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HEALTHCARE-SEEKING BEHAVIOUR FOR SCHISTOSOMIASIS-RELATED SIGNS AND SYMPTOMS IN THE GA SOUTH DISTRICT

BY

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DECLARATION

I, David Boateng Appiah hereby declare that with the exception of the references of other people's work which has been duly acknowledged, this dissertation is the outcome of my original research. This dissertation has not been submitted anywhere either in whole or part for the award of another degree.

David Boateng Appiah		18th Nov. 2020
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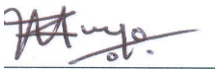
Dr. Mawuli Dzodzomenyo		18th Nov. 2020
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DEDICATION

This dissertation is dedicated to God Almighty, my parents, Mr. and Mrs. Appiah; my siblings, Mr. Stephen Appiah, Mrs. Florence Akpakli-Mireku, Emmanuel Baah Appiah and Enoch Kojo Bordotsiah; my uncle and auntie, Mr. and Mrs. Ameyaw; my cousins, Prince Ameyaw, Michael Ameyaw and David Ameyaw; and finally, to my God-given friends, Maame Bemah Okrah-Siabour, Immanuel Adom-Miah, Samuel Agbenu, Samuel Ofori-Appiah, Linda Awenbil, Collins Anipah, Asare-Konadu Kwadwo Asante, and Baba Nasara. God richly bless you all for your prayers and encouragement.

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ABSTRACT

Background: Schistosomiasis is an infection caused by parasitic flatworms called schistosomes. Schistosomiasis ranks second among neglected tropical diseases globally and is mostly endemic in areas with inadequate sanitation and poor water supply. Dams, ponds, lakes, streams, drains and irrigation canals, marshes and swamps serve as habitats for the intermediate snail hosts and also sources of the infection. The World Health Organization has adopted preventive chemotherapy as a strategy to combat schistosomiasis by periodically administrating the drug, praziquantel.

Objective: The study aimed to assess the healthcare-seeking behaviour of inhabitants of Ga South Municipal District on schistosomiasis-related signs and symptoms.

Method: A cross-sectional study involving the use of a questionnaire was conducted to assess the healthcare-seeking behaviour of inhabitants of Galilea and Mahem communities on schistosomiasis-related signs and symptoms within the Ga South District, which is in close proximity to the lake. A simple random sampling technique was employed in selecting the house numbers to ascertain the households for data collection. Computer-generated random numbers were used to randomly select the households, which subsequently led to the identification and selection of household heads for the study. A total of 242 household heads were interviewed in the two communities within the district. The data collected for the study were analyzed using SPSS version 21.

Results: The awareness of schistosomiasis in the two communities stood at 92.6%. Over a third (77.7%) of the respondents indicated that infected persons within the family would visit the hospital or clinic for treatment of schistosomiasis. Majority of the respondents chose the hospital as their source of seeking healthcare due to the perceived quality of healthcare received in treating the infection (efficacy). Chi-square analysis conducted between the socio-

demographic factors of the respondents and their healthcare-seeking behaviour showed that only area of residence was significantly associated (p=0.007) with the healthcare-seeking behaviour of the respondents.

Conclusion: The awareness of schistosomiasis in the Galilea and Mahem communities was very high due to the educational programmes and research activities conducted regularly in both communities. Most respondents sought care at the hospital or clinic, though some indicated self-medication as their second line of seeking healthcare, and this can be reduced by educating the people on the consequences of engaging heavily in self-medication.

LIST OF ABBREVIATIONS

ACRONYM	MEANING
CDC	Centre for Disease Control
FGS	Female Genital Schistosomiasis
GSS	Ghana Statistical Service
HBM	Health Belief Model
HPV	Human papillomavirus
NTDs	Neglected Tropical Diseases
WHO	World Health Organization
OR	Odds Ratio
CI	Confidence Interval

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DEFINITION OF TERMS

Schistosomiasis: Schistosomiasis is an infection that is caused by blood flukes belonging to the genus Schistosoma.

Urogenital Schistosomiasis: A type of schistosomiasis that is caused by *Schistosoma haematobium* and affects the urinary tract.

Intestinal Schistosomiasis: A type of schistosomiasis that affects the intestine and is caused by *Schistosoma mansoni, Schistosoma intercalatum* and *Schistosoma japonicum*.

Hepatolienal schistosomiasis: A type of schistosomiasis that is characterized by the deposition of schistosomal eggs in the liver of a host cell leading to granuloma formation and neoangiogenesis.

Neglected Tropical Diseases: They are a group of diverse infections most common in tropical and sub-tropical areas such as Africa, Asia, and the Americans.

Haematuria: Haematuria simply refers to blood in the urine. The presence of blood in the urine may either be visible or non-visible to the eye (can be detected microscopically).

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to Study

Blood flukes (Schistosomes) are trematodes belonging to the family Schistosomatidae and genus *Schistosoma*. These blood flukes cause the disease Schistosomiasis, also known as Bilharziasis. Schistosomiasis can be classified mainly into two types, intestinal and urogenital. *Schistosoma haematobium* causes urogenital schistosomiasis while *Schistosoma intercalatum*, *Schistosoma japonicum*, *Schistosoma mansoni*, *Schistosoma mekongi* and *Schistosoma giuneensis* causes intestinal schistosomiasis (Mewabo et al., 2017). According to D. Yirenya-Tawiah, Rashid, Futagbi, Aboagye, and Dade (2011), there are five species of pathogenic parasites that are infectious to man and these are; *Schistosoma haematobium*, which causes urogenital schistosomiasis, *S. japonicum*, *S. intercalatum*, *S. mekongi* and *S. mansoni*, all causing intestinal schistosomiasis. In Ghana, three Bulinid snail species are commonly found. *Bulinus truncatus* and *Bulinus globosus* are known as the intermediate host of *S. haematobium*; however, *B. forskalii* does not transmit schistosomiasis even though it is widely distributed throughout Ghana (Anto et al., 2013). *Biomphalaria pfeifferi* is the snail intermediate host known to transmit *S. mansoni*.

The common parasitic disease that affects humans worldwide after malaria is Schistosomiasis (Neghina et al., 2009). Globally, about 290 million people are projected to be infected with schistosomiasis, those at risk of infection falls between 600-780 million and morbidity as a result of infection estimated to be 2.8 million disability-adjusted life years (Gichuki et al., 2019; World Health Organization, 2016) . The disease is endemic in more than 78 countries, with about 90% of the infection occurring in sub-Saharan Africa (Sady et al., 2015). In tropical and subtropical areas, mainly in poor communities, the disease is prevalent due to the lack of

potable water and inadequate sanitation (Nkegbe, 2010). Transmission of schistosomiasis occurs when humans come into contact with freshwater bodies containing cercariae (World Health Organization, 2014). Adolescents, young adults and school-aged children are usually the groups at risk of getting the infection due to frequent contact with infected water (Deribe et al., 2012; Verjee, 2019). Stunted growth, poor cognitive performance, and anaemia are the symptoms associated with schistosomiasis in children (World Health Organization, 2014).

According to Paperna (1970), the aftermath of the Akosombo dam's construction led to the emergence of schistosomiasis, thereby serving as a health threat. The creation of the dam provided a conducive environment for the schistosome parasites to breed. The prevalence of *S. haematobium* stood between 5-10% before the construction of the dam but quickly shot to more than 90% along communities located near the Volta lake, hence, raising a serious public health concern (Scott, Senker, & England, 1982). The creation of a dam on the River Densu led to the creation of the Weija lake in the year 1979. Most communities located near the Weija lake were endemic with water-related diseases such as schistosomiasis. The creation of the lake provided the ultimate environment for the transmission of the infection. The prevalence of urogenital schistosomiasis in most communities drained by the Densu river was reported to be between 54.8% and 60% (Aryeetey et al., 2000).

The current global strategy of the World Health Organization against schistosomiasis is by administering periodically the antischistosomal drug called praziquantel (World Health Organization, 2006). According to the World Health Organization, mass drug administration coverage globally was 44.9% in 2017, with 98.7 million people receiving retreatment out of the 220 million people requiring treatment globally (World Health Organization, 2016). Although the antischistosomal drug (praziquantel) reduces morbidity and also impact on the transmission of schistosomiasis, it rarely eliminates the infection (Muhumuza, Kitimbo, Oryema-Lalobo, & Nuwaha, 2009). Aside chemotherapy, other interventions such as health

education, water, sanitation and hygiene (WASH), and snail control are important in controlling schistosomiasis (Campbell et al., 2018; Li, Gurarie, Lo, Zhu, & King, 2019).

Healthcare-seeking behaviour can be defined as any action taken by an individual who perceive himself or herself to have a health problem for the purpose of finding an appropriate remedy (Olenja, 2003). A decision-making process precedes the health seeking behaviour of an individual which is further governed by community norms, household behaviour, expectations as well as provider-related characteristics and behaviour (Gerald & Ogwuche, 2014). The process of seeking healthcare is not homogenous depending on cognitive and noncognitive factors only, but it also involves sociocultural as well as economic factors (Kakkar, Kandpal, Negi, & Kumar, 2013). Individuals seek healthcare for schistosomiasis by visiting a health facility, self-medicating with allopathic drugs, visiting the herbalist for traditional treatment or do nothing. As revealed by Chippaux (2000), healthcare-seeking behaviour is an important factor to consider when treating schistosomiasis since it can increase or decrease the risk of schistosomiasis infection.

In Galilea and Mahem communities within the Ga South District, schistosomiasis is still a major public health issue since the combined prevalence rate of the infection in both communities (52%) is about twice as that of the country-wide prevalence of 23.3% (Kulinkina et al., 2018). Despite the widespread prevalence and efforts to contain the disease, it appears that a higher population of people in most endemic settings know little about schistosomiasis (Noël, 2014) and healthcare-seeking behaviours are often directed towards traditional methods in most tropical regions (Acka et al., 2010). Only a few studies have targeted the topic of healthcare-seeking behaviours regarding schistosomiasis epidemiology. Hence, there is a need to conduct studies in this area due to the paucity of information on the healthcare-seeking behaviour of humans for schistosomiasis-related signs and symptoms.

The study is organized into five (5) chapters. Chapter one (1) introduces the study on healthcare-seeking behaviours for schistosomiasis-related signs and symptoms. The chapter also contains the problem statement, conceptual framework, justification, research questions and objectives for the study. In chapter two (2), a comprehensive review of relevant literature on healthcare-seeking behaviours for schistosomiasis-related signs and symptoms have been discussed. Such literature review indeed serves as a guide to the study and therefore informs the research methodology and the findings of the study. Chapter three (3) describes the methodological approach to the study, highlighting, among others, the research design, stud y location, study variables, sample size, sampling techniques, data collection tool and data analysis. In chapter four (4) of this study, data analysis is conducted, which is informed by the research questions. Chapter five (5) provides a fitting conclusion and makes recommendations based on the research findings.

1.2 Problem statement

Globally, among the parasitic diseases of socio-economic and public health importance, schistosomiasis ranks second and hence its impact on human life cannot be overlooked considering the current rise of the disease especially in sub-Saharan Africa (Neghina et al., 2009). This is because, in sub-Saharan Africa, almost 131 million people are estimated to be affected by the disease as compared to an estimate of 200 million people infected worldwide (N'Guessan et al., 2017). Nonetheless, in Ghana, the infection is endemic, and the country-wide prevalence of schistosomiasis is 23.3%, with focal or localized prevalence levels > 50 % (Kulinkina et al., 2018). In effect, the infection has a significant economic burden on communities and countries as a whole since it affects labour performance and hence accounting for the rise in poverty (Adenowo, Oyinloye, Ogunyinka, & Kappo, 2015). Dams in Ghana were purposely created for hydropower production and also enhancing agricultural production and livestock breeding of which the Weija dam is not an exception. The root cause for the

emergence and rise of infectious diseases like schistosomiasis is as a result of the environmental transformation derived from the construction and operation of dams (Diakité et al., 2017).

A significant body of evidence shows that schistosome eggs rather than adult worms induce the morbidity caused by schistosome infections (Burke et al., 2009). Eggs of schistosomes that are not excreted becomes partly dislodged in the liver, intestines, bladder and urogenital system of the host cell (Colley, Bustinduy, Secor, & King, 2014). In these organs or systems within the host organism, the eggs induce a granulomatous host immune response characterized largely by lymphocytes, eosinophils, and alternatively activated macrophages (Fairfax, Nascimento, Huang, Everts, & Pearce, 2012). According to Colley et al. (2014), these granulomas possess egg proteolytic enzymes which prevent tissue necrosis, however, the process of granuloma formation induces chronic inflammation that leads to the disease manifestation of schistosomiasis.

The clinical presentations or manifestations of schistosomiasis can be classified as acute or chronic. Acute schistosomiasis is characterized by cercarial dermatitis and Katayama syndrome (Caldas et al., 2008). Cercarial dermatitis occurs rarely among populations that are endemic for schistosomiasis but is common among visitors and migrants after primary infections (Olveda, 2001). It is an IgE-mediated hypersensitivity response directed against penetrating cercariae (Olveda, 2001). The clinical characteristics of cercarial dermatitis that manifests after several hours of exposure to contaminated water include a maculopapular, pruritic rash which may persist for several days (Bruno Gryseels, Polman, Clerinx, & Kestens, 2006). The katayama syndrome is an immune-complex mediated hypersensitivity response directed against migrating schistosomula and early egg deposition (A. G. Ross, Vickers, Olds, Shah, & McManus, 2007). Katayama syndrome manifest 14-84 days after an individual is

exposed to schistosome infection and it is characterized by the rapid onset of fever, fatigue, eosinophilia, myalgia, and abdominal pain (A. G. Ross et al., 2007).

Chronic schistosomiasis depends on the anatomical location of adult schistosome within the host organism. Hepatointestinal and hepatosplenic disease is caused by *S. japonicum* and *S. mansoni* infection, whereas genitourinary and urogenital schistosomiasis is caused by chronic infection of *S. haematobium*. Gastrointestinal schistosomiasis is characterized by loss of appetite, diarrhoea (usually containing blood), intermittent abdominal pain and discomfort (King, 2001). Hepatosplenic schistosomiasis is as a result of the deposition of schistosome eggs in the hepatic sinusoids resulting in the development of granulomas, hepatomegaly, periportal fibrosis and progressive occlusion of the portal veins (Hayashi, 2003). Urogenital schistosomiasis is due to the egg-laying S. haematobium worms living within the veins and draining the main pelvic organs, including the bladder, cervix, and uterus (L. L. Santos et al., 2021). Urogenital schistosomiasis is characterized by haematuria (blood in urine), fibrosis, granulomata, inflammation, parenchymal tissue destruction, and fibrotic nodules (J. Santos et al., 2015). Cancer of the bladder is importantly a frequent and dire complication of chronic urogenital schistosomiasis and untreated patients often develop schistosome-related bladder cancer (J. Santos et al., 2015).

Genital schistosomiasis is characterized by the deposition of eggs in the reproductive organs. It can result in lesions of the fallopian tubes and ovaries in women and therefore lead to infertility whiles in men, a common symptom is hemospermia (Barsoum, Esmat, & El-Baz, 2013). In men, the testicles, prostrate, epididymis, and spermatic cords can be affected as a result of genital schistosomiasis (Feldmeier, Leutscher, Poggensee, & Harms, 1999; Poggensee & Feldmeier, 2001). Other symptoms in female patients include hypertrophic and ulcerative lesions of the vagina, vulva, and cervix, which might aid sexual transmission of infections

(Barsoum et al., 2013). The risk of acquiring HIV infections is higher among women with urinary or genital schistosomiasis (Mbabazi et al., 2011).

In a study conducted by Aboagye and Edoh (2009), urinary schistosomiasis persists in the Mahem and Galilea communities within the Ga South District with a combined prevalence of 52% even though studies have revealed that there is periodic distribution of the antischistosomal drug (praziquantel) in these communities. Schistosomiasis is a problem in the Galilea and Mahem communities because their combined prevalence of 52% is almost as twice as that of the National prevalence of 23.3% (Aboagye & Edoh, 2009; Kulinkina et al., 2018).

Most people in these communities usually report to the health facilities extremely late due to their perceived seriousness of the infection. Also, the cultural or traditional beliefs guide some inhabitants as to how to handle schistosomiasis. The infection persists as a result of the negative healthcare-seeking patterns of inhabitants in these communities, and a significant body of evidence suggests that the health-seeking patterns or behaviours of individuals can either increase or decrease the risk of schistosomiasis infection (Chippaux, 2000). Moreover, both communities depend on the Weija lake as their source of water for activities like bathing, swimming, fishing, among others. It is therefore essential to tackle the issue of schistosomiasis in these communities within the Ga South District by looking at the healthcare-seeking behaviour of inhabitants for schistosomiasis even though chemotherapy is ongoing.

1.3 Conceptual Framework

The conceptual framework was developed by adopting relevant aspects of the Health Belief Model (HBM) for this study. The conceptual framework, as shown below, highlights socio-cultural, physical, and demographic factors that determine the health-seeking behaviours of the inhabitants of the Ga South District for schistosomiasis-related signs and symptoms.

The socio-demographic factors such as age, sex, level of education, occupation, and area of residence have been shown to influence the healthcare-seeking behaviours of inhabitants. In a study conducted by Danso-Appiah, De Vlas, Bosompem, and Habbema (2004), children below ten (10) years of age and adults were more likely to seek healthcare as compared to teenagers. Concerning the susceptibility of schistosomiasis, young boys and fisherfolks are more likely to contract schistosomiasis as a result of their frequent contact with water bodies (for example, lake) infected with schistosome cercariae (Knopp et al., 2013). An individual's level of education could affect their attitudes and behaviour towards schistosomiasis treatment. Highly educated individuals are more likely to seek healthcare for schistosomiasis than individuals with no level of education (Ugbomoiko, Ofoezie, Okoye, & Heukelbach, 2010).

The perceived severity of the infection influences the healthcare-seeking behaviours or actions of inhabitants (Danso-Appiah et al., 2010). The individual's knowledge of the signs and symptoms of the disease, the duration of the signs and symptoms in the infected individual and the cultural beliefs of the individual as to what ill-health is with respect to their area of residence constitutes the severity of the disease. An individual's perceived severity of the disease could influence their healthcare-seeking behaviour for the infection or disease. The actions that are taken concerning healthcare within a geographical location is significantly influenced by cultural beliefs or practices (Twumasi, 2005).

According to Shaikh, Haran, Hatcher, and Azam (2008), perceived quality of care expected (efficacy), distance to a health facility (accessibility), availability and cost of medicine, and user fees charged (affordability) also influenced health-seeking behaviour. The ability of an individual to receive the needed care within a convenient distance and also within a stipulated time frame from the practitioner of choice to the urgency of the problem is termed as Accessibility (Haggerty & Martin, 2005). Affordability in this regard, is defined as the capability or capacity of an individual to pay for a healthcare service or treatment. Availability

is defined as what is readily found at all times concerning healthcare. Efficacy describes how effective the health service treats or heals the health problem (Tabi, Powell, & Hodnicki, 2006). Time also refers to how long it takes for an individual to receive the healthcare that he or she seeks at that source.

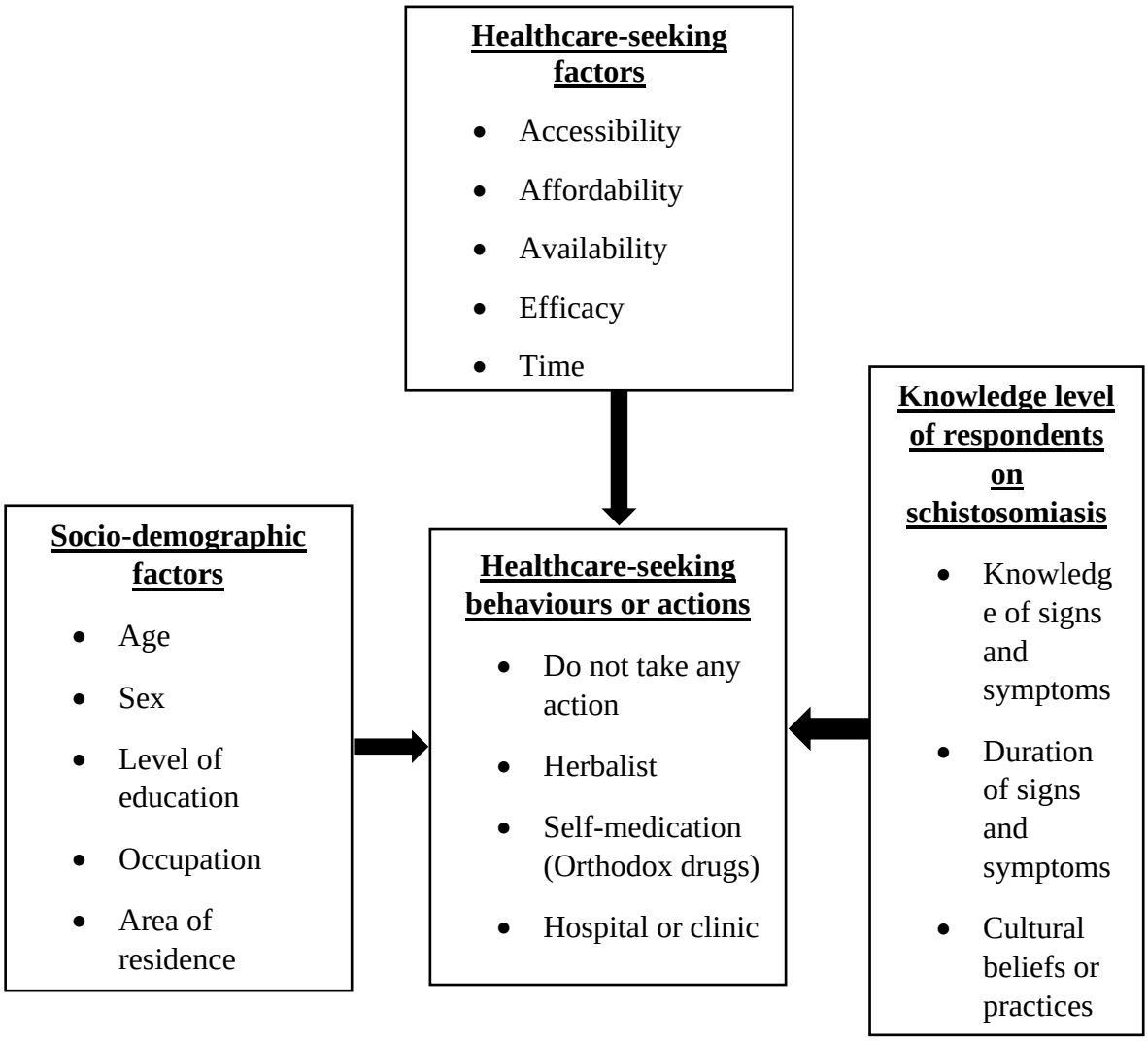

Figure 1: **Conceptual Framework Showing Variables and Linkages (Adopted from HBM)**

1.4 Justification

Schistosomiasis infection persists in sub-Saharan Africa because much study has not been done on the healthcare-seeking behaviour of individuals, which can increase or decrease the risk of infection even though chemotherapy is still ongoing. The prevalence of urinary schistosomiasis in the Galilea and Mahem communities within the Ga South District is still high (48% and 58% respectively) as a result of frequent contact with the lake for activities like fishing, swimming, washing, fetching of water for domestic purposes, and bathing even though chemotherapy is still ongoing (Tay, Amankwa, & Gbedema, 2011). It is, therefore, significant to assess the inhabitants' healthcare-seeking behaviours for schistosomiasis-related signs and symptoms as a substantial body of evidence suggests that human healthcare-seeking behaviours can either increase or decrease the risk of schistosomiasis infection (Chippaux, 2000).

Understanding the healthcare-seeking behaviour of people and factors influencing the decision to self-report with schistosomiasis-related signs and symptoms is, therefore, highly relevant for health planners and policy-makers towards the control of parasitic diseases within the health system. Results from this study will add up to the existing literature on the healthcare-seeking behaviours for schistosomiasis-related signs and symptoms and also provide stakeholders' knowledge on the need to give attention to human healthcare-seeking behaviour to help reduce the risk of schistosomiasis infection in addition to the use of chemotherapy.

1.5 Research Questions

1. What is the healthcare-seeking actions of inhabitants for schistosomiasis-related signs and symptoms?
2. What is the inhabitants' level of knowledge about the signs and symptoms related to schistosomiasis?
3. What are the factors influencing the inhabitants' healthcare choice for schistosomiasis-related signs and symptoms?

1.6 Research Objectives

1.6.1 General Objectives

To assess the healthcare-seeking behaviour of inhabitants of Ga South District on schistosomiasis-related signs and symptoms.

1.6.2 Specific Objectives

1. To determine the healthcare-seeking actions of inhabitants of Ga South District on schistosomiasis-related signs and symptoms.
2. To assess the inhabitants' level of knowledge about the signs and symptoms related to schistosomiasis.
3. To determine the factors influencing the inhabitants' healthcare choice for schistosomiasis-related signs and symptoms.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of pertinent literature on healthcare-seeking behaviours for schistosomiasis-related signs and symptoms. It subsequently reviews available literature on concepts such as epidemiology of schistosomiasis, signs and symptoms of schistosomiasis, prevention and control of schistosomiasis, healthcare-seeking behaviour for schistosomiasis-related signs and symptoms, the factors influencing the choice of healthcare for schistosomiasis, among others.

2.2 Schistosomiasis

Schistosomiasis is a parasitic disease caused by trematodes belonging to the family Schistosomatidae. Intestinal and urogenital schistosomiasis are the two main types of schistosomiasis. Schistosomiasis is principally found in tropical and subtropical regions, particularly in South and Central America, Africa, and Asia, where there are inadequate sanitation and lack of potable water (Hotez et al., 2007). *S. mansoni* and *S. japonicum* cause intestinal schistosomiasis whereas *S. haematobium* causes urogenital schistosomiasis. Other rare forms of intestinal schistosomes include *S. mekongi*, *S. guineensis*, and *S.intercalatum* which are commonly found in Cambodia, Lao People's Democratic Republic and the rain forest areas of Central Africa (Landouré et al., 2012). People become infected when they have contact with water bodies infested with *Schistosome* parasites. Water contact activities like farming, fetching of water, fishing, swimming, irrigation and washing clothes or dishes creates an avenue to the free-living secondary larvae; cercariae to penetrate the skin, infecting humans which leads to the completion of the life cycle of the trematode.

Because Schistosomes live in blood vessels, they are often referred to as blood flukes. Schistosome transmission usually requires the presence of an intermediate and suitable snail

host. Contaminating the surfaces of water bodies with human excreta and urine causes the release of the primary larvae (miracidia) which infects the snails and develops to free-living secondary larvae in snail host. Dams creation and rapid urbanisation creates local snail habitation and consequently, increases the local prevalence of schistosomiasis (Bustinduy & King, 2011; B Gryseels & Strickland, 2013).

2.3 Epidemiology of Schistosomiasis

It has been projected that about 290 million people are infected with schistosomiasis worldwide, and about 90% of these infections occur in sub-Saharan Africa (Gichuki et al., 2019; Sady et al., 2015). The prevalence is high in sub-Saharan Africa, especially in poor sanitary areas and people with low socioeconomic status (Zhang, MacArthur, Mubila, & Baker, 2010). Movement of people to new areas results in urbanization and increased power requirement leading to the construction of dams facilitating the infection. Previous studies have reported a reduced risk in sub-Saharan Africa since the year 2000, but the prevalence remains high. According to Lai et al. (2015), 163 million people in sub-Saharan Africa were infected with either S. mansoni or S. haematobium in 2012 of whom children of school-going age constituted 35%. Among children of school-going age, Mozambique recorded the highest prevalence of 52.8% for urinary schistosomiasis. Other African countries like Equatorial Guinea, Rwanda, Burundi, and Eritrea recorded a lower prevalence rate of 10% among children of school-going age (Lai et al., 2015).

In West Africa, statistics have shown that the prevalence of Schistosoma spp. in people less than 20 years on the average ranges from 17.6% to 51.6% (Schur et al., 2011). For instance, studies conducted in countries like Mali, Liberia, Ghana and Sierra Leone had median prevalence rates higher than 40% (Schur et al., 2011). Mali recorded a prevalence of 45.1%, the prevalence rate in Ghana stood at 45.1%, Sierra Leone recorded a prevalence rate of 51.6%,

Liberia had a prevalence rate of 41.5% and that of Nigeria stood at 39.4% per the study (Schur et al., 2011).

Furthermore, in Ethiopia, a study conducted by Deribew, Tekeste, and Petros (2013) reported a mean prevalence rate of 24.54% for urinary schistosomiasis among school-going children. Per the study conducted in Nigeria by Morenikeji, Atanda, Eleng, and Salawu (2014), they reported a prevalence rate of 52% and their subsequent studies in 2016 revealed a prevalence rate of 75.1% among children of school-going age in the same community which indicates a 23.1% increment in prevalence. In Zimbabwe, the prevalence rate of *S. haematobium* among school-going children was reported to be 52.3% (N Midzi et al., 2010). A prevalence rate of 55% was revealed by Amuta and Houmsou (2014) in their study on the prevalence and intensity of infection of urinary schistosomiasis in Nigeria. According to their research, approximately 87% of their respondents had light infection compared with 13.3% with heavy infection (Amuta & Houmsou, 2014).

In a study carried out by Aboagye and Edoh (2009) on the risk of infection of urinary schistosomiasis, it was stated that there was an overall prevalence of 52% both in the Mahem and Galilea Communities. According to Anto et al. (2013) and Magalhaes et al. (2011), the prevalence rates of urogenital schistosomiasis in Ghana among school-going children were reported between 14% to 33%. According to Kulinkina et al. (2018), the country-wide prevalence rate of schistosomiasis in Ghana is 23.3% with localized or focal prevalence levels > 50%.

2.4 Risk factors associated with Schistosomiasis

The transmission of schistosomiasis generally occurs in areas that have dams and irrigation sites associated with a waterbody. Also, the transmission of schistosomiasis tends to be location-specific. The most important factor of transmission is contact with infected water

bodies. Transmission may also involve other factors such as age, socioeconomic status, distance to safe and unsafe water sources, sex, and occupation (Kosinski et al., 2012). Those who are at a higher risk of contracting *S. haematobium* infection are young adults, adolescents (usually 15 to 20 years) and school-aged children, usually between the ages of 10-15 years (Agnew-Blais et al., 2010; Verjee, 2019). Young adults, adolescents, and children are most prone to water contact activities like bathing, swimming, fishing, among others in infested water bodies. According to the study conducted by Agnew-Blais et al. (2010), the socio-demographic factors that affect schistosomiasis are male gender and both adolescence and pre-adolescence. The prevalence of schistosomiasis is mostly higher among males as compared to females due to behavioural differences (Kosinski et al., 2012; M'Bra et al., 2018). Individual's sources of water for drinking could increase or decrease the prospect for schistosomiasis infection (Sady et al., 2013). A research undertaken by Geleta et al. (2015) showed that children who had their father's occupation as fishers were more likely to get the infection. Moreover, parents who allowed their children to play near or around water bodies were also likely to get the disease (Ekpo et al., 2012).

2.5 Lifecycle of Schistosomiasis

Humans release the eggs of schistosomes into the environment through faeces or urine (Shuja et al., 2018). The released eggs develop into miracidia in freshwater, which hatch and infects snails (Geyer et al., 2018). The miracidium after infiltrating the snail sheds off its cilia and grows into a mother sporocyst which further yields daughter sporocysts (Gurarie, Lo, Ndeffo-Mbah, Durham, & King, 2018). Cercariae are produced by these daughter sporocysts (Mouahid et al., 2018).

These cercariae develop into schistosomulae after penetrating the human skin and releasing its forked tail. Through blood circulation, the schistosomula travel throughout the body's tissues (Mouahid et al., 2018). The schistosomula develops into schistosomes and later matures into

adult worms (Chala & Torben, 2018). The male adult worms have a ZZ chromosome pair, and that of the females have a ZW chromosome pair (Gurarie et al., 2018). In humans, the adult worms can be located in specific areas of the body, depending on the schistosome species (Abe et al., 2018). They can either be located in the bladder, ureter, rectal venules, or small intestines (Abe et al., 2018). Human contact with water containing cercariae can cause human schistosomiasis (Braun, Grimes, & Templeton, 2018).

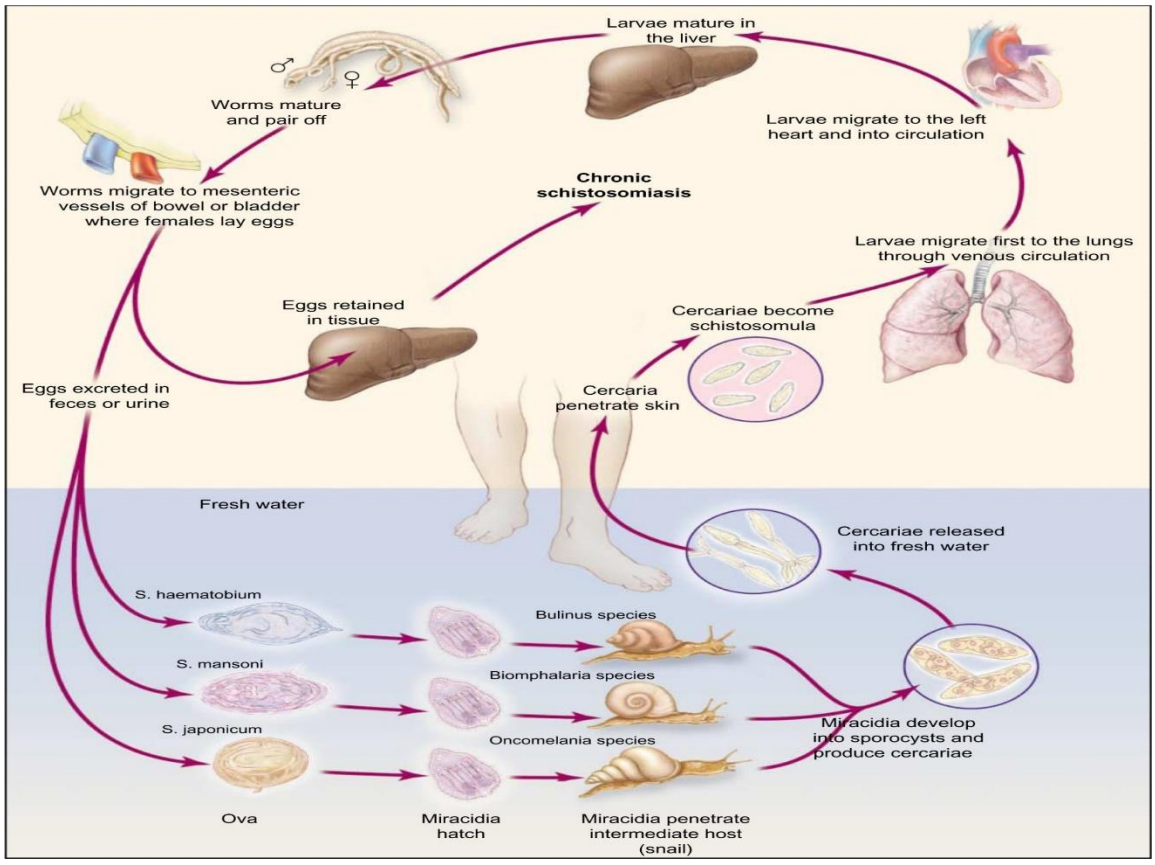

Figure 2: The life cycle of Schistosomiasis. (Source: The New England Journal of Medicine)

2.6 Signs and Symptoms of Schistosomiasis

The clinical manifestation of schistosomiasis can either be chronic or acute. Cercarial dermatitis (CD) and Katayama syndrome characterizes acute schistosomiasis. Acute schistosomiasis often occurs among travellers or immigrants to schistosome-endemic areas who are exposed to schistosome antigens for the first time usually at an older age (Colley et al., 2014). It usually occurs weeks to months after infection, as a result of worm maturation, egg production, release of egg antigen, and the host's florid granulomatous and immune complex responses (Colley et al., 2014). Acute schistosomiasis, also known as Katayama syndrome has an incubation period of 14 to 84 days (Nelwan, 2019). The typical clinical manifestations of acute schistosomiasis include maculopapular pruritic rash, malaise, headache, myalgia, eosinophilia, fatigue, abdominal pain lasting 2 to 10 weeks, and onset of fever (A. G. Ross et al., 2007).

Chronic schistosomiasis on the other hand varies and usually depends on the anatomical location of adult schistosomes within the mammalian host system. For urogenital schistosomiasis, the adult S. haematobium worms settle and lives in the small venules around the ureter and bladder of the urinary tract (D. P. McManus et al., 2020). The clinical presentations of urogenital schistosomiasis include ureter and urethra obstruction, haematuria, dysuria, cancer of the bladder, hydronephrosis, granulomata, fibrosis, fibrotic nodules, bladder calcification, and proteinuria (L. L. Santos et al., 2021).

In the genital system of humans, schistosome eggs are often deposited in the prostate and the seminal vesicles (in men) or in the cervix (in women) characterized by cervical lesions with pronounced tissue inflammation (D. McManus et al., 2018). The clinical manifestations in infected females include genital lesions (vulvar nodules), fallopian tube damage, vaginal bleeding, and dyspareunia whiles men present with increased numbers of leucocytes in semen

and increased levels of inflammatory cytokines (D. McManus et al., 2018). S. haematobium in both men and women has been associated with increased risk of human immunodeficiency virus (HIV) with attraction of inflammatory cells and presence of virus possibly in the semen (D. P. McManus et al., 2020). According to Nicholas Midzi, Mduluza, Mudenge, Foldager, and Leutscher (2017), sexual intercourse in women can result in bleeding lesions on the friable mucosa of the cervix and the vagina.

Gastrointestinal schistosomiasis is characterized by diarrhoea (especially in children), blood in stool, loss of appetite, and colicky hypogastric pain or pain in the left iliac fossa (A. Ross, Bartley, Sleigh, Olds, & Li, 2002). Clinical manifestations common with neuroschistosomiasis are myelopathy, radiculopathy, increase in intracranial pressure and subsequent clinical sequelae (Ferrari & Moreira, 2011). The common signs and symptoms of hepatosplenic schistosomiasis are hepatomegaly, abdominal ascites, splenomegaly and periportal fibrosis (Gray, Ross, Li, & McManus, 2011a).

2.7 Treatment and Prevention of Schistosomiasis Infection

Chemotherapy is the main approach for schistosomiasis control since no vaccine exists against schistosomiasis and the molluscs acting as intermediate hosts of the infection. Praziquantel is the main form of drug available for treatment of schistosomiasis, and its main distribution is through mass administration programs to millions of people every year. Chronic schistosomiasis treatment relies on the use of praziquantel, a broad-spectrum schistosomaticide drug that combines safety, efficacy, cost and ease of distribution (Cioli, Pica-Mattoccia, Basso, & Guidi, 2014). Treatment of schistosomiasis from the early stages with praziquantel regularly prevents the infection from progressing to genital damage and other complications. The World Health Organization recommends regular large-scale administration of preventive chemotherapy in endemic areas to entire communities or routinely in health facilities (Wang, Wang, & Liang, 2012).

The antischistosomal drug (Praziquantel) is very active against the adult stages of schistosomes (Obonyo, Muok, & Mwinzi, 2010). Treatment of schistosomiasis with praziquantel kills the adult worms and also provides relief and regression of inflammatory lesions. In the early 1980s, the antischistosomal activity of the artemisinin derivatives was discovered leading this family of compounds to be used as a broad-spectrum antischistosomal drug (Xiao, Keiser, Chen, Tanner, & Utzinger, 2010). Artemisinin derivatives are complementary to praziquantel activity and act against the developmental stages of the parasite (Liu et al., 2011). The lack of awareness of genital schistosomiasis can lead to misdiagnosis and, therefore, ineffective and false therapy. Antihelminthic treatment with praziquantel goes beyond the simple benefits of curing schistosomiasis and preventing its related genital morbidity (Gray, Ross, Li, & McManus, 2011b).

Oxamniquine is an aminoethyltetrahydroquinolone derivative known to be effective against S. mansoni only, particularly the adult worms and invasive stages (da Paixão Siqueira et al., 2017). Oxamniquine has shown to be more effective against male parasites and has no notable effect on other *Schistosoma* species apart from *S. mansoni* (da Paixão Siqueira et al., 2017). Oxamniquine prevents the occurrence of chronic S. mansoni infection and egg-laying when prescribed during the early stage (usually the first week) of the infection or during acute schistosomiasis (Coelho, Enk, & Katz, 2009; Jauréguiberry, Paris, & Caumes, 2010).

Preventing contact with freshwater bodies infected with Schistosome parasites is the primary way of preventing Schistosoma infection. Water contact activities like wading, swimming, washing of clothes, collection or fetching of water, fishing and bathing expose the human skin to possible penetration by the cercariae. Vigorous towel drying is recommended to help block the skin from being penetrated by the cercariae in cases when there is brief accidental contact with infected water bodies. Water fetched from these freshwater bodies must be boiled for some few minutes to help kill the parasites that may be found in the water before drinking it or

bathing with it. An alternative way to help prevent the infection is by allowing the water fetched from these freshwater bodies to stand for 24 hours or more before using it. Cercariae perchance contained in the water may be filtered using fine-mesh filters. According to Montgomery (2011), application of repellents such as DEET (N, N-Diethyl-meta-toluamide) may block cercariae from penetrating the skin. Other ways of controlling or eliminating schistosomiasis include behavioural change of the inhabitants, providing a safe supply of water, and improvement in sanitation. Educational programmes can improve the knowledge of inhabitants on schistosomiasis and its healthcare-seeking actions.

2.8 Healthcare-seeking Behaviour for Schistosomiasis-related Signs and Symptoms

Healthcare-seeking behaviour is any action carried out by persons who identify themselves to have a health challenge to find an appropriate remedy (Olenja, 2003). The Health Belief Model (HBM) proposed that the particular health behaviour that a person performs is guided by two factors: the degree to which the person perceives the disease as terrifying and the extent to which the health behaviour is deemed to be effective in lowering the risk of an adverse health effect. Decision-making process precedes a healthcare-seeking behaviour that is further governed by individual and household behaviour, community norms and expectations as well as providing related characteristics and behaviour. For this cause, the nature of healthcare-seeking is not homogenous depending on non-cognitive and cognitive factors that call for a contextual analysis of healthcare-seeking behaviour. The context in this regard may be a factor of cognition or awareness, socio-cultural as well as economic factors.

In most communities in Southern Ghana endemic with schistosomiasis, a large number of the community members have improved knowledge and awareness about schistosomiasis and its harmful outcomes or effects because of more education and research activities undertaken in these areas (D. R. Yirenya-Tawiah, Ackumey, & Bosompem, 2016). Studies have shown that community members assigning local names to schistosomiasis in their various communities or

localities have also contributed to the high knowledge and awareness of the disease in these localities or communities (Odhiambo et al., 2014).

According to a study conducted by Aagaard-Hansen, Mwanga, and Bruun (2009), it has been shown that in some communities, schistosomiasis is associated with socio-cultural factors and a perceived hereditary disease. Following the study undertaken by D Yirenya-Tawiah et al. (2011), it was revealed that women who were suffering from female genital schistosomiasis were unwilling to communicate to their husbands about their health condition due to the fear of being divorced or their husbands dumping them for other women. Also, most women in these communities did not seek healthcare because the symptoms of FGS usually are not different from those of most sexually transmitted infections (STIs). Hence, the condition was frequently misconstrued as an STI, which is stigmatized typically in these communities. In some cultures, schistosomiasis is seen as a sign of growth among males and females, and others believe that schistosomiasis becomes sickness if one's puberty stage is associated with infidelity (Ukwandu & Nmorsi, 2004). The study also revealed that the river gods cause schistosomiasis after visiting the water bodies at one's early stages of life. In another study conducted in Western Kenya, religious beliefs influenced the healthcare-seeking behaviour of the inhabitants greatly (Opisa et al., 2011). With some community members, it is better to seek spiritual healing than go to the hospital or take medication (Musuva et al., 2014).

With regards to the main actions taken for schistosomiasis-related signs and symptoms, doing nothing, self-medicating and visiting a health facility were commonly reported according to a study conducted by (Danso-Appiah et al., 2010). The study also indicated that a large majority of people who experienced blood in the urine or painful urination did not seek health care. In contrast, a greater majority with fever, diarrhoea and abdominal pain did take action, mostly engaging in self-medication with allopathic drugs. The researchers further revealed that patients were more likely to visit a hospital or clinic as their first line of action. Some patients

practised multiple actions by self-medicating and then visiting a hospital either as a second or third alternative and vice versa. Moreover, the tendency to seek healthcare was least among patients with chronic features such as swollen belly, blood in urine, and painful urination but when these patients do something, they are more likely to go to the hospital (Danso-Appiah et al., 2010).

2.9 Factors Influencing the Choice of Healthcare for Schistosomiasis

Healthcare-seeking behaviours are driven by complex mechanisms, requiring approaches that are multidimensional to help bring together all aspects connected to access and utilization of healthcare. A descriptive study conducted on healthcare-seeking behaviour demonstrated the complexity of influences on the behaviour of an individual at a given place and time (MacKian, 2003). Even though healthcare-seeking action focuses mostly on the individual as a purposive and decisive agent, in other situations, the factors stimulating the healthcare-seeking behaviours are not entirely rooted in the individual, but it involves a more dynamic, interactive, and collective element. The idea of healthcare-seeking action is a tool for comprehending how individuals utilize the healthcare systems in their respective economic, demographic, and socio-cultural circumstances.

A sick individual may receive assistance in several ways. As stipulated by Twumasi (2005), a sick individual may receive assistance by visiting the herbalist or appealing to the gods or ancestral spirits. The decision of the individual will be significantly influenced by the nature of the illness. According to Moshabela et al. (2011), the limited options for healthcare delivery system in most rural and urban poor areas is due to the long distance to hospitals or health centres which happens to be the primary and effective source for schistosomiasis treatment and diagnosis, high user fee-for-health service and the traditional health beliefs that places less emphasizes on modern medicine among other competing options have all been identified to influence the healthcare-seeking decisions of individuals.

As stipulated by Shaw (2001), individuals with higher socioeconomic status frequently sought healthcare and visited health facilities than individuals with low socioeconomic status. Similarly, in a study conducted in Cote d'Ivoire among school children, it was reported that individuals with higher socioeconomic status frequently sought healthcare and visited health facilities often as compared to those with low socioeconomic status (Raso et al., 2005). In another study conducted in Pakistan on healthcare-seeking behaviour and health service utilization; educational status, family size, parity and occupation of the family head positively affected the healthcare-seeking behaviour of a family besides age, gender, and marital status (Shaikh & Hatcher, 2005). In relation to a study conducted by Osubor, Fatusi, and Chiwuzie (2006), it was shown that regardless of the age, level of education, and socio-economic status of the head of the family, cultural practices and beliefs were prevalent (Shaikh & Hatcher, 2005). Also, the study revealed that these cultural factors and beliefs affected the availability and acceptability of service, gender, and the awareness and recognition of the severity of illness.

Before an individual seeks healthcare, he or she must consider the health threat of the illness and also have resources at hand to receive any kind or form of medical assistance. Based on the research led by Shaikh et al. (2008), it was proven that healthcare-seeking behaviour does not only involve knowing the cause and treatment of the disease; nonetheless, it also involves cultural practice, socio-economic status and perceived seriousness and duration of the disease. Perceived quality of healthcare expected (efficacy), distance to a health facility (accessibility), availability and cost of medicine, and user fees charged (affordability) also influenced healthcare-seeking behaviour (Shaikh et al., 2008). However, in a study conducted by Danso-Appiah et al. (2004), efficacy (perceived quality of healthcare) was not considered as an essential determinant of healthcare-seeking behaviour. Instead, it was the symptoms of the disease that caused affected individuals to visit the health facility. The perceived severity of

schistosomiasis-related signs and symptoms contributes significantly to the healthcare-seeking behaviour of individuals (Gazzinelli et al., 1998). Subsequently from the study, it was shown that the rate of seeking healthcare for chronic characteristics of schistosomiasis-related signs and symptoms was extremely low. Other significant predictors of healthcare-seeking treatment (especially allopathic medicine) include ethnicity, sex, education of the household head and type of illness (Masud Ahmed, 2001).

CHAPTER THREE

3.0 METHODOLOGY

3.1 Introduction

Chapter three (3) gives a thorough account and explanation of the methodology that was employed for the study. It also captures the study design, study area, study population, sampling procedure, ethical issues, quality control, among others. This chapter precedes the research findings and conclusions. The chapter continues in the following sub-sections.

3.2 Study Design

This study was a descriptive cross-sectional survey that employed quantitative methods to assess the healthcare-seeking behaviour of inhabitants for schistosomiasis-related signs and symptoms as indicated by household heads in the Galilea and Mahem communities within the Ga South District. A structured questionnaire was used to collect data on the socio-demographic characteristics, level of knowledge, healthcare-seeking actions, and the factors influencing the healthcare-seeking choice of inhabitants. The study was conducted from 20th August 2020 to 18th September 2020.

3.3 Study Area

The study was conducted in the Ga South District in the Greater Accra Region of Ghana. The district is among the 26 districts in the Greater Accra Region with an estimated population of 507,192 (GSS, 2019). The Ga South District was carved out from the Ga West District in November 2007 and was established by Legislative Instrument 2134 in July 2012 with Weija being the District capital (GSS, 2012). It lies at the southwestern part of Accra and shares boundaries with the Accra Metropolitan Area to the South-East, Ga Central to South-East, Akwapim South to the north-east, Ga West to the east, West Akim to the north, Awutu-Senya to the west, Awutu-Senya East to the south-east, Gomoa and the Gulf of Guinea to the south-west and south respectively. The study was conducted in two selected communities (Galilea

and Mahem) within the Ga South District. Both communities are located in the western part of the District and near to the Weija lake, hence, acting as a Schistosome infection site. Both communities are endemic for schistosomiasis with a prevalence rate of 58% and 49% in the Mahem and Galilea communities respectively (Tay et al., 2011). People living in these areas depend extensively on the Weija lake for activities such as fishing, swimming, washing, bathing, and other domestic activities. Other sources of water in both communities include boreholes, wells, and pipe-borne water. The inhabitants of both communities are mostly fisher folks, petty traders and migrant fishers from different parts of the country.

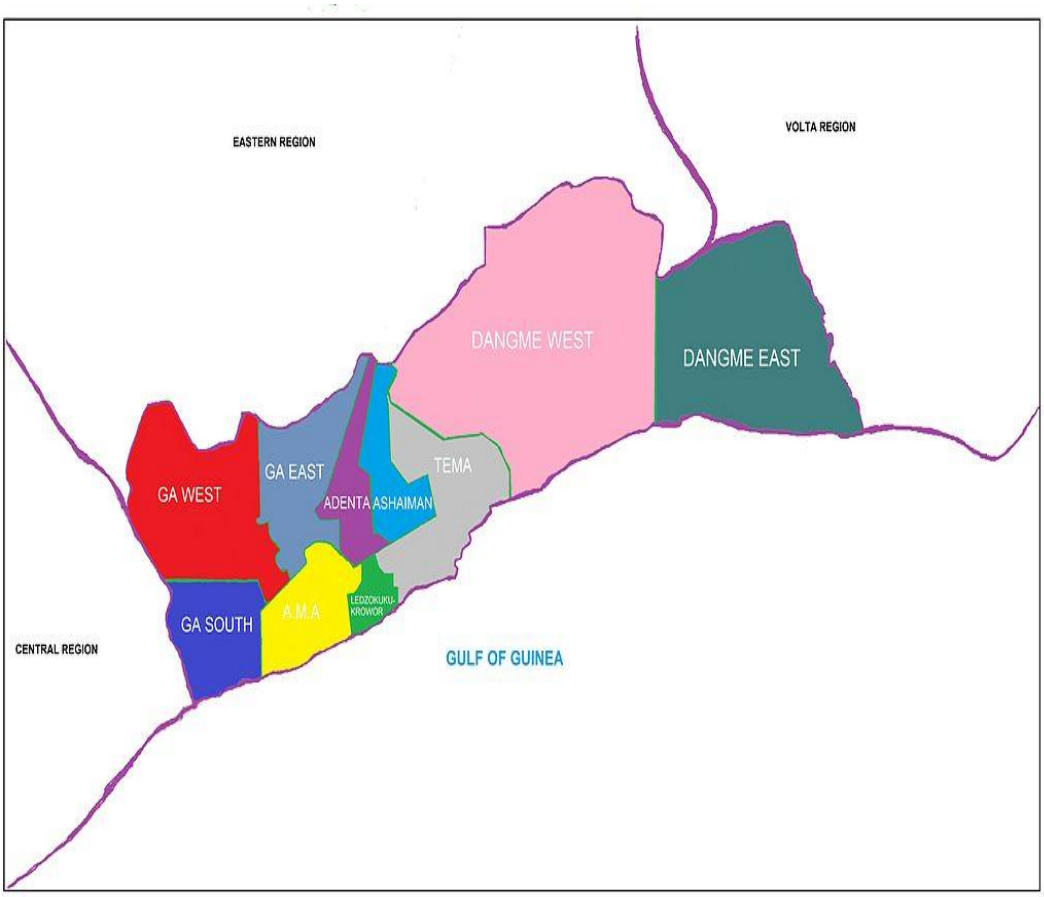

Figure 3: Map showing the Ga South District location. (Source: Google)

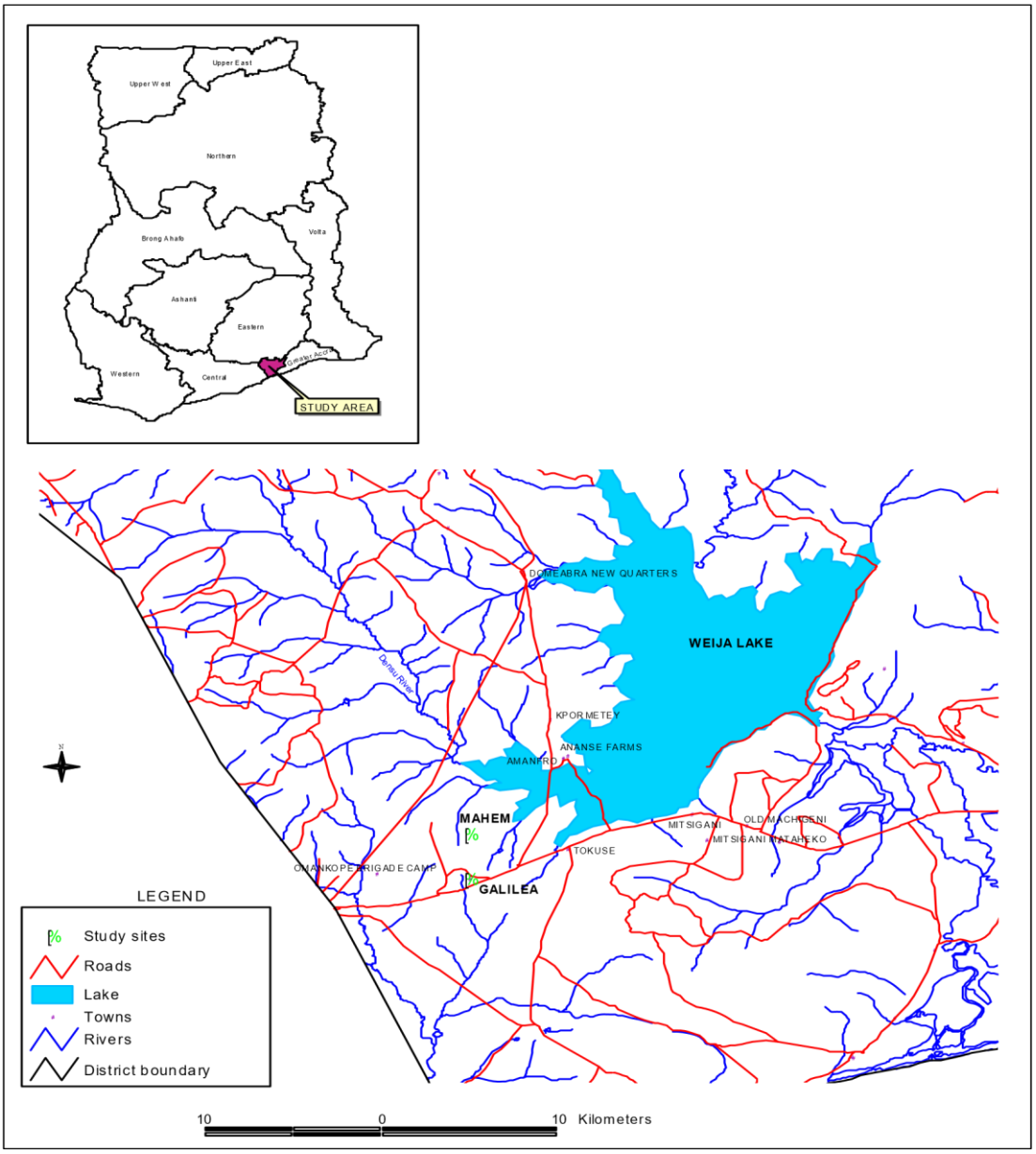

Figure 4: Map of Galilea and Mahem Communities. (Source: Google)

3.4 Study Population

The study population included household heads from the Galilea and Mahem communities within the Ga South District. A household head is an individual who has an economic and social responsibility for the household. The choice for household heads was due to the key decisions they take regarding the health of family members.

3.4.1 Inclusion criteria

Household heads who were at least 18 years old, had lived in the community or area for at least a year and had given their consent to partake in the study.

3.4.2 Exclusion criteria

Household heads who were below 18 years of age, had lived in the community for less than a year and did not give their consent to partake in the study.

3.5 Study variables

3.5.1 Independent Variables

- Socio-demographic factors of the respondents such as age, sex, occupation, level of education and area of residence.
- The respondents' level of knowledge of schistosomiasis such as the knowledge of the signs and symptoms, duration of the signs and symptoms, and cultural beliefs.
- Factors associated with healthcare-seeking choice or actions such as accessibility, affordability, availability, efficacy, and time.

3.5.2 Dependent Variable

The healthcare-seeking behaviour for schistosomiasis-related signs and symptoms.

3.6 Sample Size of the Study

The sample size for this study was calculated using Cochran's (1977) sample size estimation formula as given below:

$$n = \frac{Z^2 p(1-p)}{d^2}$$

where n is the sample size

Z^2 is the standard normal variate for level of significance = 1.96

d is the desired level of precision or margin of error = 0.05

p is the proportion population based on a previous study or pilot survey = 50% or 0.50

Total number of households in both communities, N = 650

$$n = \frac{(1.96)^2 0.5(1-0.5)}{(0.05)^2} = \frac{0.9604}{0.0025} = 384.16$$

The sample size was then modified using the finite study population formula, $S = \frac{nN}{n+(N-1)}$

$$S = \frac{384.16 \times 650}{384.16 + (650 - 1)} = \frac{249704}{1033.16} = 242$$

The total sample size for the study was 242 household heads.

3.7 Sampling

The Mahem and Galilea communities within the Ga South District were purposively selected for the study because of their closeness to the Weija lake, which is understood to be infected with *Schistosome* parasites (Armoo et al., 2020). Also, both communities are endemic for schistosomiasis, and they rely extensively on the Weija lake as their source of water, making the lake a source of schistosomiasis infection.

The simple random sampling technique was applied in selecting the house numbers to ascertain the household heads for data collection. Averagely, a house in the Ga South District comprised of three to five households. Computer-generated random numbers were used to randomly select the households, which subsequently led to the identification and selection of household heads for the study. The sampling was done without replacement. The simple random sampling technique was preferred to other sampling techniques since it allowed for an equal chance of the household heads to be selected for the study. A total of 242 household heads were randomly selected for the study.

3.8 Data Collection Tool or Technique

A structured questionnaire was used for the collection of data in the study communities. A face-to-face interview was employed to administer the questionnaire to respondents. The

questionnaire comprised of four sections. The first section collected data on the socio-demographic characteristics of the respondents, such as age, sex, occupation, level of education, marital status, and area of residence. The second section sought information on the level of knowledge of respondents on schistosomiasis which included the knowledge of the signs and symptoms, duration of the infection, and cultural beliefs. Questions like these (Have you heard of schistosomiasis?, How is schistosomiasis contracted?, Who is likely to have schistosomiasis in the community?, What is seen when one has schistosomiasis?, What is done when someone has schistosomiasis in the family?, and Men who experience the passage of blood in urine are experiencing what infection?) were used to assess the knowledge level of respondents (as shown in appendix 2) on schistosomiasis.

The third section of the questionnaire focused on the healthcare-seeking actions, which included visit to the hospital, visit to the herbalist for traditional medicine, self-medicating with allopathic drugs and doing nothing. Finally, the fourth section sought information on the factors associated with the healthcare-seeking choice or actions such as accessibility, affordability, availability, efficacy, and time. To ensure effective collection of data, the principal investigator and two other trained research assistants collected data from both communities.

3.9 Pre-testing

As part of ensuring that quality data was collected for the analysis of the study, the data collection tool was pre-tested on 20 household heads at Omega Community in the Ga South District before the actual administration in the study area. The pretesting was done to assess the reliability and validity of the data collection tool. Besides, the pre-testing was useful in determining whether respondents understood the questions and had appropriate information for the questions.

3.10 Data Analysis

Data collected for the study was edited to ensure that the necessary corrections were made. The data was then coded, categorized, and processed using Microsoft Excel and exported to SPSS version 21 for analysis. In analyzing the research questions and objectives of the study, the independent variables for the study were analyzed using a descriptive statistical test which involved frequencies and percentages. Cross tabulations were performed on the sex and area of residence of the respondents against the first and second line of healthcare-seeking actions for schistosomiasis-related signs and symptoms. Chi-square analysis was performed to test the association between the socio-demographic factors of the respondents and their healthcare-seeking behaviours. Binary logistic regression was conducted to analyze the association between the socio-demographic characteristics and visit to the hospital and self-medication.

3.11 Quality Control

The structured questionnaire (data collection tool) was designed in relation to the objectives of the study and inputs from my research supervisor. Based on the information gathered from the pre-testing conducted, the questionnaire was revised. As a way of ensuring that quality data was collected for the study, two research assistants were recruited and trained thoroughly by the principal investigator for the data collection process. The objectives of the study were also explained to them to help them perform the survey task. The principal investigator was involved actively during the data collection process and besides supervised the research assistants to ensure that the right responses from participants were recorded. Some of the completed forms were randomly selected and cross-checked from time to time to identify errors been recorded.

3.12 Ethical Considerations

Ethical approval was sought from the Ghana Health Service Ethics Review Committee (GHS-ERC) before the start of the study. Approval to conduct the research was also sought from the

Ga South Health Directorate. Consent was sought individually from respondents after the aim of the study was verbally explained to them. Participants who were unable to read and write in English had the study interpreted to them in their local dialect by an interpreter. Moreover, participants who were not able to sign on the consent forms were allowed to thumbprint as a more comfortable alternative. Respondents' confidentiality and privacy were ensured in the study. Any information given by the respondents were treated with the utmost confidentiality. As part of ensuring confidentiality, codes were assigned to participants who were recruited to be part of the study rather than using their real names so that no one would be able to trace any information back to the participants. Participants' names were not used in the writing of the report, but their ideas and suggestions were helpful in the conduction of the study. Respondents who participated in the study was voluntary, and they were informed about their right to either refuse or be a part of the study. They were not under any obligation to participate, and also, they were at liberty to pull out from the study at any given point in time. They were informed about their right to refuse to participate at any point in time during the data collection process. Due to the emergence of COVID-19 at the time of data collection, some precautionary measures such as the wearing of face mask, sanitization of the hands with alcohol-based sanitizers, and social distancing were enforced before, during, and after the administration of the questionnaires to the respondents who were recruited voluntarily for the study. The data collected for the study was stored with a password on the principal investigator's computer.

3.13 Funding

This study was self-sponsored by the principal investigator.

CHAPTER FOUR

4.0 RESULTS

4.1 Introduction

This chapter provides detailed results of the healthcare-seeking behaviour for schistosomiasis related signs and symptoms in the Galilea and Mahem communities within the Ga South District. It also presents comprehensive results of the respondents' level of knowledge of schistosomiasis-related signs and symptoms, healthcare-seeking actions and factors influencing the choice of healthcare.

4.2 Socio-demographic characteristics of respondents

Table 1 presents the socio-demographic characteristics of household heads that were sampled for the study. Respondents between the ages of 26-35 years had the highest frequency representing 28.1% (68) while those between the ages of 56 years and above had the lowest frequency constituting 9.5% (23). In terms of the sex of the respondents, 68.6% (166) were males (166), whereas the remaining 31.4% (76) were females. With regards to the marital status, 83.9% (203) of the respondents were married, followed by those who were divorced representing 7.4 % (18), those who were widowed representing 5% (12) and those who were single representing 3.7% (9). Based on the educational qualification of respondents, the study found that 41.8% (101) had completed Middle School/JHS, followed by those who had completed Basic School representing 26% (63), those who had completed Senior High were 16.9% (41), those who had no formal education were 12.4% (30), and the remaining 2.9% (7) had completed tertiary education. In relation to the ethnicity of the respondents, it was found that majority of the respondents were Ewes representing 32.6% (79). In line with the occupational status of the respondents, 43% (104) were traders, 41.3% (100) were fisherfolks, 6.6% (16) were in the teaching field, 6.2% (15) were labourers, and the remaining 2.9% (7) were engaged in other jobs.

For the religious status of the respondents, 87.2% (211) were Christians, 12% (29) belonged to the Islamic religion, and 0.8% (2) belonged to the African Traditional Religion. For the residential background of respondents, 50% (121) resides at Galilea, while the remaining 50% (121) reside at Mahem. Furthermore, 36% (87) of the respondents had lived in their community for 10 years and above, followed by those who had lived for 1-5 years constituting 32.2 % (78), and those who had lived for 6-9 years representing 31.8% (77).

Table 1: Socio-demographic characteristics of household heads

Characteristic	Frequency	Percentage (%)
Age		
18-25	48	19.9
26-35	68	28.1
36-45	62	25.6
46-55	41	16.9
56 and above	23	9.5
Total	**242**	**100**
Sex		
Male	166	68.6
Female	76	31.4
Total	**242**	**100**
Marital status		
Married	203	83.9
Divorced	18	7.4
Widowed	12	5.0
Single	9	3.7
Total	**242**	**100**
Educational qualification		
Basic school	63	26.0
Middle school/JHS	101	41.8
SHS	41	16.9
Tertiary	7	2.9

No formal education	30	12.4
Total	**242**	**100**
Ethnicity		
Akan	71	29.4
Ga-Adangbe	59	24.4
Ewe	79	32.6
Hausa	25	10.3
Others	8	3.3
Total	**242**	**100**
Main occupation		
Teaching	16	6.6
Fishing	100	41.3
Trading	104	43.0
Labourer	15	6.2
Others	7	2.9
Total	**242**	**100**
Religious background		
Christian	211	87.2
Islamic	29	12.0
African Traditional	2	0.8
Total	**242**	**100**
Area of residence		
Galilea	121	50
Mahem	121	50
Total	**242**	**100**
Length of stay in the area		
1-5 years	78	32.2
6-9 years	77	31.8
10 years and above	87	36.0
Total	**242**	**100**

4.3 Sources of water and usage of water from the lake

Figure 5 provides details as to the sources of water available to residents in both communities within the Ga South District. The respondents' indicated they had access to multiple sources of water such as borehole, lake, pipe borne water, and hand dug well. Therefore, the study revealed that 98.35% of the respondents indicated that pipe-borne water was a major source of water been used by residents of Galilea and Mahem communities in the Ga South District. Furthermore, the results showed that apart from pipe-borne been the major source of water, residents also obtain water from the lake (88.84%), borehole (34.71%), and hand-dug well (25.62%) as shown in fig 5 below.

On the other hand, the study sought the views of respondents regarding what they use water from the lake for (Table 2). It was found that 27.7% (67) of the respondents used the water for bathing, 57.8% (140) for washing, 2.1% (5) for construction purposes, 0.8% (2) for gardening, and 0.4% (1) for cooking. However, 11.2% (27) of the respondents indicated that water from the lake does not serve any purpose to them. In line with how often respondents fetch water from the lake within a day (Table 3), 21.5% (52) of them fetch water once, 36.4% fetch water twice, 25.2% (61) fetch water thrice, and 5.7% (14) fetch water four times. Additionally, 11.2% (27) of the respondents indicated that they do not fetch from the lake because water from it does not serve any purpose to them.

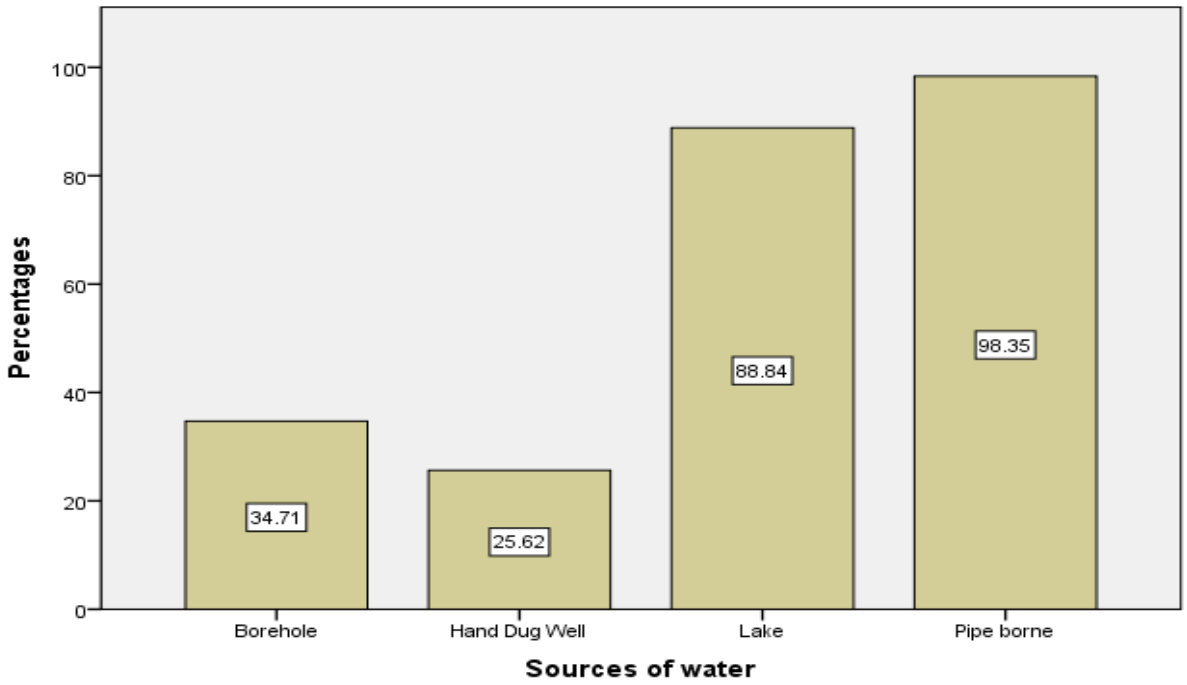

Figure 5 Sources of water (multiple responses)

Table 2: Usage of water from the lake

Variable	Frequency	Percentage (%)
Water purpose		
Bathing	67	27.7
Washing	140	57.8
Construction	5	2.1
Gardening	2	0.8
Cooking	1	0.4
None	27	11.2
Total	**242**	**100**

Table 3: How often respondents fetch water from the lake within a day

Variable	Frequency	Percentage (%)
Water fetch (Lake)		
Once	52	21.5
Twice	88	36.4
Thrice	61	25.2
Four times	14	5.7
None	27	11.2
Total	**242**	**100**

4.4 Knowledge of Schistosomiasis-related signs and symptoms

Table 4 presents knowledge of the respondents about the signs and symptoms related to schistosomiasis. From the study, 92.6% (224) of the respondents specified that they have ever heard of schistosomiasis while the remaining 7.4% (18) suggested otherwise. Based on how schistosomiasis is contracted, 10.7% (26) of the respondents indicated that it is contracted by drinking infected water, 78.9% (191) of them suggested it is contracted by swimming or walking in infected water, and the remaining 10.4% (25) of the respondents indicated they do not know how it is contracted. Concerning the susceptibility of schistosomiasis, 52.9% (128) of the respondents specified that boys were more susceptible, 43.8% (106) of them said men were more susceptible, 2.5% (6) indicated that girls were more susceptible and 0.8% (2) of the respondents stated women were more susceptible.

Majority of the respondents, 79.3% (192) asserted that men experiencing the passage of blood in urine from their penis is a sign of schistosomiasis. Furthermore, 20.3% (49) of the respondents also indicated that the passage of blood in urine is a sign of sexually transmitted infection. In comparison, 0.4% (1) of the respondents specified the passage of blood during urination as a sign of malaria.

Figure 6 provides details on the signs and symptoms related to schistosomiasis, as indicated by the respondents. With reference to the signs and symptoms of schistosomiasis, respondents noted that abdominal pain, blood in faeces, fever, blood in urine, painful urination, diarrhoea and swollen belly with their corresponding percentages of 44.63%, 37.19%, 20.66%, 80.58%, 41.74%, 20.66%, and 21.9% were likely to be seen as a result of schistosomiasis. Besides, 9.504% of the respondents did not know any sign or symptom related to schistosomiasis.

Table 4: Knowledge of schistosomiasis-related signs and symptoms by respondents

Variable	Frequency	Percentage (%)
Ever heard of schistosomiasis		
Yes	224	92.6
No	18	7.4
Total	**242**	**100**
Schistosomiasis contraction		
Drink infected water	26	10.7
Walk or swim in infected water	191	78.9
Don’t know	25	10.4
Total	**242**	**100**
Susceptibility of schistosomiasis		
Boys	128	52.9
Girls	6	2.5
Men	106	43.8
Women	2	0.8
Total	**242**	**100**
Blood in the urine is a sign of:		
Malaria	1	0.4
Sexually transmitted infection	49	20.3
Schistosomiasis	192	79.3
Total	**242**	**100**

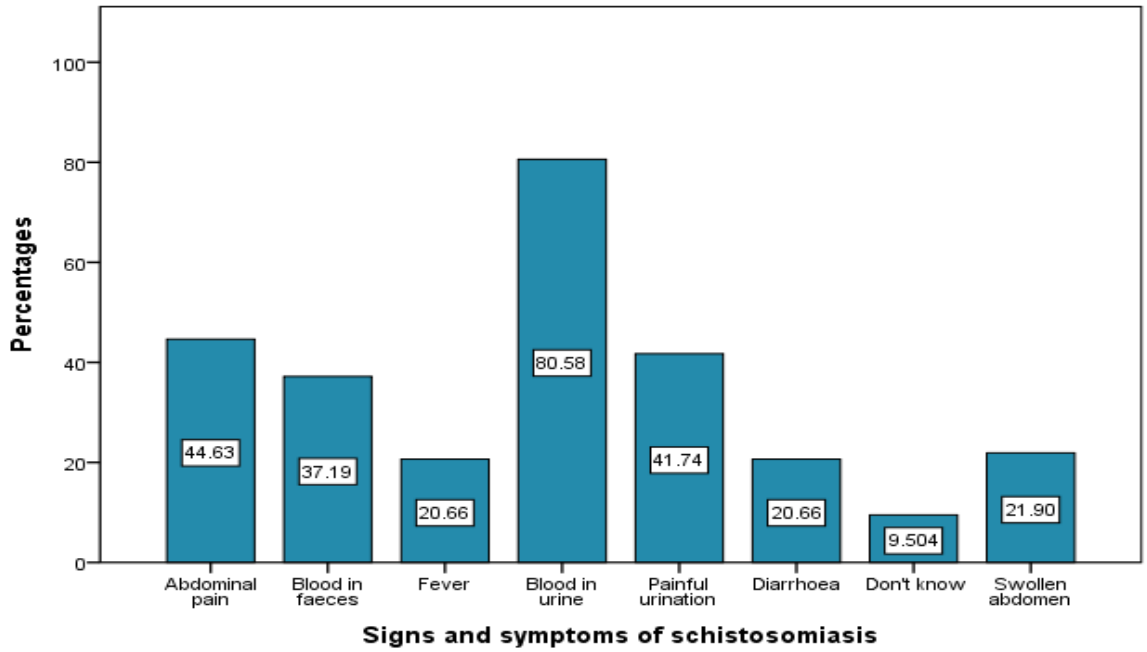

Figure 6 Knowledge of signs and symptoms of schistosomiasis by respondents

4.5 Healthcare-seeking behaviour for schistosomiasis-related signs and symptoms

Table 5 presents information on the healthcare-seeking behaviour for schistosomiasis-related signs and symptoms. A greater proportion of the respondents (77.7%) indicated that infected persons within the family would visit the hospital for treatment, 16.9% specified that infected persons within the family would undertake self-medication with allopathic drugs, and 5.4% indicated that infected persons would visit the herbalist for traditional treatment.

When respondents were asked about the stage of schistosomiasis infected persons within their families would seek for healthcare, 82.2% (199) of the respondents (household heads) specified that infected persons would seek for healthcare as soon as the symptoms were recognized, 16.6% (40) of the respondents (household heads) specified that infected persons would seek for healthcare when symptoms persist for one week, 0.8% (2) of the respondents (household heads) indicated that infected persons would seek for healthcare when symptoms persist for

two weeks, and 0.4% (1) of the respondent (household heads) noted that infected persons would seek for healthcare when symptoms persist for three or more weeks.

With regards to who decides where infected persons should seek for healthcare, 58.3% (141) of the respondents specified that the father chooses where infected persons should seek for healthcare, 23.1% (56) of the respondents indicated that the head of the house decides where infected persons should seek for healthcare, and 18.6% (45) of the respondents specified that the mother chooses where infected persons should seek for healthcare.

Concerning the groups of people who were most likely to seek for healthcare, 55.4% (134) of the respondents indicated that boys were most likely to seek for healthcare, 2.9% (7) of the respondents specified that girls were most likely to seek for healthcare, 40.9% (99) of the respondents indicated that men were most likely to seek for healthcare, and 0.8% (2) of the respondents noted that women were most likely to seek for healthcare.

Table 5: Healthcare-seeking behaviours of respondents for schistosomiasis

Variable	Frequency	Percentage (%)
Healthcare-seeking behaviour		
Go to the herbalist (traditional treatment)	13	5.4
Go to the hospital or clinic	188	77.7
Self-medication (allopathic drugs)	41	16.9
Total	**242**	**100**
Healthcare-seeking stage		
As soon as the symptoms are recognized	199	82.2
When symptoms persist for one week	40	16.6
When symptoms persist for two weeks	2	0.8
When symptoms persist for three or more weeks	1	0.4
Total	**242**	**100**
Healthcare-seeking decision taker		
Father	141	58.3
Head of the house	56	23.1
Mother	45	18.6
Total	**242**	**100**
Groups likely to seek healthcare		
Boys	134	55.4
Girls	7	2.9
Men	99	40.9
Women	2	0.8
Total	**242**	**100**

The association between the socio-demographic factors of the respondents and their healthcare-seeking behaviour is shown in Table 6 below. From the Chi-square test, it was revealed that the age of the respondents did not show a significant association with their healthcare-seeking behaviour (p=0.969). Moreover, the sex of the respondents did not show a significant association with their healthcare-seeking behaviour (p=0.127). Likewise, the educational qualification of the respondents was not statistically significant with their healthcare-seeking behaviour (p=0.328). Similarly, the occupation of the respondents was not statistically significant with their healthcare-seeking behaviour (p=0.368). The ethnicity of the respondents did not also show a significant relationship with their healthcare-seeking behaviour (p=0.101). The marital status of the respondents according to the Chi-square test, was not statistically significant (p=0.932). There was no association between the religious status of the respondents and their healthcare-seeking behaviour (p=0.318). Among the demographic factors of the respondents, only the area of residence showed a significant association with their healthcare-seeking behaviour (p=0.007).

Table 6: Association between socio-demographic factors and healthcare-seeking behaviours

	Go to the herbalist	Go to the hospital	Self-medication	Total	Chi-square value	P-value
Age (years)					**2.331**	**0.969**
18-25	1	38	9	48		
26-35	5	51	12	68		
36-45	3	50	9	62		
46-55	3	31	7	41		
56 and above	1	18	4	23		
Total	**13**	**188**	**41**	**242**		
Sex					**4.126**	**0.127**
Male	11	123	32	166		
Female	2	65	9	76		
Total	**13**	**188**	**41**	**242**		
Educational qualification					**9.173**	**0.328**
Basic school	2	47	14	63		
Middle school/JHS	5	84	12	101		
SHS	2	32	7	41		
Tertiary	0	6	1	7		
No formal education	4	19	7	30		
Total	**13**	**188**	**41**	**242**		

Main Occupation					**8.699**	**0.368**
Teaching	0	15	1	16		
Fishing	8	70	22	100		
Trading	4	86	14	104		
Labourer	1	12	2	15		
Others	0	5	2	7		
Total	**13**	**188**	**41**	**242**		
Ethnicity					**13.325**	**0.101**
Akan	3	63	5	71		
Ga-Adangbe	4	42	13	59		
Ewe	4	60	15	79		
Hausa	1	16	8	25		
Others	1	7	0	8		
Total	**13**	**188**	**41**	**242**		
Marital status					**1.859**	**0.932**
Married	12	158	33	203		
Divorced	1	13	4	18		
Widowed	0	10	2	12		
Single	0	7	2	9		
Total	**13**	**188**	**41**	**242**		
Religious status					**4.717**	**0.318**

Christian	11	168	32	211		
Islamic	2	19	8	29		
African Traditional	0	1	1	2		
Total	**13**	**188**	**41**	**242**		
Area of residence					**9.930**	**0.007**
Galilea	11	85	25	121		
Mahem	2	103	16	121		
Total	**13**	**188**	**41**	**242**		

4.6 Healthcare-seeking actions for schistosomiasis-related signs and symptoms

When respondents were asked about their first line of healthcare-seeking action for schistosomiasis-related signs and symptoms (Table 7), 76.9% (186) of the respondents indicated that going to the hospital or clinic was their first line of action, 17.8% (43) stated that they resort to self-medication with allopathic drugs, and 5.4% (13) indicated that going to the herbalist for traditional treatment was their first line of action. For respondents second line of action for schistosomiasis-related signs and symptoms, 66.9% (162) of respondents indicated that self-medication with allopathic drugs was their second line of action in an event where the first line of action failed, 16.9% (41) of the respondents noted that going to the herbalist for traditional treatment was their second line of action in an event where the first line of action failed, and 16.2% (39) of the respondents specified that going to the hospital or clinic was their second line of action in an event where the first line of action failed.

Table 7: Healthcare-seeking actions of respondents for schistosomiasis

Variables	Frequency	Percentage (%)
The first line of action		
Go to the herbalist (traditional medicine)	13	5.4
Go to the hospital	186	76.8
Self-medication (allopathic drugs)	43	17.8
Total	**242**	**100**
The second line of action		
Go to the herbalist (traditional medicine)	41	16.9
Go to the hospital	39	16.2
Self-medication (allopathic drugs)	162	66.9
Total	**242**	**100**

Table 8 and 9 below present the cross tabulation of sex and area of residence of the respondents against the first and second line of healthcare-seeking actions. Concerning the respondents first line of healthcare-seeking actions for schistosomiasis, 11 males as against 2 females indicated that they would go to the herbalist for traditional treatment as their first line of seeking healthcare for schistosomiasis, 121 males as against 65 females specified that they would go to the hospital or clinic as their first line of seeking healthcare for schistosomiasis, and 34 males as against 9 females stated that they would self-medicate with allopathic drugs as their first line of seeking healthcare action against schistosomiasis. Regarding the respondents' second line of healthcare-seeking action for schistosomiasis in case the first line of action failed, 30 males as against 11 females specified that they would go to the herbalist for traditional treatment as their second line of action, 28 males as against 11 females indicated that they would go to the hospital or clinic as their second line of action, and 108 males as against 54 females stated that they would self-medicate with allopathic drugs as their second line of action should the first line of seeking healthcare failed.

Regarding the respondents first line of healthcare-seeking action, 11 respondents from Galilea as against 2 respondents from Mahem revealed that they would go to the herbalist for traditional treatment as their first line of seeking healthcare, 82 respondents from Galilea as against 104 respondents from Mahem indicated that they would go to the hospital, and 28 respondents from Galilea as against 15 respondents from Mahem stated that they would self-medicate with allopathic drugs. For the second line of healthcare-seeking actions by respondents, 26 of them from Galilea as against 15 of them from Mahem specified that they would go to the herbalist for traditional treatment as their second line of seeking healthcare for schistosomiasis, 26 of the respondents from Galilea as against 13 of the respondents from Mahem stated that they would go to the hospital, and 69 of the respondents from Galilea as against 93 of the respondents from Mahem revealed that they would self-medicate with allopathic drugs as their

second line of action should in case the first line of seeking healthcare for schistosomiasis-related signs and symptoms fails.

Table 8: Cross tabulation of sex and area of residence against the first line of healthcare-seeking action

Characteristics	Go to the herbalist	Go to the hospital	Self-medication	Total	Chi-square value	P-value
Sex					**4.822**	**0.090**
Male	11	121	34	166		
Female	2	65	9	76		
Total	**13**	**186**	**43**	**242**		
Area of residence					**12.763**	**0.002**
Galilea	11	82	28	121		
Mahem	2	104	15	121		
Total	**13**	**186**	**43**	**242**		

Table 9: Cross tabulation of sex and area of residence against the second line of healthcare-seeking action

Characteristics	Go to the herbalist	Go to the hospital	Self-medication	Total	Chi-square value	P-value
Sex					**0.863**	**0.649**
Male	30	28	108	166		
Female	11	11	54	76		
Total	**41**	**39**	**162**	**242**		
Area of residence					**10.840**	**0.004**
Galilea	26	26	69	121		
Mahem	15	13	93	121		
Total	**41**	**39**	**162**	**242**		

In line with the Pearson Chi-square test, it was shown that there was no significant relationship between the sex of the respondents and the first line of healthcare-seeking actions for schistosomiasis (p=0.090). However, concerning the area of residence of the respondents and the first line of healthcare-seeking actions for schistosomiasis, there was a significant relationship (p=0.002). Also, with the Pearson Chi-square test, it was revealed that there was no significant relationship between the sex of the respondents and the second line of healthcare-seeking actions for schistosomiasis (p=0.649). On the other hand, there was a significant relationship between the area of residence of the respondents and the second line of healthcare-seeking actions for schistosomiasis (p=0.004).

4.7 Factors influencing healthcare-seeking actions

In line with the factors influencing the respondents' healthcare-seeking actions (Table 10), 83.9% of them chose the hospital or clinic due to accessibility, 33.5% of them picked the hospital due to affordability, 83.9% of the respondents opted for the hospital due to availability, 92.1% of them chose it due to efficacy, and 42.1% of the respondents chose the hospital due to the time spent to receive healthcare. Furthermore, 72.3% of the respondents preferred self-medication with allopathic drugs based on accessibility, 72.7% of them preferred self-medication with allopathic drugs because of affordability, 74% of the respondents indicated self-medication with allopathic drugs as a result of availability, 28.9% of them selected self-medication with allopathic drugs because of efficacy, and 75.6% stated self-medication with allopathic drugs due to time spent to receive healthcare. Besides, when respondents were asked about their reasons for visiting or choosing the herbalist for traditional treatment as their healthcare-seeking choice, 26.4% indicated accessibility as their reason, 26% specified affordability as their reason, 25.2% stated availability as their reason, 14.9% identified efficacy as their reason, and 25.6% indicated time spent to receive treatment as their reason.

Table 10: Factors influencing the choice of healthcare

Variable	Hospital	Self-medication	Herbalist
Factors			
Accessibility	203(83.9%)	175(72.3%)	64(26.4%)
Affordability	81(33.5%)	176(72.7%)	63(26.0%)
Availability	216(89.3%)	179(74.0%)	61(25.2%)
Efficacy	223(92.1%)	70(28.9%)	36(14.9%)
Time	102(42.1%)	183(75.6%)	62(25.6%)

Note: Multiple responses

Table 11: Binary logistic regression of socio-demographic characteristics with hospital visit

Variables	Odds ratio	P-value	95% CI
Age group (years)			
18-25	1		
26-35	0.903	0.851	0.309, 2.633
36-45	1.723	0.362	0.535, 5.550
46-55	0.771	0.686	0.219, 2.714
56 and above	1.517	0.582	0.344, 6.687
Sex			
Male	1		
Female	1.772	0.308	0.590, 5.320
Area of residence			
Galilea	1		
Mahem	2.957	**0.004**	**1.410, 6.199**
Length of stay in area			
1-5 years	1		
6-9 years	1.138	0.790	0.439, 2.952
10 years and above	0.778	0.601	0.303, 1.997
Religious status			
Christian	1		
Islamic	0.464	0.447	0.064, 3.357

African Traditional	0.427	0.596	0.018, 9.920
Marital status			
Married	1		
Divorced	0.544	0.362	0.147, 2.016
Widowed	1.433	0.700	0.230, 8.908
Single	0.401	0.337	0.062, 2.590
Education			
Basic School	1		
Middle school/JHS	1.187	0.698	0.500, 2.817
SHS	0.357	0.091	0.108, 1.177
Tertiary	0.220	0.357	0.009, 5.536
No formal education	0.439	0.142	0.147, 1.316
Occupation			
Teaching	1		
Fishing	0.076	0.078	0.004, 1.330
Trading	0.103	0.114	0.006, 1.720
Labourer	0.203	0.310	0.009, 4.413
Others	0.094	0.128	0.004, 1.981
Ethnicity			
Akan	1		
Ga-Adangbe	0.293	**0.033**	**0.0905, 0.905**
Ewe	0.358	0.054	0.126, 1.018
Hausa	0.358	0.376	0.037, 3.480
Others	0.915	0.952	0.051, 16.410

1 refers to the reference category

Table 12: Binary logistic regression of socio-demographic characteristics with self-medication

Variables	Odds ratio	P-value	95% CI
Age group (years)			
18-25	1		
26-35	0.810	0.720	0.255, 2.566
36-45	0.593	0.412	0.171, 2.064
46-55	0.832	0.795	0.208, 3.334
56 and above	0.651	0.590	0.137, 3.101
Sex			
Male	1		
Female	0.664	0.501	0.202, 2.187
Area of residence			
Galilea	1		
Mahem	0.471	0.062	0.214, 1.037
Length of stay in area			
1-5 years	1		
6-9 years	0.852	0.761	0.303, 2.393
10 years and above	0.888	0.821	0.317, 2.487
Religious status			
Christian	1		
Islamic	2.227	0.481	0.240, 20.643
African traditional	5.866	0.281	0.234, 146.748
Marital status			
Married	1		
Divorced	2.329	0.237	0.573, 9.462
Widowed	1.734	0.573	0.256, 11.755
Single	3.768	0.173	0.560, 25.350
Education			
Basic school	1		
Middle school/JHS	0.628	0.344	0.240, 1.647
SHS	2.430	0.172	0.679, 8.695
Tertiary	4.177	0.391	0.159, 109.557

No formal education	1.215	0.749	0.367, 4.019
Occupation			
Teaching	1		
Fishing	8.117	0.153	0.460, 143.149
Trading	6.232	0.197	0.387, 100.447
Labourer	3.009	0.495	0.127, 71.425
Others	9.237	0.153	0.438, 194.808
Ethnicity			
Akan	1		
Ga-Adangbe	4.330	**0.025**	**1.200, 15.630**
Ewe	3.626	**0.035**	**1.095, 12.006**
Hausa	3.977	0.280	0.325, 48.634
Others	0.000	0.999	0.000

1 refers to the reference category

Table 11 and 12 above presents the association between the socio-demographic characteristics of the respondents and hospital visit and as well as self-medication respectively. The association between the socio-demographic characteristics of the respondents and hospital visit and as well as self-medication was performed using binary logistic regression to estimate the P-values and odds ratios at a 95% confidence interval.

From table 11, there was a significant association between residence in Mahem and visit to the hospital (OR=2.957; 95% CI 1.410, 6.199, P-value=0.004). Also, there was a significant association between Ga-Adangbe's and visit to the hospital (OR=0.293; 95% CI 0.0905, 0.905, P-value=0.033).

From table 12, there was a significant association between Ga-Adangbe's and self-medication (OR=4.330; 95% CI 1.200, 15.630, P-value=0.025) and also Ewe's and self-medication (OR=3.626; 95% CI 1.095, 12.006, P-value=0.035).

CHAPTER FIVE

5.0 Discussion

This chapter presents a brief discussion of the results conducted in chapter four (4). This chapter highlights on discussions such as the socio-demographic characteristics of respondents, the healthcare-seeking actions of household heads (respondents), the respondents' level of knowledge of schistosomiasis, and the factors influencing respondents' healthcare-seeking actions. This chapter is divided into subsections below:

5.1 Socio-demographic characteristics of respondents (household heads)

Socio-demographic characteristics such as age, level of education, sex, occupation, marital status and area of residence have been widely reported to affect the healthcare-seeking behaviour for schistosomiasis. In a study conducted by Sacolo, Chimbari, and Kalinda (2018), it was revealed that uneducated people were more susceptible to schistosomiasis due to poor knowledge on preventive and control measures as compared to educated people. This contradicts what was revealed by this study which showed that educational qualification was not statistically significant with healthcare-seeking behaviour for schistosomiasis. Both educated and uneducated people had a sound knowledge of schistosomiasis in the district which could be attributed to the frequent educational campaigns organized by the district health directorate in both communities.

From the study, marital status had no significant association with healthcare-seeking behaviour of respondents for schistosomiasis. This finding refutes what was conducted among care givers in Tanzania were married women had significantly higher levels of knowledge related to schistosomiasis compared to unmarried women (Ng'weng'weta & Tarimo, 2017). Area of residence was significantly associated with healthcare-seeking behaviour for schistosomiasis which affirms the study conducted by Danso-Appiah et al. (2010), where people in Tomefa were more likely to visit a health facility than those in Manheim.

5.2 Level of knowledge for schistosomiasis-related signs and symptoms by respondents

The study revealed that the respondents had a sound knowledge and awareness of schistosomiasis in both communities within the district. The improved knowledge and high awareness of the disease could be attributed to the educational interventions and research activities regularly conducted in these communities within the Ga South District. This finding corresponds with earlier studies conducted in Zimbabwe where it was stated that people living in the villages were critically aware of schistosomiasis (Ndamba, Makura, Gwatirisa, Makaza, & Kaondera, 1998). Also, in a study organized in Brazil, it was shown that the people were moderately aware of schistosomiasis (Uchoa et al., 2000). The finding is also similar to what was conducted by (D. R. Yirenya-Tawiah et al., 2011) in the Volta Basin of Ghana where the respondents had a broad knowledge of schistosomiasis.

Regarding the transmission of schistosomiasis, the respondents indicated that walking or swimming in infected water bodies (lake) and drinking infected water could cause one to contract schistosomiasis. This finding is congruent with a study conducted in Northern Cote d'Ivoire and Southern Mauritania where it was revealed by the respondents that drinking infected water and swimming or walking in infected water bodies could lead to one contracting schistosomiasis (Koffi, Doumbia, Fokou, Keita, & Koné, 2018).

Concerning the signs and symptoms related to schistosomiasis, the respondents stated that blood in urine, painful urination, diarrhoea, blood in faeces, swollen abdomen, fever, and abdominal pain are all signs and symptoms related to schistosomiasis. In this study, the respondents asserted that blood in the urine (haematuria) was seen as a sign of schistosomiasis in both communities rather than it been attributed to male menstruation. This finding contradicts with what was found in Southeastern Nigeria, where the respondents indicated blood in urine as a sign of growth among males and females (Ukwandu & Nmorsi, 2004). Furthermore, this finding confirms what was conducted in the Ga District where community

members identified blood in urine as a symptom of bilharzia and not as a sign of male menstruation (Codjoe & Larbi, 2016). With reference to the study, majority of the respondents indicated that boys and men were more susceptible to schistosomiasis than girls and women. This may be attributed to behavioural differences and occupational status as fisher folks (predominantly men) are mostly exposed to water bodies for several hours, and also children (especially boys) swim in infected water bodies during the hot seasons, therefore, increasing the susceptibility of these two groups to schistosomiasis. This finding confirms what was conducted in Rural Northern Ghana where it showed infections to be higher among males than females due to behavioural and cultural differences in gender roles (Anto et al., 2013). The finding also agrees to what was reported in earlier studies conducted in Adasawase in Ghana by (Kosinski et al., 2012) and in an urban area in Cote d'Ivoire by (M'Bra et al., 2018).

5.3 Healthcare-seeking behaviour for schistosomiasis-related signs and symptoms

The study showed that a greater proportion of the household heads indicated they would go to the hospital to seek healthcare for schistosomiasis-related signs and symptoms. A sizeable proportion of the household heads indicated that they would self-medicate as their way of seeking healthcare for schistosomiasis-related signs and symptoms. From the study, there was a significant association between the area of residence and healthcare-seeking behaviour for schistosomiasis-related signs and symptoms. This may be attributed to the endemicity of the disease and also the high awareness and knowledge of the disease in these localities. These findings agree with what was reported by (Danso-Appiah et al., 2010) that, people in the south are more likely to seek healthcare than people from the north and central. The study also revealed that patients were more likely to visit a hospital or self-medicate as a way of seeking healthcare for schistosomiasis.

From the study, boys dominated in seeking healthcare for schistosomiasis followed by men as the two groups were the most susceptible to the infection. This was due to the easy detection

of blood in their urine as compared to girls and women who often mistake the passage of blood in their urine as part of their menstrual cycle or a sign of sexually transmitted infection. The high percentage of men seeking for healthcare as compared to women in this study is not in agreement with the study conducted by (Galdas, Cheater, & Marshall, 2005) where men were reported to have poor healthcare-seeking behaviour compared to women.

Majority of the respondents indicated that they sought healthcare for schistosomiasis-related signs and symptoms as soon as the symptoms were recognized. This high percentage of respondents could be attributed to the perceived risk of the infection and also the awareness of the signs and symptoms of the disease. The study showed that fathers mostly decided where infected persons should seek healthcare for schistosomiasis-related signs and symptoms. This is similar to a research that was conducted in Navrongo which reported that male dominance had an impact on the healthcare-seeking behaviour of women (Ngom, Debpuur, Akweongo, Adongo, & Binka, 2003).

5.4 Healthcare-seeking actions for schistosomiasis-related signs and symptoms

For the first line of seeking healthcare for schistosomiasis-related signs and symptoms, a majority of the respondents indicated that they would go to the hospital or clinic followed by those who noted that they would self-medicate as their first line of seeking healthcare for schistosomiasis-related signs and symptoms. The high percentage of respondents going to the hospital as their first line of call for seeking healthcare could be attributed to the perceived quality of healthcare received (efficacy) in treating schistosomiasis-related signs and symptoms as compared to other treatment options. This is contrary to what was found in the Magu district of Tanzania, where a majority of the patients mostly visited the herbalist as their first line of seeking healthcare for schistosomiasis (Mwanga, Magnussen, & Aagaard-Hansen, 2004). In some cases, respondents engaged in multiple healthcare-seeking actions for schistosomiasis-related signs and symptoms either by visiting a hospital, self-medicating with allopathic drugs,

or visiting a herbalist for traditional treatment as the first line of seeking for healthcare and self-medicating, visiting a hospital, or visiting a herbalist as the second line of seeking for healthcare. This finding is congruent with what was reported by (Tabi et al., 2006) that, the use of traditional medical practice and other healthcare-seeking sources has always been a part of a typical Ghanaian community.

There was no significant relationship between the sex of the respondents and the first line of seeking healthcare for schistosomiasis-related signs and symptoms. On the other hand, there was a significant relationship between respondents' area of residence and the first line of seeking healthcare for schistosomiasis-related signs and symptoms. Likewise, there was no significant association between the sex of the respondents and the second line of healthcare-seeking action for schistosomiasis-related signs and symptoms. Nonetheless, there was a significant association between the respondents' area of residence and the second line of healthcare-seeking action for schistosomiasis. These findings are in line with what was reported earlier by (Danso-Appiah et al., 2010).

5.5 Factors influencing healthcare-seeking choice for schistosomiasis

According to this study, majority of the respondents chose the hospital as their main source of receiving treatment for schistosomiasis because of efficacy, whiles self-medication with allopathic drugs was most preferred based on affordability and time. These findings agree with what was reported by (Shaikh et al., 2008). These factors influence the healthcare-seeking behaviours or actions for schistosomiasis-related signs and symptoms.

The study revealed a significant association between the respondents residing in the Mahem community and visit to the hospital. This could be attributed to the availability and accessibility of the hospital to the residents in this community. This finding is not in agreement with the

study conducted by Danso-Appiah et al. (2010), where it was revealed that participants from Mahem were less likely to visit the hospital than participants from Tomefa.

The study also showed a significant association between Ga-Adangbe's and self-medication and as well as Ewe's and self-medication. This significant association could be attributed to the high user fees charged for receiving treatment from the hospital; hence people belonging to these ethnic groups prefer self-medication with allopathic drugs as a cheaper alternative. This finding affirms what was reported by Musuva et al. (2014), where participants felt that receiving treatment from the hospital was expensive, thereby causing them to seek for cheaper alternative treatment sources.

From the study, age, sex, level of education, and occupation did not show any significant association with hospital visit and self-medication.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 CONCLUSION

The study showed that the respondents had a sound knowledge and awareness of schistosomiasis-related signs and symptoms. Based on the socio-demographic characteristics of the household heads, it was noted that the area of residence was significantly associated with the healthcare-seeking behaviour or actions of respondents for schistosomiasis-related signs and symptoms. Majority of the respondents' indicated that they would visit the hospital as their first line of seeking healthcare for schistosomiasis-related signs and symptoms. Self-medication with allopathic drugs was the second most preferred treatment option behind hospital visit by the respondents. The factors influencing the choice of healthcare for schistosomiasis included accessibility, affordability, availability, efficacy, and time. The healthcare-seeking behaviour of inhabitants is, therefore, an important determinant in reducing the prevalence of schistosomiasis in these two communities.

6.2 RECOMMENDATIONS

District Health Directorate and the Ministry of Health should:

- Organize educational programmes regularly to educate the inhabitants on the adverse effects of engaging heavily in self-medication.
- Organize periodic, targeted treatment with praziquantel through large-scale treatment (preventive chemotherapy) of affected populations.

Health Organizations and Policymakers should:

- Frequently organize disease control programmes to help reduce the morbidity of the disease.
- Incorporate traditional and orthodox medicine fully in the healthcare delivery system of the country since a significant proportion of the population still utilize the traditional healthcare system.
- Introduce special incentives for people to seek healthcare from the hospital or clinic for schistosomiasis-related signs and symptoms.

Hospitals or Clinics in both Communities should:

- Improve the quality of healthcare (especially the time taken for infected persons to receive treatment).

Public Health

- Communities should organize regular clean-up exercises to help reduce the cycle of the infection.
- Protective clothing such as boots should be worn regularly by fisher folks to protect them against regular contact with infected water bodies.

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APPENDIX 1: PARTICIPANTS INFORMATION SHEET

Form number [ ]

Project title

HEALTHCARE-SEEKING BEHAVIOUR FOR SCHISTOSOMIASIS-RELATED SIGNS AND SYMPTOMS IN THE GA SOUTH DISTRICT

Name and address of Principal Investigator

David Boateng Appiah, School of Public of Health, University of Ghana, Accra, Legon.

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Email Address: appiahb.david@gmail.com

Institution affiliated

School of Public Health, University of Ghana, Legon, Accra. Department of Biological, Environmental and Occupational Health Sciences (BEOHS).

Introduction

David Boateng Appiah is my name. I am currently a student at the School of Public Health, the University of Ghana and I am researching the healthcare-seeking behaviour for schistosomiasis-related signs and symptoms in the Ga South District. Please kindly spend some few minutes to fill the questionnaire. All information collected will be treated as confidential, and no one will be able to trace any information back to you.

Procedure

The study is targeted at household heads because they take key decisions with regards to the health of family members and are responsible for the family member's health. Selection of participants will be done randomly and voluntarily. Participants will be made to complete a

questionnaire in return to the principal investigator. This is purely academic research, which forms part of my work for the award of a Master of Public Health.

Risks and Benefits

There is a minimal risk involved in the study due to the current COVID-19 situation; however, the study will help health planners and policymakers towards the integration of parasitic diseases control within the regular health services.

Right to refuse

Your concern to participate in this study is voluntary. You are not under any obligation to participate, and you are at liberty to withdraw from this study at any point in time. However, I will appreciate it if you can complete it.

Anonymity and Confidentiality

Be assured that, any information given will be used purely for this research. Any information given will be treated with the utmost confidentiality. Your name will not be used in any report, but your ideas and suggestions will help health planners and policymakers towards the integration of parasitic diseases control within the regular health services.

Dissemination of Results

The results of this study will be mailed to you if you provide your address below.

Before taking the consent, do you have any questions you wish to ask about the study?

Yes (if yes, questions to be noted below)

No

……

……

If you have questions later, you may contact me (David Boateng Appiah) on 0202947235 / 0242867542 or Dr. Mawuli Dzodzomenyo on (0208376845), all of the Department of Biological, Environmental and Occupational Health Sciences; School of Public Health, University of Ghana, Legon.

Your rights as a Participant

This research has been reviewed and approved by the Ethical Review Committee of the Ghana Health Service. If you have any questions about your right as a research participant, you can contact the Ethical Review Administrator on 0503539896 (Ms. Nana Abena Apatu). If you have any questions to ask me, (If yes, note questions below).

Costs and/or Payments to Subject for Participation in Research

Participants will not be compensated but will benefit from the awareness and changed policies the study might bring eventually.

Consent Form

STUDY TITLE: HEALTHCARE-SEEKING BEHAVIOUR FOR SCHISTOSOMIASIS-RELATED SIGNS AND SYMPTOMS IN THE GA SOUTH DISTRICT

Participant's Statement

The above documents describe the benefits, risks, and procedures for the research topic "Healthcare-seeking Behaviour for Schistosomiasis-related Signs and Symptoms in the Ga South Municipal District". I acknowledge that I have read or have had the purpose and contents of the Participants' Information Sheet read, and all questions satisfactorily explained to me in a language I understand (Twi/English). I fully understand the contents and any potential

implications as well as my right to change my mind (i.e. withdraw from the research) even after I have signed this form.

I voluntarily agree to be part of this research.

Name……Date……

….

Signature……

……

Thumbprint

Interpreter's Statement

I interpreted the purpose and contents of the Participants' Information Sheet to the aforenamed participant to the best of my ability in the (Twi/English) language to his/her proper understanding.

All questions, appropriate clarifications sort by the participant and answers were also duly interpreted to his/her satisfaction.

Name of Interpreter……

Signature of Interpreter…….. OR Thumb Print …….....

Date:……

Contact Details

Statement of Witness

I was present when the purpose and contents of the Participant Information Sheet was read and explained satisfactorily to the participant in the language he or she understood (Twi/English)
I confirm that he or she was given the opportunity to ask questions or seek clarifications and the same were duly answered to his or her satisfaction before voluntarily agreeing to be part of the research.

Name:……

Signature……... OR Thumb Print …….....

Date:……

Investigator Statement and Signature

I certify that the participant has been given ample time to read and learn about the study. All questions and clarifications raised by the participant have been addressed.

Researcher's name…….

Signature …….

Date……

APPENDIX 2: QUESTIONNAIRE

Study Title: Healthcare-Seeking Behaviour for Schistosomiasis-Related Signs and Symptoms in the Ga South District

Record ID:

……

Date of Completion:

…….

Interviewer ID:

…….

SECTION A

Socio-Demographic Characteristics of Respondents

Indicate participants' responses to the following questions by writing and/or ticking [√] appropriately in the spaces or boxes provided after each item in this questionnaire.

1. Age of respondent (years)

(a) 18 – 25 [ ]

(b) 26 – 35 [ ]

(c) 36 – 45 [ ]

(d) 46 – 55 [ ]

(e) 56 and above [ ]

2. Sex of respondent

(a) Male [ ] (b) Female [ ]

3. Where do you reside?

(a) Galilea [ ] (b) Mahem [ ]

4. How long have you stayed or lived in this community?

(a) 1 – 5 years [ ] (b) 6 – 9 years [ ] (c) 10 years and above [ ]

5. Which ethnic background do you belong to?

(a) Akan [ ] (b) Ga [ ] (c) Ewe [ ] (d) Hausa [ ]

(e) Others specify _____

6. What is your religious affiliation?

(a) Christian religion [ ] (b) Islamic religion [ ] (c) Traditional African religion [ ]

7. What is your current marital status?

(a) Married [ ] (b) Divorced [ ] (c) Widowed [ ] (d) Single [ ]

8. What is your educational qualification?

(a) Basic School [ ] (b) Middle/JSS/JHS [ ] (c) Secondary/SSS [ ] (d) Tertiary [ ]

(e) No formal education [ ]

9. What is your main occupation?

(a) Teaching [ ] (b) Fishing [ ] (c) Trading [ ] (d) Labourer [ ]

(e) Others specify _____

10. What are your sources of water? (Please tick as many answers as applicable)

(a) Borehole [ ] (b) Hand dug well [ ] (c) Lake [ ] (d) Pipe born [ ]

(e) Others specify _____

11. What do you use the water from the dam and/or lake for? _____

12. How often do you fetch water from the dam/lake in a day? (Please provide only one

answer)

(a) Once [ ] (b) Twice [ ] (c) Thrice [ ] (d) Others specify

_____

SECTION B

Level of Knowledge of the Signs and Symptoms Related to Schistosomiasis

This section of the questionnaire seeks your knowledge on schistosomiasis-related signs and symptoms that present itself when you (household head) or someone in the family has it.

13. Have you ever heard of schistosomiasis?

(a) Yes [ ] (b) No [ ]

14. Schistosomiasis is contracted when someone or you: (Please provide only one answer)

(a) Eat snails [ ] (b) Do not eat well [ ] (c) Walk or swim in infected water [ ]

(d) Drink infected water [ ] (e) Don't know (f)Others specify

_____

15. Who is likely to have schistosomiasis in your community? (Please provide only one answer)

(a) Boys [ ] (b) Girls [ ] (c) Men [ ] (d) Women [ ]

16. If someone or you have schistosomiasis what do you see? (Please tick as many answers as applicable)

Signs/Symptoms	Tick (√) here
a. Abdominal pain	
b. Blood in faeces	
c. Fever	
d. Blood in urine	
e. Painful urination	
f. Diarrhoea	
g. Don't know	
h. Swollen belly	
i. Others specify _____	

17. Men who experience the passage of blood from their penis during urination in this community might be experiencing symptoms of (Please provide only one answer)

(a) Malaria [ ] (b) Male menstruation [ ] (c) Schistosomiasis [ ]

(d) Sexually transmitted disease [ ]

SECTION C

Healthcare-seeking actions for Schistosomiasis-related Signs and Symptoms

This section is concerned with the respondent's healthcare-seeking choice or treatment for schistosomiasis.

18. What do you do when you or someone in your family has schistosomiasis? (Please provide only one answer)

(a) Do nothing [ ] (b) Go to the herbalist [ ] (c) Go to the hospital/clinic [ ]

(d) Self-medication [ ] (e) Others specify _____

19. At what stage of schistosomiasis will you or someone in your family seek health care? (Please provide only one answer)

(a) As soon as the symptoms are recognized [ ]

(b) When symptoms persist for one week [ ]

(c) When symptoms persist for two weeks [ ]

(d) When symptoms persist for three and more weeks [ ]

20. What will be your first line of healthcare-seeking action for schistosomiasis? (Please provide only one answer)

(a) Go to the herbalist [ ] (b) Go to the hospital/clinic [ ] (c) Self-medication [ ]

(d) Others specify _____

21. Which will be your second line of healthcare-seeking action if the first fails? (Please provide only one answer)

(a) Go to the herbalist [ ] (b) Go to the hospital/clinic [ ] (c) Self-medication [ ]

(d) Others specify _____

22. In the last three to six months, have you or any of your households experienced any Schistosomiasis-related signs and symptoms?

(a) Yes [ ] (b) No [ ]

23. If Yes, how did you handle the situation?

……

SECTION D

Factors Associated with Healthcare-Seeking Behaviours for Schistosomiasis

24. In questions 20 and 21 above, you have shown your sequence of healthcare-seeking action for schistosomiasis. What are your reasons for using those healthcare-seeking actions for schistosomiasis?

Explain these terminologies to the respondent as follows:

(a) Accessibility means easy to come by.

(b) Affordability is your capability to buy or pay for something or service.

(c) Availability means what is readily found all the time.

(d) Efficacy is how effective the source treats schistosomiasis.

(e) Time is how long it takes you to get the care you seek at that source.

(Please tick as many answers as applicable)

	Herbalist	Health facility (orthodox)	Self-medication
Accessibility			
Affordability			
Availability			
Efficacy			
Time			
Others specify			
_____			

25. In your family, who decides where to seek healthcare for schistosomiasis? (Please provide only one answer)

(a) Father [ ] (b) Head of house [ ] (c) Mother [ ] (d) Others specify _____

26. Which groups of people are most likely to seek care for schistosomiasis in this community? (Please provide only one answer)

(a) Boys [ ] (b) Girls [ ] (c) Men [ ] (d) Women [ ]

THANK YOU