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ACCEPTABILITY OF SCHOOL-BASED DE-WORMING EXERCISE FOR THE CONTROL OF SCHISTOSOMIASIS IN THE BIAKOYE DISTRICT OF GHANA

BY

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DECLARATION

I Dorinda Hayford declare that this thesis is mine and has not been submitted anywhere else for another degree. This is my original work except for duly referenced authors.

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DEDICATION

This thesis is dedicated to all persons involved in running the school-based de-worming exercise in Ghana and to all whose support made this work a success.

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LIST OF ABBREVIATIONS

CHPS	Community-based Health Planning Services
DA	District Assembly
EJHTS	End-joining Homology Techniques
FGD	Focused Group Discussion
FGS	Female Genital Schistosomiasis
FOI	Force of Infection
GHS	Ghana Health Service
GHS ERC	Ghana Health Service Ethical Review Committee
HIV	Human Immunodeficiency Virus
IDI	In-Depth Interview
JHS	Junior High School
KND	Kasena Nankana District
MDA	Mass Drug Administration
MGS	Male Genital Schistosomiasis
NTD	Neglected Tropical Diseases
PTA-page	Parents Teachers Association
PZQ	Praziquantel
SAC	School-aged Children
SBD	School-Based De-worming
SCH/Schisto	Schistosomiasis
SDA	Seventh Day Adventist
STH	Soil Transmitted Helminthiasis
WHO	World Health Organisation

ABSTRACT

The School-Based De-worming Exercise was introduced to reach communities and targets school going children who are often infected with schistosomiasis. As such the study sought to explore the knowledge about schistosomiasis among residents of the district, to determine perceptions of school-based deworming exercise and to identify challenges and coping strategies in relation to school-based de-worming exercise. This study used a qualitative approach employing phenomenological design to identify the factors that promotes acceptability of the School-Based De-worming Exercise in the Biakoye district. A total of 27 participants were recruited to take part in this study. Out of this number, fourteen caregivers were grouped into two FGD's of 6 and 8 members respectively. Then through purposive sampling three (3) IDI'S with disease control officers, five (5) IDI's with teachers and five (5) more IDI's with caregivers was also conducted. With the aid of NVivo version 12.0, inductive-deductive analysis was done after recorded interviews were transcribed word for word, coded and analysed for generating themes. These themes and sub-themes have been duly presented in the results and discussion sections of this paper. There is basic knowledge on schistosomiasis and the School-Based De-worming exercise among respondents. Among the people studied, it is accepted that the SBD exercise is beneficial, it has improved school attendance and their performance in school. It is a very good avenue for children from poor homes to get dewormed. Yet despite these widely accepted benefits, some caregivers do not allow their wards to take part in the exercise due to limited knowledge on the consequences of schistosome infections. Other contributing factors misconceptions of praziquantel and the SBD exercise and fear of what may happen to a child who takes the drug. Overall, there exist high acceptability of the school-based de-worming exercise. Based on the findings above, it was recommended that more education should be given to residents of Biakoye

district those who have benefitted from the SBD exercise should share their experiences with others to encourage joining in.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the Study

Schistosomiasis is an acute and chronic disease caused by parasitic worms. Among parasitic infections, schistosomiasis ranks second after malaria in terms of worldwide morbidity (Karani, Muthami, Kihara, & Mberia, 2013). Upon its discovery in 1851, it was known as Bilharzia named after Theodor Bilharz but now it has been given the name schistosomiasis (Ross et al., 2001; Inobaya et al. 2018). Despite efforts to contain schistosomiasis, over 230 million people are infected world-wide, majority of whom can be found in sub-Saharan Africa. Similar to well-known parasitic diseases, schistosomiasis is caused by different species of worm-like parasites of the genus schistosome, which results in chronic health conditions with adverse effects on the socio-economic development of tropical and sub-tropical countries (Gidimadjor, 2016). Globally there is not an identified vaccine to prevent it (Tebeje et al., 2016).

According to the Centre for Disease Control and Prevention (2012) there are several species of schistosomes that affect the human organism; three most predominant in Ghana are; *Schistosoma haematobium, S. japonicum, and S. mansoni*. There exist also three other species, more localized geographically, *S. mekongi, S. intercalatum, and S. guineensis (*previously considered *synonymous* with *S. intercalatum).* Of these classes, the most predominant in Sub-Saharan Africa remain *Schistosomiasis haematobium and Schistosomiasis mansoni* which lead to reproductive tract and intestinal schistosomiasis, respectively (Sacolo, Chimbari & Kalinda, 2018).

The World Health Organization reported in 2006 that Urinary schistosomiasis is caused by *Schistosoma haematobium* and *intestinal schistosomiasis* by any of the organisms such as *S. intercalatum, S. mansoni, S. japonicum, and S. mekongi* (WHO, 2006; Sacolo, Chimbari, & Kalinda, 2018).

Persons with the condition present night-time fever peaks, coughing, wide-ranging muscle ache, headache, and a tender inflamed liver (Ross et al., 2001). When deworming pills are distributed all at once to communities, districts or even countries for its control, it is known as mass drug administration (Secor, 2019). According to Ofosu and Ako-Nnubeng (2014) educational strategies such as the school-based de-worming exercise are important methods and systems through which governments promote human capital investment and economic growth. School-based deworming is an effective, inexpensive and easy to implement anti-poverty program (Kimani, Mbugua, Kihara, Ng'ang'a, & Njomo, 2018).

Kimani et al., (2018) discovered that due to the safety and efficacy of praziquantel even an uninfected individual can safely take a deworming tablet. Moreover, the close contact and trust that teachers have with communities and students makes them ideal distributors of the drugs and heralds for deworming (Bruun, Aagaard-Hansen, & Watts, 2008). Schistosome parasitic worms have adverse effect on School-Aged Children (SAC) growth, academic performance and successive negative consequences on a country's economic sector has led to great response from the international community to solve the problem (Aboagye & Edoh, 2009). Especially in 2012, numerous medicinal corporations, heads of states and global health organizations contracted the 'London Declaration on Neglected Tropical Diseases

(NTD) in London (Mines and Communities, 2001), to see how mining industries can be regulated to protect communities and ecosystems from causing more parasitic diseases.

The World Health Organisation (WHO) stated in its 2012 guidelines for implementation and control of NTDs, five key strategies of which preventive chemotherapy through Mass Drug Administration (MDA) was first and foremost. During the summit, the stakeholders promised to ensure the elimination and eradication of NTDs including schistosomiasis. Over 2.4 billion tablets for use in NTD cure are currently being distributed yearly to areas which require them through the WHO with a global target of reaching 75% of children at risk of infection with deworming tablets by 2020. Following these guidelines, the government of Ghana on the 5th February, 2007 started a nationwide school-based de-worming program to reduce the morbidity among school-going children. But to the current age, schistosomiasis is still endemic in Ghana especially among those residing along the Volta basin and in the south. In an instance about 25,000 schistosomiasis cases were reported into the Ghanaian District Health Information Management System (DHIMS) in 2010 (Kulinkina et al., 2018). This motivated he researcher to conduct this study to identify acceptability of the only the school-based de-worming exercise.

1.2 Statement of the Problem

The incidence of Schistosoma infections has been on the surge in Ghana for the past recent years, regardless of the existence of strategies and measures to control the disease. Studies have showed that much of the burden is borne by the then Volta region formerly encompassing the Oti Region (Tetteh-Quarcoo et al., 2013). In the year 2007-2008, the Ghana Health Service conducted a baseline study on the prevalence of schistosomiasis across the country. The study found that schistosomiasis was endemic in both urban and peri- urban

towns with a prevalence rate above 50% in the Biakoye district (Tetteh-Quarcoo et al., 2013). Because of the high prevalence of the disease in the district, it was put into category 'A' indicating the high-risk of infection with schistosomiasis (Neglected Tropical Disease-NTD, 2012).

Treatment of schistosomiasis with praziquantel (PZQ) has played a central role in the control and prevention of schistosomiasis. Praziquantel being the only approved and effective drug is currently available globally (Tebeje et al., 2016). The use of an integrative approach through preventive chemotherapy in a school-based de-worming exercise to control and eliminate schistosomiasis has been adopted globally. The drug is wholly supplied by the World Health Organisation to be administered through the school-based de-worming exercise currently going on in Ghana (Tuhebwe et al., 2015). With the deliberate expansion of PZQ accessibility, statistics as at 2013 demonstrated that of the more than 260 million people in need of treatment for schistosomiasis world-wide, less than 40 million (15.4%) obtained it (Secor, 2019). To improve performance, an exhaustive understanding of sociocultural factors that may influence the acceptance of the treatment activities and services through school-based de-worming exercise is urgent (Sacolo, Chimbari, & Kalinda, 2018). According to (Chinyem et al., 2017) in a study conducted in north eastern Nigeria, the minority of school children were dewormed because majority of caregivers did not know about de-worming. In Ghana the situation is no different (Koffi et al., 2018), Moreover, (Brooker et al., 2001) indicated that some caregivers expressed discontent with teachers administering the drug, they would rather prefer a health worker being present to supervise the teachers or administering it themselvesThe question then arises as to what accounts for a lack of tolerance for deworming in schools among caregivers of the district.

A study conducted by Secor (2019) revealed that this gap can be ascribed to a number of reasons, including the enduring discrepancy in the volume of obtainable praziquantel, the

expense accompanied with recognising where Mass Drug Administration (MDA) is desired and the distribution of the treatments form barriers for many or restrain agendas in the absence of peripheral backing to support these exercises. Of interest also is the issue of lack of compliance with treatment programs by persons needing to take the drug due to ingrained sensitivities (Chami et al., 2017; Danso-Appiah et al., 2010).These sensitivities to a larger extent act as sources of reasons for some supposed beneficiaries of the treatment to back out. Neglected tropical diseases such as schistosomiasis remain in poor zones with insufficient sanitation system and limited access to clean water. Mass drug administration through the school-based de-worming program is a means for the distribution of free preventive chemotherapies (praziquantel) to entire target populations, encompassing both infected and uninfected persons who live in areas with high risk (Chami e al., 2017).

According to Danso-Appiah et al. (2010) Ghanaians' health seeking behaviour for both urinary and intestinal schistosomiasis was low due to low information on the severity of the condition. Thus, knowledge on the severity of being infected with schistosome worms may inform how residents of this district accept the school-based de-worming exercise to control schistosomiasis. Other reasons contributing to the above situation, according to Danso-Appiah et al., (2010) could be due to socio-economic status and educational level, improved knowledge and awareness about the disease and its consequences. Danso-Appiah et al., (2010) and Yirenya-Tawiah, Ackumey, and Bosompem, (2016) again observed similar findings that in most endemic areas the people have limited knowledge on the consequences of the two schistosome infections prevalent in Ghana namely, S. haematobium and S. Mansoni.

A similar study from two settings in the Ivory Coast revealed that the common construction of the disease varies from the biomedical definition; for instance, in Korhogo, schistosomiasis was attributed to notable diseases such as stomach ulcer and gonorrhoea. Some believed that schistosomiasis is caused by contact with goat and dog urine in their surroundings. In Kaédi, the infection was well-thought-out to be transmitted by ecological elements like sun and dirty water. In both settings, solutions they sought to control the symptoms they had were largely influenced by local beliefs and self-medication obtained from locally manufactured drugs (Koffi et al., 2018a). In the same study, the authors found evidence of misconceptions such as schistosomiasis being caused by ingestion of contaminated food and water, belief that schistosomiasis is as a result of HIV and even mistaking syphilis for schistosomiasis. In a similar vein, others thought that schistosomiasis was contracted through un-safe sexual activities and sharing of privies with people who are already infected with schistosomiasis. Witchcraft, acquiring it in utero or delivery and even perceptions of the drug being unsafe due to the aftereffects and the rate of reinfection with the disease make most people across sub-Saharan Africa including Ghana doubt the efficacy of praziquantel (Koffi et al., 2018).

In Ghana the situation is no different as studies by Hotez, Biritwum, Fenwick, Molyneux, and Sachs, (2010) and Inobaya et al., (2018) observed similar misconceptions influence the level of acceptance of treatmentpraziquantel in the district options and especially can contribute to care-givers and their children's acceptance of the school-based de-worming exercise used to control schistosomiasis.

Available data which dating back into the 1970s indicated that Urinary Schistosomiasis was widespread country-wide. The same data showed that Intestinal Schistosomiasis was restricted and patchy in its distribution. The Volta basin recorded prevalences as high as 80-90% in many communities living along the lake. Similarly, the Volta estuary was endemic.

With infection rates of 76.2% for S. mansoni and 6.3% for S. haematobium. Generally, Schistosomiasis was found to be highly endemic within communities located along rivers in all ten regions of Ghana.

Schistosomiasis was subsequently mapped nation-wide in 2007. With the finalization of this mapping in 2010, a total of 6,618,064 school-aged children in all 170 districts were identified as being at risk. The NTDP started treatment of school-aged children nation-wide in 2008 (GHS, 2016). Despite efforts to control and eliminate schistosome infection in Biakoye district area, it is still endemic with Schisto and considered a high-risk area due to challenges of non-compliance, uptake and availability of the drug. This study seeks to identify if these factors that influence the acceptability of the school-based de-worming exercise being used to administer praziquantel exist in the district?

1.3 Research Questions

Following the above narration of the problems associated with the control of schistosomiasis, the following questions are being asked:

1. What knowledge do community members have about schistosomiasis?
2. What are the perceived benefits and adverse effect of Praziquantel?
3. What challenges exist in relation to the school-based deworming exercise?
4. What indicates acceptability of the school-based de-worming exercise?

1.4 General Objective

The general objective of this study was to assess the acceptability of school-based de-worming exercise for the control of schistosomiasis within the Biakoye District in the Oti Region.

1.4.1 Specific Objectives

The following were the specific objectives.

1. To explore the knowledge about schistosomiasis among residents of the district.

2. To determine perceived benefits and adverse effects of Praziquantel.

3. To identify challenges in relation to school-based de-worming exercise.

4. To identify indicators of acceptability for the school-based de-worming exercise.

1.5 Justification of the Study

Similar to well-known parasitic diseases, schistosomiasis is caused by different species of worm-like parasites of the genus schistosome, which results in chronic health conditions with adverse effects on the socio-economic development of tropical and sub-tropical countries (Gidimadjor, 2016). These pathologies can progress to a stage where they are irreversible and untreatable, resulting in death or lifelong disability and lack of social, educational or economic prospects to those affected and their families, hence contributing to the poverty cycle (Hotez & Kamath, 2009).

In areas where susceptibility to schistosomiasis is high,(Stothard, Sousa-Figueiredo, Betson, Bustinduy, & Reinhard-Rupp, 2013) existing literature found out that the symptoms of both male and female genital schistosomiasis (MGS & FGS) to reveal themselves not immediately after infection but at a later time after the initial infection. With this in mind there is a need for further studies in areas such the Biakoye district where interventions like mass drug administration through school-based de-worming exercise is being used, to help inform the Ministry of Health (MOH) and the Schistosomiasis Control Division of the Ghana Health

Service (GHS) on factors influencing the level of acceptability of the intervention so as to improve on enabling factors and deal with factors that prevent beneficiaries from accepting the intervention.

According to the MDA report (2018) on school-based de-worming exercise in Biakoye district, a coverage rate of 97.8% was obtained. This is a much higher achievement in comparison to the coverage rate of 92.7% in 2012 (MDA, report 2012). Despite this spike in achievement in the treatment of schistosomiasis in Biakoye, can one really say that this is the actual situation on the ground? Can coverage rate of MDA through school-based deworming exercise be a reflection? These questions were what this research sought to answers by assessing community members knowledge on schistosomiasis particularly on how it is acquired, transmitted, signs and symptoms, and treatment, resident knowledge on school-based deworming exercise, and other hindrances to the exercise and coping mechanisms that community members adopt in relation to school-based deworming program.

It will be extremely impossible to achieve WHO's goal of globally eliminating schistosomiasis infection by 2020 and completely eradicating it by 2025, when due to some factors, interventions are not accepted by the people in areas where infection rate is high. Already, the infection is spreading as a result of development pains through agricultural farming, water reserves which provide conducive environments for the intermediate snail host of the sickness to breed (Baldwin & Weisbrod, 1974). There is the need therefore for this study to be conducted so as to identify facilitating factors for the SBD exercise, which could be explored and hindrances to the exercise that can be addressed to aid acceptability of the

intervention towards achieving WHO objectives and improving the health and wellbeing of the people

1.6 Theoretical Framework for the Study

The diffusion of innovations theory was adopted by the researcher to develop the conceptual framework for this research. This theory was propounded by E.M. Rogers in (1962) who posited that four elements- innovation, communication channels, time and social systems, affect the spread of a new idea among a certain group of people (Lockyer, 1997). The theory was first published as an effective communications tool but has over the years been adopted into the social sciences to explain health seeking behaviour. Throughout his theory Roger, suggested four major elements that influence the spread of new ideas or interventions. These include; the innovation itself, communication channels, time and social systems.

According to the theory an innovation should be widely acceptable to the masses. Information on the new proposed idea should be made available so that interest will be built using appropriate communication channels to reach everyone. Since new ideas are not easily adopted, time ought to be allowed for people to buy into the new intervention. All these processes occur within a social system made up of individual and societal factors, governments, the role of the media and social networks.

These elements when available produce five characteristics of people that are classified as ideal type for comparison. These include the innovators, early adopters, early majority, late majority and the laggards (Dearing & Cox, 2018; Lockyer, 1997). Based on Everett Rogers's studies the most likely to adopt an innovation first is the innovators because they are thrilled with new ideas. The second in line to adopt an innovation is the early adopters: they are often opinion leaders who often have a higher social standing due to finances and a higher

education; followed by the early majority and the late majority. The last group to adopt an intervention is the Laggards. The laggards are the last on the adopters scale and those who are in opposition to change and often want to maintain long held traditions and status quo.

Diffusion of new ideas takes place through a series of five step decision making process. Rogers five stage steps are: knowledge, persuasion, decision, implementation and confirmation.

During the knowledge or awareness stage, the individual or community is exposed to the innovation but has not yet been motivated to find out more. At the second stage, interest in the innovation has been developed and the individual seeks even more information about the innovation. Thirdly there is the decision to go through with or to reject the innovation after weighing the advantages against disadvantages of an innovation and decides whether to accept it or not. The next stage is implementation stage; the individual or group of individuals puts an innovation into use depending on the situation at hand. Confirmation or continuation is the final stage by which diffusion is accomplished. During the final stage, the individual concludes their decision to continue using the innovation. This takes place at the group level as well, but these stages of decision making are also influenced by five main factors namely; relative advantage, compatibility, complexity, tribality and observability.

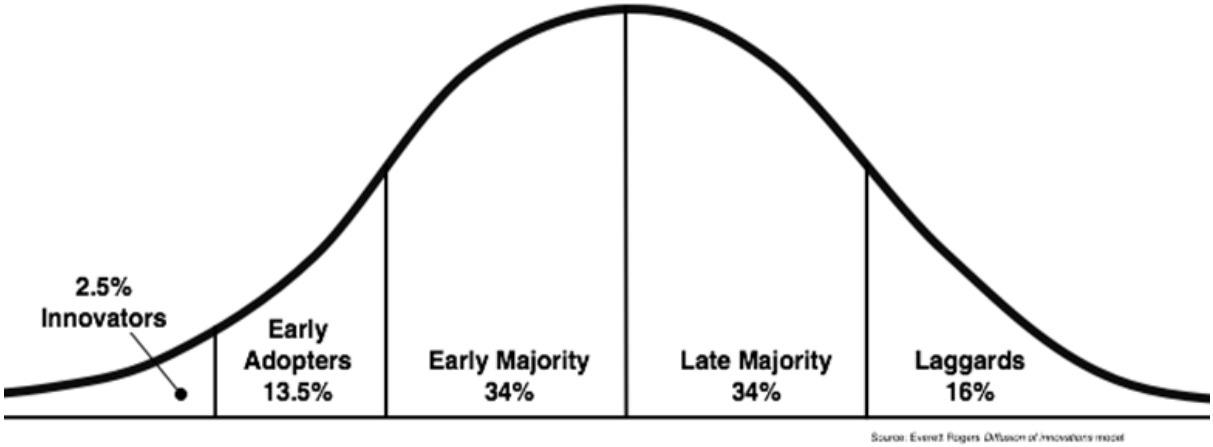

Figure 1.1: Exhibition Types of Adopters

Source: Adopted from Lockyer (1997) :Adopter categorization on the basis of innovativeness

This research draws on socio-demographic factors as well as knowledge of the intervention that leads to persuasion and a decision by individuals and communities to accept the intervention. From the diffusion of innovations theory, at the initial stage where the school-based de-worming exercise s introduced, it is believed that facts about the school-based de-worming exercise should be fully accepted by the "innovators" if the intervention is agreeable with their culture, if adequate knowledge of the exercise is provided and participating in it proves to be more advantageous than not. Community gatherings, church activities and community broadcast systems have been used to share information concerning SBD activities over the years. This should foster the acceptance of the school-based de-worming exercise and the opposite those who initially accept the exercise can motivate their friends and relatives to do same as they observe the benefits of Praziquantel. Nonetheless, since the introduction of the school-based de-worming exercise in 2007, acceptability and compliance are still debatable issues within the district. Below is a conceptual model of how the concepts of the diffusion of innovations theory can be used to explain and predict

acceptability of the SBD exercise. The concepts of this conceptual diagram were adopted from the literature reviewed and will be used to guide development of the interview guides for data collection.

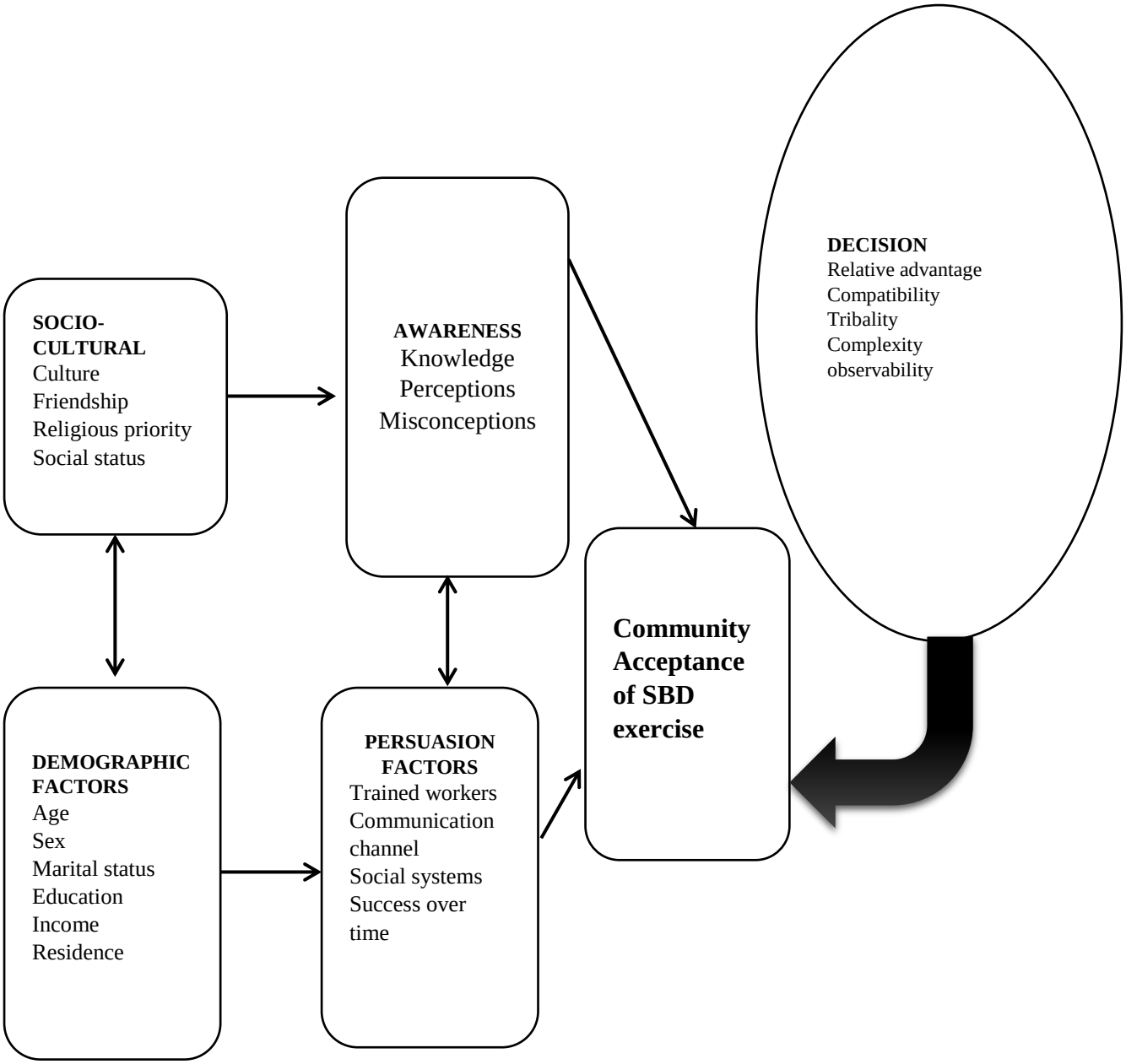

Figure 1.2: Conceptual diagram: Conceptual diagram for the acceptability of school-based de-worming exercise

The framework for the study looks at the individual socio-cultural and institutional factors that have supported the adoption of the school-based de-worming exercise and also why there are still issues with acceptance of the intervention within the Biakoye district. It is to be noted that the individual components of the framework are interrelated and influence each other as

they operate within the same setting.

For instance, from the framework (Figure 1.2), regardless of a caregivers age or gender, with adequate knowledge on Schisto and SBD caregivers can be persuaded to find out more about the exercise from social institutions like the schools, and clinics that surrounds them. This will in-tern help them make a decision to allow their children partake in the exercise or not after weighing the advantages and disadvantages in doing so. On the other hand, if there are misconceptions or poor knowledge on the benefits of Praziquantel to children, caregivers as well as teachers may not be fully motivated to comply with the program. As a result, they are influenced by those they associate with. This can affect the acceptance or rejection of the innovation (school-based de-worming exercise).

Nonetheless over time more individuals and communities in the district will come to hear of the exercise and its benefits. The “early adopters”, “early majority”, “late majority” and “laggards” will join the “innovators” in making a decision to accept the SBD exercise when information continues to spread.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter presents information on known facts about schistosomiasis and school-based de-worming exercise globally and in Ghana as well. It covers issues such as definition of schistosomiasis, factors associated with schistosomiasis, transmission/infection, global knowledge and perceptions about the disease, control interventions, benefits of interventions, challenges and coping strategies.

2.2 What is schistosomiasis?

Schistosomiasis also known as Schisto, Bilharzia and Snail Fever is a waterborne disease caused by exposure to blood flukes whose intermediate host is the fresh water snail (Chami et al., 2017). By description, schistosomiasis is the disease caused by human infection with parasitic flukes of one of the five Schistosoma species that infect humans: *S. mansoni, S. haematobium, S. intercalatum, S. japonicum, S. mekongi, found* (King 2014). Schistosomiasis over some period has been termed as the unconquered plaque (Baldwin & Weisbrod, 1974). According to Koffi et al. (2018), of the sixteen species of the genus schistosome there are five among them that affect humans namely; S. haematobium, S. mansoni, S. japonicum, S. intercalatum and S. mekongi and that schistosomiasis is a parasitic disease second only to malaria (Koffi et al., 2018; Bruun, Aagaard-Hansen, & Watts, 2008). These differences exist because of the varying transitional host, structure and where they can be found in the human body. According to King (2007) schistosomiasis infection is a complicated infection that can hide in the human body for over decades. This has resulted in the differences in the way it is experienced by people across the world. This differences in the way Schisto experienced in

different cultures affects community attitude towards available treatments. Hence the need for this study.

2.3 Human Schistosomiasis Epidemiology

Schistosome haematobium and *S. Mansoni*, are the commonest of the schistosome species Ghana. These are transmitted to the human host through an intermediate fresh water host of any of the aquatic snail species. When human or animal urine and faecal matter infected with the parasite gets into contact with these water bodies, this contributes to the contraction and reinfection of others with schistosomiasis (Nerius, 2013). Studies have shown that schistosomiasis infection and its accompanying signs and symptoms are more clearly defined among human settlement on the basis of the social constructs about the sickness. Nonetheless it involves all the dynamics of social life including the gender roles, occupation, social networks of friends and family (Ahlberg, Mwangi, Poggensee, Feldermeier, & Krantz, 2003). Though this is true, this research left out a very important contributor to schistosomiasis infection and reinfection; which is the role of the environment. The nature of the disease is such that it eludes its victims of its presence as it shares similar symptoms such as fever, abdominal pains and fatigue. The actual result of the deaths caused by schistosomiasis among its victims is often not adequately reported since it can be easily confused with other maladies like malaria (Kheir et al., 1999).

According to Yirenya-Tawiah, Ackumey, and Bosompem (2016) in a study to determine whether urogenital schistosomiasis endemic community members were aware of reproductive health related signs and symptoms to S. haematobium infection, 94% of male respondents and 88.7 % of female respondents acknowledged schistosomiasis as a water-borne disease. In

the study, only 207 (18.9%) subjects from 1,096 agreed that urinary schistosomiasis has reproductive implication. The authors attributed this situation to minimum information about schistosomiasis among those who live in endemic areas. Although this seems to

Be plausible the study could have gotten this s result due to research bias sine participants were required to recall previous experiences with Schisto. This is not surprising since A much recent systematic review across sub-Saharan Africa by Sacolo et al., (2018) based on four major themes namely: socio-demographic, knowledge and awareness on schistosomiasis, attitudes and beliefs related to schistosomiasis and Practices related to schistosomiasis prevention and control, revealed that out of the 27 studies, 16 of them reported misconstructions on schistosomiasis prevention and control. This reveals that misconceptions and limited knowledge can affect tolerance to MDA activities such as the school-based de-worming program. In the conceptual model of this study, misconceptions and information are depicted to influence acceptance of SBD activities.

2.4 Transmission and Lifecycle of Schistosomiasis

The spread of schistosomiasis varies from locations. Each case of Schisto, transmission is enabled by the interrelated effects of broader environmental, climatic, biological, political, demographic, economic, social and cultural trends (Danso-Appiah et al., 2010; Nerius, 2013). Furthermore, programmes for disease control are influenced by policies and priorities of resource allocation. Important to the cycle and transmission of schistosomiasis is pathway between human-snail force of infection (FOI). As part of the transmission cycle, Schistosoma must infect a typical type of snail host that goes through several processes of extensive asexual duplication within the snail host so as to form the free-swimming cercariae that goes on to infect the second host required for its survival in the human body (Gurarie, Lo, Ndeffo-Mbah, Durham, & King, 2018).

Thus, the transmission of schistosomiasis requires a series of stages listed below:

1. There should be a source of infection be it a man or animal for the contamination of water bodies through urine or solid waste elements containing schistosome eggs (Nerius, 2013).

2. The presence of the right species of snail in the water within which Miracidia from the eggs transform into cercariae which can infect man. Bulinus truncates mostly in the main irrigation canal and Blomphalaria globosus in the lakes and farmlands are responsible for the transmission of S. haematobium (urinary schistosomiasis) and S. mansoni (intestinal schistosomiasis) respectively (Amankwa et al., 1994).

3. Man is the main source of infection. This occurs during farming, fishing, swimming and intentional direct urination in fresh water bodies by children. The eggs from an adult female worm in the definitive mammalian host are passed into fresh water via the urine or stool according to species of schistosome where they hatch into the first larval stage – a miracidium. This then enters the intermediate host snail, and after a period of four to seven weeks, emerges from the snail at the second larval stage – cercariae.

4. Cercariae live in the water for 48 to 72 hours during which time they must find a new mammalian host or die. The immature form of the parasite penetrates the skin of a new host when he or she is swimming, washing or standing in infected water. They settle in the liver, where they mature into adult worms.

5. Male and female adult worms mate (Figure 2.2) and deposit their eggs in the blood vessels of either the intestine (Schistosoma mansoni) or bladder (Schistosoma haematobium). The eggs pass out into the water in either the faeces or urine, to continue the infection cycle. urine, to continue the infection cycle.

The lifecycle of schistosomiasis is shown in Figure 3 below:

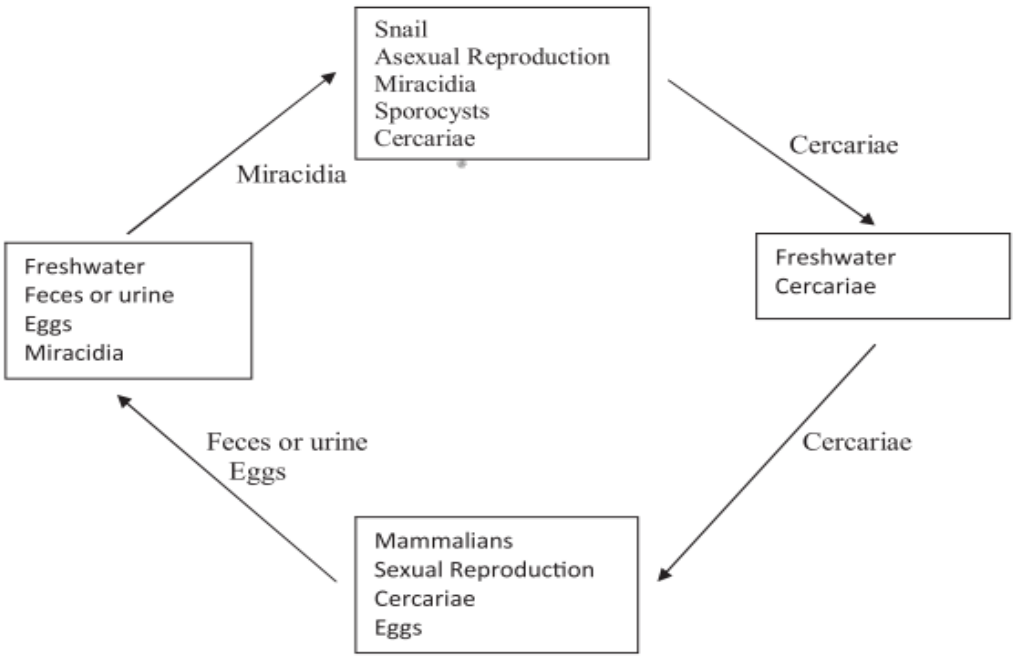

Figure 2.1: Adopted from (Nelwan, 2019): Schistosomiasis life cycle. Asexual reproduction in snails and sexual re- production in mammals.

Overall, this aspect of the literature review has helped the researcher know what kind of questions to ask and probe for and to seek respondents understanding of the lifecycle of the disease. This helps to understand the first objective of this study that is to identify the knowledge on Schisto and.

2.5 Prevention and Control of Schistosomiasis

Worldwide, the well-known options for the treatment of schistosomiasis is through preventive chemotherapy, using a single dose of 40mg/kg of praziquantel as recommended by the World Health Organization for all species and ages. The use of harmless and affordable drugs has greatly enabled the effective control and management of the infection.

Albeit, there are still challenges owing to the presence of factors that foster reinfection and the fact that praziquantel does not eliminate immature worms present in the body during the time of drug administration (Bruun et al., 2008; Nelwan, 2019). In this case other methods of control through molluscicides and environmental control are also used. Control through snail supervision is helpful because it helps reduce the quantity of intermediate snail hosts in the waterbodies. It is often achieved through molluscicide or snail bait to kill the nails (Nelwan, 2019; World Health Organization., 2006). Genetic manipulation techniques can be beneficial to control schistosomiasis (Nelwan, 2019).

Schistosomiasis infection is often related to human environmental factors such as bathing and defecating in water bodies and at the same time using the water source for domestic activities. Priiss-Ustin and Corvalan (2007) suggest that excreta management, safe water supply, irrigation, and other agricultural practices and protection of workers by wearing of protective boots can help prevent getting into contact with the infection. This section of the literature review helped the researcher formulate research questions on what respondent think can be done to protect themselves from the disease.

2.6 Effect of Schistosomiasis Infection.

A report by WHO (2002) revealed that schistosomiasis infection results in reduced cognitive development in children who are in schools. This is a clear evidence of diminished educational performance due to anaemia or iron deficiency in children of school going age that are frequently infected. In a cross-sectional study on female genital schistosomiasis around the Afram stretch of the Volta Lake and the lower Volta river basin areas in Ghana by Yirenya-Tawiah et al., (2016) it was found that sexual dysfunction and urethral discharge were the most frequently reported symptoms among males. The disease can progress from

early signs such as blood in the urine or stool and anaemia and impaired growth and development in children, to life-threatening conditions including bladder cancer, kidney malfunction, and liver cirrhosis (Joseph et al., 2015).

According to Stothard et al., (2013), schistosomiasis can result in morbidity during school age. Delaying in treating schistosomiasis results in an unfavourable downstream of clinical outcomes even affecting detrimental onslaughts to the health of children during key developmental stages. Moreover, the species causes cuts of the liver, and intestine. In most people, schistosomiasis causes chronic, subtle morbidity, which may go unnoticed. And in more dangerous cases, liver damage leads to periportal fibrosis, portal hypertension, hepato-splenomegaly, ascites and death. Schistosomiasis may also serve as a chronic growth impediment if not checked in time (Tuhebwe et al., 2015). The economic and health effects of schistosomiasis are considerable and the disease disables more than it kills (WHO, 2019).

2.7 Schistosomiasis Control and the School-Based De-Worming Exercise

Since 2001, WHO control strategy of schistosomiasis is based on preventive chemotherapy via mass drug administration offering praziquantel, especially to school-aged children since they play a critical role in the transmission of schistosomiasis (Inobaya, 2018). According to Chami et al., (2017) Mass Drug Administration is a critical tool in the treatment and control of schistosomiasis globally. Molyneux et al., (2016) also discovered the importance of MDA in the control of schistosomiasis. The authors ascribed this to the fact that MDA is cost effective and most viable in areas with less access to health care services. Greenwood (2014) in his study on the "Contribution of vaccination to global health: Past, present and future", he discussed other measures of control for schistosomiasis stating that:

> *For schistosomiasis, control measures have included a combination of drug treatment, improved sanitation and molusciding, with some enhanced education components. Of these, snail control was once thought to be the answer, but after development of PZQ's in the 1970's chemotherapy has emerged as the major tool.*

Tebeje et al., (2016) also confirmed the need for the development of vaccines but then acknowledged that developing the vaccine was challenging and costly and new funding is required. They further stated that though obsolete, snail control, through the use of molluscicides, and environmental modifications, awareness creation and preventive chemotherapy will be needed.

2.8 Knowledge on Schistosomiasis

Koffi et al., 2018b in a study on community knowledge on Schisto in Cote d' Ivoire observed local names given to describe Schisto depicts urinary pain; 'sonfichichan' refers to the pain during urination. On the average participants were able to provide terminologies they used to describe Schisto based on symptoms and causes of schistosomiasis (Amoin et al., 2018). Despite there being high knowledge of how important it is to de-worm among study those studied, the researcher observed poor practices relating to deworming (State, Stanley, & Oreh, 2013). Knowledge does not translate into attitude. Amoin et al., (2018) discovered also that, educatonal level correlated positively with knowledge on signs and symptoms especially with regards to knowledge on pain during urination though no further explanation was given in this regard.

Almazan (2017) study on knowledge and preventive practices among the Philipines indicated that majority of respondents supported the idea that Schisto was as a result of

worms, dirty water, swimming in lakes and drinking dirty water cause schistosomiasis. Although there was abundant knowledge on the pathology of schistosomiasis since 1960's it was not yet considerd a public health concern (Colley, Bustinduy, Secor, & King, 2014).

Exploring community knowledege and perception on school-based de-worming programes, Karani, Muthami, Kihara, and Mberia (2013) concluded that a large section of caregivers lack adequate knowledge on parasitic worms, how one gets them, and signs and symptoms as a result of poor educational background and poor economic standing. In Zeng et al., (2011) study on the impact of ecological changes around the three gorges dam of China and local people knowledge on the risk they bear, it was discovered that 66.3% of the people were not having access to good drinking water, 47.9% constantly having contact with the flowing water, and the fact that a lot of people were not having adequate toilet put residents at higher risk of schistosomiasis. According to Inobaya et al., (2018c) even among health professionals 52.2% only had basic knowledge of schistosomiasis. Again, a small section of local residents scored a little over average on knowledge owing to educational level, occupation and income level.

Almazan (2017) reported instances where respondents in male and female categories believed that sexual intercourse is a mode of transmission. This is in line with similar studies in Africa. When community knowledge and attitude was studied in Cote d' Ivoire, participants comments showed that schistosomiasis can be contracted through water or sun. Community members misconstrued that schistosomiasis could be contracted by drinking unsafe water or playing in dirty water; and using dirty and defected toilets (Amoin et al., 2018). It is also perceived that MDA drugs are a form of contraceptive used to check reproduction or to

reduce sexual activity among recipient (Krentel, Fischer, & Weil, 2013). In their review papers, Sacolo et al., (2018) identified other wrong conceptions like Schistosomiasis results from drinking unclean water, through witchcraft, unprotected sex and sharing of toilets with infected persons within the sub-Saharan region. Moreover, Almazan (2017) also reported that partcipants in male and female focused grop discussions associated acquiring this disease to toilet.

Because of the similarity in signs and symptoms such as blood in urine and stools, accompanied with abdominal pains some ethnic groups associated it to other health condition. Sometimes it was confused with dysentery (Amoin et al., 2018). According to Sacolo et al., (2018) though there is an increasing awareness of Schistosomiasis, there is just not adequate understanding of how it manifest in the human body, how it is transmitted and how it could be avoided. Inobaya et al., (2018b) comfirmed how there is low awareness on signs and symptoms and treatment options. In addition to these reports, a study which focused on Sub-Saharan Africa did not deviate from these misconceptions (Hotez & Kamath, 2009). In addition, Sacolo et al., (2018) confirmed this as their findings revealed a lack of clear understanding between prevention and transmission of Schisto and soil helminth (STH). Respondents attributed eating contaminated food and drinking contaminated water to be the cause of Schisto. There is evidence to back the claim that deworming in schools is economical and should be adopted at national levels (Njomo et al., 2010). This can be maintained if teachers who are key actors ensure that pupils eat heavily, rest well and monitor them for some time before dispersing then to go home and caregivers clear their misconceptions about schistosomiasis and the school-based de-worming exercise to freely allow their children to partake in the exercise.

2.9 Benefit of the School-Based De-Worming Exercise

In a survey that investigated community perception and support towards a school-based de-worming exercise in Ha Giang one of the poorest provinces in Vietnam, discovered almost all the parents expressed satisfaction and good health for their children (Mondadori et al., 2006). Studies have showed that through the school-based de-worming exercise, absenteeism, school dropout and general performance of children has improved in schools benefitting from the de-worming exercise (Karani et al., 2013). Ofosu and Ako-Nnubeng, (2014) made similar observations in a study on the Kwahu people of Ghana with an 8% reduction in absenteeism among participants. the school-based de-worming exercise is good to check reinfection with parasitic worms among school age children and this agrees with findings of Ahiadorme and Morhe (2020) in ten years review of soil helminth infection among high prone areas in Ghana that as a result of deworming activities prevalence of soil helminth infection has reduced. The same was found in another study in the Eastern part of Ghana assessing the impact of the school-based de-worming exercise by Ofosu and Ako-Nnubeng, (2014).

Also according to Abu-basha, Al-shunnaq and Gehring (2012), deworming interventions directed towards school-aged children or in the community promotes growths and reduces absenteeism. However, Davey, Aiken, Hayes, and Hargreaves in 2015 published on the proposition that school-deworming exercise promotes attendance or performance in school holds no claim as there is no evidence to support it. The reasons for being confident with their findings was given as in other studies that revealed otherwise are liable to researchers' biases, issues with missing data and difficulty interpreting school attendance patterns. This totally agrees with other studies by Karani et al., (2013) and Ofosu and Ako-Nnubeng (2014) cited in this section attesting to the positive impact of the SBD exercise. Awasthi et al., (2008) also opined de-worming to have a positive impact on body weight in a Cluster-Randomized Trial

in India. Moreover this was in agreement with findings of Sur, Saha, Manna, Rajendran, and Bhattacharya study of one of the Urban settings in India in 2005 reported benefits of SBD on growth and diarrhoea among children. Also Leslie et al., (2011) acknowledged the cost effectiveness of SBD than community delivery though this varies from country to country.

2.10 Adverse Effect of Praziquantel

The WHO defines serious adverse reaction as "an event that is fatal, life-threatening, disabling, or incapacitating or that results in hospitalization after drug intake. Any experience that the investigator regards as serious or that would suggest any significant hazard, contraindication, side-effect, or precaution that may be associated with the use of the drug. This is different from side effects since side effects are often known, not life threatening and those involved with MDA distribution can easily provide education on how to manage them however, adverse effects may not be known and have to reported in pharmacovigilance.

According to Fincham et al., (2005) study about women and children in South Africa as at 2005 no adverse reactions have been recorded yet in relation to school de-worming. Contrary to Fincham et al., (2005) findings, Phongluxa, van Eeuwijk, Soukhathammavong, Akkhavong, and Odermatt in a 2015 study reported praziquantel beneficiaries reporting drug reactions like dizziness, stomach-ache, vomit, and light diarrhoea with some of these adverse reactions occurring in minutes. Specifically vomiting/ nausea and stomach ache are reactions linked to Praziquantel intake (Njomo et al., 2010). In a research into the cause of rumours about adverse reactions following drug administration, it was reported that abdominal pains and headaches which resulted in hospitalisation (Peñas, 2018).

The World Health Organization., in 2006 declared most of reactions observed during de-worming activities are not severe . People who often react to the drug are first timers and those heavily infected with worms (World Health Organization., 2006). Coincidentally, Njomo et al. (2010) conducted a study of adverse effect of praziquantel and Albendazole in Kenya a detected that minor reactions to praziquantel was present among pupils despite the fact that they ate heavily before swallowing praziquantel; but none could be characterised as severe or excessive. Children who took albendazole and praziquantel (49.7%) complained of stomach ache, vomiting or nausea, headache while those subjected to Albendazole alone (39.2%) only complained of cough, headache and stomach ache the rest faced no side effect.

Adverse reactions to praziquantel are important to this study since they can affect acceptance of SBD. For example, if people experience adverse effect, they are more likely not to get involved or not allow their children to accept Praziquantel in the next administration. On the other hand, caregivers and their wards who may have not experienced adverse reactions will be more agreeable towards MDA activities like SBD (Njomo et al., 2010).

2.11 Challenges Affecting the Success of the SBD Exercise & Coping Strategies Adopted

Mofid and Gyorkos, (2017) identified fear and the difficulty in reaching beneficiaries as one challenge deworming programmes encounter. Moreover, the WHO (2006) also identifies difficulty in reaching high risk individuals also as a challenge. Research has shown that there are side effect associated with the intake of school de-worming drugs like Praziquantel but then explained that these reactions are minor and not out of the control of teachers who administer the medicine (Kimani et al., 2018; Njomo et al., 2010). A research into the cause

of rumours about adverse reactions following drug administration, it was reported that abdominal pains and headaches which resulted in hospitalisation (Peñas et al., 2018).

In another study in Laos that looked at how perceived illness drives participation in mass deworming campaigns respondent perceived notions of adverse reactions led to intolerance (Phongluxa et al., 2015). The current most adopted means of treating schistosomiasis in endemic regions is use of preventive chemotherapy among school children (Kimani et al., 2018). The question arises, is praziquantel that efficacious, Secor (2019) wrote that a single dose of praziquantel may not be enough to eliminate worms from the body. The size and taste of praziquantel makes it not suitable to all age groups.

Danso-Appiah, Olliaro, Donegan, Sinclair, & Utzinger (2013) found out how persons with painful urination and blood in urine did nothing but for those with blood in stools and abdominal pains resorted to self-care and over the counter medication to relieve the symptoms. This s not good for schistosomiasis control if asymptomatic individuals fail to seek health care the appropriate way. Alternative sources of medication and/or Self-medication with herbs is a challenge (Bruun, Aagaard-Hansen, & Watts, 2008; Danso-Appiah et al., 2013). Secor, (2019) elaborated how a lack of compliance with treatment programs by persons needing to take the drug retards elimination goals. The reason he gave contributing to this lack of compliance is perceived side effects that discourage from accepting treatment.

Since praziquantel is not to be administered to pre-school children, Kimani et al., (2018) opined this to be a cause for more community transmission since these children still have regular contact with water bodies. According to Gurarie, Lo, Ndeffo-Mbah, Durham, & King, 2018; Kimani et al., 2018) the absence of a vaccine allows subsequent infections with

schistosome parasites due to poor sanitation exercise and visits to surrounding water bodies. Globally dosage of praziquantel issued to school pupils is determined by measuring their height (Montresor et al., 2005; Njomo et al., 2010).

In 2005 Montresor et al. recommended a paper strip pole must be included in each container of praziquantel to facilitate drug distribution this showed support of the use of a measuring pole in determining dosage than using age and weight. This has been confirmed by another researcher who suggests that the low level of literacy in African communities calls for using height to determine praziquantel dosage notwithstanding this weight is the best to be used (Idowu et al., 2007).

2.12 Acceptability of the School-Based De-Worming Exercise

Other reasons that have given mass involvement in MDA programs according to Mulebeke et al., (2019) is due to strong mobilization of community employing community resources and communication system. Njomo et al., (2010) studies in central Kenyan showed that previous involvement experience of benefits of de-worming drugs created a welcoming attitude towards new de-worming sessions when pupils from two communities Mwea and Ndia were compared. According to Bruun et al. (2008), reasons why one may not seek treatment for schistosome symptoms is partly if symptom is not considered serious enough. Karani et al., (2013) related how community tolerance of school-based de-worming activities was informed by seeing how it improves children's health and academic performances.

Even teachers that did not receive any specific training were able to distribute the drug successfully following the page of written instruction accompanying the drug (Mondadori et al., (2006). Teachers seem more tolerant to deworming exercise since it is easy and training requires less effort (Sacolo et al., 2018). Krentel, Fischer, & Weil, (2020) confirmed this

when in qualitative study looking at Factors That Influence Individual Compliance with Mass Drug Administration, providing skills and motivation of drug distributors is critically important, because these people directly interact with target populations, and their actions can affect MDA compliance decisions by families and individuals. Personnel, supplies and appropriate logistics are needed for successful drug distribution. It is also added that getting the population ready by informing them what to do and clear perceptions that draw away from compliance is key (Krentel et al., 2013; Mulebeke et al., 2019). After analysing respondent's information, personal qualities such as age, sex, income level, occupation, and area of residence not only expose people to diseases but affect a person's attitude towards MDA programs. This again is affected by an understanding of the benefits of MDA and effects of the medicine (Bruun et al., 2008).

2.13 Conclusion

This chapter has reviewed the existing literature that were relevant to this present study. The researcher reviewed literature on socio-cultural factors that influence community perceptions of school-based de-worming exercise. This literature review enabled the researcher to develop a clear understanding of the issues regarding the SBD exercise and to come up with concepts to create the conceptual framework. It is hoped that the findings of the study will aid in strengthening interventions that tackle schistosomiasis control among school-aged children. In the next chapter, detailed descriptions of the methodology used in the study will be presented.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Introduction

This section gives an overview of the study design employed, the study area, the study population, inclusion and exclusion criteria, sample size, sampling method, and details of other processes that were undertaken. The chapter also throws more light on the tools for data collection, quality control strategies, data processing, management and analysis, ethical consideration, and dissemination of results.

3.2 Study Design

This study used a qualitative research approach. Specifically, phenomenological design was used in this study. This helped to ascertain possible attitudes and coping strategies of residents and how these behaviour patterns impact the acceptance of schistosomiasis treatment in the school-based deworming exercise going on in the area. Essentially a phenomenological design was used because this study sought to describe the lived experiences of the people of the area (Chambers, 2013). This implies that the research was designed to discover and understand the meaning and experiences in relation to the school-based de-worming exercise since individual and groups of individuals experience a phenomenon differently (Brédart, Marrel, Abetz-Webb, Lasch, & Acquadro, 2014; Gyimah & Dako-Gyeke, 2019). The researcher in this study examined the knowledge and perception of the people about the de-worming exercise, perceived benefits and adverse effects and challenges as well as coping strategies employed.

3.3 Study Area

The Biakoye district is among the eight districts of the newly created Oti region with Nkonya Ahenkro as the district capital. It is located about 185 kilometres from Accra, the national capital. The district was carved out of the former Jasikan district in 2007. It has about thirty-six towns. The major source of livelihood for the people is agriculture. According to the 2010 census report, the total number of people living in the district were 65,901 of which 33,057 are males and 32,844 are females. The census also found out that almost about 22,373 and 43,528 live in urban and rural sectors respectively. The district shares common border with the Hohoe and Jasikan districts in the east, Kpando in the south, Kajebi and Krachi East districts to the north and lastly Volta lake in the west (Areas, 2019). Guan, Akan and the Ewe are the three most dominant ethnic groups in the district with the Guans as the most predominant.

The major water source is the Volta Lake which drains the whole western part of the district. The lake supplies water for agricultural and domestic activities throughout the year. From the 1992 constitution of Ghana, the highest level of political authority in the district is the district assembly headed by the district chief executive. Notwithstanding this, the people also have great respect for their chieftaincy system and this system plays a key role in the mobilization of the people for development (Biakoye district, 2016). A study conducted by Obeng (2013) schistosomiasis was endemic in Ghana. High prevalence rate was recorded for regions around the Volta basin including the Biakoye district which is the focus of this study. Also, it is revealed that, children under 15 years of age accounts for 40.2 percent and caregivers of these children are mainly into agricultural activities like farming and fishing (Ghana, 2014). These findings have implications for choosing this location since invariably, children are exposed to the lake as they assist their caregivers.

Table 3.1: Schools in Biakoye district.

Facility Type	Public	Private	Total
Pre-School	74	20	94
Primary School	74	20	94
Junior High School (JHS)	42	14	56
Senior High School (SHS)	2	2	4
Total	192	56	248

Source: Ghana Statistical Service (2014)

Table 3.1 depicts the number of schools in the District. According to the 2014 Ghana Statistical Service there are 248 educational facilities, of which 77.4 percent were public and 22.6 were private. This study focused on school-based de-worming within the primary and Junior High Schools. Caregivers that were selected had children in the following schools; Nkwanyase DA Primary, Kejebi DA Primary School, Nkornya Senior High Basic School, Nkornya Instumuru EP JHS, Nkornya Ahenkro Roman Catholic School, Ntsumuru EP Primary School, Royal Preparatory School, Nkornya Kejebi DA Basic School, Ntsumuru SDA Primary School, Nkornya Ntsumuru SDA JHS School, Arabic, Abotoase RC Primary School, Global Evangelical Church School, Abotoase DA JHS, Risen Primary School, Nkornya DA Basic school, Nkwanyase Kejebi D.A. basic, Abotoase E.P JHS. These schools are scattered within the district in towns like Nkornya Ahenkro, Kejebi, Ntsumuru, Akloba and Abotoase. Figure 3.2 below is the district map showing some of the major settlements (towns).

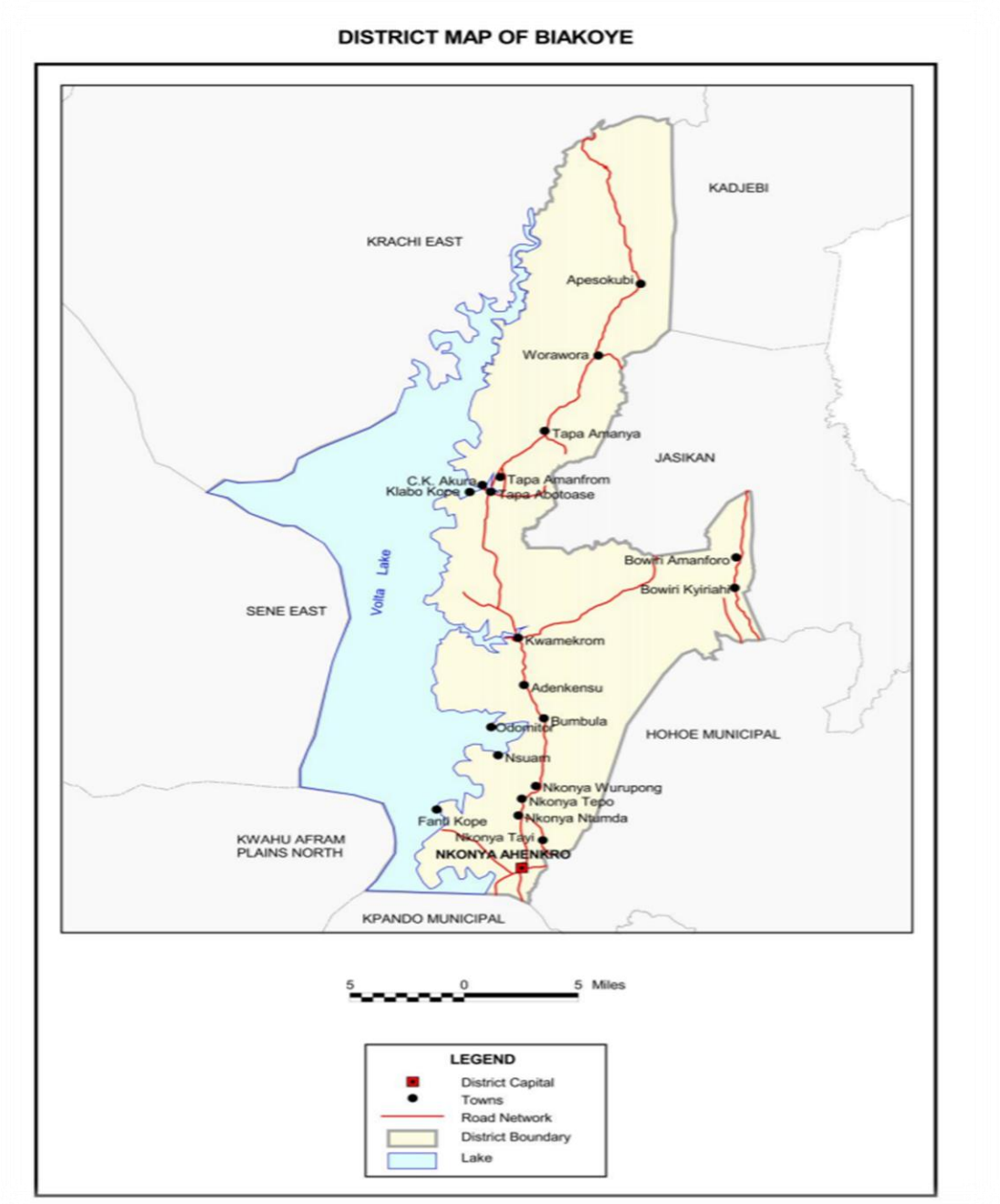

Figure 3.1: Map of Biakoye Districts

Source: Ghana statistical service report 2014.

3.4 Study Population

The population targeted for this study were caregivers of school-going children as well as teachers who administer praziquantel for the school-based de-worming exercise, and disease control officers in the district.

3.4.1 Inclusion Criteria

The following are criteria for inclusion:

1. A parent or guardian, teacher and a disease control officer who resides in the district.
2. Caregivers should have children who attend either primary school or JHS school in the district.
3. Should be able to express themselves in Twi or English to allow for easy data analysis.

3.4.2 Exclusion Criteria

1. Parents, teachers and disease control officers who reside in the district but have no knowledge of Schisto and SBD activities.
2. Caregivers whose children did not attend primary and JHS schools in the district and whose have never made the decision to allow their wards partake of the exercise or not.
3. Caregivers who can either express themselves in Twi or English but would not want to be audio taped

3.5 Sampling Technique

Eligible participants were selected purposively. This method allowed the researcher to select participants who were able to help answer the research questions and objectives. Moreover, purposive sampling is considered as the most important kind of non-probability sampling technique, to identify the primary participants (Banerjee & Chaudhury, 2010). Initially, using community entry techniques, the researcher identified two teachers from the district. These teachers were used as point of contact to caregivers to seek their consent as to whether they would like to be part of the study or not.

With the aid of an introductory letter from the School of Public Health, the researcher sought permission from the Biakoye Health Directorate. A document containing the purpose of the study and a copy of the ethical clearance were provided to the directorate to facilitate the progress of the research. The director of the facility upon reviewing introductory letter and ethical clearance, assigned three disease control officers to assist in data collection by identifying more parents and teachers for the interviews. Nineteen parents, five teachers and three disease control officers were contacted on the first day of recruitment. Upon agreeing to partake in the research, the purpose of the research was explained to them along with every detail on the information sheet and the consent form (Appendix B). Interested Participants who agreed to participate were given the consent forms to sign or thumb print. The researcher during the visit also arranged for dates and venue for the interviews.

3.6 Sample Size

A total of 27 participants were recruited to be part of the study including parents, teachers and disease control officers from the District Health Directorate. The number of participants was determined on the principle of information saturation (Guest, Bunce, & Johnson, 2006). By the twenty-seventh participant, most of the information received were repetitive indicating a point of saturation.

3.7 Data Collection Tools

To help in getting the right information from the participants, a semi structured interview guide was used since it is a great qualitative tool in getting deep seated thought and reasons surrounding an event (Brédart, Marrel, Abetz-Webb, Lasch, & Acquadro, 2014). With the aid of a semi-structured interview guide, face-to-face interviews and FGD's were conducted. The

interview guides were developed by the researcher based on the general and specific objectives of the study, conceptual framework and literature reviewed. The interview guides were divided into various sections covering participants knowledge and perceptions of Schisto, the school-based de-worming exercise, benefits and adverse effects as well as challenges and coping strategies in relation to praziquantel administration during SBD exercise. Semi-structured interview guide was also designed for the focused group discussion and key informant interviews. Other principal tools used included recording devices, field notebook and pens and pencils to record information.

3.8 Pre-Testing of Interview Guide

Pre-test was carried out in the Weija community where schistosomiasis is a major disease of concern. According to Rothgeb, Willis, and Forsyth (2007), pretesting is an important step in determining whether the interview questions would help the researcher obtain the information they want. The aim was to check if the interview guides would yield the responses in the actual study site. In all, two parents, one Disease Control Officer, and a female teacher in Weija Gbawe district helped in pre-testing the tools. The interviews took place in their respective homes and offices. The results of the pre-test helped the researcher to amend and modify the interview guides for more clarity and precision.

3.9 Data Collection Method

Specifically, focused group discussions (FGDs) and in-depth interviews (IDIs) were scheduled with caregivers and teachers first since they have direct and close contact with the children during the school-based de-worming program. Only caregivers were included in the FGD's because it was easier to get more parents to form the group than teachers and Disease

Control Officers. Most of the interviews with participants took place in a space provided by the District Health Directorate. Aside the group discussions with caregivers (14 of them), in-depth interviews with five (5) parents was conducted in their homes. There were two sessions of FGDs with parents/caregivers of school children. Th first FGD comprised of six (6) parents whiles eight (8) parents participated in the second FGD. Five (5) selected teachers were interviewed individually as key informants. Teachers were classified as key informants since they directly administer Praziquantel to school children and as a result are familiar with all issues that affect acceptability. And three (3) disease control officers were included. Each interview sessions lasted between 30-40 minutes.

3.10 Data Management

Audio recordings from the interviews were played back and transcribed verbatim. Each participant was assigned a unique code such as (Participant 1- Participant 27) according to the order in which they were interviewed. Some interviews were translated from "Twi" (local dialect) to English considering the meaning the participant was trying to convey. Recording devices that contained participants responses were carefully stored to prevent access to other people. Only the researcher and the supervisor had access to the recordings. Participant information were deleted after the translation, transcription, coding and reporting were done.

Each of the transcribed interviews was coded, labelled and saved in a file on the researcher's computer protected by a password. They were coded according to the order in which the interviews were conducted. The soft-copies of the transcripts were also saved on a pen drive to serve as a backup. They were kept together with the field notes in a secured cabinet.

3.11 Data Processing and Analysis

The audios were listened to carefully for about three times before they were written out word for word. The written-out transcripts were read all over again before they were imported into NVivo 12.0 software for analysis. A thematic content analysis employing deductive-inductive analysis (Creswell, 2009) was used. Thereafter a codebook was created based on the objectives of the study and the subject areas explored during the interviews. The codes that emerged initially, were continually reviewed, to develop themes that answered the research questions. Themes that were maintained upon careful review with field supervisor have been presented for easy reading and understandability.

3.12 Rigour or Trustworthiness

Credibility, dependability, confirmability, transferability and authenticity are the major criteria for establishing trustworthiness in qualitative research (Barusch, Gringeri, & George, 2011and Koecielak, 2013). These strategies were used by the researcher to demonstrate rigour in this study.

To allow for credibility the researcher made sure that respondents who were trying to pose as parents but not were removed from participating after doing some background checks on them (Bolarinwa, 2015). It also ensured that participants were admitted based on the inclusion criteria of the study. Careful observation was made on the responses to ensure that they contribute to achieving the objectives of the study. Moreover, the supervisor listened to and read all the interviews and transcripts, to compare with codes, sub-themes and themes the researcher identified if they were credible. This was done by mutual understanding between the supervisor and the researcher. Authenticity of the report has been was ensured by

presenting precisely the responses of parents, teachers and disease control officers in relation to the school-based de-worming exercise with the meanings they were trying to portray. Dependability, this is to ensure that the study can be replicated by another researcher and this was met by describing the full background of participants, also the researcher's report provided and the detailed description of the methods of the research. Peer reviewing was also used to crosscheck all information. **Confirmability:** the researcher ensured this by maintaining a clear communication with research assistants in the study area. They provided clarity and assessed proposed claims.

3.13 Ethical Considerations

Ethical clearance was obtained from the Institutional Review Board of the Ghana Health Service (GHS-ERC020/01/20) upon submission of the proposal for ethical approval. With approval letter in hand, introductory letters were obtained for the study site from the School of Public Health for submission to authorities in the study site. Along with a verbal explanation of what was required of them, a copy of information sheet containing the purpose of the research was given to each participant to help them make an informed decision a day before the interviews took place. Participants who indicated their willingness to be part of the study by sign or thumbprint the consent form.

Confidentiality was ensured by not allowing any unauthorised person access to participant details, and not reporting their information in any public place in a way that identifies them as the informants. Information was only made accessible to the researcher, the supervisor and the transcriber. Anonymity was guaranteed by assigning pseudonyms to all participants.

3.14 Study Limitations

Like any other qualitative study, the sample size of this study is just too small to allow for making generalizations to other places where Schisto is endemic. By using purposive sampling to get 27 respondents, other community members whose knowledge and perceptions could have greatly informed this study was lost. Again, it was difficult having equal representative of males and females thus gender parity could not be ensured. Some of the interviews were transcribed from "Twi" into "English" it is possible some vital details in participants responses were left out due to this factor. In the face of all these limitations, the results of this study must be treated valid and a direct indication of issues concerning the school-based de-worming exercise in elimination of schistosomiasis.

3.15 Conclusion

This chapter gave a detailed description of the researcher's choice of design, setting, population and sampling technique, data collection method, pilot study, data analysis, research rigor, and ethical considerations used in conducting this study in assessing acceptability of the school-based de-worming exercise.

CHAPTER FOUR

4.0 RESULTS

4.1 Introduction

This chapter presents the data collected from respondents on the level of acceptability of the School -based de-worming exercise for the control of Schistosomiasis. The chapter begins with a description of the participants and then key findings expressed under themes and subthemes. Themes that emerged are presented under the following headings; knowledge and perception about SBD and Schisto, perceived benefits and adverse effect of the SBD exercise, challenges and coping strategies in relation to the school-based de-worming exercise and acceptability of the SBD exercise among residents of the district.

4.2 Description of Study Participants

Out of twenty-seven (27) participants recruited for the study, nineteen (19) of them were caregivers, five (5) were teachers and three (3) were Disease Control officers from the District Health Directorate. Sixteen (16) of the respondents were females and nine (9) were males. The average age of respondents was approximately thirty-eight (38) years. They all came from the district and resided in the district capital Nkornya Ahenkro and its neighbouring communities namely Kejebi, Akloba, Mempekasa and, Abotoase and Ntsumuru. The highest level of education attained by the respondents was a Diploma degree and the lowest was primary school education. All caregivers numbering nineteen used Twi language to communicate with the researcher but teachers and disease control officers could communicate in English. The average number of children per parent was four (4). Eight (8) of the participants government workers the rest were either self-employed traders or in the Agric sector. A summary of the demographic data is be provided in Table 2 on page 92.

4.3 Knowledge and Perceptions About Schistosomiasis and School-Based De-Worming Exercise Among Residents of the District.

Knowledge is defined as the fact or condition of knowing something with familiarity gained through experience or association (Merriam-Webster, 2019). On the other hand, perception has been defined as the way in which something is regarded, understood, or interpreted. It is also described as a belief or opinion, often held by many people and based on how things seem. The findings revealed that caregivers have some basic knowledge on both schistosomiasis and the school-based de-worming exercise. Knowledge was assessed by asking participants views on how Schistosomiasis is acquired, transmitted and treated. Responses from parents revealed that they are aware the disease results in urinating blood but they were not familiar with the name Schistosomiasis or Bilharzia. Instead, local term such *as "Amɛ Elewudo", 0dɛ 0blfo blodgya",* and *"Ewudodo"* meaning "urinating blood". What caregivers thought of Schisto and SBD exercise could influence acceptance or not. Perceptions was determined looking at social construct and beliefs about the schistosomiasis and the school-based de-worming exercise. Their level of understanding is presented in subthemes below.

4.3.1 Knowledge on Schistosomiasis

Concerning what participants know about the disease schistosomiasis, most of them expressed that it is a disease acquired from the water especially flowing water body. Knowledge encompassed perceptions, misconceptions and knowledge gaps. Respondents described schistosomiasis as a disease caused by the presence of the lake Volta and some animals in water bodies. The exact name of the parasite and the cycle through which the schistosome parasites gets into the human body was not expressed by almost all participants including the disease control officers. The range of information given were largely on how

the disease infects a person, how it manifests itself in human body as well as the mode of treatment and treatment options available.

Moreover, there were misconceptions about schistosomiasis as well. It was believed that one can get schistosomiasis through spiritual means such as witchcraft and by sharing privies with others who may have the infection. Poor handwashing practice before and after eating, eating spoilt foods/cold food and unripe mangoes. Among caregivers, acquiring schistosomiasis was also linked to un-protected sex, mother to child transmission, bathing in rain water and walking barefooted. In expressing what she knows about schistosomiasis, a forty-one years old mother related that when children bath in water that is passing like the Akosombo, then they can get it. A participant who is a mother and resides in Kejebi said there are germs in the water that causes it. Though caregivers may be aware of the deworming exercise in schools, they do not really know what drug their children are receiving. Below are some responses from participants;

After hearing the name schistosomiasis, a thirty-five (35) years old male teacher from Nkornya Kejebi said:

> *Mmm this word is actually a big word that I can't really picture it but what we know is that we have been doing de-worming… [IDI with IDI with Participant 10 from Kejebi]*

Some of these misconceptions are presented below in participants own words:

One caregiver who is a grandmother and pensioner from Nkornya Ahenkro echoed that:

> *…yes! you can get it through the use of washrooms, toothbrushes with other people. [Participant 9 from 1st FGD resident of Kejebi]*

A twenty- eight years old care-giver also related her experience this way:

> *when we leave them to roam about and they go and pluck these bad mangoes and eat, also when they roam shirtless and walk bare footed, they can get the disease. [Participant 14 from 2nd FGD resident of Nkornya Ahenkro]*

A father who is a taxi driver from Abotoase also related his opinion this way:

> *Since it is a blood disease if either of your father has it and impregnates his wife, it is possible you can get it. If the father urinates blood, it is possible it can happen like that. [IDI with Participant 24 from Abotoase]*

4.3.2 Knowledge & Perception of School-Based Deworming Exercise

Caregivers were informed of the exercise since their children and grandchildren receive medicines in school. Majority of caregivers have heard of the school-based deworming exercise as they attend PTA meetings, through announcements in their churches, via public address systems in their communities and through consent forms their children bring home. Because of the presence of the lake, most parents applaud the government initiative to distribute praziquantel in schools. Despite these success stories, there are misconceptions concerning the drugs distributed during SBD activities among caregivers. Some respondents claimed it is a government initiative to win political favours. Some teachers feel de-worming activities in the schools should be the mandate of health workers and not teachers. It is also perceived that SBD activities are avenues for distributing contraceptives among school children.

A mother who partook of one of the FGD confirmed how she receives a consent forms that educates her about the program. She said:

> *Whenever they want to give the medicine to the children**,** they give them a sheet of paper and you can find the name on it. [Participant 13 from 2nd FGD resident of Ntsumuru]*

Another father from Abotoase also said:

> *…I haven't heard about that but my children say that, when they go to school, they are given some drugs but I don't know the drug they give them. Some of them say that the teachers tell them is for those urinating blood, those with stomach problems like that ah huh are also given the drug but I don't know the drug. [IDI with Participant 24 resident of Abotoase]*

A forty-one years old mother with three children mentioned that the SBD exercise is good for the children. She explains why below:

> *So, some children when they close from school, they can go to the lake to bath they will get the disease from there so this government initiative is good and helps the children. [IDI with Participant 20 from Abotoase]*

There were some beliefs about the school-based de-worming exercise. The researcher wanted to find out flaws in the community understanding of schistosomiasis and the SBD exercise which could intern hamper successful uptake of the intervention being run. Some believed SBD activities are used by the ruling political parties to win favours from citizens

and that through such activities, their children are taught to lead immoral lives. Below are a few of such responses:

A thirty-eight (38) years old mother who sells in one of the selected schools revealed how political affiliations can affect attitude towards SBD exercise. She said:

> *Some people use it as politics. Some will say because this party is in power that is why they have brought this drug to be given to their children, so due to that they won't allow their children to take it [Participant 6 from 1st FGD resident of Akloba]*

Among caregivers it is believed that their children are being taught to be promiscuous. One thirty-nine (39) disease control officer commented on it this way:

> *… at that tender age some age limit parent might think you are rather teaching them to go and have sex so some parents might think like that… [IDI with Participant 1 from Abotoase]*

4.4 Benefit and Adverse Praziquantel

Caregivers despite the challenges and fears they experience, had a positive view of the SBD exercise. Among caregivers it is believed that allowing children to partake in the SBD exercise can protect them from being infected by schistosomiasis. It also reduces the harm that can result from infection. Again, the SBD exercise allows both teachers and caregivers to know the status of the children they have; looking at how they react when they receive praziquantel. According to some caregivers, their children formerly used to complain about stomach problems but upon the inception of the exercise this has reduced. The positive effect

of the school-based de-worming is seen in the way it helps lots of children to be in school all the time.

A twenty-six years old divorced mother described how Praziquantel helps her children below. She said:

> *It is okay because when they were not giving the drugs sometimes the children will complain of their stomach but after they took it, they have stopped and study very well. [Participant 9 from 1st FGD resident of Kejebi]*

Another participant also expressed how Praziquantel protects children from diseases. He said:

> *Yes, I think now it is it is good because when there are drugs that you can easily base on it and work on it and its rather keep from occurring it helps so now that there is a program like that and they are running it for years it is helping yes. [Participant 1-IDI]*

Talking about the important purpose the de-worming plays in the life of poor caregivers, a thirty years old male teacher said this:

> *…some parents you see the whole year they will not de-worm their children but because of this de-worming exercise you see that every year students get or children eh these de-worming drugs to take so it is good aha [IDI with Participant 3 from Nkornya Ahenkro]*

A male participant who has been teaching for the past ten years observes how praziquantel distribution helps children stay in schools:

...Even those absenteeism children to you see some of them in school, it means that the community knows the positive effects this medicine will be giving to their children so they even try sending them to school. [IDI with Participant 10 from Kejebi - IDI]

Like most drugs, praziquantel when taken results in mild to severe reactions. Frequent reactions from praziquantel ranged from headaches to stomach pains to dizziness and collapsing. Knowledge on adverse effect following drug distribution was major concern to caregivers. Knowledge of this can reduce opportunities or cause attitudes of not accepting the exercise as they should. The caregivers described the resulting effect on their children as worrying and being the only factor to cause them not to allow their children to accept praziquantel when the exercise is carried out.

Some caregivers' comments are captured below:

A forty-one years old mother said this:

It beats them means it makes them feel dizzy ahaa. When they take the medicine, they bring the complain that mama I'm feeling dizzy... [IDI with Participant 20 from Abotoase]

A teacher who has been teaching for five years shared his experience of how his students react to Praziquantel. He stated:

...after we have sent them to the hospital, they went to their houses to still the weakness and other things continued so they have to take them to the hospital.

Then he went on to say

...after taking the drug you see them sleeping, then some to they just sit down at one place if you ask them to come, they will tell you their face is turning them meaning

dizziness and then on rare occasions you see vomiting some of them vomit... [IDI with Participant 3 from Nkornya Ahenkro]

Another teacher with two children also related what he has observed to be the effect that follows after taking the medicine. He stated:

...let say it will overpower you yeah it means that you will not be able to stand firm you cannot… the child will even be lying down… maybe vomiting. [IDI with IDI with Participant 10 from Kejebi from Kejebi]

Another mother of three added to the side-effect of praziquantel when she said:

...he took the drug and came home he was supposed to do extra classes at the house but he slept a lot so I woke him up and asked him why? The he said his stomach is aching him.... [Participant 4 from 1st FGD resident of Nkornya Ahenkro]

4.5 Challenges of the SBD Exercise

This section addresses the third objective of the study identifying challenges of the SBD exercise. The challenges identified to influence acceptability of SBD exercise, can be grouped into drug related factors, institutional inconsistencies, challenges in the use of height as a measuring tool, possible causes of reinfection.

4.5.1 Drug Factors

The major challenges that affect the SBD exercise include factors that have to do with the nature of praziquantel; the size, smell and differences in dosage given per student discourages some from accepting it. There were concerns on regular or timely availability and supply of Praziquantel for SBD exercise which delays the exercise from being carried

out at the stipulated time. Moreover, prior to the administration of the medicine, communities are notified to inform caregivers to prepare their children for the day of the administration. One such preparation methods is by ensuring that their children are well fed heavily before taking in the medicine since praziquantel cannot be taken on empty stomachs; but most children come to school on the day of drug administration on an empty stomach. Other caregivers tell their children to run away from school to avoid taking the medicine due to effect those who receive it get.

Some caregivers shared how the nature of the drug hinders them or their wards from partaking in the exercise. One mother who took part in the first FGD said this:

> *For the scent they used to talk about it. Some don't take it because of the scent, because it makes them vomit. [Participant 7 from 1st FGD resident of Kejebi]*

Another participant who teaches in the district described the size of praziquantel in a negative light. He said:

> *Imagine you giving this Praziquantel a very big tablet to a child to take or a KG child to take she will not just accept or agree to take it. Some of these medicines are very bitter and we have even pampered some of them to chew it. [IDI with IDI with Participant 10 from Kejebi]*

A participant commented on the regularity of drug supply this way:

> *At times they delay before bringing it to us directly that is the only problem but the delay is not from the directorate it is from the top [IDI with Participant 22 from Abotoase]*

A participant inadequate supply of Praziquantel as one challenge. He said:

...we were not err given enough of err how do you call it err stock of the err drug so there was shortage err that is the only this thing that I err how do you call it observation that I made. [IDI with Participant 26 resident of Abotoase]

4.5.2 Institutional Inconsistencies

This sets of challenges focuses on those that emanates from institutions directly involved in administering the drug in schools and their commitments to supplying the necessities for the program such as notices to parents and caregivers. Responses obtained showed that in most cases, caregivers do not receive consent forms prior to drug administration. Some teachers who are directly involved in the exercise said the have never seen one before. Most schools in the district do not have proper drinking facilities so the student must find their own water. In addition, during SBD activities, praziquantel is administered by teachers but some still feel that it is the work of nurses and doctors. Some students rely of the SFP but, the quantity of food given in the school-feeding program is not enough and so worry those who depend on it.

Speaking about the distribution of the consent forms to caregivers, a teacher who has been teaching for more than twenty years said this:

We normally show it to the children and but we don't quite remember the day we even given this to the children to be sent to their parents to sign.

He also added;

…I have never seen anything of that sort in my class before because I handle a whole class and I have never seen that a child brought it and said my parents… my father or mother signed it so this no… [IDI with Participant 22 from Abotoase]

There is the controversy of who should champion the administration work while some caregivers think it is the work of the nurse's others also think teachers should be tasked to it.

A male teacher who teaches in Abotoase related how he feels about his role in administering praziquantel:

…it is not the work of the teacher. It is the work of the health workers they are supposed to administer the drugs. But when they come, they give it to we teachers, we have no option... [IDI with Participant 22 from Abotoase]

4.5.3 Possible Causes for Reinfection

As it stands there is no known vaccine for schistosomiasis and this leads to reinfection despite SBD activities. Some attributed it to factors like the physical environment they find themselves and their activities. Some children take interest in trading activities either than being in schools due to the presence of the lake and fishing. Due to this they are missed during the drug administration exercise. There is also a challenge in the exercise reaching those overbank communities. Even when personnel successfully get there the children are often nowhere to be found as they are busy helping their parents in their trades. To successfully eliminate and eradicate Schisto permanent structures need to be put in place to prevent new infection.

One disease control officer explained why we haven't been able to successfully eliminate Schisto. She said:

> *I think what actually is the problem is that when somebody is being cured and then the person goes back to swim so reinfection… [IDI with Participant 1 from Abotoase]*

A participant who is a teacher spoke of how the physical surrounding inform children's behaviour:

> *…if you take the medicine you are not immune to the virus or disease or whatever it is, so definitely if you take the medicine after that you go to swim you could still be affected. [IDI with Participant 27 resident of Abotoase]*

4.5.4 Using Height as a Measuring Tool

Another challenge identified was in the use of height in determining doses of praziquantel. This is considered effective when compared to using age, weight and the upper arm circumference. Despite this some caregivers and teachers in the study area had a different perception of the use of height. Some viewed this method as ineffective and a disadvantage to children well advanced in age but not in height as well as those who have the height but not well aged.

One respondent who is a teacher and caregiver of two adopted children mentioned how discrepancy in doses per child discourages some from taking it. He said that:

> *…Most of the students took the albendazole aa most of them took it aha. But the praziquantel some they were complaining that it is too much because it is given to them based on their height… [IDI with Participant 3 from Nkornya Ahenkro]*

Another caregiver who is a teacher and assists in the administration of praziquantel related his personal opinion on the use of height as against age or any other means in determining number of tablets. He related his opinion this way:

> *You see personally I had an issue when we went to the workshop with the coordinator because somebody might be very old but might not be that tall and somebody might be very tall but might not be that old...*

He added:

> *Like it might go against some of the kids using the height as a measurement to give the drug*

He went on further to say that;

> *...if they use your age instead of the height it will help rather than the height because someone might be in class two and might be old enough to take it because of the height will be not allowed to take of the medicine [IDI with Participant 27 resident of Abotoase]*

4.6 Strategies to address challenges in SBD in relation to Praziquantel

Both benefactors and implementors of the school-based de-worming work adopts mechanisms to deal with the stresses of the program. These are specific efforts both behavioural and psychological, caregivers employ to master, tolerate, reduce or minimize stressful events associated with drug administration in schools. These strategies are presented under sub-themes like active strategy that promotes acceptance, avoidant strategies that reduces acceptance, cognitive appraisal and financial coping strategies. From the data collected caregivers as well as teachers adopted some thinking processes to help them deal with challenges of the SBD exercise. One thinking process caregivers adopt is by thinking

that each medicine has its side effect including praziquantel. Some also gave in to fear. Other caregivers reasoned that since no one has been killed by praziquantel they do not see reasons why they shouldn't allow their children to take it. Efforts borne by resident during the de-worming exercise also covers monetary sacrifices

4.6.1 Active strategies that promotes acceptance

Active strategies are those practices caregivers engage in that increases acceptability of SBD activities. Despite negative reactions and it accompanying stress to caregivers, some caregivers work hand-in-hand with teachers to ensure that their children engage in the exercise. Yet still others take steps to find out more from program implementers and to relay their worries. This helps prepare themselves and their children so that they can partake in the exercise even accompanying them to school on the day of drug administration. Both caregivers and teachers relate bearing some cost financially. They either give money directly or indirectly to support the program and to allow one's child to partake in the exercise. To help get more student to partake in the exercise, teachers intentionally plan games and sporting activities. Below are some responses;

A mother of three, who is self-employed also said what she does when she is needs clarifications. She said:

> *... me for instance I go there and ask if my child can really take the medicine due to his age so the parent can go there and ask questions [Participant 8 from 1st FGD resident of Kejebi]*

A teacher who has been teaching for close to ten years also mentioned the tactics his friend employs on students this way:

> *...a friend of mine will have to be even be clapping for them, singing for them some songs for them…*

He also related this strategy saying:

> *...because they like playing and the ehe before the administration of the drug they brought football into the area and say ah ok; today we will be playing football so but before we play the football, we have to take drugs. They say we are all not feeling well so that we have more energy to play. Football is there... come and see... all of them came together, they took the medicine…. [IDI with Participant 10 from Kejebi - IDI]*

In schools that benefits from the school feeding program, a teacher explains a strategy they use to reduce adverse reactions. He said:

> *...what happens is immediately we give them the food thirty minutes time then we give them so the drug so that at least the food can sustain the drug. [IDI with Participant 26 resident of Abotoase]*

A teacher also shared how he spends money during the administration of praziquantel. Though he bears the cost, by doing this he gets student to take the drug. He related:

> *I remember last time we did I have to buy food for some of the few children before they will take it.*

He also added;

> *so that is when you the teacher you have to come in. I even I have to ask her that day which food do you like best that day even if you have 20 Ghana in your pocket and she says the food is somewhere 5 cedi's, you have to buy it! you have to buy it. [IDI with Participant 10 from Kejebi]*

4.6.2 Avoidant strategies that leads to poor acceptance

Some also avoid the exercise all together this type of strategy is avoidant in nature. Most of the time caregivers resulted to this form of adjustment to shield themselves from emotional, psychological and financial torture due to adverse reaction to the drug (praziquantel). Some caregivers strictly warn their children not to take the medicine or to even run away from school that day. Other caregivers were not allowing their children to go to school on the day of drug distribution. Even among the children, they take the medicine alright but they don't ingest it.

A mother of three children related some negative attitude of caregivers towards the exercise. She said:

> …they don't even allow the children to go to school. Yes, like if it was announced yesterday, they will not ask their children go to school today. They won't. They fear their ward will get another disease *[Participant 5 from 1st FGD resident of Kejebi]*.

One disease control officer said:

> *…so, they complain that they won't take it again where as soon as they hear the information that the following day, they will take the medicine some children will not even come to school… [Participant 2 - IDI from Nkornya]*

Another participant who is a teacher in the district said:

> *most of them when they take it this year, next year they feel reluctant to take it because of the effect; the way the medicine… what the medicine did to them the previous year [IDI with Participant 10 from Kejebi- IDI]*

One teacher also gave this response:

…immediately we start to issue the drug one or two will sneak out because of the fear of taking medicine and so some of them actually find a way to actually get away… [IDI with Participant 27 resident of Abotoase]

4.7 Indicators of acceptability of the school-Based de-worming exercise

Acceptability is a multi-faceted construct that reflects the extent to which people delivering or receiving a healthcare intervention consider it to be appropriate, based on anticipated or experienced cognitive and emotional responses to the intervention (Sekhon, Cartwright, & Francis, 2017). The level of acceptability for the SBD exercise among respondents was assessed looking at the various knowledge or awareness, communication channels used to reach beneficiaries and human capital general affection towards the exercise. These are presented under these sub-themes: knowledge or awareness of personal risk of infection, collaboration among social institutions, skills fr program implementors in schools and impact of caregivers' income.

4.7.1 Knowledge or awareness of personal risk of infection with Schisto

Individuals understanding of their personal risk for Schisto directs them to follow SBD directives by freely allowing their children to do same. Respondents with limited knowledge on consequences of Schisto and the benefits of SBD exercise, were not favourable to the exercise. But those who fully were aware of Schisto, how it affects their children's education and the benefits of Praziquantel accepted the exercise whole-heartedly.

On this subject one 42 years old mother and farmer shares how being in the know influences her acceptance of the exercise. She said:

...we know the children will play and bath in the water so when it happens that they are to be given the drug we will permit it, probably they will get it from the rain [Participant 8 from 1st FGD resident of Kejebi]

A mother of four children also mentioned the positive attitude for Praziquantel

...some schools also have water surrounding them at the school so they can get the disease as they play in it so this makes us believe that they probably have the disease so they need to take the medicine... [Participant 5 from 1st FGD resident of Kejebi]

4.7.2 Collaboration among social institutions

Acceptability was also determined looking at the collaboration between social institutions some existing social resources and support from the society. Opportunities in the district that could facilitate acceptance among caregivers. Existing facilities like the school feeding program and presence of CHPS Compounds where children with severe reaction could be transferred to increased caregivers' tolerance. Another such social service is the provision of the National Health Insurance services in the district. Residents of the communities who could donate water also did so to support the exercise.

One disease control officer also shared how those in the community support the exercise, he said:

... they provide the water for the students to take the medicine eh because the husband is a eh he is having the pure water company you know the water so he is selling the pure water so he normally provides the water for the students to take the medicine any program like that she has been doing that. [Participant 2 - IDI from Nkornya].

Schools also benefits from social events. One teacher relates how his school still has disposable cups from the Independence Day celebration events that they still use on days of administration. He narrated:

> *... when they brought the Ghana at fifty cups, they didn't give all t the children. One of them they say the headmaster said because of this de-worming exercise most children they come to school without cups so they were using such cups. [IDI with Participant 10 from Kejebi - IDI]*

A teacher who has seen the administration of the exercise for some time expressed the collaboration between the schools and the health facilities in the district. He said this:

> *So, if you see there is a problem with the child, we rush him to the hospital or the clinic without aha their parents [IDI with Participant 3 from Nkornya Ahenkro]*

When caregivers have a good relationship with those at the health facilities it promotes a more tolerant attitude also. A mother related her views by saying;

> *Oh for me I allow my child to take the medicine even when he doesn't get it from the school due to the fact I am close with the community nurses they sometimes ask me and they give it to me to give it to my child and also they sometimes give it to me myself to take it [Participant 4 – 1st FGD]*

4.7.3 Skills for Program Implementers in Schools

With any innovation, the human resources or personnel plays a crucial role in the success of the innovation. Throughout the study teachers who were confident in their ability to meet up with the demands of the exercise and had general affection for the exercise also promoted acceptability and cultivated it in others. Workshops organised for teachers improved their

capabilities and caregivers trust in them to leave their children in their hands. Some respondent revealed their confidence in their ability to cope with the demands of the exercise.

A teacher related how personal interest in the children helps them to be effective in getting them to accept Praziquantel. He said:

> *For the smell it is bad but they are our children so we know how to mingle with them, we will find ways to make them take it and sometimes we break it into two and give them half first. [Participant 16 from 2nd FGD resident of Kejebi]*

Another participant who has taught in the district for the past five years stated how workshops organized for teachers increases confidence in his ability to administer praziquantel. He said:

> *…before we share the medicines the health instructors are educated on the medicine for about a day or two. It is something like a class, they teach us how the medicine work and others even before we go to education office to take the drug. So, it is not only the nurses who know about it we the teachers also know about it.... [IDI with Participant 3 from Nkornya Ahenkro]*

One teacher in the field for close to ten years recounted

> *so, the next day they come to school, then we examine them to make sure they have eaten some of them if they haven't eaten, I remember last time we did I have to buy food for some of the few children before they will take it. [IDI with Participant 22 from Abotoase]*

4.7.4 Impact of caregivers' income

It was evident that a parent's ability or inability to deal with the health cost financially of their wards influenced acceptance of the school-based de-worming exercise. Caregivers who could afford to take their children to either a pharmacy or health facility when they contracted schistosomiasis could tell their children not to partake in the SBD exercise. On the other hand, caregivers who felt they couldn't cope with that financial burden, gracefully embraced the exercise.

Caregivers' economic status determines acceptability. One mother commented on it this way:

> *Yes, money can determine where one should go for treatment. Since the person has money, he can choose whether to go to the hospital, church or any other place for treatment. [Participant 9 from 1st FGD resident of Kejebi]*

A father's comments reveal this when he said:

> *...but for me I've told my children not to take in such drugs when they give them such drugs at school because if they are sick, I'll take them to hospital. [IDI with Participant 23 resident of Abotoase]*

A mother of five children related what motivates her decision. She said:

> *Someone like me I don't have the fund to take my children to the hospital so if an opportunity to protect them, I will go ahead with it. [IDI with Participant 25 resident of Abotoase]*

CHAPTER FIVE

5.0 DISCUSSION

5.1 Introduction

This chapter discusses the findings. The purpose of this study was to assess acceptability of school-based de-worming exercise towards the control of schistosomiasis. The discussion focuses on themes such as knowledge and perception, challenges and coping strategies, perceived benefits and adverse reactions and acceptability or tolerance with their sub-themes which reflected the constructs in the conceptual model used for this study.

5.2 Knowledge and Perception on Schistosomiasis

It is very important to determine familiarity and awareness among key players when looking at acceptability of a health intervention. Overall caregivers had basic knowledge about schistosomiasis. They understood the cause, identified some symptoms and knew the mode of treatment. Schistosomiasis was associated with water either for bathing, swimming in rivers or drinking water from the rivers and almost all caregivers could identify the disease with Bilharzia than with schistosomiasis. According to Inobaya et al., (2018b) accurate understanding of transmission through infected waters promotes positive compliance, this supports findings of the current study where caregivers who knew the role water plays in transmission, were quite tolerant towards praziquantel distribution in schools.

Again, this findings is consistent with reports from Sacolo et al., (2018) who suggested that despite increasing spread of information there is just not adequate understanding of how it

manifest in the human body, how it is transmitted and how it could be avoided. They further indicated that some even confused prevention and transmission of Schisto with soil ransmitted helminths (STH) whiles the majority confused schistosomiasis for syphilli. This was further comfirmed by Inobaya et al. (2018b) that there is low awareness on signs and symptoms and treatment options for Schisto. Caregivers also echoed misconceptions concerning Praziquantel, schistosomiasis and the school-based de-worming exercise. Some residents think that the school-based de-worming exercise is an avenue for clearing expired drugs from the system, that praziquantel distributed in schools is aimed at teaching their children to have sex and also to kill them.

Thus most participants agreed that schistosomiasis was treatable, this was in contrast to what Inobaya et al., (2018b) found that there are uncertainties about treatment for schistosomiasis and whether schistosomiasis is treatable at all. The findings of a study conducted years earlier revealed that quiet a number of persons thought that sexual intercourse could transmit Schistosomiasis (Almazan et al., 2017). This supports the results of the current study. Moreover, in Amoin et al., (2018), participants comments showed that schistosomiasis can be contracted through dirty water, community members misconstrued that schistosomiasis could be contracted by drinking unsafe water or playing in dirty water. Furthermore, supernatural causes were held responsible for schistosome infection. These reports agree with the present study. In addition , a study in sub-Saharan Africa by Sacolo et al., (2018) identified other wrong conceptions like Schisto is as a result of drinking unclean water, witchcraft, unprotected sex and sharing of toilets with infected persons seemed to be the cause of transmission. Whereas, Almazan (2017) also reported that patcipants in male and female focused group discussions associated acquiring this disease to toilet. These earlier study findings are all in line with those of the current study.

5.3 Benefit and Adverse Effect of Praziquantel

Caregivers interviewed expressed gratitude and satisfaction for the exercise especially those who do not regularly deworm their children. Praziquantel distributed during the SBD exercise is very helpful as it helps teachers to know the status of the children in their care. Some care givers related how formerly their children would complain of stomach aches but following the drug administration this has ceased. Within the district, SBD activities has reduced absenteeism in schools and an overall reduction in cases of Schistosomiasis infection. This is in line with a report on a survey that investigated community perception and support towards a school-based de-worming exercise which indicated almost all the parents expressed satisfaction and good health for their children (Mondadori et al., 2006). Coincidentally, Ofosu and Ako-Nnubeng (2014) made similar observations in a study on the Kwahu people of Ghana which indicated 8% reduction in absenteeism among participants. The school-based de-worming exercise is good to check reinfection with parasitic worms among School-aged children. Also according to Abu-basha, Al-shunnaq, and Gehring (2012) deworming interventions directed towards school-aged children or in the community promotes growth and reduces absenteeism. Awasthi et al., (2008) also opined a benefit of de-worming to have a positive impact on body weight in a Cluster-Randomized Trial in India. Moreover this was in agreement with findings of Sur, Saha, Manna, Rajendran, and Bhattacharya (2005) who also reported a benefit of school-based de-worming on growth and diarrhoea. Also Leslie et al., (2011) acknowledged the cost effectiveness of SBD than community delivery though this varies from country to country. The current study findings have confirmed all these earlier findings. However these findings have been contrasted by Davey, Aiken, Hayes, and Hargreaves, (2015) who suggested that the assertion school-deworming exercise promotes attendance or performance in school holds no claim since there is no evidence to support it. The reasons they gave were that, studies that revealed otherwise were liable to researchers'

biases, that there could be issues with missing data and yet still difficulty interpreting school attendance patterns.

Reactions that follow after ingesting praziquantel have been common. More than half community members who receive it report with side effects (Tuhebwe et al., 2015). Findings from this study also indicated that most caregivers lamented about the side effects of praziquantel. They used words and phrases like; *"it beats them", "it overpowers them" and makes them "bɛtɛɛ"* (weak) was used to describe how children react. To them the drug and the whole exercise is good, but the side effect it has on their children makes them scared. Nonetheless, some caregivers were confident that since praziquantel has not killed anyone yet to the best of their knowledge, they knew side effects will subside and their children will be well again. Notable reactions that were reported include; stomach aches, vomiting, bed wetting, running stomach, dizziness, tiredness and collapsing. As per WHO definitions of adverse effects, many of the above-mentioned reactions cannot be considered serious reactions since they are not life threatening in themselves. This is in line with WHO reports in 2006 which declared most of reactions observed during de-worming activities are not severe. Those who react to the drug are often first timers and were the ones heavily infected with worms (World Health Organization., 2006).

Additionally, Njomo et al., (2010) conducted a study of adverse effect of praziquantel and Albendazole in Kenya and detected that minor reactions to praziquantel was present among pupils despite the fact that they ate heavily before swallowing praziquantel; but none could be characterised as severe or excessive.

Moreover, according to Fincham et al., (2005) in a study about women and children in South Africa, no adverse reactions was recorded yet in relation to school de-worming this is in support of the current study. Furthermore, the findings of the current study is confirmed Phongluxa, van Eeuwijk, Soukhathammavong, Akkhavong, and Odermatt., (2015) which indicated that praziquantel benefactors reported reactions like dizziness, stomach-ache, vomit, and light diarrhoea with some of these reactions occurring in minutes. Among study respondents, it was believed that praziquantel, can affect pregnant girls negatively so they were exempted from the exercise. However, this is a contrasted by a recent study which supports using Praziquantel during pregnancy (Friedman, Olveda, Mirochnick, Bustinduy, & Elliott, 2018).

5.4 Challenges affecting the success of the SBD exercise

Mofid and Gyorkos, (2017) identified fear and the difficulty in reaching beneficiaries as one challenge deworming programmes encounter. The result of the current study showed a similar pattern where those who live across the lake that is *"overbank regions"* could not be easily reached by SBD exercise. This limitation is not only in the difficulty to reach these communities because of the lake that separates them, but that the presence of the lake enables school children to fish and sell on market days to support themselves instead of staying in schools. The current study also showed that this is largely due to single parenting with about 85% SAC living with their female parents. Moreover, the WHO (2006) also identifies difficulty in reaching high risk individuals as a major challenge.

In addition, parents who do not attend PTA meetings were intolerant towards the school-based de-worming exercise since they do not receive adequate information, needed to make

informed decisions. This proves to be a challenge especially when friends and family easily convince them with their negative experiences with the exercise. This finding is consistent with Phongluxa et al., (2015) who found that better knowledge on the consequences of worm infections and on its modes of transmission fosters the distribution and acceptance of appropriate preventive treatment. Similarly, Stothard et al., (2013) cited that, unpleasant scent and huge size of praziquantel poses a challenge. In the current study it was revealed that children refuse to take praziquantel due to the strong scent and the size of Praziquantel which scares the children. Globally the dosage of praziquantel issued to school pupils is determined by measuring their height (Montresor et al., 2005; Njomo et al., 2010).

The respondents of the present study felt the discrepancy in dosage as a result of using height other than age is not required. Caregivers feared that height can be deceptive and those who can really withstand the effect of praziquantel but because they are disadvantaged in height might receive less tablet than they require. This is a contrast to reports by Montresor et al. (2005) who supported the use of a measuring pole in determining dosage than using age and weight. The findings of the current study is again contrary to the suggestions of researchers who suggest that the low level of literacy in African communities calls for using height to determine praziquantel dosage even though weight is the best method to be used (Idowu et al., 2007).

In this study, respondents stated not having any knowledge of herbs used to cure schistosomiasis but then if one is recommended without the side-effects of Praziquantel, they would welcome that instead of Praziquantel. Reasons stated for this position is that herbal medicines are better than “these chemicals” as they called it. Alternative sources of

medication, self-medication with herbs poses a challenge to the school-based de-worming exercise (Bruun et al., 2008; Danso-Appiah et al., 2013).

5.5 Strategies to address challenges in SBD in relation to Praziquantel

Caregivers adopt strategies to cope with the stresses of school-based de-worming exercise. These coping strategies were those that supported the success of the SBD exercise as well as those that withdrew from the exercise. Caregivers reported approaching the school teachers to make further enquiries to help them decide. The information they received enabled them to prepare their children well by making sure they eat heavily in the morning; they also give them money to buy food and water whilst in school so that they can partake in the exercise. For caregivers who support the SBD exercise, some decide to stay home to wait for their children on the day of administration so that they can take care of them home by monitoring their reactions.

On the part of the teachers, they adopt some ingenuity to deal with ensuing challenges. In instances, some teachers had to pamper the students using different strategies to get them to accept the drug. They also follow up on parents by contacting them about their decision not to allow their child to receive the drug. In some cases, parents do not allow their children to go to school or tell them to run away when the teachers want to give them the drug. This they mostly do because they lack adequate information on the seriousness of schistosomiasis and they fear the worst might happen to their children if they take it.

5.6 Acceptability of the School-Based De-Worming Exercise

The result of this study showed that caregivers who could afford to take their children to the health centre were more likely to ask them not to partake in this exercise. The roles of

mothers facilitate acceptability of school-based de-worming exercise since they prepare their wards by feeding them well and caring for side-effect of the drug.

In the current study, it was evident that using community communication facilities allowed many caregivers to be reached with the news of drug administration. Caregivers were confident in the exercise as they looked upon the CHPS compounds in the district since. They conclude that their children will be taken care of in the event of adverse reaction.

In addition, other factors that promoted acceptability were when caregivers knew and understood Schistosomiasis and the benefits of deworming in schools. Njomo et al., (2010) showed that previous experience of benefits of de-worming drugs created a welcoming attitude towards new de-worming sessions when pupils from two communities Mwea and Ndia were compared. Karani et al., (2013) confirmed these findings when they related how community tolerance of school-based de-worming activities was informed by seeing how it improves children's health and academic performances. Other reasons that have yielded mass involvement in MDA programs according to (Mulebeke et al., 2019) were due to strong mobilization of community, employing community resources and communication system.

In the present study it was revealed that teachers seem convinced that they are in the best position to administer praziquantel to the children in schools. This was confirmed by Leslie et al., (2011) who indicated that teachers were more tolerant to deworming exercise since it is easy and training requires less effort. Krentel, Fischer, & Weil, (2020) also confirmed this when in a qualitative study looking at "Factors That Influence Individual Compliance with Mass Drug Administration", that providing such skills to teachers promotes trust and spread of information that can offset fear of the unknown.

After analysing respondent's information, personal qualities such as age, sex, income level, occupation, and area of residence not only expose people to diseases but affect a person's attitude towards MDA programs like the School-based de-worming exercise. Nonetheless,

this again is affected by an understanding of its benefits and effects of the medicine (Bruun et al., 2008). The positive impact of the school-based de-worming exercise has motivated some residents in water production to supply some schools with water on the de-worming day.

CHAPTER SIX

SUMMARY, CONCLUSION AND RECOMMENDATION OF THE STUDY

6.0 Introduction

This chapter presents the summary of the study. It also highlights a conclusion as well as recommendations for specific individuals and organisations to take action to improve the de-worming exercise.

6.1 Summary

This is a qualitative study which explored acceptability of the school-based de-worming exercise in the control of schistosomiasis among school going children of the Biakoye district. A qualitative research design was used specifically employing purposive sampling to recruit participants for this study. Twenty-seven (27) participants were recruited in all from the district. All participants were interviewed once and data was analysed using thematic content analysis. The four themes that emerged in this study were understanding of schistosomiasis and school-based de-worming exercise, perceived benefits and adverse effect of Praziquantel and lastly acceptability of the de-worming exercise.

The findings of the study were that, the school-based de-worming exercise is seen as a good exercise and almost all caregivers are aware that drugs are given to their children in their various schools. After observing how their children's health has improved. Another finding was that adverse effect of Praziquantel mostly discourages caregivers for, allowing their wards partake in the SBD. They feared financial burdens and not knowing when the medicine will harm their children. Moreover, the role of teachers in administering the drug in schools is very helpful. They are innovative and establish good relationship with parents and guardians and this help promote good attitude towards the de-worming exercise. A few other challenges that undermine success of the same is lack of adequate engagement with caregivers with

government representatives and insufficient knowledge about the serious consequences of schistosomiasis in later years of its development in the body.

6.2 Conclusion

In conclusion, most caregivers have some knowledge on schistosomiasis and the school-based de-worming exercise but this knowledge is not comprehensive to motivate them make effective decisions. Instead, wide spread misconceptions about schistosomiasis and the school-based de-worming exercise, what others say, and the fear of what might happen to one's child takes precedence when deciding to allow one's child to partake of the exercise or not. Despite this, residents especially caregivers with children in primary and JHS are happy with the exercise since absenteeism is reduced, and overall health of their children has improved. It is also noteworthy that even though there were side effects following drug administration, these could not be termed as adverse reactions.

Some major challenges that affected the SBD exercise towards eliminating Schisto had to do with the nature of praziquantel. The differing dosage given per child based on height discourages the children who are beneficiaries of the exercise and to some caregivers this method is not effective. Amidst these difficulties, caregivers who have noticed the positive impact of the exercise in their children's health are tolerant of the exercise and allow their children to be part of it.

Furthermore, among caregivers, the school-based de-worming exercise was an excellent initiative from the government to help their children. This was indicated by the personal time and efforts put in place to prepare their children for the exercise. Seeing the benefit, the exercise has on the children they handle, teachers embrace the exercise and encourage caregivers to do same. Other residents of the district give off resources such as sachet water to some schools to support the exercise. This indicates that's the level of acceptability of

school-based de-worming exercise is high among caregivers with school-going children in the district

6.3 Recommendations

The study makes the following suggestions for policy makers, program implementers, beneficiaries and future research into the school-based de-worming exercise.

6.3.1 Recommendations for Policy Makers

1. The SHEP coordinators and Disease control officers must collaborate to provide adequate training and specific skills that can boost teacher's confidence to be more effective
2. Schistosomiasis control division of the Ghana Health Service (GHS) must generate funds every year to supply schools with consent forms, meals and proper drinking water to school children especially on days of administration

6.3.2 Recommendations for Regional and District Health Directorate

1. Government personnel in the regional and district offices should take a foremost role in mass community engagement and house to house engagement create awareness on the dangers of schistosomiasis. This can be done to counteract wrong perceptions among community members.
2. Health promotion advocates should avoid drawing on political party lines as this can push people to opt out of MDA activities especially when their party is not in office.

6.3.3 Recommendations for Future Research

The findings of this study revealed some areas that can be taken up by future researchers in implementation research interventions for schistosomiasis. A typical one is including school children as study participant.

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APPENDCES

APPENDIX A: PARTICIPANT INFORMATION SHEET

PARTICIPANT INFORMATION SHEET

The information sheet answers questions on the research for participant to make a decision as to be part or not partake in the research. It entails the title of the research, what to expect and expectations of participants and other contact details.

Tittle of the study

Acceptability of school-based deworming exercise for the control of schistosomiasis in the Biakoye district of the Oti region.

Introduction

My name is Dorinda Hayford of address number P.O. Box LG 13, Legon, Accra and telephone number 0500534402 or 0573653337. I am the principal investigator for this study and I can also be contacted via email at dorindahayford@gmail.com.

Background and purpose of the research

The school-based de-worming exercise has been rolled out in the country for more than a decade now. Despite the numerous achievements of the exercise, issues of acceptability, coverage and compliance still persists. The aim of the research is to help identify issues concerning the school-based de-worming exercise and how these occurrences affect acceptance of the drug used to treat schistosomiasis. This study is conducted in support of WHO's goal of eliminating schistosomiasis by 2020 and completely eradicating it by 2025.

Nature of the research

You will be asked a series of questions on what you feel about the school-based de-worming exercise and the role of perceptions that influences acceptance of praziquantel during the

exercise. We would also like you to share with us the factors that motivates you to allow your children to accept and swallow the drug during the exercise. This will be done via interviews and group discussions. A total of about thirty participants will be used for this study including parents/guardians, teachers and NTD control officers in the district.

Participants involvement

Participants will be required to sign participant consent forms upon agreeing to take part in the study. After which you will be required to share your experiences with the school-based de-worming exercise with us. This will require you to commute to a designated location for an interview slated for not more than an hour. No lasting risk will be borne by the participant except for; in rare cases, discomfort and fatigue.

Cost and compensation

Please note that the cost of coming and leaving the designated location will be borne by you. For participating in this study, you will be entitled to a token of fifty Ghana cedi.

Confidentiality

For the purpose of confidentiality, the interview will be carried out in an enclosed space and the actual names will not be taken. The interview will be conducted by non-residents of the district. This will help prevent tracing you out even after the study.

Voluntary participation/ withdrawal: you have the freedom to choose to partake or not. Withdrawal from the interview at any given time is also voluntary.

Outcome and Feedback: whatever information you provide us will be transcribed, analysed and interpreted to answer the research question and nothing more. The result of the study will be communicated to the district health directorate for the benefit of all members of the district.

Provision of Information and Consent for participants

Each participant will receive a copy of the information sheet and consent forms to authenticate their voluntary participation.

Who to Contact for Further Clarification/Questions?

To get more information or clarification on any of the information provided on this sheet please do so by contacting the principal investigator: Dorinda Hayford, on 0573653337 or 0500534402 and by email via dorindahayford@gmail.com

You can also contact the administrator of the GHS ethics review committee, Nana Abena Apatu on 0503539896 and also at ethics.research@ghsmail.org for ethical issues and the rights to participation.

APPENDIX B: CONSENT FORM FOR PARTICIPANTS

This study is being conducted by researchers from the University of Ghana. The aim of this study is to find out how knowledge, treatment factors, perceptions, socio-cultural factors and others influences acceptance of the school-based de-worming exercise. We are therefore interested in the amount of information you have, cultural factors, challenges and coping strategies that you as a member of the community adopt that influences acceptability of the school-based de-worming exercise in the district

You have been selected to participate in this study. By agreeing to be part of the study, you will be subjected to some questions which you are expected to answer. Please bear in mind that some questions are quite personal and could make you uncomfortable as such you may choose to or not to answer any question of your choice. Information you provide to support the study will be audio recorded and then kept confidentially by the researchers, and also note that the information you provide will not be traced back to you.

Each interview session will last a maximum of an hour. By agreeing to participate in this study, you are also entitled to any benefit that comes along with it.

If you have questions about this study at any time you can contact the principal investigator:

Dr Kwabena Opoku Mensah GHS-ERC Administrator

Social and Behavioural Science Department

School of Public Health University of Ghana

P.O. Box LG 13, Legon, Accra

Email: opokumens@hotmail.com

Tel: +233 244273182

Do I have permission to continue? Yes [ ] No [ ]

I, _____, have understood all that has been explained to me about this study and agree to participate.

[IF YES] I, _____(Interviewer) certify that the respondent has given permission to participate in the study.

Signature_____

Verbal consent _____ (To be indicated by the interviewer

APPENDIX C: INTERVIEW GUIDES

INTERVIEW GUIDES FOR DISEASE CONTROL OFFICERS

1. What is the level of uptake of praziquantel in the district?
2. How is the drug stored?
3. Are there issues with the supply of the drug?
4. What has been the situation in the district with schistosomiasis?
5. Would you consider the district as a hotspot zone?
6. Prior to the exercise, are the any steps taken to inform all stakeholders about it?
7. How do you think this affect their attitude toward the school-based de-worming activities?
8. What would you like to be improved or changed about the way information is shared with the people?
9. Which schools benefit from the exercise?
10. What criteria do you look out for in selecting a school in which the exercise will take place?
11. What do you perceive or from your experience have to observe to hinder the progress of the school-based de-worming exercise in the schools in this district?

FGD INTERVIEW GUIDE

1. Name and introductions.
2. What is your marital status?
3. What is your level of education?
4. Which religion do you belong to?
5. How many children do you have?
6. Do you know of the distribution of praziquantel during school-based de-worming exercise?
7. What is your understanding of Bilharzia/schistosomiasis?

   In what ways has your understanding of the disease affected your perception of distribution of praziquantel during SBD
8. Do you think it is caused by?
   - The sharing of privies (washrooms) with others?
   - Witchcraft?
   - Inherited from parents?
   - Conditions in the school?
9. Do you think income or wealth influences health seeking behaviours of people in your community?
10. Is it believed that urinating blood is something good in this community?
11. Are there any motives you that influences allowing your children to take or not take the drug.?

12. Has your child ever reacted to the drug? How did this affect your attitude during the next exercise?
13. Are you informed about the exercise before the drug is given? How does this make you feel?
14. Are you happy with the drug being given to your child in the school?
15. What is your perception of the drug?
16. Are your decisions to allow your child to take the drug influenced by what your friends say?

IN-DEPTH INTERVIEW GUIDE

Acceptability of School-Based De-Worming Exercise for the Control of Schistosomiasis within the Biakoye District in the Oti Region.

Introductory Questions

- Kindly tell me about yourself. (probe for the following demographics if not part of the participant's narration)
  - Age
  - Level of education
  - How long have you been teaching?
  - Do you have children of your own, where do they school?
- Questions related to knowledge on schistosomiasis and school-based de-worming exercise
  - What do you understand by school-based de-worming exercise?
  - What issues come up when you hear schistosomiasis/ Bilharzia?
  - What information do you have about the following issues…….?
    - How schistosomiasis is acquired and transmitted
    - Do you think care-givers are adequately informed about the SBD exercise?
- Questions related to notices to parents
  - Are the regular meetings with the parents?
  - Do parents receive and submit assent forms sent to them?

- Do you know who to contact in relation to a child?
- Do you encounter any challenges when trying to communicate information about the exercise to care-givers?

❖ Questions related to acceptability and perceptions of the exercise

- What is the general attitude of parents, caregivers and students concerning the exercise?
- Do you feel well equipped to administer drugs to students? How do you think your role affects acceptance of the drug?
- Are you satisfied with the level of acceptability among community members? If not, what do you suggest to be done?

❖ Questions on recommendations to improve SBD exercise to control schistosomiasis

- What would you like to see improved in the way you SBD exercise to control schistosomiasis is undertaken?
- Any other comments that you would like to make on the issues discussed?

APPENDIX D: ETHICAL CLEARANCE

GHANA HEALTH SERVICE ETHICS REVIEW COMMITTEE

In case of reply the number and date of this Letter should be quoted.

Research & Development Division
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MyRef. GHS/RDD/ERC/Admin/App 120/31
Your Ref. No.

15th January, 2020

Dorinda Hayford
University of Ghana
School of Public Health
College of Health Sciences

The Ghana Health Service Ethics Review Committee has reviewed and given approval for the implementation of your Study Protocol.

GHS-ERC Number	**GHS-ERC020/01/20**
Project Title	Acceptability of School-based De-worming Exercise for the Control of Schistomiasis within the Baikoye District of the Oti Region
Approval Date	15th January, 2020
Expiry Date	14th January, 2021
GHS-ERC Decision	**Approved**

This approval requires the following from the Principal Investigator

- Submission of yearly progress report of the study to the Ethics Review Committee (ERC)
- Renewal of ethical approval if the study lasts for more than 12 months,
- Reporting of all serious adverse events related to this study to the ERC within three days verbally and seven days in writing.
- Submission of a final report **after completion** of the study
- Informing ERC if study cannot be implemented or is discontinued and reasons why
- Informing the ERC and your sponsor (where applicable) before any publication of the research findings.

Please note that any modification of the study without ERC approval of the amendment is invalid.

The ERC may observe or cause to be observed procedures and records of the study during and after implementation.

Kindly quote the protocol identification number in all future correspondence in relation to this approved protocol

SIGNED.....
Dr. James Akazili
(Head, Ethics and Research Management Department)

Cc: The Director, Research & Development Division, Ghana Health Service, Accra

APPENDIX E: CHARACTERISTICS OF RESPONDENTS

Demographics	Groups	Frequency	Total(Q/%)
Age	20-29	7	25.9%
	30-39	11	40.7%
	40-49	5	18.5%
	50 and more	4	14.8%
Gender	Male	11	40.7%
	female	16	59.3%
Educational level	O-level	4	14.8%
	Primary	1	3.7%
	JHS-SHS	14	51.9%
	Tertiary	8	29.6%
Marital status	Single	2	7.4%
	Married	14	51.9%
	Divorced	8	29.6%
	widowed	3	11.1%
Number of children	1-3	21	77.8%
	4-6	6	22.2%
Religion	Christian	25	92.6%
	Muslim	1	3.7%
	Traditionalist	1	3.7%
Occupation	Public sector employee	8	29.6%
	Self-employed	18	66.7%
	Retired	1	3.7%

APPENDIX F: LIST OF THEMES AND SUB-THEMES

Number	Themes	Categories
1.	Knowledge and Perception on SBD and Schisto	▪ Knowledge and perceptions of Schistosomiasis ▪ Knowledge and perceptions of the school-based de-worming exercise
2.	Benefit and Adverse effect Praziquantel	▪ Adverse effect of Praziquantel ▪ Benefit of Praziquantel
3.	Challenges affecting the success of the SBD exercise & strategies adopted to contain the challenges	**CHALLENGES** ▪ Drug factors ▪ Institutional inconsistencies ▪ Possible causes for reinfection ▪ Using height as a measuring tool **COPING STRATEGIES** ▪ Active strategies that lead to acceptance ▪ Avoidant strategies that lead to poor acceptance
4.	Indicators of acceptability of the school-based de-worming exercise	▪ Knowledge or awareness of personal risk of infection with Schisto ▪ Skills for program implementors ▪ Collaborations among social institutions ▪ Impact of caregiver's income