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Predictors of patients' knowledge of causes, signs and symptoms of among health care workers regarding uncomplicated Malaria fever in the primary healthcare facilities in Saudi Arabia 2022

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Abstract:

Background*:*
Uncomplicated malaria is disease in Saudi Arabia caused mainly through a parasitic infection, Plasmodium falciparum, with resulting symptoms including fever, headache, joint pain, malaise, vomiting, body ache, poor appetite and body weakness, without signs of severity or evidence of vital organ dysfunction. According to the malaria treatment guideline for Saudi Arabia, case management of the disease involves early diagnosis and prompt treatment with effective and recommended anti-malarial drugs. The guideline states clearly the use of artemether-lumefantrine as the recommended anti-malarial drug for the case management of uncomplicated malaria treatment after diagnosis, using either microscopy or RDTs approach in identifying the parasite, or the use of artesunateamodiaquine if artemether-lumefantrine is unavailable. Malaria is one of the deadliest mosquito-borne diseases in the world. More than 80% of the total [1]populations are at risk of malaria in the 22 countries in Asia and the Pacific. South Asia alone is home to an estimated 1.4 billion people at risk of contracting malaria. ***Aim of the study*****:** *To determined factors that influenced patients' knowledge, of causes, signs and symptoms regarding uncomplicated malaria in primary healthcare (PHC) facilities in Makah City at Saudi Arabia 2022.* ***Methods:*** *Across sectional descriptive study conducted among including health care workers at the primary healthcare in Makah Al-Mokarramah city, during the October to December, 2022, the Sample size of medical practitioners. Our total participants were (350).* ***Results:*** *shows the majority of participant approximately (40.0%) was aged from 35-50 years of age. Regarding sex, more than half of participant (64.9%) were male, regarding marital status, the majority of participant more than half (38.0%) were divorced, also for educational level, this table reveals that approximately of participant (30.0%) were primary and university.* ***Conclusion:*** *The overall outcomes*

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showed significant differences and relationships between the variables, and the overall outcomes of multinomial logistic regression analysis indicated that patients' knowledge on uncomplicated malaria was predicted from age, highest level of education, attitudes and practices, while their attitudes were predicted by gender, occupation, monthly income, knowledge and practices. Their practice with regard to the treatment of malaria was significantly predicted by their monthly incomes,
Keywords: *determined, influenced, knowledge, causes, signs, symptoms, uncomplicated malaria, (PHC) , facilities Makah, Saudi Arabia .*

Introduction

The high scourge of malaria in KSA has been linked to the inappropriate use of anti-malarial drugs, weather condition of the country, as well as the poverty level of the people. Overcoming the problems of inappropriate use of drugs in managing the ailment is possible when both healthcare and patients have good levels of understanding and attitudes towards the disease and its management, which will influence their treatment practices. an individual knowledge on disease has been described as his understanding of the cause, sign, and symptoms, how to prevent and/or treat the disease, while his attitude could be expressed as the way he/she feels and beliefs toward the disease.[1]

Malaria is a mosquito-borne infectious disease that affects humans and other animals.[2,3] Malaria causes symptoms that typically include fever, tiredness, vomiting, and headaches.[1] In severe cases, it can cause yellow skin, seizures, coma, or death.[4] Symptoms usually begin ten to fifteen days after being bitten by an infected mosquito.[5] If not properly treated, people may have recurrences of the disease months later.[6] In those who have recently survived an infection, reinfection usually causes milder symptoms.[7] This partial resistance disappears over months to years if the person has no continuing exposure to malaria.[8] The WHO has estimated that every year, about 3 million HCPs globally experience exposure to blood-borne Hepatitis C and B and HIV viruses while 2.5% of HIV cases and 40% of HBV and HCV cases among HCPs all over the world are caused by exposures to such infections.[9] The Centers for Disease Control and Prevention (CDC) recommended using standard precautions by both health care workers and patients.[10] Many studies conclude that adherence to standard precautions measures is fundamental to control healthcare associated infections among health care workers as well as patients.[11-12]

The appropriate use of drugs based on treatment guidelines is essential in the management of ailments for the purpose of achieving the required treatment success rate [13, 14]. When such medication practices are appropriately carried out based on treatment guidelines, it will result in the cure of the malarial disease, relieve symptoms and alleviate patient suffering [15]

Inappropriate use of anti-malarial drugs has been reported in Nigeria, with their consequences including a reduction in quality of drug therapy leading to drug resistance and treatment failure, unwanted side effects and increased cost of medications [16]. This might not be unconnected with the reported poor use of public healthcare (PHC) facilities in the country [17]

Although previous studies had linked poorer patients' medication practices with many factors including patients' lack of knowledge, health beliefs and treatment-seeking behavior's, in addition to how they use their medicines [18,19], there was scant information on studies from the rural areas of the country, especially in Plateau state. Hence, there was a need to assess factors that might have influenced patients' knowledge, attitudes and practices (KAP) among rural communities who are most affected by the disease. [20] For these rural communities, the PHC facilities had been their main source when seeking treatment. The study is important because it could provide a comprehensive picture of the determinants of treatment and management of uncomplicated malaria among patients.[21] The outcomes of the study could also be useful in helping advise health policymakers, as well as healthcare workers and patients themselves, with any necessary changes and interventions in finding realistic solutions to any substandard treatment and management

practices in the PHC settings..[22] According to the World Health Organization (WHO), about 229 million new cases of malaria were reported worldwide in 2019 and over 3.4 billion people are at risk of infection [23]. Almost 94% of the malaria cases were reported in the WHO African Region (AFR), while 3.0 and 2.2% of the cases were recorded in the WHO Southeast Asia Region (SEAR) and Eastern Mediterranean Region (EMR), respectively [24]. Moreover, approximately 409,000 malaria deaths occurred worldwide in 2019, with sub-Saharan Africa accounting for about 95% of all global malaria deaths [25,62]. Plasmodium falciparum is considered the most virulent and prevalent Plasmodium species, accounting for 99.7, 69 and 62.8% of the reported malaria cases in the AFR, EMR and SEAR regions, respectively [19]. Furthermore, it has been estimated that about 14.3 million malaria cases in 2018 were attributable to Plasmodium vivax and that 3.3 billion people are at risk of vivax malaria infection worldwide [27].

Literature Review

Al Zahrani et al.revealed that malaria remains a public health problem in KSA region. Since the introduction of a malaria elimination strategy in 2004, the burden of malaria in Saudi Arabia has been markedly reduced, and the country has successfully decreased the burden and geographic extent of malaria nationwide [28]. However, a limited number of malaria foci remain in Jazan and Aseer regions in southwestern Saudi Arabia [29].

Previous studies conducted in Jazan and some other regions of the country, including the Makah region and in the Al-Ahsa governorate in Eastern province [30,31,32,33]. El Hassan et al. [9] showed a dual trend of malaria cases in Jazan between 2000 and 2014, i.e., a significant reduction in autochthonous malaria cases (from 35.3 per 10,000 population in 2000 to the lowest rate of 0.11 cases per 10,000 population in 2014 and a constant number of imported malaria cases. A similar situation was also reported in the neighboring Aseer region [30]. However, since 2015, a steady rise in malaria cases in both Jazan and Aseer regions has been noted [33], and this observation is supported by the findings of the current study. Compared to the very low proportion of autochthonous cases reported annually as compared to imported cases since 2014, the anther study found that 4.5% (51/1124) of the cases can be considered autochthonous, with autochthonous cases reported during the outbreak in Baysh governorate were excluded. Hence, generally, it can be said that Saudi Arabia continues to make good progress toward achieving the WHO [6]. Bin Dajem et al.[34] showed that the knowledge scores regarding standard precautions were above 90%, but most health care professionals had poor knowledge about injection safety, while house officers, laboratory scientists and junior nurses had lower compliance compared with experienced doctors and nurses.

The current findings also showed that P. falciparum was the predominant cause of malaria in Jazan which is consistent with previous reports [33, 29]. The majority of vivax malaria cases identified by the current study were among non-Saudi patients, particularly Pakistani patients followed by Indian and Yemeni patients, as compared with only three cases among the Saudi patient group. Although P. falciparum is the predominant species in the neighboring endemic country, Yemen [42, 43], the incidence of vivax malaria has been rising since 2015 [4]. In addition, it was recently estimated that over three quarters (79·5%) of the global burden of vivax malaria in 2017 was attributable to India, Pakistan and Ethiopia [4]. Favier et al.,(2005) report that malaria fever 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 [35]. This could be due to a lack of training on the recognition of warning signs and case classification of malaria fever as per the updated WHO guidelines. Identification of warning signs of malaria fever and indications that lead to shock is critical for managing dengue [14].

also previous knowledge, attitude and practices (KAP)studies concerning control of Malaria fever 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]

Rationale:
The Knowledge of Malaria fever causes and symptoms among health care workers in Makah may pace alarm and improve the outcome of malaria control. In Saudi Arabia the national malaria control programmer, which was established in 1948, has achieved a tremendous reduction in the annual number of malaria cases. However malaria cases increased after 2014, with 5,382 malaria cases reported in 2016, including 272 locally transmitted cases 270 falciparum and two vivax malaria. In the global context, this number of cases is considered high and the country therefore remains determined to make vigorous efforts to achieve status stability

Aim of the study:
To determined factors that influenced patients' knowledge, of causes, signs and symptoms regarding uncomplicated malaria in primary healthcare (PHC) facilities in Makah City at Saudi Arabia 2022

Objectives:
To determined factors that influenced patients' knowledge, of causes, signs and symptoms regarding uncomplicated malaria in primary healthcare (PHC) facilities 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 Makah 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 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 primary health-care regarding the malaria fever in Makah the sample was selected to include primary health-care medical practitioners who aged from <25years - > 50 years and their total number was 350

Selection criteria

Inclusion criteria
- aged from 25 to 50 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; (350). 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, 2020,

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; (350).

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 Malaria 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 causes, signs and symptoms of Malaria fever:

Include items that determine the patient's knowledge about clinical manifestations of Malaria 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 been 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 ≤ 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 has 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 malaria fever in the participants . (n=350)

	N	**%**
Age		
<25years	67	19.1
25-35 years	98	28.0
35-50 years	140	40.0
>50 years	45	12.9
Range	22-65	
Mean+SD	37.942+12.737	
Sex		
Female	123	35.1
Male	227	64.9
Marital status		
Single	60	17.1
Married	77	22.0
Widow	80	22.9
Divorced	133	38.0
Educational level		
Illiterate	77	22.0
Primary	105	30.0
Secondary	63	18.0
University	105	30.0
Income		
Less than 5000 SR	77	22.0
5000-10000 SR	81	23.1
>10000 SR	192	54.9
Sources of knowledge about dengue fever		
TV	35	10.0
Health professionals	51	14.6
Family	105	30.0
Communication Web-sites	140	40.0

Journals and magazines.	19	5.4

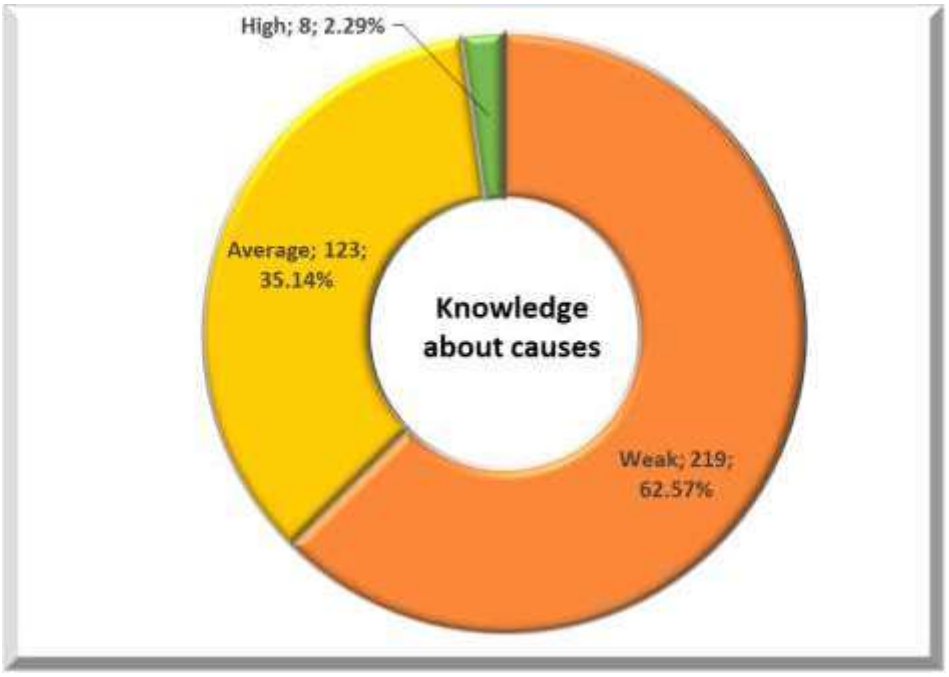
This table 1 shows that the majority of participant approximately (40.0%) were aged from 35-50 years of age, while Range (22-65) Mean+SD (37.942+12.737) . Regarding sex, more than half of participant (64.9%) were male, regarding marital status, the majority of participant more than half (38.0%) were divorced, also for educational level, this table reveals that approximately of participant (30.0%) were primary and university. Regarding income, more than half of participants (54.9%) were have more than >10000 SR monthly, while Sources of knowledge about dengue fever the majority of participant Communication Web-sites were (40%).

Table(2) and figure(1) Distribution of the Knowledge among causes of the malaria fever

Knowledge about causes			
		N	**%**
Weak		219	62.6
Average		123	35.1
High		8	2.3
Total		350	100.0
Score	**Range**	1-10.	
	Mean+SD	5.031±1.689	
Chi-square	**X^2**	191.320	
	P-value	<0.001*	

Table 2 and figure (1) Regarding Knowledge of the participants among responses to cause of the malaria fever results show the majority of participant had weak information were(62.2%) while average of the Knowledge about causes of the malaria fever were(35.1%) the data ranged from(1-10) by mean ±SD(5.031±1.689) and a statistical significant relation While Chi-square X2 191.320 and P=value 0.001.

figure(1) Distribution of the Knowledge among causes of the malaria fever

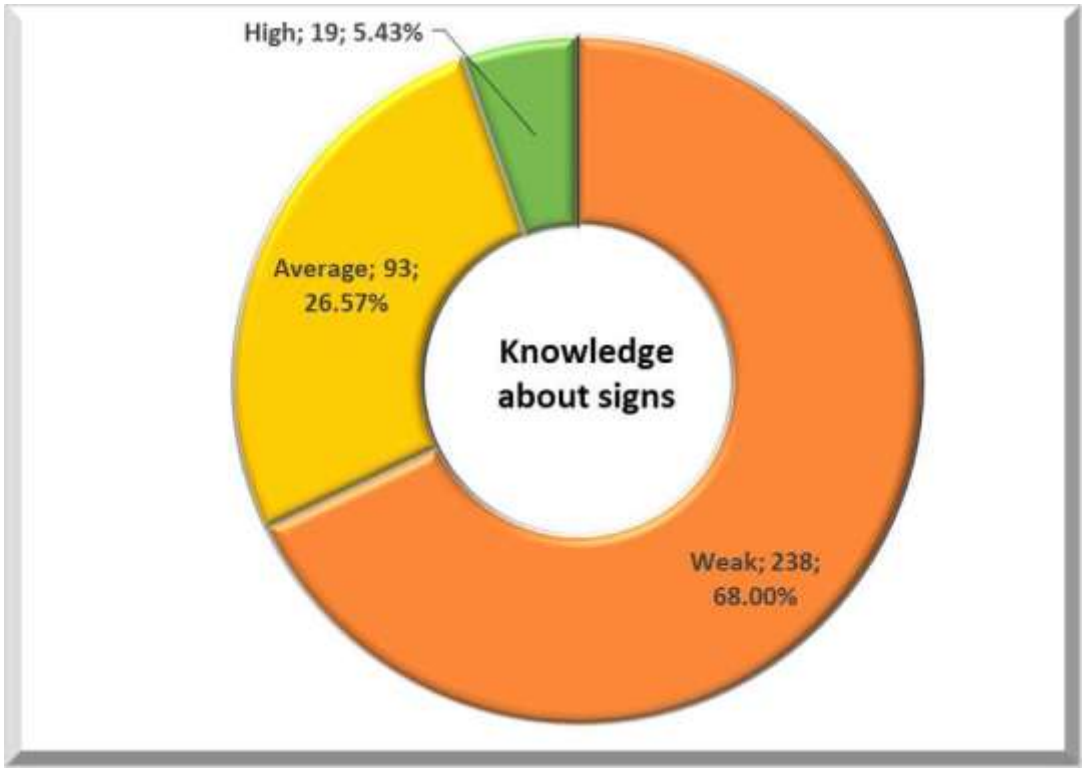


Table(3) and figure(2) Distribution of the Knowledge **about signs** of the malaria fever

Knowledge about signs			
		N	**%**
Weak		238	68.0
Average		93	26.6
High		19	5.4
Total		350	100.0
Score	**Range**	0-14	
	Mean+SD	6.063±3.156	
Chi-square	**X^2**	212.749	
	P-value	<0.001*	

Table 3 and figure(2) Regarding Knowledge of the participants about the signs of the malaria fever results show the majority of participant had weak information were(68.0%) while average of the Knowledge about participants signs of the malaria fever were(26.6%) the data ranged from(0-14) by mean ±SD(6.063±3.156) and a statistical significant relation While Chi-square X2 212.749 and P=value 0.001

figure(2) Distribution of the Knowledge **about signs** of the malaria fever



Total knowledge			
		N	**%**
Weak		219	62.6
Average		117	33.4
High		14	4.0
Total		350	100.0
Score	**Range**	1-24.	
	Mean+SD	11.094±4.503	
Chi-square	**X^2**	180.109	
	P-value	<0.001*	

Table(4) and figure(3) Distribution of the total knowledge of the malaria fever

Table 4 and figure(3) Regarding **Total knowledge** of the malaria fever results show the majority of participant had weak information were(62.6%) while average of the Knowledge about participants signs of the malaria fever were(33.4%) the data ranged from(1-24) by mean ±SD(11.094±4.503) and a statistical significant relation While Chi-square X2 180.109 and P=value 0.001

figure(3) Distribution of the total knowledge of the malaria fever

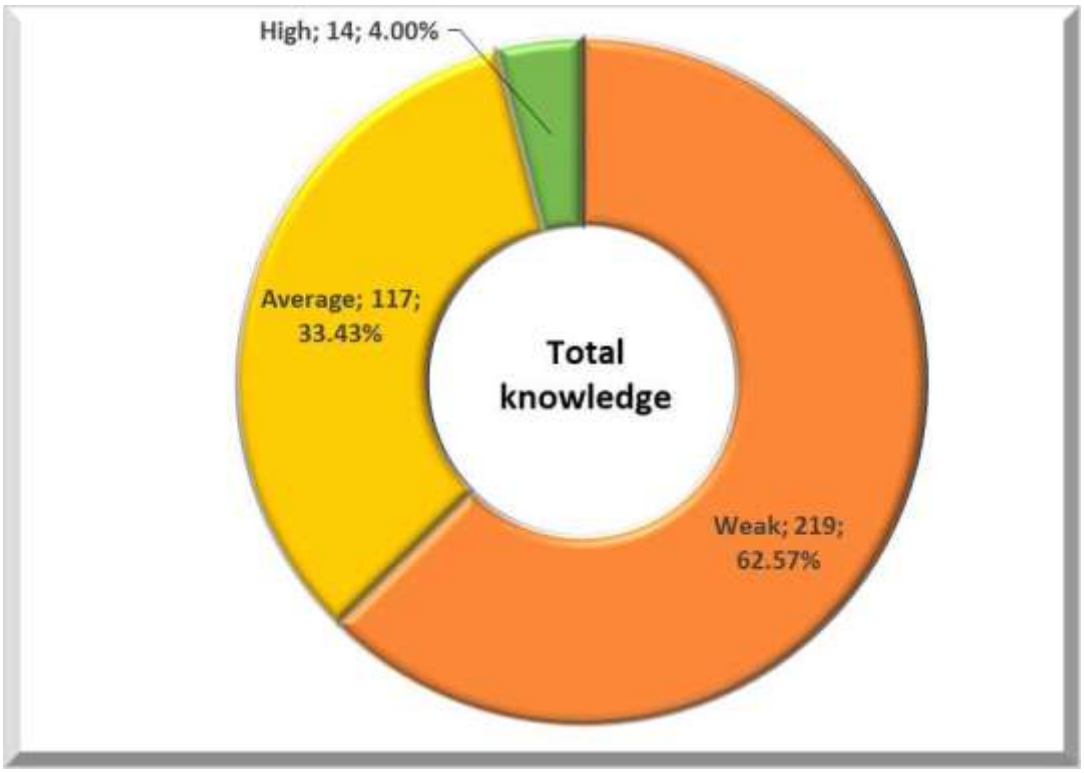


Figure (4): Correlation between Knowledge about causes and knowledge about signs

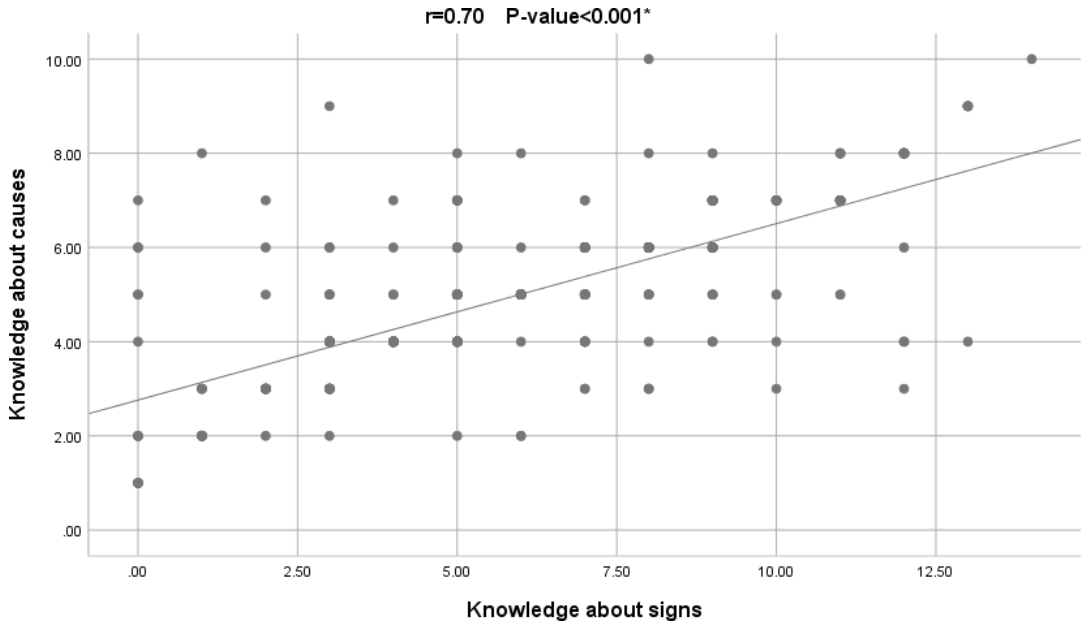


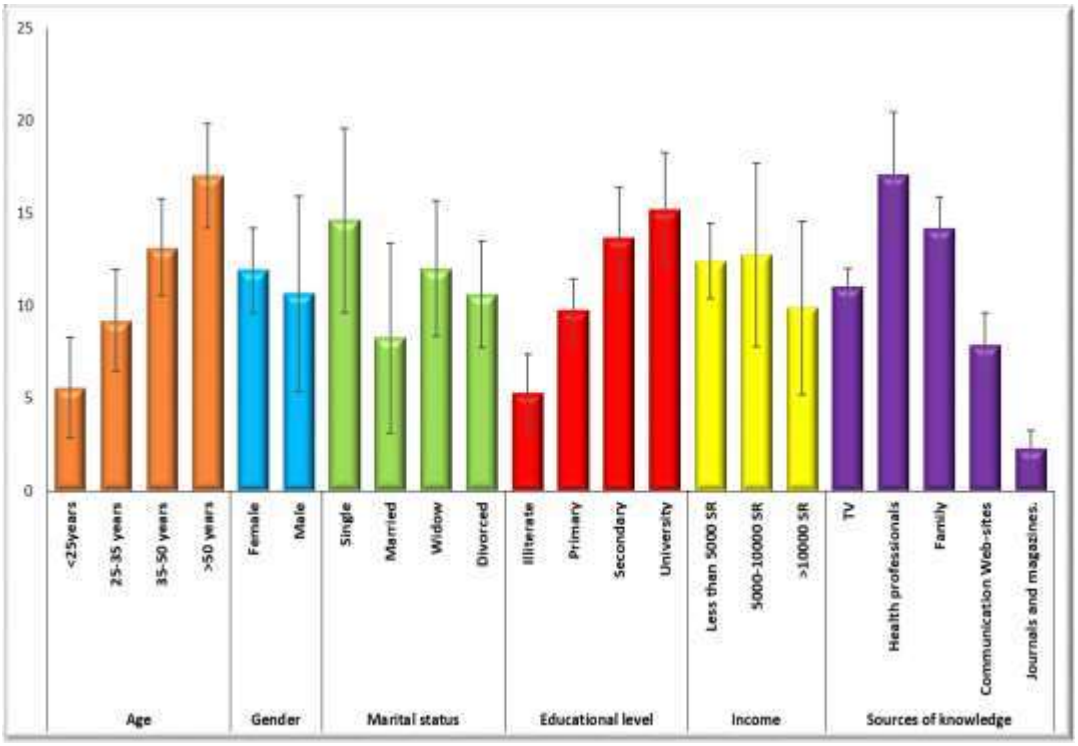
Table show that is a significant positive correlation between Knowledge about causes and signs were r= 0.70) and p-value =0.001

Table(5) and figure(5) Distribution of the total knowledge and the demographic data(age, gender, marital status, level of education, income level, sources of knowledge)

		N	Total knowledge	F or T	ANOVA or T-test	
			Mean ± SD		Test value	P-value
Age	**<25years**	67	5.582 ± 2.737	**F**	206.716	<0.001*
	25-35 years	98	9.224 ± 2.745			
	35-50 years	140	13.136 ± 2.629			
	>50 years	45	17.022 ± 2.816			
Gender	**Female**	123	11.911 ± 2.298	**T**	3.090	0.002*
	Male	227	10.652 ± 5.283			
Marital status	**Single**	60	14.600 ± 4.968	**F**	29.915	<0.001*
	Married	77	8.247 ± 5.153			
	Widow	80	12.000 ± 3.663			
	Divorced	133	10.617 ± 2.868			
Educational level	**Illiterate**	77	5.247 ± 2.128	**F**	278.740	<0.001*
	Primary	105	9.743 ± 1.710			
	Secondary	63	13.651 ± 2.737			
	University	105	15.200 ± 3.036			
Income	**Less than 5000 SR**	77	12.403 ± 2.021	**F**	17.154	<0.001*
	5000-10000 SR	81	12.741 ± 4.979			
	>10000 SR	192	9.875 ± 4.660			
Sources of knowledge	**TV**	35	11.000 ± 1.022	**F**	372.161	<0.001*
	Health professionals	51	17.039 ± 3.388			
	Family	105	14.162 ± 1.693			
	Communication Web-sites	140	7.850 ± 1.783			
	Journals and magazines.	19	2.263 ± 0.991			

Table (5) and figure (5) show that is a significant relation between total knowledge and demographic data regarding age (increase in >50 years follow by age 35-50) where F=206.716 and P-value=<0.001 by mean+ SD (17.022±2.816, 13.136±2.629). Regarding gender In our study the majority of our participants were noticed in female more than male with Mean± SD (11.911±2.298) with a significant relation between total knowledge and gender were T=-3.090 and P-value=0.002. Regarding marital status show that a significant relation between total knowledge and marital status (increase in single) were F=29.915 and P-value=0.001 by mean+ SD (14.600±4.968). Regarding Level of education show that a significant relation between total knowledge and Level of education (increase in university) were F=278.740 and P-value=0.001 by mean+ SD (15.200±3.036). Also regarding the income level show that a significant relation between total knowledge and income level (increase in the high income participants) were F=17.154 and P-value=0.001 by mean+ SD (12.741±4.979). Regarding Sources of knowledge show that a significant relation between total knowledge and sources of knowledge (increase in health professionals) were F=372.161 and P-value=0.001 by mean+ SD (17.039±3.388).

Figure (5) Distribution of the total knowledge and the demographic data(age, gender, marital status, level of education, income level, sources of knowledge)



Discussion

The present study provided an insight into assessment of the Knowledge of Malaria fever causes and symptoms among health care workers at the primary healthcare in Makah. The quality of services rendered by healthcare workers in the management of ailments depends on their knowledge and attitude levels toward the disease and its medications 19 .

our study reported the most of the participants they were weak about Knowledge of Malaria fever causes (62.6%) had insufficient information about causes of the malaria. Surprisingly the main source of information was the communication Web-sites (40%), and then the family, health professionals and TV were less utilized as a source of information. (see table 1,2and figure1), regarding Knowledge of the participants among the cause of malaria fever results the majority of participant had weak information were (62.2%) while average of the Knowledge about causes of the malaria fever were(35.1%) the data ranged from(1-10) by mean ±SD(5.031±1.689) and a statistical significant relation While Chi-square X2 191.320 and P=value 0.001 .

These results are in contrast to the findings from a study conducted in Swaziland in 2009 that reported healthcare facilities as the primary source of malaria information [36]. A possible explanation for the results of our study is that the respondents' answers reflect the impact of technological advancements on public health. However, the potential risks that may be associated with the accessibility and use of open communication (i.e., social media) should not be ignored, despite the fact that it is currently a readily available and accessible source of information on a previously unfamiliar disease .

Another study reported also as far as public health information on Malaria fever causes is concerned, approximately 70% of the participants in this study believed that they did not have sufficient knowledge about malaria, and a similar proportion thought that it was not a treatable disease. These findings are inconsistent with a previous study that reported that 78.1% of participants believed that malaria was preventable [37]. Most of the respondents were open to receiving information about measures for the prevention and treatment of malaria. It can be speculated that the relatively high frequency of illiteracy among participants (15.9%) plays an important role in limiting the acquisition of knowledge or awareness about malaria which is an uncommon disease in the study area. Nevertheless, despite the level of illiteracy, participants showed interest in learning more about malaria. Thus communicable diseases awareness programs and other teaching strategies should be

developed and implemented to educate and increase the public awareness of this disease.[38]

This study was conducted to assessment of the Knowledge of Malaria fever signs among health care workers at the primary health. The present study showed that more of participants had weak were (68.0%) knowledge regarding malaria fever signs and total knowledge were(62.6%). there were statistically significant differences regarding participants' knowledge of signs. (see table3,4), the signs of the malaria fever results show the majority of participant had weak information were(68.0%) while average of the Knowledge about participants signs of the malaria fever were(26.6%) the data ranged from(0-14) by mean ±SD(6.063±3.156) and a statistical significant relation While Chi-square X2 212.749 and P=value 0.001, also in total knowledge of the malaria fever results show the majority of participant had weak information were(62.6%) while average of the Knowledge about participants signs of the malaria fever were(33.4%) the data ranged from(1-24) by mean ±SD(11.094±4.503) and a statistical significant relation While Chi-square X2 180.109 and P=value 0.001

Compared to previous studies that was conducted among Nigerian Health care providers, the current knowledge status of participants was lower than that (41%).[39] In another study from Nigeria good and fair knowledge among participants was reported as 50% and 44% respectively. In Ethiopia, Yakob et al. showed that all participants had acceptable knowledge about contaminated needles and sharp materials that transmit disease causative agents, while 70.4% knew that gloves and gowns were required for any contact with patients, also identified a gap between knowledge of standard precautions and the practical applications among physicians.[40]

Contrary to the results of our study, we found anther a study, reported that though the knowledge of malaria fever causes and symptoms among some participants was found to be generally high, which was similar to the previous studies conducted in Nigeria, Zimbabwe and Sudan [41], the barriers seem mostly to be at the implementation step, largely due to socio-economic and cultural factors. This study has also revealed that those people who were most at risk mainly children and pregnant women were not given priority when dealing with preventive and treatment measures at both healthcare and household levels. This was consistent with the findings from Ethiopia's studies[39] as they reported that malaria mostly affected poor and underserved tribal populations, who lived in remote forest areas, as these people are deprived in terms of access to adequate modern treatment facilities.[30]

according to their socio-demographic characteristics or their PHC center regarding the age, gender, marital status, level of education, income level, sources of knowledge show that is a significant relation between total knowledge and demographic data regarding age P-value=<0.001 gender In our study the majority of our participants were noticed in female more than male P-value=0.002. marital status show that a significant relation between total knowledge and marital status (increase in single) P-value=0.001 Level of education show that a significant relation between total knowledge and Level of education P-value=0.001 by mean+ SD (15.200±3.036). income level show that a significant relation between total knowledge P-value=0.001 Sources of knowledge show that a significant relation between total knowledge and sources of knowledge (increase in health professionals) P-value=0.001

Our study supports a study In SA, found most of the people are poor and marginalized, their level of education is relatively poor and they mostly live in the remote villages, often deprived of modern healthcare facilities.[36] Several studies supported similar findings stating that people mainly the tribal or indigenous communities were less able to obtain appropriate and timely treatment, even for minor illness, found the demographic data (age, gender, marital status, level of education, income level, sources of knowledge) have the a significant relation between the knowledge and the result, also they not only rely upon unproven traditional methods [30], but are also obliged to seek inappropriate care due to

their low level of knowledge and level of education and low income the level awareness about the causes, symptoms and seriousness of malaria [32]. That may ultimately lead them to delay treatment. A previous study reported that in 2006, four out of six deaths from malaria occurred due to delayed of the knowledge of symptoms and treatment [40]
this study has added significantly to the literature on assessment of the Knowledge of malaria fever causes and symptoms among prevention and control of malaria in this region . As far as the authors are aware, this is perhaps the first of its kind in terms of research to determine the knowledge of malaria fever causes and symptoms among prevention and control attitudes and beliefs about malaria in this region. We found that appropriate understanding and awareness of malaria are considered essential components before taking any informed action for the prevention and treatment of malaria [38]

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