IMPACT OF THE AWARENESS REGARDING SCHISTOSOMIASIS SIGNS, SYMPTOMS, TRANSMISSION AND PREVENTION AMONG HEALTH CARE WORKERS AT THE PRIMARY HEALTHCARE IN MAKKAH CITY AT SAUDI ARABIA 2022

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Abstract:

Background: While the distribution of schistosomiasis has changed over the last fifty years and there have been successful control programmers, the number of people estimated to be infected or at risk of infection has not been reduced. Today, 85% of the numbers of infected people are estimated to be on the African continent where few control efforts are made. In terms of disease burden, there is therefore a growing discrepancy between sub-Saharan Africa and the rest of the world. WHO has now developed a dual strategy for the control of schistosomiasis: a strategy for morbidity control adapted to the public health context in high burden areas, and a strategy to consolidate control in areas where a low endemic level has been reached and elimination may be feasible.

Aim of the study: To assessment the awareness regarding schistosomiasis signs, symptoms, transmission and Prevention among health care workers at the primary healthcare in Makkah City at Saudi Arabia 2022.

Methods: This is a cross-sectional study in which (200) respondents aged <30years More than 60 years from Makkah City communities along were interviewed using a structured questionnaire discussions were also conducted descriptive statistics were used to determine the frequency of responses for each question posed and Chi squared tests used to determine the associations between demographic variables and variables of interest.

conducted about the awareness regarding schistosomiasis signs, symptoms, transmission and Prevention among health care workers at the primary healthcare in Makkah City, during the May to September, 2022.

Results: awareness of the participants among Signs and symptoms results the majority of participant had high information were(36.0%) While no statistical significant relation while Chi-square X^2 1.720and P-value = 0.423. awareness of the participants among Transmission results majority of participant had average information were(45.0%) While a statistical significant relation while Chi-square X^2 12.520 and P-value = 0.002.

Conclusion: The awareness of schistosomiasis, a disease which is still affecting a large number of poor people in the developing world, deserves more and renewed attention and commitment, particularly in Saudi Arabia. Simple, but sustained control measures can relieve an underestimated and surely unnecessary disease burden in high transmission areas.

Keywords: Awareness, schistosomiasis, signs, symptoms, transmission, Prevention, primary, health care, Makkah

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DOI: - 10.53555/ecb/2022.11.02.021

Introduction

Schistosomiasis remains one of the most prevalent parasitic infections in the world. It is endemic in 76 countries and territories, and continues to be a global public health concern in the developing world. Because it is a chronic insidious disease, it is poorly recognized at early stages, and becomes a threat to development as the disease disables men and women during their most productive years.[1] It is particularly linked to agricultural and water development schemes. It is typically a disease of the poor who live in conditions which favors transmission and have no access to proper care or effective prevention measures[2].

Schistosomiasis is one of the leading neglected tropical diseases, second to malaria in prevalence. In Uganda, more than 10 million People (25.6%) are currently infected, with prevalence in some areas as high as 90%, and more than 55% of the population is at risk .[3]

The most at-risk populations are the fishing communities and school aged children. Despite the government's prevention and control programs such as mass drug administration (MDA) andsensitization, infections and re-infections have continued to occur, even in areas where MDA has been implemented. Previous studies have linked this with risky behavior. However, information from Saudi Arabia is inadequate.[4] We conducted a mixed-methods study to assess community awareness regarding schistosomiasis signs, symptoms, transmission and Prevention and practices, and to understand their opinions and perspectives regarding the disease. The study found that, whereas there is adequate awareness of schistosomiasis and although there is a positive attitude toward avoiding water contact and the use of latrines, it is difficult to do so, something that could explain the persistent risky practices.[5]

The risky practices could also be compounded by myths and misconceptions surrounding the disease. These findings shall form the basis for the design and implementation of contextualized, community-based, participatory communication tools for behavior change. Community involvement in schistosomiasis prevention programs could lead to increased awareness about disease prevention and could debunk existing myths and misconceptions, thereby improving behaviors, practices, and habits, ultimately lowering infection .[6]

Intestinal schistosomiasis is a waterborne parasitic disease which, caused by Schistosoma mansoni fluke and disturbs a hundred millions of people worldwide[7]. Schistosomiasis is a neglected tropical disease exerts a substantial public health problem in 54 tropical and subtropical countries, mainly in Africa and the eastern Mediterranean region [8].Acute intestinal schistosomiasis or Katayama syndrome is one of the clinical manifestations of infection with S. mansoni [9] .

Urogenital schistosomiasis is one of thirteen most common chronic infections, known as neglected tropical diseases, among the world's poorest people [10], approximately 93 % of the world's 207 million schistosomiasis infections occur in sub-Saharan Africa; 15 million cases occurring in Ghana.[11] Two-thirds of these cases are caused by Schistosoma haematobium, the etiologic agent of urogenital schistosomiasis. Now that the name of the disease has been broadened to include the genital form of the disease, it is necessary for both, health professionals and endemic populations to become aware of the broadened scope of signs and symptoms to help with diagnosis and management of the infection[12]

Schistosomiasis or bilharzias, one of the most prevalent neglected tropical diseases (NTDs), is still considered as a public health problem in many developing countries in the tropics and subtropics.[13]

Literature Review

Several studies conducted in Saudi Arabia to assessed clinical aspects and factors associated with the likelihood of developing communicable diseases besides, other health and disease conditions [14]. These studies highlighted the need to increase public awareness disease control at the local community. Studies in Saudi Arabia indicated that the prevalence of Hepatitis B surface antigen (HBsAg) ranges from 7.4 to 17% denoting high endemicity [15]. Recent survey on first year medical students of Jazan University showed that half of the students (64.4%) had basic awareness about hepatitis B and C infection as well as about symptoms[16].

Earlier studies on urogenital schistosomiasis, focused extensively on the urinary form of the disease commonly called urinary schistosomiasis with little attention to the genital form of the disease. The World Health Organization, in the year 2009, renamed urinary schistosomiasis as urogenital schistosomiasis to cater for the genital

involvement of infection and estimated that about 45 million women of child bearing age are estimated to suffer from urogenital schistosomiasis. [17]
Yegorov et al. (2018) compared 1-week recall for measurement of acute properties with the standard (1-month recall) and found that 1-week recall yielded high-quality data. Also, showed that 60% of subjects in Kenya under-reported self-medication of common illnesses using a recall period of 2 weeks. Given the recall of one month for this study, we anticipated under-reporting by subjects with mild schistosomiasis related signs and symptoms.[18] A number of community based studies have highlighted the importance of urogenital schistosomiasis in reproductive and sexual health[19] . The tendency of the disease to have negative consequences on marriages was reported by Sacolo, et al.(2018) [20] and Christinet , et al.(2016)[21]

A recent study from Yemen showed that 59 % of the squamous cell carcinoma (SCC) cases were caused by S. haematobium chronic infection among adults. However, data on the knowledge, attitude, and practices awareness of populations in endemic areas in Yemen are not available. Community awareness and involvement are considered as one of the cardinal tools for the success and sustainability of any disease control programme.[22]

Many studies have investigated the effect of awareness on seeking health care for infectious diseases . Nevertheless, the impact of knowledge and attitudes on regular health care use has not been widely studied. awareness studies on schistosomiasis.[23] established prevalence figures and distribution of knowledge and practices, but did not show consequences on particular actions taken. Few previous reports elsewhere showed variation in the level of awareness amongst the Nigerian population; 33.8%-42.0% in Delta State, Southeastern Nigeria [24], and 64.4% in Ogun and Niger states along the middle belt and southwestern region[25]. In comparison with findings from other countries, poor knowledge of schistosomiasis and its causes was reported in Malawi and Kenya,[26] while a high level of awareness (80%) was reported in Zimbabwe [27].

Rationale:
Saudi Arabia, intestinal and urogenital schistosomiases are the two common types, with intestinal schistosomiasis being endemic in parts of the country. Common signs and symptoms include a swollen belly, blood in the feces, skin rash, fever, head, and body aches, breathing difficulties, diarrhea and constipation, liver fibrosis, intestinal ulcers, and sometimes high blood pressure, stunted growth, cognitive impairment in children, and infertility. Diagnosis is normally through the detection of the schistosome eggs during microscopically urine and stool analysis. Several socio-cultural risk factors, such as awareness, attitude, and practices and personal characteristics such as age, education, gender, and economic and environmental factors are found to influence schistosomiasis infection and prevention. There is a link between schistosomiasis infection and the level of knowledge, attitude, and water, sanitation and hygiene (WASH) practices. It is often argued that awareness influences a person's attitudes and beliefs, which in turn, can influence practices thereby increasing the risk of infection

Aim of the study:
To assessment the awareness regarding schistosomiasis signs, symptoms, transmission and Prevention among health care workers at the primary healthcare in Makkah City at Saudi Arabia 2022.

Objectives:
To assessment the awareness regarding schistosomiasis signs, symptoms, transmission and Prevention among health care workers at the primary healthcare in Makkah City at Saudi Arabia 2022.

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

Study Area
The study has 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.

Study Population
The study has be conducted among primary health-care regarding the schistosomiasis in Makkah the sample was selected to include primary health-care medical practitioners who aged from <30years - More than 60 years and their total number was 200.

Selection criteria:
Inclusion criteria
- Aged from <30years - More than 60 years

Exclusion criteria :
- No specific exclusion criteria.

The sample size
The sample size has been calculated by applying Raosoft sample size calculator based on (The margin of error: 5%, Confidence level: 95%, and the response distribution was considered to be 20%) accordingly to sample size from medical practitioners by the required sample size; (200). (male and female) and adding 10 more to decrease margin of error. After adding 5% oversampling, the minimum calculated sample has been 200. Computer generated simple random sampling technique was used to select the study participants. Data collection was done by the researcher during a during the May to September 2022.

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

Data collection tools of the study:
Tool was designed to collect the necessary data, and developed by the researchers after review of the literature.

Tool: Health care workers awareness about schistosomiasis causes, signs and symptoms structured interview questionnaire:

Part one: Patient's socio demographic characteri stics:
This part consisted data about participant age, sex, level of education, income and sources of information.
Part two: awareness about regarding schistosomiasis signs, symptoms, transmission and Prevention of schistosomiasis :
Include items that determine the patient's awareness about transmission and prevention of schistosomiasis.

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 $\leq$ 0.05 will be considered statistically significant.

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

Ethical considerations
Permission from the Makkah 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 a result 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 dengue fever in the participants . (n=200)

	N	%
Age		
<30years	76	38
30-45 years	50	25
45-60 years	66	33
More than 60 years	8	4
Sex		
Female	118	59
Male	82	41
Educational level		
Illiterate	48	24
Primary	52	26
Secondary	46	23
University	54	27
Income		
Less than 5000 SR	84	42
More than 5000SR	62	31
>10000 SR	54	27
Toilet facility		
Pour flush system	46	23
Pit (ground dug)	154	77
Drinking water		
Safe (treated)	88	44
Unsafe	112	56
Sources of knowledge about schistosomiasis signs and symptoms		
Health center for schistosomiasis control	76	38
Health clinic/hospitals	80	40
Mass media	12	6
School	22	11
Do not remember	10	5

This table 1 shows that the majority of participant approximately (48.0%) were aged from <30 years of age, while 45 to 60 years were (33.0%). Regarding sex, more than half of participant (59.0%) were female, while male were (41.0%) regarding educational level, this table reveals that approximately of participant (27.0%) were university . Regarding income, the most of participants less than 5000SR were(42.0%) flowed by more than 5000 SR were (31.0%) but have more than >10000 SR monthly were(27.0%) , regarding the Toilet facility the most of participants Pit (ground dug) were(77.0%) while Pour flush system were (23.0%), regarding the drinking water the most of participants unsafe were (56.0%) while safe (treated) were (44.0%), while Sources of knowledge about schistosomiasis signs and symptoms the majority of participant Health clinic/hospitals were (40%) followed by Health center for schistosomiasis control were(38.0%)

Table 2 . Distribution of the awareness about signs and symptoms of the schistosomiasis in the participants

Awareness about Signs and symptoms	Yes		No	
	N	%	N	%
Blood in stool	156	78	44	22
Hematuria	138	69	62	31
Abdominal pain	90	45	110	55
Diarrhea	170	85	30	15
Fever	32	16	168	84
Burning urination	144	72	56	28
Vomiting	44	22	156	78
Itching	20	10	180	90
Pale face (anemia)	152	76	48	24
Fatigue	172	86	28	14
Loss of appetite	166	83	34	17
Cough	42	21	158	79
Swollen abdomen	40	20	160	80
Dysentery	38	19	162	81

This table 2 shows the awareness about Signs and symptoms regarding the schistosomiasis the majority of participant answer regarding blood in stool Yes were (78.0%) were No were(22.0%), while regarding Hematuria majority of participant answer Yes were(69.0%) while No were (31.0%). Regarding abdominal pain, most of participant answer No were (55.0%) but regarding Yes were (45.0%). Regarding Diarrhea most of participant answer Yes were (85.0%) but regarding No were (15.0%), regarding Fever most of participant answer No were (84.0%) but regarding Yes were (16.0%), regarding Burning urination most of participant answer Yes were (72.0%) but regarding No were (28.0%), regarding Vomiting most of participant answer No were (78.0%) but regarding Yes were (22.0%), regarding Itching most of participant answer No were (90.0%) but regarding Yes were (10.0%) regarding Pale face (anemia) most of participant answer Yes were (76.0%) but regarding No were (24.0%), regarding Fatigue most of participant answer Yes were (86.0%) but regarding No were (14.0%), regarding Loss of appetite most of participant answer Yes were (83.0%) but regarding No were (17.0%), regarding Cough most of participant answer No were (79.0%) but regarding Yes were (21.0%), regarding Swollen abdomen most of participant answer No were (80.0%) but regarding Yes were (20.0%), regarding Dysentery abdomen most of participant answer No were (81.0%) but regarding Yes were (19.0%).

Table 3 . Distribution of the awareness about Transmission and Prevention regarding the schistosomiasis the participants

	N	**%**
Awareness about Transmission		
Playing with soil	170	85
Swimming/bathing in infested water	154	77
Dirty hands4	184	92
Eating contaminated	134	67
Drinking untreated water 2	176	88
Snail 3	194	97
Have contact with a water body 3	174	87
Had history of infection 1	198	99
Experienced haematuria	156	78
Experienced blood in stool	172	86
Drinking water	174	87
Worms 4	172	86
Polluted water 1	178	89
Salty or sour food	172	86
Poor personal hygiene 2	196	98
Awareness about Prevention		
Avoid playing with soil	176	88
Washing hands before eating	158	79
Avoid swimming/bathing in ponds/streams	180	90
Washing vegetables/fruit before eating	172	86
Taking anti-schistosomal drugs	182	91
Avoid drinking untreated water	172	86
Avoid washing clothes in ponds/streams 1	198	99

This table 3 shows the **awareness about Transmission** regarding the schistosomiasis the majority of participant answer Had history of infection were (99.0%) followed by Poor personal hygiene were (98.0%) while Snail were (97.0%) but Dirty hands were(92.%) followed by (Polluted water were 89.0%, Salty or Drinking contaminating water 87.0%, Have contact with a water body 87.0%,sour food were 86.05).

Regarding awareness about Prevention regarding the schistosomiasis the majority of participant answer avoid washing clothes in ponds/streams were(99.0%) followed by Taking anti-schistosomal drugs were(91.0%) but Avoid swimming/bathing in ponds/streams were(90.%) while avoid playing with soil were(88.0%)

Table(4) Distribution of the awareness of schistosomiasis about signs, symptoms, transmission and prevention among health care workers at the primary healthcare

	Weak		Average		High		Chi-square	
	N	%	N	%	N	%	X^2	P-value
Awareness about Signs and symptoms	70	35	58	29	72	36	1.720	0.423
Awareness about Transmission	58	29	90	45	52	26	12.520	0.002
Awareness about Prevention	88	44	64	32	48	24	12.160	0.002
Total awareness	76	38	80	40	44	22	11.680	0.003
Score	5-31.							
	21.765+5.776							

Table 4 Regarding awareness of the participants among about Signs and symptoms results show the majority of participant had high information were(36.0%) while weak of the awareness about Signs and symptoms were(35.0%). While no statistical significant relation while Chi-square X^2 1.720and P-value = 0.423. Regarding Knowledge of the participants among Transmission results show the majority of participant had average information were(45.0%) while weak of the awareness about Transmission were(29.0%) While a statistical significant relation while Chi-square X^2 12.520 and P-value = 0.002. Regarding awareness of the participants about Prevention results show the majority of participant had weak information were(44.0%) while average of the awareness about Prevention were(32.0%) While a statistical significant relation while Chi-square X^2 12.160 and P-value = 0.002 .

Regarding total awareness of the participants about schistosomiasis results show the majority of participant had average information were(40.0%) while weak of the Knowledge were(38.0%) While a statistical significant relation while Chi-square X^2 11.680and P-value = 0.003 the Score data ranged from(5-31) by mean ±SD(21.765+5.776)

Figure (1) Distribution of the awareness of schistosomiasis about signs, symptoms, transmission and prevention among health care workers at the primary healthcare

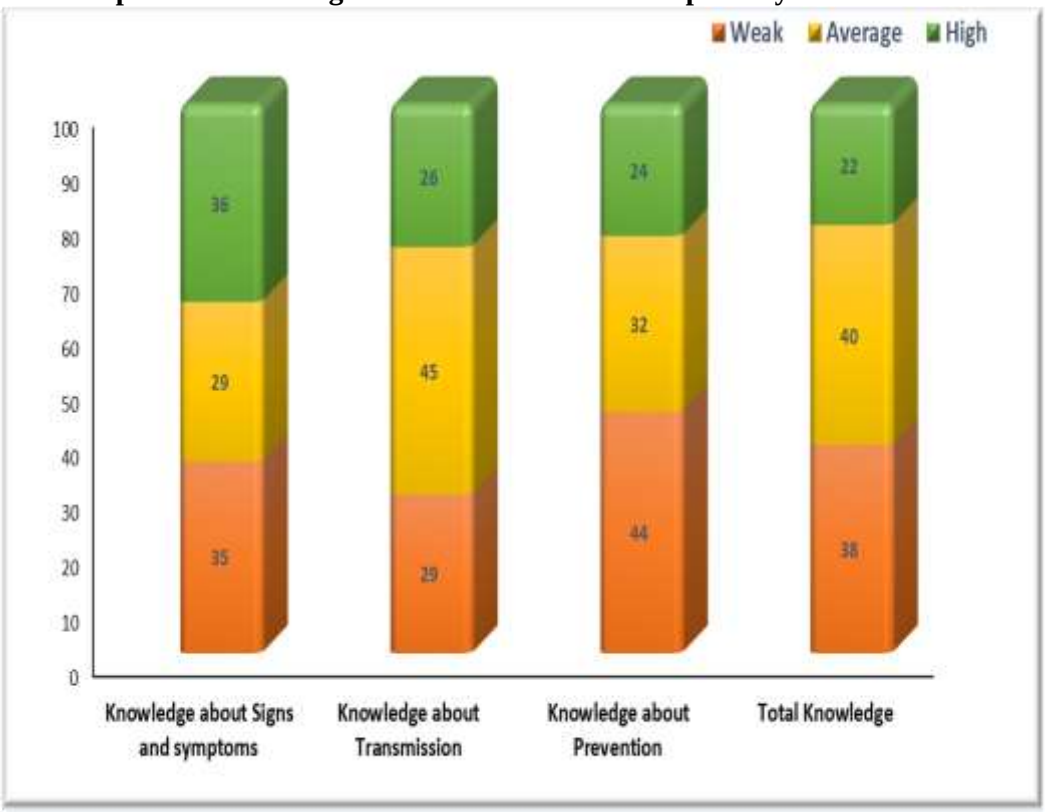

Figure (2) Distribution of the awareness of schistosomiasis about signs, symptoms, transmission and prevention among health care workers at the primary healthcare

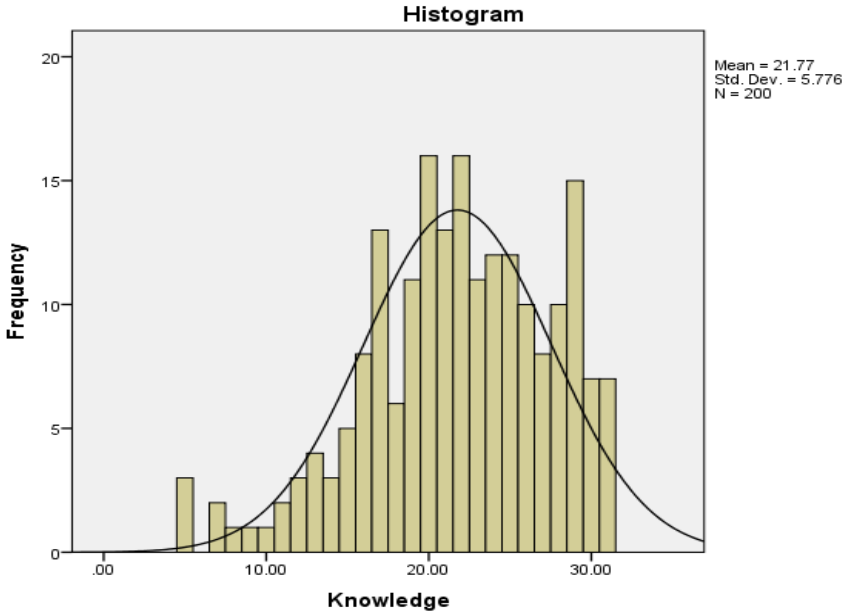

Table (5) Distribution relation of the awareness regarding the schistosomiasis and demographic data(age, gender, level of education, income level)

		N	Awareness			F or T	ANOVA or T-test	
			Mean	±	SD		Test value	P-value
Age	**<30years**	76	17.237	±	4.797	**F**	57.654	<0.001*
	30-45 years	50	22.160	±	4.335			
	45-60 years	66	25.697	±	3.663			
	More than 60 years	8	29.875	±	1.126			
Sex	**Female**	118	22.034	±	6.038	**T**	0.789	0.431
	Male	82	21.378	±	5.390			
Educational level	**Illiterate**	48	14.813	±	4.475	**F**	161.998	<0.001*
	Primary	52	19.442	±	2.218			
	Secondary	46	25.435	±	2.903			
	University	54	27.056	±	2.521			
Income	**Less than 5000 SR**	84	18.107	±	4.989	**F**	46.384	<0.001*
	More than 5000SR	62	23.226	±	5.152			
	>10000 SR	54	25.778	±	3.956			

Table (5) show that is a significant relation between awareness and demographic data regarding age (increase in More than 60 years follow by 45-60 years) where F=57.654 and P-value=0.001 by mean+ SD (29.875±1.126, 25.697±3.663). Regarding gender In our study the majority of our participants were noticed in female more than male with Mean± SD (22.034±6.038) with no significant relation between total knowledge and gender were T=0.789 and P-value=0.431. Regarding Level of education show that a significant relation between awareness and Level of education (increase in university) were F=161.998and P-value=0.001 by mean+ SD (27.056±2.521). Also regarding the income level show that a significant relation between knowledge and income level (increase in the high income >10000 SR) were F=46.484 and P-value=0.001 by mean+ SD (25.778±3.956).

Discussion

The present study revealed that the prevalence rate of schistosomiasis about 6.5% of the population suffer from schistosomiasis17.8% with no significant difference in the prevalence of urogenital (8.3%) and intestinal schistosomiasis

(8.9%). in the study area Saudi Arabia is located between two of the major endemic schistosomiasis areas in the world, the Nile River and the Tigris and Euphrates valleys. Four species of snail vectors exist in the country. The main natural habitat of the vector snails appears to be in the Sarawat Mountains where there are various natural water sources. This prevalence is in accordance with prevalence rates reported by previous studies; 11.5% in Adamawa State[28], 15.3% in Ebonyi State, 17.4% in Oyo State, and 18.7% in Plateau and Nasarawa states of Nigeria. However, higher prevalence rates were reported earlier in the same state, Kano. There are also foci of schistosomiasis in surrounding countries, namely Iraq, Lebanon, Syria, Occupied Palestine, Yemen, Ethiopia, Somalia, and Sudan.[29] Over time, the disease has crossed the borders of the Arabian peninsula by means of population movements, pilgrimage, and trade. The main natural habitat of the vector snails appears to be in the Sarawat mountains where there are various natural water sources such as permanent streams, ponds, and springs. The snails disseminate along the major flood routes from the natural water sources in the Sarawat Mountains and fill the wide beds in the plains. Water often overflows into man-made wells and cisterns and introduces snails to man-made habitats. With regards to the knowledge towards signs and symptoms schistosomiasis, our findings showed that the respondents were conversant with schistosomiasis, about three-quarters (36.0%) of the respondents have prior knowledge of schistosomiasis. (See table2, 3,4)This could be attributed to the fact that schistosomiasis is endemic in Saudi Arabia the high percentage of self-reported history of infection among the participants supports the endemicity of infection in these communities. similar In Nigerian accordance, few previous reports elsewhere showed variation in the level of awareness amongst the Nigerian population; 33.8%-42.0% in Delta State, Southeastern Nigeria , and 64.4% in Ogun and Niger states along the middle belt and southwestern region(34). In comparison with findings from other countries, poor knowledge of schistosomiasis and its causes was reported in Malawi and Kenya[31] while a high level of awareness (80%) was reported in Zimbabwe [30].
He reported a high prevalence of the disease in Al-Kharj, Dariya, Taif, WadiFatma, Tabuk, and Tayma. His conclusion was that bilharziasis in Saudi Arabia is easy to control since the foci of infection are well defined and therefore lend themselves to focal control and even eradication within a relatively short period[31]

Many studies have investigated the effect of awareness on seeking health care for infectious diseases Nevertheless, the impact of knowledge and attitudes on regular health care use has not been widely studied. awareness studies on schistosomiasis established prevalence figures and distribution of knowledge and practices, but did not show consequences on particular actions taken.[32]

Conclusion:

Despite adequate awareness of schistosomiasis and a positive attitude towards its prevention, existing myths and misconceptions, coupled with persistent risky water, sanitation, and hygiene practices still pose a challenge. A more robust community-based awareness intervention using bottom-up participatory approaches, accompanied by the provision of clean and safe water sources and increasing latrine coverage, could provide lasting solutions to these barriers. Schistosomiasis control is not an "all-or-nothing" phenomenon. A few basic measures can easily be implemented in all circumstances. Essential anti-schistosomal drugs must be accessible at all levels of the health system, and appropriate treatment strategies must be established in accordance with the endemic level. Many diseases are intimately related to poverty and poor living conditions. This is particularly true for parasitic diseases. Poor people are therefore likely to have more than one parasitic disease.

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