ENSIGN COLLEGE OF PUBLIC HEALTH, KPONG EASTERN REGION, GHANA.

PREVALENCE OF SCHISTOSOMIASIS AMONG FEMALE ADOLESCENTS IN OTI SUB-DISTRICT OF KRACHI EAST IN THE VOLTA REGION, GHANA.

BY

ERASMUS OTUTEY KWAKU GIDIMADJOR

A THESIS SUBMITTED TO THE DEPARTMENT OF COMMUNITY HEALTH

IN THE FACULTY OF PUBLIC HEALTH IN PARTIAL FULFILMENT

OF THE REQUIREMENTS FOR THE DEGREE

MASTER OF PUBLIC HEALTH

147100015

JULY, 2016

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SUPERVISOR: DR. FRANK BAIDEN

JULY, 2016

DECLARATION

CANDIDATE'S DECLARATION

I hereby declare that this project work is the result of my own original research and that no part of it has been presented for another Master of Public Health Degree Certificate in Ensign College of Public Health, Kpong or elsewhere.

Candidate's Name: GIDIMADJOR OTUTEY KWAKU ERASMUS

Signature _____

Date: _____

SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of the project work were supervised in accordance with the guidelines on supervision of project work laid down by the Kwame Nkrumah University of Science and Technology (KNUST), Kumasi.

Supervisor's Name:

Signature _____

Date: _____

ABSTRACT

INTRODUCTION

Schistosomiasis is the second most important parasitic disease after malaria. It is caused by different species of trematode parasites of the genus Schistosoma, which leads to chronic ill health with serious consequences on the socioeconomic development of tropical and sub-tropical countries. Schistosomiasis in females could have long term consequences. There is very little targeted with access the burden of schistosomiasis among young females in Ghana. This study sets out to investigate the prevalence of urinary and intestinal schistosomiasis among young female adolescents in the Oti sub-district of the Krachi East District.

METHODS

The study used the simple random sampling technique to draw 400 female pupils between the ages of 11 and 15 from Primary 6 to JHS 3. A Probability proportional to size sampling approach was used to select the number of pupils per class.

A mixed approach which combined the use of semi-structured interview and a collection of urine and stool samples of respondents for laboratory investigations were used.

RESULTS

It was revealed that young female adolescents possessed adequate knowledge about the disease. These help explain why the prevalence rate of urinary schistosomiasis among young female adolescents was found to be as low 7.58%. It was also found that the association between the urine strip and urine microscopic examinations is statistically significant. It was also found that 5.87% of young female adolescents who took praziquantel for the past three months tested positive of haematobium ova. Sanitary practices of households is not the best, 76.28% of the respondents do not have toilet facilities. Many therefore use public toilets and the bush if they want to defecate.

CONCLUSION

It is concluded that, Schistosomiasis is still a public health problem in Oti Sub-District (communities) in the Krachi East District of the Volta Region, despite respondents' knowledge about the disease was high. Mass Drug Administration, Community

Mobilization and Health Education regarding the cause, transmission and prevention of the disease, education about good personal and sanitary hygiene practices could be considered in order to significantly reduce the prevalence of infection to the barest minimum within these communities.

ACKNOWLEDGEMENT

My first and the foremost gratitude goes to the Almighty God for taking me through this research and coming out successfully with this master piece. His name be lifted high forever, Amen. Secondly, to my caring and concerned nuclear family; Lady Vivian Elaine Afi Gidimadjor (of U.S.A), my children Karl and Kendrick Gidimadjor for their moral and financial support they have given me throughout the course and the research. More grease to their elbows.

I am highly indebted to my Supervisor, Dr. Frank Baiden (Lecturer and Epidemiologist, Ensign College of Public Health) also and to Dr. Samuel Abudey (District Director of Health Services, Kpando) whose constructive criticisms and experienced guidelines made this project a successful one.

I can't stop appreciating my colleagues Brown-Brown "Political Will", Chief Borbison, Pastreel, Vidash and among others. To the entire Maiden Group of ECOPH-2014 and entire Ensign Community I shout a big thank you.

I also express my profound gratitude to all Staff and Pupils of Primary and Junior High Schools in the Oti Sub-District in the Krachi East of the Volta Region. I am privileged to have them as respondents to this research project.

Also, my thanks go to Gidimadjor-Nartey family without whose company and advise this research.

My last thank goes to the Staff of the Health Facilities and District Health Directorate, Ghana Health Service - Krachi East for their help and support.

DEDICATION

This project work is dedicated to Almighty God for His love and care.

It is dedicate to:

- Mrs. Vivian Elaine Afi Gidimadjor (of U. S. A)
- My children Karl and Kendrick Gidimadjor
- Gidimadjor-Nartey family home and abroad
- Staff of District Health Directorate, Ghana Health Service - Krachi East
- Staff of District Health Directorate, Ghana Health Service – Lower Manya Krobo Municipal
- The Basic Schools in the Oti Sub-District in the Krachi East District.

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CHAPTER ONE

INTRODUCTION

1.1 Introduction

This chapter describes the following; Background of the study, Statement of the Problem, Purpose of the Study, Objective(s), Research questions, Rationale of the Study.

1.2 Background of the Study

In spite of the fast improving knowledge in the area of urinary schistosomiasis, which cuts across global burden, treatment, and associated morbidity [1] there are repeated cases of these parasites in humans, especially children. This causes untold hardship as a result of the associated morbidities and mortalities [2]. Schistosomiasis is a parasitic disease caused by different species of trematode parasites of the genus *Schistosoma,* which leads to chronic ill health with serious consequences on the socio-economic development of tropical and sub-tropical countries. Schistosomiasis or bilharziasis is a very ancient disease. It was Theodore Bilharza German pathologist, who first discovered *Schistosoma haematobium* worms while performing autopsy in Cairo, Egypt in 1852[3].

Bilharza reported both terminal and lateral spine eggs in the oviduct of the female worms, while others like Manson found only lateral spine eggs in a patient from the Caribbean islands[4]

The lateral spine species of *Schistosoma* is named after Sir Patrick Manson. With time the problem of schistosomiasis has been exacerbated by water and agricultural development projects, especially in the developing countries where the use of science and technology in agrarian practices is on the ascendancy. In endemic rural areas of

many developing countries, the schistosomiasis is an important occupational hazard[5] The disease is endemic in 74 countries in Africa, South America, India, China, South East Asia, Sri Lanka, the Caribbean, Indonesia, Philippines, and Taiwan[6]

The World Health Organization (WHO) reports that when these countries are considered together, 600 million people are at risk of infection and 200 million more are actually infected in these areas. In 1990, the disease was responsible for the loss of 1.5 million Disability Adjusted Life Years (DALY's) worldwide; and mortality is estimated to exceed 100,000 per year. In Ghana, it is the second most prevalent parasitic disease after malaria [7]

The disease is endemic in the rural areas possibly due to the contamination of the source of water and the social and cultural practices of the inhabitants. Water is obtained from surface water for drinking and household chores. The water is fetched while standing in the water and laundry is sometimes done whilst standing in the water. When it is hot people swim in the water for considerable lengths of time. In most of these places there are no bridges and so people cross the river and streams to go from one bank to the other. These socio-cultural activities enhance skin-water contact, increasing risk of skin penetration by the cercariae[6]

In Ghana, prior to 1951, little precise information was available concerning schistosomiasis apart from brief references in the annual medical report[8]

Prior to the formation of the Volta Lake, *Bulinus globosus* was the commonest and most widely distributed snail host in Ghana. It was found in all areas of the country but it was rare in the Volta Basin. *Bulinus truncatus,* on the other hand, was limited to

the Savannah areas, that is, the south-east areas of the Volta Delta and parts of the Northern Ghana [9]

In Ghana, recent studies indicate that the disease is of great public health importance. A study by Aryeetey et al. (2000) revealed that prevalence of Schistosoma haematobium infection in some communities drained by the Densu river ranged between 54.8% and 60.0%.[10]

Before 1964, the Medical Field Unit had reported that the overall prevalence of schistosomiasis for the country was about 18% among children but with pockets of high prevalence around the Volta Delta where 75% of the children and 40-60% of the adults were infected. However, the prevalence was generally less than 5% among children in other parts around the Lake. The low prevalence of schistosomiasis in this area was related to the scarcity of suitable snail hosts, which in turn was attributed to the less favorable ecological condition (Ashitey G.A et al., 1974).

1.3 Statement of the Problem

A few years after the formation of the Lake Volta, schistosomiasis became the most important public health problem along the Volta Lake and its basin. That this disease would become a health problem around the lake was anticipated as it was one of the diseases, which the Preparatory Report had mentioned. *(Report of the Preparatory Commission, 1956).*In furtherance of this and in accordance with the provisions of section 13 of the Volta River Development Act of 1961(Act 46), a Schistosomiasis Control Unit was established under the Health and Safety Department of the Volta River Authority (VRA) to limit the incidence of the disease as a Public Health problem along the Lake.

The objectives of this unit are:

- To maintain health surveillance over the Volta Lake to ensure that the formation of the lake does not adversely affect the health of the population around the Lake;
- To ensure that, proliferation of weeds in the Volta Lake is controlled through periodic harvesting and surveillance of obnoxious weeds, which provide conducive habitat for vectors of water-borne diseases *(Schistosomiasis Control Unit, (1998).*

The main activities undertaken to achieve the above objectives of the

Schistosomiasis Control Unit involves:

- Diagnosis and treatment
- Snail host control and
- Health Education

TABLE 1;

THE DYNAMIC OF PREVALENCE OF BILHARZIA IN KRACHI EAST DISTRICT OF THE VOLTAREGION

Locality	**Year of Survey**	**Prevalence (%)**
Adakope	1998	91.5
	1999	70.9
Aglakope	1998	85.0
	1999	77.7

Atsonglokope	1998	72.0
Kudorkope	1998	94.1
Otisokpedzi	1999	71.4
Tokpo	1999	64.1
Azizakope	1999	76.9
Jerusalem	1999	85.9
	2002	89.4
	2004	90.8

SOURCE: VRA PUBLIC HEALTH UNIT (SCHISTOSOMIASIS CONTROL PROGRAMME) AKOSOMBO, 2015

Despite the control programme which has been in place for some time, available statistics show that the disease is still a major public health problem in the Oti Sub – District of the Krachi East District of the Volta Region of Ghana. *(Source: District Health Directorate: Dambai, Krachi East).*

Table 2:

The number of cases reported to the Health Facilities from 2012 to 2014 in the Krachi East.

YEAR	NUMBER REPORTED
2012	268
2013	142
2014	167

Source: District Health Directorate: Dambai, Krachi East

Oti Sub - District is one of the fifth Sub-Districts and located in the North-Eastern part of Krachi East District in the Volta Region. It has estimated population of 52, 025 inhabitants. (*District Health Directorate: Dambai, Krachi East, 2015*)

The main occupation of the people is fishing and farming activities on and along the bank of the Volta Lake; parents do not attach much importance to Diseases of Public Health concern and the School Age Children lack some of Health Hygiene Practices.

Despite the measures, effort, precaution and finances which the Ghana Health Service and Volta River Authority (VRA) have put in place to bring down the prevalence of Urinary Schistosomiasis; a disease of Public Health Importance or concern, if care is not taken these finances and measures will be in vain.

Some of such measures are the introduction or distribution of Praziquantel tablets against Bilharzia or schistosomiasis for School Age Children on the method: Directly Observed Therapy (DOT). Health Education on practices of hand washing and sanitation. Distribution of de-wormers tablets against intestinal parasites.

From observations by the help of Teachers, Oti Sub-District School Age Children are still urinating blood, as well as investigation from Krachi East District Health Directorate.

In view of the above table 2, in-spite of the achievements made by Krachi East District Health Directorate and School SHEP coordinator through distribution of Praziquantel tablets for Bilharziasis or Schistosomiasis by the help of Volta River Authority (VRA), the disease remains endemic in the communities.

The main reason of the researcher to carry out a study on female genital schistosomiasis are Schistosomiasis has been implicated in women's reproductive health.

The consequences include spontaneous abortions, infertility, post coital bleeding, dypareunia vaginal discharge, pelvic pain, and genital itch.[11] and it has It has also been shown to facilitate the transmission of sexually transmitted infections such as the human papilloma virus (HPV) and HIV-1through the stimulation of the immune system with a strong bias towards type 2 CD4 helper T cells.[11].

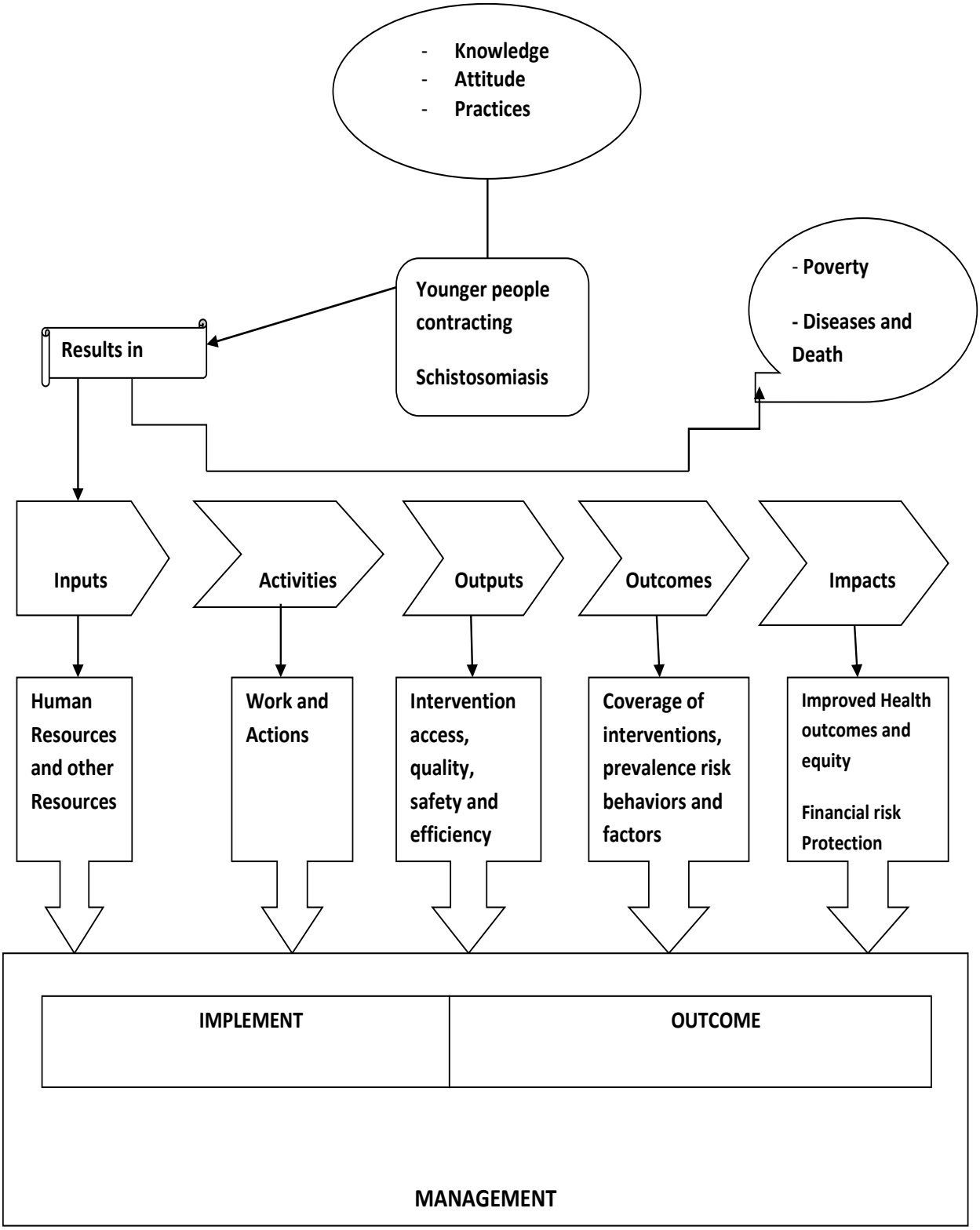
The researcher therefore, believe that for women to give birth to healthy babies to create wealth for a nation, the young adolescents must be female genital schistosomiasis and also among other diseases.

Based on the above findings, there is a need to do a study; to examine knowledge on urinary schistosomiasis. Also, the study would investigate other casual factors, attitude and practice which prevent best practices of Public Health concepts in Oti Sub-District in the Krachi East District of the Volta Region.

1.4 Rationale of Study

This study seeks to establish the current burden of schistosomiasis infection among female adolescents in the Oti Sub-district.

The study will also explore factors that contribute to the persistent of the infection and what implications are for the development of female genital schistosomiasis.



Source; Adopted and **modified**from:*www.conceptualframework.google.com.gh*

1.5 Research Questions

The research questions were:

1. What is the prevalence of urinary and intestinal schistosomiasis among young females (aged 11 – 15) in this sub-district?

2. How is infection with schistosomiasis related to water-related activities in the sub-district?

3. What are their attitudes towards the schistosomiasis prevention and treatment?

4. How is infection with schistosomiasis related to sanitary conditions in the sub-district?

5. How current infection related to access to praziquantel during mass treatment campaigns.

1.6 Aim

The aim of the study is to describe the epidemiology of urinary Schistosomiasis infection among female adolescents (aged 11 to 15) in the Oti sub-District of the Krachi East district of the Volta Region of Ghana.

1.7 Primary Objective

To determine the prevalence of urinary and intestinal schistosomiasis among school-going adolescent females in the Oti sub-district

1.8 Secondary Objective

The specific objectives of the study are to survey:

- To determine the prevalence of urinary and intestinal schistosomiasis co-infection
-

- To assess how schistosomiasis infection is related to water (Volta Lake)-related activities undertaken by adolescent females in the sub-district
- To assess how schistosomiasis infection is related to sanitary condition in the sub-district
- To find the association between the followings urine strip and urine microscopic.

CHAPTER TWO

LITERATURE REVIEW

This chapter intends to review available materials or literature on the topic under review.

Human schistosomiasis is one of the most common NTDs; it is an intravascular parasite caused by the trematode blood fluke (Schistosoma). Most human infections are caused by S. haematobium, S. mansoni, and S. japonicum; less prevalent species include S. mekeongi and S. intercalatum. Schistosomiasis is endemic in 77 countries in tropical and subtropical regions; estimates of infected individuals worldwide are237 million; another 600–779 are at risk of being infected (Chitsulo et al. 2000; Steinmann et al. 2006; WHO Weekly Epidemiological Report 2012). The life cycle of the parasite is characterized by alteration of generation; a-sexual reproduction occurs in the snail intermediate host and sexual reproduction occurs in humans.

The pathology of schistosomiasis is due to egg-mediated immune response in the form of granuloma formation followed by fibrosis which results in obstructive manifestations in the gastrointestinal tract (GIT) in case of intestinal schistosomiasis and in the urinary tract in the case of S. haematobium (Nash et al. 1982; Wynn et al. 2004; Wilson et al. 2007). However, eggs can be disseminated to other organs, e.g., the brain, the spinal cord, genital organs, and the lungs leading to severe morbidity (Gryseels et al. 2006). Squamous cell carcinoma is one of the serious complications of urinary schistosomiasis in Egypt and North Africa (Fedewa et al. 2009). In infected children, studies of physical and intellectual functions indicate significant reductions in physical fitness and spontaneous activity among children (Latham et al. 1990). Linear growth and nutrition are impaired, resulting in stunting and underweight status

among infected children (Assiset al. 1998; Coutinho et al. 2006). Poor performance in standardized intelligence and achievement tests has also been associated with schistosomiasis (Nazelet al. 1999; Jukes et al. 2002; Ezeamama et al. 2005, 2012).[12]

Schistosomiasis poses a public health challenge however for several reasons it is not considered a priority in national and local health policies and programmes. Even where schistosomiasis is widespread, only a few people notice the symptoms and even fewer react in response to them. Relatively inexpensive and safe medication is available and has been used with success. The spread of schistosomiasis is very closely tied to factors beyond health authorities' traditional sphere of influence. The fact that the infection is mainly found among people with very limited access to decision-making processes at both local and national levels further contributes to the limited attention given to the infection.[13] Global prevalence of schistosomiasis estimates of morbidity and mortality from schistosomiasis vary considerably:

All parasitic infections, schistosomiasis is second only to malaria in terms of public health impacts and has been estimated to affect to least 200 million people – equivalent to one in 30 people being affected worldwide. Urogenital schistosomiasis is endemic in 53 countries in Africa and the Middle East. The control groups in all studies to date are women who had been exposed to the same water sources. The differences between exposed and unexposed groups are therefore probably larger than the reported figures. It has been estimated that 16 million women will acquire the genital manifestations of Schistosoma haematobium infection and that, if cured, 120,000 new cases of HIV could be averted through regular praziquantel treatment in the next decade. However, the optimal timing for curative treatment for girls and novel treatment of adults remains to be explored.[14]

Schistosomiasis, like many tropical diseases, is endemic in areas where poor living conditions and poverty are prevalent. Because these are water-borne species, populations that primarily rely on agriculture and fishing for their livelihood are at the highest risk of contamination. Often, individuals in these regions are also co-infected with other parasitic diseases, such as malaria and hook worm. Women and children (peaking at age 10 to 19 years) are at high risk. Children play in water and women use water for their daily chores. Given the water-borne species, populations that primarily rely on agriculture and fishing for their livelihood are at the highest risk of contamination. Often, individuals in these regions are also co-infected with other parasitic diseases increased migration from rural to urban regions, the disease is spreading to urban areas and infecting swimmers. Due to increased ecotourism, the cases of schistosomiasis are being diagnosed more often in travelers.[15]

Travelers, defined as coming from non-endemic areas, are often exposed for a limited time. Unfortunately schistosomiasis, and in particular genital schistosomiasis, has been neglected in travelers despite increasingly common travel activities such as rafting and other forms of so-termed ecotourism Eighteen percent of asymptomatic travelers to Africa, exposed to infested freshwater and subsequently screened at the Hospital for Tropical Diseases in London over the period 1993–1997, were found to have schistosomiasis. Katayama fever, fatigue, and pain on urination were the commonest presentations in symptomatic travelers.[14]

Even though the more pathogenic type of schistosomiasis is found in Asia (caused by *Schistosoma japonicum*), most of the severe cases occur in Africa, due to lacking morbidity control.

Africa is estimated to account for 85% of all schistosomiasis transmission globally and there is a growing discrepancy between sub-Saharan Africa and the rest of the world in terms of transmission and control.

(Source: Chitsulo et al., 2000; Engels et al., 2002; WHO, 2002; Steinmann et al., 2006)

The first assessment of the global distribution of schistosomiasis and other worm infections (Stoll, 1999) and the fact that Western soldiers were posted in China, the Philippines and the Pacific Islands during the Second World War made schistosomiasis a priority in the international health community (Sandbach, 1975:518). Israel, Japan, Puerto Rico and the former Venezuela initiated national control programmes during or soon after the war. Based on rather loose (and, according to Sandbach, possibly exaggerated) estimates of the economic loss

due to schistosomiasis, the first World Health Assembly in 1948 decided to establish an expert committee to deal with schistosomiasis alone and not in conjunction with other parasitic diseases (Sand bach, 1976:266). The policy of the newly formed WHO was influenced by previous experience in Egypt and snail control was recommended as the most important single method of preventing schistosomiasis. The development of more powerful molluscicides kept optimism high without much experimental evidence that this approach could reduce the prevalence of schistosomiasis.[3]

But yet schistosomiasis is still remaining neglected disease and public health concern in most part of the world today.

SCHISTOSOMIASIS IN GHANA

Urinary and intestinal schistosomiasis occur widely in Ghana. Whereas the Schistosomiasis haematobium infection is present in all regions, the S.masoni infection is recorded only in the northern and southern quarters of the country.

Urinary schistosomiasis was first reported in 1895, and intestinal schistosomiasis was not identified in Ghana until 1920. Before 1952 data on the distribution of schistosomiasis in Ghana was derived from hospital records. Subsequently, surveys of rural or urban communities in the interior of the country were reported. Surveys of areas at risk were done to assess the epidemiology consequences of the Akosombo dam which formed Lake Volta [3]

Preventive chemotherapy with praziquantel is a crucial component for disease control that immediately reduces morbidity and ill health caused by schistosomiasis.
Extensive work on schistosomiasis has been undertaken along the Volta River basin, leaving very little data and information on this infection in the urban and peri-urban areas in Ghana.

Prevalence of Schistosoma infections has increased in Ghana considerably over the past few decades, despite numerous programmes and measures put in place to control the disease. Investigations carried out to determine. The burden of schistosomiasis in Ghana have mainly been around the Volta Lake. The Schistosomiasis Control Programme of the Ghana Health Service (GHS) has mapped out areas showing the prevalence rate within the various regions.

In spite of the success of this exercise, there are several urban and peri-urban communities that are still un- der the affliction of this parasitic disease. One of the major problems is how to locate these communities. Various ways of spotting these communities have been adopted by the GHS, including data/information on hospital attendance. The shortfall of this strategy can be lack of actual representation to aid in locating these peri-urban communities due to urban migration of people from endemic areas.[16]

There has not been a recent survey to determine the extent and severity of schistosomiasis on a national level... The available data, which dates back to 1970s indicated that Urinary schistosomiasis, widespread in all parts of the country. The same data shows that Intestinal schistosomiasis is restricted and patchy in its distribution. The Volta basins has prevalence as high as 80% to 90% in many communities living along the lake shore. Similarly, the Volta estuary is endemic with infection rate of 76.2% for S.masoni and 6.3% for S.heamatobuim. Generally, schistosomiasis is found to be high within communities located along rivers in all ten regions of Ghana[17]

In Ghana, urinary schistosomiasis was considered a public health problem in the rural communities only. Recent reports are pointing to the resurgence of this infection in urban and peri-urban settlements. There was yearly trend of S. haematobium infection during the period under review. This has shown that after every three years, prevalence of S. haematobium infection increases with peaks values of 32.7%, 17.0 % and 14.5 as observed in 2000, 2004 and 2008 respectively. This has also shown that the prevalence rates in these years were declining over time. This present study has demonstrated that S. haematobium in these study sites showed a three-year seasonal pattern of major increase with time. This may be due to increase in survival of the snail intermediate host in favorable environment after every three years. Thus, results obtained from both hospitals in this present study shows that the prevalence of S. haematobium infection is seasonal.[18]

Schistosomiasis among younger female adolescents is a neglected area in schistosomiasis research in Sub-Sahara Africa This is despite the fact that schistosomiasis in females causes major gynecological problems Female Genital Schistosomiasis (FGS) occurs when ova or adults of the trematode parasite,

Schistosoma sp ectopically locate in the female genital system. Although any of the Schistosoma parasites that affect humans may cause FGS, its occurrence is more common with S. haematobium infections, the causative agent of urinary Schistosomiasis[11]

FGS prevalence in urinary schistosomiasis endemic areas is estimated to range between 30-50%. Even in the absence of ova excretion in women, 23-41% of them are found to have genital schistosomiasis.[11] FGS has been implicated in women's reproductive health.

The consequences of FGS include spontaneous abortions, infertility, post-coital bleeding, dypareunia vaginal discharge, pelvic pain, and genital itch. Genital schistosomiasis is associated with bleeding disorders, lower abdominal pain but also with infertility. A simultaneous affection of the ovaries and fallopian tubes and /or peritoneum. A high tissue egg burden is associated with generalized inflammation and fibrosis and thus mechanically impairs the tubal motility or the tubal patency. Ectopic pregnancies or infertility are the highest possible outcome of this.[19]

Genital manifestations of infection with Schistosoma haematobium, although long known, have not attracted much attention. Only recently have the individual and public health implications of female genital schistosomiasis (FGS) been reported. An estimated 9–13 million women may be afflicted by this disease entity in Africa alone. This caused the World Health Organization to include FGS into a group of gender-specific diseases that deserve high-priority research. Besides debilitating or life-threatening consequences such as infertility and ectopic pregnancy, FGS seems to be a risk factor for the transmission of human immunodeficiency virus (HIV).[20]

Recently, it was shown that bacterial vaginosis is likely to increase the susceptibility of women to HIV-1 infection in sub-Saharan Africa. Since in FGS the physical barrier

function of the epithelium is impaired, women with genital schistosomiasis may also be at a higher risk for HIV infection than women with a normal reproductive tract. Moreover, there is circumstantial evidence that the immunologic micro-environment of the peri-oval granuloma facilitates the local propagation and systemic spread of HIV. If this hypothesis is correct, the control of urinary schistosomiasis, similar to the control of bacterial vaginosis, could reduce transmission of HIV[20]

Because intra vaginal inspections is usually not performed before the onset of sexual activity, the normal and pathologic characteristics of the pre-pubertal tissue have not been studied. (P Pillay - et al 2014) Furthermore, adolescents are often too shy to come for gynecological investigations during the first few years after sexual debut.[14]

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter presents the techniques adopted in collecting data for analysis. It details the research approach, sampling procedure, tool of data collection, administration of data collection tools and data analysis technique.

3.1 Research Methods and Design

The research is aimed at determining schistosomiasis knowledge, attitudes and practices (KAP) among female adolescents aged 11 to 15 living in the Oti Sub-District of the Krachi East District of the Volta Region. This was undertaken using a cross-sectional design that included questionnaire administration, urine and stool sample examination.

3.2 Data Collection Instruments

Data collection was in two forms. Firstly, students were given questionnaire to complete. After completing and returning the questionnaires, urine and stool samples were collected and sent to the laboratory for examination.

3.2 1 Semi-Structured Interview

The questionnaire consisted of both close-ended and open-ended questions. The open-ended questions were analyzed qualitatively. The close-ended questions were however analyzed quantitatively.

The questionnaire was sectioned into four. The first part collected data on the socio - demographic characteristics of respondents. The data collected in this section included age, class, tribe, place of residence, and proximity of place of residence to

the water body. The second section collected data on the knowledge of respondents on schistosomiasis. Respondent's knowledge about schistosomiasis was measured using a five-point Likert scale as follows: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = strongly agree. The indicators used to measure respondents' knowledge on schistosomiasis included questions on whether blood in urine was considered a disease or not, perception of blood in urine their communities, treatment of blood in urine, preventive measures and access to Praziquantel.

The third section of the questionnaire collected data on common practices among respondents that may lead to Schistosomiasis infection. These included swimming in a water body, urination into river or stream, fishing and standing in the river while washing. The frequency of these practices was measured using a five-point Likert scale as follows: 1=Not at all, 2= sometimes, 3= occasionally, 4 = often and 5 = very often. Data on the sources of water for bathing, drinking, cooking and washing were also gathered. Data on the availability and type of toilet facilities in the houses of respondents were also collected.

The final section of the questionnaire measured respondents' attitudes toward schistosomiasis. Indicators for attitudes were measured using a five-point Likert scale as follows: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = strongly agree.

The score of each respondent on the indicators used to measure knowledge, attitudes and practices were summed up to determine her total scores. Structured interview questionnaire was chosen as the appropriate tool of data collection because it suited the mixed approach the study adopted.

3.2.2 Urine and Stool Sample Collection

Urine samples of all the participants were taken and examined at Dambai health center and Dan-Moser Memorial Clinic laboratories within three hours for examination to determine the presence of haematobium ova. Also, 80 stool samples of randomly selected respondents were also sent to the same laboratories within three hours for examination to determine the presence of Schistosoma mansoni ova and other intestinal parasites.

3.2.3 Laboratory Procedures for Urine Examination.

Each of the 400 urine sample was poured into a test tube and given the number as per each urine container from the field. The urine strip as well as slide were also given the same unique number. The urine strip was deep into the content of the urine in the test tube, removed for few second for reading of presence of blood. If blood presence or not, the result was recorded on a form designed having the same unique number per the sample from the field. Each urine was centrifuged for a few seconds and the deposits were loaded on the slide with the same unique number as the test tube and the urine strip, then put under the microscope for examination or detection of Schistosoma haematobium ova. If ovum (ova) presence or not, the result was recorded on a form designed having the same unique number per each sample from the field.

3.2.4 Laboratory Procedures for Stool Examination

Each of the 80 stool sample was mixed with normal saline in the same container from the field having a unique number on a form designed for the results. The same number also was written on slides which was a bit of the mixed stool with normal saline was placed and covered with a cover slip for examination or detection of other parasitic

infections. If ovum (ova) presence or not, the result was recorded on a form designed having the same unique number per each sample from the field.

3.2.5 Administration of Data Collection Instrument

Before the questionnaires and the laboratory examinations were administered the researcher conducted informative talks with head of schools, teachers and pupils on the purpose of the study. The questionnaires were self-administered in a conducive atmosphere which paved the way for respondents to answer the questions without fear. The researcher was present to guide respondents to complete the questionnaires appropriately.

3.3 Study Population

Krachi East District is located at the north western corner of the Volta Region of Ghana and lies between latitudes 7º 40'N and 8º 15'N and longitudes 0º 6'E and 0º20'E. It is bounded to the south west by Krachi West District, Jasikan District to the south east, Kadjebi District to the east and Nkwanta District to the north. [21]. The District is divided into 5 Sub-Districts by the Ghana Health Service for easy administration and management. Oti Sub-District one of the five sub-Districts. The study population, therefore comprised of young female adolescents living and attending Primary Schools (Primary 6 specifically) and Junior High Schools in the Oti Sub-District for the past twelve months, irrespective of their socio-economic status, religion or tribe.

3.4 Study Variables

In research, variables denote characteristics or features that could be measured. The variable that is being studied is urinary schistosomiasis. In other words, urinary schistosomiasis is the independent variable under investigation. Other dependent

variables include Knowledge, Attitudes and Practices, age, tribe, class and proximity to water body. The table below presents the dependent variables and their level of measurement.

Table 3.1 Measurement of Variables

No	Variable	Level of Measurement	Measurement Details
1	**Urinary Schistosomiasis**	Laboratory Examination	1.Microscopic Test 2. Urine Strip test
2	**Knowledge**	Ordinal Scale	**LIKERT SCALE** 1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree
3	**Attitude**	Ordinal	**LIKERT SCALE** 1 = Not at all 2 = Sometimes 3 = Occasionally 4 = Often 5 = Very often
4	**Practices**	Ordinal	**LIKERT SCALE** 1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree
5	**Age**	Interval-Ratio	-
6	**Tribe**	Nominal	-
7	**Class**	Ordinal	
8	**Proximity to water** body	Interval-ratio	-

Source: Authors own construction, 2016.

3.5 Sampling

3.5.1 Sample Size Determination

A target sample size of 400 female pupils was set. This was based on the assumption that the total number of female pupils in enrolment was 1800, and the prevalence of

schistosomiasis infection would be about 26%. The target sample size would therefore afford an estimation of the prevalence of schistosomiasis infection within a margin of error of 4%, at 95% confidence levels accounting for a participation refusal rate of 10%. Due to logistic constraints it was conveniently decided that the stool samples to be collected will be 20 % of the number of urine samples collected.

3.5.2 Sampling Technique

A Probability proportional to size sampling approach was used to select the number of pupils per class. The number enrolled per class was done proportional to the number of female pupils in the class. The class list was used in systematic random sampling in each class.

3.6 Pre-testing of Data Collection Tool

The questionnaire was pre-tested among 20 JHS and Primary female students of Kpelema Basic Schools. These Schools are located outside of Oti-Sub District but in the same District with the selected schools. This was done because Kpelema Basic Schools is in the same District as those to participate in the survey. The pre-testing exercise revised questions and study procedures. The order of the questions was also changed to improve logic and consistency. It was also used to the approach to data analysis.

3.7 Data Handling

Completed questionnaires were serially numbered from the first to the last. Questionnaires were checked for completeness, accuracy and legibility. Specimen bottles were used to collect urine and stool samples and wrapped in zip plastic bags to avoid cross contamination. Aseptic procedures were adopted. Each specimen bottle was given a serial number to match those on the questionnaire. Urine and stool

specimen bottles were put in two separate reverse cold-chain carrier and taken to the laboratory.

3.8 Data Analysis

Data was analyzed using a platform created in Epi Info (version 7.1.50) and SPSS (version 20). Entry, verification and cleaning were run concurrently with data collection. The entry, which was in SPSS format, was converted into STATA format for analysis. STATA software was used to generate frequency tables, bar charts, pie charts and cross-tabulations to describe and summarize field data.

3.9 Ethical Considerations

An introduction letter was obtained from the Ensign College of Public Health which was delivered to the Krachi East District Education Directorate. The Directorate then gave permission for the survey to be conducted in the schools. School authorities assisted to obtain informed consent from parents and guardians. Data collected from the students were used only for the purpose of completing this academic research.

3.10 Limitations

Resource constraints limited the number of stool samples that could be collected and analyzed.

Being a cross-sectional design, it was not possible to make definite conclusions about how the associated factors temporarily related to schistosomiasis infection.

CHAPTER FOUR

DATA ANALYSIS, INTERPRETATION AND FINDINGS

4.0 Introduction

This chapter present on the analysis, interpretation and findings of the study. The chapter also focuses on the details of the responses from the 409 respondents from the target group.

4.1 Characteristics of Respondent

Data was collected on respondents' ages, proximity of respondents to water bodies, persons respondents are staying with and items possessed by respondents' parents.

4.1.1 Age

The age of respondents was classified into a two-age group as follows: 11-13 and 14 – 15 years.

Table 4.0 Characteristics of Respondents

Age	Frequency	Percentage
11 -13	83	20.8
14 -15	317	79.2
Total	**400**	**100**

Mean = 15, Sd= 1.05

Source: Field data (2016)

From the table it is observed that 79.2% of respondents were in the age range of 14-15 age range. The mean age is 15 years and the standard deviation is 1.05

4.1.2 Proximity to Water Body

The table below indicates that 280 respondents constituting 68.5% walked over 1000 meters to draw water for domestic purposes. Also, 4.5% of respondents walked

between 600 and 1000 meters before they could access water for use. Those who cover 500 meters and below form 27% of respondents sampled for the study. On the average respondents walk 957.1 meters to draw water for domestic use.

Table 4.1 Proximity to Water Body

Distance (m)	Frequency (f)	Percentage	Midpoint (x)	Fx
1 – 500m	111	27	250.5	27805.5
501 – 1000m	18	4.5	750.5	13509
1001-1500m	280	68.5	1250.5	350140
Total	**400**	**100**	**400**	**391454.5**

Source: Field data (2016)

Mean (x) $= {\sum fx}/{\sum x}$

$= {391454.5}/{409}$

= 957.1 meters

4.1.3 Persons Respondents are staying with

Represented below are the persons respondents are staying with. About 51.0% stay with their mother, 18.5% with their Aunty and 6.3% with their Uncle. Approximately 13.0% stay with other relatives such as brother, sister, family friends, etc.

Table 4.2 Persons Respondents are staying with

Person	Frequency	Percentage
Mother	204	51.0
Father	54	13.5
Aunty	74	18.5
Uncle	25	6.3
Others	52	13.0
Total	400	100

Source: Field data (2016)

4.1.4 Items Possessed by Parents

The study also sought to investigate the socio-economic status of respondents' parents. Respondents were asked to state which items their parents possessed. Table 4.3 below displays the responses.

Table 4.3 Items Possessed by Parents

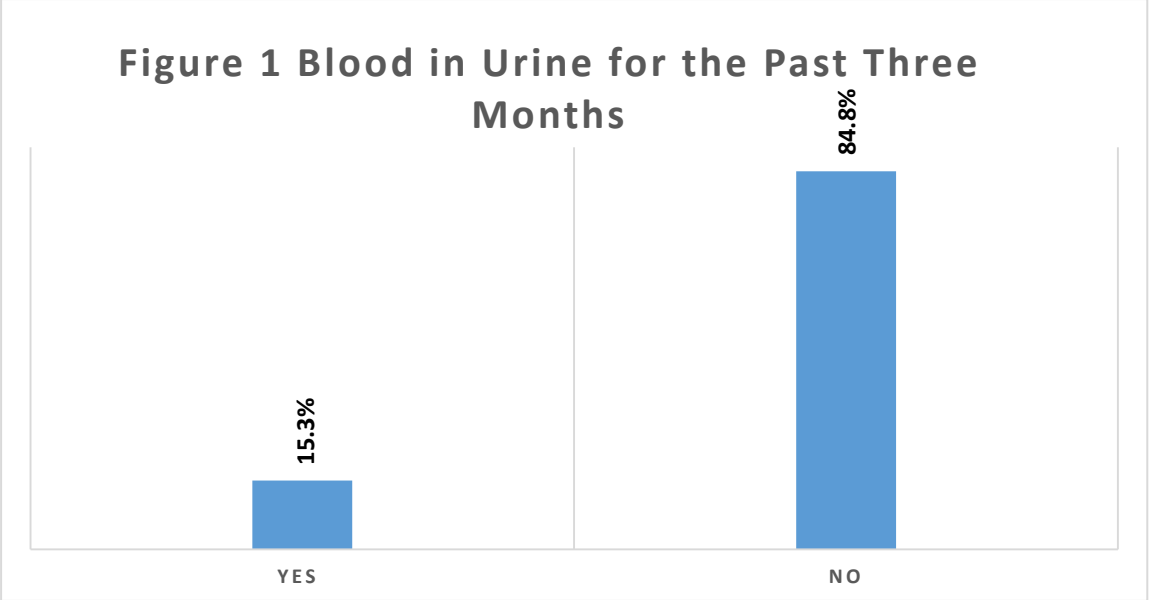
Item	Frequency	Percentage
Bicycle	103	25.6
Radio	146	36.5
Mobile Phone	146	36.5
Others	14	3.5
Total	**400**	**100**

Source: Field data (2016).

In terms of items possessed by parents, 146 representing 36.5% indicated that their parents possessed mobile phones as well as radio sets. About 25.6% of respondents indicated that their parents own bicycles. The remaining 3.5% stated that their parents possessed items such as motor-bike, TV, laptop computers and others.

4.1.5 Blood in Urine

Respondents were asked if they have detected blood in their urine for the past three months. The responses as presented in the graph below indicates that 15.2% of the respondents had blood in their urine for the past three months, while 84.8% stated that they did not have or seen blood in their urine in the past three months before the study



Source: Field data, 2016

4.2 Knowledge on Schistosomiasis

It is noted in table 6 that 5.7% and 6.5% of the respondents strongly disagree and disagree respectively that blood in urine is a disease. Another 6.8% of respondents remained neutral while 31.0% agree that blood in urine is disease. Also, half (50%) of the people interviewed strongly agreed that blood in urine is a disease.

From table 4.4 below, it can be deduced that, 31.0% of respondents strongly agreed that blood in urine is common in their community, while 15.0% said they do not know and 10.3% of the respondents strongly disagreed that blood in urine is not commonly found in the community.

It could be observed that 50.5% of respondents strongly agreed that persons urinating blood should be treated at the Health Facility. About 6.3% said they do not know whether someone urinating blood should be treated at the Health Facility or not. Also 2.8% strongly disagreed that person urinating of blood should seek treatment from any Health Facility.

Represented below in table 4.4 indicated that 48.0% and 5.3% of respondents agreed and disagreed respectively that people could get the disease through swimming, fetching water, bathing and fishing. However, 6.3% of the respondents said they did not know whether people could get it through swimming, fetching water, bathing and fishing or not.

In terms of blood in urine prevention, revealed that, 88.5% strongly agreed and agreed that blood in urine can be prevented and controlled, meaning it is well noted that it is not normal to have blood in urine, so therefore it is a disease.

Table 4.4 Respondents' Knowledge on Schistosomiasis

No	KNOWLEGDE	RESPONSE					
		Strongly Disagree	***Disagree***	***Neutral***	***Agree***	***Strongly agree***	***Total (%)***
1.	**To what extent do you agree or disagree that blood in urine is a disease**	5.7%	6.5 %	6.8 %	31.0 %	50.0 %	100
2.	**To what extent do you agree or disagree that blood in urine is common in your community**	10.3 %	11.4 %	15.0 %	31.0 %	32.0 %	100
3.	**Do you agree or disagree that a person urinating blood should be treated in the hospital or any nearest health facility**	2.4 %	2.8 %	3. 8 %	39.8%	51.2 %	100
4.	**To what extent do you agree or disagree that people could get the disease through swimming, fetching water, bathing and fishing**	2.7 %	5.3 %	6.3 %	37.7%	48.0 %	100
5.	**To what extent do you agree or disagree that blood in urine could be prevented and controlled**	3.8 %	3.5 %	4.3 %	38.0 %	50.4 %	100

Source: Field data, 2016

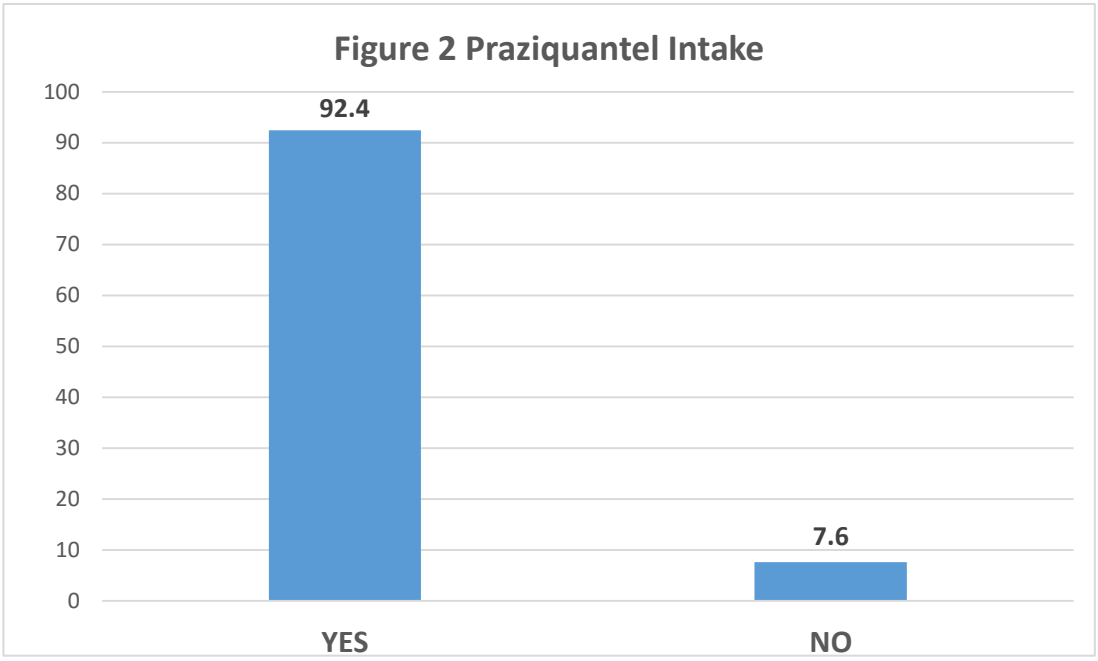
The fact that schistosomiasis has local names in the languages in the study area means that people have knowledge of its existence. The major languages spoken in the study area include Ewe, Twi, Kokomba, Ga-Dangme, Krachi and Nchumuru. The Ewe call blood in urine Wu Dordor. The Twi call it DwonsoMogya. It is called Nnyienfar and Muo among the Konkombas and Ga-Adangme respectively. The Krachi call it NbrufoMogya while it called NbrufoNkelang among the Nchumuru. The table on the names of schistosomiasis in the local languages reveals that the Konkombas constitute the major language spoken by the people.

Table 4.5 Name of Bilharzia in Local Languages

Name	Frequency	Percentage
Wu Dordor	114	27.9
DwonsoMogya	31	7.6
Nnyienfar	137	33.5
Muo	12	2.9
NbrufoMogya	98	24.0
NbrufoNkelang	17	4.2
Total	**400**	**100.00**

Source: Field data (2016)

Respondents were also asked if they had taken praziquantel. The figure 2 indicates that, 92.4% of the respondents have taken praziquantel before and it was taken mostly for the past three months before this study was done, while 7.6% of the respondents said they have not taken any bilharzia drugs for the past three months or so.



Source: Field Report, 2016

4.3 Attitudes toward Schistosomiasis

The study also examined respondents' attitudes toward schistosomiasis. From table 4.6 below it can be observed that, 61.2% of the respondents strongly agreed that people who have blood in their urine should inform their parents immediately, while 4.2% strongly disagreed. Also, 1.3% said they do not know whether to report the disease to their parents or not.

The table also indicates that 63.3% and 27.2% of the respondents strongly agreed and agreed respectively that that people who have blood in their urine should seek treatment in Health Facilities respectively, while 3.3% and 4.2% respectively strongly disagreed and disagreed that that people who have blood in their urine should seek treatment in hospital/ clinic

About 48.2% of the respondents strongly disagreed that people who have blood in their urine should go to a traditional healer for treatment, while 8.5% strongly agreed

that disagree that those who have blood in their urine should go to a traditional healer for treatment.

The table 4, shows clearly that, 32.8% of the respondents disagreed that, people who have blood in their urine should buy drugs and take, but 17.5% agreed that those who have blood in their urine should buy for self-medication, while 17.5% said they do not known.

The indication from table 5 shows that, 45.8% of the respondents strongly disagreed that people who have blood in their urine should do anything about it, but 9.5% of the respondents as well as 10. 2% agreed and strongly agreed that those who have blood in urine should do anything.

Table 4.6 Attitudes of Respondents towards Schistosomiasis

No	ATTITUDES	RESPONSE					
		Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**	**Total (%)**
1	To what extent do disagree that people who have blood in their urine should inform their parents you agree or immediately	4.2	3.3	1.3	30.0	60.2	100
2	To what extent do you agree or disagree that people who have blood in their urine should seek treatment in hospital/ clinic	3.3	4.2	2.0	27.2	63.3	100
3	To what extent do you agree or disagree that people who have blood in their urine should go a traditional healer for treatment	48.2	30.5	6.0	6.8	8.5	100
4	To what extent do you agree or disagree that people who have blood in their urine should buy drugs and take	25.0	32.8	6.2	17.5	17.5	100
5	To what extent do you agree or disagree that people who have blood in their urine should do nothing	45.8	29.7	4.8	9.5	10.2	100
6	To what extent do you agree or disagree that people who have blood in their urine should be given education on how it spread	14.2	10.8	7.0	27.8	40.2	100
7	To what extent do you agree or disagree that those who urinate blood should be taken out of the community in which they live	49.2	33.0	4.5	8.31	4.89	100
8	To what extent do you agree or disagree that those who urinate blood should be allowed to go near the river	40.83	40.83	6.36	8.3	5.0	100
9	To what extent do you agree or disagree that we should eat or drink with those who urinate blood	15.0	15.8	14.0	32.7	22.5	100

Source: Field Report, 2016

4.7 Schistosomiasis and Water Related Activities

About one- third (35.0%) of respondents stated that they do not swim in the river at all. More than half (55.3%) of respondents sometimes swim in river while 5.7% occasionally did. Also, 2.5% and 1.5% often and very often swim in ponds respectively.

Majority (60.2%) of respondents do not urinate in the river at all. Again, 33.3% of respondents sometimes urinate in the river or stream. Occasionally, 4.2% of respondents urinate in the river while 1.5% often urinate in the river. Approximately 0.8% of respondents very often urinate in the river.

Fishing is a common activity in the Oti-Sub District. However, 66.5% of respondents stated that they do not fish in the river. About 22.5% sometimes fish on the river. Occasionally, 6.0% fish on the river while 3.3% and 1.7% respectively often and very often fish on the river.

Respondents were asked do they stand in the river while washing. The responses indicate that 55.5% do not stand in the river to wash. Also, 36.5% of respondents sometimes stand in the river while washing while 4.3% occasionally stand in the river while washing. Again, 2.2% of respondents often stand in the river while washing their clothes. About 2.0% of respondents very often stand in the river while washing.

It is also evident the common source of water for domestic use is stream/river water. This is followed by pipe-borne water (33.0%). Other sources of water available in the community for domestic purposes include pond, bore-ole and well.

The majority (53.5%) of respondents derive their water from stream/river for bathing. Also, 34.5% of respondents use pipe-borne water for bathing while 5.2% of respondents

derive their bathing water from bore-hole. About 3.8% and 3.0 % of respondents get their bathing water from pond and well respectively.

Even though the stream/river is the commonest source of water in the study area, it does not constitute the main source of drinking water for respondents. About 52.5% of respondents use pipe-borne water as drinking water as compared to 36.2% who use river/stream water for drinking. Only 1.5% of respondents use well water for drinking while 6.3% use bore-hole as source of drinking.

As in the case of drinking, majority (52.5%) use pipe-borne water for cooking as compared to 41.6% who rely on stream/river water for their cooking. About 5.5% and 4.8% respectively use bore-hole and pond water for cooking. Approximately 2.8% rely on well water for cooking.

An overwhelming 60.8% of respondents rely on stream/river water for washing while 26.2% use pipe-borne water for washing. Those who use pond and bore-hole water for washing constitute 5.0% and 4.2% respectively.

Table 4.7 Water Related Practices

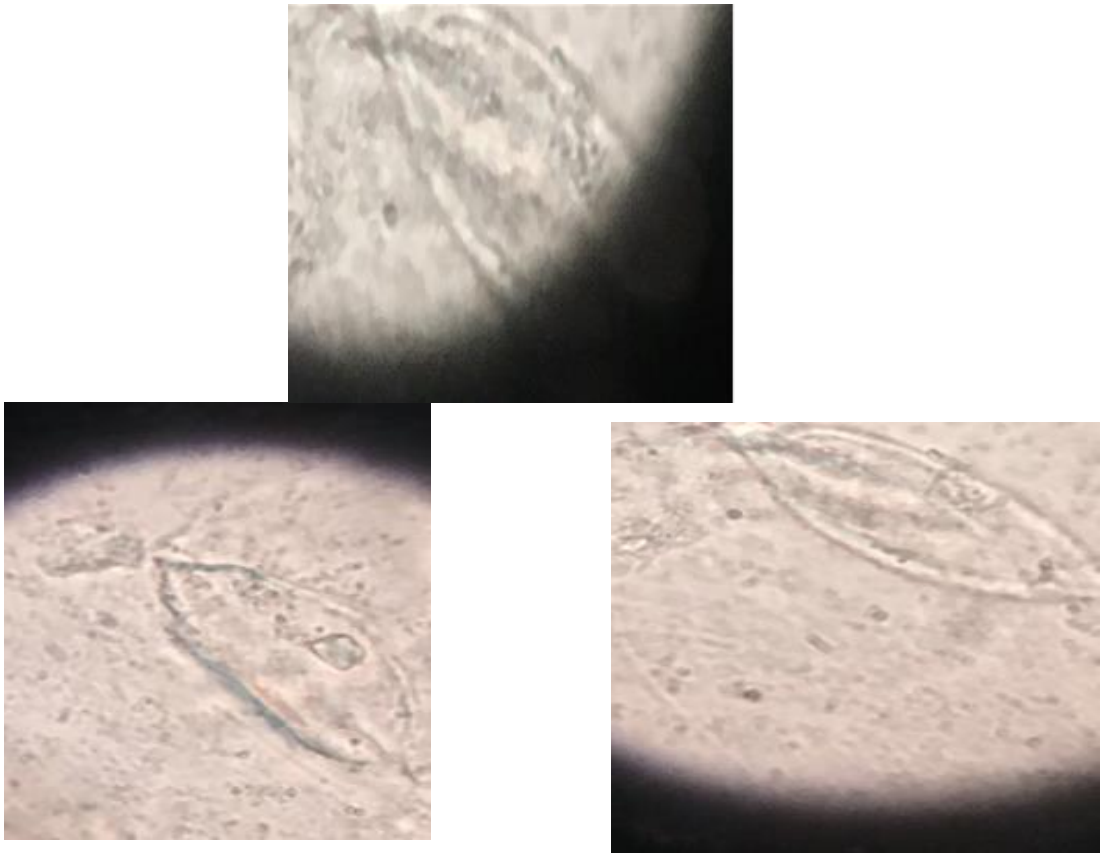
No	PRACTICES	RESPONSE						
		Not at all	**Sometimes**	**Occasionally**	**Often**	**Very often**	**Others**	**Total (%)**
14	**Do you swim in a river or pond**	35.0%	55.3 %	5.7%	2.5 %	1.5 %	--	100
15	**Do you urinate in river or stream**	60.2 %	33.3%	4.2%	1.5%	0.8%	-	100
16	**Do you fish in the river**	66.5%	22.5 %	6.0 %	3.3%	1.7 %	-	100
17	**Do you stand in the river and wash your clothes**	55.2%	36.5%	4.3 %	2.2%	2.0 %	-	100

		stream/ river	***pond***	***Bore-hole***	***well***	***pipe-borne water***	***Others***	***Total (%)***
18	Which of the following do you have in your locality	52.5 %	3.2 %	6.8%	4.5 %	33.0 %	-	100
19	From where do you get water for bathing	53.5 %	3.8 %	5.2 %	3.0 %	34.5%	-	100
20	From where do you get water for drinking	36.2 %	2.2 %	6.3 %	1.5 %	52.5 %	1.3 %	100
21	From where do you get water for cooking	41.6 %	4.8 %	5.5 %	2.8 %	45.0 %	0.5 %	100
22	From where do you get water for washing	60.8 %	5.0 %	4.2 %	3.5%	26.2%	0.3 %	100

Source: Field Report, 2016

4.5 Prevalence of Urinary Schistosomiasis

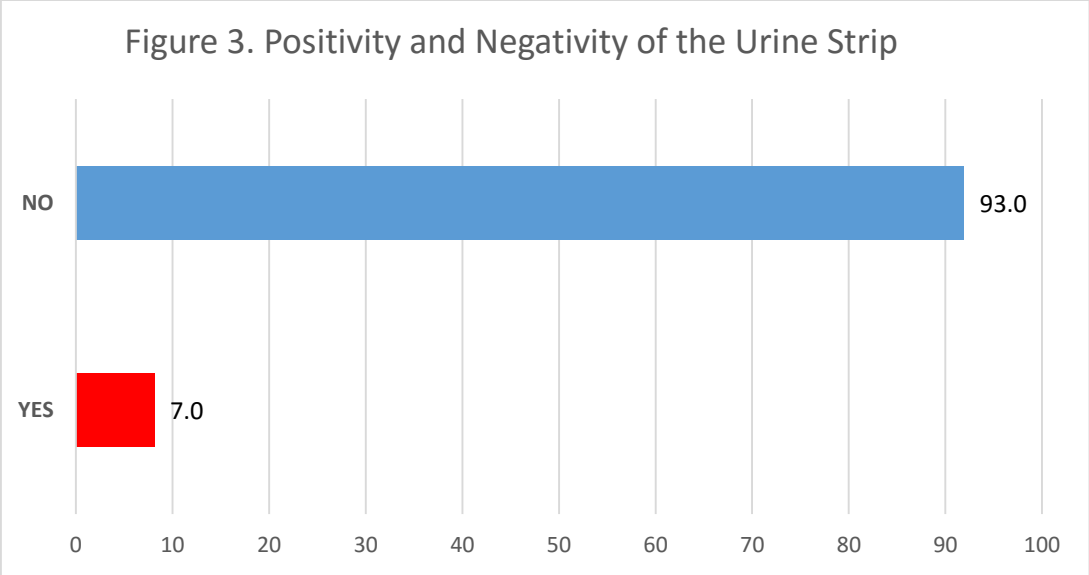
Figure 3 Heamatobium Ova (eggs)



Some of the pictures of Schistosoma haematobium ova seen in the laboratory during the laboratory investigation.

4.5.1 Urine Strip Examination

The graph below indicates that 91.9% of the respondents tested negative while 8.1% proved positive at the end of the test.

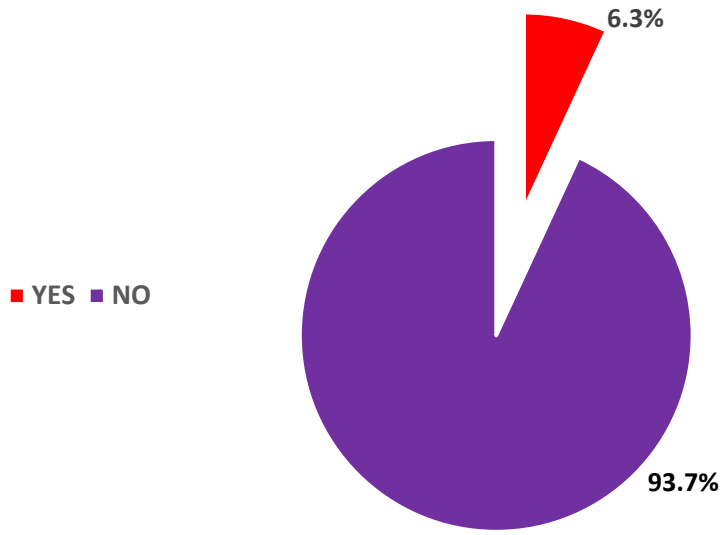


Source: Field Data, 2016

4.6.2 Urine Microscopic Examination

The chart represented below reveals that the ova of Schistosoma haematobium were not seen in 381 of the respondents, forming 92.4%. On the other hand 7.6% of the respondents tested positive of Schistosoma haematobium ova.

Figure 4. Schistosoma Heamatobium Ova In Urine



Source: Field Data, 2016

4.5.3 Association between Urine Microscopic and Urine Strip Examination

Table 4.9 below is a cross tabulation for Urine Microscopic and Urine Strip examinations. From the table, 6.3% of respondents tested positive of blood in urine. Out of the 6.3% of respondents who tested positive of blood in urine, 6.0% of those tested positive by urine microscopic examination also tested positive by urine strip examination. Also, 93.8% of respondents who tested negative by urine microscopic examination also tested negative by urine strip examination. The relationship between these examinations by the using the Cramer's V is 90.0%. This shows that 90.0% of the times, people who

test positive by urine microscopic examination will also test positive by urine strip examination and vice versa. The validity of the relationship between these two examinations was also found to be statistically significant at the 0.01, 0.05 and 0.10 level of significance.

Table 4. 9 Cross-Tabulation Urine Microscopic and Urine Strip Examinations

		Urine Microscopic Examination		**Total**
		Yes	**No**	
Urine Strip Examination	**Yes**	24 **6.0%**	4 **1.0%**	28 **7.0%**
	No	0.3 **0.2%**	371 **92.7%**	372 **93.0%**
Total		25 **6.3%**	375 **93.8%**	400 **100%**

Chi (2) = 324.5 **Source: Field data, 2016**
Cramer's V = 0.9006
Pr = 0.000

The cross tabulation therefore, brought about two main factors,

1. Urine strip examination strongly associated with urine microscopic results
2. Intake of praziquantel not associated with presence of Schistosoma haematobium ova

4.5.4 Praziquantel and Urinary Schistosomiasis Prevalence

Table 4.10 below is a cross-tabulation of praziquantel intake and urinary schistosomiasis prevalence among respondents. Respondents are asked if they had taken praziquantel for the past three months. About 6.3% of respondents who took praziquantel for the past three months tested positive of haematobium. On the other hand, 93.8% of respondents

who took the drug tested negative of the presence of haematobium ova in their urine. However, 0.8% of respondents did not take the drug but tested positive of the presence of haematobium ova. Also, 6.8% of young female adolescents who did take the drug tested negative of the presence of haematobium ova in their urine.

Table 4.10 Praziquantel and Urinary Schistosomiasis

Praziquantel Intake	**Presence of Schistosoma haematobium Ova**		**TOTAL**
	Yes	No	
Yes	22 **5.5%**	348 **87.0%**	370 **92.5**
No	3 **0.8%**	27 **6.8%**	30 **7.5%**
Total	25 **6.3%**	375 **93.8%**	400 **100%**

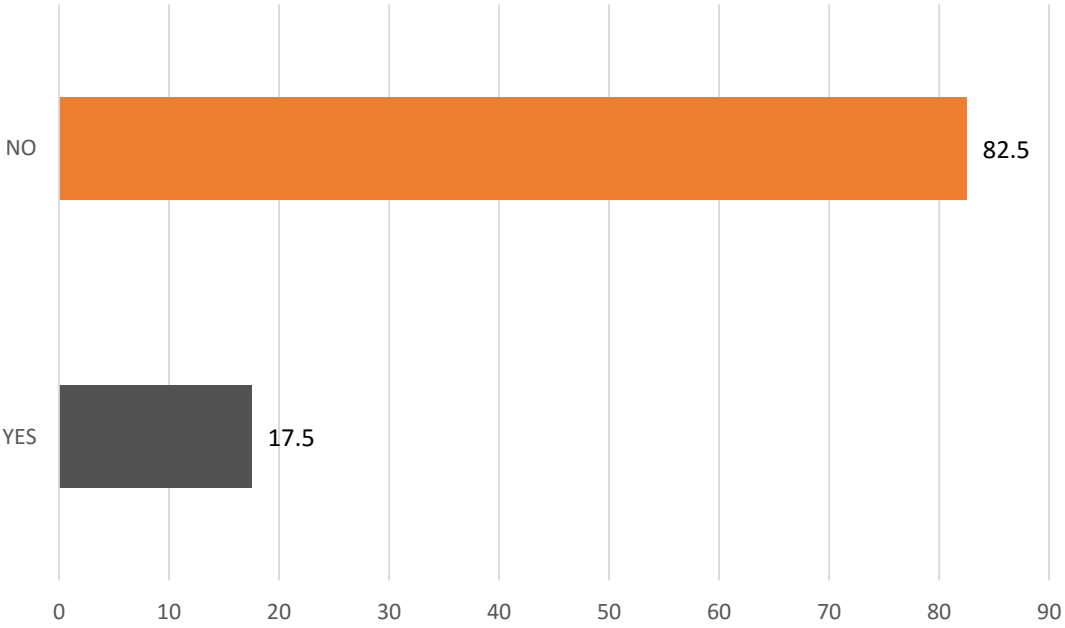
Chi (2) = 1.9298 **Source: Field data, 2016**
Cramer's V = -0.0687
Pr = 0.165

4.7 Urinary and Intestinal Schistosomiasis Co-infection

Though urinary schistosomiasis has been detected among respondents, intestinal schistosomiasis (Schistosoma mansoni ova) has not been detected, during the stool examination in the laboratory, as part of determining the prevalence of urinary and intestinal schistosomiasis co-infection.

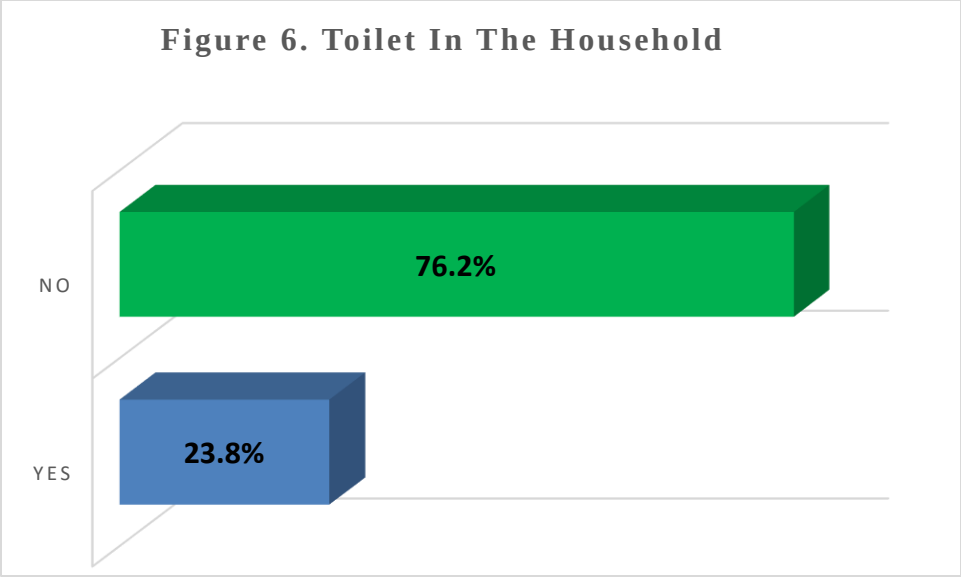
The study also sought to investigate other parasitic worm infections in the stool samples. The graph below indicates that, 82.5%% of the respondents have no other parasitic worm ova seen by the stool microscopic in the laboratory, while 17.5% proved positive by the stool examination.

Figure 5. Other Parasitic Infections

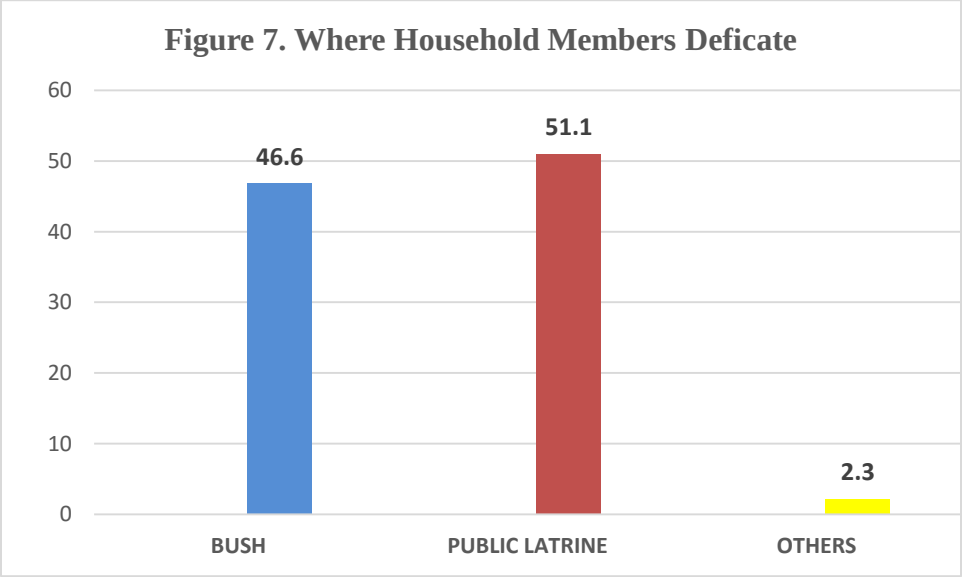


4.7 Sanitary Practices and Schistosomiasis Infection

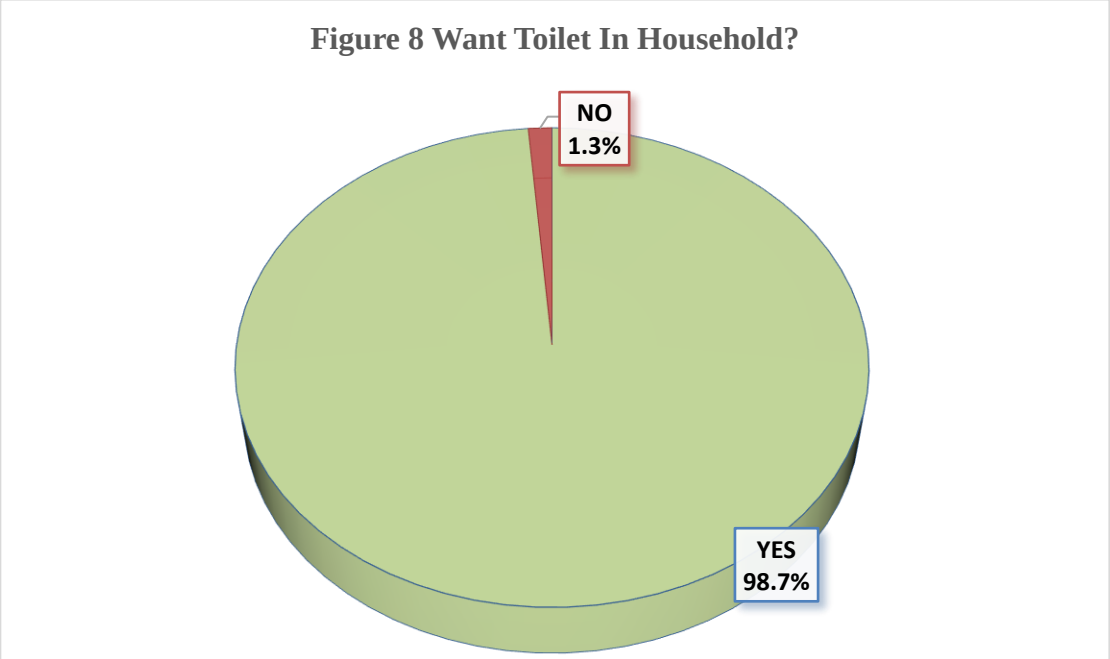
Figure 8 below shows that, 76.3% of the respondents do not have toilet facility in their household. Only 23.7% of respondents have toilet facilities in their homes.



Those who do not have toilet facilities in their homes were asked to state where they defecate. Approximately 46.6% defecate in the bush while 51.1% use public latrines. About 2.2% use refuse dumps, toilet facilities of their friends and relatives.



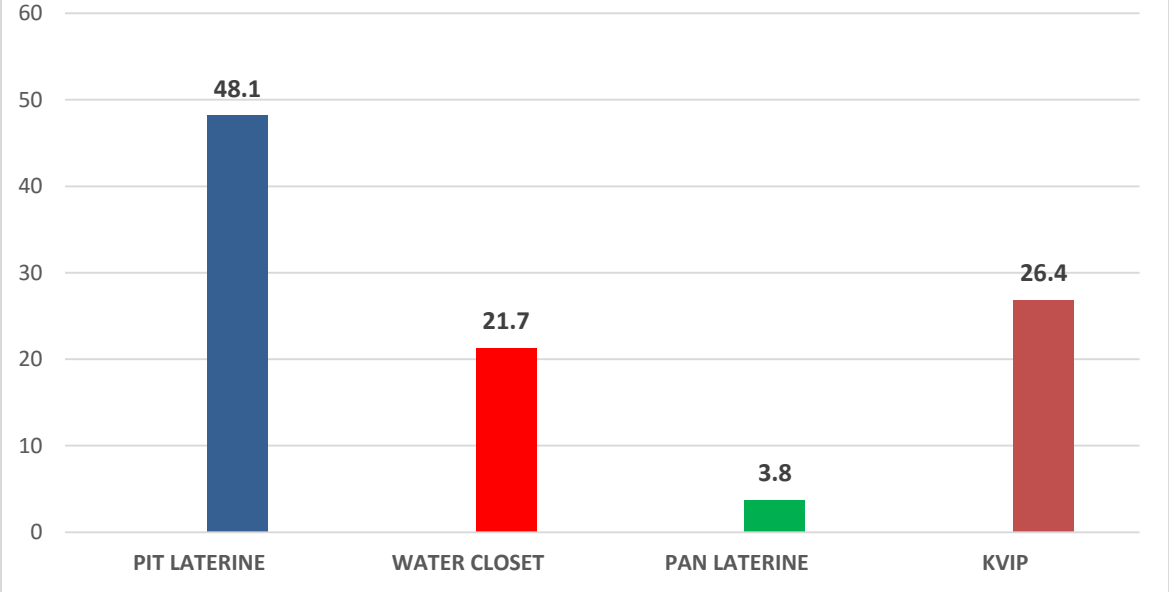
It is evident from figure 8 that 98.7% of respondents who have no toilet facilities in their homes express interests of possessing toilet facilities in their homes. Citing bad odor, the prevalence of houseflies and non-ownership of their houses, 1.3% of respondents are unwilling to possess toilet facilities in their homes.



Source: Field data, 2016

Represented in below in figure 9 indicates that 48.2% of the respondents use pit latrine, 26.9% uses Kumasi Ventilated Improved Pit (KVIP), 21.3% of uses water closet and 3.7 uses pan latrine.

Figure 9. Type of Toilet Facility in the House



Source: Field data, 2016

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.1 Introduction

The main objective of this study is to examine the prevalence rate of schistosomiasis among young female adolescents aged 11 to 15 in the Oti Sub-district of the Krachi District of the Volta Region. Data was collected and analyzed and the findings reported in chapter four of this study. This chapter therefore discusses the main findings as presented in the previous chapter and is structured according to the specific objectives of the study.

5.2 Characteristics of Young Female Adolescents

Data collected on the characteristics of respondents include age, proximity to water body, persons respondents are staying with, items possessed by respondents' parents and detection of blood in their urine for the past three months. The majority of young female adolescents are between 14-15 years of age on the average, respondents cover 957.1meters before they can access water for use, similarly a study indicated that, about two-thirds (68.9%) of the participants revealed that they live near a water body(< 250meter) [22] The study also reveals that respondents are not only living with their fathers and mothers but aunties, uncles, family friends and friends. This has implications for urinary schistosomiasis infection. Younger female adolescents not staying with their biological parents are more likely to be burdened with household chores such as fetching water[23]. The regularity with which younger females visit these water bodies may expose their skins to penetration by the Schistosoma other study also reported that these young girls contribute significantly to the pollution of the water sources. Schistosomiasis

poses high risk particularly to female members of some African societies because of their multiple water-related activities [24]. Respondents' parents also possess items such as bicycles, radio sets, mobile phones and other items such as television sets, motor bicycles, computers and others. It is also revealed that the majority (84.6%) of respondents has not detected blood in their urine for the past three months. Only 15.4% of respondents respond that they have seen blood in their urine for the past three months.

5.3 Knowledge on schistosomiasis

Indicators that are used to assess respondents' knowledge of schistosomiasis include blood in urine being a disease, commonality of blood in urine in their communities, treatment of blood in urine in a health facility, mode of infection and control of blood in urine. It is noted that 4.9% and 6.6% of the respondents strongly disagree and disagree respectively that blood in urine is a disease. Approximately 32.3% agree that blood in urine is disease. Also, nearly half (49.6%) of the people interviewed strongly agree that blood in urine is a disease. Once the majority of respondents admit that blood in urine is a disease, it calls for celebration. This is because one it has been accepted as a disease in the community, the community will readily respond to health education on its treatment and prevention. In terms of the commonality of blood in urine in the Oti sub-district, an overwhelming 63.3% agree that blood in urine is common in their community, other study reported that knowledge of the participants regarding schistosomiasis transmission, signs and symptoms and prevention, it was found that a majority of 231 (92.4 %) of the respondents had heard about schistosomiasis (locally known as Bilharzia) [25]. This is indicative of the awareness of the prevalence of schistosomiasis in the Oti sub-district. About 14.9% of respondents are not aware of its prevalence or otherwise. However,

10.3% of respondents stated that blood in urine is not a common disease in their communities. Knowledge of the spread of schistosomiasis is very crucial for prevention, similarly a study reported that concerning the knowledge about the prevention of schistosomiasis, 47.2 % (109/231) were able to give at least one measure of prevention, with 26.8 % mentioning avoiding swimming in ponds/ streams, 10.4 % avoiding washing clothes in ponds/streams, and 18.6 % mentioned taking anti-Schistosoma drugs [25]. It is evident that 85.8% of respondents know that schistosomiasis is gotten through swimming, fetching of water, bathing and fishing. Only 8.1% of respondents disagreed that urinary schistosomiasis could be gotten through swimming, fetching of water, bathing and fishing. Respondents' adequate knowledge on the mode of schistosomiasis transmission helps explain why the prevalence rate among respondents was found to be very low.

In terms of blood in urine prevention, revealed that, 88.5% strongly agreed and agreed that blood in urine can be prevented and controlled, meaning it is well noted that it is not normal to have blood in urine, so therefore it is a disease.

The foregoing discussion suggests that respondents' knowledge about schistosomiasis is adequate. This could be one of the reasons why its prevalence is low in the Oti sub-district.

5.4 Attitudes toward Schistosomiasis

The study also examined respondents' attitudes toward schistosomiasis. It is observed that, 60.2% of the respondents strongly agree that people who have blood in their urine should inform their parents immediately. The majority (62.1%) agree that they should get their parents informed if they detect blood in their urine. On the other hand, 28.6% of

respondents do not see the need reporting to their parents if they detect blood in their urine. The study also reveals that more than half (62.1%) of respondents agree that people urinating blood should seek treatment in health facilities as against 7.3% of do not think so. In terms of seeking treatment for urinary schistosomiasis from traditional healers, an overwhelming 78.5% of respondents disagree. Only 15.4% of respondents think victims of schistosomiasis should resort to traditional healers for treatment. It was also found 58.2% of respondents do not buy the suggestion that victims of schistosomiasis should buy drugs and take. However, 35.7% are of the opinion that victims of schistosomiasis should buy drugs and use. The majority of respondents disagree that people urinate blood should do nothing about it. While 26.2% of younger female are of the view that public education on the spread of urinary schistosomiasis is not necessary, 67.0% see the need for public education on the spread of urinary schistosomiasis. Also, younger females think that the practice where those urinating blood are taken of the community as in the case of other diseases should not be encouraged. Only 12.0% of respondents encourage such a practice. The majority (81.7%) of respondents disapprove of the suggestion that victims of urinary schistosomiasis should not be allowed to go near the river. The study also reveals that majority of respondents approve that we can eat and drink with people affected by urinary schistosomiasis. Just as practices, respondents have very positive attitudes toward urinary schistosomiasis.

5.5 Practices

Because schistosomiasis is a water-related disease, an examination of water practices among respondents when conducting a study on the disease cannot be over emphasized. The study revealed that the majority of respondents occasionally swim the river. Apart

from swimming in the river, the study revealed that the majority of respondents do not urinate in the river, fish on the river or stand in the river to wash. The main source of water in Oti sub-district is the river. As such, 61.1% and 54.3% depend on this water source for washing and bathing respectively. Though the river is the main source of water in the study area, more than half (52.1%) of respondents depend on pipe-borne water for drinking. All the same, 36.9% of respondents use river water for drinking. On the whole, water practices among respondents can be described as good and point to the low prevalence rate of urinary schistosomiasis among young female adolescents.

5.6 Prevalence of Urinary Schistosomiasis

Urine samples of respondents were subjected to different examinations in the laboratory. About 91.9% of respondents tested negative of blood in urine by urine strip examinations. Only 8.1% tested positive of blood in urine. As stated above, the low prevalence rate of urinary schistosomiasis could be due to the adequate knowledge that respondents have about the disease or females are not more working in and around contaminated areas like males to contract the disease as a similar studies have reported, higher prevalence of the infection was recorded among males than females. This is probably due to increase contact with infected water bodies by males than female as result of engagement in swimming and or agriculture activities. Nsowah-Nuamah et al. also reported high rates of the infection among males (55.9%) than the female counterparts (3.7%). Chimbari and Chirundu, conducted a similar study in Zimbabwe which also revealed higher infection rates among males than the females. These observations are expected considering the fact that some socio-cultural practices such as farming, fishing and recreational activities expose males to infected water bodies than the

female counterparts [18]. Also positive attitudes that respondents have toward urinary schistosomiasis explains this low prevalence rate of the disease.

As the survey was done in the last four months for 50 samples and 10 were positive [26], as a result of that drugs of choice was distributed in the last three months before this study hence contributed to low prevalence

Another cause of the low prevalence rates of schistosomiasis is the good water-related practices that respondents engage in. The urine microscopic examination reveals that 92.4% of respondents did not test positive of Schistosoma haematobium ova. Only 7.6% tested positive of Schistosoma haematobium ova.

Further examination of the association between these two examinations using the chi-square statistic reveals that the use of the urine strip is as valid as the use of the urine microscopic. The test reveals that 88.0% of the times, a person who tests positive of urinary schistosomiasis will test positive by the use of the urine microscopic and vice versa. And this association between the two tests is found to be highly statistically significant.

Praziquantel is one of the commonest and cheapest drugs used for treating urinary schistosomiasis with success[27]. Pupils took this drug three months before this study was conducted. The efficacy of the medicine translated into the low prevalence rate of urinary schistosomiasis among young female adolescents in the study area. It is however worthy of note that a few respondents who did not take this drug for the past three months tested negative of the presence of haematobium ova in their urine. Interestingly, 5.9% of respondents who took this drug for the past three months tested positive of the

presence of haematobium ova in the urine. It must be pointed out that though praziquantel is efficacious in treating urinary schistosomiasis, it is not supreme. Other factors may be responsible for the presence of haematobium ova in the urine of young female adolescents who took the praziquantel three months before the conduct of this research. Phamarco -tolerance, improper administration of the drug, among others could result in the situation where people who took the drug test positive of urinary schistosomiasis.

5.7 Urinary and Intestinal schistosomiasis Co-infection

While urinary schistosomiasis has been detected in urine samples of respondents, there is no trace of Schistosoma mansoni ova in stool samples. However, 17.5% of respondents tested positive of other parasitic ova such as hookworm, tape worm and round worm.

5.8 Sanitary Practices and Schistosomiasis Infection

The study reveals that the majority of respondents do not possess toilet facilities in their homes. They constitute 76.3% of the sample. This indicates that the ways of disposing fecal matter among these people is not good for the prevention of Schistosoma mansoni, soil transmitted helminth, cholera, typhoid fever and others. The absence of toilet facilities in houses leads to the situation where 46.8% of respondents are compelled to defecate in the bush. In the absence of toilet facilities in the house, the majority (51.0%) young female adolescents resort to using public latrines. Pit latrines constitute the commonest toilet facilities in the study area. However, a few homes use water closet and KVIP.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.0 Introduction

The purpose of this research is to investigate the prevalence of schistosomiasis among young female adolescents aged 11-15 years in the Oti sub-district of the Krachi East District of the Volta Region. This chapter presents the conclusion and recommendations. This chapter (on conclusion) present on the important issues raised and discussed in the study.

6.1 Conclusion

The ultimate goal in the control of the second parasitic infections after malaria, such as schistosomiasis is to break the chain of its transmission by bringing about a change in the environment and negative habits of the people making them acquired the infection. Many of those changes are needed in areas where these infections are endemic and resources limited in supply. This study, undertaken through knowledge, attitude and practice (KAP) on bilharzia with a view to finding reasons for differing prevalence in Oti Sub-District has provided some insight into essential activities, which must take place to ensure the success of any programme on schistosomiasis.

The adequate knowledge of respondents on schistosomiasis coupled with positive attitudes and good water-related practices is a major reason why the prevalence rate on schistosomiasis among young female adolescents is very low.

The chi-square statistic reveals that the use of the urine strip is as valid as the use of the urine microscopic; 88.0% of the time, a person who tests positive of urinary

schistosomiasis will also test positive by the use of the urine microscopic and vice versa. And this association between the two tests is found to be highly statistically significant.

Interestingly, 5.9% of respondents who took praziquantel for the past three months tested positive of the presence of haematobium ova in their urine. The implication of this is that though praziquantel is common, efficacious and cheap, its administration needs properly monitoring to achieve desired results.

The study also reveals that the majority (76.3%) of respondents do not possess toilet facilities in their homes. This indicates that the ways of disposing fecal matter in the homes of respondents is not good for the prevention of Schistosoma mansoni, soil transmitted helminth, cholera, typhoid fever and others, in the Oti Sub-District in the Krachi East District.

6.2 Recommendations

On the basis of the study findings, the following recommendations are made:

1. It is suggested that health education on mode of transmission of Schistosomiasis on the followings; swimming, fetching of water, bathing and fishing, also on buying of drugs from drug sellers for treatment of the disease. This Education should be given to the public by Ghana Health Service (GHS) in collaboration with Ghana Education Service (GES) and National Commission for Civic Education (NCCE). This Education would go a long way to help those who do not know that bilharzia can be gotten through activities in the water bodies. The education may also insists on the fact that the drug of choice must be obtained from a well-recognized institution with the appropriate dosage.

2. It is evident from the study that the use of urine strip is as good as urine microscopic. Therefore the Ministry of Health and the Ghana Health Service could introduce the use of urine strip for detection of Urinary Schistosomiasis since it is very easy to use, cheap and saves time. The urine microscopic examination may be reserved as a Goal Standard.
3. The study reveals that some respondents who took praziquantel in the past three month still tested positive of urine schistosomiasis. It is therefore recommended that the Ministry of Health and the Ghana Health Service investigates the reason why those who took the drug in the past three months before the study still tested positive of urinary schistosomiasis by both urine strip and urine microscopic examinations.
4. Majority of homes do not have toilet facilities. This compels people to resort to defecating in bushes, using public toilet facilities and using the facilities in other homes. This expose people to infections such as typhoid, cholera, Schistosoma mansoni, soil transmitted helminth, etc. It is therefore recommended that the District Assembly advises landlords who do not have toilet facilities in their houses to make them necessities. Also, Non-Governmental Organizations could assist landlords to build toilet facilities in their houses at low prices

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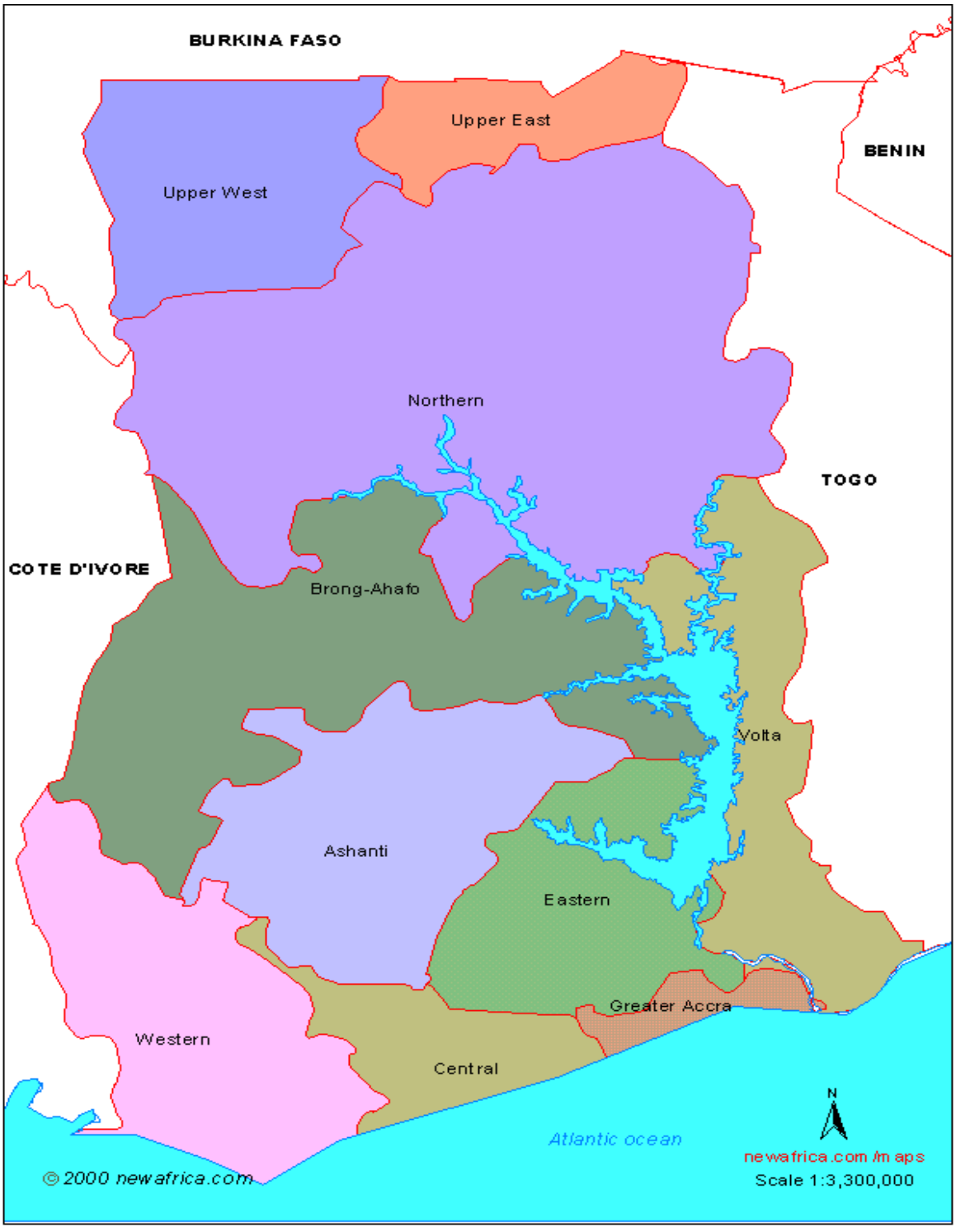
APPENDIX A

GHANA ADMINISTRATIVE MAP



Source: www.2000newafrica.com

APPENDIX B

THE MAP OF THE VOLTA REGION WITH DISTRICTS

APPENDIX C

MAP OF KRACHI EAST SHOWING THE PROJECT AREA

Source: Krachi East District Assembly

APPENDIX D

SEARCHLIGHT MAP OF OTI SUB-DISTRICT SHOWING THE PROJECT AREA

(Source: google earth)

APPENDIX E
CARDINAL POINTS IN DEGREES
OF THE PROJECT SITES IN THE KRACHI EAST DISTRICT

NAME OF PROJECT SITE	CARDINAL POINTS
Dambai H/C	Latitude: 0806429 Longitude: 000.18653 Altitude: 0 m
Dan-Moser E.PH/C	Latitude: 8.062931 Longitude: 0.178935 Altitude: 0m
D.H. Directorate, Dambai	Latitude: 08.06852 Longitude: 000.16956 Altitude: 0m
Dist. Education Office, Dambai	Latitude: 8.062931 Longitude: 0.178935 Altitude: 0m
E.P Primary A and B	Latitude: 8.062931 Longitude: 0.178935 Altitude: 0m
E.P. JSS A and B	Latitude: 8.062931 Longitude: 0.178935 Altitude: 0 m
R.C. Primary	Latitude: 8.062931 Longitude: 0.178935 Altitude: 0 m
R.C. JSS	Latitude: 8.062931 Longitude: 0.178935 Altitude: 0 m
Sankis Advanced Prep.	Latitude: 8.062931 Longitude: 0.178935 Altitude: 0 m
Banka L.A. Primary	Latitude: 8.062931 Longitude: 0.178935 Altitude: 0 m
Banka L.A. JSS	Latitude: 8.062931 Longitude: 0.178935 Altitude: 0 m
Lapaz Primary; JSS A and B	Latitude: 8.062931 Longitude: 0.178935 Altitude: 0 m
Mefekope Primary and JSS	Latitude: 08.06756 Longitude: 000.16733 Altitude: 0 m
Lakeside Primary; JSS A and B	Latitude: 8.062931 Longitude: 0.178935 Altitude: 0 m

APPENDIX F

ENSIGN COLLEGE OF PUBLIC HEALTH, KPONG.

EASTERNREGION.

LABOLARTROY INVESTIGATION REPORT SHEET

DATE	ID NUMBER	RESULTS			REMARKS
		URINESTRIP	MICROSOPIC	STOOL	
	ESS-001-P				
	ESS-002-P				
	ESS-003-P				
	ESS-004-P				
	ESS-005-P				
	ESS-006-P				
	ESS-007-P				
	ESS-008-P				
	ESS-009-P				
	ESS-010-P				
	ESS-011-P				
	ESS-012-P				
	ESS-013-P				
	ESS-014-P				
	ESS-015-P				
	ESS-016-P				
	ESS-017-P				
	ESS-018-P				
	ESS-019-P				
	ESS-020-P				
	ESS-021-P				
	ESS-022-P				
	ESS-023-P				
	ESS-024-P				
	ESS-025-P				

Name of Laboratory Technician: ……. Name of Lab: ……

ENSIGN COLLEGE OF PUBLIC HEALTH, KPONG.

EASTERN REGION.

LABOLARTROY INVESTIGATION REPORT SHEET

DATE	ID NUMBER	RESULTS			REMARKS
		URINE STRIP	MICROSOPIC	STOOL	
	ESS-112-j				
	ESS-113-j				
	ESS-114-j				
	ESS-115-j				
	ESS-116-j				
	ESS-117-j				
	ESS-118-j				
	ESS-119-j				
	ESS-120-j				
	ESS-121-j				
	ESS-122-j				
	ESS-123-j				
	ESS-124-j				
	ESS-125-j				
	ESS-126-j				
	ESS-127-j				
	ESS-128-j				
	ESS-129-j				
	ESS-130-j				
	ESS-131-j				
	ESS-132-j				
	ESS-133-j				
	ESS-134-j				
	ESS-135-j				

Name of Laboratory Technician: ……. Name of Lab: ……

Phone No.: ……..

ENSIGN COLLEGE OF PUBLIC HEALTH, KPONG.

EASTERN REGION.

LABOLARTROY INVESTIGATION REPORT SHEET

DATE	ID NUMBER	RESULTS			REMARKS
		URINE STRIP	MICROSOPIC	STOOL	
	ESS-216-jh				
	ESS-217-jh				
	ESS-218-jh				
	ESS-219-jh				
	ESS-220-jh				
	ESS-221-jh				
	ESS-222-jh				
	ESS-223-jh				
	ESS-224-jh				
	ESS-225-jh				
	ESS-226-jh				
	ESS-227-jh				
	ESS-228-jh				
	ESS-229-jh				
	ESS-230-jh				
	ESS-231-jh				
	ESS-232-jh				
	ESS-233-jh				
	ESS-234-jh				
	ESS-235-jh				
	ESS-236-jh				
	ESS-237-jh				
	ESS-238-jh				
	ESS-239-jh				

Name of Laboratory Technician: ……. Name of Lab: ……

Phone No.: ……..

ENSIGN COLLEGE OF PUBLIC HEALTH, KPONG.

EASTERN REGION.

LABOLARTROY INVESTIGATION REPORT SHEET

DATE	ID NUMBER	RESULTS			REMARKS
		URINE STRIP	MICROSOPIC	STOOL	
	ESS-317-jhs				
	ESS-318-jhs				
	ESS-319-jhs				
	ESS-320-jhs				
	ESS-321-jhs				
	ESS-322-jhs				
	ESS-323-jhs				
	ESS-324-jhs				
	ESS-325-jhs				
	ESS-326-jhs				
	ESS-327-jhs				
	ESS-328-jhs				
	ESS-329-jhs				
	ESS-330-jhs				
	ESS-331-jhs				
	ESS-332-jhs				
	ESS-333-jhs				
	ESS-334-jhs				
	ESS-335-jhs				
	ESS-336-jhs				
	ESS-337-jhs				
	ESS-338-jhs				
	ESS-339-jhs				
	ESS-340-jhs				

Name of Laboratory Technician: ……. Name of Lab: ……

Phone No.: ……..

ENSIGN COLLEGE OF PUBLIC HEALTH, KPONG.

EASTERN REGION.

LIST OF PARTICIPANTS SELECTED AT RANDOM WITH THEIR IDs

DATE: ……..

Name of Participants	ID Number	Remarks
	ESS-001-P	
	ESS-002-P	
	ESS-003-P	
	ESS-004-P	
	ESS-005-P	
	ESS-006-P	
	ESS-007-P	
	ESS-008-P	
	ESS-009-P	
	ESS-010-P	
	ESS-011-P	
	ESS-012-P	
	ESS-013-P	
	ESS-014-P	
	ESS-015-P	
	ESS-016-P	
	ESS-017-P	
	ESS-018-P	
	ESS-019-P	
	ESS-020-P	
	ESS-021-P	
	ESS-022-P	
	ESS-023-P	
	ESS-024-P	
	ESS-025-P	

ENSIGN COLLEGE OF PUBLIC HEALTH, KPONG.

EASTERN REGION.

LIST OF PARTICIPANTS SELECTED AT RANDOM WITH THEIR IDs

DATE: ……..

Name of Participants	ID Number	Remarks
	ESS-117-j	
	ESS-118-j	
	ESS-119-j	
	ESS-120-j	
	ESS-121-j	
	ESS-122-j	
	ESS-123-j	
	ESS-124-j	
	ESS-125-j	
	ESS-126-j	
	ESS-127-j	
	ESS-128-j	
	ESS-129-j	
	ESS-130-j	
	ESS-131-j	
	ESS-132-j	
	ESS-133-j	
	ESS-134-j	
	ESS-135-j	
	ESS-136-j	
	ESS-137-j	
	ESS-138-j	
	ESS-139-j	
	ESS-140-j	
	ESS-141-j	

ENSIGN COLLEGE OF PUBLIC HEALTH, KPONG.

EASTERN REGION.

LIST OF PARTICIPANTS SELECTED AT RANDOM WITH THEIR IDs

DATE: ……..

Name of Participants	ID Number	Remarks
	ESS-219-jh	
	ESS-220-jh	
	ESS-221-jh	
	ESS-222-jh	
	ESS-223-jh	
	ESS-224-jh	
	ESS-225-jh	
	ESS-226-jh	
	ESS-227-jh	
	ESS-228-jh	
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	ESS-232-jh	
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	ESS-237-jh	
	ESS-238-jh	
	ESS-239-jh	
	ESS-240-jh	
	ESS-241-jh	
	ESS-242-jh	
	ESS-243-jh	

ENSIGN COLLEGE OF PUBLIC HEALTH, KPONG.

EASTERN REGION.

LIST OF PARTICIPANTS SELECTED AT RANDOM WITH THEIR IDs

DATE: ……..

Name of Participants	ID Number	Remarks
	ESS-319-jhs	
	ESS-320-jhs	
	ESS-321-jhs	
	ESS-322-jhs	
	ESS-323-jhs	
	ESS-324-jhs	
	ESS-325-jhs	
	ESS-326-jhs	
	ESS-327-jhs	
	ESS-328-jhs	
	ESS-329-jhs	
	ESS-330-jhs	
	ESS-331-jhs	
	ESS-332-jhs	
	ESS-333-jhs	
	ESS-334-jhs	
	ESS-335-jhs	
	ESS-336-jhs	
	ESS-337-jhs	
	ESS-338-jhs	
	ESS-339-jhs	
	ESS-340-jhs	
	ESS-341-jhs	
	ESS-342-jhs	
	ESS-343-jhs	

APPENDIX G

CONSENT FORM

Part 1. Participant Information

Introduction

I am from Ensign College of Public Health in Kpong. I am conducting a study that involves research to assess the current community patterns of Schistosomiasis in Oti Sub-District and to identify factors for acquiring the schistosomiasis disease. I will be explaining all about the study to you and you will also also receive a copy of the leaflet that explains all about this research study that you are being asked to join in. Please take all the time you need to read it carefully. You may ask me any questions about anything you do not understand at any time. You are a volunteer. You can choose not to take part and if you join, you may quit at any time. There will be no penalty if you decide to quit the study.

Why you are being asked to participate

You have been asked to take part in this study because you live in Oti Sub-District of the Krachi East District of Volta Region. Specifically, I am interested in talking to young people ages: 10 to 24 years old, in schools, and in all I plan to ask such people to participate in the study.

Procedures

If you agree to be part of the study, a trained project staff will ask you a series of survey questions alone for approximately 45 - 60 minutes. Your stool and urine samples would be taken for microscopical examination of other parasitic infections and haematuria detection through use of urine dipstick test and microscopic respectively.

Your responses will be recorded on paper and later entered into a computer database by study staff. As a participant, if you agree to participate in this study, data from your responses may be used as part of my assessment of identifying factors causing Schistosomiasis or Brilharzia disease in Oti Sub-District.

Risk and Benefits

I anticipate minimal or no risk to you. There is no direct benefit to you for being in the study; however, study outcomes may lead to better understanding factors causing the disease and provide effectively interventions to control Schistosomiasis in the area for healthy life.

Confidentiality

All data will be de-identified and will be kept private. Your identifiable data such as name or date of birth will not be used in documents, reports, or publications related to this research.

I will keep all documents secured and under locked.

When typing your survey responses into the computer, all data will be entered without any information that will make it possible for your identity to be known. The information you provide will be kept strictly confidential and will be available only to persons related to the study. (myself and my supervisors) The Office of Ethical Review Board of Ensign College may also have access to study records upon their request. Your responses will not be shown to other participants or community members. The original paper survey forms will be destroyed once data entry is complete.

Voluntariness and Withdrawal
Your participation in the study is completely voluntary and you reserve the right not to participate, even after you have taken part, to withdraw. This is your right and the decision you take will not be disclosed to anyone. It will not affect the care that will be offered to you at the health facility now or in future. If you join the study, you can change your mind later. You can choose not to take part and you can quit at any time. There will be no negative consequences if you choose not to participate in the study. Please note however, that some of the information that might have been obtained from you without identifiers, before you choose to withdraw, may be used in analysis reports and publications.

Cost/Compensation
Your participation in this study will not lead to you incurring any monetary cost during or after the study.

Who to contact
This study has been approved by the Institutional Review Board of Ensign College. If you have any concern about the conduct of this study, your welfare or your rights as a research participant or if you wish to ask questions, or need further explanations later, you may contact me. Erasmus Gidimadjor (0244 18 13 22) of Ensign College of Public Health, or My supervisor Dr. Frank Baiden (0204591181) You may also contact the Adminitrator of the Institutional Ethics Committee of the Ensign College of Public Health at (+233245762229).

Thank you.

Do you have any questions?

Part 2. CONSENT DECLARATION

"I have read the information given above, or the information above has been read to me. I have been given a chance to ask questions concerning this study; questions have been answered to my satisfaction. I now voluntarily agree to participate in this study knowing that I have the right to withdraw at any time without affecting future health care services"

Name of **participant**_____

Signature of **Participant** _____

Date: / / 2016

Name of **witness**_____

Signature of **witness** _____

Date: / / 2016

Name of **investigator**_____

Signature of **investigator** _____

Date: / / 2016

APPENDIX H

QUESTIONNAIRE

ENSIGN COLLEGE OF PUBLIC HEALTH, KPONG

INTERVIEW SCHEDULE FOR RESPONDENTS; BETWEEN THE AGES OF 11 – 15 YEARSON PREVALENCE OF URINARY SCHISTOSOMIASIS AMOUNG FEMALE PUIPILS IN OTI SUB-DISTRICT IN THE KRACHI EAST OF THE VOLTA REGION, GHANA.

IDENTIFICATION DATA

Age:…… Class……

Tribe…… .

Proximity to water body (in meters)……

ECONOMIC STATUS

1. **Who do you live with?** (a) Mother (b) Father (c) Aunty (d) Uncle (e) Others……
2. **Which of the followings do your parent(s) have**
   (a) Bicycle (b). Radio (c). Mobile Phone (d). Others ……

Bednet possession

3. **Last night did you sleep under the mosquito net (bed net**)
   (a) Yes (b) No

4. **Have you detected blood in urine for the past three months?**
   (a) Yes (b) No

5. **How do you call blood in urine in your local language?**
   ……

6. **To what extent do you agree or disagree that blood in urine is a disease?**
   (a) Strongly disagree (b). Disagree (c) Neutral (d) Agree (e) Strongly agree

7. **To what extent do you agree or disagree that blood in urine is common in your community**?
   (a) Strongly disagree (b) Disagree (c). Neutral (d) Agree (e) Strongly agree

8. **Do you agree or disagree that a person urinating blood should be treated in the hospital or any nearest health facility?**
   (a) Strongly disagree (b) disagree (c) Neutral (d) Agree (d) Strongly Agree

9. **To what extent do you agree or disagree that people could get the disease through swimming, fetching water, bathing and fishing**?
   (a) strongly disagree (b) Disagree (c) Neutral (d) Agree (e) Strongly agree

10. **To what extent do you agree or disagree that blood in urine could be prevented and controlled?**
    (a) Strongly disagree (b) Disagree (c) Neutral (d) Agree (e) Strongly agree

11. **Have you ever taken PRAZIQUANTEL before?** (a) Yes (b) No

12. **If yes, when was the last time you took PRAZIQUANTEL as a treatment for Bilharzia?**
    (a) 1 month (b) 2 months (c) 3 months (d) Other……

13. **Which member of your family and/or friends ever had blood in their urine?**
    (a) Father (b) Mother (c) Brother (d) Sister (e) Other ……

PRACTICES

14. **Do you swim in a river or pond?**
    (a) Not at all (b) Sometimes (c) Occasionally (d) Often (e) Very often

15. **Do you urinate in river or stream**
    (a) Not at all (b) Sometimes (c) Occasionally (d) Often (e) Very often

16. **Do you fish in the river?**
    (a). Not at all (b). Sometimes (c) Occasionally (d) Often (e) Very often

17. **Do you stand in the river and wash your clothes?**
    (a) Not at all (b) Sometimes (c) Occasionally (d) Often (e) Very often

18. **Which of the following do you have in your locality?**
    (a) stream/ river (b) pond (c) Bore-hole (d) well (e) pipe-borne water (f) Others……..

19. **From where do you get water for bathing?**
    (a) stream/ river (b) pond (c) Bore-hole (d) well (e) pipe-borne water (f) Others……..

20. **From where do you get water for drinking?**
    (a) stream/ river (b) pond (c) Bore-hole (d) well (e) pipe-borne water (f) Others……..

21. **From where do you get water for cooking?**
    (a) stream/ river (b) pond (c) Bore-hole (d) well (e) pipe-borne water (f) Others……..

22. **From where do get water for washing?**
    (a) stream/ river (b) pond (c) Bore-hole (d) well (e) pipe-borne water (f) Others……

23. **Do you have a toilet in your house?** (a) Yes (b) No

(If *YES, skip and continue from Q26*)

(If NO, continue and skip only Q26)

24. **If No, where do you and members of your household usually defecate?**
    (a) In the bush (b). Public latrine (c).Other (specify)
    ……

25. **Do you want a toilet built in your house?** (a) Yes (b) No

26. **What type of toilet facility do you have in the house?**
    (a) Pit latrine (b) Water closet (c). Pan Latrine (d) KVIP (e) Other……

ATTITUDES

27. **To what extent do you agree or disagree that people who have blood in their urine should inform their parents immediately?**
    (a) Strongly disagree (b) Disagree (c). Neutral (d) Agree (e) Strongly agree

28. **To what extent do you agree or disagree that people who have blood in their urine should seek treatment in hospital/ clinic?**
    (a) Strongly disagree (b) Disagree (c). Neutral (d) Agree (e) Strongly agree

29. **To what extent do you agree or disagree that people who have blood in their urine should go a traditional healer for treatment?**
    (a) Strongly disagree (b) Disagree (c). Neutral (d) Agree (e) Strongly agree

30. **To what extent do you agree or disagree that people who have blood in their urine should buy drugs and take?**
    (a) Strongly disagree (b) Disagree (c). Neutral (d) Agree (e) Strongly agree

31. **To what extent do you agree or disagree that people who have blood in their urine should do nothing?**
    (a) Strongly disagree (b) Disagree (c). Neutral (d) Agree (e) Strongly agree

32. **To what extent do you agree or disagree that people who have blood in their urine should be given education on how it spread?**
    (a) Strongly disagree (b) Disagree (c). Neutral (d) Agree (e) Strongly agree

33. **To what extent do you agree or disagree that those who urinate blood should be taken out of the community in which they live**
    (a) Strongly disagree (b) Disagree (c). Neutral (d) Agree (e) Strongly agree

34. **To what extent do you agree or disagree that those who urinate blood should be allowed to go near the river?**
    (a) Strongly disagree (b) Disagree (c). Neutral (d) Agree (e) Strongly agree

35. **To what extent do you agree or disagree that we should eat or drink with those who urinate blood?**
    (a) Strongly disagree (b) Disagree (c). Neutral (d) Agree (e) Strongly agree

THANK YOU