

## Community Knowledge, Awareness And Preventive Practices Regarding Dengue Fever At The Primary Healthcare Level In Makkah City At Saudi Arabia 2022

Abdulmajeed Hammad Almutairi<sup>1</sup>, Abdullah Khalid Abdullah Alruways<sup>2</sup>, Abdulmajed Saleh Alhossan<sup>3</sup>, Rafdan Mohammad Khaled Algathani<sup>4</sup>, Abdullah Nasser Al-Harbi<sup>5</sup>, Mohsen Abdullah Saad Alotaibi<sup>6</sup>, Abdullah Saud Abdullah Alhawah<sup>7</sup>, Fayeze Bashed Alanazi<sup>8</sup>, Hamad Abdullah Alqahtani<sup>9</sup>, Abdullah Dafer Alqahtani<sup>9</sup>, Mahammed Abdallah AlQahtani<sup>10</sup>

### Abstract:

#### **Background:**

Dengue is an infectious disease caused by dengue virus (DENV). It is endemic in many tropical and subtropical areas. Patients infected with DENV have a wide spectrum of clinical manifestation, ranging from silent infections with no symptoms to a mild flu-like syndrome, dengue fever (DF), or severe dengue disease (SDD), including dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS). Recently, DF has become one of the most challenging public health problems in affected regions, as the DF incidence increases rapidly worldwide. There are approximately 2.5 billion people at risk for DF worldwide. Fifty million people would acquire DENV annually, and half a million among them would develop dengue hemorrhagic fever, including 22,000 deaths. The major determinants of dengue control are vector eradication, early case recognition, and adequate clinical management, Knowledge and practice (KP) among primary healthcare professionals (HCPs) regarding dengue diseases may pace alarm and improve the outcome of dengue control, Primary physicians. **Aim of the study** :To ascertain Community knowledge, awareness and preventive practices regarding dengue fever at the primary healthcare level in Makkah City at Saudi Arabia 2022. **Methods**: Across sectional descriptive study conducted among health care workers selected primary health-care centers in Makkah Al-Mokarramah city, during the September to October, 2022, the Sample size of medical practitioners. Our total participants were (200). **Results**: shows majority of participant were (34.0%) were aged from 30-45 years of age, sex, more than half of participant (58.0%) were male, experience the majority of participant <2 y were (43.0%), specialty the majority of participant internal medicine were (39.0%), majority of participant married were (49.0%) while single were (34.0%) but widow were (10.0%), regarding reported a dengue case more than half of participant answer Yes were (75.0%). **Conclusion**: There is a lack of in-depth knowledge on dengue epidemiology in the Saudi

<sup>1</sup>Epidemiology inspector ,wtheilan hospital

<sup>2</sup>Epidemiology Inspector, Compliance Assist Administration, Compliance Third West Office, Al Duwadimi , Saudi Arabia

<sup>3</sup>Epidemiology Inspector, Iquwayiyah hospital

<sup>4</sup>Epidemiology Supervision, Alnadwah primary Healthcare center, Riyadh

<sup>5</sup>Epidemiological monitoring technician, RIYADH THIRD HEALTH CLUSTER, SAJIR GENERAL HOSPITAL

<sup>6</sup>Epidemiology Supervision Technician (Male), Al-Shu'ara Primary Health Care Center

<sup>7</sup>Epidemiology technician, Riyadh -Khreiman Health Center

<sup>8</sup>Epidemiology Supervision, Alnadwah primary Healthcare center, Riyadh

<sup>9</sup>Epidemiology technician, Abu Salim Health Center

<sup>10</sup>Epidemiology Inspector, Al-Rain general Hospital

*Arabia community and observation revealed that more needs to be done by the Government as well as community members to prevent vector mosquito breeding . This paper recommends the gathering of efforts to establish the proper knowledge of dengue infection and the warning signs listed by the WHO, educational programs for health care workers on dengue fever management and prevention should be organized .*

**Keywords:** *Dengue, fever, knowledge, practices, symptoms, health care workers, primary, Makah .*

## **Introduction**

Dengue is one of the most dreadful arboviral diseases of humans with over half of the world's population living in areas of risk. An estimated 3.5 billion people, or half the world's population, are at risk for dengue virus (DENV) infection in tropical and subtropical countries.(1) Sporadic outbreaks of Dengue fever (DF) have been reported in India for over two centuries (2,3) but the earliest virologically confirmed outbreak occurred in 1956 in Vellore, Tamil Nadu.(4) The first major outbreak of dengue began in 1963 in Calcutta, West Bengal, from where it spread to other states, eventually affecting most parts of the country.(5) The frequency, magnitude and geographical distribution of epidemic dengue and potential occurrence of life-threatening dengue hemorrhagic fever (DHF) have increased dramatically in the past 40 years as the viruses and the mosquito vectors have both expanded geographically in the tropical regions of the world.(6) The factors responsible for this increase and expansion are societal changes such as population growth, urbanization, changing habitats and behavior, and lack of effective vector control.(7) High human population density and inadequate water supply (water storage practice) are regarded as major contributors to dengue epidemics. (8)

Dengue is a viral disease transmitted to humans by the bite of infected females of the main vector *Aedes aegypti* and to lesser extent *Aedes albopictus* mosquitoes (9). The World Health Organization has classified dengue into three categories according to disease severity; Dengue Fever (DF), Dengue Hemorrhagic Fever (DHF), and Dengue Shock Syndrome (DSS)24. Severe dengue (DHF and DSS) causes lethal complications that included severe hemorrhage, plasma leakage, organ impairment, fluid accumulation, or respiratory distress .(10,11)

Disease Control and Prevention, there are two species of mosquitoes that transmit dengue fever, but the primary vector of dengue is *Aedes aegypti*. (12) This species, whose food source is human blood, lives mainly inside buildings in dark areas such as closets and bathrooms. However, it can also be found in outdoor areas with standing water such as construction sites and gardens.(13)

Severe dengue (previously known as dengue hemorrhagic fever) was first recognized in the 1950s during dengue epidemics in the Philippines and Thailand. (15) Today, severe dengue affects most Asian and Latin American countries and has become a leading cause of hospitalization and death among children in these regions. (16) Dengue fever has a wide range of presentations from mild to severe. On the mild side, it entails a low, self-limited fever, but severe cases can entail life-threatening hemorrhagic shock. The incubation period of the dengue fever virus in humans ranges from 3 to 14 days.(17)

The World Health Organization (WHO) recognized the need for general guidelines for dengue management and published the first and revised editions of the dengue guideline in 1975 and 1997.(18) The 1975/1997 WHO guidelines divided clinical dengue disease into dengue fever, dengue hemorrhagic fever, and dengue shock syndrome.(19) Criticisms of the 1975/1997 guidelines included a rigid definition of dengue hemorrhagic fever and the lack of data from the adult group outside of the southeastern Asia region.(20) The WHO released the newest (third) edition of the dengue guideline in 2009 in response to the criticism after conducting the multicenter dengue control study.(21) By introducing the concepts of 'warning signs' and 'severe dengue', the 2009 guidelines intended to provide a more clinical management tool than merely a classification for dengue control and management.(22,23)

## **Literature Review**

In 2009, the WHO published a classification of dengue cases, which was attributed to several benefits shown in literature (24). One of those values was the considerable sensitivity in capturing the severe case (25). Moreover, a study proved that this classification was easy to apply with its user-friendliness to healthcare providers (26). Nevertheless, the WHO 2009 classification listed seven warning signs of dengue without providing a precise definition of these signs. These lead to the different application of these signs for the diagnosis and treatment of dengue patients between healthcare personnel.(27)

In 2009, the Saudi MOH reported a total of 3350 cases of DF in the Kingdom and estimated the case fatality rate to be 4.6 per thousand (28). The reemergence of DF in Saudi Arabia can be explained by the growing levels of urbanization, international trade and travel .(29)

in another study found some major gaps in knowledge regarding some important issues that need reconsideration were identified such as believing that A Egypt, the mosquito vector for dengue virus, typically bites after dark, prescription of aspirin or ibuprofen for confirmed dengue case, dengue infection by one serotype DEN (30) will give lifelong immunity against all serotypes, and reporting that the most sensitive and specific method of acute dengue infection diagnosis is isolation in cell culture using immunofluorescence. Similar gaps in the PHC physicians' knowledge have been reported in a recent study conducted in Jeddah.(31)

Nanyingi (2018) reported, poor knowledge on transmission of dengue was evident from the respondent's inability to recognize the feeding time of dengue mosquitoes. Similar findings have been documented by Huang et al. in Taiwan, where, only 14.4% of respondents correctly identified the feeding behavior of dengue mosquitoes (32). Having accurate knowledge on the behavior of dengue mosquitoes will help MPs to impart appropriate health education (33), which remains one of the cornerstones of preventing dengue. Respondents had low knowledge of the signs that lead to dengue shock and thrombocytopenia. Such findings were also reported in Puerto Rico, where only 29.0% of the respondents correctly identified early signs of shock, and 48.0% identified severe abdominal pain and persistent vomiting as warning signs of severe dengue (34).

Sahu et al.,( 2023) report that dengue vector change occurs on a large range of intricate temporal and spatial scales, where the change occurs on a daily scale to where the evolution of a potential repetition zone of the vector occurs on a yearly scale. In addition, modeling the daily changes of hotspots of the vector is conceivable on a sub-district scale but not on a sub-municipality scale, where long-range interactions cannot be modeled accurately (30). This could be due to a lack of training on the recognition of warning signs and case classification of dengue as per the updated WHO guidelines. Identification of warning signs of dengue and indications that lead to shock is critical for managing dengue (24).

Yusuf and Ibrahim reported that 56.0% of respondents lacked adequate training to manage dengue patients, including identifying warning signs, and recommended to close this gap (35). also previous knowledge, attitude and practices (KAP)studies concerning control of dengue virus showed the lack of knowledge about clinical features or control measures as the most common problem.(22) This study found almost a third of PHC physicians had insufficient knowledge about important investigations of dengue as well as prevention measures toward DF. In southern Taiwan, (36)

## **Rationale:**

Since the first case of DHF died in Jeddah in 1993, Saudi Arabia has reported three major epidemics: a dengue virus serotype (DEN)-2 epidemics in 1994 with 469 cases of dengue, 23 of DHF. The incidence of DF in Saudi Arabia by 2020 was increase the percentage among Saudi nationals and also among non-Saudi nationals. Since 1994, Makah province became a dengue-endemic area with high rate of dengue infection during spring and early summer. Several dengue outbreaks have been reported after 2015 in the Makah region. Millions of Muslims living in hyper endemic dengue areas come yearly to Makah for Hajj,

with the possibility of introduction of dengue virus. Same time gaps in the health care workers knowledge have been reported in a recent study conducted also primary physicians and nurses serve as the first-line health care providers of dengue virus infection diagnosis, notification, and treatment. Knowledge, attitude, and practice (KAP) among primary healthcare professionals (HCPs) regarding dengue diseases may pace alarm and improve the outcome of dengue control. health education can be useful for DF surveillance systems for public health officials. This method can provide an opportunity to specify the health burden of DF.

**Aim of the study:**

To ascertain Community knowledge, awareness and preventive practices regarding dengue fever at the primary healthcare level in Makah City at Saudi Arabia 2022.

**Objectives:**

To ascertain Community knowledge, awareness and preventive practices regarding dengue fever at the primary healthcare level in Makah City at Saudi Arabia 2022.

**Methodology:**

**Study design:**

This study is a prospective cross-sectional study design was used in carrying out of this study.

**Study Area**

The study will be carried out in the city of Makah Al-Mokarramah Makkah is the holiest spot on Earth. It is the birthplace of the Prophet Mohammad and the principal place of the pilgrims to perform Umrah and Hajj. It is located in the western area in Kingdom of Saudi Arabia and called the Holy Capital. Contains a population around 2.578 million. This study was conducted in Makah primary health-care centers at Saudi Arabia, and it reflects a diversified demographic profile with a considerable portion of the population comes from rural descent, while others come from an urban one. This difference translates into biological, socioeconomic and lifestyle differences in the Makah population.

**Study Population**

The study has be conducted among health care workers in the primary healthcare regarding the Knowledge and practices of dengue fever symptoms in Makah the sample was selected to include primary health-care medical practitioners who aged from <30years - More than 60 years and their total number was 200

**Selection criteria:**

**Inclusion criteria**

- All nationalities
- aged from 30 to 60 year

**Exclusion criteria :**

- No specific exclusion criteria.

**The sample size**

The sample size has been calculated by applying Raosoft sample size calculator based on (The margin of error: 5%, Confidence level: 95%, and the response distribution was considered to be 20%) accordingly to sample size from medical practitioners by the required sample size; (200 ). (male and female) and adding 10 more to decrease margin of error. After adding 5% oversampling, the minimum calculated sample has been 200. Computer generated simple random sampling technique was used to select the study

participants. Data collection was done by the researcher during the September to October to, 2022.

**Sampling technique:**

Systematic random sampling technique is adopted. After that, by using random number generator, then simple random sampling technique was applied to select the medical practitioners. Also, convenience sampling technique will be utilized to select the participants in the study. By using systematic sampling random as dividing the total medical practitioners by the required sample size; (200 ).

**Data collection tools of the study:**

Tool was designed to collect the necessary data, and developed by the researchers after review of the literature.

**Tool I: Health care workers knowledge and practices regarding dengue fever structured interview questionnaire:**

It included five parts as follows:

**Part one: Health care workers socio demographic characteristics:**

This part consisted data about patient's age, sex, marital status, level of education, religion, income and sources of information.

**Part two: Knowledge about signs and symptoms of dengue fever:**

Include items that determine the health care workers knowledge about clinical manifestations of dengue fever. This part contains 9 questions.

**Data collection technique:**

Researcher has be visits the selected primary health care setting after getting the approval from the ministry of health . The researcher has be obtained permission from primary health care setting director and participants.

After the arrival of the participants has be explained the purpose of the study to all participants attending .

**Data entry and analysis:**

The Statistical Package for Social Sciences (SPSS) software version 24.0 has be used for data entry and analysis. Descriptive statistics (e.g., number, percentage) and analytic statistics using Chi-Square tests ( $\chi^2$ ) to test for the association and the difference between two categorical variables were applied. A p-value  $\leq 0.05$  will be considered statistically significant.

**Pilot study**

A pilot study has be conducted in primary health care patient's the same sector due to the similarity to the target group using the same questionnaire to test the methodology of the study. As a feedback, the questionnaire will be clear and no defect has be detected in the methodology

**Ethical considerations**

Permission from the Makah joint program Family Medicine program has be obtained. Permission from the Directorate of health , verbal consents from all participants in the questionnaire were obtained. All information was kept confidential, and results have be submitted to the department as feedback .

**Budget:** Self-funded

**Result****Table 1.** Distribution of the demographic characteristics of about symptoms and sign of the dengue fever in the participants . (n=200)

	N	%
<b>Age</b>		
<30years	46	23
30-45 years	68	34
45-60 years	54	27
More than 60 years	32	16
<b>Sex</b>		
Female	84	42
Male	116	58
<b>Experience</b>		
<2 y	86	43
2-10 y	70	35
>10 y	44	22
<b>Specialty</b>		
Internal medicine	78	39
Surgery	24	12
Family medicine	38	19
Pediatrics	56	28
Ear, nose, throat	4	2
<b>Marital status</b>		
Single	68	34
Married	98	49
Widow	20	10
Divorced	14	7
<b>Reported a dengue case</b>		
Yes	150	75
No	50	25

This table 1 shows that the majority of participant were (34.0%) were aged from 30-45 years of age, while 45-60 of participant were (27.0%) followed by aged < 30 years (23.0%), regarding sex, more than half of participant (58.0%) were male while female were (42.0%) regarding experience the majority of participant <2 y were (43.0%) while 2-10 y were (35.0%) but the > 10 y were (22.0%) , regarding specialty the majority of participant internal medicine were (39 .0%) while pediatrics were (28.0%) but family medicine were (19.0%), regarding marital status, the majority of participant married were (49.0%) while

single were(34.0%) but widow were (10.0%), regarding reported a dengue case more than half of participant answer Yes were (75.0%) but answer No were (25.0%) .

**Table 2.** Distribution of the knowledge about symptoms of the dengue fever in the participants

	Physician				Chi square	
	Yes		No		X <sup>2</sup>	P-value
	N	%	N	%		
Many people experience no signs or symptoms of a dengue infection DF?	136	68	64	32	25.920	0.000
When symptoms do occur, they may be mistaken for other illnesses Such as the flu DF?	50	25	150	75	50.000	0.000
Usually symptoms begin four to 10 days after you are bitten by an infected mosquito DF?	62	31	138	69	28.880	0.000
Dengue fever causes a high fever — 104 F (40 C) — DF?	24	12	176	88	115.520	0.000
Most people recover within a week or so DF?	38	19	162	81	76.880	0.000
In some cases, symptoms worsen and can become life-threatening called severe DF?	70	35	130	65	18.000	0.000
Do you know Knowledge about symptoms dengue hemorrhagic fever or dengue shock syndrome .	44	22	156	78	62.720	0.000
A symptom of severe dengue happens when your blood vessels become damaged and leaky. And the number of clot-forming cells (platelets) in your bloodstream drops .	48	24	152	76	54.080	0.000
Symptoms of DF this can lead to shock, internal bleeding, organ failure and even death	68	34	132	66	20.480	0.000
A symptom of dengue fever damage to lymph and blood vessels, bleeding from the nose and gums, enlargement of the liver	44	22	156	78	62.720	0.000

Regarding distribution of the knowledge about symptoms of the dengue fever in the participants show regarding the many people experience no signs or symptoms of a dengue infection DF the majority of participant a statistical significant while P-value= 0.000 and X<sup>2</sup> 25.920 increased in answer Yes were (68.0%) while answer No were (32.0%), regarding when symptoms do occur, they may be mistaken for other illnesses Such as the flu DF the majority of participant a statistical significant while P-value= 0.000 and X<sup>2</sup> 50.000 increased in answer No were (75.0%) while answer Yes were (25.0%), regarding usually symptoms begin four to 10 days after you are bitten by an infected mosquito DF the majority of participant a statistical significant while P-value= 0.000 and X<sup>2</sup> 28.880 increased in answer No were (69.0%) while answer Yes were (31.0%), regarding dengue

fever causes a high fever — 104 F (40 C) — DF the majority of participant a statistical significant while P-value= 0.000 and  $X^2$  115.520 increased in answer No were (88.0%) while answer Yes were (12.0%), regarding Most people recover within a week or so DF the majority of participant a statistical significant while P-value= 0.000 and  $X^2$  76.880 increased in answer No were (81.0%) while answer Yes were (19.0%), regarding some cases, symptoms worsen and can become life-threatening called severe DF the majority of participant a statistical significant while P-value= 0.000 and  $X^2$  18.000 increased in answer No were (65.0%) while answer Yes were (35.0%), regarding you know Knowledge about symptoms dengue hemorrhagic fever or dengue shock syndrome the majority of participant a statistical significant while P-value= 0.000 and  $X^2$  62.720 increased in answer No were (78.0%) while answer Yes were (22.0%) , regarding A symptom of severe dengue happens when your blood vessels become damaged and leaky, the number of clot-forming cells (platelets) in your bloodstream drops the majority of participant a statistical significant while P-value= 0.000 and  $X^2$  54.080 increased in answer No were (76.0%) while answer Yes were (24.0%) , regarding symptoms of DF this can lead to shock, internal bleeding, organ failure and even death the majority of participant a statistical significant while P-value= 0.000 and  $X^2$  20.480 increased in answer No were (34.0%) while answer Yes were (66.0%), regarding A symptom of dengue fever damage to lymph and blood vessels, bleeding from the nose and gums, enlargement of the liver the majority of participant a statistical significant while P-value= 0.000 and  $X^2$  62.720 increased in answer No were (78.0%) while answer Yes were (22.0%) .

**Table 3. Distribution of the knowledge about sign of the dengue fever in the participants**

	Yes		No		Chi-square	
	N	%	N	%	$X^2$	P-value
1. The warning symptom usually begin the first day or two after your fever goes away	114	57	86	43	3.920	0.048
2. Is fever a symptom of DF?	130	65	70	35	18.000	0.000
3. Is headache a symptom of DF?	110	55	90	45	2.000	0.157
4. Is joint pain a symptom of DF?	134	67	66	33	23.120	0.000
5. Is muscle pain a symptom of DF?	130	65	70	35	18.000	0.000
6. Is pain behind the eyes a symptom of DF?	102	51	98	49	0.080	0.777
7. Are nausea/vomiting symptoms of DF?	134	67	66	33	23.120	0.000
8. Is rash a symptom of DF?	144	72	56	28	38.720	0.000
9. Is diarrhea common in DF?	80	40	120	60	8.000	0.005
10. Is stomach pain common in DF?	98	49	102	51	0.080	0.777
11. Is Swollen glands a symptom of DF	74	37	126	63	13.520	0.000

Regarding distribution of the knowledge about sign of the dengue fever in the participants show regarding the warning symptom usually begin the first day or two after



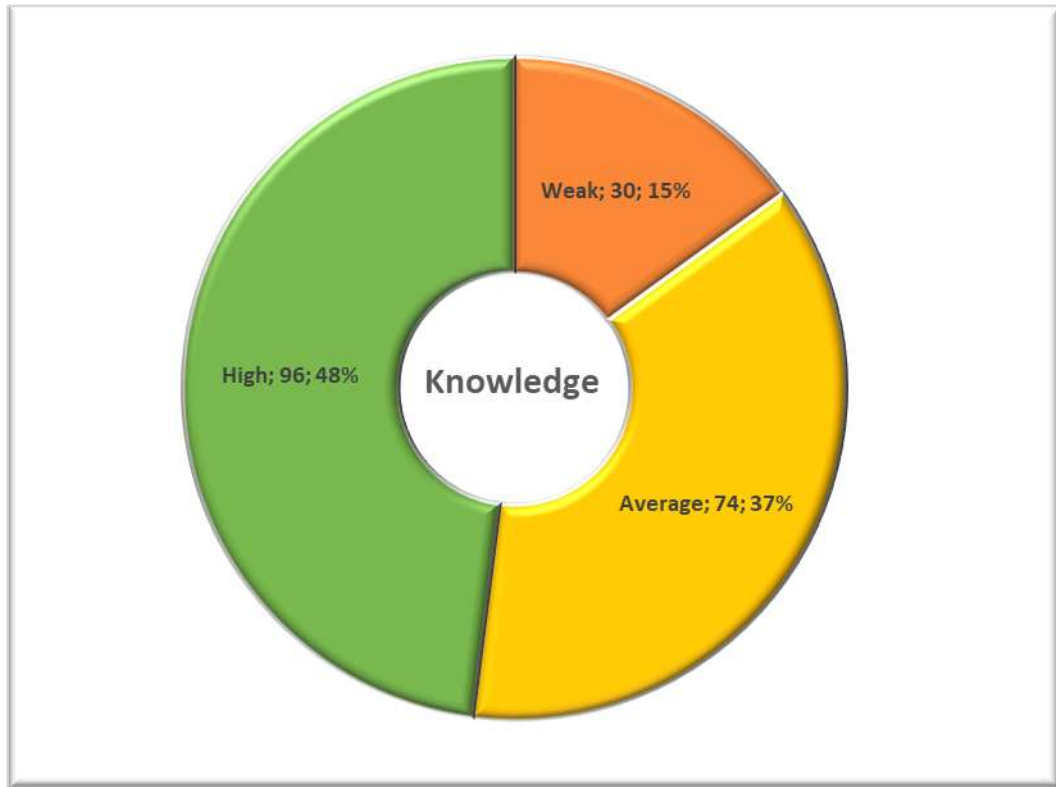
your fever goes away the majority of participant a statistical significant while P-value= 0.048 and  $X^2$  3.920 increased in answer Yes were (57.0%) while answer No were (43.0%), regarding fever a symptom of DF the majority of participant a statistical significant while P-value= 0.000 and  $X^2$  18.000 increased in answer Yes were (65.0%) while answer No were (35.0%), regarding headache a symptom of DF the majority of participant no statistical significant while P-value= 0.157 and  $X^2$  2.000 increased in answer Yes were (55.0%) while answer No were (45%), regarding joint pain a symptom of DF the majority of participant a statistical significant while P-value= 0.000 and  $X^2$  23.120 increased in answer Yes were (67.0%) while answer No were (33.0%), regarding muscle pain a symptom of DF the majority of participant a statistical significant while P-value= 0.000 and  $X^2$  18.000 increased in answer Yes were (65.0%) while answer No were (35.0%), regarding pain behind the eyes a symptom of DF the majority of participant no statistical significant while P-value= 0.777 and  $X^2$  0.080 increased in answer Yes were (51.0%) while answer No were (49.0%), regarding nausea/vomiting symptoms of DF the majority of participant a statistical significant while P-value= 0.000 and  $X^2$  32.120 increased in answer Yes were (67.0%) while answer Yes were (33.0%) , regarding is rash a symptom of DF the majority of participant a statistical significant while P-value= 0.000 and  $X^2$  38.720 increased in answer Yes were (72.0%) while answer No were (28.0%) , regarding is diarrhea common in DF the majority of participant a statistical significant while P-value= 0.005 and  $X^2$  8.000 increased in answer No were (60.0%) while answer Yes were (40.0%), regarding is stomach pain common in DF the majority of participant no statistical significant while P-value= 0.777 and  $X^2$  13.520 increased in answer No were (63.0%) while answer Yes were (37.0%) , regarding is Swollen glands a symptom of DF the majority of participant a statistical significant while P-value= 0.000 and  $X^2$  13.520 increased in answer No were (63.0%) while answer Yes were (37.0%) .

**Table (4) Distribution of the knowledge of practitioner's among the dengue fever**

	Knowledge		Chi-square	
	N	%	$X^2$	P-value
<b>Weak</b>	30	15	33.880	<0.001*
<b>Average</b>	74	37		
<b>High</b>	96	48		
<b>Total</b>	200	100		

Regarding Distribution of the knowledge of practitioner's among the dengue fever show the majority of participant a statistical significant while P-value= 0.001 and  $X^2$  33.880 increased in high knowledge were (48.0%) followed by average were (37.0%) while weak were (15.0%) the total were (100.0%) .

**Figure (1) Distribution of the knowledge of practitioner's among the dengue fever**



**Table 4: Distribution of the Practice of physicians regarding dengue fever**

	N	%
<b>How many suspected dengue cases do you see/week?</b>		
Zero	74	37
1–5	90	45
6–10	36	18
<b>Do you look for skin or mucous membrane manifestation if you suspect dengue?</b>		
Always	150	75
Most of the time	20	10
Sometimes	22	11
Never	8	4
<b>Do you perform blood pressure in any suspected case of dengue fever?</b>		
Always	132	66
Most of the time	38	19
Sometimes	20	10
Never	10	5
<b>Do you perform a dengue test if you suspect dengue?</b>		
Always	62	31
Most of the time	36	18
Sometimes	90	45
Never	12	6
<b>If you responded “always” or “most of the time” to above question, which of the following dengue diagnostic tests do you utilize most frequently?</b>		
Leukocyte, platelets, and hematocrit	68	34
Dengue serology (IgM/IgG)	80	40
Dengue reverse-transcription polymerase chain reaction (RT-PCR)	10	5
	24	12

Viral culture	18	9
<b>If you responded “sometimes” or “never” to first question, please explain briefly why you usually do not perform a dengue diagnostic test if you suspect dengue</b>		
CBC is enough	178	89
Test not available	22	11
<b>Please indicate the platelet count for which you would normally refer patients for hospital management.</b>		
<100,000/mm <sup>3</sup>	14	7
<80,000/mm <sup>3</sup>	20	10
<50,000/mm <sup>3</sup>	2	1
Platelet count is not an indicator	164	82

This table 4 regarding distribution of the Practice of physicians regarding dengue fever show regarding the many suspected dengue cases do you see/week the majority of participant 1-5 were (45.0%) while zero were (37.0%) followed by 6-10 were (18.0%), regarding you look for skin or mucous membrane manifestation if you suspect dengue more than half of participant answer always were (75.0%) while sometimes were (11.0%) but most of the time were (10.0%), regarding you perform blood pressure in any suspected case of dengue fever the majority of participant answer always were (66.0%) while most of the time were (19.0%) but sometimes were (10.0%) , regarding you perform a dengue test if you suspect dengue the majority of participant sometimes were (45.0%) while always were (31.0%) but most of the time were (18.0%), regarding you responded “always” or “most of the time” to above question, which of the following dengue diagnostic tests do you utilize most frequently the majority of participant dengue serology (IgM/IgG) were (40.0%) while Leukocyte, platelets, and hematocrit were(34.0%) but chain reaction (RT-PCR) were (12.0%), regarding you responded “sometimes” or “never” to first question, please explain briefly why you usually do not perform a dengue diagnostic test if you suspect dengue more than half of participant CBC is enough were (89.0%) but Test not available were (11.0%), regarding indicate the platelet count for which you would normally refer patients for hospital management more than half of participant Platelet count is not an indicator were (82.0%) but <80,000/mm<sup>3</sup> were (10.0%)

**Table 4 continua: Distribution of the Practice of physicians regarding dengue fever**

	N	%
<b>How frequently do you advice oral fluids and rest to dengue patients?</b>		
Always	16	8
Most of the time	22	11
Sometimes/never	162	81
<b>How frequently do you prescribe paracetamol to dengue patients?</b>		
Always	42	21
Most of the time	118	59
Sometimes/never	40	20
<b>How frequently do you perform daily full blood counts to monitor patients with suspected or confirmed dengue?</b>		
Always	32	16
Most of the time	106	53
Sometimes	24	12
Never	38	19
<b>How frequently do you advice dengue patient to avoid mosquito bite?</b>		
Always	132	66
Most of the time	48	24

Sometimes/never	20	10
<b>Does your center provide to the patient with any type of preventive method (repellent, nets, etc.) to avoid mosquito bite?</b>		
Always	24	12
Most of the time	148	74
Sometimes	24	12
Never	4	2

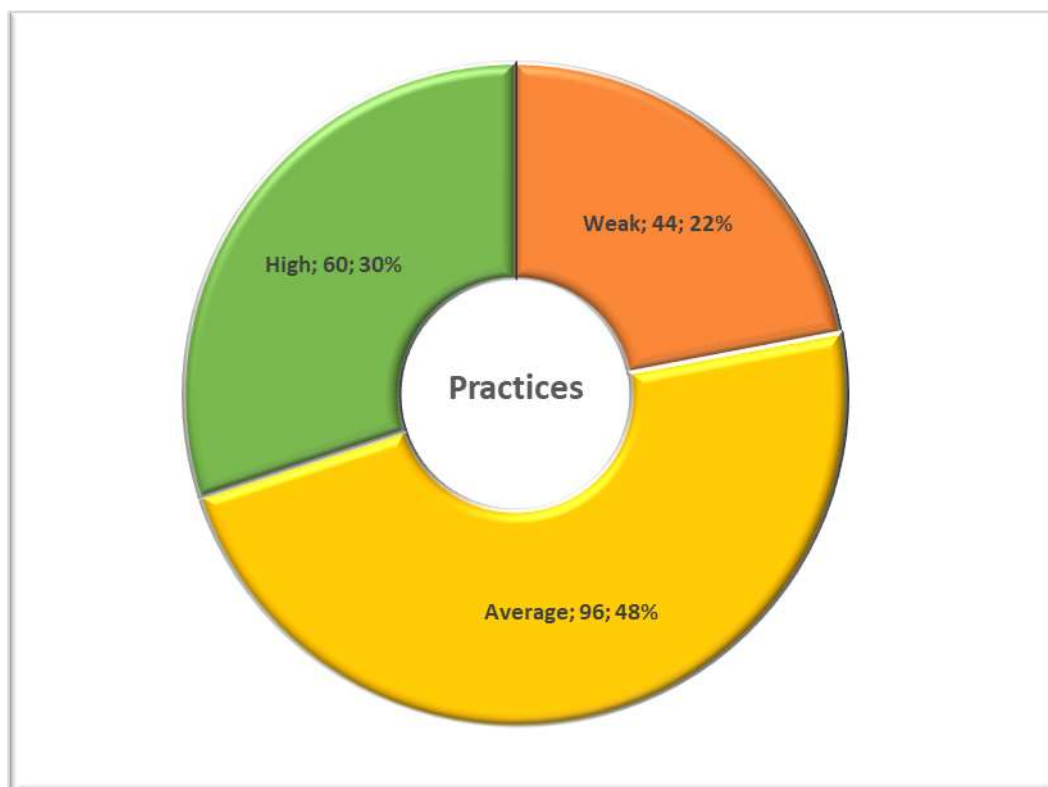
This table 4 continua regarding frequently do you advice oral fluids and rest to dengue patients the majority of participant sometimes/never were (81.0%) while most of the time were (11.0%) followed by always were (8.0%), regarding frequently do you prescribe paracetamol to dengue patients more than half of participant answer most of the time were (59.0%) while always were (21.0%) but sometimes/never were (20.0%), regarding frequently do you perform daily full blood counts to monitor patients with suspected or confirmed dengue the majority of participant answer most of the time were (53.0%) while never were (19.0%) but always were (16.0%) but sometimes were (12.0%), regarding frequently do you advice dengue patient to avoid mosquito bite the majority of participant always were (66.0%) while most of the time were (24.0%) but sometimes were (10.0%), regarding your center provide to the patient with any type of preventive method (repellent, nets, etc.) to avoid mosquito bite the majority of participant most of the time were (74.0%) while always and sometimes were(12.0%) but never were (2.0%),

**Table (5) Distribution of the Practices of practitioner's among the dengue fever**

	Practices		Chi-square	
			X <sup>2</sup>	P-value
<b>Weak</b>	44	22	21.280	<0.001*
<b>Average</b>	96	48		
<b>High</b>	60	30		
<b>Total</b>	200	100		

Regarding Distribution of the practices of practitioner's among the dengue fever show the majority of participant a statistical significant while P-value= 0.001 and X<sup>2</sup> 21.280 increased in average of practices were (48.0%) followed by high were (30.0%) while weak were (22.0%) the total were (100.0%) .

**Figure (2) Distribution of the Practice of practitioner's among the dengue fever**



## Discussion

Dengue fever is the most prevalent vector-borne viral disease in the twenty-first century. It can be found in rural regions, but it is more prevalent in metropolitan and peri-urban areas. In our study to ascertain community knowledge, awareness and preventive practices regarding dengue fever at the primary healthcare level in Makkah City at Saudi Arabia 2022. This study reveals that the majority of participants were (34.0%) aged from 30-45 years of age, sex, more than half of participants (58.0%) were male, experience the majority of participants <2 y were (43.0%), specialty the majority of participants internal medicine were (39.0%), majority of participants married were (49.0%) while single were (34.0%) but widow were (10.0%), regarding reported a dengue case more than half of participants answer Yes were (75.0%). This result is in accordance with Collij, et al. 2021 who found that the majority of study participants were male, married (25). A previous systematic review showed the wide variation of the definitions and cutoff values used by researchers to classify dengue patients (11). Likewise, the current study found a wide variation in defining the warning signs among physicians in clinical settings. Of these seven warning signs, the HCPs have not agreed on any signs, even with the definition of liver enlargement, which was predefined in WHO 2009 classification. This variation may be linked to the local modification of the guidelines, adoption of national guidelines, lack of proper training, and variation in clinical practice in different regions. (22)

Dengue fever is a major parvovirus-borne infectious disease in tropical and subtropical regions of the world. The disease is generally mild and self-limited, but some patients may develop a severe form of infection such as dengue hemorrhagic fever/dengue shock syndrome, which often leads to death. Currently, there is no vaccine available against dengue virus. The major determinants of dengue control are vector eradication, early case recognition, and adequate clinical management (25,26)

The results of the present study showed the participants have a high and high level of knowledge about signs, symptoms of dengue fever. also statistical significant correlation between knowledge symptoms of the dengue fever in the participants (see table 2,3),

regarding the distribution of the knowledge of practitioner's among the dengue fever in our study reported that majority of participant a statistical significant while  $P$ -value= 0.001 and  $X^2$  33.880 increased in high knowledge were (48.0%) followed by average were (37.0%) while weak were (15.0%) the total were (100.0%) (See table 4) in similar study men made up more than half of the participants in the present research . This is because guys outnumber girls in Yemeni university study. This result was unanimous (9). Another possibility could be physicians having more contact with patients (21)

results is in opposite with Ho et al, 2013 who conduct a study to assess Knowledge, attitude, and practice of dengue disease among healthcare professionals in southern Taiwan and found a lack of knowledge about important clinical characteristics of dengue (31). Previous study of the knowledge about dengue fever in the primary health-care medical practitioner's in KSA concerning control of dengue virus showed the lack of knowledge about sign and symptoms as the most common problem.(33,35). Another study similar found almost a third of PHC physicians had insufficient knowledge about important investigations of dengue as well as prevention measures toward DF. In southern Taiwan (35)

However, the study results was in the same line with pan et al 2020 who found that Knowledge of DF as reported by the respondents was average, respondents' knowledge of DF prevention and protection was moderate, attitude of DF as reported by the respondents was at good level, practice of DF prevention as reported by the respondents was at high level and there was statistical significant between the knowledge and attitude of the respondents and practice of DF prevention (36)

In addition, the results of the study was far away Alhaeli, et al. 2016 who conduct a study to assess Knowledge, Attitude and Practice Regarding Dengue Fever among the Healthy Population of Highland and Lowland Communities in Central Nepal. They reveal a low, unsatisfactory level of knowledge about the disease. While being in line with our study finding in relation to presence of significantly positive correlation among knowledge and practice. Among the socio-demographic variables, the education level of the participants, age, sex , marital status and income were an independent predictors of knowledge level. Education level and interaction between the marital status, income and age group of the participants were independent predictors of practice level (28,30).

similar our study shows that also regarding distribution of the practices of practitioner's among the dengue fever show the majority of participant a statistical significant while  $P$ -value= 0.001 and  $X^2$  21.280 increased in average of practices were (48.0%) followed by high were (30.0%) while weak were (22.0%) the total were (100.0%) (see table 4,5)

## Conclusion

Best first line early management for SARS CoV-2 and dengue virus and/or other described an yet to be explored respiratory and GIT viral (co)infections, saving precious lives especially in the developed countries that were and are the most affected countries as regards to dengue fever mortality and relieving the health care professionals as well as the health care authorities globally and especially in the developing countries This study showed an average of Knowledge about symptoms and sign of dengue fever among HCPs in KSA. Future continued medical/nursing education should place more emphasis on these factors to improve dengue control in this demographic area, also the study we conclude that dengue fever is prevalent in Saudi Arabia. Thus, strong and effective health education programs regarding dengue fever about symptoms, sign and risk factors are recommended to help prevent dengue fever . However, the paucity of large epidemiological studies limits generalizability of such evidence. Future studies in Saudi Arabia should focus on the expansion of dengue fever to other cities in the Kingdom. Larger epidemiological studies are needed for estimating the true burden and incidence of dengue fever in the Saudi population. Currently, there are few epidemiological studies about dengue fever.

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