

## Assessment of the Awareness and Practice of Health Team Toward Dengue Fever at Al-Hodeidah City –Yemen

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### Abstract

Dengue fever represents a major global health challenge and it is one of the most rapidly spreading mosquito-borne viral infections throughout tropical and sub-tropical regions of the world. **The study aimed:** To assess the awareness and practice of health team about dengue fever at Al-Hodeidah city. **Subjects and methods:** Descriptive research design was used in the study. Convenient sample was used. The current study included 370 divided into: - 124 physicians, 183 nurses, 33 lab technicians, and 30 midwives. **Results:** The study revealed that 57% of health team had fair awareness level about dengue fever toward dengue fever. Moreover, 60.1% of nurses & midwives had poor practices, 46.0% of physicians had fair practices, and 63.6% of lab- technicians had good practices. **Conclusion:** the study concluded that all health team had fair awareness toward dengue fever. While the physicians had fair practices the nurses and midwives had poor practices but the lab technician's practices were good. **Recommendations:** The current study recommended education programs should be organized for nurses and midwives regarding management and prevention of dengue fever.

**Keywords:** *Dengue Fever, Awareness, Practice & Health Team.*

### Introduction

Dengue fever represents a major global health challenge and it is one of the most rapidly spreading mosquito-borne viral infections throughout tropical and sub-tropical regions of the world with an estimated 390 million infections annually. Dengue causes considerable suffering to those affected but also exerts a significant economic cost to the communities and countries in which they live (Whitehorn, 2015).

Dengue is the most widespread of all mosquito-borne viral infections, with a 30-fold increase in incidence over past 50 yrs. Almost half of the world's population is at risk in >100 dengue-endemic countries (Cock & Simone, 2013).

Dengue is a potentially fatal acute febrile illness caused by infection with any of four dengue viruses (1, -2, -3, and -4). Dengue is a major public health problem worldwide (Sharp et al., 2013).

Dengue serotype 2 is apparently more danger as compared to others Den-2 and Den-3 may cause more severe disease (Kumaria, 2010). All three dengue viral serotyp1-3 was confirmed to be in Yemen by using polymerase chain reaction (PCR) but dengue virus type 2 was the predominant serotype in Yemen (Al-garadi, 2015).

In Yemen, dengue was first recorded in pandemic outbreak reported by Hirsch between 1870 and 1873 after that the epidemic dengue fever occurs in Al-Hodeidah governorate in 1954 and it became a significant health problem especially in coastal areas

like Shabwah, Aden, Taiz and Al-Hodeidah governorates. All three dengue viral serotype 1-3 was confirmed to be in Yemen by using polymerase chain reaction (PCR) but dengue virus type 2 was the predominant serotype in Yemen (Al-Garadi, 2015). Dengue viruses are transmitted from an infected person to others by the bite of the female Aedes egypti(Ae. aegypti ) mosquito. In Yemen, Ae. aegypti is the main vector. However, Aedes albopictus is considered the secondary vector and other species like Aedes polynesiensis and Aedes niveus have also been considered as secondary vectors in some countries (WHO.2015a). The four viral serotypes are transmitted from viraemic to susceptible humans mainly by bites of the females' mosquito Aedes aegypti and Aedes albopictus during daylight period (Hii, 2013).

Most dengue viruses (DENV) infections are benign and manifest either sub-clinically or as a flu-like illness known as dengue fever (DF) or clinically symptoms include sudden onset of fever, severe headache, muscle ache, joints pain, rashes, leucopenia, and thrombocytopenia. The term "break bone disease" is associated with the symptoms of muscle and joint pain. However, approximately 500,000 infections each year worldwide and result in severe disease associated with hemorrhagic manifestations (dengue hemorrhagic fever, DHF) and shock (dengue shock syndrome, DSS), which may lead to fatal complications (Hapuarachchi et al., 2015).

Currently, a vaccine against all serotypes of dengue virus is not available and there is no antiviral drug for treatment of DF. Dengue patients are treated symptomatically with appropriate patient management regimens (Hii, 2013).

Health team who interacts directly with patients has an important role in both treating and preventing the spread of dengue. Understanding how health team manages suspected cases of dengue fever is crucial to improving patient outcomes. Conversely, misunderstandings may lead health team to give patients incorrect, clinically significant advice. Adequate training of health team is crucial to reducing the burden of dengue fever through patient education and collaboration with public health authorities (Handel et al., 2016).

The community health nurse plays an important role in recognition of breeding sources and cultivation of habits of not-creating the mosquito breeding places and eliminating the breeding places (Odetola, 2013). Strengthen the education and training of personnel of public health and environmental protection. Investigating the epidemic after receiving report of a suspected dengue cases. Participation in setting medical treatment procedures of dengue haemorrhagic fever (NANDA, 2013 & Margallo, 2013).

Moreover the community health nurse may plays important role in mobilization of community and community organizations to provide training to volunteers, heads of neighborhood (village) and head of basic community who will direct community citizens to eliminating the breeding sources overall. As instructor who visit families, offices, groups and companies of neighborhoods or basic communities. To illustrate the recognition of breeding sources and the methods of removal. Trainings of workers on the insecticide spraying and training on how to use the protective clothing and equipment (CDC, 2015b).

The community health nurses had an important responsibilities regarding the care of the patient with DF. They explained how they in their work carefully observe for symptoms and alarming signs and described which controls and measurements they needed to perform, and what would be an alarming situation (Axelsson & Ekström, 2015).

### Significance of the study

Yemen faced repeated outbreaks of dengue fever in 2000. In 2015, an upsurge was reported after over 1 million people had been internally displaced and health systems had been disrupted. More than 3,000 suspected cases and three deaths were recorded between 27 Mar and 4 Jun. However, unconfirmed reports that world health organization is verifying with national authorities suggest that the number of

cases and deaths in the affected governorates, especially in Al-Hodeidah, Aden, and Taiz could be much higher (WHO, 2015b).

World health organization reported that the dengue fever became an epidemic in some parts of Yemen, spread in the coastal areas of Tehama (Hodeidah) (Abdullah et al., 2015).

### Aim of the study

Assess the awareness and practice of health team about dengue fever at Al-Hodeidah city.

### Research question

- Is health team having a high level of awareness regarding dengue fever?
- Is health team having a good practice regarding dengue fever?

### Subjects & methods

#### Research design

A descriptive research design was utilized in this study.

#### Setting

The current study conducted in the outpatient clinics at Al-Thawra hospital, Al-Olfi hospital, Al-Ssalakhanah hospital and Al-Tahrier center at Al-Hodeidah city.

Al-Hodeidah city is the capital of Al-Hodeidah governorate in Yemen. It is located on the coast of the Red Sea, and away from Sana'a, the capital of Yemen, about (226) kilometers. It has a population of 617,871 making it the biggest city in Al-Hodeidah governorate.

Hospital name	Physicians	Nurses	Midwives	Lab-technician	Total
Al-Thawra hospital	42	90	13	17	162
Al-Olfi hospital	43	78	4	-	125
Al-Ssalakhanah hospital	36	10	10	15	71
Al-Tahrier center	3	5	3	1	12
Total	124	183	30	33	370

### B. Sample

Total coverage – convenient sample of health team at the previous setting. The total numbers of studied sample were 370 it divided into (124 physicians, 183 nurses, 33 lab technicians, and 30 midwives).

### Tools of the study

The study included two tools as following:

#### Tool (I): Structured questionnaire sheet.

It has two parts.

#### Part one: Socio-demographic characteristics of the health team.

It included the socio-demographic characteristics of health team e.g. name, age, gender, marital status, occupation, qualification, and years of experience.

**Part two: Awareness of health team regarding dengue fever.** This part includes awareness scale to assess awareness of health team related to preventive measures against the disease. It was adopted by Hospital Safety center, (2008) and modified by the investigator (Ali, 2010). The items of awareness have four responses ranging from important and applied to not important and not applied. The total score is classified into poor awareness if the score is less than 50%, fair awareness if score is 50%- 70%, and good awareness if score is more than 70% (Abd Elzahr, 2014).

#### **Tool (II): Observation checklist**

Observation checklist was designed to observe practices of physicians, lab technicians, nurses, and midwives related to the management of patient with dengue fever. The total score is classified into poor practices if the score is less than 50%, fair practices if score is 50%- 70%, and good practices if score is more than 70% (Abd Elzahr, 2014).

#### **Validity and Reliability**

The evaluation of data collection tools was done by three academic experts from Nursing Faculty at Assiut University to measure the validity of the tools. Reliability was analyzed by Cronbach's alpha the value was 0.87.

#### **Ethical Consideration**

The study followed common ethical principles in research. The research was approved from ethical committee in the Faculty of Nursing at Assiut University. Oral consent was obtained from the health team to collect data. The investigator explained the eligibility of health team about the research. The health team has ethical rights to agree or refuse to participate.

#### **Methods of data collection**

- **A pilot study** was carried out on 37 persons (10%) of health team to test the clarity of tools and the time needed to fulfill the study tools. No modifications were done and included in the studied sample.

#### **Field work**

Data were collected for the study from 23 January / 2016 to the end June / 2016. The investigator introduced himself to initiate a line of communication with health team, explain the nature, purpose of the study and obtained oral consent. The investigator visited the hospitals four days/week. Every day, about four to five sheets were finished. The average of time taken for completing each self-administered questionnaire was around 15-20 minutes. Observational checklist was done by the investigator himself. He was still observing the practice of health team when they were managing the patients with dengue fever during their work. The time taken to

observation was according to the practice of the health team member.

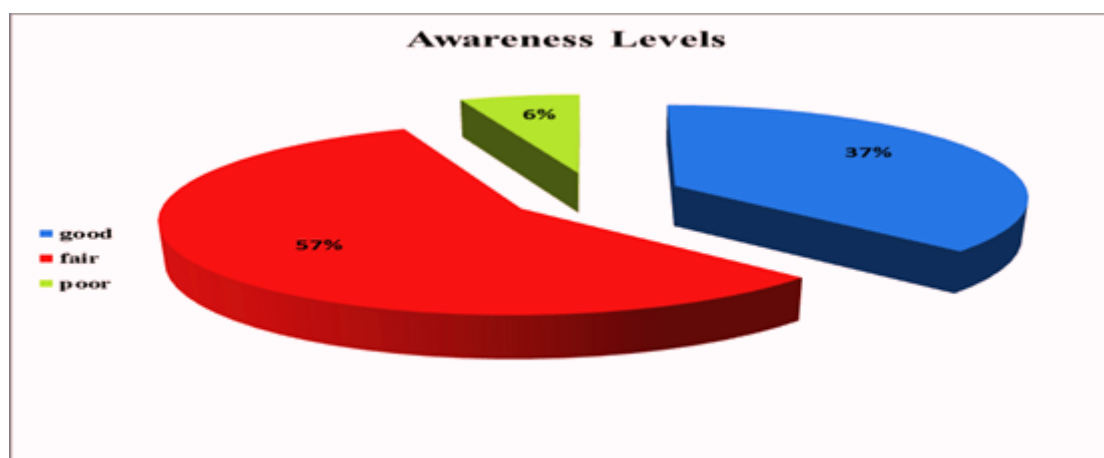
#### **Data analysis**

Data entry was done by using personal computer by the investigator. The content of each tool was analyzed, categorized, and coded by the investigator. All data were entered into (SPSS) version 20.0 software for analysis and excel for figures. Descriptive statistics (i.e. Percentage, mean  $\pm$  standard deviation) were done and for analytical statistics, Chi -square was used to determine the differences between the awareness and practice in relation to demographic characteristics of participants. Spearman correlation coefficient was used to determine the correlation between awareness and practice. Statistical significance was considered  $p$  - value  $< 0.05$ .

## Results

**Table (1):** Distribution of the health team, according to their socio-demographic characteristics, Yemen, 2016. (No= 370).

Demographic characteristics	Health team	
	No=370	%
<b>Age (years)</b>		
20 -30	213	57.6
>30 -40	109	29.4
>40 - <60	48	13.0
<b>Mean <math>\pm</math> SD</b>	<b>31.5<math>\pm</math>7.3</b>	
<b>Gender</b>		
Male	223	60.3
Female	147	39.7
<b>Marital Status</b>		
Single	140	37.8
Married	207	56.0
Widow	12	3.2
Divorced	11	3.0
<b>Occupation</b>		
Physician	124	33.5
Nurse	183	49.5
Lab. Technician	33	8.9
Midwife	30	8.1
<b>Qualification</b>		
Diploma	167	45.1
Baccalaureate	168	45.4
Post- Graduate	35	9.5
<b>Years of experience</b>		
< 5 years	205	55.4
5-10	114	30.8
>10	51	13.8
<b>Mean <math>\pm</math> SD</b>	<b>5.6<math>\pm</math>0.29</b>	
<b>Total</b>	<b>370</b>	<b>100%</b>



**Figure (1)** Awareness levels of health team regarding dengue fever.

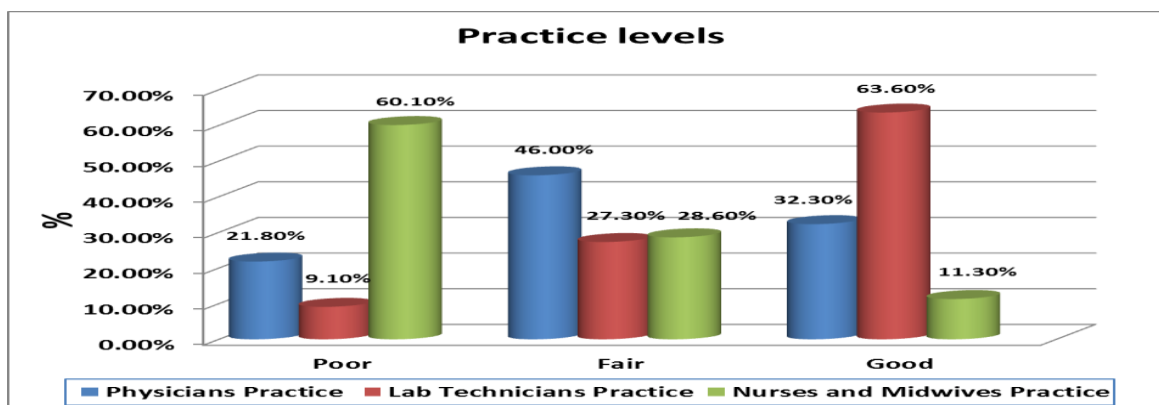


Figure (2): The physicians, lab-technicians, and nurses' practice levels regarding dengue fever.

Table (2): Relation between total score of health team awareness regarding dengue fever and their socio-demographic characteristics, Yemen, 2016. (No= 370).

Demographic characteristics	Awareness of health team regarding dengue fever						X <sup>2</sup>	P. value
			Total No. 370					
	Poor		Fair		Good			
	No.23		No.211		No.136			
	No.	%	No.	%	No.	%		
Age groups								
20-30 years	9	2.4	123	33.2	81	21.9	11.8	0.018*
>30-40 years	8	2.2	55	14.9	46	12.4		
>40 years	6	1.6	33	8.9	9	2.4		
Gender								
Male	14	3.8	125	33.9	84	22.7	3.0	0.894
Female	9	2.4	86	23.2	52	14.0		
Marital status								
Single	7	1.8	78	21.1	55	14.9	3.7	0.000**
Married	8	2.2	125	33.8	74	20.0		
Widow	5	1.4	3	0.8	4	1.1		
Divorced	3	0.8	5	1.4	3	0.8		
Occupation								
Physician	5	1.4	85	23.0	34	9.2	33.9	0.000**
Nurse	6	1.6	100	27.0	77	20.8		
Lab technician	5	1.4	12	3.2	16	4.3		
Midwife	7	1.8	14	3.9	9	2.4		
Qualification								
Diploma	10	2.7	102	27.6	55	14.9	12.3	0.014*
Baccalaureate	7	1.8	89	24.1	72	19.5		
Post graduate	6	1.6	20	5.4	9	2.4		
Years of experience								
<5 years	9	2.4	128	34.6	68	18.4	10.2	0.036*
5-10 years	8	2.2	54	14.6	52	14.1		
>10 years	6	1.6	29	7.8	16	4.3		

Chi-Square test. Significant level P at < 0.05.

Table (3): Relation between the physicians' practice regarding dengue fever and their socio-demographic characteristics, Yemen, 2016. (No= 124).

Demographic characteristics	The physician's practices regarding dengue fever						X <sup>2</sup>	P. value
	Total No.124							
	Poor		Fair		Good			
	No.27		No.57		No.40			
	No.	%	No.	%	No.	%		
Age groups								
20-30 years	9	7.3	21	16.9	14	11.3	6.5	0.164
>30-40 years	12	9.7	29	23.3	13	10.5		
>40 years	6	4.8	7	5.6	13	10.5		
Gender								
Male	21	16.9	40	32.3	33	26.6	2.0	0.364
Female	6	4.8	17	13.7	7	5.6		
Marital status								
Single	7	5.6	19	15.3	5	4.1	10.1	0.122
Married	18	14.5	33	26.6	33	26.6		
Widow	2	1.6	3	2.4	0	0.0		
Divorced	0	0.0	2	1.6	2	1.6		
Qualification								
Baccalaureate	22	17.7	45	36.3	23	18.5	6.8	0.033*
Post graduate	5	4.1	12	9.7	17	13.7		
Years of experience								
<5 years	12	9.7	31	25.0	21	16.9	0.9	0.914
5-10 years	10	8.1	19	15.3	13	10.5		
>10 years	5	4.1	7	5.6	6	4.8		

Chi-Square test. Significant level  $P$  at  $< 0.05$ .

Table (4): Relation between the nurses and midwives' practice regarding dengue fever and their socio-demographic characteristics, Yemen, 2016. (213)

Demographic data	Nurses and midwives practice regarding dengue fever						X <sup>2</sup>	P. value
	Total No.213							
	Poor		Fair		Good			
	128		61		24			
	No.	%	No.	%	No.	%		
Age groups								
20-30 years	91	42.7	44	20.7	14	6.6	3.8	0.426
>30-40 years	26	12.2	12	5.6	5	2.3		
>40 years	11	5.2	5	2.3	5	2.3		
Gender								
Male	79	37.1	31	14.6	6	2.8	11.4	0.003*
Female	49	23.0	30	14.1	18	8.5		
Marital status								
Single	50	23.5	32	15.0	12	5.6	5.9	0.431
Married	71	33.3	24	11.3	11	5.2		
Widow	3	1.4	3	1.4	0	0.0		
Divorced	4	1.9	2	0.9	1	0.5		
Occupation								
Nurse	114	53.5	50	23.4	19	8.9	2.7	0.255
Midwife	14	6.6	11	5.2	5	2.3		



Demographic data	Nurses and midwives practice regarding dengue fever						X <sup>2</sup>	P. value
	Total No.213							
	Poor		Fair		Good			
	128		61		24			
	No.	%	No.	%	No.	%		
Qualification								
Diploma	98	46.0	53	24.9	10	4.7	19.2	0.000**
Baccalaureate	30	14.0	8	3.8	14	6.6		
Years of experience								
<5 years	76	35.7	40	18.8	10	4.7	4.7	0.314
5-10 years	29	13.6	14	6.6	8	3.7		
>10 years	23	10.8	7	3.3	6	2.8		

Chi-Square test. Significant level  $P$  at  $< 0.05$ .

**Table (5): Correlation between total score of health team awareness and practice regarding dengue fever, Yemen, 2016.**

Variables	Awareness of health team regarding dengue fever	
	r. value	P. value
The physicians' practices	0.180	0.05
The lab technicians' practice	- 0.495	0.003*
Nurses and midwives practice	0.105	0.127

**Table (1):** Shows that, 57.6% of health team was in age group from 20 – 30 years with a mean age  $31.5 \pm 7.3$  years. Also, the male gender was 60.3%. Regarding marital status, 56% of health team was married and only 3.0% of them were divorced. Concerning to their occupation, 33.5% of health team was physicians also 49.5% of them were nurses, and 8.9% of them were lab technicians. In addition, 8.1% of health team was midwives.

**Figure (1):** Demonstrates that, 57% of health team has fair awareness and only 6% of them have poor awareness regarding dengue fever.

**Figure (2):** Reveals that, 46% of physicians have fair practices and 60.10% of nurses & midwives have poor practices but 63.6% of lab technicians have good practices.

**Table (2):** Explains the relation between total score of awareness about dengue fever and socio-demographic characteristics. It shows that there is statistical significant difference between the awareness of participants and their age groups  $P$ . value = 0.018, their marital status  $P$ . value = 0.000, their occupation  $P$ . value = 0.000, their qualification  $P$ .value = 0.014, and their years of experience  $P$ . value = 0.036. While there is no statistical significant between the participants awareness and their gender  $P$ . value = 0.894.

**Table (3):** Reveals the relation between total score of the physicians practice about DF and demographic characteristics. It documents that there is no statistical

significant difference between the physicians practice and their age groups, gender, marital status, and years of experience. It also indicates there is statistical significant difference between the physicians practice and their qualification  $P$ . value = 0.033.

**Table (4):** Mentions the relation between total score of the nurses and midwives' practices about DF and demographic characteristics. It explains that there is no statistical significant difference between the nurses and midwives practice and their age group. While there is statistical significant with their gender  $P$ .value = 0.003. In addition, it shows that there is no statistical significant between the nurses and midwives and their marital status, occupation, and years of experience. While there is statistical significant between their practice and their qualifications  $P$ .value = 0.000.

**Table (5):** Reports that there was positive correlation between the awareness and practice of physicians about dengue fever  $r = 0.180$ , with no statistical significant was found  $p$ -value = 0.05. While there was negative correlation between the awareness and practice of lab technicians about DF  $r = - 0.495$ , with statistical significant was found  $p$ -value = 0.003. Moreover, there was positive correlation between the awareness and practice of nurses and midwives about DF  $r = 0.105$ , with no statistical significant was found  $p$ -value = 0.127.

## Discussion

The increase of dengue fever cases in the Al-Hodeidah City is attributed for being a coastal area and it has tropical climate characterized by increasing in temperature and rainfall in the summer and autumn seasons. Regarding socio-demographic characteristics of the health team, the findings of the present study revealed that more than half of health team ranged from 20- 30years. This finding was in agreement with other study conducted knowledge, attitudes and preventive practices of house hold regarding dengue fever in the rural areas of Jazan region, Saudi Arabia by **Elyas et al., (2016)** who reported fifty-three percent of participants were in the age from 15–30 years.

In the current study, more than half of the health team was male. This attributes to the university education between males more than females in Yemen. This result was in agreement with **Kumar et al., (2016)**, who conducted knowledge and awareness regarding dengue among the undergraduate health science students of Hit region of Nepal, reported that more than half of undergraduate medical and dental students were male. The current results of the present study revealed that about half of participants were nurses and one-third of them were physicians.

In addition, 8.9% of the health team was lab technicians and only eight percent were midwives. These results concur with **Tobin et al., (2013)** who conducted assessment of knowledge and attitude towards lassa fever among primary care providers in an endemic suburban community of Edo State, reported that nurses accounted for 34.1 % auxiliary nurses, 20.1% doctors, and laboratory personnel 10.4%. Also, the present study indicated that less than half of the health team had baccalaureate, and the same percentage had diploma qualification. This results were in the same line with a study carried out in Makkah Al-Mokarramah city about knowledge and practice of primary healthcare physicians regarding the dengue fever by **(Alzahrani, 2015)**. Moreover, the current study documented that the mean of their years of experience was  $5.6 \pm 0.29$  years. This result agrees with another study conducted in Edo state by **Tobin et al., (2013)** who documented that mean duration of employment was  $6.4 \pm 8.5$  years.

The current study demonstrated that more than half of the health team had fair awareness. This may be due to the health education messages by media (television-radio-internet etc.) about dengue fever and another mosquito- borne diseases due to the endemic of the virus into the region. Similarity, other study carried out by **Handel et al., (2016)** who conducted knowledge, attitudes, and practices regarding dengue infection among public sector healthcare providers in

Machala, Ecuador, indicated that dengue is a significant threat because the virus is endemic to the region and has the potential to cause high morbidity. So, the population receives intensive health education about DF.

The present study demonstrated that less than half of physicians had fair practices regarding dengue fever, while one-third of them had good practice about dengue fever. This might be due to there was a deficit in the training of general practitioners and absence of standard guidelines for the treatment of DF in hospitals. These results were in contrast with **Aung et al., (2016)** who conducted knowledge, attitude, practices related to dengue fever among rural population in Terengganu, Malaysia, demonstrated that the vast majority of participants had a good practice. Moreover, the present study reported that slightly less than two-thirds of lab technicians had a good practice. This is due to the laboratory technicians' practices differ somewhat from other health team members. Their work was an analysis of cases samples and use safety actions in the laboratory. This outcome was consistent with **Aung et al., (2016)** who indicated that the most of lab technicians had a good practice.

The results of the current study stated that more than half of nurses and midwives had poor practices. This might be due to the most of the nurses and all midwives had diploma qualifications and do not attend training courses on dengue fever management and prevention. So, there is no update and development for their skills. This result was in accordance with **Vaishnavi et al., (2015)** who conducted study of impact of health education on knowledge, attitude, and practice related to dengue fever, documented that seventy-one percent of the participant had poor practice.

Concerning the relation between the health team awareness and socio-demographic characteristics about dengue fever, the present study demonstrated that there was the statistically significant difference between awareness of the health team and their socio-demographic characteristics except in their gender. This due to the variations between health team according to their educational period and background as well as the difference in age plays a role in increasing their experience and awareness. These outcomes in contrast with **Ramya et al., (2016)** who conducted dengue fever- awareness and knowledge among people in dengue prevalent area, found that there was statistically significant difference between the participant's awareness and their gender  $p.value=0.023$  and residence area  $p.value= 0.026$ .



Moreover, the present study found a significant difference between the physician's practice and their qualification  $P$  value = 0.015. However, other study carried out in Jazan, Saudi Arabia found a significant association between the practice of dengue fever preventive and control measures as well as the gender of the respondents  $P < 0.005$  **Alsheikh et al., (2015)** who conducted dengue knowledge, attitudes and preventive practices among secondary school students in Jazan, Saudi Arabia. In addition, the results of the present study revealed a non-significant positive correlation between practices of the physicians, nurses, and midwives with their awareness but revealed that negative correlation between the lab technicians practice and their awareness with statistical significant was found. These results coincide with **Dhimal et al., (2014)** who conducted knowledge, attitude and practice regarding dengue fever among the healthy population of highland and lowland communities in Central Nepal.

### Conclusion

the study concluded that all health team had fair awareness toward dengue fever. While the physicians had fair practice the nurses and midwives had poor practice but the lab technicians practice was good.

### Recommendation

The current study recommended educational programs should be organized for nurses and midwives regarding management and prevention of dengue fever.

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