

# ASSESSMENT OF THE KNOWLEDGE ABOUT SYMPTOMS AND SIGN OF THE DENGUE FEVER IN THE PRIMARY HEALTH-CARE MEDICAL PRACTITIONER'S IN MAKKAH AL-MOKARRAMAH CITY AT SAUDI ARABIA

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## Abstract:

### Background:

Dengue has emerged as a major public health problem, with increasing incidence and widening geographic spread over recent years. It is a vector-borne disease that is transmitted from person to person by mosquitoes. Dengue is a mosquito-borne infection found in tropical and subtropical regions around the world. In recent years, transmission has increased predominantly in urban and semi urban areas and has become a major international public health concern. Since 1994, Makkah province became a dengue-endemic area with high rate of dengue infection during, spring and early summer. The primary-care physician plays a key role in dengue diagnosis, management, and prevention.

**Aim of the study:** The study aimed to assess the level of knowledge about symptoms of the dengue fever in the primary health-care medical practitioner's in Makkah Al-Mokarramah city at Saudi Arabia

**Methods:** Across sectional descriptive study conducted among including medical practitioner's in selected primary health-care centers in Makkah Al-Mokarramah city, during the October to December, 2018, the Sample size of medical practitioners . Our total participants were (300)

**Results:** This table shows the majority of participant (43.0%) have average level of knowledge about symptoms of dengue fever followed by (36.3%) of participant high while Range(0-10) and Mean  $\pm$ SD(6.387 $\pm$ 2.323). Regarding knowledge about signs dengue fever, that majority of participant (48.3%) have average level of knowledge followed by (38.3%) of participant have a high level of knowledge while Range(1-11) and Mean  $\pm$ SD(7.877 $\pm$ 2.052). Regarding the participant total level of knowledge about dengue fever, about (41.4%) have average level followed by (38.3%) have average level of knowledge while Range(3-21) and Mean $\pm$ SD(14.263 $\pm$ 4.021)

**Conclusion:** This review highlights the need for revealed major gaps on knowledge about symptoms of the dengue fever in the primary health-care medical practitioner's related to dengue Makkah. primary health-care medical practitioner's working in primary Health care need training and regular supervision to improve their knowledge on the about symptoms of the dengue fever. The results of this study provide a useful opportunity to identify strengths and areas in need of improved, knowledge about symptoms of the dengue fever in primary-care management of dengue.

**Keywords:** Dengue fever, knowledge, symptoms, primary, health care, medical practitioner's

## 1.Introduction

Severe dengue (previously known as dengue hemorrhagic fever) was first recognized in the 1950s during dengue epidemics in the Philippines and Thailand. 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.[1] 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.[2]

The spread of DF in traditionally DF-free countries, such as Pakistan, Saudi Arabia, Yemen, Sudan, and Madagascar, between 2000 and 2007 has been alarming. In Saudi Arabia, the first experience of virus isolation during a DF outbreak was in 1994 in Jeddah, where 289 confirmed cases were recorded [3]. The first

documented case was caused by DENV-2. During the outbreak, DENV-2 and DENV-1 were isolated during a peak of cases in the summer and in the rainy season at the end of the year. In 1997, emergence of DF occurred with DENV-3 identified during the rainy season in Jeddah. The virus was not isolated in the next seven years until 2004 when DENV-1, DENV-2 and DENV-3 were isolated in Jeddah. During the same year (2004), the first outbreak in Makkah occurred with the isolated DENV-2 and DENV-3 [4]. The next outbreaks occurred in Jeddah in the winter seasons of 2005 and 2006 [5,6]. After another outbreak of DF occurred in 2006, the Saudi Preventive Department in the Ministry of Health (MOH) launched a comprehensive plan to control the disease [7]. In 2008, the first cases were reported from Al-Madinah with DENV-1 and DENV-2 isolated serotypes [8]. Dengue virus (DENV) infection has globally become a major public health concern since the incidence of dengue fever (DF) has increased more than 30-fold over the last five decades and the disease is now endemic in 128 countries. According to a recent study, 390 million DENV infections are estimated to occur per year; over three times more than previous estimates by the World Health Organization (WHO) had suggested. [9,10]

Dengue fever is a major arbovirus-borne infectious disease in tropical and subtropical regions of the world.[1] 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.[11,12] in taiwan's dengue outbreaks have a unique type of transmission: starting by import from abroad in early summer, spreading locally, and ending in the winter. This pattern repeats every year. Most dengue cases occurred in Tainan, Pingtung, and Kaohsiung of southern Taiwan. Thus, dengue control has been an important issue for healthcare professionals (HCPs) in these areas.[13]

Dengue infection may cause fever, headache, abdominal pain, rash, muscle aches, pain in the eyes and bone pain (hence 'break-bone fever'). Infection with additional dengue serotypes increases the risk of hemorrhagic disease, resulting in severe mucosal and gastrointestinal bleeding, petechial skin hemorrhage, hepatomegaly, and circulatory disturbances, hypovolemia, and potentially death. [14-15]

Dengue is transmitted in humans by two species of *Aedes* mosquitoes namely, *Aedes aegypti* (principal vector) and *Aedes albopictus*. Although infection with one dengue serotype confers lifetime immunity against reinfection by the same serotype, there is no evidence of cross immunity. Therefore, it is possible for one to be infected with dengue fever several times during one's lifetime. (16-12)

## 1.2 Literature Review

Reliably identifying dengue patients early in their clinical course could direct patient management and reduce the transmission of dengue virus in a community. Timely identification of dengue infection would potentially enable HCPs to prevent additional cases among close contacts by urging patients with a positive dengue screening test to use personal protection measures against mosquito bites.[17]

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 [18]. The reemergence of DF in Saudi Arabia can be explained by the growing levels of urbanization, international trade and travel .[19]

in another study found some major gaps in knowledge regarding some important issues that need reconsideration were identified such as believing that *A. aegypti*, 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 [17, 20] 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.[21]

Ashshi (2017) 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 [22]. Having accurate knowledge on the behavior of dengue mosquitoes will help MPs to impart appropriate health education [23], 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 [21].

Favier et al., (2005) 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[24]. 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 [14].

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 [14]. 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.[13] 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,[16]

## 2. Rationale:

Same time gaps in the PHC physicians' 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.

### 2.1 Aim of the study:

The study aimed to assess the knowledge about symptoms of the dengue fever in the primary health-care medical practitioner's in Makkah Al-Mokarramah city at Saudi Arabia

### 2.3.Objectives:

To assess the knowledge about symptoms of the dengue fever in the primary health-care medical practitioner's

## 3. Methodology:

### 3.1 Study design:

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

### 3.2 Study Area

The study will be carried out in the city of Makkah 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 1.578 million. This study was conducted in Makkah 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 Makkah population. 3

## 3.3 Study Population

The study has been conducted among primary health-care regarding the dengue fever in Makkah the sample was selected to include primary health-care medical practitioners who aged from <30 years - More than 60 years and their total number was 300

### 3.2.1 Selection criteria:

#### 3.2.2 .Inclusion criteria

- All nationalities
- aged from 30 to 60 year

#### 3.3.2 Exclusion criteria :

- No specific exclusion criteria.

## 3.4 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; (300 ). (male and female) and adding 10 more to decrease margin of error. After adding 5% oversampling, the minimum calculated sample has been 300. Computer generated simple random sampling technique was used to select the study participants. Data collection was done by the researcher during a during the October to December, 2018,

## 3.5 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; (300 ).

## 4. 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: PHC patients' knowledge and practices regarding dengue fever structured interview questionnaire:** It included five parts as follows:

### Part one: Patient's 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 patient's knowledge about clinical manifestations of dengue fever. This part contains 9 questions.

**5. Data collection technique:**

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

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

**6. Data entry and analysis:**

The Statistical Package for Social Sciences (SPSS) software version 24.0 has been 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.

**7. Pilot study**

A pilot study has been 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 been detected in the methodology.

**8. Ethical considerations**

Permission from the Makkah joint program Family Medicine program has been 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 been submitted to the department as feedback.

**9. Relevance & Expectations:**

Knowledge and practice of primary health-care medical practitioner's regarding the dengue fever in Makkah Al-Mokarramah city at Saudi Arabia.

**10. Budget:** Self-funded

**Table 1.** Distribution of the demographic characteristics of about symptoms and sign of the dengue fever in the participants. (n=300)

	N	%
<b>Age</b>		
<30years	48	16
30-45 years	93	31
45-60 years	129	43
More than 60 years	30	10
Range	21-75	
Mean+SD	69	
<b>Sex</b>		
Female	165	55
Male	135	45
<b>Marital status</b>		
Single	63	21
Married	165	55
Widow	33	11
Divorced	39	13
<b>Educational level</b>		
Illiterate	90	30
Primary	75	25
Secondary	87	29
University	48	16
<b>Income</b>		
Less than 5000 SR	141	47
More than 5000SR	159	53

This table 1 shows that the majority of participant approximately(43.0%) were aged from 45-60 years of age, while approximately one third of participant (31.0%) aged from 30- 45 years of age. Regarding sex, more than half of participant (55.0%) were female, regarding marital status, the majority of participant more than half (55.0%) were married, also for educational level, this table reveals that approximately one third of participant (30.0%) were Illiterate educated followed by secondary (29%). Regarding income, more than half of participant (53.0%) were have more than 5000 SR monthly.

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

	Yes		No		Chi-square	
	N	%	N	%	X <sup>2</sup>	P-value
<b>1. Many people experience no signs or symptoms of a dengue infection DF?</b>	45	15	255	85	147.000	0.000
<b>2. When symptoms do occur, they may be mistaken for other illnesses Such as the flu DF?</b>	66	22	234	78	94.080	0.000
<b>3. Usually symptoms begin four to 10 days after you are bitten by an infected mosquito DF?</b>	84	28	216	72	58.080	0.000
<b>4. Dengue fever causes a high fever — 104 F (40 C) — DF?</b>	45	15	255	85	147.000	0.000
<b>5. Most people recover within a week or so DF?</b>	39	13	261	87	164.280	0.000
<b>6. In some cases, symptoms worsen and can become life-threatening called severe DF?</b>	135	45	165	55	3.000	0.083
<b>7. Do you know Knowledge about symptoms dengue hemorrhagic fever or dengue shock syndrome .</b>	84	28	216	72	58.080	0.000
<b>8. 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 .</b>	99	33	201	67	34.680	0.000
<b>9. Symptoms of DF this can lead to shock, internal bleeding, organ failure and even death</b>	90	30	210	70	48.000	0.000
<b>10. A symptom of dengue fever damage to lymph and blood vessels, bleeding from the nose and gums, enlargement of the liver</b>	60	20	240	80	108.000	0.000

Most of participants are a statistical significant relation with the knowledge about symptoms of the dengue fever (Table 2, Q1-Q2 -Q3-Q4, Q5-Q7-Q8-Q9-Q10 ). While Chi-square X<sup>2</sup> respectively (147.000, 94.080, 58.080, 147.000, 164.280, 58.080, 34.680, 48.000,108.000) and P=value0.000 but Q6 (In some cases, symptoms worsen and can become life-threatening called severe DF) is no statistical significant relation with the knowledge about symptoms of the dengue fever while Chi-square X<sup>2</sup>( 3.000)P=value0.083

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

	Yes		No		Chi-square	
	N	%	N	%	X <sup>2</sup>	P-value
1. The warning symptom usually begin the first day or two after your fever goes away	198	66	102	34	30.720	0.000
2. Is fever a symptom of DF?	228	76	72	24	81.120	0.000
3. Is headache a symptom of DF?	135	45	165	55	3.000	0.083
4. Is joint pain a symptom of DF?	165	55	135	45	3.000	0.083
5. Is muscle pain a symptom of DF?	180	60	120	40	12.000	0.001
6. Is pain behind the eyes a symptom of DF?	150	50	150	50	1.000	0.000
7. Are nausea/vomiting symptoms of DF?	222	74	78	26	69.120	0.000
8. Is rash a symptom of DF?	195	65	105	35	27.000	0.000
9. Is diarrhea common in DF?	165	55	135	45	3.000	0.083
10. Is stomach pain common in DF?	135	45	165	55	3.000	0.083
11. Is Swollen glands a symptom of DF	69	23	231	77	87.480	0.000

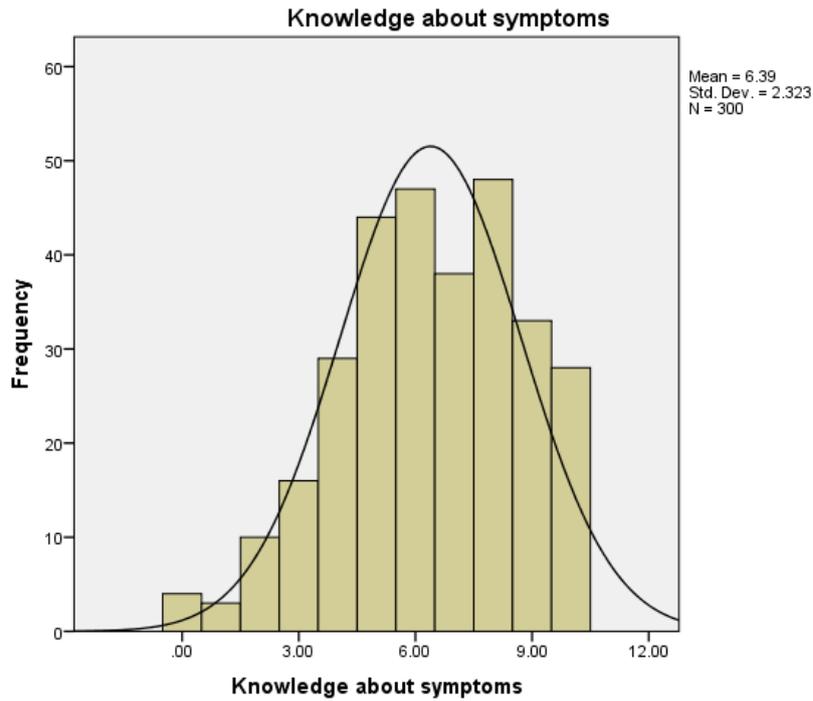
Most of participants are a statistical significant relation with the knowledge about sign of the dengue fever (Table 3, Q1-Q2-Q5-Q6-Q7-Q8-Q11). While Chi-square X<sup>2</sup> respectively (30.720, 81.120, 12.000, 1.000, 69.120, 27.000, 87.480) and P=value 0.000 but (Q3, Q4, Q9, Q10) is no statistical significant relation with the knowledge about sign of the dengue fever while Chi-square X<sup>2</sup> respectively (3.000, 3.000, 3.000, 3.000) P=value 0.083, 0.083.

**Table 4:** distribution of practitioner's knowledge about symptoms and sign dengue fever:

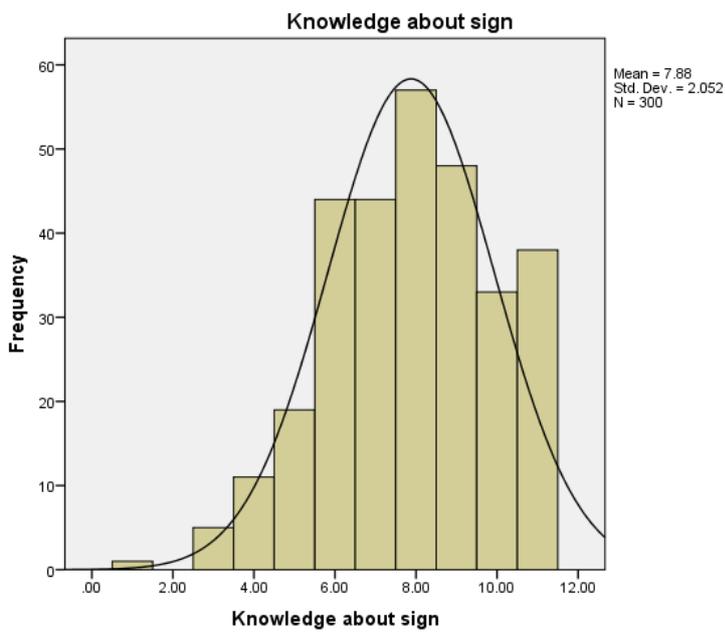
		N	%	Score	
				Range	Mean±SD
Knowledge about symptoms	Weak	62	20.7	0-10.	6.387±2.323
	Average	129	43.0		
	High	109	36.3		
Knowledge about sign	Weak	36	12.0	1-11.	7.877±2.052
	Average	145	48.3		
	High	119	39.7		
Total Knowledge	Weak	61	20.3	3-21.	14.263±4.021
	Average	124	41.3		
	High	115	38.3		

This table shows the majority of participant (43.0%) have average level of knowledge about symptoms of dengue fever followed by (36.3%) of participant high while Range(0-10) and Mean ±SD(6.387±2.323). Regarding knowledge about signs dengue fever, that majority of participant (48.3%) have average level of knowledge followed by (38.3%) of participant have an high level of knowledge while Range(1-11) and Mean ±SD(7.877±2.052). Regarding the participant total level of knowledge about dengue fever, about (41.4%) have average level followed by (38.3%) have average level of knowledge while Range(3-21) and Mean±SD(14.263±4.021).

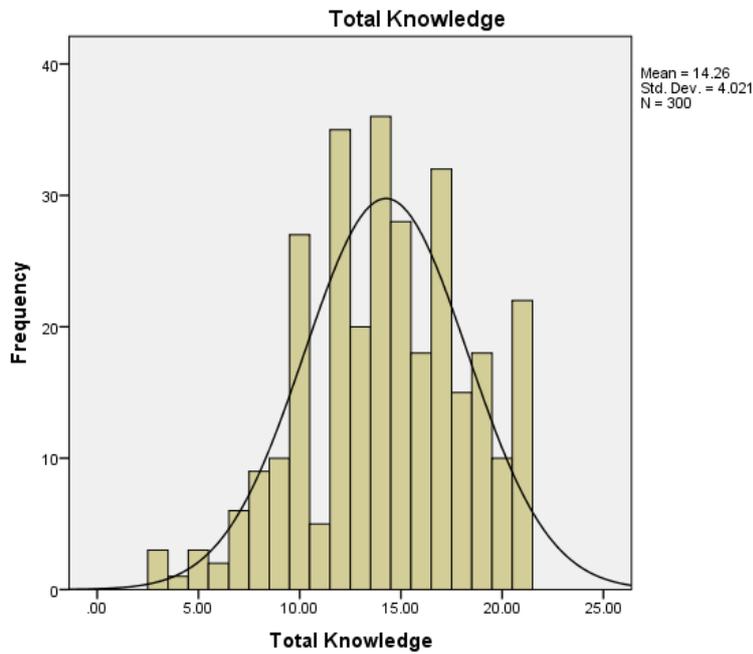
**Figure (1)** distribution of practitioner's knowledge about symptoms and sign dengue fever



**Figure (2)** distribution of practitioner’s knowledge about signs and sign dengue fever



**Figure (3)** distribution of practitioner’s total knowledge level about dengue fever

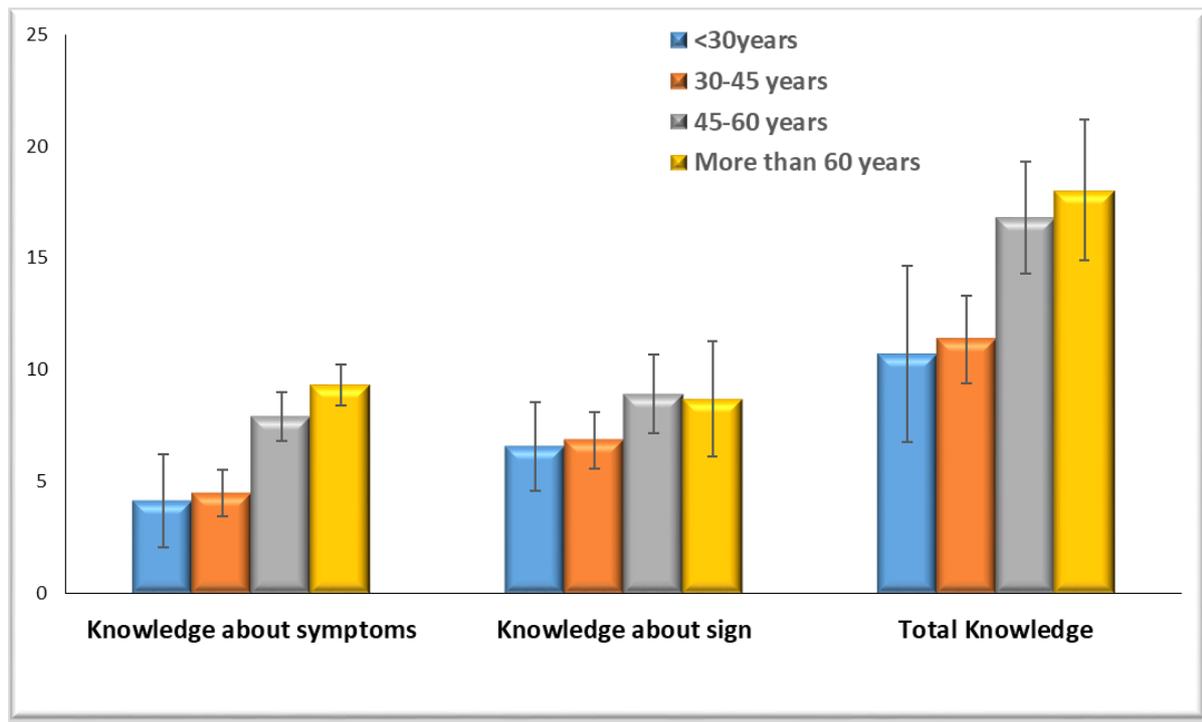


**Table (5) and Figure(4)** Distribution of the knowledge of practitioner’s among signs and symptoms of the dengue fever and the demographic data (age)

	Age				ANOVA	
	<30years	30-45 years	45-60 years	More than 60 years		
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	F	P-value
<b>Knowledge about symptoms</b>	4.146 ± 2.093	4.495 ± 1.049	7.899 ± 1.089	9.333 ± 0.922	230.468	<0.001*
<b>Knowledge about sign</b>	6.563 ± 1.988	6.860 ± 1.265	8.907 ± 1.765	8.700 ± 2.562	35.977	<0.001*
<b>Total Knowledge</b>	10.708 ± 3.935	11.355 ± 1.976	16.806 ± 2.510	18.033 ± 3.146	120.096	<0.001*

This table and figure shows that is a statistical significant difference the knowledge of practitioner’s among symptoms of the dengue fever and socio demographic characteristics in relation to age (increase in more than 60 years follow by age 45-60) where  $F=230.468$  and  $P\text{-value}=<0.001$  by mean+ SD respectively ( $9.489\pm 1.648, 7.899\pm 1.089$ ). regarding the sign that is a statistical significant difference between the knowledge of practitioner’s among sign of the dengue fever and age (increase in more than 60 years) where  $F=35.977$  and  $P\text{-value}=<0.001$  by mean+ SD ( $8.700\pm 2.562$ ), also is a statistical significant difference between the knowledge of practitioner’s among total Knowledge of the dengue fever and age (increase in more than 60 years) where  $F=120.096$  and  $P\text{-value}=<0.001$  by mean+ SD ( $18.033\pm 3.146$ ).

**Figure (4)** Distribution of the knowledge of practitioner’s among signs and symptoms of the dengue fever and the demographic data (age)

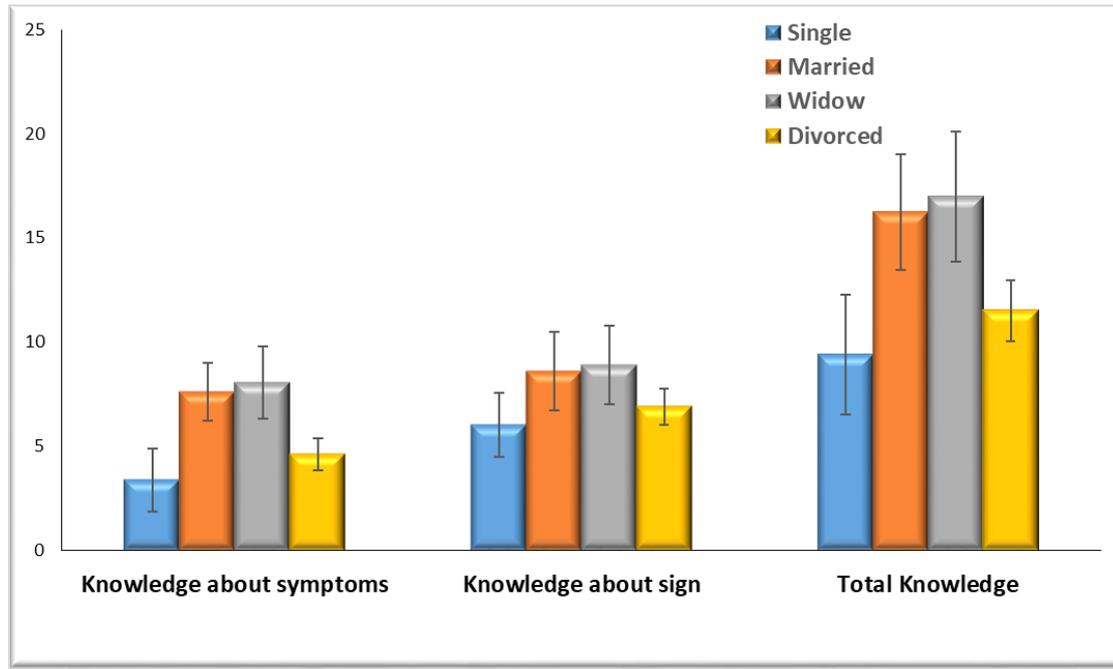


**Table (6) and Figure(5)** Distribution of the knowledge of practitioner's among signs and symptoms of the dengue fever and the demographic data (Marital status)

	Marital status				ANOVA					
	Single		Married		Widow		Divorced			
	Mean	± SD	Mean	± SD	Mean	± SD	Mean	± SD		
<b>Knowledge about symptoms</b>	3.381	± 1.529	7.618	± 1.390	8.061	± 1.731	4.615	± 0.747	176.269	<0.001*
<b>Knowledge about sign</b>	6.016	± 1.550	8.612	± 1.889	8.909	± 1.893	6.897	± 0.882	42.675	<0.001*
<b>Total Knowledge</b>	9.397	± 2.854	16.230	± 2.780	16.970	± 3.137	11.513	± 1.449	121.437	<0.001*

This table and figure shows that is a statistical significant difference the knowledge of practitioner's among symptoms of the dengue fever and socio demographic characteristics in relation to marital status (increase in Widow follow by Married) where  $F=176.269$  and  $P\text{-value}=<0.001$  by mean+ SD respectively ( $8.061\pm 1.731, 7.618\pm 1.390$ ). regarding the sign that is a statistical significant difference between the knowledge of practitioner's among sign of the dengue fever and marital status (increase in widow) where  $F=42.675$  and  $P\text{-value}=<0.001$  by mean+ SD ( $8.909\pm 1.893$ ), also is a statistical significant difference between the knowledge of practitioner's among total Knowledge of the dengue fever and marital status (increase in widow) where  $F=121.437$  and  $P\text{-value}=<0.001$  by mean+ SD ( $16.970 \pm 3.137$ ).

**Figure(5)** Distribution of the knowledge of practitioner's among signs and symptoms of the dengue fever and the demographic data (Marital status)

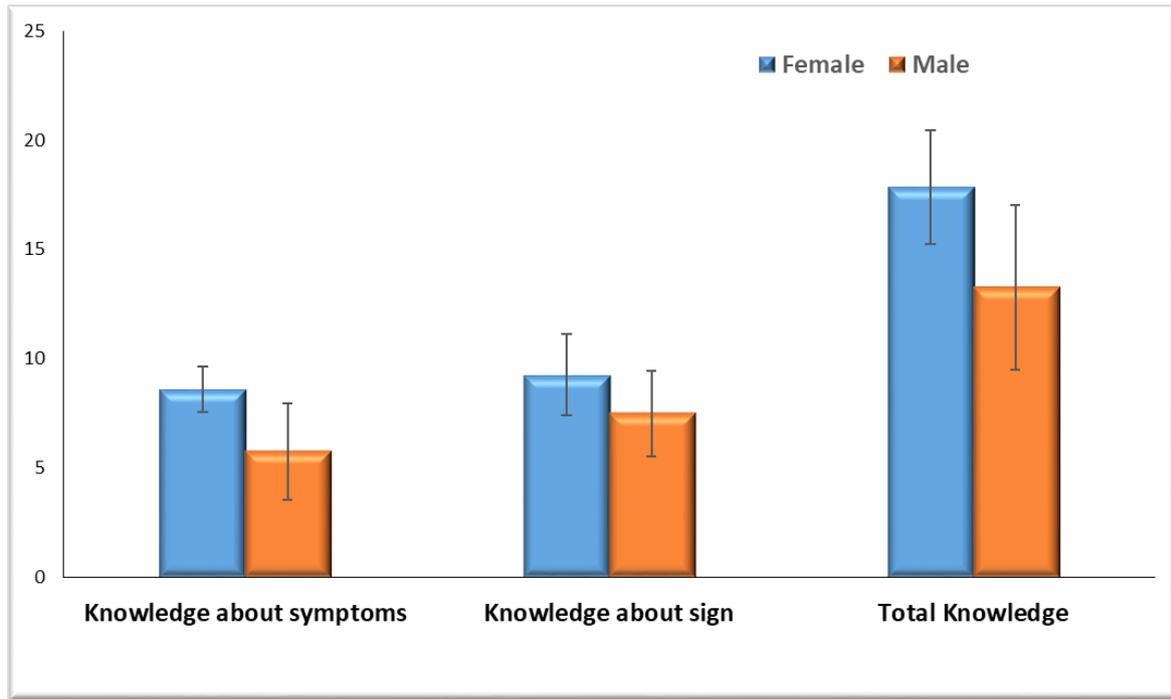


**Table (7) and Figure(6)** Distribution of the knowledge of practitioner's among signs and symptoms of the dengue fever and the demographic data (sex)

	Sex						T-test	
	Female			Male			t	P-value
	Mean	±	SD	Mean	±	SD		
<b>Knowledge about symptoms</b>	8.600	±	1.058	5.774	±	2.202	10.020	<0.001*
<b>Knowledge about sign</b>	9.262	±	1.848	7.494	±	1.940	6.568	<0.001*
<b>Total Knowledge</b>	17.862	±	2.609	13.268	±	3.769	9.228	<0.001*

This table and figure shows that is a statistical significant difference the knowledge of practitioner's among symptoms of the dengue fever and socio demographic characteristics in relation to sex (increase in female) where  $T=10.020$  and  $P\text{-value}=<0.001$  by mean+ SD (8.600±1.058). regarding the sign that is a statistical significant difference between the knowledge of practitioner's among sign of the dengue fever and sex (increase in female) where  $T=6.568$  and  $P\text{-value}=<0.001$  by mean+ SD (9.262±1.848), also is a statistical significant difference between the knowledge of practitioner's among total Knowledge of the dengue fever and sex (increase in female) where  $F=9.228$  and  $P\text{-value}=<0.001$  by mean+ SD (17.862±2.609).

**Figure(6)** Distribution of the knowledge of practitioner's among signs and symptoms of the dengue fever and the demographic data (sex)

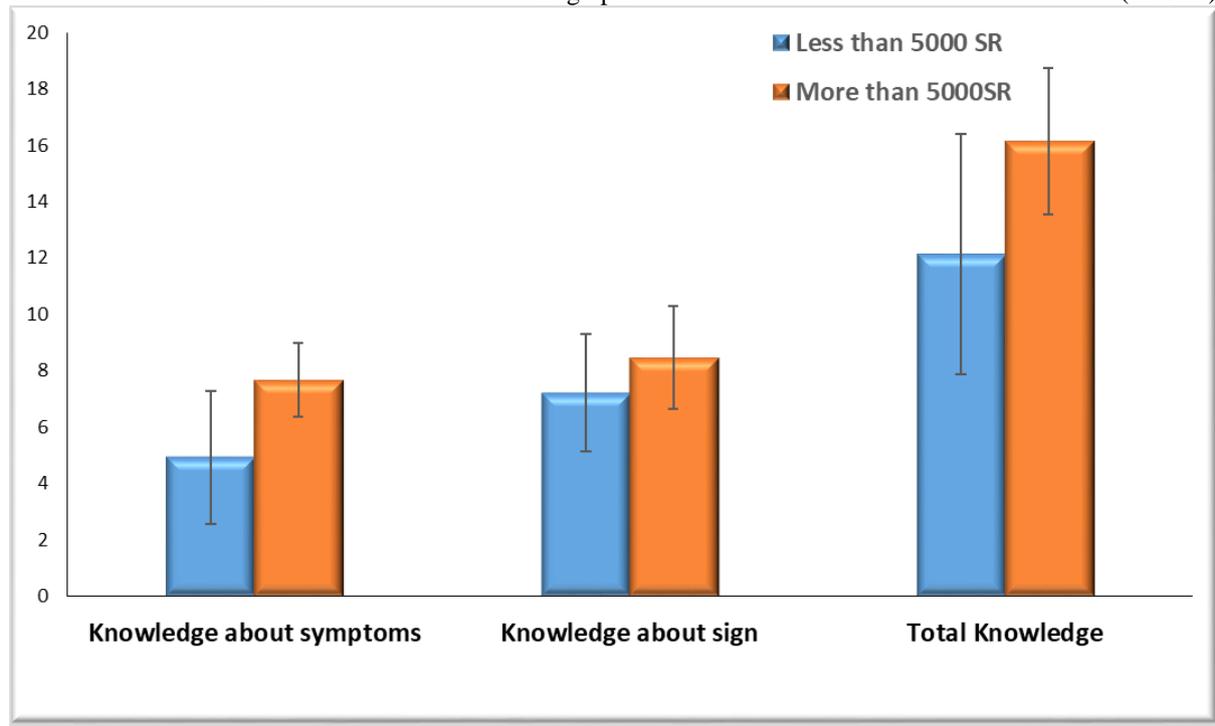


**Table (8) and Figure(7)** Distribution of the knowledge of practitioner's among signs and symptoms of the dengue fever and the demographic data (income)

	Income						T-test	
	Less than 5000 SR			More than 5000SR			t	P-value
	Mean	±	SD	Mean	±	SD		
<b>Knowledge about symptoms</b>	4.929	±	2.365	7.679	±	1.294	-12.678	<0.001*
<b>Knowledge about sign</b>	7.206	±	2.079	8.472	±	1.838	-5.599	<0.001*
<b>Total Knowledge</b>	12.135	±	4.275	16.151	±	2.603	-9.949	<0.001*

This table and figure shows that is a statistical significant difference the knowledge of practitioner's among symptoms of the dengue fever and socio demographic characteristics in relation to income (increase in more than 5000SR) where  $T=-12.678$  and  $P\text{-value}=<0.001$  by mean+ SD (7.679±1.294), regarding the sign that is a statistical significant difference between the knowledge of practitioner's among sign of the dengue fever and income (increase in more than 5000SR) where  $T=-5.599$  and  $P\text{-value}=<0.001$  by mean+ SD (8.472±1.838), also is a statistical significant difference between the knowledge of practitioner's among total Knowledge of the dengue fever and sex (increase in more than 5000SR) where  $T=-9.949$  and  $P\text{-value}=<0.001$  by mean+ SD (16.151±2.603).

**Figure(7)** Distribution of the knowledge of practitioner's among signs and symptoms of the dengue fever and the demographic data (income)



## Discussion

Assessment of the knowledge about symptoms of the dengue fever in the primary health-care medical practitioner's in KSA Makkah Al-Mokarramah city at Saudi Arabia. This study reveals that the majority of participants were aged from 45-60 years of age, female, married, illiterate educated. (see table 1) shows that the majority of participant approximately(43.0%) were aged from 45-60 years of age, more than half of participant (55.0%) were female and marital status, the majority of participant more than half (55.0%) were married. This results is in accordance with Malhotra, et al .2014 who found that the majority of study participants were male, married [25].

Dengue fever is a major arbovirus-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 average 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), most of participants are a statistical significant relation with the knowledge about symptoms of the dengue fever (Table 2, Q1-Q2 -Q3-Q4, Q5-Q7-Q8-Q9-Q10 ). While Chi-square X2 respectively (147.000, 94.080, 58.080, 147.000, 164.280, 58.080, 34.680, 48.000,108.000) and P=value0.000 but Q6 (In some cases, symptoms worsen and can become life-threatening called severe DF) is no statistical significant relation with the knowledge about symptoms of the dengue fever while Chi-square X2( 3.000) P=value 0.083 , 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 [26]. 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.[11,6]. 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[27]

The results of the present study showed the participants have a average and high level of knowledge about signs, symptoms of dengue fever. (see table 4). the majority of participant (43.0%) have average level of knowledge about symptoms of dengue fever Range(0-10) and Mean  $\pm$ SD(6.387 $\pm$ 2.323), knowledge about signs dengue fever, that majority of participant (48.3%) have average level while Range(1-11) and Mean  $\pm$ SD(7.877 $\pm$ 2.052). However, the study results was in the same line with Makornkan et al 2015 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 [28]

In addition, the results of the study was far away Dhima, et al. 2014 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 [29,30].

similar our study shows that also is a statistical significant difference between the knowledge of participants among total Knowledge of the dengue fever and age (increase in more than 60 years) where  $F=120.096$  and  $P\text{-value}<0.001$  by mean+ SD (18.033±3.146), also is a statistical significant difference between the knowledge of practitioner's among total Knowledge of the dengue fever and marital status (increase in widow) where  $F=121.437$  and  $P\text{-value}<0.001$  by mean+ SD (16.970±3.137) nad also sex and income (see table 5,6,7,8)

### Conclusion

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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