral disease transmitted by mosquitoes, specifically the Aedes species.

Aim of the study

This study evaluated the home visits educational program for housewives' knowledge and practice regarding preventing dengue fever.

Research hypothesis:

To achieve the study's aim, the following research hypothesis is proposed

H1: Housewives who participate in a home visit educational program will increase their level of knowledge.

H2: Housewives who receive home visit educational programs will enhance their practice skills.
H3: The knowledge and practices of housewives will improve following the program's implementation.

Research design:

This study executed a quasi-experimental design using a one-group pre-test and post-test methodology. A quasi-experimental design is effective when true experiments cannot be conducted for ethical or practical reasons.

Research settings:

This study was carried out at Al-Alaikat village, Qus district, Qena Governorate, which is one of Qus's rural areas. It was 10 kilometers in the southeast Qus district. It has a total population of around 54711. This village was chosen at random from the four communities experiencing a dengue fever outbreak. It was divided into four geographical sectors, and a present numbering system was introduced in every house in the sector.

Subject:

According to the local government unit of Al-Alaikat village, the systematic random sample technique was used to choose the study houses by dividing the number of total households in the village (6000) by the calculated sample size (135), so the width of the systematic random sample was as follows:

$$\frac{6000}{135} = 44$$

The first household in the study was selected by a simple random technique from the first 44 households, and then the number of the second household was the sum of the first household + 44, and so on, until the end of the sample collection, applying this technique in every sector in this village.

Sample Size calculation:

The present study will include 135 women. The sample was estimated with the following equation:

n = [DEFF*Np(1-p)]/ [(d2/Z21-α/2*(N-1) + p*(1-p)]
DEFF (Design effect) = 1
N (population) = 14093
p (hypothesized %) = 10% +/- 5
d (tolerated margin of error) = 0.05
Z (level of confidence) = 1.96
α (Alpha) = 0.05
n = [1*14093*8% +/- 5 (1-10% +/- 5) / [(0.05)2 / (1.96)21 - 0.05 * (14093 - 1) + 10% +/- 5 (1-10% +/- 5)]
n = 135 women

The Purposive sample for housewives was selected based on the following criteria:

Inclusion criteria:

- Housewives who agree to participate in the study.
- Housewives residing in Al-Alaikat village, Qus district, Qena Governorate.
-Able to communicate effectively.
- Acceptance to take part in the study.

Exclusion criteria:

-Housewives who do not wish to participate in the study.
-Housewives with trouble communicating as a result of vision or hearing impairment.
-Housewives who had no prior exposure to the educational program.

Tools of data collection:

The tools used for data collection were as follows: The researchers constructed it after reviewing relevant literature and scientific references, and it includes two tools to cover the following information:

(Tool I) - ***A structured Interviewing Questionnaire***

It was based on Chackochan et al. (2018) and modified by the researcher to evaluate housewives' knowledge of dengue prevention. It had been written in Arabic to collect data and was separated into two parts:

Part (1): The demographic data of the investigated housewives included nine items: age, education, income, source of information, type of house, number of people in the home, type of family, drainage system, and solid waste disposal.

Part (2): Housewives' knowledge of dengue fever. This tool was used to evaluate the knowledge of the study housewives. It consists of 30 multiple-choice questions, including the definition of dengue fever, risk factors, causes, special characteristics of Aedes mosquitoes, mode of transmission, mosquito life cycle, incubation period, clinical features of dengue fever, laboratory tests of dengue fever, complications of dengue fever, management, and preventive measures.

The total knowledge score will be classified as:

The right response received a grade of one (1), while the wrong response received a zero. These scores were combined to calculate a percentage score. As a result, the overall score fluctuated between zero and thirty. Mothers' knowledge can be divided into the following categories:

- Poor knowledge (less than 50%).
- Average knowledge ranges from 50% to 75%.
- Good knowledge (over 75%).

Tool (II): Housewives' self-reported practice sheet:

This tool was obtained from **Jamunarani and Arokiamary (2018)** and modified by the researcher to analyze wives' practices for dengue fever prevention. It involves 20 questions to observe dengue fever control and prevention practices.

A total level score of housewives' practices will be categorized as:

A score of 1 was assigned to the action that was completed, while a score of 0 was assigned to the action that was not completed. These scores were summed and translated into a percentage. As a result, the overall level of recorded practices was determined as follows:

- A score of 0 < 50 % indicated an unsatisfactory level of reported practices.
- Scores≥ 50 % referred to satisfactory levels of reported practices.

Tools' validity and reliability:

The tool's content validity was evaluated by a panel of five professionals, three in community health nursing and two in medical-surgical nursing, from the Faculty of Nursing at Sohag and Qena University. Every member was called and requested to check the tool's content and structural design to ensure that the items of questions were complete and clear. All comments and recommendations were taken into account, some statements were reworded and sequenced, and adjustments were made in response to their feedback.

Reliability: The researcher employed the test-retest approach to assess the tools' internal consistency and dependability. It was completed before data collection began during the pilot study. Cranach's alpha for knowledge is 0.755, whereas it is 0.785 for practice.

Ethical considerations:

The study received official permission from the Faculty of Nursing, South Valley University's ethical committee approved the research by No (17) on July 1, 2024, and the local authority unit director before the study began. Furthermore, all housewives verbally agreed to participate after the researchers explained the purpose of the study and assured them that their privacy would be respected throughout the trial. All participants were made aware that their information would be kept strictly confidential and used only for research purposes.

Pilot study:

A pilot study was conducted on 10% of the total sample size (14 housewives) working in the previously specified settings to assess the clarity and applicability of the tools and to establish the time required to complete the structured questionnaire. Subjects from the pilot research were excluded from the study because there were some changes to the study tools. The pilot study's goal was to evaluate the clarity, relevance, comprehensiveness, understanding, application, and ease of use of tools, as well as estimate the time required to fill out the various data collection tools, test the wording of the questions, and estimate the time needed for the interview. Also, to find any challenges or difficulties that may occur in the collection of data.

The study was conducted through the following four phases:

Phase 1: preparatory phase (assessment phase and fieldwork):

-Permissions for data collection were granted by the head of the local council unit of the Al-Alaikat village, Qus Center, Qena Governorate, Egypt, and by the submission of a formal letter from the Faculty of Nursing, Qena University**.**

- Once the researcher was granted approval, housewives who fulfilled the inclusion criteria were interviewed individually by the researchers with face-to-face interviews in their homes in every sector of the village. The home visit educational program was developed based on a review of related literature and an assessment tool (pretest).

- Before conducting the study, an exploratory visit was done to the homes of housewives to choose the place that would give the health education program, to evaluate the suitable time for collecting data and to explain the purpose of the study and gain their best possible cooperation.

-The interview took approximately 30 min according to the interviewers' level of understanding and comfort. This phase covers a period of two months, from the beginning of July 2024 until the end of August 2024. The numbers of telephones and addresses of every housewife in every sector of the village were taken to arrange for program sessions.

II- Planning phase:

These phases involved assessing pre-test findings and determining the needs of the study's housewives. The researcher followed by creating an educational program to improve housewives' knowledge and practice of dengue fever, taking into account the most recent relevant literature.

The general objectives:
By the end of the educational program, the housewives' knowledge and practice regarding dengue fever had developed.
Specific objectives: By the end of the educational program, the housewives were able to:
1. Define dengue fever.
2. Describe the special characteristics of Aedes mosquitoes.
3. Discuss epidemiological features.
4. Explain the mode of transmission.
5. Enumerate the life cycle of a mosquito.
6. Determine the incubation period.
7. Illustrate clinical features of dengue fever.
8. Demonstrate laboratory test of dengue fever.
9. Apply management and prevention.
10. Enlist the complications of dengue fever.

III- Implementation phase:
The proposed program in every sector of the selected village a day started from 8:00 a.m. To 12:00 p.m. The housewives were organized into 4 groups in total. Every group in the sector included 33 housewives. 40–45 minutes/session, twice/week, four groups/day. The sessions were performed in the home of a housewife chosen randomly, and all the group reported the address of the chosen home for applying the educational program. The total number of sessions was 20 sessions, 5 sessions per group.

-This phase covered three and a half months from the beginning of September 2024 till the middle of December 2024. Before the conduction of the program session, the researchers chose the environment to be calm and comfortable for each member of the groups, well-ventilated and with adequate lighting.

-The researchers distributed the designed manual booklet to each participant to clarify the desired knowledge and skills. This booklet contains the illustrative colored pictures and the main points of each session of the home visit educational program as follows.

Visit 1: Taking into consideration the use of simple language according to the educational level.	Welcoming and introduction - Goal setting - definition of dengue fever - Causes and risk factors of dengue fever. - The types of mosquitoes.
Visit 2: Knowledge about how dengue fever is transmitted:	- Welcoming - Summary about the previous session - special characteristics of Aedes mosquitoes - epidemiological features - Modes of transmission. -Life cycle of mosquito.
Visit 3: Information about the signs and symptoms of dengue fever:	- Welcoming - summary about the previous session -incubation period. -clinical feature of dengue fever. -Laboratory test for dengue fever.
Visit 4: Knowledge about dengue complications:	- Welcoming - summary about the previous session -Complications of dengue fever.
Visit 5: Knowledge about treatment and prevention of dengue fever:	- Welcoming -summary about the previous session - Management and prevention of dengue fever.

Teaching techniques involved group discussion, role-playing, demonstration, and re-demonstration, along with appropriate teaching mediums such as handouts, dolls, and audiovisual materials. Action plan calendars were created and distributed to each participant in order to identify obstacles to achieving necessary goals.
Evaluation/follow-up phase

To evaluate the effectiveness of the proposed program, a reassessment of each participant was done after the implementation of the program. This took 1.5 months of evaluation from the middle of December 2024 to the end of January 2025. The total period of data collection, including the three phases of the program, covered 7

months from the beginning of July 2024 to the end of January 2025.

Statistical analysis:

The collected data was organized, classified, coded, tabulated, and analyzed with the Statistical Package for Social Sciences (SPSS), version 26. Data was presented in tables and figures as percentages, means, standard deviations, and t-tests. The McNamara test and chi-square test were used to find an association between two qualitative variables, and P-values < 0.05 indicated statistical significance.

Limitation of the Study:

- ❖ The investigator was unable to generalize the findings as the sample size was small.
- ❖ Inadequate nationwide studies have been conducted to study the current research issue.
- ❖ Data on practice was acquired through the self-reporting of respondents and was neither measured nor witnessed by the investigator.

Results:

Table 1 shows that 38.5% of the studied housewives were between 36 and 40 years old, while 4.4% of them were between 26 and 30 years old. Regarding housewives' education, 31.8% of them had unknown reading and writing skills, while 9.6% of them had a university education. The table also showed that 76.3% of the housewives didn't have enough income, 76.3% of them were extended family, and 71.8% had more than four people in the home. Concerning the type of house, the results showed that 76.3% of the housewives reported Kutcha for their formation of houses, 53.3% were open drainage systems, and 62.2% of them threw solid waste disposal in the streets.

Regarding the source of information, **figure 1** showed that 47.7% of the studied housewives got their information pre-implementation of the program from mass media, while only 4.4% of them got their information from relatives.

Table 2 illustrated that there was a significant difference in knowledge items before and after implementing the home visits educational program (P < 0.001). The mean total knowledge was 7.837±7.7913 pre-intervention and 21.844±3.663 post-intervention. This figure depicts the initial research hypothesis.

Figure 2 revealed that only 8.9% of the housewives had a good level of knowledge regarding dengue fever pre-implementation of the program, compared to 49.7% post-implementation. This figure represented the first research hypothesis.

Figure 3 indicated that 28.9% of the housewives had a satisfactory level of practice regarding their dengue fever pre-implementation of the program compared to 80.7% post-implementation. This figure covered the second research hypothesis.

Tables 3 and 4 revealed a highly statistically significant association between housewives' age, education, family income, types of families, number of persons in the home, and their total knowledge scores (P = .000**). Furthermore, a statistically significant relationship was found between housewives' types of houses, drainage systems, solid waste disposal methods, and their total knowledge scores before the program's implementation (P = .0.002**, P = .000**, and P = .000**, respectively). In contrast, no statistically significant relationship was discovered between housewives' age, education, family income, types of families, and number of persons in the home, types of houses, drainage systems, solid waste disposal methods, and their total knowledge scores after the program's implementation.

Table 5 revealed a highly statistically significant association between housewives' age, education, family income, types of families, and their total practice scores (P = .000**). Furthermore, a statistically significant relation was found between housewives' number of persons in the home and their total practice scores (P = 0.018*). A statistically significant relation was found between housewives' type of drainage system, number of persons in home, and their total practice scores pre-implementation of the program (P = .0027* and P = .000**), respectively, while a statistically significant relation wasn't found between housewives' age, education, family income, types of families, number of persons in home, types of houses, type of drainage system, type of solid waste disposal, and their total practice scores post-implementation of the program.

Table 6 showed a highly statistically significant difference between the housewives' total knowledge and total practice scores regarding dengue fever pre and post-implementation of the program. This table covered the first, second, third, and fourth research hypotheses (P =.001** and P =.001**), respectively.

Table 1: Distribution of the investigated housewives based on their demographic characteristics (n=135):

demographic characteristics	N	%
Age/years		
From 26-30 years	6	4.4
From 31-35 years	26	19.3
From 36-40 years	52	38.5
Above 40 years	51	37.8
Educational status of housewives		
Unknown read and write	43	31.8
Primary education	39	28.9
Preparatory education	21	15.6
Secondary education	19	14.1
University education	13	9.6
Monthly income of the family		
Enough	32	23.7
Not enough	103	76.3
Types of family		
Nuclear	32	23.7
Extended	103	76.3
Total number of persons in home		
Three	12	8.9
Four	26	19.3
Morethan4	97	71.8
Type of the house		
Kutcha	103	76.3
Pucca	32	23.7
Type of drainage system		
Open drainage	72	53.3
Closed drainage	63	46.7
Type of Solid waste disposal		
Throw into street	84	62.2
Collect by municipality	51	37.8

Figure (1) distribution of the studied housewives according to their source of information about dengue fever pre-implementation of the program (n=135):

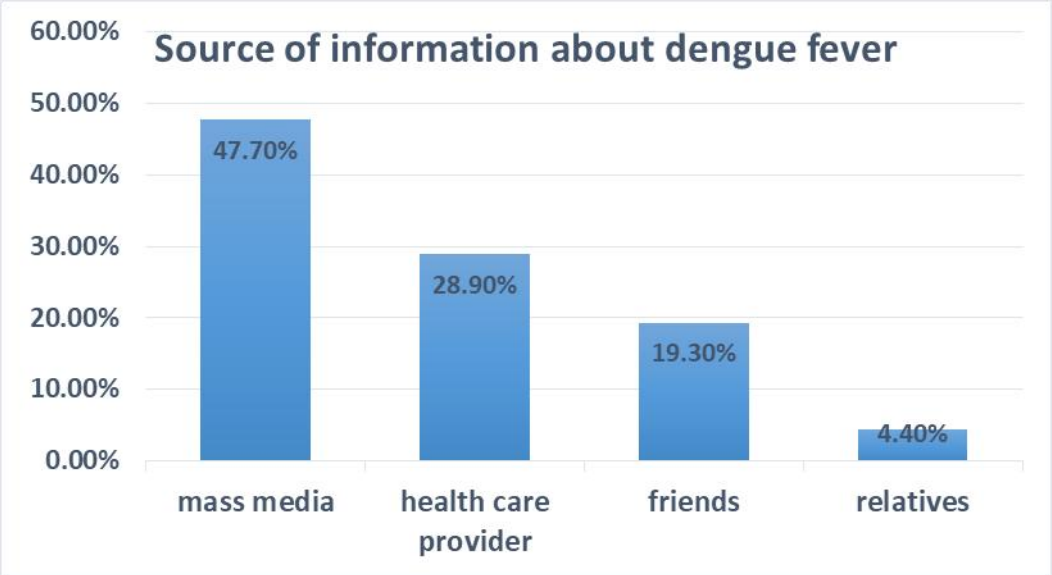
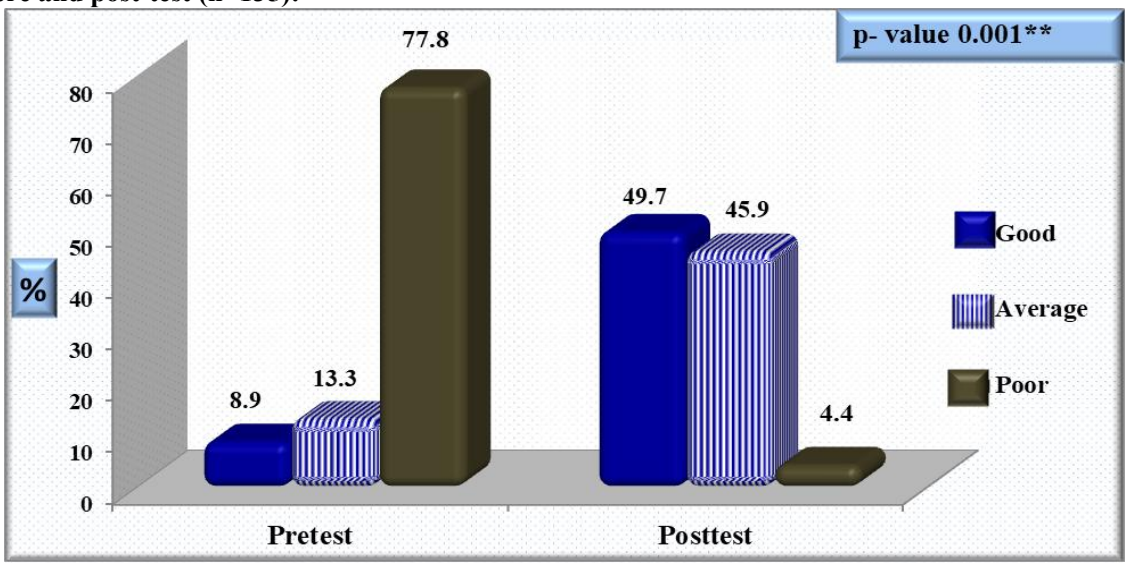


Table (2): The distribution of the studied housewives based on the mean scores of items regarding knowledge about dengue fever in the pre- and post-tests (n=135):

Items	Mean± SD		P-value
	Pre-test	Post-test	
Meaning of dengue fever	.511±.818	1.644±.480	**0.001****
Causes and risk factors of dengue fever	1.85±2.120	5.504±1.021	**0.001****
Mode of transmission of dengue fever	.667±1.239	3.11±.739	**0.001****
Signs and symptoms of dengue fever	1.19±1.2488	2.911±.28564	**0.001****
Complications of dengue fever	.378±.721	1.778±.41729	**0.001****
Management of dengue fever	3.229±2.219	7.718±1.7219	**0.001****
Prevention of dengue fever	.511±.818	1.644±.480	**0.001****
Total knowledge scores	**7.837±7.7913**	**21.844±3.663**	**0.001****

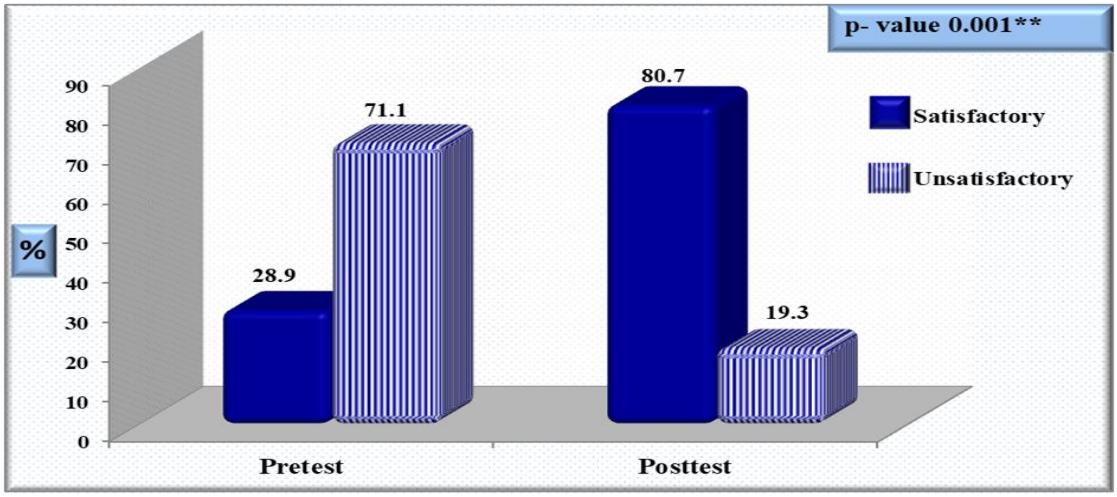
T-test
(**) highly statistically significant

Figure (2) distribution of the studied housewives according to their total level score of knowledge about dengue fever in pre and post-test (n=135):



McNemar test
(**) highly statistically significant
Poor level of knowledge <50% of total score
Average level of knowledge: 50% to 75% of total score
Good knowledge is more than 75% of total knowledge

Figure (3) distribution of the studied housewives according to their total level score of self-reported practices about dengue fever in pre and post-test (n=135)



McNemar test
(**) highly statistically significant
Unsatisfactory level of practices = <50% of total score
Satisfactory level of practices = more than 50% of total score

Table (3) Relation between the studied housewives' total level of knowledge before intervention and their demographic characteristics (n=135):

demographic characteristics	Total level of knowledge before intervention						P-value
	Good (12)		Average (18)		Poor (105)		
	N	%	N	%	N	%	
Age/years							
From 26-30 years	6	50.0	0	0.0	0	0.0	**0.001****
From 31-35 years	4	33.3	3	16.7	19	18.1	
From 36-40 years	2	16.7	15	83.3	35	33.3	
Above 40 years	0	0.0	0	0.0	51	48.6	
Educational status of housewives							
Unknown read and write	0	0.0	0	0.0	43	41.0	**0.001****
Primary education	0	0.0	0	0.0	39	37.1	
Preparatory education	0	0.0	0	0.0	21	20.0	
Secondary education	8	66.7	9	50.0	2	1.9	
University education	4	33.3	9	50.0	0	0.0	
Monthly income of the family							
Enough	12	100.0	18	100.0	2	1.9	**0.001****
Not enough	0	0.0	0	0.0	103	98.1	
Types of family							
Nuclear	12	100.0	18	100.0	2	1.9	
Extended	0	0.0	0	0.0	103	98.1	**0.001****
Total number of persons in home							
Three	2	16.7	4	22.2	6	5.7	
Four	4	33.3	9	50.0	13	12.4	**0.001****
Morethan4	6	50.0	5	27.8	86	81.9	
Type of the house							
Kutcha	12	100.0	18	100.0	73	69.5	**0.002****
Pucca	0	0.0	0	0.0	32	30.5	
Type of drainage system							
Open drainage	4	33.3	3	16.7	65	61.9	**0.001****
Closed drainage	8	66.7	15	83.3	40	38.1	
Type of Solid waste disposal							
Throw into street	0	0.0	0	0.0	84	80.0	**0.001****
Collect by municipality	12	100.0	18	100.0	21	20.0	

Chi-square test
(**) highly statistically significant

Table (4) Relation between the studied housewives' total level score of knowledge after intervention and their demographic characteristics (n=135):

demographic characteristics	Total level of knowledge after intervention						P-value
	Good (67)		Average (62)		Poor (6)		
	N	%	N	%	N	%	
Age/years							
From 26-30 years	4	6.0	1	1.6	1	16.7	0.386 (NS)
From 31-35 years	16	23.9	9	14.5	1	16.7	
From 36-40 years	22	32.8	28	45.2	2	33.3	
Above 40 years	25	37.3	24	38.7	2	33.3	
Educational status of housewives							
Unknown read and write	16	23.9	23	37.1	4	66.7	0.094 (NS)
Primary education	25	37.3	14	22.5	0	0.0	
Preparatory education	9	13.4	12	19.4	0	0.0	
Secondary education	11	16.4	6	9.7	2	33.3	
University education	6	9.0	7	11.3	0	0.0	
Monthly income of the family							
Enough	17	25.4	13	21.0	2	33.3	0.716 (NS)
Not enough	50	74.6	49	79.0	4	66.7	
Types of family							
Nuclear	17	25.4	13	21.0	2	33.3	0.716 (NS)
Extended	50	74.6	49	79.0	4	66.7	
Total number of persons in home							
Three	8	11.9	3	4.8	1	16.7	0.136 (NS)
Four	17	25.4	9	14.5	0	0.0	
Morethan4	42	62.7	50	80.7	5	83.3	
Type of the house							
Kutcha	49	73.1	50	80.6	4	66.7	0.515 (NS)
Pucca	18	26.9	12	19.4	2	33.3	
Type of drainage system							
Open drainage	33	49.3	36	58.1	3	50.0	0.597 (NS)
Closed drainage	34	50.7	26	41.9	3	50.0	
Type of Solid waste disposal							
Throw into street	48	71.6	33	53.2	3	50.0	0.080 (NS)
Collect by municipality	19	28.4	29	46.8	3	50.0	

Chi-square test
(**) highly statistically significant
(*)statistical significant
(NS) No statistical significant

Table (5) Relation between the studied housewives' total level score of self-reported practices before and after intervention and their demographic characteristics (n=135):

demographic characteristics	Total level of practices before intervention				P-value	Total level of practices after intervention				p-value
	Satisfactory (39)		Unsatisfactory (96)			Satisfactory (109)		Unsatisfactory (26)		
	N	%	N	%						
Age/years										
From 26-30 years	6	15.4	0	0.0	**0.001****	5	4.6	1	3.8	0.940 (NS)
From 31-35 years	12	30.8	14	14.6		22	20.2	4	15.4	
From 36-40 years	15	38.4	37	38.5		41	37.6	11	42.3	
Above 40 years	6	15.4	45	46.9		41	37.6	10	38.5	
Educational status of housewives										
Unknown read and write	6	15.4	37	38.5	**0.001****	36	33.1	7	26.9	0.853 (NS)
Primary education	4	10.3	35	36.5		31	28.4	8	30.9	
Preparatory education	2	5.1	19	19.8		18	16.5	3	11.5	
Secondary education	19	48.7	0	0.0		14	12.8	5	19.2	
University education	8	20.5	5	5.2		10	9.2	3	11.5	
Monthly income of the family										
Enough	27	69.2	5	5.2	**0.001****	24	22.0	8	30.8	0.346 (NS)
Not enough	12	30.8	91	94.8		85	78.0	18	69.2	
Types of family										
Nuclear	27	69.2	5	5.2		24	22.0	8	30.8	0.346 (NS)
Extended	12	30.8	91	94.8	**0.001****	85	78.0	18	69.2	
Total number of persons in home										0.710 (NS)
Three	7	17.9	5	5.2	**0.018***	9	8.3	3	11.5	
Four	10	25.6	16	16.7		20	18.3	6	23.1	
Morethan4	22	56.5	75	78.1		80	73.4	17	65.4	
Type of the house										
Kutcha	32	82.1	71	74.0	**0.316 (NS)**	84	77.1	19	73.1	0.667 (NS)
Pucca	7	17.9	25	26.0		25	22.9	7	26.9	
Type of drainage system										
Open drainage	15	38.5	57	59.4	**0.027***	59	54.1	13	50.0	0.705 (NS)
Closed drainage	24	61.5	39	40.6		50	45.9	13	50.0	
Type of Solid waste disposal										
Throw into street	11	28.2	73	76.0	**0.001****	69	63.3	15	57.7	0.596 (NS)
Collect by municipality	28	71.8	23	24.0		40	36.7	11	42.3	

Chi-square test
(**) highly statistically significant
(*)statistical significant
(NS) No statistical significant

Table (6) Relation between the studied housewives' total level score of knowledge and practices before and after intervention (n=135):

demographic characteristics	Total level of practices before intervention				P-value	Total level of practices after intervention				p-value
	Satisfactory (39)		Unsatisfactory (96)			Satisfactory (109)		Unsatisfactory (26)		
	N	%	N	%						
Total level of knowledge before intervention					**0.001****					**0.002****
Good	12	30.8	0	0.0		60	55.0	7	26.9	
Average	13	33.3	5	5.2		47	43.2	15	57.7	
Poor	14	35.9	91	94.8		2	1.8	4	15.4	

Discussion

Dengue fever, a viral infection caused by mosquito bites, affects roughly half of the world's population. Dengue prevention entails keeping mosquitoes at bay, emptying stagnant water, wearing loose clothing, staying in cool places, using mosquito repellents, and using bed nets. Human environmental knowledge and behavior also contribute to dengue transmission **(Ribeiro et al., 2020; Pai et al., 2020).**

The current study was aimed at evaluating the effect of a home visit educational program for housewives' knowledge and practice regarding the prevention of dengue fever in Qena governorate.

In light of the current study findings on the demographic data of the investigated housewives. The present study showed that more than third housewife's were between 36 and 40 years old, more than one-third of them had unknown read and write and almost three-quarters were extended family and in enough family income Furthermore, it was discovered that more than two third of them had more than person in the home, almost three quarter of the housewife's reported Kutcha for their formation of houses, and more than half were Open drainage system and more than two third of them throw solid waste disposal in the streets. This finding is supported by **Basra et al. (2019),** who conducted a study about knowledge, attitude, and practice regarding dengue fever among residents of Indira Colony, Ghaziabad, who reported that more than one third (33.6%) of the participants were in the age group 31-40 years and only 9.2% of the study participants were illiterate. This finding is consistent with the findings of **Ayed et al. (2023**, who investigated the effect of Educational Guidelines on Mothers' Knowledge, attitudes, and Practice in Preventing Dengue Fever Complications in their Children in Sohag City. A study found that 20% of mothers aged 30-40 and 17% of mothers of preschool-aged children were unable to read or write. According to **Yousif et al. (2024),** a study on the effectiveness of an educational program on pregnant women's knowledge and practices for preventing dengue fever found that one-third of mothers were aged 30 to 40.

Similarly, **Gupta et al. (2014),** who performed a study on knowledge, attitude, and practices regarding dengue fever among people living in urban areas of Jhansi City, discovered that 72% use public dustbins for waste disposal, while 60% use open drainage.

Regarding the source of information, it showed that less than half of the housewives got their information pre-implementation of the program from mass media, while only 4.4% of them got their information from relatives. These findings were corroborated by **Hossain et al. (2021**, who observed that television/radio is a highly effective source of information regarding dengue. The result is similar to **Rahman et al.'s (2020)** study on "Climate Change and Dengue Fever Knowledge, Attitudes, and Practices in Bangladesh," which discovered that social media in Bangladesh has proven to be a key source of news and information. That study was carried out in Delhi, India's urban slums. **Basole et al. (2018)** conducted a cross-sectional study on knowledge of dengue disease among people in an urban region and discovered that the majority of participants got their information about dengue via television. Furthermore, **Kohli et al. (2019)** indicated that for DF, television is the primary source of information.

In addition, **Pai et al. (2020)** also found that the media, including radio, television, and newspapers, was the most common source of information about dengue. This indicates the impact of the government's public education programs on the broader general public. The media, particularly television, has made a significant impact in raising public awareness. This was consistent with findings from the Kuala Lumpur study (**Shuaib et al., 2019)**.

There was a significant difference in knowledge items before and after implementing the home visits educational program ($P < 0.001$). The findings supported by **Ayed et al. (2023)** showed that there was a significant difference and improvement between all items of knowledge regarding dengue fever among the studied mothers, as the mothers had higher knowledge scores in all knowledge items post-educational guidelines implementation than pre-educational guidelines implementation. From the researchers' point of view, this has a good impact on program implementation. According to **Yousif et al. (2024),** a statistically significant difference was found between the knowledge and practice of pregnant women regarding dengue fever prevention measures following the implementation of the educational program.

According to the research hypothesis about the total level of knowledge of the studied housewives regarding the prevention and control of dengue fever. The current study revealed that a small proportion of the housewives had a good level of knowledge regarding dengue fever before the implementation of the program, compared to nearly half post-implementation. This figure covered the first research hypothesis. This finding was confirmed by **Harapan et al. (2018),** who carried out a cross-sectional study on Acehnese residents' knowledge, attitudes, and practices regarding dengue virus infection and discovered that over half of the participants knew nothing about dengue fever beforehand. Similar to **Basole et al. (2018),** who conducted a cross-sectional study on urban residents' knowledge of dengue disease, the study participants' knowledge was found to be insufficient.

Similarly, **Rahman et al. (2022)** discovered that many participants in the web-based research of the public and college students were uninformed of the dengue virus's infectious characteristics, indicating a knowledge gap caused by ineffective mosquito breeding prevention strategies. Furthermore, it is consistent with research from Bangladesh and Vietnam (**Nguyen et al., 2017**).

In addition**, Selvarajoo et al. (2020)** observed that only a small percentage of participants properly anticipated their risk of acquiring dengue during pregnancy, which is comparable to our study.

However, in a study about an awareness program on dengue fever among adults residing in an urban slum area in Coimbatore, **Sugunadevi, and Dharmaraj (2017)** found that health education on dengue fever awareness among adults aged 20 to 30 years in the urban slum of Coimbatore led to a 48 percent improvement in knowledge. According to the study conducted by **Yousif et al. (2024),** 18% of them had satisfactory knowledge of dengue fever before the implementation of an educational program, which increased to 80% after the program was implemented. Consistently agree with **Ayed et al. 2024**, who found that less than one-fifth of mothers had adequate information about dengue fever before the establishment of educational guidelines, but this increased to four-fifths after the recommendations were implemented.

According to the research hypothesis about the total practice level of the studied housewives regarding dengue fever prevention and control, the current findings discovered that less than one-third of the housewives had a satisfactory level of practice regarding dengue fever pre-implementation, compared to the majority post-implementation. This figure covered the second research hypothesis. Conforming to **Ghani's (2019)** research carried out in Malaysia, individuals from dengue fever-affected areas demonstrate superior knowledge and practice after implementing a proactive program targeted at protecting the health of vulnerable groups within the community. Earlier Malaysian research by **Zaki (2019) and Alhoot (2017)** found that urban inhabitants generally had positive attitudes regarding dengue prevention and good dengue prevention practices. Moreover, a few other studies **(Abas et al., 2019 & Mahyiddin et al., 2019)** showed effective dengue prevention actions in urban settings, as well as positive knowledge, attitudes, and dengue prevention practices. This is in line with previous cross-sectional research conducted by **Abdul Aziz (2019)** in Malaysia. **Shuaib et al. (2019**, who studied knowledge, attitudes, and practices regarding dengue fever and its prevention and control measures in South Indian urban slums, discovered that there was a satisfactory level of dengue and mosquito control measures. Surveillance, as well

as regular health education for the population and sufficient training of health staff, is essential.

These findings are reinforced by **Arneliwati et al. (2019),** who investigated the impact of audiovisual health education in enhancing family behavior in preventing dengue hemorrhagic fever. They discovered that using audiovisual media resulted in a significant rise in changes in families' attitudes and actions toward dengue fever prevention (p = 0.000) and (p = 0.000). This finding is consistent with **Ayed et al., 2024**, who showed that only 14% of the studied mothers had an adequate level of practice of pre-educational guidelines as compared with three-quarters of post-instructional guidelines. Similarly, **Yousif et al. (2024** illustrate that 10% of pregnant women had adequate practice levels regarding dengue fever pre-implementation educational programs, which improved to 93% post-implementation educational programs.

Concerning the relationship between the total knowledge score of the housewives studied and their demographic characteristics. Revealed a highly statistically significant association between housewives' age, education, family income, types of families, number of persons in the home, and their total knowledge scores (P =.000**). Furthermore, a statistically significant relation was found between housewives' types of houses, Type of drainage system type of Solid waste disposal, and their total knowledge scores pre-implementation of the program (P = . 0.002**, P =.000**and P =.000**) respectively while a statistically significant relation wasn't found between housewives' age, education, family income, types of families, number of persons in home, types of houses, Type of drainage system type of Solid waste disposal, and their total knowledge scores post-implementation of the program.

This result was confirmed by **Hossain et al. (2021)**, who conducted a study on dengue outbreak knowledge, awareness, and preventive practices in Bangladesh. A nationwide study found that respondents' knowledge scores were significantly correlated with their socioeconomic status, residence (place of residence), and degree of education. Similarly, **Thomas and Selvan (2022),** who conducted a study to assess the knowledge and practice of dengue fever among housewives in selected urban areas under Gandhi Nagar CHC, Bhopal, MP, and to prepare a health education package, discovered that sociodemographic characteristics such as age, educational level, husband's occupation, income, and type of house have a significant impact on their level of knowledge. According to **Kumar 2021,** who carried out a study on people's knowledge and practice on dengue fever prevention and control in Mangalpur VDC, Chitwan District of Nepal, the level of knowledge about dengue fever was statistically significant with age (p = 0.002), marital status (p = 0.005), education status (p = 0.010), religion (p = 0.003), and occupation (p = 0.000).
Concerning the association between the total practice score of the housewives investigated and their demographic characteristics. The current study indicated a highly statistically significant association between housewives' age, education, family income, types of families, and their total practice scores (P = .000**). Furthermore, a statistically significant relation was found between housewives' number of persons in the home and their total practice scores (P = 0.018*). A statistically significant relation was found between housewives' type of drainage system, type of solid waste disposal, and their total practice scores pre-implementation of the program (P = .027* and P = .000**, respectively). In contrast, a statistically significant relation wasn't found between housewives' age, education, family income, types of families, number of persons in the home, types of houses, type of drainage system, type of solid waste disposal, and their total practice scores post-implementation of the program.

This finding is corroborated by **Thomas and Selvan (2022)**, who report the findings of the correlation between the practice of dengue fever and the demographic traits of housewives, including age, family type, income, source of information, and educational attainment. Similarly, **Khairi et al. (2021)** examined dengue fever prevention knowledge, attitudes, and practices among populations in Mutiara Ville, Cyberjaya. They found that dengue prevention practices were significantly correlated with age and knowledge level.

The present study found a highly statistically significant difference between the housewives' total knowledge and total practice scores regarding dengue fever pre- and post-implementation of the program. This table covered the first, second, and third research hypotheses (P = .001** and P = .001**, respectively).

This finding is consistent with that of **Yousif et al., 2024,** who reported that following an educational program, pregnant women's knowledge and application of dengue fever prevention techniques were strongly correlated (P < 0.001). This conclusion is corroborated

by **Hossain et al. (2021),** who discovered a significant ($p < 0.05$) relation between dengue fever prevention practices and knowledge.

This relationship indicates that good information usually results in a better attitude, which leads to good practice. The researchers concluded that a lack of understanding leads to inadequate procedures and bad attitudes. However, after implementing the educational program, this result demonstrates the benefit of the educational program, which fulfilled the housewives' demands and gave them the necessary knowledge, attitude, and practice to cope with this disease. As participants' knowledge increases, so do their attitudes and practices in the studied area. Additionally, a significant association was identified between knowledge, attitude, and practice. Our results closely align with those of previous studies **(Kamel, 2017; Nasaruddin et al., 2019).**

According to earlier research, effective breeding site removal by seek-and-destroy methods necessitates sound knowledge and technique (**Carandang et al., 2020).** Some researchers, like **Azfar (2017)** and **Mahyiddin et al. (2019),** showed no relationship between best practices and knowledge. This result differs from other KAP research that discovered knowledge gaps about dengue infection **(Souza et al., 2018)**; yet, these differences may stem from the survey participants' high levels of education. In a similar vein, Research indicates that higher levels of education are positively associated with a better understanding of dengue(**Benítez-Díaz Harapan et al., 2020).**

Conclusion:

This study found that the health educational program effectively improves housewives' knowledge and practices for preventing dengue fever. As a result, the research hypotheses were validated.

Recommendations:

According to the current study, the following recommendations can be made:

- Guide the media and community health centers to promote parental performance toward controlling and preventing dengue fever.
- The same study could be performed in a bigger sample size community.
- Future research should evaluate different strategies for dengue fever prevention.
- A comparative study can be conducted between urban and rural communities or between two groups regarding knowledge and practices for the control and prevention of dengue fever.

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