Factors influencing schistosoma heamatobium infection among men in Wete District Pemba Zanzibar

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FACTORS INFLUENCING SCHISTOSOMA HEAMATOBIUM INFECTION AMONG MEN IN WETE DISTRICT PEMBA ZANZIBAR

By

Haji Khatib Fakih

A Dissertation Submitted in (Partial) Fulfillment of the Requirements for the Degree of Master of Public Health Dissertation of

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CERTIFICATION

The undersigned certifies that he has read and hereby recommend for acceptance by Muhimbili University of Health and Allied Sciences a dissertation entitled: **"Factors influencing Schistosoma haematobium infection among men in Wete District Pemba Zanzibar",** in (partial) fulfillment of the requirement for the degree of Master of Public Health of Muhimbili University of Health and Allied Sciences.

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Dr. Mangi J. Ezekiel

(Supervisor)

_____

Date

DECLARATION AND COPYRIGHT

I, **Haji Khatib Fakih**, declare that this **dissertation** is my own original work, and that it has not been presented to any other university for similar or any other degree award.

Signature ..... **Date** .....

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DEDICATION

This dissertation is dedicated to my daughter Farhat Haji and my sons Mohamed Haji, Ibrahim Haji and Ismail Haji for their patience and enduring loneliness during the period I was away pursuing further studies.

ABSTRACT

Background

Schistosomiasis is a parasitic disease caused by trematode worms of the genus Schistosoma. It is the second major parasitic problem of the world; 200 million people are at risk to this infestation. It has been estimated that over 500,000 deaths occur every year due to schistosomiasis. Approximately two-thirds of the schistosomiasis cases are due to infection caused by *Schistosoma haematobium*. Possible consequences of *Schistosoma haematobium* infection include, dysuria, nutritional deficiencies, and lesions of the bladder, kidney failure, an elevated risk of bladder cancer and in children growth retardation.

According to Sacolo et al., (2018), emphasize that socio-cultural behaviors that affects knowledge, attitude and practices influence effective prevention and control of parasitic infections. studies have indicated that majority of the adolescents and adult's male who are head of the families are more prone to schistosomiasis infection than other groups due to their involvement in different risky economic activities.

Objective: To assess factors influencing Schistosoma *haematobium* infection among men in Wete district – Pemba, Zanzibar.

Methods: This was a Cross-sectional study design conducted within five wards of Wete District, Pemba Island in Zanzibar. The study included a total of 168 men aged between 18-45 years. Data on water contact behaviors, socio-economic and health system factors were collected by use of structured questionnaire translated into Swahili. Data were analyzed by SPSS software. Multiple logistic regressions were used to determine independent factors influencing *S. Haematobium* infection.

Results: A total of 168 men were included in the study, 23.3% (n=39) of the study participants reported to have suffered from Schistosoma infection within the past three months. Majority of the participants (51.1%, n=82) were aged between 18-34 years. Most of the study participants (58.6%, n=98) had attained secondary level education.

Results showed that water contact for <30 minutes, bathing and swimming behaviors, age between (18-34 years), lower education level, being rural or peri urban residents, respondents awareness of Schistosoma infection, availability of health centers, accessible medical services for schistosomiasis, prevailing symptoms and signs, and individual willingness to pay for the screening were associated factors for *S. haematobium* infection among the studied group.

Conclusions and recommendations: The proportion of men with history of *S. haematobium* infection in Wete district is still high 23.3%. Factors such as the water contact behavior, low education, area of residence and awareness of the available medical services for the treatment for *S. haematobium* were significantly associated with Schistosomiasis infection. It is recommended that prevention and control strategies should focus more on behavior change interventions.

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ABBREVIATIONS

MOH	Ministry of Health
PHCU	Primary Health Care Units
PZQ	Praziquental is the drug of choice in the treatment of all forms of Schistosomiasis
SCP	Schistosomiasis Control Program
SSA	Sub-Saharan Africa
WHO	World Health Organization
ZEST	Zanzibar Elimination of Schistosomiasis Transmission

OPERATIONAL DEFINITION OF TERMS

Schistosoma infection: in this study, schistosoma haematobium infection is referred to as the history of suffering from Schistosomiasis (as reported by the study participants) within the past three months.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Schistosomiasis or bilharzia is one of the preventable acute and chronic parasitic disease caused by Trematoda worms of the genus Schistsoma (WHO, 2019). World Health Organization (WHO) report about six species of schistosomiasis that infects humans and causing disease namely *Schistosoma haematobium*, *Schistosoma mansoni*, *Schistosoma japonicum*, *Schistosoma intercaltum*, *Schistosoma mekongi* and *Schistosoma Malaysian* (WHO, 2019). The predominant species that cause schistosomiasis are *S. haematobium* and *S. mansoni* (WHO, 2017).

According to WHO, it is estimated that more than 102.3 million people in 78 countries worldwide were infected with Schistosomiasis in the year 2017 (WHO, 2019). Globally, 200,000 deaths are attributed to schistosomiasis annually and it is estimated that 700 million people are at risk of infection in 78 countries where the disease is considered endemic, as their agricultural work, domestic chores, and recreational activities expose them to infested water (WHO, 2019). Approximately 85% of infections occur in sub-Saharan Africa and at least 90% of people requiring treatment for schistosomiasis live in Africa, Tanzania being the second after Nigeria (WHO, 2017; Gbalégba, et al., 2017). Majority of populations in Sub-Saharan Africa have marginalized communities with low socio-economic status, limited access to clean water and adequate sanitation (Sacolo, et al., 2018).

Infection occurs when schistosomes are transmitted through contact with fresh water contaminated with human excreta containing parasite eggs; a snail hosts needs to be present in the water to allow the parasite to complete the life cycle. The disease manifests in intestinal and urogenital forms (WHO, 2017). Possible consequences of *Schistosoma haematobium* infection include haematuria, dysuria, nutritional deficiencies, lesions of the bladder, kidney failure, and elevated risk of bladder cancer and in children growth retardation (Chu et al., 2010)

Evidence from studies have shown positive correlations between schistosomiasis transmission and several epidemiological and socio-economic factors (Nagi, et al., 2014). Sacolo, et al., (2018) adds that children, women, people with low education status and those working in contact with natural water bodies continue to be at greater risk. In the study done by Kabuyaya, et al., (2017), found age of the respondents, household head, poor sanitation, access to water source and negative knowledge about schistosomiasis are the common risk factors for schistosomiasis. In addition, negative attitudes, risky water behavior practices among community members are the identified factors for continuous transmission of the disease (Sacolo, et al., 2018; Kabuyaya, et al., 2017).

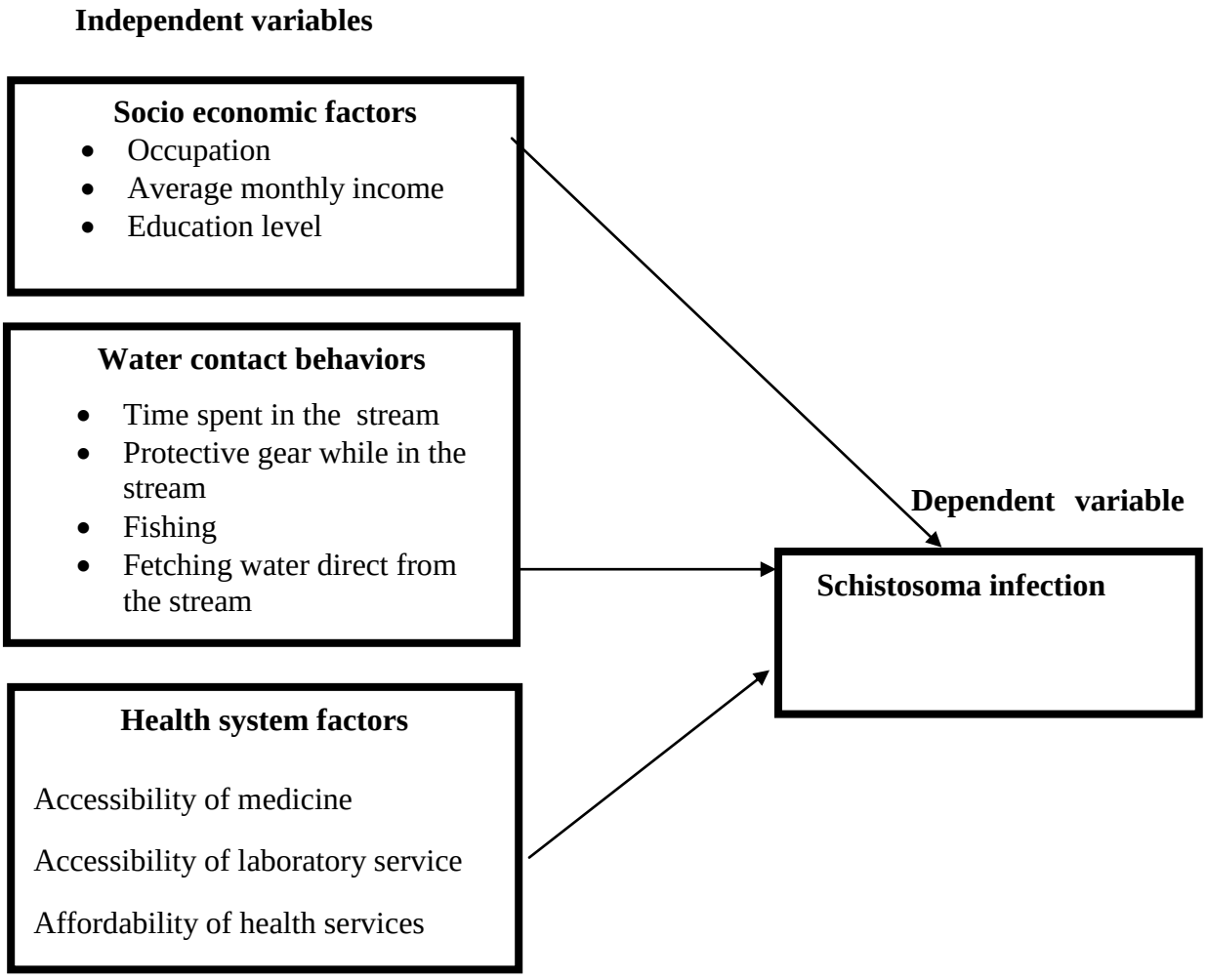
Furthermore, studies have indicated that majority of the adolescents and adult's male who are head of the families are more prone to schistosomiasis infection than other groups due to their involvement in different risky economic activities (Dawaki, et al., 2015; Sanya, et al., 2015; Calasans, et al., 2018; Knopp, et al., 2018). Studies have also shown that higher prevalence of schistosomiasis infections in male adults is due to the fact that males utilizes health services less frequently compared to women and children (Calasans, et al., 2018; Dawaki, et al., 2015). Thus, this study sought to assess risk factors for schistosomiasis is among men in Wete district.

1.2 Problem statement

Schistosoma haematobium has been endemic in Zanzibar for several decades, particularly in areas situated along streams and ponds in Wete District of Pemba Island. Over the past decades, regular mass drug administration (MDA) with praziquantel, improved access to safe water, better socio-economic conditions and climatic changes have reduced disease prevalence and morbidity of *Schistosoma haematobium* in Zanzibar. Initial magnitude of the problem before interventions, infection rate were 50% but now has been reduced to 5% in Unguja and 12% in Pemba (RGoZ, 2015; Knopp, et al., 2018). But despite these efforts the infection of *S. Haematobium* remains to be a major concern in Pemba Island (French, et al., 2015; RGoZ, 2015; Ame, 2018). Studies have revealed that majority of the preventive and treatment programs have focused on school aged children and exclude other community members and children under-five years (Sacolo, et al., 2018; Ame, 2018).

Sacolo et al., (2018), emphasize that socio-cultural behaviors that affects knowledge, attitude and practices influence effective prevention and control of parasitic infections. The degree of such influence however varies according to community settings and programs implemented. Knopp, et al., (2013), insisted on control measures targeting specific high-risk groups (males, young adults, people born in Pemba or mainland Tanzania) and individuals using natural freshwater. Therefore, this study was designed to identify the factors that influence schistosomiasis among males aged 18 to 45.

1.3 Conceptual framework



The framework shown in the figure above depicts the relationship between the dependent and independent variables. The independent variables are hypothesized to have an influence on S. haematobium transmission and they include; socio economic factors, water contact behaviors, and health system factors. The socio-economic factors include those factors (related to respondents' occupation, average monthly income, age and education level)**,** water contact behaviors (frequency and duration of being exposed to water, use of protective gears) and health system factors related to (access, affordability, availability of treatment in health facilities).

1.4 Rationale

The findings from the study may inform the Zanzibar Elimination of Schistosomiasis Transmission (ZEST) and add up to the ongoing efforts to reduce transmission of the *S. haematobium* in the Island and thereby prevent further new infection. Findings may be used to inform sensitization efforts and eventually contribute to positive behavior change at the community level.

1.5 Research questions

i. What is the proportion of men in Wete district that have ever suffered from *S. haematobium* infection in the past three months?
ii. What are the water contact behaviors associated with of *S. haematobium* infection among men in Wete district?
iii. What are the socio-economic factors associated with *S. haematobium* infection among men in Wete district?
iv. What are the health system factors associated with *S. haematobium* infection among men in Wete district?

1.6 Objectives

1.6.1 Broad objective

To assess factors influencing Schistosoma *heamatobium* infection among men aged 18 to 45 years in Wete district – Pemba, Zanzibar.

1.6.2 Specific objectives

i. To determine the proportion of men in Wete district who have ever suffered from Schistosomiasis in the past three months
ii. To determine water contact behaviors that are associated with *S. haematobium* infection among men in Wete district.
iii. To determine the socio-economic factors that are associated with *S. haematobium* infection among men in Wete district.
iv. To determine health system factors that are associated with *S. haematobium* infection among men in Wete district.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 The epidemiology of Schistosomiasis infection, transmission and control measures in Zanzibar

Evidence have clearly established the transmission of Schistosomiasis to be dependent on the certain species of snail host, and their spreading is influenced by the environment, water development schemes and people migration (WHO, 2015). Infection in human occurred during domestic, occupational and recreation activities that involve having contact with water infested with cercariae from the intermediate host snails (Adenowo, et al., 2015). Sometimes, the spread of disease to a new place where disease is absent occurs due to people's movements from areas of high endemic to non-endemic places where the snail intermediate host is present (WHO, 2015). For example, areas with insufficient and erratic rains due to climate change and the construction of water development schemes to meet power and agricultural needs are usually associated with the movement of people from both endemic and non-endemic areas into the project areas thereby introducing or exacerbating the transmission of schistosomiasis (Kabuyaya, et al., 2017).

The distribution of Schistosomiasis has changed over the few decades and there have been successful control programmes. However, the number of people estimated to be infected or at risk of infection has not been reduced in Sub-Saharan Africa (Nzallah, 2015). Today 85% of infected people are estimated to be on the African continent where limited control efforts are made. In terms of disease burden, there is a growing discrepancy between Sub-Saharan Africa and the rest of the world (WHO, 2019). In Tanzania, both urinary and intestinal schistosomiasis are still highly endemic in Tanzania and cause significant morbidity (Knopp, et al., 2013). The urogenital parasite, *S. haematobium*, is widespread, and transmission tends to coincide with the rainy season in Tanzania (Bakuza, et al., 2017). Experts explain that as the number and level of water bodies increase, female *Bulinus* snails lay large numbers of eggs that mature and start shedding cercariae shortly after the rainy season. The intestinal parasite, *S. mansoni*, is more focally endemic, and its transmission follows a similar pattern. Year-

round transmission of both forms of schistosomiasis occurs in permanent waterbodies along the shores of Lake Victoria, in irrigation schemes, and near hydroelectric dams (Bakuza, et al., 2017).

Pemba and Unguja Islands (Zanzibar Archipelago, United Republic of Tanzania) have been historically identified as 'model islands' for implementing multiple effective infectious disease control and elimination programmes in sub-Saharan Africa (Pennance et al., 2016). For schistosomiasis control, Zanzibar also offers an advantage due to the allopatric transmission of *S. haematobium* through a single snail host, *Bulinus globosus*, on both Islands. Mass drug administration using praziquantel, currently used as a key intervention measure, have been successful in decreasing prevalence of infection.

2.2 Factors associated with infection and transmission of Schistosomiasis

Neglected tropical diseases, such as schistosomiasis, require prevention and control measures and elimination efforts; therefore, an understanding of the transmission factors in a particular area should be obtained. These factors include the characteristics of the environment and the sociocultural processes that influence the transmission process.

2.3 Human water contact behaviour and Schistosomiasis transmission

Water sources have been indicated to be number one cause of disease transmission among different groups. Lack of clean water sources were more associated with infection in school aged children (Kabuyaya, et al., 2017). Human habits of using contaminated water in different economic activities such as fishing, river bathing for leisure and other activities at the rivers and dams have high rate of the infection to male than female (Calasans, et al., 2018; Dawaki, et al., 2015; Enk, et al., 2010). In other studies, Kabuyaya, et al., (2017) found female can be infected during fetching water and washing clothes. However, Calasans, et al., (2018), found contact with contaminated water can also be accidental in the rainy season, when floods and overflowing streams facilitate human contact with the parasite. Leisure activities in water contant has been reported to have strong association with schistosomiasis infections (Enk, et al., 2010). People who spent much of their time with contact with water has higher risk of

being infected compared to those who spend short time (Kabuyaya, et al., 2017). Other studies have found that swimming, fetching water, washing clothes, and watering the garden were not significantly associated with schistosomiasis (Kabuyaya, et al., 2018).

2.4 Socio economic factors related to Schistosomiasis transmission

Socio-economic related factors such as age, sex, education level, and economic status and surroundings has been associated with schistosomiasis infections and transmissions in different places. Poor sanitation, hygiene and lack of proper toilet facilities and people's defaction in the bushes has also been associated with high rates of infections (Kabuyaya, et al., 2017; Calasans, et al., 2018; Enk, et al., 2010; Koffi, et al., 2018). In another studies, Abdulkareem, et al., (2018), found unemployment, low income was greater risk for schistosimiasis, while Koffi, et al., (2018) reports lack of education is not associated with knowledge of schistosomiasis symptoms. There is a link between socio-economic status and treatment seeking behaviors where people with low education, low income status and no employment, are less likely to have good latrines and use it or proper knowledge of urogenital schistosomiasis and intestinal worms (Macharia, et al., 2016).

2.5 Health system factors and schistosomiasis transmission

A previous study conducted to assess health seeking behaviour and utilization of health for schistosomiasis related symptoms revealed that people with higher socio-economic status sought health care more frequently than people with low socio-economic status (Abdulkareem, et al., 2018). Males are reported to have less tendency of seeking health services (Kabuyaya, et al., 2017; Calasans, et al., 2018). Other studies found that perceived inadequacy of health services, unavailability of medications from health services; Preferences to self-treat the infection using herbal remedies or medications obtained from local markets resulted in health services not being consulted (Cronin, et al., 2013). Self-treatment were more associated with lower cost and higher accessibility, relative to health services (Cronin, et al., 2013). Koffi et al., (2018) in their study reported that knowledge of the schistosomiasis disease affects curative healthcare seeking behaviours. Others reports traditional medicine was preferred for

schistosomiasis treatment than formal healthcare settings while others perceive treatment is expensive and doubted its efficacy prior to MDA (Dawaki, et al., 2015). Poor health seeking behaviour was related to side-effects, smell and size of praziquantel (PZQ), together with shortage of Praziquantel in health facilities (Calasans, et al., 2018; Abdulkareem, et al., 2018). In another study Musuva, et al., (2014), found respondents felt health facilities were far, expensive, had long queues and sometimes no drugs thus they resorted to spiritual interventions, herbal treatments and medicine shops.

From the literature, studies have shown that there is a link between socio-economic status and treatment seeking behaviors where people with low education, low income status and no employment, are less likely to have good latrines and use it or proper knowledge of urogenital schistosomiasis and intestinal worms (Macharia, et al., 2016). Furthermore, studies have indicated that majority of the adolescents and adult's male who are also head of the families have are more prone to schistosomiasis infection than other groups due to their involvement in different risky economic activities (Dawaki, et al., 2015; Sanya, et al., 2015; Calasans, et al., 2018; Knopp, et al., 2018). Also, socio-cultural behaviors that affects knowledge, attitude and practices influence effective prevention and control of parasitic infections (Sacolo, et al., 2018).

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study design

A cross sectional study design was used, this enables the investigator in establishing the characteristics of the study participants and assessing the factors influencing the outcome at a single encounter.

3.2 Study area

The study was conducted in Wete District, one of the two districts in the North Pemba Region of Zanzibar. The administrative seat is Wete town. Wete District is administratively divided into seventeen wards. The District is densely populated and has an area of about 218 km square (534 people per square kilometer). The topology of the area is hilly and valley resulting into formation of slow-moving streams and semi-permanent ponds. This topography makes an agricultural important of the district thus people are growing variety of food and cash crops using flooding and sprinkling irrigation (RGoZ, 2015).

A total of 400 Schistosomiasis cases are reported annually in Pemba, of these, 40% are from Wete district signifying high prevalence of the disease in study area (RGoZ, 2015). On the same note, an average of 10 cases are reported per month, some of them with serious bladder lesions that are always referred to Urologists for further management and investigation. Wete District has one District Hospital and twenty health facilities which are categorized into Primary Health Care Units plus (PHCU). Primary Health Care Units plus provide diagnosis services like microscopic examination while PHCU malaria rapid diagnostic test for malaria diagnosis only (RGoZ, 2015).

3.3 Study population

The study was purposively done in men because according to the findings of the recent systematic review study done by Calasans, et al., (2018) indicates majority of Schistosoma treatement and infection interventions have focused on school-schildren and forgets other community members especially those who are involving in agriculture and water related activities. Earlier studies have shown men the highest rates of Schistosomiasis infection because they spend more time in fishing and agricultural activities (Dawaki, et al., 2015; Calasans, et al., 2018).

3.4 Inclusion criteria

- Male adults that reside within study area
- Those aged 18 – 45 years

3.5 Exclusion

- Those who were unable to communicate for any reason.

3.6 Sampling and sample size

3.7 Sample size estimation

The following formula was used to estimate the population size to be studied

$$n = \frac{z^2 p\,(100-p)}{\varepsilon^2}$$

Where

z= level of confidence (1.96 for 95% confidence level)

p = prevalence of S. haematobium in Zanzibar (12%), (RGoZ, 2015)

ε = margin of error = 5%

n= minimum sample size required

$$\frac{1.96^2 \times 0.12(1-0.12)}{0.05^2} = 162$$

To adjust for non-response rate (f) of 10%, the adjusted sample size (N) 178 male respondents.

3.8 Sampling procedure

Determination of sample size selection from the respondents the study based on two sampling techniques. Purposive sampling technique to select Wete district because it is the one of districts in Pemba that still have higher prevalence of Schistosoma infections.

Then a multi stage sampling technique was conducted to select representative numbers of households in each of the wards in Wete district. In the first stage; five wards were randomly selected from a total of seventeen wards. From the census statistics, on average each ward has total number of 1000-1200 households (URT, 2013). A list of households was obtained and from the list systematic sampling technique was used to obtain a total of 33 household. The first element was selected randomly from the sampling interval unit and from there selection was based on the 30^{th} household was selected until 33 households were reached.

In each of the selected households one male participant was invited to participate in the study. In case there were more than one eligible male in the household, a simple random selection method was used to get only one male participant. After obtaining 33 households, then convenient sampling technique was used to select individual male respondents. Since it was not easy to reach all male respondents at the same time, selection of the participants was done in a convenient basis. That is all male adults who were found at the household were approached and requested to participate based on their convenience. This was done each time until the required amount was reached.

3.9 Study variables

3.9.1 The Dependent variable

Ever suffered from Schistosoma infection in the past three months (yes/no).

3.9.2The Independent variables

- Occupation
- Education
- Average monthly income
- Time spent in the stream

- Fishing
- Fetching water direct from stream
- Accessibility of medicine and affordability

3.10 Data collection method and procedure

3.10.1 Data collection method

Data were collected using an interviewer administered questionnaire. The questionnaire consisted of three (3) sections. Section 1 collected socio-demographic data such as (age, marital status, place of residence, education level, primary occupation and monthly income level); section 2, water contact behaviors (distance of water stream from home, water contact activities done by respondents, and time taken in water contact); section 3 assessed health system factors (awareness on Schistosoma infections, accessibility of health services, distance of health service, and affordability of health services for treatment).

Data were collected by both researcher and researcher assistants. Research assistant were trained on how to obtain informed consent and how to administer questionnaire to eligible study participants. The research assistants were also trained on principles of research ethics including how to observe privacy and confidentiality.

3.11 Data analysis

Statistical Package for Social Sciences software (SPSS version 21) was used for data analysis. Descriptive statistics was done using mean (standard deviations) for continuous variables and frequencies and proportion for categorical variables. Association between dependent variable and independent variables were analyzed using Chi-square ($\chi 2$) test. Multivariable logistic regression analysis was used to determine independent factors that are associated with Schistosoma infection as well as controlling for confounding. Odds Ratios and 95% Confidence Interval was reported for the multivariable logistic regression models. In all the analyses a p-value of < 0.05 was considered statistically significant.

3.12 Ethical procedures/clearance

The ethical clearance with approval number (Ref. No. DA.287/298/01A) was obtained from the MUHAS-Research Publication Ethics Committee (Appendix E). Thereafter, a copy of clearance was submitted to Zanzibar Medical and Research Ethical Committee, in Wete district and the selected wards. Permission to collect data was sought from the ward secretariat who then introduced a research team to the respective ten-cell leaders there after the permission to collect data from individual households. Informed consent was sought from each eligible man in the household before the actual interview commenced.

CHAPTER FOUR

4.0 RESULTS

4.1 Demographic characteristics

A total of 168 men participated into the study. More than half (51.1%, n= 82) were in the age group between 18-34 years. Majority of the respondents, (58.3%, n=98) had attained secondary education level. 41.7% (n= 70) were traders/crafts men, whereas 34.5% (n=58) worked in fishing activities as primary source of income. On average, only 25% (n=42) were earning more than 200,000Tsh per months. Based on place of residence 45.2% (n=76) were rural residents. When Schistosoma infection history was assessed, findings revealed that 23.2% (n=39) of the respondents reported to suffer from Schistosomiasis in the past three months. More details are shown in table 4.1 below.

Table 4.1: Demographic characteristics of the respondents (N=168)

Variable	Category	Frequency (N)	Percent (%)
Age	18-34	86	48.8
	35-45	82	51.2
Education level	Primary and below	55	32.7
	Secondary	98	58.3
	Tertiary	15	8.9
Occupation	Farmer	40	23.8
	Fishing	58	34.5
	Trader/ crafts man	70	41.7
Monthly income	>200,000 / =	42	25.0
	<200,000 / =	126	75.0
Nature of residence	Rural	76	45.2
	Urban	22	13.1
	Peri urban	70	41.7
Schistosoma infection for the past three months	Yes	39	23.2
	No	129	76.8
At least one sign and symptoms experienced	Diarrhea	6	15.4
	Bloody urine	10	25.6
	Abdominal pain	9	23.1
	Nausea	8	20.5
	Fatigue	5	12.8
	Drowsiness	1	2.6

4.2.1 Water contact behaviors that are associated with S. haematobium infection among men in Wete district

The study assessed water contact behaviours of men and schistosomiasis infection. Table 4.2 below shows that (53.8%, n=22) whose distance from water source was more than 1 km suffered from Schistosomiasis as compared to those whose distance was less than 1 km (46.2%, n=17). Majority of the respondents (56.4%, n=21) who were infected with schistosomiasis visited water stream in the past three months as compared to those who did not visit water stream (43.6%, n=18). Other respondents who were infected with schistosomiasis were engaged in swimming (35.9%, n=14), fishing (35.9%, n=14), collecting household water (17.0%, n=7) as well as collecting snails (7.7%, n=3). However, this was not statistically significant (p-value >0.05).

There was statistically significant difference in proportion of respondents who were infected with *S. haematobium* and the duration of contact with water. Majority of the respondents (48.7%, n=19) contacted water for 1-2 hours compared to (30.7%, n=12) who contacted water for more than 2 hours, and (23.1%, n=9) contacted with less than 30 minutes. This relationship was statistically significant (p= 0.018).

Table 4.2: Bivariate analysis of water contact behaviors associated with S. haematobium infection among men in Wete district (N-168)

	Suffered from S. haematobium infection in the past three months				
	Yes	**No N=129(76.8%)**	**X^2**	**df**	**p-value**
Distance of water from your household					
< 1 km	17 (46.2)	41 (38.0)			
> 1 km	22 (53.8)	88 (62.0)	4.568	1	0.174
Respondents visit to water stream for the past 3 months					
Yes	21 (56.4)	83 (58.9)			
No	18 (43.6)	46 (41.1)	1.399	1	0.237
Main activities reported by study participants					
Swimming	14 (35.9)	43 (33.3)			
Fishing	14 (35.9)	51 (39.5)			
Bathing	1 (2.6)	10 (7.7)	5.187	4	0.269
Collecting water for household use	7 (17.9)	23 (17.8)			
Collection of snails	3 (7.7)	2(1.6)			
Approximate duration of water contact					
<30 minutes	9 (23.1)	12 (8.6)			
1-2 hours	19 (48.7)	49 (37.9)	8.075	2	0.010
`>2 hours	12 (30.7)	68 (52.7)			

In the multivariate analysis we found that factors that independently associate with Schistosoma infection included; spending less than 30 minutes in water (AOR 0.389, 95%C I; 0.160-2.609), collecting snails (AOR 0.389, 95%C I; 0.160-2.609). Participants who had bathing behavior 15 times higher odds (AOR; 0.361, 95% CI; 0.147-0.885) of suffering from Schistosoma compared to others.

Table 4.3: Multivariate analysis of water contact behaviors

Variable	COR (95% CI)	AOR (95% CI)
Distance of water from your household		
< 1 km	0.538 (0.057-5.085)	0.603 (0.290-1.255)
> 1 km	1	1
Respondents visit to water stream for the past 3 months		
Yes	1.974 (0.095-9.981)	1.547 (0.749-3.194)
No	1	1
Main activities reported by study participants		
Swimming	4.372 (0.643-29.703)	5.464 (0.83-35.968)
Fishing	2.545 (0.290-22.302)	4.607 (0.697-30.431)
Bathing	8.287 (0.443-154.868)	15 (0.983-228.8)
Collecting water for household use	3.742 (0.492-28.45)	4.929 (0.681-35.666)
Collection of snails	1	1
Approximate duration of water contact		
<30 minutes	0.156 (0.111-3.456)	0.389 (0.160-2.609)
1-2 hours	0.279 (0.155-0.502)	0.267 (0.139-0.511)
>2 hours	1	1

[1] ***reference;***

[a]***Univariable model;***

[b]***Multivariable model with all variables in the table adjusted for water contact behavior attributes;***

[c]***Odds ratio (95% Confidence Interval); [*]p value <0.05***

4.2.2 Socio economic factors that affect transmission *S. haematobium* among men aged 18 to 45 years in Wete district

In this study socio-economic variables such as education level, source of income of the respondents, monthly income and place of residence were considered among the factors which influence persistent transmission of *S. haematobium*.

The results show that there were significant statistical association between place of residence and risk of being infected where 51.3% (n=20) of the *S. haematobium* infected respondents were living in rural areas as compared to (28.2%, n=11) of those who reside in urban areas and those who are in peri urban (20.5%, n=8) (p-value 0.001).

Other variables such as age group, greater risk was among respondents who aged between 25-35 years (35.9%, n=14) and those with 39-45 (25.6%, n=10) compared to those with age between 18-24 years (17.9%, n=7).

On the education level, the risk of being infected with schistosomiasis was greater among respondents who had secondary education level (64.1%, n=25) and those with primary education (33.3%, n=13) compared to those with tertiary education level (1.6%, n=1).

Majority of the respondents 69.2%, n=27 who had less income were more at risk of being infected with schistosomiasis compared to those with >200,000Tshs. However, the results indicate statistical insignificant association (table 4.4).

Table 4.4: Bivariate analysis of socio-economic factors associated with S. *haematobium* infection among men aged 18-45 years in Wete district

	Have you ever been infected with Schistosomiasis (S. haematobium)				
	Yes =39 (23.2%)	No N=129 (76.8%)	x^2	Df	p-value
Age group					
18 – 24 years	7 (17.9)	22 (17.1)	6.787	4	0.148
25 – 31 years	14 (35.9)	56 (43.4)			
32 – 38 years	8 (20.5)	38 (29.5)			
39- 45 years	10 (25.6)	13 (10.1)			
Education level					
Primary level	13 (33.3)	31 (24.0)			
Secondary level	25(64.1)	82 (63.6)	3.856	2	0.145
Tertiary level	1 (2.6)	16 (12.4)			
Primary occupation / source of livelihood					
Wage earner	2 (5.1)	7(5.4)			
Farmer	8 (20.5)	34 (26.4)			
Fishing	14 (35.9)	37(28.9)	2.148	3	0.342
Trader/ crafts man	15 (38.5)	51 (39.5)			
monthly income (minimum wage)					
>200,000 / =	12 (30.8)	30 (23.3)			
<200,000 / =	27 (69.2)	99 (76.7)	0.902	1	0.342
Nature of residence					
Rural	20 (51.3)	56 (43.4)			
Urban	11 (28.2)	11 (8.5)	14.615	2	0.001
Peri urban	8 (20.5)	62 (48.1)			

In the multivariate analysis we found that factors that independently associate with Schistosoma infection included; age group, those with 32-38 years (AOR 1.730, 95%C I; 0.164-18.227), education level, those with primary education (AOR 0.162, 95%C I; 0.006-4.446). Participants who had age between 32 and 38 years were 4.7 times higher odds (AOR 0.149, 95%C I; 0.018-1.244) of suffering from Schistosoma compared to others.

Table 4.5: Multivariate analysis of socio-economic factors

Variable	COR (95% CI)	AOR (95% CI)
Age group		
18 – 24 years	2.819 (0.306-25.937)	3.143 (0.513-19.248)
25 – 31 years	1.936 (0.243-15.438)	4.000 (0.728-21.986)
32 – 38 years	1.730 (0.164-18.227)	4.750 (0.807-27.960) *
39- 45 years	1	1
Education level		
Primary level	0.162 (0.006-4.446)	0.149 (0.018-1.244) *
Secondary level	0.332 (0.033-3.360)	0.205 (0.026-1.623)
Tertiary level	1	1
Primary occupation / source of livelihood	0.684 (0.163-28.79)	2.111 (0.765-5.827)
Wage earner	1.284 (0.318-5.175)	1.171 (0.526-2.605)
Farmer	1.867 (0.976-12.546)	1.345 (0.616-3.666)
Fishing	1	1
Trader/ crafts man		
Monthly income (minimum wage)		
>200,000 / =	1.718 (0.182-16.226)	1.467 (0.663-3.242)
<200,000 / =	1	1
Nature of residence		
Rural	0.314 (0.182-16.226)	0.361 (0.147-0.885)
Urban	0.112 (0.023-0.539)	0.129 (0.042-0.393)
Peri urban	1	1

[1] ***reference;***

[a]***Univariablemodel;***

[b]***Multivariable model with all variables in the table adjusted for socio-economic attributes;***

[c]***Odds ratio (95% Confidence Interval); [*]p value <0.05***

4.2.3 Health System Factors influencing on *S. haematobium* transmission in Wete district

In this study health system variables such as awareness of *S. haematobium*, recognition of signs and symptoms, accessibility of health services including drugs, distance to a nearby health facility and affordability of the services were considered to the among the factors which influence *S. haematobium*.

The results show that there were significant statistical association between respondents' awareness of *S. haematobium* infected respondents (84.6%, n=33) compared to (15.4%, n=6) of those who were not aware. Majority of the respondents who had infected with schistosomiasis 71.8%, n=28 were aware on the availability of health centers providing services for treating Schistosoma infections compared to (28.2%, n=11). Majority of infected respondents accessed treatment for the signs and symptoms experienced 87.2%, n=34 and individual willingness to pay for urine screening 66.7%, n=26. These variables were significant with statistical value of p-value < 0.005.

Other variables such as distance to the nearest health center and affordability of the medical services for treating Schistosomiasis had no statistical relationships (p-value >0.05) (table 4.6).

Table 4.6: Relationship between health system factors and transmission of *S. haematobium*

Have you ever been infected with Schistosomiasis (*S. haematobium*)					
	Yes =39 (23.2%)	**No N=129 (76.8%)**	**x^2**	**Df**	**p-value**
Awareness of *S. haemotabium*					
Yes	33 (84.6)	56 (43.4)			
No	6 (15.4)	73 (56.6)	10.102	1	0.001*
Awareness on availability of health centers providing services for *S. haematobium*					
Yes	28 (71.8)	84 (65.1)	6.065	1	0.048*
No	11 (28.2)	73 (34.9)			
Awareness on provision of treatment for *S. haematobium*					
Yes	34 (87.2)	30 (23.3)	9.150	1	0.002
No	5 (12.8)	99 (76.7)			
Treatment for the signs of infections					
Yes	30 (76.9)	1 (7.8)	4.447	1	0.035*
No	9 (23.1)	128 (99.2)			
Distance of nearest health center					
1-5 km	6 (15.4)	15 (11.6)	.768	2	0.681
5-10 km	25 (64.1)	80 (62.0)			
> 10km	8 (20.5)	34 (26.4)			
Affordability of the medical bills for treatment services of *S. haemotabium*					
Yes	5 (12.8)	32 (24.8)	2.505	1	0.113
No	34 (87.2)	97 (75.2)			
Individual willingness to pay for urine screening					
Yes	26 (66.7)	11 (8.5)	6.045	1	0.001
No	13 (33.3)	118 (91.5)			

Results of the multiple logistic regression have shown that after adjusting for the confounders infected respondents. Results shows that awareness of the schistosomiasis were more than 4.2 times among infected respondents (AOR 4.219 (11.653-10.768) and awareness on the availability of health centers providing services for Schistosomiasis treatments 1.3 times higher odds (AOR 1.318 (1.115-1.878) among infected respondents.

Out of which those who were 4.3 more times to get treatment for the signs and symptoms they experienced when they were infected (AOR 4.304 (1.578-11.738). They also willing to pay for urine screening for chances of being infected again (AOR 1.311 (0.118-0.818) (table 4.7)

Table 4.7: Multivariate analysis of health system factors and transmission of *S. haematobium*

Variable	COR (95% CI)	AOR (95% CI)
Awareness of *S. haemotabium* infection		
Yes	2.710 (0.248-29.563)	4.219 (11.653-10.768) *
No	1	1
Awareness on availability of health centers providing services for *S. haematobium*	1.591(0.243-10.439)	1.318 (1.115-1.878) *
Yes	1	1
No		
Awareness on provision of treatment for *S. haematobium*		
Yes	5.576 (0.314-98.967)	2.677 (1.046-6.85) *
No	1	1
Treatment for the signs of infections		
Yes	3.718 (0.182-16.226)	4.304 (1.578-11.738) *
No	1	1
Distance of nearest health center		
1-5 km	1.446 (0.206-10.139)	0.588 (0.174-1.993)
5-10 km	0.948 (0.243-3.701)	0.753 (0.309-1.836)
> 10km	1	1
Affordability of the medical bills for treatment services of *S. haemotabium*		
Yes	0.948 (0.243-3.701)	2.243 (0.809-6.223)
No	1	1
Individual willingness to pay for urine screening		
Yes	0.275 (0.059-1.274)	1.311 (0.118-0.818) *
No	1	1

[1] ***reference;***

[a]***Univariablemodel;***

[b]***Multivariable model with all variables in the table adjusted for socio-economic attributes;***

[c]***Odds ratio (95% Confidence Interval); [*]p value <0.05***

CHAPTER FIVE

5.0 DISCUSSION

5.1 Proportion of Schistosomiasis infection among men in Wete district

Study objective number one aimed to assess the prevalence of Schistosomiasis infection among the respondents of the current study. It was revealed that out 168 respondents only 39 (23.3%) reported being infected with Schistosomiasis for the past three months. This is still a very high prevalence in this group, according to RGoZ, (2015), there are more than 400 schistosomiasis cases being reported annually in Pemba Island out of which 40% came from Wete district. Contrary to the findings of other studies which indicated the prevalence of Schistosomiasis in Pemba were reduced to less than 12% (Ame, 2018; Knopp, et al., 2013; Asya, 2013; Knopp, et al., 2019). According to Knopp et al., (2019) the prevalence of Schistosoma infection among adults in Zanzibar has been reduced from 3.9 to 1.5%. There is a need to extend massive studies to capture all of the community members and assess the prevalence of the infections as there is a greater chance for the re-infections to all of the groups that have been targeted with the existing programs (Calasans, et al., 2018).

5.2 The influence of water contact behaviors on the transmission of *S. haematobium* among men in Wete district

The results of this study showed that water contact had an influence on the transmission of S. haematobium as justified at both univariate, as most of respondent lived close to the water bodies and engaged in activities like swimming, fishing, collecting household water as well as collecting snails. However, the binary findings revealed statistical difference in proportion of the number of the respondents who were infected with S. haematobium and time for water contact for less than 30 minutes, and those who spent 1-2 hours in contact and slightly difference in those who contacted more than 2 hours. According to Asya, (2013) prolonged exposure time to snail infested water has high risk of contracting of infection. In this study risk of being infected was confirmed in a multivariate logistic regression where bathing were 15 more times significantly to be infected and 5 more times for those who were swimming

than those who were fishing and collecting water for household uses. This was in line with the findings reported from previous studies which indicated men to spend most of their time in water contact especially those who are involved in bathing or collecting water from the streams (Abdulkareem, et al., 2018; Dawaki, et al., 2015). On the same note, high water contact in males has been observed to correspond with a high peak of cercarial shedding (Dawaki, et al., 2015).

However, these findings are in contrast with previous evidence from Tanzania and Senegal which showed that distance to a water body was not found to be a strong contributor to schistosomiasis transmission (Asya, 2013; Gbalégba, et al., 2017). In terms of the number of water contacts per person per day, the results in this study did not show marked differences with other schistosomiasis endemic countries for example like Senegal where intensive observational water contact studies have been performed (Koffi, et al., 2018).

5.3 Socio-economic factors that affect transmission S. haematobium among men in Wete district

The results show that there were significant statistical association between place of residence and risk of being infected where 51.3% of the *S. haematobium* infected respondents were living in rural areas. Similar findings were observed in other studies (Dawaki, et al., 2015; Calasans, et al., 2018; Enk, et al., 2010). This study observed that age of the respondents, education level, primary source of income and income level had no statistical relationships with the risk of being infected. Contrary to the previous studies which found the statistical association between age, education level and economic status of the individuals (Sacolo, et al., 2018; Nagi, et al., 2014; Kabuyaya, et al., 2018). In this study area of residence were significantly associated with the risk of being infected. Similar findings were reported by (Kabuyaya, et al., 2017). Abdulkareem, et al., (2018) people living in rural community were strongly associated with schistosomiasis prevalence, which was attributed to lack of economic differentiation, widespread poverty and uniformly high exposure risk in the population.

Multivariate findings indicated that education level was significantly related to transmission whereby the risk of being infected were less likely to occur in people with primary education level. This can be attributed by the current Schistosomiasis preventions programs that targets school-aged children. There is a possibility among the young adult male respondents who formed nearly half of the study group. Contrary to the previous studies which reported lower education levels is more associated with the risk of infections (Asya, 2013; Kabuyaya, et al., 2018; Knopp, et al., 2013). According to Sacolo, et al., (2018), education level may affect attitudes and behaviour in different ways and settings. Individuals with low educational background are more likely to cross a stream or Ponds bare footed (exposing themselves to cercarial penetration) than their more educated counterparts who are likely to afford foot ware (Knopp, et al., 2018).

Additionally, limited educational achievement also affects employment opportunities in that the educated are usually employed and thus can afford fetching clean water from taps which means they are able to avoid direct contact with the fresh water snail infested water (Adenowo, et al., 2015). Of all occupations, being a fisherman was found to be responsible for the highest transmission of S. Haematobium among the people in the study area as indicated in the results section. This is because fishing by virtue of being done locally must have involved throwing nets into the water and then drawing them out after to collect the catch, in shallow waters however fishermen go on to step into the water and throw the nets followed by patiently standing still to wait for the catch. Both scenarios thus, bring about and increase water contact allowing for enough contact time between the parasites and the skin as an entry point on the fishermen.

5.4 Health system factors that influence S. haematobium infection among men a in Wete district

The results show that there were significant statistical association between respondents' awareness of S. haematobium infected respondents, awareness on the availability of health centers providing services for treating Schistosoma infections, majority of infected respondents accessed treatment for the signs and symptoms experienced, and individual

willingness to pay for urine screening. However, this finding was more on the proportion of the infected respondents. To uninfected respondents with lower proportion suggests a gap in the health services system of the district. Firstly there seems to be a challenge in the number of health facilities available that can offer schistosomiasis treatment to the public whereas for those which are available they are located distances so far from the residences of the respondents and secondly people who stay very far (more than 5km) from treatment point in the district are not going for the services. In addition, a lack of information, the costs of travel and health-services fees, and frequently unavailable services are also major barriers that people are facing in accessing health services in Wete District. However, these variables had no statistical relationships. Similar findings were also reported in previous studies (Abdulkareem, et al., 2018; Cronin, et al., 2013; Kabuyaya, et al., 2017).

Furthermore, results of the multiple logistic regression have shown that after adjusting for the confounders infected respondents there were more than 4.2 times of the respondents to be aware of the Schistosomiasis infections and 1.3 times awareness on the availability of health centers providing services for Schistosomiasis treatments. Out of which those who were 4.3 more times to get treatment for the signs and symptoms they experienced when they were infected. They also willing to pay for urine screening for chances of being infected again. This is in line with the current studies (Calasans, et al., 2018; Kabuyaya, et al., 2018).

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

Water contact was found to be of immense significance in the transmission of S. haematobium in Wete district more so among people who spend longer times in contact with the water through various activities like Swimming and fishing are at high risk of infection. The water contact levels in Wete district are not remarkably high and thus cannot solely explain the high infection intensities as observed in this study.

Socio economic factors also influenced transmission most especially low-income level and occupation for those involved in fishing are more prone to acquire schistomiasis infection, to compare those who are working in government official office or other sectors.

As for accessibility of health services, the study findings showed that S. haematobium treatment services were not readily available, located at long distances and were not available. Similarly, most of the treatment services were not affordable by most people in Wete district.

Evidence established from this study revealed that despite considerable efforts made to control schistosomiasis using various approaches in Zanzibar, the disease remains a serious public health problem and its prevalence continues to increase with increase in the population size. The incidence of S. haematobium in Wete district though has decreased over time it is still high, thus calling for more health services efforts to eliminate the infections.

6.2 Recommendations

Based on the study findings, the following is recommended

The current study is recommending for extension of the available health programs focusing on provision of mass drugs administration, conducted by the Zanzibar Elimination of Schistosomiasis Transmission (ZEST) project to extend its programs and focus on all the community's members including adolescents and adult male. ZEST should also focus on behavior change interventions such as proper use of sanitation and hygienic measures,

importance of wearing protective gears such as gumboots during farming, fishing and swimming habits in damps and ponds. Also, there is a need to include all of the government sectors in addressing the issues of Schistosoma infections. Ministry of health, should also strengthen availability of health services that are accessible to all of the community members with affordable costs.

6.3 Area for further studies

Since the study focused only on male adults, there is a need to conduct large studies representing all of the Pemba district and re-assessment of the prevalence should be evaluated.

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APPENDICES

Appendix I: Study Questionnaire

Section 1: Socio – demographic data

1. Age……

2. Residence……..

3. Marital status

    1. Married ☐

    2. Single ☐

Section 2: S. haematobium transmission

4. Have you ever suffered from schistosoma infection in the past three months?

    1. Yes
    2. No (if no go section 3)

6. If yes which of the following symptoms and signs did you experience?

Symptom	yes	No
Diarhoes		
Abdominal pain		
Bloody urine		
Nausea		
Fatigue		
Drowsiness		
Other_____		

7. How many episodes of Schistosomiasis have you had for the past of two years?

1. 1
2. 2
3. 3
4. 4
5. More than 4

Section 3: Water contact behavior

8. How far is the water body from your household?

1. < 1 km

2. > 1 km

9. Have you visited a stream, other than the local one, within the past 3 months?

1. Yes
2. No

10. Which of the following activities do you engage in?

1. Swimming
2. Fishing
3. Bathing
4. Collecting water for household use
5. Collection of snails

11. For each of the above activities engaged in, what is the approximate duration of water contact per day?

s/n	**ACTIVITY**	**TIME**								
		5 Min	10 min	15 min	20 min	30 min	1 hour	2 hours	3 hours	4 hours
1	Swimming									
2	Fishing									
3	Bathing									
4	Collecting water for household use									
5	Collection of snails									

Section 4: Socio Economic Factors

12. What is your level of education?

1. Primary level
2. Secondary level
3. Tertiary level

13. Primary occupation / source of livelihood

1. Wage earner
2. Farmer
3. Fishing
4. Trader/ crafts man

14. Household monthly income (minimum wage)

1. >200,000 / =
2. <200,000 / =

15. Nature of residence
    1. Rural
    2. Urban
    3. Peri- urban

Section 5: Health system factors

16. Have you heard about S. haematobium?
    1. Yes
    2. No

17. Were you treated when you had signs of infection?
    1. Yes
    2. No

18. Method of treatment
    1. Drugs
    2. Herbal
    3. Both
    4. None

Accessibility of health services

19. Are there any health centers in this community that provide Schistosomiasis treatment?
    1. Yes
    2. No
    3. Don’t know
20. How far is it to the nearest health facility from your place of residence?
        1. 1 km
        2. 1 – 3 km
        3. > 4km

21. Would you go to the health centers in this community for Schistosomiasis treatment?
    1. Yes
    2. No (go to question 23)

If yes, what motivates you to go

……

……

……

……

……

……

22. If No, what is your reason?
    1. Lack of confidentiality
    2. Inconveniency of service delivery time
    3. Health service fee is expensive
    4. Long waiting time for services
    5. Am sensitive on the gender of the health workers
23. How much time does it take you to reach the health facility?
    1. 10 – 30 minutes
    2. 1 hour
    3. 1 – 3 hours
    4. > 4 hours

Affordability

24. Are you able to afford medical bill for treatment of Schistosomiasis?
    1. Yes
    2. No
25. Are you willing to pay for urine screening services?
    1. Yes
    2. No

26. How would you rate the cost of services at the health centers in your community?
    1. Reasonable
    2. Expensive
    3. Very expensive
27. Are drugs for treating Schistomiasis always available in the health facilities?
    1. Yes
    2. No

END OF QUESTIONNAIRE

THANK YOU FOR YOUR TIME

Appendix II: Informed Consent Form

Interviewee No.....

Consent to participate in a study

My name is **Haji Khatib Fakih**. I am a Postgraduate student at Muhimbili University of Health and Allied Sciences (MUHAS). I am here to study the factors influencing persistence transmission of schistosoma haematobium infection among men in Wete District Pemba.

Purpose of the Study

This study is conducted in partial fulfilment of the requirement for the award of Master's Degree in Public Health of MUHAS. The study is aiming at assessing the factors which influencing persistence transmission of schistosoma haematobium infection. Also the finding in this study may contribute to further control measure against schistosomiasis in the District which will in turn improve the health of the population, and implementation of effective measures to provide protection from exposure to disease, You are being asked to participate in this study because your information is very important for the success of this study and will be used to make recommendation where necessary. Kindly collaborate to provide a clear picture on situation of disease.

Participation involvement

If you agree to take part in the study, you will be asked some questions to answer. This will take between 15 and 20 minutes to be completed.

Confidentiality

I assure you that, whatever information received will be kept strictly **CONFIDENTIAL** and will be used only for research purposes. Your name will not be written in this report. All information collected from the study will be entered in computers with identity codes known by the interviewer only.

Risks

We do not expect any harm as a result of your participation in this study. There may be some questions that you are not willing to answer; do not hesitate to tell the interviewer your feeling on those questions. You may reject to answer any particular question and also you may end the interview session at any time you wish.

Right to withdraw

It is voluntary to take part in this study. You can withdraw your participation at any time, even if you accepted at the beginning. Refusal to participate in this study has no penalty.

Benefits

The information you provide will lead to know factors which influences the persistence of the disease in the area. Also will provide evidence base for the need to establish robust programmes to break the transmission of the disease in Pemba Island.

Who to contact

In case of any problem about this study, do not hesitate to contact the researcher;

Haji Khatib Fakih
Muhimbili University of Health and Allied Sciences
P.O. Box 65001
Dar es Salaam. Tel: +255 777473660

You may also contact the supervisor;

Dr. Mangi Ezekiel
Muhimbili University of Health and Allied Sciences
P.O. Box 65001
Dar es Salaam. Tel No: +255713788811 or 0772228811

You may also contact:

Dr. Bruno Sunguya

Director of Research and publication

MUHAS

P.O. Box 65001

Dares Salaam: Tel +255685217272

Do you agree to participate in the study?

I have read the contents in the consent form and understand.

I agree I do not agree

Signature of participant……

Signature of interviewer……..... Date....…….....

Appendix II1: Dodoso La Utafiti (Swahili version)

Sehemu 1: Socio – demographic data

2. Una umri wamika mingapi……?

3. Pahala unapoishi……..

4. Hali yandoa

1. Umeowa ☐

2. Hujaowa ☐

Sehemu 2: S. haematobium transmission

5. Jee umewahi kuugua kichocho katika kipindi cha miezi mitatu iliyopita?

Ndio

Hapana (kama hapana neda sehemu ya tatu)

7. Ikiwa umeshawahi kuugua ni dalili gani uliweza kuzigundua?

Dalili	Ndio	Hapana
Kuharisha		
Kuumwa tumbo		
Mkojo kuwa na damu		
Kichefuchefu		
Machofu ya mwili		
Kizunguzungu		
Nyenginezo		

8. Ni mara ngapi umewahi kupata maambukizo ya kichocho katika kipindi cha miaka miwili?

6. 1
7. 2
8. 3
9. 4
10. Zaid yamara 4

Sehemu 3: Water contact behavior

9. Nimasafa gani kutoka kwenye bwawa la maji na nyumbani unapoishi?

1. Chiniya 1 km
2. Zaid ya 1 km

10. Umewahi kutembelea mto, wowote ule, ukiachana na ule uliouzowea, kwa kipindi cha miezi 3 ?

1. Ndio
2. Hapana

11. Nikitendo gani kati yahivi hua unavifanya?

1. Kuogelea
2. Kuvua samaki
3. Kukoga
4. Kuchukua maji kwa matumizi ya nyumbani
5. Kukusanya makonokono

12. Katika vitendo unavyovifanya ambavyo umevitaja hapojuu, nimudagani huaunatumia kwakila kitendo kwa siku?

Namba	**Kitendo**	**Muda**								
		5 dakika	10 dakika	15 dakika	20 dakika	30 dakika	1 saa	2 saa	3 saa	4 saa
1	Kuogelea									
2	Kuvuasamaki									
3	Kuoga									
4	Kuchotamajikwamatumiziyan yumbani									

Sehemu 4: Socio Economic Factors

13. Kiwangochako cha elimu ?

1. Elimuyamsingil
2. Elimuya secondary
3. Chuo

14. Shughuliyako / chanzo cha mapato

1. UnapokeaMshahara
2. Mkulima
3. Mvuvi
4. Mfanyabiashara

15. Patolako la mwezi (kiwango cha chini)

1. Zaid ya 200,000 / =
2. Chiniya 200,000 / =

16. Makaaziyako
    1. Kijijini
    2. Mjini
    3. Kandoyamji

Sehemu 5: Health system factors

17. Umeshawahi kusikia kuhusu kichocho?
    1. Ndio
    2. Hapana

18. Umewahi kutibiwa pale ulipoonyesha dalili za kichocho?
    1. Ndio
    2. Hapana

19. Njia gani za tiba ulitumia
    1. Dawa za hospital
    2. Dawa za kienyeji
    3. Njiazote
    4. Hapana hata moja

Accessibility of health services

20. Jee kuna kituo chochote cha afya hapa chenye kutoa matibabu ya kichocho katika jamii?
    1. Ndio
    2. Hapana
    3. Sijui

24. Nimasafa gani kutoka kituo cha afya mpaka unapoishi?
    1. 1 km
    2. 1 – 3 km
    3. Zaid ya 4km

22. Umeshawahi kwenda kituo cha afya kupata matibabu ya kichocho?

3. Ndio
4. Hapana (Nendaswali la 23)

Kama ndio nikitu gani wewe kulikuvutia ukaenda

……..

……

……

23. Kama hapana, jee unasababu gani?

1. Hakuna usiri
2. Jee kunachangamoto katika muda wautoaji huduma
3. Gharama za matibabu ni kubwa
4. Muda wakusubiri huduma ni mkubwa
5. Unahisia zozote kuhusiana na jinsia ya mtoa huduma wa afya

25. Ni mudagani inakuchukua wewe kukifikia kituo cha afya?

1. 10 – 30 Dakika
2. 1 Saa
3. 1 – 3 Saa
4. Zaid yamasaa 4 hours

Affordability

26. Jee unamudu kulipia matibabu ya kichocho?

3. Ndio
4. Hapana

26. Jee ukotayari kulipia uchunguzi wa mkojo?

3. Ndio
4. Hapana

27. Unazipima jee harama za huduma za afya katika jamii yako?

1. Rahisi na unazimudu
2. Ghali
3. Ghali sana

28.Jee dawa za kutibiakichocho kwakawaida huwazinapatikana katika kituo cha afya?

3. Ndio
4. Hapana

MWISHO WA MASWALI

AHASANTE KWA KUTUMIA MUDA WAKO.

Appendix IV: Fomu Ya Ridhaa (Swahili version)

Namba ya Msailiwa…….

Ridhaa ya kushiriki katika utafiti

Ninaitwa **Haji Khatib Fakih,** mwanafunzi wa shahada yauzamili wa Afya ya Jamii katika chuo kikuu cha Sayansiya Afya na Tiba Muhimbili. Nafanyautafiti wakuangalia kuendelea kuwepo kwa maambukizi ya kichocho katikaWilaya ya Wete Pemba.

Madhumuni ya utafiti:

Utafiti huu unafanyika ili kukamilisha masomo yashahada yauzamiliwa Afya ya Jamii katika chuo kikuu cha Sayansi ya Tiba Muhimbili. Utafiti una lengo la kutambua ni vitu gani vinavyopelekea kuwepo kwa maambukizi yamuda mrefu ya kichocho katika wilaya ya Wete Pemba.

Unaombwa kushiriki katika utafiti huu kwa sababu utachangia kudhibiti maambukizo ya kichocho katika wilaya, hivyo kuboresha afya za watu na kupanga mikakati ya kudhibiti maradhi ya kichocho, kwa hivyo tunakutaka ushiriki katika utafiti huu kwa vile taarifa kutoka kwako ni muhimu katika kufanikisha utafiti huu. Tafadhali shirikiana nasisi kwa kupata picha halisi ya maraddhi haya.

Masuala yanayohusu ushiriki:

Iwapo utakubali kushiriki katika utafiti huu, utasailiwa masuala yaliyokwenye mwongozo wa usaili ili kutoa maelezo husika.

Usiri

Nakuhakikishia kwamba majibu, taarifa, maoni na ushauri wowote utakao toa utatumika kwa utafiti huu. Jina na cheo chako hakitaandikwa katika taarifa hii.Aidha, taarifazote tutakazo kusanya kutoka kwenye utafiti huu, zitaingizwa kwenye kompyuta kwa kutumia namba za utambulisho ambazo zinajulikana kwa msaili tu.

Madhara

Sitegemei kuwa ushirikiwako katika utafiti huu utakuwanamadhara yoyote. Iwapo kuna maswali ambayo hutayapenda, unaruhusiwa kutoyajibu .Aidha, una uhuru wakutoendelea nausaili wakati wowote.

HakiyaKujitoa/ kutoshirikikatikautafiti

Ushiriki wako katika utafiti huu ni wahiari. Una hiariya kujitoa katika utafiti huu wakati wowote hata kama ulikubali mwanzoni. Kujitoa kwako hakutaathiri stahili zako kwanamna yoyote ile.

Manufaa:

Taarifa utakazotoa zitasaidia kujua mbinu za kupambana na maambukizo ya maradhi ya kichocho. Wakati huo huo taarifa hizo zitapelekea kuanzisha mpango mzuri au madhubuti wakupambana na maambukizo ya maradhi haya hapa Pemba.

WatuwaKuwasiliana

Iwapo una suala au tatizololote kuhusu utafiti huu**,**unaweza kuwasiliana na mtafiti, **Haji Khatib Fakih**, Chuo Kikuu cha Sayansi za AfyanaTiba, Muhimbili,
S.L.P. 65001, Dar es Salaam. Nambayasimu: 0777 473660

Pia unaweza kuwasiliana na Msimamizi wa utafiti huu, **Dr. Mangi Ezekiel**
Chuo Kikuu cha Afya na Sayansi Shirikishi, Muhimbili,
S.L.P. 65001, Dar es Salaam. Nambayasimu: +255 772228811 or 0713788811
Pia unaweza kuwasiliana na :

Dr. Bruno Sunguya
Mkurugezi wa utafiti na machapisho
MUHAS
P .O. Box 65001
Dar es Salaam: Tel +255685217272
Je umekubali kushiriki katika utafiti huu?

Mimi……nimesoma maelezo katika fomu hii na kuelewa.

Nakubali

Sikubali

Sahihi ya Msailiwa……

Sahihi ya Msaili.....……

Tarehe ……..

Appendix V: Approval Of Ethical Clearance

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
OFFICE OF THE DIRECTOR OF POSTGRADUATE STUDIES

P.O. Box 65001
DAR ES SALAAM
TANZANIA
Web: www.muhas.ac.tz

Tel G/Line: +255-22-2150302/6 Ext. 1015
Direct Line: +255-22-2151378
Telefax: +255-22-2150465
E-mail: dpgs@muhas.ac.tz

Ref. No. DA.287/298/01A/ 15th August, 2018

Mr. Haji Khatib Fakih
Master of Public Health
MUHAS.

RE: APPROVAL OF ETHICAL CLEARANCE FOR A STUDY TITLED: "FACTORS INFLUENCING PERSISTENT TRANSMISSION OF SCHISTOSOMA HAEMATOBIUM INFECTION AMONG MEN IN WETE DISTRICT PEMBA ZANZIBAR"

Reference is made to the above heading.

I am pleased to inform you that, the Chairman has, on behalf of the Senate, approved ethical clearance for the above-mentioned study. Hence you may proceed with the planned study.

The ethical clearance is valid for one year only, from 13th August, 2018 to 12th August 2019. In case you do not complete data analysis and dissertation report writing by 12th August, 2019, you will have to apply for renewal of ethical clearance prior to the expiry date.

Dr. Emmanuel Balandya
ACTING: DIRECTOR OF POSTGRADUATE STUDIES

cc: Director of Research and Publications
cc: Dean, School of Public Health and Social Sciences

Appendix VI: Permission Letter

SERIKALI YA MAPINDUZI YA ZANZIBAR
OFISI YA RAIS TAWALA ZA MIKOA SERIKALI ZA MITAA NA IDARA MAALUM ZA SMZ
OFISI YA MKUU WA WILAYA YA WETE
S.L.P 99 WETE, PEMBA

Kumb. OMWW/OR/ORTMSMIM/SMZ/P/A.I/VOL.X58. 24/08/2018

Sheha wa Shehia ya .....

YAH: RUHUSA YA KUFANYA UTAFITI NDG. HAJI KHATIBU FAKIH

Kwa heshima naomba uhuske na mada ya hapo juu.

Mtajwa wa hapo juu ni Mwanafunzi wa Chuo Kikuu cha Sayansi ya Tiba Muhimbili ambaye atafanya utafiti kuhusu Ugonjwa wa kichocho katika eneo lako.Pamoja na barua hii naomba umpe mashirikiano ili akamilishe kazi yake.

Nategemea utampa mashirikiano mema katika kutekeleza majukumu yake.

Ahsante.

(Mkufu Faki Ali)
Kny: MKUU WA WILAYA YA WETE
PEMBA

Tarehe 24/08/18

Barua zote zitumwe kwa katibu anuani Mkuu wa Wilaya ya Wete, Pemba S.L.P 99 Wete, Pemba
Mawasiliano ya moja kwa moja simu na. 0242451772