



بسم الله الرحمن الرحيم

كلية نبتة

Napata College

Program of Medicine and Surgery

**Knowledge, awareness and preventative practices regarding dengue fever
among the adult population in Kassala city 2024.**

**A graduation project submitted to the Napata College in Partial fulfillment of
the requirements of Bachelor's degree in Medicine and surgery.**

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الآية

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قال تعالى:

{إِنَّ اللَّهَ لَا يَسْتَحْيِي أَنْ يَضْرِبَ مَثَلًا مَا بَعُوضَةً فَمَا فَوْقَهَا فَأَمَّا الَّذِينَ آمَنُوا فَيَعْلَمُونَ أَنَّهُ الْحَقُّ مِنْ رَبِّهِمْ وَأَمَّا الَّذِينَ كَفَرُوا فَيَقُولُونَ مَاذَا أَرَادَ اللَّهُ بِهَذَا مَثَلًا يُضِلُّ بِهِ كَثِيرًا وَيَهْدِي بِهِ كَثِيرًا وَمَا يُضِلُّ بِهِ إِلَّا الْفَاسِقِينَ}.

صدق الله العظيم

سورة البقرة

الآية (26)

DEDICATION

This research is dedicated to:

The citizens of our bereaved country who has endured this cruel conflict with patience and perseverance, hoping that Allah will grant us peace and security.

To our wonderful parents, who never cease giving of themselves in innumerable ways, our cherished brothers and sisters, our friends who uplift and support us, and all the people in our lives who hold a special place in our hearts.

Acknowledgement

First and foremost, we give thanks to Allah for helping us finish this research. We express our gratitude to our supervisors. We also appreciate the volunteers' confidence in us and their provision of the necessary information.

List of Abbreviations

Abbreviations	Statement
DENV	Dengue virus
DF	Dengue fever
KAPs	Knowledge, attitude and practices
SPSS	Statistical package for the social science

Abstract

Background: Dengue fever is a prevalent arthropod-borne disease spread through the bites of *Aedes* mosquitoes, with *Aedes aegypti* being the primary vector. The virus is a non-segmented, positive single-stranded, enveloped RNA virus belonging to the genus *Flavivirus* of the family *Flaviviridae*. It is primarily found in tropical and subtropical countries, primarily in urban and semi-urban environments. The incidence of dengue fever has dramatically increased globally, with an estimated 100400 million new cases reported annually. The virus can be caused by one of four genetically related serotypes (DENV-1-4). Early diagnosis has a significant positive impact on patient recovery following appropriate case management. Dengue fever has a negative linear economic impact due to the spread of complex factors associated with its resurgence, such as rapid population growth, unplanned urbanization, and increased international travel. Since there is no specific medication for treating dengue therefore, the community's knowledge, attitudes, and practices are essential for effective prevention.

Objectives: To assess Knowledge, awareness and preventative practice of people about dengue fever in Kassala-2024.

Method: is an cross sectional study conducted in kassala city, during the period from (25 May 2024 to 15 August 2024), which include 288 individuals (133 males and 155 females). Data was analyzed using SPSS.

Result: The study found that younger females (70% aged 18-23) had a higher understanding of dengue fever than males (50%). They learned about the disease from family and friends, while males were more likely to learn through social media. Females were more aware of mosquitoes transmitting the disease, while males were more likely to learn about it through social media. Both genders identified fever as a primary symptom, but there were no significant differences in recognizing other symptoms. Females were more aware of prevention methods like mosquito nets.

Conclusion: Survey participants were knowledgeable about dengue fever, but less about mosquito breeding grounds, vector habits, and symptoms. Misunderstandings about antibiotic usage and treatment were prevalent. Education and awareness programs needed.

الخلاصة:

المقدمة: حمى الضنك هي مرض منتشر ينتقل عن طريق المفصليات وينتشر عن طريق لدغات بعوض الزاعجة المصرية، وتكون الزاعجة المصرية هي الناقل الرئيسي. الفيروس هو فيروس RNA غير مجزأ، إيجابي، مفرد الجديلة، مغلف، ينتمي إلى جنس Flavivirus من عائلة Flaviviridae. يوجد في المقام الأول في البلدان الاستوائية وشبه الاستوائية، وخاصة في البيئات الحضرية وشبه الحضرية. لقد زاد معدل الإصابة بحمى الضنك بشكل كبير على مستوى العالم، حيث يتم الإبلاغ عن ما يقدر بنحو 100400 مليون حالة جديدة سنوياً. يمكن أن يكون سبب الفيروس أحد الأنماط المصلية الأربعة المرتبطة وراثياً (DENV-1-4) التشخيص المبكر له تأثير إيجابي كبير على تعافي المريض بعد إدارة الحالة المناسبة. ولحمى الضنك تأثير اقتصادي خطي سلبي بسبب انتشار العوامل المعقدة المرتبطة بعودة ظهورها، مثل النمو السكاني السريع، والتوسع الحضري غير المخطط له، وزيادة السفر الدولي. وبما أنه لا يوجد دواء محدد لعلاج حمى الضنك، فإن معرفة المجتمع ومواقفه وممارساته ضرورية للوقاية الفعالة.

الأهداف: تقييم المعرفة والوعي والممارسات الوقائية للناس حول حمى الضنك في كسلا-2024.

الطريقة: هي دراسة مقطعية أجريت في مدينة كسلا خلال الفترة من (25 مايو 2024 إلى 15 أغسطس 2024)، وشملت 288 فرداً (133 ذكراً و155 أنثى). وتم تحليل البيانات باستخدام برنامج SPSS.

النتيجة: وجدت الدراسة أن الإناث الأصغر سناً (70%) ممن تتراوح أعمارهن بين 18 و23 عاماً لديهن معرفة أكثر بحمى الضنك مقارنة بالذكور (50%). لقد تعلموا عن المرض من العائلة والأصدقاء، بينما الذكور تعلموا عن المرض أكثر من خلال وسائل التواصل الاجتماعي. وكانت الإناث أكثر معرفة بأن البعوض ينقل المرض، بينما كان الذكور أكثر معرفة عليه من خلال وسائل التواصل الاجتماعي. اختار كلا الجنسين الحمى كعرض أساسي، ولكن لم تكن هناك فروق ذات دلالة إحصائية في التعرف على الأعراض الأخرى. وكانت الإناث أكثر وعياً بطرق الوقاية مثل الناموسيات.

الاستنتاج: كان المشاركون في الدراسة الاستقصائية على دراية جيدة بحمى الضنك، والعوامل المسببة لها، وخصائص الناقلات. غير أنهم كانوا أقل معرفة باماكن تكاثر البعوض، وعادات ناقل المرض، وهناك أيضاً عدم معرفة كافية بالأعراض الإضافية غير الحمى، وهناك سوء فهم بشأن استخدام المضادات الحيوية وأن حمى الضنك يمكن الشفاء منها. وأيضاً هناك عدم كفاية في أساليب الوقاية من البعوض في خزانات المياه النظيفة. هناك حاجة إلى برامج للتثقيف والتوعية للحد من آثار انتشار حمى الضنك، ولمنع تكاثر البعوض، ولا سيما خلال مواسم الأمطار.

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1. Introduction, justification and objectives

1.1Background

Dengue fever is one of the most prevalent arthropod-borne diseases in the world, dengue virus (DENV) is spread through the bites of Aedes mosquitoes; Aedes aegypti has been identified as the primary vector of the virus, while Aedes albopictus has been implicated as the vector in several epidemics in several endemic countries. DENV cases are prevalent in tropical and subtropical countries, primarily in urban and semi-urban environments. [1]

The incidence of dengue fever has dramatically increased globally in recent decades, with a recent study estimating that half of the world's population is susceptible to dengue, and an estimated 100400 million new cases of the virus reported globally each year. [2]

Dengue virus infection can be caused by one of four genetically related serotypes (DENV-1-4) that circulate in many regions of the world. [3]

Dengue virus is a non-segmented, positive single-stranded, enveloped RNA virus belonging to the genus Flavivirus of the family domesticated and breeds in small bodies of Flaviviridae. The mosquito vector Ae. Aegypti water, including various tanks around houses in urban areas of the tropical and subtropical world. It only consumes humans during the day and rests indoors.[4]

Illnesses ranging from a self-limiting flu-like illness to severe dengue hemorrhagic fever and dengue shock syndrome with fatal outcomes. Most DENV infections are asymptomatic and febrile illness is characterized by headache, rash, myalgia and other symptoms. [5]

Without laboratory diagnosis to confirm viral circulation, it is difficult to differentiate between dengue fever and other arbovirus infections clinically. [6]

However, early diagnosis appears to have a significant positive impact on patient recovery following appropriate case management. Dengue fever has a negative linear economic impact, as the global incidence of dengue fever has increased dramatically due to the spread of several complex factors associated with its resurgence. [7]

These complex factors are associated with rapid population growth, unplanned and uncontrolled urbanization, and increased international travel. [8]

Since DF is a viral infection that may be avoided, the community's knowledge, attitudes, and practices (KAPs) regarding the illness are essential to its effective prevention. Although the number of cases of DF in Sudan—and Kassala state in particular—is rising, no published study has examined the risk factors, the community's knowledge, attitudes, and practices, or recorded these outbreaks.

Recently, DENV epidemics have increased in African countries, mainly in East Africa. The emergence of DENV in Sudan started in Darfur region in West Sudan and it has been associated with post-conflict social and environmental changes. [9]

Understanding the epidemiology of DENV in Africa is difficult for several reasons, including inadequate surveillance, underreporting of disease syndromes, and poor diagnostic capacity. These situations delay the detection and detection of epidemics. [10]

The outbreaks were reported in Kassala State, eastern Sudan, on the border with Eritrea, between March 2016 and March 2017. [11]

The outbreaks extended south-west to El-Gadariah State; Dengue outbreaks also were reported in El Obeid in North Kordofan in December 2012 and January 2013. [12]

In Sudan - 2023, twelve states are affected by dengue fever, most cases were reported from Khartoum, Kassala, Gadariah and North Darfur states. [13]

1.1.1 Treatment:

There is no specific medication for treating dengue; instead, we treat its symptoms, such as fever and headache, with paracetamol.

1.2 Problem statement

In Sudan, dengue fever has been a serious public health issue, especially in Kassala State. (3961) cases, Kassala account for 93.5% of all cases in Sudan, were reported between August 2019 and January 2020.

on February 28, 2023.12 States with 83 locales (44%) and 67% of cases of dengue disease reported. With an attack rate of 3.3 per 10,000 people, a total of 6,501 suspected cases and 1,612 confirmed cases have been reported.

By 2024, this number will have increased significantly, and Kassala was thought to be one of the key states that experiences an outbreak.

According to the WHO criteria, Kassala's public health laboratory and monitoring system received the lowest rating for preparedness and response to epidemics.

1.3 Justification

In Sudan, so far there is no adequate knowledge about the KAP of Dengue disease, If there's not enough awareness about this disease it will lead to a health-related crisis.

The research is expected to evaluate how much information Kassala state population has and it will generate a valuable knowledge about dengue fever and its health problems.

1.4.1 General objective

To assess Knowledge, awareness and preventative practice of people about dengue fever in Kassala-2024.

1.4.2 Specific objectives

- To Determine the extent of knowledge individuals have about dengue fever including key facts, concepts, guidelines, and information related to the disease.
- To Explore individuals' attitudes, beliefs, perceptions, and opinions toward dengue fever to understand their feelings, values, motivations, and emotional responses.
- To Evaluate individuals' behaviors, actions, habits, and practices related to the disease to assess their adherence to recommended guidelines, engagement in preventive measures, and adoption of healthy behaviors.
- To Identify gaps in knowledge, misconceptions, misunderstandings, or misinformation that may exist among individuals regarding dengue fever.

2. Literature Review

Various studies investigated the knowledge, attitudes, and preventive measures that different communities carried out against dengue fever. These studies highlighted the need for training of healthcare providers, strengthening the surveillance system, organising workshops, raising the awareness of the communities, providing the necessary resources for dengue-patient management, and increasing health education campaigns and communication programs in the community.

For instance, A Study was conducted among the community in Qardho District they found that most participants of the study had, poor knowledge of dengue fever, the agent, responsible for the disease, the nature of the vector transmitting it, the breeding sites of mosquitoes, and the biting behaviour of the vector. The preventive measures against mosquitoes in clean water holding containers were insufficient. Though most of the respondents stated that their source of information about dengue fever was from healthcare professionals, the percentage was rather low, and, therefore, there is a need for carrying out awareness and learning campaigns to prevent the impact of the disease, especially during rainy seasons. Tap water is the major source of water in the study area, and there is a low chance of breeding sites in the containers. However, the rainy season is a major risk factor, where stagnant water and collection of water in containers and tires are common. Based on their results, they recommend the Ministry of Health organise health education programs for the communities to raise their awareness against dengue fever, particularly during rainy seasons. [14]

Another study carried out in Keren Anseba region Eritreia found that a pretty good knowledge, poor attitude and poor practice was observed in the study population.

Thus, the Ministry of Health should implement inclusive community involvement and multi-sectoral collaboration to improve the community's knowledge, attitude and practice. [15]

A study conducted among Sudanese people in Khartoum, Sudan, demonstrated that participants had an intermediate level of understanding, with the majority demonstrating a favorable attitude and suitable habits. The study found that those with a personal or family history of infection had more knowledge than other groups. This calls for the creation of relevant public health interventions and educational activities. [16]

A study conducted in the city of Sennar, Sudan, found that the majority of the population had a good knowledge of the transmission, signs and symptoms of dengue, were well informed about the different aspects of the disease, and used appropriate preventive measures against dengue. . They proposed to continue health education through various means to increase societal awareness, dispel misconceptions about Dengue fever and increase awareness, understanding and detection through social studies programs.[17]

Another study conducted in the city of Dhaka, Bangladesh, which has become a hot spot for dengue, found positive attitudes about dengue among university students living in Dhaka. However, the population model lacks adequate preventive knowledge and behavior. Many students believed that their lives would be dangerous if they contracted dengue. Students from various disciplines are required to complete courses related to infectious diseases and demonstrate knowledge to prepare them for dengue in the future. In addition, these youth groups can share their knowledge with their families and neighbors, helping to reduce the risk of dengue in the community. Despite the high exposure and status effect, the male group was found to have attitudes that are more negative and behaviors than their female counterparts did. To the girl Residents of mixed groups are more likely to develop dengue fever due to greater exposure and vulnerability. Their study found that students in advanced categories had higher knowledge and lower KAP than students in mixed categories. They found that local and national controls are aimed at this population,Will provide accurate information, The community-university partnership will help students prepare for future dengue outbreaks. The authorities can help you in this regard. We can also prepare our entire community through college students to be the leaders of our nation.[18]

According to a study done in Tanzania's Pwani Region, the populace is very susceptible to getting diseases because there is a lack of awareness and a negative attitude regarding symptoms, preventive measures, and how the disease is spread. Additionally, they recommended that courteous, accurate, and straightforward information, education, and education messaging be developed and improved for the public.[19]

In an internal study of urban communities in Taiz province, Yemen, they found that most people in urban areas of Taiz understand most of the signs/symptoms of dengue disease but have good ideas about the severity and transmission of the disease. Dengue Fever: Dengue fever. However, negative attitudes about risk perception and risk prevention are widespread among small

segments of the population and follow training programs. They also said that public awareness of dengue signs/symptoms and factors related to the spread and management of its vector is not well understood.[20]

Another study of the Healthy Population of Highland and Lowland Communities in Central Nepal discovered that, despite the increasing spread of DENV in Nepal, people's knowledge of DF was extremely poor. As a result, they proposed that huge awareness campaigns be launched immediately to protect people's health against DF and limit its spread across the country.[21]

Another study in Sri Lanka found that participants who reported knowledge gaps and negative attitudes were affected by the level and frequency of prevention activities. Their findings highlight the need for more information, education and communication programs in the community.[22]

A study conducted in rural India found that the rural population has little knowledge about dengue, its symptoms, preventive measures and biological control of dengue diseases.

The use of preventive measures is also inadequate. They found that rural people need to be made aware of various preventive measures and reduce this knowledge gap.

They said that television plays an important role in providing health information to the public.
[23]

There is a lack of basic data regarding the knowledge, awareness, and preventive practices towards dengue fever among the communities in Sudan specially Kassala city, the present study aims to assess these factors about dengue fever among kassala residents. The results may be useful for developing strategies for disease prevention.

3. Research Methodology

3.1 Study design

A cross-sectional community based descriptive study.

3.2 Study area/setting

In 1991 and 1994, Kassala—also known as Ash Sharqiyah—had an area of 36,710 km² and population estimate of 2,519,071 in 2018. consists of 12 locations, including Aroma Hamashkoraib, Halfa el Jadida (New Halfa), Khashm el Girba, and Telkuk. It is the capital of the state in eastern Sudan. Kassala is surrounded by the states of the Red Sea to the north, Khartoum and the River Nile to the west, Eritrea and Ethiopia to the east, and Gadarif state to the south-west.

3.3 study duration

From May-2024 to august-2024.

3.4 Study population

Kassala's state has 2.8 million inhabitants, and the annual population growth rate is about, 2.8 per cent. The average household size has 5.5 people. There are 1,271,780 children, (aged 0-18) and 25,338 youth (aged 19-24). The majority of the people do not enjoy their full rights; most have significant humanitarian and development needs. The major ethnic groups are the Hadandwa, Bani Amir, Nuba, Shukria, Iahwain, Fallata and the Hawsa.

The Ministry of Health of Kassala consider the main health threats in the state are dengue fever, chikungunya, Rift Valley fever, cholera, and malaria. The mainstay of Kassala's economy is agriculture and livestock. Kassala has a rich cultural heritage influenced by both African and Arab traditions. The city's position as a trade hub has brought various cultural influences over the years, including from Eritrea and other parts of Sudan.

The social structure is often organized around family and tribal affiliations, with strong communal ties and local traditions playing a significant role in social interactions and community life.

3.5 Inclusion

Male

Female

Adult more than 18 years

Sudanese

3.6 Exclusion

Children who are less than 18 years

Non-Sudanese

3.7 Sampling type and procedure

Simple random sampling.

3.8 Sample size

$n_0 = Z^2 PQ \div D^2$

$N = 1.96 \times 1.96 \times 0.25 \times (1 - 0.25) \div 0.05 \times 0.05 = 288$

N= SAMPLE SIZE. Z= THEN= $1.96 \times 1.96 \times 0.25 \times (1-0.25) \div$
NORMAL STANDARD DEVIATE (Z=1.96).

P= THE FREQUENCY OF OCCURRENCE OF AN EVENT

Q= 1-P (THE FREQUENCY OF NON-OCCURRENCE OF AN
EVENT)

D= DEGREE OF PRECISION (0.05) %.

3.9 Data Collection

Data was collected via closed-ended questionnaires.

3.10 Data management and analysis

Data was documented in an excel sheet and analyzed using the Statistical Package for Social Science Program (SPSS). The frequencies table was used as descriptive statistics.

3.11 Ethical Considerations

The Board of Napata College approved the study, the information collected was not used for any purpose other than this study, Verbal consent was obtained from each participant.

4.Results

This is an observational cross-sectional community based study conducted in Kassala city during the period (May _ August 2024) to assess Knowledge, awareness and preventative practices regarding dengue fever among the adult population. A total of 288 people had participated using a questionnaire, the obtained results were statistically analyzed by using SPSS. The result was as follow:

Table 4.1: Demographic characteristics and exposure to dengue fever among the study participants grouped by gender.

Characteristic	Overall, N = 288¹	Male, N = 133¹	Female, N = 155¹	p- value²
Age				0.002
18-23	174 (61%)	66 (50%)	108 (70%)	
24-29	80 (28%)	44 (34%)	36 (23%)	
30-35	22 (7.7%)	16 (12%)	6 (3.9%)	
36-41	5 (1.8%)	2 (1.5%)	3 (1.9%)	
> 41	4 (1.4%)	3 (2.3%)	1 (0.6%)	
Heard about Dengue Fever				
Yes	286 (100%)	133 (100%)	153 (100%)	
- Heard from Family and Friends	120 (42%)	49 (37%)	71 (46%)	0.12
- Heard from social media	29 (10%)	19 (14%)	10 (6.5%)	0.028
- Heard from TV/Radio	43 (15%)	23 (17%)	20 (13%)	0.3
- Heard from Lectures	63 (22%)	32 (24%)	31 (20%)	0.4
- Heard from others	62 (22%)	40 (30%)	22 (14%)	0.001
Infected with Dengue Fever before	65 (23%)	28 (21%)	37 (24%)	0.6

Characteristic	Overall, N = 288 ¹	Male, N = 133 ¹	Female, N = 155 ¹	p- value ²
Contacted diagnosed cases	147 (51%)	66 (50%)	81 (53%)	0.6

¹n (%)

²Fisher's exact test; Pearson's Chi-squared test

Table 1 report The age distribution which showed a significant difference, with a larger proportion of younger females (70% aged 18-23) compared to males (50%) in the same age group. All participants had heard about dengue fever. However, the sources of information varied. More females (46%) than males (37%) learned about dengue fever from family and friends. Conversely, males were more likely to learn about dengue fever through social media (14% versus 6.5% for females).

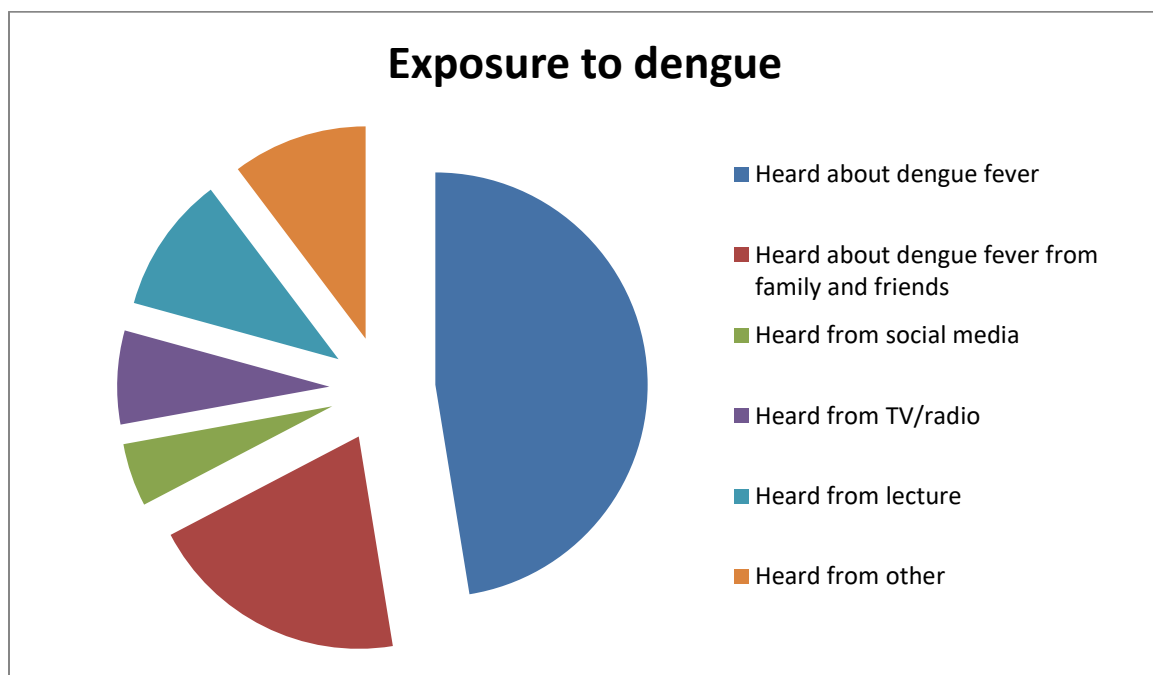


Figure 4.1: figure showing the exposure of participants to DF.

Table4.2: Knowledge and attitude of the participants regarding the etiology and transmission of dengue fever grouped by gender.

Characteristic	Overall, N = 288 ¹	Male, N = 133 ¹	Female, N = 155 ¹	p-value²
Dengue Fever is viral disease	215 (76%)	103 (77%)	112 (74%)	0.5
Transmission				
- By mosquito	261 (91%)	115 (86%)	146 (94%)	0.025
- From person to person	42 (15%)	19 (14%)	23 (15%)	0.9
- By contaminated water	34 (12%)	19 (14%)	15 (9.7%)	0.2
Mosquito breeding				
- Contaminated water	209 (73%)	97 (73%)	112 (72%)	0.9
- Clean water	86 (30%)	34 (26%)	52 (34%)	0.14
- Trees	35 (12%)	19 (14%)	16 (10%)	0.3
Knowing the shape of the mosquito	172 (60%)	86 (65%)	86 (56%)	0.13
Timing of mosquito bite				0.2
Day	161 (56%)	74 (56%)	87 (56%)	
Day and Night	80 (28%)	32 (24%)	48 (31%)	
Night	45 (16%)	26 (20%)	19 (12%)	
Dengue fever significantly occur in				
Autumn	257 (90%)	118 (89%)	15 (11%)	0.7
Summer	30 (10%)	139 (90%)	15 (9.7)	

¹n (%)

²Pearson's Chi-squared test

Table 2 discuss the Knowledge and attitude of the participants regarding the etiology and transmission of dengue fever, Participants showed a strong understanding that dengue fever is a viral disease. However, there were notable differences in knowledge about transmission. A higher percentage of females (94%) recognized that mosquitoes transmit dengue fever compared to males (86%).

Etiology and transmission of dengue fever

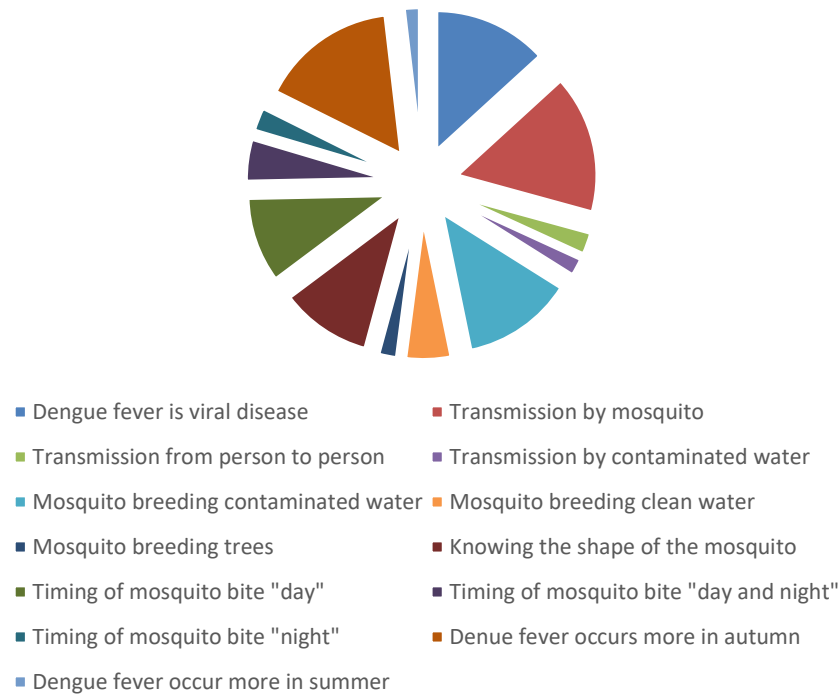


Figure 4.2: Etiology and transmission of DF.

Table 4.3: Knowledge and attitude of the participants about symptoms and treatment of dengue fever grouped by gender.

Characteristic	Overall, N = 288¹	Male, N = 133¹	Female, N = 155¹	p- value²
Symptoms				
- Fever	252 (88%)	119 (89%)	133 (86%)	0.3
- Headache	164 (57%)	73 (55%)	91 (59%)	0.5
- Nausea and vomiting	130 (45%)	61 (46%)	69 (45%)	0.8
- Bleeding	112 (39%)	45 (34%)	67 (43%)	0.10
- Abdominal pain	55 (19%)	22 (17%)	33 (21%)	0.3
- Itching	38 (13%)	18 (14%)	20 (13%)	0.9
Dengue Fever can become hemorrhagic	253 (88%)	109 (82%)	144 (94%)	0.001
Dengue Fever is treatable	252 (88%)	112 (84%)	140 (92%)	0.038
Paracetamol is given when symptoms appear	259 (92%)	120 (91%)	139 (92%)	0.7
Antibiotics should be given to the infected patient	150 (54%)	81 (61%)	69 (47%)	0.014
¹ n (%)				
² Pearson's Chi-squared test				

Table 3 report the Knowledge and attitude of the participants about symptoms and treatment of dengue fever. Regarding symptoms, both genders similarly identified fever as a primary symptom, but there were no significant differences in recognizing other symptoms like headache, nausea, vomiting, bleeding, abdominal pain, and itching. Females (94%) were significantly more aware than males (82%) that dengue fever can become hemorrhagic. In terms of treatment, a higher percentage of females (92%) believed that dengue fever is treatable compared to males (84%). There was also a significant misconception among males (61%) that antibiotics should be administered to dengue fever patients, compared to 47% of females.

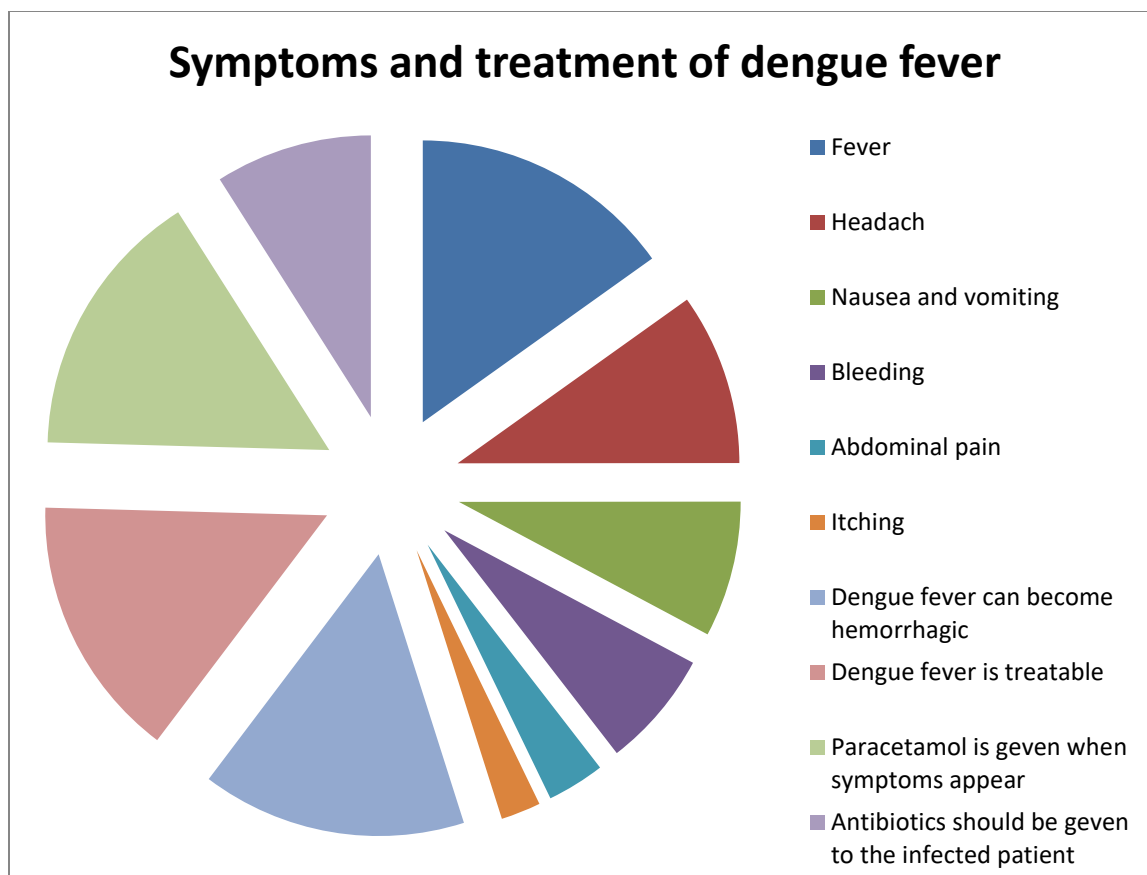


Figure 4.3: Knowledge about symptoms and signs of DF and its treatment.

Table 4.4: preventative practices of participants regarding dengue fever grouped by gender.

Characteristic	Overall, N = 288¹	Male, N = 133¹	Female, N = 155¹	p-value²
Prevention				
- Pesticides	161 (56%)	70 (53%)	91 (59%)	0.3
- Coverage of doors and windows with mosquito nets	185 (64%)	75 (56%)	110 (71%)	0.010
- Disposal of garbage	142 (49%)	68 (51%)	74 (48%)	0.6
- Sterilization of drinking water not storing water more than three days	217 (75%)	103 (77%)	114 (74%)	0.4
- Removal of the bush around houses	98 (34%)	45 (34%)	53 (34%)	>0.9
Vaccine is available for Dengue Fever	139 (50%)	70 (54%)	69 (46%)	0.2
Infection occurs once in life	61 (22%)	30 (23%)	31 (21%)	0.7
				0.7
¹ n (%)				
² Pearson's Chi-squared test				

Table 4 show the preventative practices, When it came to prevention, more females (71%) than males (56%) knew about the use of mosquito nets to cover doors and windows. Knowledge about other prevention methods such as using pesticides, proper garbage disposal, and watersterilization was similar across genders. Awareness of the availability of a vaccine for denguefever was consistent, with no significant difference between males and females.

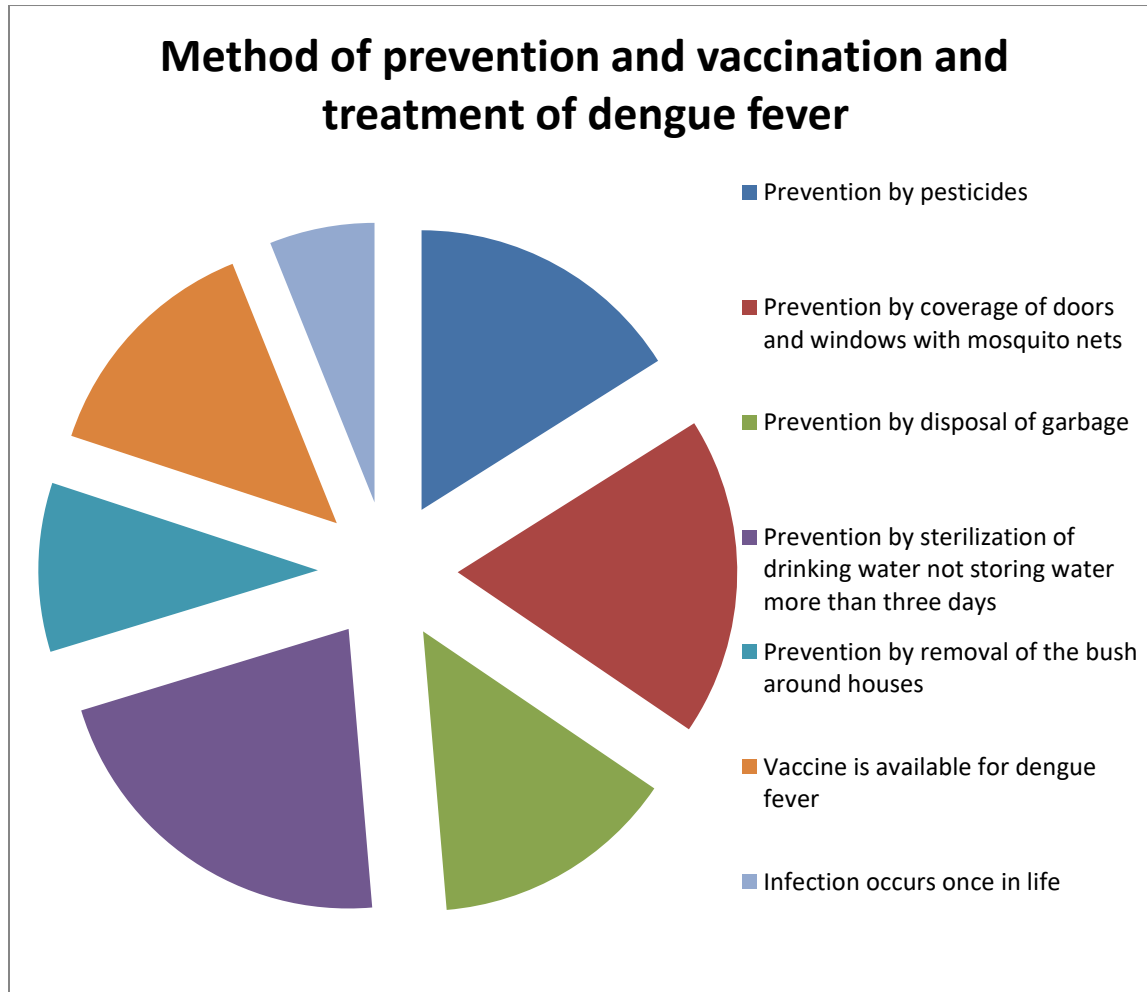


Figure 4.4: Preventative practices of participants.

5.DISCUSSION

This study provides valuable information on the demographic characteristics, knowledge, attitudes and practices of residents of Kassala-Sudan regarding dengue fever (DF). Our study included 288 adults, with a response rate of 90.24%. Most participants were female and (70%) aged (18-23) compared to males who were (50%) in the same age group.

According to our study, about (100%) had heard about dengue disease, and most of them (42%) had heard about dengue from their family and friends, (23%) of the participants were previously infected with dengue and (51%) had been in contact with a diagnosed case, most of the participants showed a good knowledge that dengue is a viral disease and that it can occur more than once in a lifetime.

About (88%) of the participants agreed that fever is a symptom of DF, while other symptoms and signs were moderately familiar (34%), about (88%) of the participants agreed that DF can progress into dengue hemorrhagic fever.

Regarding preventive practices, (55%) of the participants experienced good practices, about (75%) of them chose to sterilize drinking water and not store water for more than three days as the best method of prevention.

Considering the vaccination of DF (50%) they knew the presence of vaccines, In addition, the majority (91%) of them correctly identified DF is transmitted by mosquito bites, while (66%) of them identify the mosquito unique shape, despite their good knowledge of the vector and its shape, they have a wrong idea about breeding sites and time of mosquito bite, and (90%) agreed that DF infection occurs more in autumn.

In general, our study's degree of DF knowledge to past results from similar KAP studies in Khartoum [16], Sennar [17], Bangladesh [18], Tanzania [19], Yemen [20], Nepal [21] and Sri Lanka [22]. With the exception of a study from Nepal, which revealed low understanding as a result of a decline in the campaign including health professionals and social media, we discovered that all research results demonstrated strong knowledge, consistent with our own study and that may be due to rise in DF cases and the high level of infected history with DF among participants.

In terms of attitude Our study, along with studies conducted in Khartoum, Sennar, and Bangladesh, demonstrates a positive attitude in terms of participants' knowledge and the existence of educational programs. However, participants in research conducted in Tanzania,

Yemen, Nepal, and Sri Lanka had a negative attitude, which can be attributed to a lack of training, education, and communication programs.

When it comes to preventative measures, generally all of the studies result showed that knowledge and attitude levels are higher than practices. The studies conducted in Khartoum, Sennar, and our study demonstrated appropriate levels of practices; this is a result of the outbreaks that have increased in Sudan which lead to increase the awareness and the social studies program in recent years, as well as the participants' high levels of understanding.

Nevertheless, other research from Bangladesh, Yemen, Tanzania, Sri Lanka, and Nepal demonstrates that preventative efforts are ineffective, and this is due to low levels of understanding, knowledge, and attitude in these nations as well as a lack of education program.

Regarding misconception, our study revealed a misperception regarding the breeding sites: 73% of participants selected the contaminated water as a breeding site, which is in line with the findings of the Sennar study. Additionally, about 54% of participants believed that antibiotics should be used in DF treatment.

In comparison between our study and another study done by Ibrahim Adel et al - Khartoum, Sudan-2023 there is a disagreement between our results, our result indicated that family and friends were the primary source of information regarding DF, but their results indicated social media was the primary source. They found that the knowledge rate is (52%), which is less than what our study found. In terms of prevention strategies, our research indicates that the best approaches are to sterilize drinking water and not keep it for longer than three days, this contrasts with another study their result showed that the best approaches are to cover water containers and fans. [16]

This is in contrast to another study conducted in Sennar, Sudan - 2023, done by Esraa Moham mad Ahmed et al. Both studies showed that the preventative practice level is less than the knowledge level towards the DF. Our study indicates that only (28%) of participants know the mosquito bite time, whereas their study result showed that (21%) knew the correct timing. It also indicates that (100%) of participants had heard about DF and that (88%) knew that fever is one of the symptoms, whereas their study result showed that only (79%) had heard about DF and (45%) knew about the fever.

Both studies also revealed misconceptions regarding the breeding ground. Participants in both studies chose the dirty water as the breeding site. In conclusion, the findings of the two studies agreed. [17]

Another study carried out in Dhaka City, Bangladesh in 2022 done by Md. Mostafizur Rahman et al, shows that their level of knowledge, attitude, and practices is higher than ours. However, there is a lack of knowledge about the disease infectious behavior. Our results show a somewhat greater history of DF infection among the participants (23%), compared to their result of (20%). [18]

In comparison, a different study was conducted in the Pwani region of Tanzania in 2019 by Method Kazaura et al. revealed a high degree of awareness (97%) which was quite like our result (100%). In contrast to our result, which was deemed to be somewhat convenient, (80%) of the participants in their study had limited understanding regarding symptoms, transmission, and vector control techniques. In contrast to our results, which revealed a 55% positive attitude on DF prevention, just 20% of theirs did. [19]

Another study carried out in Taiz governorate, Yemen-2016 done by Mohammed Ali Saghir et al, revealed a high level of knowledge about the fever (90%) and bleeding (80%) as a symptom compared to our result which was (88%) and (39%) respectively. Their result revealed a high level of knowledge about DF transmission with negative attitude towards the prevention, unlike our result which showed an acceptable level of knowledge about the transmission but with a positive attitude towards the prevention. Concerning the Knowledge about vector of DF they had a poor outcome unlike ours which was relatively good. [20]

Meghnath Dhimal et al.'s 2014 study in central Nepal revealed that just (77%) of its participants had heard of DF previously, which is comparatively lower than our study's (100%) participation rate. In contrast to our results, which revealed the reverse, theirs revealed a poor level of practice and knowledge. [21]

According to a 2012 study conducted in Sri Lanka by K P Jayawickreme et al, social media is the primary source of knowledge about DF, but family and friends are the primary source in our study, Their results revealed a larger percentage (58%) than ours, which was (50%), in terms of awareness of symptoms and transmission, Furthermore, compared to our study, which found just (55%) of beneficial practices, theirs revealed (85%). [22]

6. CONCLUSSION AND RECOMMENDATION

6.1 CONCLUSION

We discovered that while most survey participants were well-informed about dengue fever, its causative agent, and the characteristics of the vector that spreads the illness, they were less knowledgeable about mosquito breeding grounds and the vector's habit of biting people. additional than the fever, little is known about additional symptoms of DF. There were misunderstandings regarding the usage of antibiotics in the treatment of DF as well as the fact that DF is treatable. The mosquito-prevention methods used in clean water holding containers were inadequate. Even while the majority of respondents said that friends and family were the primary source of knowledge about dengue fever, this was a relatively low percentage, and Therefore, it is imperative to run education and awareness programs to lessen the disease's effects, particularly during the rainy seasons. The research area's primary water source is tap water, and there is little possibility of breeding grounds in the containers. On the other hand, stagnant water and the accumulation of water in tires and containers are frequent during the rainy season, which poses a serious concern.

6.2 RECOMMENDATIONS

- Based on our findings, we recommend the Ministry of Health to set up health education initiatives in the communities to increase people's knowledge about dengue fever, especially in the rainy seasons.
- A serious threat to public health is dengue disease. Health practitioners should be taught to provide appropriate advice in order to try and change some strongly ingrained traditional practices, such as storing water in the home without suitable covers.
- It is possible to improve door-to-door survey coverage by increasing public participation and staffing levels.

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APPENDIX

Consent Form

Name: -----

Information about the study has been explained to me by the researcher.

I have understood that the objective of this study is to measure the awareness toward dengue fever. I agree to participate in the study and hereby approve my agreement with my signature.

Participant signature: -----

Date: -----

نموذج الموافقة

الإسم.....

شرحت لي معلومات عن الدراسة عن طريق الباحث. فهمت أن الهدف من الدراسة هو تقييم مدى وعي بحمى الضنك ووافقت

مشاركتي بتوقيعي. على المشاركة في الدراسة وأكدت

توقيع المشارك:.....

التاريخ.....التاري

Research questionnaire

1. Agree ☐

2. Age

a. 18-23 ☐

b. 24-29 ☐

c. 30-35 ☐

d. 36-41 ☐

e. More than 41 ☐

3. Gender

1. Male ☐ 2. Female ☐

4. Ever heard about dengue fever

1. Yes ☐ 2. No ☐

5. Source of information regarding dengue fever

a. Radio/Television ☐

b. social media ☐

c. Family / Friend ☐

d. Others ☐

6. Experience in getting dengue fever or reporting suspected dengue fever case

1. Yes ☐ 2. No ☐

7. Dengue fever is virus

1. Yes ☐ 2. No ☐

Etiology and mode of transmission:

8. Dengue fever can spread through: -

a. from human to human ☐

b. Bite of mosquito ☐

c. Drinking dirty water ☐

° Breeding ground for the vector

9.The vector breeds in: -

- a. dirty water ☐
- b. The vector breeds in clean water ☐
- c. The vector breeds in plants and vegetables ☐

10.Did you know the shape of mosquitoes

1.Yes ☐ 2. No ☐

11.The vector frequently bite in: -

- a. the morning
- b. the daytime ☐
- c. Bite at night ☐

12.Dengue epidemic occurs only in:

- a. rainy season ☐
- b. hot weather ☐

Sign and symptom:

13.The symptom include the following: -

- a. Fever ☐
- b. Nausea and vomiting ☐
- c. Bleeding ☐
- d. Headache ☐
- e. Rash ☐
- f. Abdominal pain ☐

14.Dengue fever may become dengue hemorrhagic fever

1.Yes ☐ 2. No ☐

Treatment and prevention: -

15.DF is treatable

1.Yes ☐ 2. No ☐

16.Paracetamol should be given to patient suspected to have Dengue fever
☐

1. Yes 2. No ☐

17. Antibacterial drugs should be given to patient suspected to have dengue fever

1. Yes ☐ 2. No ☐

18. dengue can be prevented by

a. Mosquito spray with insecticide can prevent from dengue fever ☐

b. Windows and doors screen can prevent from dengue fever ☐

c. Cleaning of garbage and trash can prevent from dengue fever ☐

d. Preventing water stagnation can prevent from dengue fever ☐

e. Pouring chemicals in standing water can prevent from mosquito breeding ☐

f. Covering water containers can prevent mosquito breeding ☐

g. Cutting bushes around the house can prevent breeding of mosquito ☐

19. There is vaccine for dengue fever

1. Yes ☐ 2. No ☐

20. A patient can only get dengue fever once

1. Yes ☐ 2. No ☐

تقييم مدى المعرفة والوعي والممارسات الوقائية للناس حول حمى الضنك - كسلا -2024

١ - أوافق على المشاركة في هذا الإستبيان

نعم

لا

٢ -العمر

18-23

24-29

30-35

36-41

أكثر من 41

٣ -الجنس

ذكر

أنثى

٤ -هل سمعت بحمى الضنك؟

نعم

لا

٥ -إذا كانت الإجابة نعم ، من أين سمعت عنها؟

الراديو/التلفاز

العائلة / الأصدقاء

وسائل التواصل الإجتماعي

حاضرات توعوية

أخرى

٦ -هل سبق لك الإصابة بحمى الضنك؟

نعم

لا

٧ -هل تعاملت مع حالات مشخصة بحمى الضنك؟

نعم

لا

٨ -حمى الضنك مرض فيروسي

نعم

لا

_الأسباب وطرق الانتقال

٩ -تنتقل حمى الضنك عن طريق الآتي:

من شخص لآخر

لسعة البعوض

شرب الماء الملوث

١٠ -مكان توالد البعوض

الماء الملوث

الماء العذب

الأشجار

١١ -هل لديك معرفة بشكل الباعوضة المسببة لحمى الضنك؟

نعم

لا

١٢ -دائماً ما تلسع الباعوضة في

الصباح

النهار

الليل

الليل والنهار

-الأعراض

١٣ -تشمل أعراض حمى الضنك الآتي:

حمى

ظمام واستفراغ

نزيف

صداع

حكة

ألم في البطن

١٤ -يمكن أن تتحول حمى الضنك الى حمى نزفية

نعم

لا

_العلاج والوقاية من حمى الضنك

١٥ -يمكن علاج حمى الضنك

نعم

لا

١٦ -يعطى البندول للشخص الذي تظهر عليه أعراض حمى الضنك

نعم

لا

١٧ -يجب اعطاء المصاب بحمى الضنك مضادات حيوية

نعم

لا

١٨ -يمكن الوقاية من حمى الضنك بالآتي:

المبيدات الحشرية

تغطية الأبواب والشبابيك بإستخدام شاشات مضادة للحشرات والباعوض

التخلص من القمامة

تعقيم مياه الشرب وعدم تخزينها لأكثر من ثلاثة أيام

تقطيع الأشجار والنباتات حول المنازل

١٩ -هل يوجد لقاح لحمى الضنك؟

نعم

لا

٢٠ -يمكن الاصابة بحمى الضنك مرة واحدة في العمر

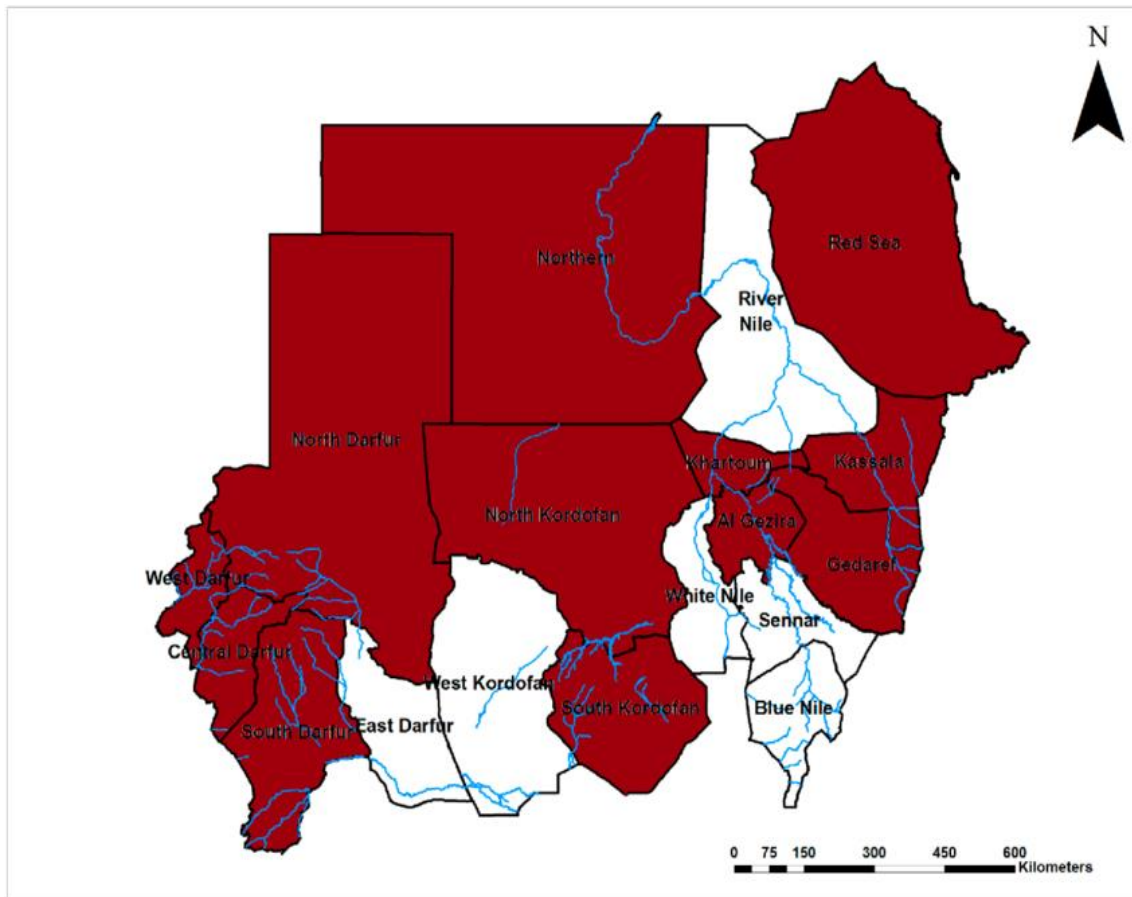
نعم

لا

٢١ -تحدث حمى الضنك بصورة كبيرة في فصل

الخريف

الصيف



A map showing the distribution of dengue fever in Sudan.