KNOWLEDGE, SOURCES OF INFORMATION AND HEALTH-SEEKING BEHAVIOUR FOR SCHISTOSOMIASIS CONTROL BY PRIMARY SCHOOL HEALTH TEACHERS IN SEME SUB-COUNTY, KISUMU COUNTY, KENYA

BY

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A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF PUBLIC HEALTH (HEALTH PROMOTION OPTION)

SCHOOL OF PUBLIC HEALTH AND COMMUNITY DEVELOPMENT

MASENO UNIVERSITY

DECLARATION

I hereby declare that this thesis is my original work and has not been presented to any other university or institution for a degree or any other award.

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ACKNOWLEDGMENT

I thank my supervisors Prof. Collins Ouma of Maseno University and Dr .Diana Karanja of Centre for Global Health Research for their tireless support and guidance throughout the course, thesis research and presentation.

I thank the Neglected Tropical Diseases personnel for all their assistance in carrying out this study. I am grateful to Dr. Evan Secor, of Centers for Disease Control and Prevention, Atlanta GA for his input in designing and supporting this proposal.

Many thanks to the Director, Kenya Medical Research Institute for his approval to conduct this study and to all who assisted me in one way or another; i am sincerely grateful.

I sincerely thank the Ministry of Education Kisumu county leadership and Seme Sub-county (formerly Kisumu West District) Education officer for their permission to conduct the study

Finally, I thank my mother for the gift of education, my husband Elisha Odhoch for his inspiration and unending support; our children Paul, Eunice, Timothy, Diana, Joseph and Don for their patience and understanding.

Above all, I thank God for the strength, wisdom and ability He gave me to have this work accomplished.

DEDICATION

I dedicate this study to my family for their support and for creating an enabling environment for this work.

ABSTRACT

Schistosomiasis is a chronic disease and a leading cause of morbidity and mortality in sub Saharan Africa. Globally over 240 million people are infected while more than 700 million people living in endemic areas are at risk of infection. In Kenya, about 9 million people are infected with schistosomiasis. Endemic areas are found around the shores of Lake Victoria (Western Kenya), coastal strip and some pouches of Eastern Province. In Western Kenya, Kisumu West District (currently Seme Sub-County) has the highest prevalence (average of 19%) among school going population with moderate of 10-24%. Schools are recognized as conducive environments for schistosomiasis control through MDA hence school health teachers can be key implementers with minimal supervision from health professionals. Although WHO recommends the school-based delivery strategy which focuses on children, schistosomiasis affects all populations. Knowledge, sources of information and health-seeking behaviour for schistosomiasis among target adult populations, such as teachers can help scale-up control. However the knowledge, sources of information on MDA and health-seeking behaviour for schistosomiasis control by health teachers, who implement MDAs in schools remain unknown. This study was thus undertaken in Kisumu West District (currently Seme Sub-County) to explore knowledge, sources of information on MDA and health-seeking behaviour for schistosomiasis control by primary school health teachers. A total of 250 health teachers participated in the study. A descriptive cross-sectional study design was used in which both qualitative and quantitative approaches were employed. Saturated sampling was used for participants' selection and data collected by use of exploratory survey and focus group discussions. Qualitative data was analysed by Atlas *ti* through thematic decomposition while quantitative analysis was done using Chi-square and logistic regression. Statistical significance was tested at $P \leq 0.05$. Results on knowledge demonstrated that 117 (56.80%) did not know correct signs and symptoms, and 169 (82.04%) did not know mode of transmission for schistosomiasis. Additional results revealed that 87 (42.23%) of the participants obtained information on bilharzia from the print/media, 61 (29.61%) got information from professionals during trainings or seminars and 58 (28.16%) from awareness meetings done by chiefs (also reported as others). Those obtaining information from the media had a 99.7% likelihood of seeking healthcare relative to those who obtained the information from professionals (OR, 3.2177, 95% CI, 1.4878-6.9592, P=0.003).Findings for associations revealed that participants knowledge of signs and symptoms and mode of transmission was insufficient for health-seeking behavior (OR, 0.6592, 95% CI, 0.2652-1.6235, P=0.362) and (OR, 0.4853, 95% CI, 0.1581-1.4898, P=0.206). Association of drinking water and health seeking behaviour showed that those whose drinking water was treated had a 90% likelihood of health-seeking behaviour for schistosomiasis control relative to those who did not (OR, 1.1027, 95% CI, 0.0184-0.0575, P=0.010). Likewise, those whose source of drinking water was safe had about 58% likelihood of seeking healthcare for schistosomiasis control (OR, 0.4259, 95% CI, 0.01829-0.9917, P=0.048) relative to those whose source of drinking water was unsafe. Findings from qualitative analyses supported these trends and the fact that schistosomiasis was not perceived as a threatening condition by the primary school teachers. Collectively results demonstrated that despite implementing MDA in schools the teachers' knowledge for schistosomiasis control was low hence the need to be strengthened; print and media play a big role in information despite preferences for health professionals. Findings will help MDA providers and other schistosomiasis agencies to review training content and help provide basis for design and execution of health education on schistosomiasis if control and elimination is to be achieved.

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ABBREVIATIONS AND ACRONYMS

DALYs- Disability-adjusted life years

EI- Education International

FGD- Focus Group Discussion

FTC- Federal Trade Cooperation

HBM- Health belief model

HSB- Health-seeking behaviour

IEC- Information, Education and Communication

KDHS- Kenya Demographic and Health Survey

KESSP- Kenya Education sector support program

MDA- Mass Drug Administration

MOE- Ministry of Education Science and Technology

MOPHS- Ministry of Public Health and Sanitation *(although defunct now, cited information reflects work during this departments' operation)*

NSDP-National Schools Deworming Programme

NHSP- National School Health Program

NTD- Neglected Tropical Diseases

QASO- Quality Assurance and Standards Officer

SCORE- Schistosomiasis Consortium for Operational Research and Elimination

SLTS- School Led Total Sanitation

UNICEF - United Nations Children's Emergency Fund *(formerly United Nations International Children's Emergency Fund)*

WHA- World Health Assembly

WHO- World Health Organization

OPERATIONAL DEFINITIONS OF KEY TERMS AND CONCEPTS

Health-seeking behaviour- any remedial actions that individuals undertake to rectify perceived health. In this study health-seeking behaviour will refer to voluntary activities undertaken by the health teachers towards schistosomiasis control; will include: health education to pupils, use of toilets, access and use of safe drinking water, where to attend health care in the event of sickness. These activities will also be referred to as prevention measures.

Health teacher-any teacher in primary school who has been given the responsibility of taking care of pupils' health matters in school.

Mass drug administration- this is the administration of drugs or medicine to whole populations irrespective of disease status in order to reduce the risk of spreading the disease and will indicate praziquantel administration for schistosomiasis control.

Knowledge- will refer to awareness and the ability to understand basic information or science on the signs and symptoms of bilharzia, cause and mode of transmission, source of information and basic prevention measures as a way of controlling schistosomiasis.

Source of information- this will refer to both channels of information and the person giving out the message or awareness on schistosomiasis, includes seminars, trainings, media reports and campaign on schistosomiasis control.

Professionals- refer to ministry of health staff responsible for health promotion and or treatment.

Schistosomiasis-a neglected tropical disease; also known as bilharzia, will be the main reference in the study.

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CHAPTER ONE: INTRODUCTION

1.1. BACKGROUND INFORMATION

Schistosomiasis is a chronic communicable parasitic disease caused by trematode flat worms of the genus Schistosoma. Three main species of schistosomes infect human beings namely *Schistosoma mansoni, Schistosoma heamatobium* and *Schistosoma japonicum*. *Schistosoma mansoni* and *S. heamatobium* occur in Africa and the Middle East whereas only *S. mansoni* is found in the Americas. *Schistosoma japonicum* is localised to Asia primarily the Philippines and China. Other species not very common include *Schistosoma mekongi* found in South East Asia*;* and *S. guineensis* and *S. Intercalatum* occurring in West Africa. The vectors for schistosomiasis are snails of the Phylum Mollusca belonging to two genera Biomphalaria found in streams, lakes and irrigation schemes; and Bulinus found in temporary water bodies like ponds, dams and paddy fields, for *Schistosoma mansoni* and *Schistosoma heamatobium* and *intercalatum* respectively (Colley *et al.*, 2014). Transmission is by water through contact with infected fresh water snails which are the intermediate host while man acts as the definitive host. The cercariae (larva) from the snails penetrate the body through the skin causing schistosomiasis infection which may be acute or chronic. Initiatives for control and elimination include Mass Drug Administration (MDA), health education, access to safe water and good sanitation, and in limited situations, mullusciciding. Schistosomiasis is classified under Neglected Tropical Diseases group of infections and currently, it is on the worlds agenda as a major public health concern (WHO, 2006).

Over 240 million people are infected globally while more than 700 million people living in endemic areas are at risk of infection (King, 2010). Second to malaria among parasitic infections, schistosomiasis is a leading cause of morbidity in sub-Saharan Africa with an estimated morbidity and mortality (200,000 deaths are attributed to schistosomiasis annually) burden of 90% and disability range of from 2%–25%. Schistosomiasis is often associated with poverty, limited access to safe water and poor sanitation; most at risk populations being the school age-going and adolescent populations (King, 2008; Steinmann *et al.*, 2006). In Kenya, about 9 million people are infected with schistosomiasis (MOPHS, 2011). Endemic (King, C.

H., 2008)areas are found around the shores of Lake Victoria, coastal strip and some pouches of Eastern Province. Studies report that prevalence in Eastern Province is estimated at 54% (Masaku *et al.*, 2015); around lake Victoria shore (also referred to as western Kenya) rates of up to 80% have been recorded (Handzel *et al.*, 2003) and coastal strip is estimated at 60-85% (Satayathum *et al.*, 2006). In Western Kenya the seven districts included in the Schistosomiasis Consortium for Operational Research and Elimination (SCORE) study namely Rachuonyo, Homabay, Nyakach, Kisumu East, Rarieda, Bondo and Kisumu West (currently Seme Sub-County) lie within schistosomiasis endemic areas. The prevalence rates in these areas vary with individual rates of up to 80% according to eligibility survey done by SCORE in 2010. However, Kisumu West district has the highest prevalence among school populations within the seven districts with an average of 19%.

The World Health Organization recommends school-based regular Mass Drug Administration (MDA) using praziquantel targeting school age children with a focus on reducing morbidity from chronic infection (WHO, 2006). Infection prevalence and intensity is at its peak in the adolescent (8-15) but morbidity is experienced in older age groups in association with chronic infection (Gryseels *et al.*, 2006). MDA is conducted in schools with an assumption that it is cost effective and that teachers can assist to administer the drugs to the children (Brooker *et al.*, 2008). Health teachers are the immediate health service providers and a link between the pupils, parents and health professionals at level one health care system of the Ministry of Public Health and Sanitation (MOPHS, 2005). For this reason, school health teachers play implementation roles for not only MDA but any other health program in school. The Kenya National School Health Policy and the Ministries of Public Health and Sanitation and Education (MOPHS & MOE, 2009b) recognize this role and therefore offer support in terms of training and supervision. Given this role followed by the fact that children spend most of their time with teachers; it becomes imperative that health teachers play a role in schistosomiasis control. Following implementation of MDA in schools for the control of schistosomiasis, health teachers have received training on schistosomiasis control. The trainings focus on definition of schistosomiasis, cause and mode of transmission and signs and symptoms. This is in effort to provide information that can help control schistosomiasis besides chemotherapy. Besides National School-based Deworming, the study by Schistosomiasis Consortium for Operational

Research and Elimination (SCORE) is seeking to delineate what future managers need to gain in order to control schistosomiasis. It is with this background that the current study, nested within the SCORE study, sought to assess the knowledge of teachers' understanding of schistosomiasis. A previous study in Mwea District states that teachers were trained by education and health ministry officials on the adverse effects of praziquantel before carrying out MDA in two schools. The study emphasized the need for enhanced monitoring and evaluation of MDA activities while stressing the importance of having health officials provide moral support for teachers. However, there was no assessment on knowledge for schistosomiasis control in that study by the teachers (Njomo *et al.,* 2010). Other studies have been carried out to assess bilharzia awareness in communities (Bundy *et al.,* 2008) but the teacher's knowledge for bilharzia control remains unknown. As such, the current study explored teachers' knowledge levels on MDA for schistosomiasis control.

According to WHO, schools are among the most strategic places to promote health for children. Over the years school health has shifted from classroom to a more comprehensive approach focusing on pupils' health behavior and a supportive school environment of health promotion (*Deschesnes* et al., 2003). For example, School Led Total Sanitation (SLTS) focuses on children as change bearers and entry points for sanitation campaign in both school and community (*UNICEF*, 2006). The effectiveness of health programs in school depends on the teachers' initiative. With this in mind, sources of information on health promotion remain vital. There are several sources of information in regard to health care (FTC, 2008; Redmond *et al.*, 2010), and every source has its specific impact. For example previous reports show that people suffering from chronic condition prefer information from health professional while those with rare conditions seek help from similar support groups (Fox & Duggan, 2013). Schistosomiasis has its source of information from the media, booklets and trainings at various centers by MDA implementing agencies in preparation for MDA activities (MOPHS, 2011; MOPHS & MOE, 2009a). In relation to health-seeking behavior, sources of information about health conditions are necessary for action. Bilharzia is a chronic condition under the neglected diseases group. It is not known what sources of information would impact its control by the health teachers. Many programs specify where to get information and who is responsible for what kind of information

for example, a study of a community in Brazil, showed that treatment campaigns provided necessary information for creating awareness and transmission control for schistosomiasis (Rollinson *et al.*, 2012). Similarly, World Health Organization (WHO) advocates for community strengthening and health education as a way of creating awareness for health promotion for communities (Uta & Sanders, 2007). In another study (Lansdown *et al.*, 2002) on achieving behavior change in primary schools in Lushoto, it is shown that teachers undertook a training by Tanzanian staff but does not make public the source of information. It is with this understanding that the study sought to establish what sources of information would impact schistosomiasis control by the health teachers in Kisumu West District.

MDAs on the other hand need to be strengthened by behavioural actions that will ensure sustainable control. The Kenya National Vision 2030 and the National Multi-year Strategic Plan action for control of Neglected Tropical Diseases (MOPHS, 2011) emphasizes the need for enhanced health-seeking behavior for schistosomiasis control as one of the ways of reducing the country's disease burden. Health-seeking behaviour is one of the measurable indicators that show individuals have moved from knowledge to action voluntarily (Edelman & Mandle, 2006). Health-seeking behaviour is voluntary action that individuals engage to promote, protect and maintain health regardless of actual or perceived health status (Redmond *et al.*, 2010). These actions include self-seeking of treatment at recognized health facilities on recognition of disease symptom, presentation to health facilities for regular check-ups and or treatment, improved lifestyle e.g. good environmental sanitation habits, exercise, good nutrition, mass screening and mass drug administration among others. In other words Health-seeking behaviour includes behaviours that are associated with maintaining a healthy and mental state also known as primary prevention, behaviours that help control disease and combat unaffordable costs of health care (secondary prevention) and behaviours that reduce impact of illness progression (secondary prevention) (*David*, 2002). A study by Innovation for Poverty Action in Busia, Kenya reports that teachers have received training on MDA and worm prevention behaviour (Miguel & Kremer, 2002) that has resulted in a number of pupils getting de-wormed however the same report is not made for teachers. Another study in Cote d'Ivore reported that knowledge improved prevention and control of worms in schools (Acka *et al.*, 2010) but no information is reported on health-seeking behaviour for schistosomiasis control by the teachers who are MDA

implementers. Health-seeking behavior is as a result of knowledge individuals have about life-threatening conditions; for example, washing hands after toilet use is a health-seeking behavior for preventing diarrheal diseases (Greene *et al.*, 2012) which is a silent killer disease.

The National School Deworming Programme (NSDP) has been carrying out deworming programs in schools to control not only bilharzia but also soil-transmitted helminthes (Olds, 2013). A study by Schistosomiasis Consortium for Operational Research and Elimination (SCORE) aims to determine what future leaders need in order to control and eliminate schistosomiasis. It is upon this background that the current study was carried out in Kisumu West District to identify health-seeking behavior for schistosomiasis control by teachers as implementers of MDA in schools as a complementary potential component of strengthening the MDA interventions for schistosomiasis control.

1.2. STATEMENT OF THE PROBLEM

With over 200,000 deaths annually, a Disability Adjusted Life Years (DALYs) of 10-25% and 700 million people being at risk of infection in endemic areas, schistosomiasis remains a global public health concern (King, C. H., 2008; Manderson *et al.*, 2009). In Kenya, 9 million people are estimated to be infected with schistosomiasis and its morbidity and mortality continues to dominate disease profile in the country despite the initiation of mass drug administration program for schistosomiasis and other helminthes in 2009 by the Ministry of Health (MOPHS, 2011). Kisumu West District still posts an average prevalence of 19% (Eligibility Survey, KEMRI/CDC 2010). The WHO recommendation to reach 75% treatment coverage for mass drug administration in schools remains unreached (Barry *et al.*, 2013). Furthermore related reports reveal that chemotherapy is limited in controlling schistosomiasis (Doenhoff *et al.*, 2009; Erko *et al.*, 2012). The most at risk populations (children of school going age and adolescents) spend most of their time with teachers who are key implementers of MDA in schools. Obtaining information regarding the teacher's knowledge of schistosomiasis is vital in controlling the disease. Sources of information on health determine action either at individual or community level hence providing knowledge and source of information about causes of ill health and providing available choices helps to promote health-seeking behavior (Redmond *et al.*, 2010).

Health teachers were exposed to trainings on schistosomiasis in preparation for MDA but so far there has been no evaluation on their health-seeking behavior. Identifying health-seeking behaviour for schistosomiasis control by primary school health teachers in Kisumu West District, Kenya is central to schistosomiasis control.

1.3 HYPOTHESIS

Teachers' participation in Mass Drug Administration in primary schools has no influence on their knowledge of schistosomiasis control.

1.4 BROAD OBJECTIVE

To assess knowledge, sources of information on MDA and health-seeking behaviour for schistosomiasis control by primary school health teachers in Kisumu West District, Kenya.

1.4.1 SPECIFIC OBJECTIVES

1. To assess knowledge for schistosomiasis control by health teachers in Kisumu West District, Kenya.
2. To assess sources of information for schistosomiasis control by health teachers in Kisumu West District, Kenya.
3. To identify health seeking-behaviour for schistosomiasis control by health teachers in Kisumu West District, Kenya.

1.4.2 RESEARCH QUESTIONS

1. What is the knowledge for schistosomiasis control by primary school health teachers in Kisumu West District, Kenya?
2. What are the sources of information on health-seeking behaviour for schistosomiasis control by primary school health teachers in Kisumu West District, Kenya?
3. What is the health seeking-behaviour for schistosomiasis control by health teachers in Kisumu West District, Kenya?

1.5 SIGNIFICANCE OF THE STUDY

Schistosomiasis is a global public health concern and although the disease affects all populations (Aagaard-Hansen *et al.*, 2009), children, especially adolescents are particularly vulnerable.

The government through the Ministry of Health initiated Mass Drug Administration to help control schistosomiasis. At the same time other agencies like Schistosomiasis Consortium for Operational Research and Elimination (SCORE) engaged schools around the lake shore in a research to determine what future leaders need to gain and control schistosomiasis. Teachers have the capacity to influence students, fellow teachers and members of their own communities for better health seeking behaviour. Results from this study is currently being used to strengthen the current interventions on bilharzia and provide direction for execution of health education on schistosomiasis control by the National School Health Programs and other agencies with a burden to eliminate the disease.

CHAPTER TWO: LITERATURE REVIEW

2.1 KNOWLEDGE ON SCHISTOSOMIASIS CONTROL

Schistosomiasis is a chronic tropical disease second only to malaria as a parasitic disease and as a major cause of global disability (Steinmann *et al.,* 2006, King, 2010). Knowledge on schistosomiasis reveals that the disease causes stunting, reduced ability to learn and anaemia in children, while in adults it is a major cause of bladder cancer and infertility (Aagaard-Hansen *et al.*, 2009). The disease' progress is slow and can be asymptomatic, with chronic schistosomiasis emerging even after 5-15 years by means of severe complications such as liver fibrosis, Ascites and gastro-intestinal bleeding (Trainor-Moss & Mutapi, 2016). This burden brings about prolonged Disability Adjusted Life Years (DALYs) in the life of children and their parents. Although chemotherapy can reduce morbidity caused by the infection, rapid re-infection usually occurs in school children, requiring repeated treatment (Coulibaly *et al.*, 2012) as such medical intervention alone is insufficient to control the disease. Integrating health education and medical intervention remain a high priority for the World Health Organization's control programs.

The Ottawa Charter while defining Health promotion demonstrates that health-seeking behaviour is the process of enabling people to increase control over, and to improve their health. It emphasizes the need to provide health information in schools, home, work and community settings to enable people exercise control over their own health and their environments (WHO, 1997). It is with this background that schools are considered as suitable environment for health promotion (Bundy *et al.,* 2008). To implement health promotion in schools are teachers who have the responsibility of overseeing health issues in their respective schools. Teachers are paramedics who compliment health activities in schools. This is similar to Community Health Workers (CHWs) who oversee, render basic health services and assist health professionals with their tasks. It further states that volunteers, community leaders and front-line health workers are the backbone of public-health delivery systems and disease surveillance; control of these diseases must therefore involve their active participation (Rosenthal *et al.*, 2010; Uta & Sanders, 2007). In Kenya's health care system volunteer health workers form part of the health care team that operate at tier one (Oyaya & Rifkin, 2003). The Kenya National School Health Policy

(NSHP) has been developed to help with school health. The policy encourages the need to not only lead to healthy children but also impact the community (Flessa *et al.*, 2011; MOPHS & MOE, 2009a). A review of National School Health Program (NSHP) by Saito in the republic of Lao reveals that training teachers is a key factor for sustaining school health (Saito e*t al.*, 2014).
Knowledge on schistosomiasis states that transmission occurs in two hosts that is the snail (as an intermediate host) and man as the definitive host). The eggs from an infected person are eliminated through faeces for *Schistosoma mansoni* (*S. mansoni*) and urine *Schistosoma haematobium* (*S. heamatobium*) and find their way to the water where under good conditions they hatch and release miracidia. The miracidia then swim and finding specific intermediate hosts (snail) they penetrate them and mature into sporocysts which further produce cercariae. The infective cercariae swim freely in water and finding man swimming, fishing, bathing or planting, they penetrate the skin shedding off their tail as they move to the veins, eventually ending up in the small intestines for *S. mansoni* or bladder for *S. heamatobium* where they mature. They produce eggs which, are then eliminated through stool and or urine and the cycle continues. The main mode of transmission through the skin is by infected snails. Signs and symptoms of schistosomiasis are grouped in three stages namely invasion, early disease and late disease (Bennet & Buga, 1993) (Table 2.1).

Table 2.1 Signs and symptoms of schistosomiasis

STAGE	**SIGNS AND SYMPTOMS**
EARLY INVASION	Mild itching, papular dermatitis, local oedema, abdominal pain, cough, fever, fatigue, nausea, malaise
EARLY DISEASE	Abdominal pain, bloody diarrhoea, intestinal mucosal ulcerations, bloody urine (Heamatobium)
LATE DISEASE	Ascites, bowel fibrosis, congestive cardiac failure, portal hypertension, oesophageal varices bleeding, cancer Hepatospleenomegaly, anaemia, ulcerations, liver fibrosis and cirrhosis, cystitis.

Table courtesy of Buga and Bennet-Communicable diseases, 1993

Complications of schistosomiasis include among others anaemia, stunting and reduced ability to learn in children while in adults it is linked to portal hypertension, and one of the causes of bladder cancer and infertility. Even though these symptoms represent schistosomiasis in some cases schistosomiasis can remain asymptomatic for as long as 5-15 years (Aagaard-Hansen *et al.*, 2009). A study by Massa in Lushoto Tanzania sought opinion of Community Drug Treatment (Com DT) carried out by Community Drug Distributors (CDD). Teachers were included as drug distributors and so they received same training on MDA as the community volunteers and gave out treatment to pupils. Their work was successful, however, the teachers reported that they needed further training on schistosomiasis (Massa *et al.*, 2009). Another study by Njomo in Mwea district on adverse effects of praziquantel and albendazole administered by trained teachers' reveals that teachers received training on MDA and how to monitor adverse effects; however both reports are silent on the level of knowledge primary health teachers need for schistosomiasis control. In a report on consultation for schistosomiasis control, it was reported that there is need to go beyond morbidity control, reduce frequency and modify strategies and focus on knowledge levels since this can enhance health-seeking behaviour (WHO, 2006). The World Health Assembly (WHA) (Barry *et al.*, 2013) passed a decree asking its member states to help reduce the burden of schistosomiasis by de-worming school age children who are the most at risk. The target stands at 75% of all school-going age going children. Kenya launched the national de-worming programme in 2009 and 8,218 schools in 45 districts (MOPHS, 2011) undertook the activity. Teachers received training on MDA, implemented the activity but the treatment coverage remains less than 100%. In as much as health teachers are presumed to have substantive information on the control of schistosomiasis (MOPHS & MOE, 2009a), it still remains unknown what knowledge the teachers have on schistosomiasis control. Since this disease has the highest burden among school-going and adolescents who spend three quarter of their time with teachers exploring knowledge for schistosomiasis control by the health teachers will help sustain control. As such, the current study established the knowledge for schistosomiasis control by primary school health teachers in Kisumu West District.

2.2 SOURCES OF INFORMATION

Effective communication is based on timely, meaningful and relevant message, right channels of communication, audience preparation and being able to receive a feedback (Redmond *et al.*, 2010). The source of any communication is vital to any form of teaching hence the feedback. For qualitative studies, one case study is worth many in quantitative aspects. Health education as a component of primary health care is a significant factor in disease prevention and control. It is communicated through trainings, seminars and workshops, theatre, bill boards, written materials and radio. The accuracy of disease-specific health information, which is integrated into primary health care, is of paramount importance for successful disease management (Liu *et al.*, 2015). Health education comprises all the information needed to influence health change. However, convincing people to adopt healthy behaviors is not an easy task therefore understanding preferred source of information by the health teachers will help strengthen interventions for schistosomiasis control.

The health teachers who implement MDA for schistosomiasis control receive trainings through half-day workshops in preparation for MDA. This therefore suggests that teachers are change agents hence assessing their knowledge on schistosomiasis control cannot be ignored. Health Belief Model (HBM) states that what an individual knows in regard to health affects attitude which in turn controls behaviour (Rimer & Glanz, 2005). This theory states that perceived threat and severity are central in health-seeking behaviour that is shaped at the time of information giving. It has been observed that health programs in schools are components based on global concepts (Saito *et al.,* 2014) hence the need to understand preferred source of information for action. Perception for health-seeking behaviour is gained through observation which is also known as vicarious learning or direct training (Bandura, 2004).

A previous study revealed that treatment campaigns helped create awareness and transmission control in a community in Brazil (Rollinson *et al.*, 2012). Another study (Omedo *et al.*, 2012) in western Kenya on the SCORE research reported that media (radio announcements) and road shows for treatment campaign were very effective ways of communicating for Mass Drug Administration uptake. The study shares the same sentiments with Rollinson *et al.* that communication campaigns are effective for MDAs. Health teachers receive information for

MDAs in seminars, workshops when the activity is just about to be carried out as reported in a study in Mwea District (Njomo *et al.*, 2010). However, it remains to be established what teachers would prefer as source of information for schistosomiasis control in western Kenya. Whereas Kenya national school health guideline and policy booklet provide information on schistosomiasis control, a review of these policy reports that teachers do not get enough information from the booklet (Saito *et al.,* 2014). Despite the implementation of MDA in primary schools in Kisumu West District, it remains unestablished whether health teachers in this region have any preferences for sources of information for schistosomiasis control. It is on this background that the current study sought to know the preferred sources of information for schistosomiasis control by health teachers in Kisumu West District.

2.3 HEALTH-SEEKING BEHAVIOUR

The WHO recommends MDA, targeting school children as a preferred approach and strategy for control of the disease in endemic regions, however, children are just half of the population that require treatment (Rollinson *et al.*, 2012; WHO, 2006). MDAs on the other hand, however, need to be strengthened by behavioural actions that will ensure sustained success. The Kenya National Vision 2030 and the National Multi-year Strategic Plan action for control of Neglected Tropical Diseases-2011-2015 (MOPHS, 2011) emphasizes the need for enhanced health-seeking behavior for schistosomiasis control as one of the ways of reducing the country's disease burden profile. Kenya's Health System Strategic Plan recognizes schools as part of formal health service delivery system at level one (MOPHS, 2005; Oyaya & Rifkin, 2003), besides schools are more than health facilities hence teachers can be great tools in addressing health inequalities in the community (Manderson *et al.*, 2009).

Health-seeking behaviour refers to the sequence of remedial actions that individuals undertake to rectify perceived ill health (Lansdown *et al.*, 2002). It is initiated with symptom definition where upon a strategy for treatment is devised. Health-seeking behaviour is one of the measurable indicators that show individuals have moved from knowledge to action voluntarily (Edelman & Mandle, 2006). It includes early recognition of symptoms, presentation to health facilities for check-up and compliance with effective treatment, current knowledge about the disease which

touches on causes and risk factors, improved lifestyles and good sanitation habits. Other practices include maintenance of environmental sanitation, compliance with effective treatment and use of intermediate vector control where possible, strengthening health education, developing and improving inter-sectoral action and coordination as well as community participation (Bennett & Buga, 1993). Health-seeking behaviour enhances the ability to make positive lifestyle that supports social and political health thereby sustaining health (MOPND, 2007).

A survey done in Tanzania among primary school children on achieving behaviour change demonstrated that there was a significant change among the pupils but report on behaviour change among teachers was non-existent (Lansdown *et al.*, 2002). In Bangladesh, a study on the health of the girl child in school emphasized the role of teachers on de-worming in schools but evidence of teachers' health-seeking behaviour was not evaluated (Islam, 1990). A review of National School Health Program (NSHP) in Lao demonstrated that teachers implementing school health policies were taught to not only acquire knowledge but also skills needed to sustain practices by themselves which are health-seeking behaviour (Saito *et al.,* 2014). So far, despite the MDA implementation in Kisumu West District, it remains unestablished if teachers actually practice health-seeking behaviour as a way of controlling schistosomiasis. It is in this view that the current study sought to identify health seeking-behaviour for schistosomiasis control by health teachers in Kisumu West District, Kenya.

2.4 THEORETICAL FRAMEWORK

The health belief model was employed. This model has been continuously refined and modified to help identify and explain the behaviour of those who access the health care system to prevent illness. The premise for the conceptual base of this model is that an individual's perceived susceptibility; perceived susceptibility and perceived severity of a disease determine a perceived threat that will increase the likelihood of preventive action or participation in a health intervention that will decrease or lessen the perceived threat. Acknowledgement of both perceived severity and susceptibility must exist before threat becomes sufficient to motivate a readiness for action and behaviour change (Basavanthappa, 2008). It was developed in the 1950s by social psychologists and got reviewed in the early 70s. The model seeks to find answers to

why few people despite the severity participated in disease prevention programs (Rimer & Glanz, 2005). The main concepts of this model are:

- Perceived Susceptibility: refers to a person's perception that a health problem is personally relevant or that a diagnosis of illness is accurate.
- Perceived severity: even when one recognizes personal susceptibility, action will not occur unless the individual perceives the severity to be high enough to have serious organic or social complications.
- Perceived benefits: refers to the patient's belief that a given treatment will cure the illness or help to prevent it.
- Perceived Costs or barriers: refers to the complexity, duration, and accessibility and accessibility of the treatment.
- Motivation: also known as cues to change; includes the desire to comply with a treatment and the individual perceptions on readiness to change including any strategies to activate change.
- Self-efficacy: includes one's ability to take action and move forward to maintain it. If one has strong self-efficacy he or she will set up goals and live to accomplish them unlike one with low self-efficacy (Basavanthappa, 2008).

Health-belief model is used to formulate action plans that meet a person's capability in relation to behaviour change (Edelman & Mandle, 2006). However, in the current study it was applied retrospectively. Figure 2.2 represents conceptualization of the model.

2.4.1 CONCEPTUALIZATION OF HEALTH BELIEF MODEL

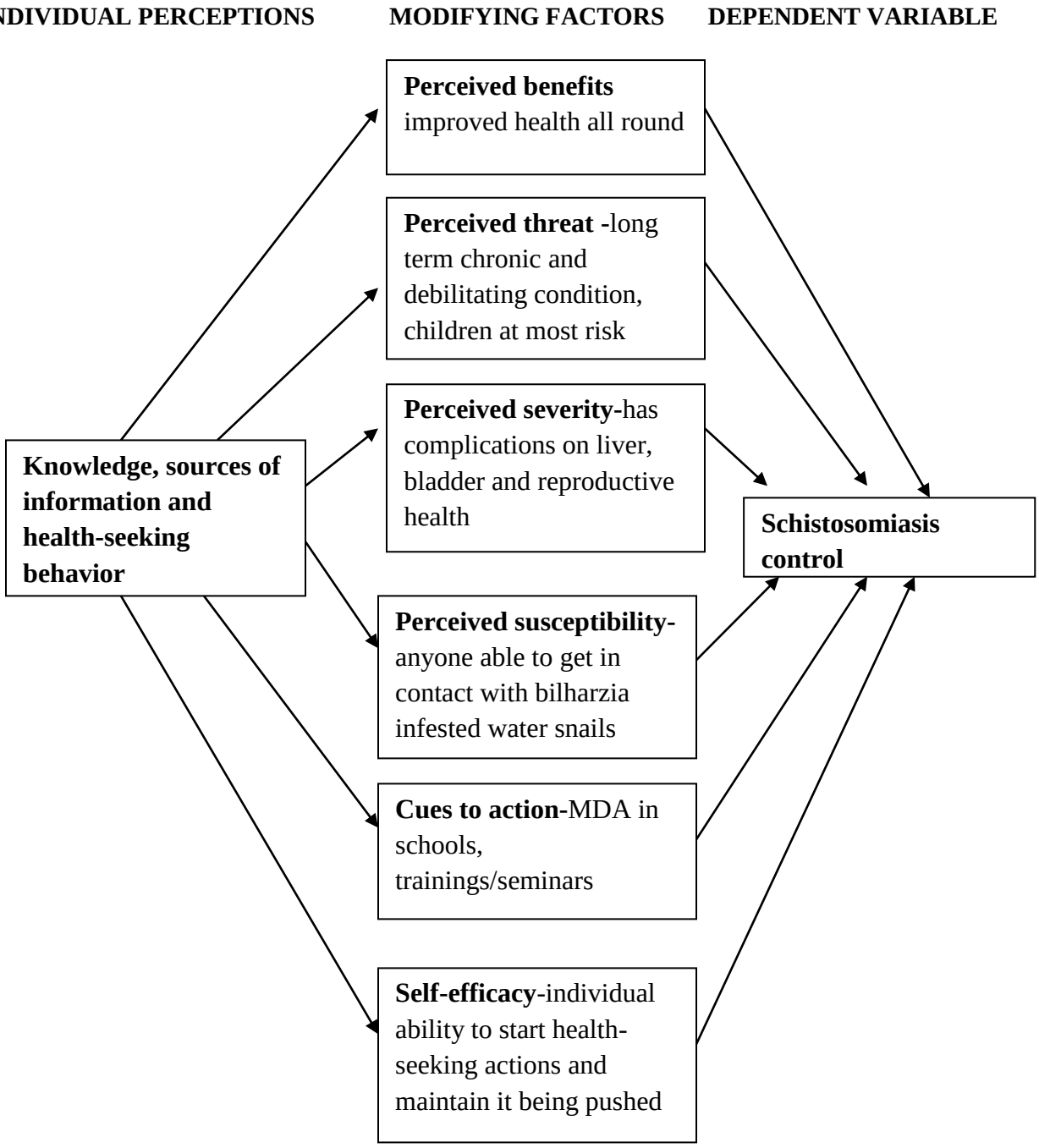


Figure 2.2. Conceptualization of Health Belief Model (courtesy Rimer and Glanz in Theory at a glance, 2005).

CHAPTER THREE: MATERIALS AND METHODS

3.1 THE STUDY AREA

The study area was Kisumu West District (currently Seme Sub-County) which was selected due to its high prevalence among school populations. This area is located on the North Eastern shores of Lake Victoria and covers an area of 369km^2 with a population of 131,246. Kombewa hospital, a level 4 health facility and 11 health facilities belonging to tier two and three of the Kenya health services system provide health services in this sub-County. Toilet coverage in this district stands at 42%, with a population sharing toilets standing at 21%. Approximately 37% of the population have their own toilets and the main source of drinking water is surface water. Outpatient morbidity indicates that the district suffers high burdens of diarrhoea, malaria and typhoid among other diseases (KWDHSS, 2011-Courtesy Walter Reed Project/KEMRI Kisumu). There is no data on schistosomiasis either at the tier four hospital level or tier two and three health facilities, despite a national mass drug administration program against schistosomiasis in this area.

There are 139 public primary schools and 3 private primary schools, with a total population of 1,126 teachers (671 males and 455 females), respectively. Pupil enrolment stands at 43,747 (boys-21,485, girls-22,262). The schools are divided into two divisions according to the Ministry of Education boundaries namely Maseno and Kombewa. Out of the 139 schools, 41 were selected for the study. The schools in the current study fall in Kombewa Division which lies around the lake region. Schistosomiasis prevalence is highest in people living within proximity of up to four kilometres from the water source hence the selection of schools in Kombewa Division. Secondly, these schools had undertaken Mass Drug Administration activities against schistosomiasis. The quality assurance standards officer (QASO) is responsible for teacher staffing, transfers and any school development activities including school health activities. Every primary school has a school management committee that comprises of teaching staff and parents.

Kisumu West District is one of the Districts that received MDA for bilharzia control by the National School Deworming Program (NSDP) and one of the study sites on the Schistosomiasis

Consortium for Operational Research and Elimination (SCORE). Eligibility survey in 2010 before treatment and 2014 after treatment still posts an average prevalence of 19%. Earlier studies had also indicated that Kisumu West has an average prevalence of 19% with a range of 10-90% (Handzel *et al.*, 2003; Verani *et al.*, 2009) which stands high compared to other moderate prevalence areas around the lake shore. At the time of the current study, the schools had undergone two rounds of MDA with health teachers being key implementers. Figure 3.1 represents the area map.

Figure 3.1 Map of the study area (Courtesy- Google maps)

3.2 THE STUDY POPULATION

The study population comprised of primary school teachers responsible for health issues in their respective primary schools in Kisumu West District. Teachers are employed by the government or private educational institutions for the purposes of providing quality education to pupils. Besides teaching they have a responsibility of providing first level health care to pupils in their respective schools.

3.3 THE STUDY DESIGN

A descriptive cross-sectional study design using both qualitative and quantitative method was adopted in the current study. Both self-administered questionnaire and in-depth interviews (focus group discussion) were employed for all the study objectives.

3.3.1 INCLUSION CRITERIA

- Health teachers in schools participating in MDA for schistosomiasis control.

3.3.2 EXCLUSION CRITERIA

a. Health teachers that had an MDA but not for schistosomiasis control.
b. Any teacher participating in the MDA but unwilling to give consent or participate in the study.

3.4 DATA COLLECTION TOOLS AND SAMPLING METHODS

Since the study participants were part of an on-going study (Mass Drug Administration), saturated sampling was used. A total of 41 schools had been enrolled for the MDA study, hence, all health teachers in these schools were selected for the current study. A total of 328 teachers were selected for the study (one from every class who handles health issues in school in the absence of a designated health teacher). Out of these 28 undertook the pilot study; 250 participated while 50 were unwilling to take part in the study. For the focus group discussions, a

random selection of designated health teachers was done comprising eight (8) to twelve (12) persons per group.

Structured questionnaire with both open and closed ended questions was developed to gather quantitative data while semi-structured questionnaires were used for focus group discussions. Research assistants were trained for this activity and a pilot study done with 28 teachers in four schools from the study area; the data from the pilot study was not used in the final analyses. Results were tested to ensure the questionnaires were valid and reliable; corrections and amendments were done accordingly. The questionnaire contained information on demographic data (age and sex of teachers), length of service as a teacher, basic training on health matters, other sources of income, signs and symptoms of bilharzia, mode of transmission and sources of information for schistosomiasis control. It also had information on what health-seeking behaviour the teachers have against schistosomiasis (also referred to as individual prevention); symptoms that would make them seek health care, and if they were at risk of schistosomiasis infection. Lastly, it had information on source of drinking water, type of toilet facilities and whether they are recognized as health providers by the community.

The focus group discussions were used to acquire additional, more detailed information on health-seeking behaviour. The idea was to help draw in-depth information on their knowledge levels of schistosomiasis and sources of information which are key issues in health-seeking behaviour. The interviews also sought insight into factors in knowledge and source of income that would influence health-seeking behaviour and helped identify any health-seeking behaviour for schistosomiasis control among the participants. Saturation of information gathered during the FGDs determined the number of FGDs conducted. Total number of participants per FGD ranged between eight (8) and twelve (12), all heterogeneous. Since all the teachers understood English, both the questionnaires and the focus group discussions were conducted in English so there was no need for translation.

3.5 DATA MANAGEMENT AND ANALYSIS

Quantitative data collected through questionnaires was first verified to ensure completeness. Due to inclusion of open-ended questions and provision of answers to select from some of the

questions, responses from participants were summed up and coded. Data was entered on Microsoft Excel then exported to SPSS version 18.0. Chi square test was used to test proportions for objective one and two while logistic regression was used for objective three to infer associations for health-seeking behaviour. Statistical significance was tested at $P \leq 0.05$. Results were presented in tables and pie charts.

Qualitative data from focus group discussions was collected through a voice recorder and later transcribed in a word document. The transcripts were then exported to *Atlas.ti* software for qualitative data analysis. Themes were categorized and analyzed utilizing the principle of grounded theory without the aim of developing a theory (Braun & Clarke, 2006; Callaghan-Koru *et al.*, 2012). The findings from the group discussion were then interpreted with a view to provide possible and plausible explanations by choosing examples of extracts from the transcript to illustrate elements of the themes. These responses were presented in narrative form; every themes' prevalence was estimated from the number of speakers who articulated it. Soft copy of all the interviews and the survey were protected using a password while the hard copies were stored in data storage room only accessible to the investigator. Lastly, all qualitative and quantitative data results were reported together to give a more complete picture of the variables under study.

3.6 ETHICAL CONSIDERATIONS

Ethical clearance was approved by Kenya Medical Research Ethics committee Protocol no SSC 1800 (Appendix 1). Permission to conduct the study was sought from the Maseno University School of Graduate studies (SGS) (Appendix 2) and Ministry of Education office Kisumu West District (Appendix 3). In carrying out the study, informed consent was sought with full information being provided and comprehension being affirmed (attached to every questionnaire, Appendix 4 and 5).

CHAPTER FOUR: RESULTS

4.1. DEMOGRAPHIC CHARACTERISTICS

Results for this study include quantitative and qualitative outcomes. They were reported simultaneously to give a complete picture for every objective. Demographic data included age, sex, length of service and any health training. A total of 250 participants attempted the survey. The mean age was 35 years; there were more males (147) than females (103) and length of service (i.e. years of experience) was distributed as 0-2 years 43 (17.2 %), 3-5 years 48 (19.2 %), 6-9 years 49 (19.6%), 10-19 years 52 (20.8 %) and 20 years and above 58 (23.8%). Other than teaching as a profession, 40 participants (18.9%) had received some training on health matters. Specifically, 36 participants (14.4%) had received training on Mass Drug Administration and national de-worming program for schools (Table 4.1). Majority of the participants 134 (53.6%) depend on teaching as a source of income; 79 (31.6%) and 37 (14.8%) double up as farmers and business men, respectively. There was no specific training given as a qualification for health teacher. All the participants stated that it was a delegated responsibility by the school management and may change from time to time. The results also include outcomes from 5 focus group discussions (FGDs) selected randomly from the same schools who did not participate in the survey. The number of FGDs was determined by saturation; this is a level in in-depth interviews where no new information is received from the participants. The FGDs were heterogeneous in composition and had 8 – 12 participants.

Table 4.1. Demographic characteristics of respondents

	F Number	Proportions
YEARS OF EXPERIENCE		
0-2 yrs	43	17.2%
3-5 yrs	48	19.2%
6-9 yrs	49	19.6%
10-19 yrs	52	20.8%
20yrs and above	58	23.2%
SEX		
Female	103	41.2%
Male	147	58.8%
HEALTH TRAINING		
Non-health	40	16%
Health related	50	20%
*KEMRI/CDC; National De worming program	36	14.4%
No training	124	49.6%
OTHER SOURCES OF INCOME		
Business	37	14.8
Fisherman	0	0
Farmer	79	31.6
Others/none	134	53.6
Total	**250**	**100.0**

Table legend: *= KEMRI/CDC-Kenya Medical Research Institute in collaboration with Centres for Disease prevention and Control, Kenya National School De-worming program.

4.2 KNOWLEDGE-OF SIGNS AND SYMPTOMS AND MODE OF TRANSMISSION FOR SCHISTOSOMIASIS

The study explored knowledge of signs and symptoms and mode of transmission (Table 3). Out of 250 participants, 44 had never heard of bilharzia and were reluctant to respond to the rest of the questions as such results reported here consist of 206 participants only. The local name was given as "Aremo" translated in English as "blood". Regarding knowledge of signs and symptoms, majority of the participants 117 (56.8%) did not know signs and symptoms for schistosomiasis. A good number 55 (26.7%) reported blood in urine as a sign for schistosomiasis while 6 (2.9%) expressed blood in stool as a sign for schistosomiasis. Only 28 (13.5%) reported both blood and urine as signs for schistosomiasis. The outcomes on mode of

transmission showed that majority 169 (82.1%) of the participants reported drinking contaminated water as a form of transmission while 29 participants (14.1%) said it was through walking or swimming in contaminated water and 8 participants (3.8%) did not know the mode of transmission.

Table 4.2. Results on knowledge of signs and symptoms and mode of transmission

Level of knowledge of signs and symptoms	**Frequency**	**Proportion**
Others*	117	56.8
Blood in urine	55	26.7
Blood in stool	6	2.91
Blood in urine and stool	28	13.59
Total	**206**	**100**
Mode of transmission		
walking/swimming in infected water	29	14.08
Drinking infected water*	169	82.04
Others*	8	3.88
Total	**206**	**100**

***Refers to incorrect responses by the participants**

Findings from focus group discussion had similar reports as the quantitative result. As quoted below, majority of participants reported to be aware of schistosomiasis. A good number understood signs and symptoms as only blood in either stool or urine. Results on mode of transmission were skewed towards soil transmitted helminthes with majority reporting contaminated water as the main mode of transmission. It is important to note that the main mode of transmission for bilharzia is skin contact. Drinking contaminated water is not the major mode and if the water is left standing for a longer period, the chances of transmission are reduced to none. Further information from FGD suggested that mode of transmission was by taking meat or food that was contaminated and stepping on stool bare foot. There results on mode of transmission gave an impression that teachers understood soil transmitted helminthes better than schistosomiasis. The following statements express some of the responses:

"I think the bacteria normally stay in the water fluids, so the people living around flooded areas like Kano and Budalangi [These are areas in western Kenya that are prone to floods during rainy seasons] are more likely to contract the disease, because the water is stagnant, they walk bare footed or drink that water, or untreated water that contains the snails so they get it through drink or the foot" (Health-teacher from an FGD at Diemo primary school).

"One of the sign is the blood stain in the urine or stool, the person will start realizing blood stains and then the body, with time the person develops swollen body lymph, and the body swells like the legs"(Health-teacher from an FGD at Kambudi primary school).

"I think when there is severe stomach pain and when you go to the toilet then there is this blood stains in the stool" (Health-teacher from an FGD at Abol primary school).

"I am just adding, itching around the anus, I think there is that element of itching on the groins; your groins tend to itch" (Health-teacher at an FGD at Diemo primary school).

The following are responses on mode of transmission from the discussions:

"Yes, I want to concur with my colleagues, you know he has said that bilharzias does not affect only human beings, they also affect animals, but they are there in the presence of worms, like lukeworm, is in the animals like pigs, when you eat that meat and is not properly cooked you are likely to get the bilharzias, because it is one of the contaminated diseases" (Health-teacher from an FGD at Kitmikayi primary school).

"Okay, just what my colleague has said on how we get it, it is a water-borne disease, and I think we may also get it by consuming contaminated drinks and food, and also untreated water"(Health-teacher from an FGD at Otenga primary school).

"Another issue is that when you leave the stool, then another person comes and they step on it bare footed, this increases the possibility of being infected, so it spreads from infected to uninfected, if he does not use proper hygiene" (Health-teacher from an FGD at Abol primary school).

"*When a person walks bare foot and then steps on the stool of a person who had the disease...It is gotten through walking barefoot and then you step on a stool which had the bacteria" (Health teacher at an FGD at Diemo primary school).*

4.3. SOURCES OF INFORMATION

Results revealed that 87 (42.23%) of the participants obtained information on bilharzia from the print/ media. Majority of these included lessons learnt while in primary school. About 61 (29.61%) got information from professionals during trainings or seminars and 58 (28.16%) from awareness meetings done by chiefs (also reported as others). Area chiefs are the gate keepers in

communities and hence their involvement in any community development or health programs. Together with village elders, they prepare and inform the community on all developmental issues of any aspect that is beneficial to the community whether spearheaded by government or by non-governmental organizations. The preferred source of information was print and media with 102 (49.51%) responses. Table 4.3 below gives the details on source of information.

4.3. Results on sources of information

Source of information	**Frequency**	**Proportion**
Print/Electronic media	87	42.23
Professionals	61	29.61
Others	58	28.16
Total	**206**	**100**
Preferred source of information		
Professionals	89	43.21
Print/media	102	49.51
Others	15	7.28
Total	**206**	**100**

Results from FGD demonstrated that majority (80%) of the respondents had primary school level knowledge as the main source of information while a few reported that their relatives had suffered from schistosomiasis disease as shown in the statements. A good number had also been exposed to media during the mass drug administration campaign for bilharzia control in schools. There was an impression that professionals had not created much awareness as reported in the following statements:

> *"I actually learned about bilharzia when I was in primary, in class six when we were being taught about the tropical diseases, communicable diseases and water borne diseases, that is when I come across to learn about bilharzia"(Health-teacher in an FGD at Kambudi primary school).*

> *"…when a boy complained that he was always urinating blood, and when taken to the hospital he was diagnosed of bilharzia, that is how I got to know first, I was related to the boy"(Health-teacher in an FGD at Abol primary school).*

> *"Yes, I have also heard about it over the radio and even read it on the newspaper, yeah I have heard about it from such"(Health teacher in an FGD at Diemo primary school).*

"I can also support him because I also learnt of it, and I didn't know that it existed, maybe it was just something just to pass the exams, I didn't know about bilharzias until I met the CDC people, I think by then the government was also not serious about it" (Health teacher in an FGD at Kit Mikayi primary school).

"...but the government has not taken it to be serious, we had focus on other diseases, for example, AIDS and malaria, while it seems bilharzia is more common around the lake region, due to the fact that many people are affected. They have diverted that attention to other diseases, because I have never seen them taking any initiative around the area or the community that live around, until you people you came around with this program" (Health teacher in an FGD at Otenga primary school).

The results demonstrate that source of information is well spread. Overall, print and media had a wider coverage than the rest; although the teachers prefer information from health professionals.

4.4 HEALTH-SEEKING BEHAVIOUR

Results demonstrated that the participants were recognized 113 (54.86%) by both school and community as health teachers. Furthermore health teachers were responsible for health education in schools 133 (64.5%) which is one of the activities among health-seeking behaviour. In addition, 81 (39.3%) of the participants received funds from school to help them run school health activities while a total of 102 (49.5%) reported that they receive training from health professionals to enhance health activities in school. Besides, the participants expressed that majority of school health activities are reported to the schools' administration 85(41.2%), 68 (33.0%) reported to the health facility while 53 (27.7%) did not know where to report the activities. Generally, the results revealed that anybody is at risk of getting infected; bilharzia was a health problem in the area and that teachers were not excluded from the disease. However, despite these information, majority 139 (67.5%) stated that they only sought treatment when they were sick. Outcomes for whether the participants were well informed showed that the differences was very minimal; for those who said 'yes' it was 104 (50.4%) and 'no' was 102 (49.5%) (See Table 4.4).

Table 4.4. Overview of health-seeking behaviour

Recognized as health teachers	**Frequency**	**Proportions**
Yes	113	54.86
No	93	45.14
Responsible for health education		
Health teacher	133	64.56
Others	73	35.44
Support received from school		
Supervision	56	27.18
Training	69	33.49
Funds	81	39.32
Support received from professionals		
Supervision	9	4.36
Training	102	49.51
Funds	95	46.11
School health activities reported at?		
Health facility	68	33.01
School administration	85	41.26
Do not know	53	27.73
Who is at risk of getting bilharzia		
Any body	184	89.32
Fishermen	13	6.31
School going children	9	4.36
Is bilharzia a problem?		
Yes	146	70.87
No	60	29.12
Can teachers get bilharzia?		
Yes	198	96.12
No	8	3.88
Generally seek treatment		
When very sick	139	67.47
During an outbreak	10	4.85
Generally healthy	45	21.84
None of the above	12	5.82
Well informed as a teacher		
Yes	104	50.49
No	102	49.51

Figure 4.1 and 4.2 below display results given in response to what symptoms would take one to hospital and reasons for not seeking health care. A total of 37% would seek treatment for blood in urine while only 12% would do likewise for blood in stool; 24% would seek treatment for blood in urine and stool and 7% would be prompted by pain on urination. Lastly, 20% of the participants would seek health care for other ailment (headache, fever, abdominal pain, and cough). In addition, results revealed that reasons for non-health-seeking behaviour were cost of health services (time taken at the hospital and lack of drugs and diagnostic tools) (42%), limited access to health facilities (19%), availability of herbal treatment (1%) and others (religious beliefs and traditional options) being 38%.

Figure 4.1. Symptoms that would warrant hospital attention

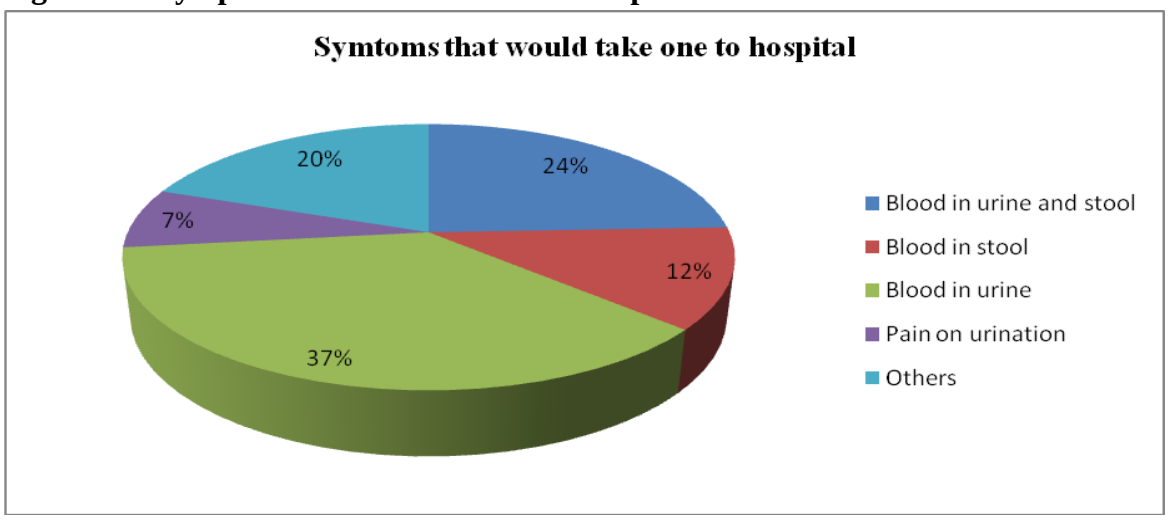
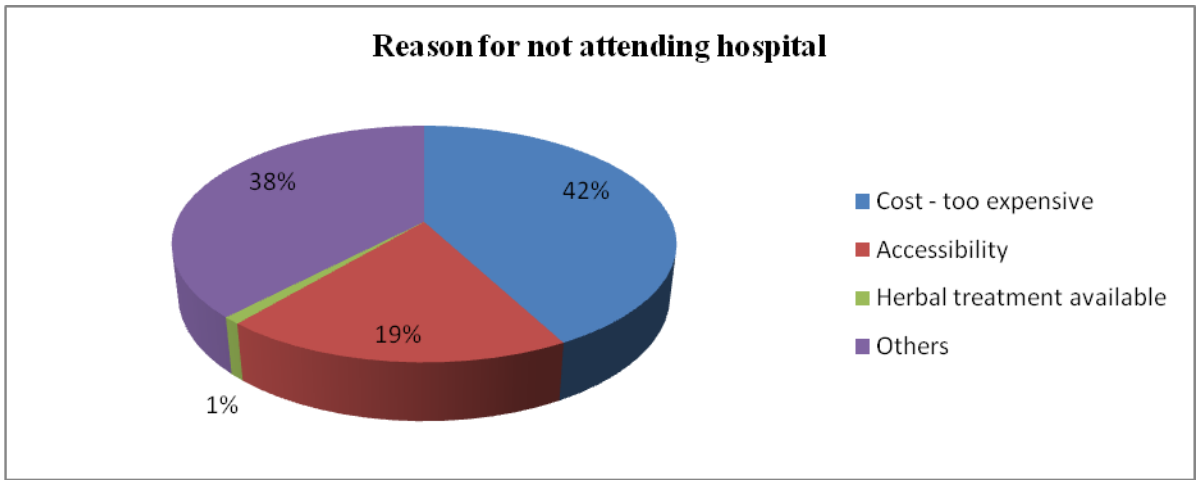


Figure 4.2. Reasons for not attending hospital



Results on individual prevention and prevention in schools (Table 4.7) demonstrated that sanitation (use of toilets) was given preference at individual level (n=85, 41.26%) while health education (n=73, 35.4%) was preferred to deworming.

Table 4.5. Preventive measures by individuals and in school

Individual prevention measures	**Frequency**	**Proportion**
Sanitation (use of toilet)	85	41.26
De worming	29	14.08
Clean drinking water	22	10.68
Health education	19	9.22
Go to hospital*	12	5.83
Personal Hygiene*	39	18.93
Preventive measures in school		
Sanitation (use of toilet)	55	26.69
Health education	73	35.44
Protection	37	17.96
Periodic de worming	20	9.71
Personal hygiene*	21	10.19

*** Refers to others -specified**

Results from focus group discussions bore the same sentiments on health-seeking behaviour as stated in the following statements:

> *"Usually, we get encouraged to go and seek for the treatment for the symptoms of severe pain. When there is no pain we normally don't seek treatment" (Health teacher in an FGD at Otenga primary school).*

> *"When we go to the hospital like there is one up there, the district hospital, you can stay the whole day without being attended to; because you find that it is very rare a patient has gone there that she is suffering from bilharzia. You may give the doctor the symptoms and signs may be he may not find out it is bilharzia so you rather prefer going to the pharmacy you buy the drug rather than going to waste your time there"(Health teacher in an FGD at Kit Mikayi primary school).*

> *"…traditional way, we have some herbs, that can be cooked and then the soup (the liquid end product from the boiled herbs)……that can be used to cure the disease traditionally" (Health teacher in an FGD at Kit Mikayi primary school).*

> *"Another thing, we may also opt to go for drugs that are bought over the counter, you go to them, you explain your problems and then they give you drugs" (Health teacher in an FGD at Diemo primary school).*

> *"I think with prayers it is effective, depending on someone's faith like me, it is effective for me, I can pray and then get healed, I do not have to necessarily go to the hospital"(Health teacher in an FDG at Abol primary school).*

With reference to individual and school prevention the participants had this to share:

> *"Number one is hygiene, number two is hygiene and number three is hygiene. Hygiene because the disease mostly is, the germ that lives in the water and you know we human beings at times we take advantage, or we assume things...so treat water before you use it" (Health teacher in an FGD at Abol primary school).*

> *"We need to be careful about how we dispose of our wastes. Like urinating and defecation, yeah, we need to be very careful with that because if we do it in the open, it is likely to get back to the water sources and that one will be infecting us with the disease, so we need to be careful on how to dispose our wastes"(Health-teacher in an FGD at Otenga primary school).*

Whereas it was clear that waste disposal was given priority, some participants reported that use of toilets was minimal

> *("Sanitation in this area is a problem, because of proper disposal of wastes, most people are not using their toilets a hundred percent, so that one leads to the spread of the disease to the stagnant water" reported in an FGD at Diemo primary school).*

These results revealed that sanitation was given emphasis as a health-seeking behaviour. However use of toilets was questionable due to the revelation that waste disposal was an issue. More to this is that in as much as they knew they were susceptible they felt it was not a serious condition as reported in the following statements:

> *"I can also support him because I also learnt of it, and I didn't know that it existed, maybe it was just something just to pass the exams, I didn't know about the bilharzias until I met the CDC people, I think by then the government was also not serious about it" (Health-teacher in an FGD at Kit Mikayi primary school).*

> *"...but the government has not taken it to be serious, we had focus on other diseases, for example we look at Aids we look at Malaria, while that bilharzias is more common around the lake region, so it has not just, they have not put it a priority, that many people are affected. They have diverted that attention to other diseases, more than this, because I have never seen them taking any initiative around the area or the community that live around, until you people you came around with this program" (Health-teacher in an FGD at Otenga primary school).*

> *"Well, first of all I will take it just like any other disease, I will go to the hospital and be treated, now after treatment, because it is not something that is very prevalent here, I will have to think how I came about it, where could I have gotten this particular disease, maybe I would have not reached the conclusion but it will remain in my mind, how did I get it or where did I get it FROM?" (Health-teacher in an FDG at Diemo primary school).*

> *"I think it is the work of NGOs, for sure this bilharzias case, I only learnt more about it when the CDC come reinforce, the government has been there for long the community is there and has been there, and I think very little has been done by the government.....but this issue of bilharzias the awareness was created by CDC.....". (Health teacher in an FGD at Abol primary school).*

> *"I just wanted to say that there are specific herbs that when they are used they can cure bilharzia...." (Health teacher in an FGD at Kit Mikayi primary school).*

Collectively, these results show that most participants did not view bilharzia as a serious disease. They felt that since the government organs (health professionals) did not talk about it as other diseases then it was less serious. Lastly, religious and traditional beliefs were also mentioned as options for health care for schistosomiasis control. Additional logistic regression analyses was carried out to identify factors associated with health-seeking behaviour for schistosomiasis in this population. Findings further revealed that those drinking treated water have a 90% likelihood of health-seeking behaviour for schistosomiasis control relative to those who do not (OR, 1.1027, 95% CI, 0.0184-0.0575, *P*=0.010). Those obtaining information from the media had 99.7%

likelihood of seeking healthcare relative to those who obtained the information from professionals (OR, 3.2177, 95% CI, 1.4878-6.9592, *P*=0.003). Likewise, those whose source of drinking water was safe had 57.41% likelihood of seeking healthcare for schistosomiasis control (OR, 0.4259, 95% CI, 0.01829-0.9917, *P*=0.048) relative to those whose source of drinking water was unsafe.

On the other hand results demonstrated that those who did not know signs and symptoms and mode of transmission had 34.38% and 51.47% less likelihood of observing health-seeking behaviour (OR, 0.6592, 95% CI, 0.2652-1.6235, *P*=0.362) and (OR, 0.4853, 95% CI, 0.1581-1.4898, *P*=0.206). Further still, those that did not have information on health education had a 20% likelihood of not seeking healthcare compared to those who actually practised sanitation (use of toilets or proper waste disposal), protection and periodic de worming (OR, 1.2070, 95% CI, 0.4891-2.9785, *P*=0.683). Similarly, those who found reason for going to hospital as being too expensive had 33.1% less likelihood of seeking health care compared to those with other reasons like accessibility, herbal treatment or religious beliefs (OR, 0.6689, 95% CI, 0.2312-1.9347, *P*=0.458).Subsequently anybody at risk of bilharzia infection had 71.02% more likely not to observe health-seeking behaviour compared to fishermen and others who are more at risk (OR, 1.7102, 95% CI, 0.4521-6.4699, *P*=0.429). Lastly, those who did not have blood or urine in stool had a 9.76% likelihood of not seeking health care compared to those who had other symptoms such as headache, diarrhoea or abdominal pain (OR, 0.9024, 95% CI, 0.3911-2.0825, *P*=0.810).

These results therefore reveal knowledge of signs and symptoms and mode of transmission need to be strengthened if they have to impact health-seeking behaviour for bilharzia control. Whereas anybody is at risk of bilharzia its severity is underestimated hence seeking health care for bilharzia control by the health teachers remains an uphill task. With this result we therefore accept the hypothesis that although teachers participate in MDAs as implementers their knowledge of disease and health-seeking behaviours remain unchanged (Table 4.8).

Table 4.6. Factors associated with health-seeking behaviour for schistosomiasis control

Independent variable	Dependent variables	Odds Ratio	95% CI		*P*
Knowledge of signs and symptoms and mode of transmission for Bilharzia					
Level of knowledge of signs and symptoms	Blood in urine or stool	0.6562	0.2652	1.6235	0.362
	Other symptoms[1]	1.0000			
Mode of Bilharzia infection	Walking or swimming in infected water	0.4853	0.1581	1.4898	0.206
	Others (contaminated water, open defecation)	1.0000			
Awareness of safe water	Treats drinking water	0.1027	0.0184	0.0575	**0.010***
	Does not treat	1.0000			
Is Bilharzia a problem?	No	1.3813	0.6134	3.1105	0.435
	Yes	1.0000			
Source of information on Bilharzia					
Source of information	Print/electronic media	3.2177	1.4878	6.9592	**0.003***
	Professionals	1.0000			
Health-seeking behaviour					
Individual prevention measures	Health education	1.2070	0.4891	2.9785	0.683
	Others (sanitation, protection, periodic de worming)	1.0000			
Source of drinking water	Safe source (rain, protected spring, piped)	0.4259	0.1829	0.9917	**0.048***
	Unsafe source (surface, unprotected spring)	1.0000			
Reason for not going to hospital	Cost-too expensive	0.6689	0.2312	1.9347	0.458
	Other reasons(accessibility, herbal treatment, religious beliefs)	1.0000			
Who is at risk of getting Bilharzia?	Anybody	1.7102	0.4521	6.4699	0.429
	Fishermen/school-going children	1.0000			
Bilharzia Symptoms that will take one to hospital	Blood in stool and/or urine	0.9024	0.3911	2.0825	0.810
	Others (headache, diarrhoea, abdominal pain)	1.0000			

*Values whose p-values are statistically significant.

CHAPTER FIVE: DISCUSSION

5.1 INTRODUCTION

The current study was conducted to assess knowledge, sources of information and health-seeking behavior for schistosomiasis control by health teachers in Kisumu West District. This was in relation to the health teachers' role of implementing mass drug administration against schistosomiasis in schools as national program and SCOREs study on what measures need to be put in place for bilharzia control. Results demonstrate that majority of the participants did not have knowledge of signs and symptoms of bilharzia including mode of transmission. Source of information was mainly print and media; and schistosomiasis is not perceived as a serious disease hence no effort is put in place for health-seeking behaviour. However, it was observed that those drinking treated water and whose source of drinking water was safe and those obtaining information from the media had a higher likelihood of seeking healthcare for schistosomiasis control relative to their counterparts. We therefore accept the null hypothesis that knowledge, sources of information and health-seeking behavior by health teachers has both positive and negative impact on bilharzia control.

5.2 DEMOGRAPHIC CHARACTERISTICS

A total of 250 participants attempted the survey. However, only 206 individuals were included in subsequent analyses since 44 indicated that they had no knowledge on schistosomiasis and were unwilling to continue with the study. In the current study, there was a higher tendency to have more male than female health-teachers; one would ask whether male teachers are preferred to females in regard to health issues in schools. It is not known whether there is a criterion for health teacher selection in schools as the participants stated it was just a delegated responsibility. Perhaps a research in this area would give direction on who qualifies as a health teacher in primary schools. Also the majority had been in service for more than ten years and more than half had not received any health-related training. As the results depict, majority depended on teaching as main source of income. Generally this confirms the fact that teachers are employed by the government though this may vary. According to Education International Wintour states

that some teachers are employed on contractual terms, others by legislation and some are employed to provide part time services (Wintour, 2013). The Education Act in Kenya is silent on teachers' involvement in other activities; however a study done in Burkina Faso demonstrates that 42% of teachers dependent on teaching as a main source of income while the rest earned extra income from other activities besides teaching (International, 2009). Perhaps it is time to carry out a research on other sources of income for teachers in Kenya to establish the source of the current struggle on remunerations.

5.3 KNOWLEDGE OF SIGNS AND SYMPTOMS AND MODE OF TRANSMISSION FOR SCHISTOSOMIASIS CONTROL

Out of 250 participants only 206 had knowledge of schistosomiasis and were able to mention the local name. As results portray, in as much as the participants were aware of bilharzia, majority 117 (56.8%) did not know the correct signs and symptoms. Of the remaining 89, only 28 (13.59%) had correct information. The correct signs and symptoms include the *swimmers' itch* (papular dermatitis), fever, cough, nausea and fatigue in the early stages. Later, there is bloody urine or stool as the disease gets more complicated. In regard to mode of transmission the report was skewed to soil-transmitted helminthes demonstrating a misconception between schistosomiasis and other worms. The correct mode of transmission is skin contact with the freely swimming cercariae in infested waters. The reported misconceptions give an impression that teachers have the information but attention is not given to detail during trainings or seminars. Important to note is that the training for bilharzia is given at the same time with training for other worms, and this is a strong factor for the generated misconception. The current results were congruent to what Musuva reports in her study among adults in community-wide treatments in Western Kenya (Musuva *et al.*, 2014). The previous study states that awareness is excellent but details on schistosomiasis are a missing factor that may not influence health-seeking behaviour. It would be thus critical to carry out a study amongst pupils to help strengthen this observation. Another study carried out among adults in Nyalenda also reported low levels of knowledge despite community awareness on schistosomiasis (Odhiambo *et al.*, 2014). The study indicates that few of the participants had correct knowledge of signs, symptoms and mode of transmission for bilharzia. Subsequently a study in Senegal demonstrated that there

was still low awareness despite seven years of health education (Sow *et al.*, 2003). According to WHO on school de worming at a glance; they explain that teachers need only a few hours of training to understand the rationale of de worming (Miguel & Kremer, 2003), yet teachers volunteer to support health services in school which is part of the bigger community just like other Community Health Workers (CHWs). For example a study in Katana health zone in the Democratic Republic of Congo using CHWs to scale up malaria control; CHWs undertook malaria training of two weeks and motivation through health education; the CHWs performed their services under health personnel supervision and it resulted in a 50% drop in malaria morbidity and change in health behaviors dramatically (Uta & Sanders, 2007). In the same way schools are visualized as centers for change, therefore, with this revelation, the knowledge content on schistosomiasis control needs to be re-evaluated. In yet a different study in Mwea District on adverse reactions due to praziquantel (Njomo *et al.*, 2010), it was illustrated that teachers get quick training on MDA for the purpose of managing chemotherapy in schools. It is therefore important to suggest that given the burden of schistosomiasis as a public health concern and the most at risk being children who spend most of their time with the teachers, a full curriculum on what must be taught needs to be developed. In addition, trainings for the control of soil transmitted helminthes and schistosomiasis should be conducted separately to create a clear distinction between the two worms and how to control them. This would go a long way to not only influence health-seeking behaviour but also sustain control of bilharzia.

According to Health Belief Model, severity, threat and benefits of a condition are embedded in knowledge of the disease which collectively influence health-seeking behaviour (Rimer & Glanz, 2005) or disregard the same. According to Rosenthal and Oliver (Oliver *et al.*, 2015; Rosenthal *et al.*, 2010) health volunteers are part of public health solution hence training and supervision cannot be ignored. As such, if knowledge is not well understood then sustaining health in schools becomes a challenge (Saito e*t al.*, 2014). From the results of this study, it is evident that in as much as teachers are key implementers of MDAs in school for schistosomiasis control, their knowledge of the disease has not been well understood.

5.4 SOURCES OF INFORMATION

Given that schools are recognised as viable environment for health promotion (WHO, 1997), several organizations and or structures in the community use schools as entry point for health promotion in schools with an aim of reaching the entire community. To reach the school, communication has to be done well to achieve given objectives hence the source of information is of paramount importance. According to Schiavo any health communication needs to be organised to help support and sustain change which includes exchange of information, motivating target audience and influencing communities or individuals to changing behaviour (Schiavo, 2007). Being a public health concern information on schistosomiasis is given out as health communication as such the source of this information is vital for control. Redmond states that certain sources of information are used in varying degrees among different socioeconomic and demographic groups (Redmond *et al.*, 2010), therefore it is important to determine if specific sources are more effective than others in promoting health. The channel of information, the provider and the message therein is all important for feedback whether positive or negative. Kenya's Health care system recognizes school as tier one health care level (MOPHS, 2005) hence the need for excellent communication on health matters. It is believed that choice of channel for communication plays a vital role for imparting change (Nduati & Wambui, 1997). Findings from the current study revealed that the participants' source of information was basic knowledge acquired by them during their primary school education and from print and media (42.23%); while 29.61% was from health professionals. A small portion (28.61%) had gotten the information from the chiefs' barazas. From the FGDs it was observed that majority of the participants had not heard about the condition until the time of MDA as conducted by the Ministry of Education in collaboration with partners and the ongoing research by SCORE. This further confirmed bilharzia as a neglected disease hence the need to enhance source of information. Ministry of Health (Neglected Tropical Disease Division) (MOPHS, 2011) emphasizes that lack of mapping for neglected diseases is a major constrain for intervention control. This could be the reason for low information coverage by health professionals. A study by Wasonga in Kilifi, Kenya on lessons learnt from comprehensive school health program revealed that coordination and networking between Ministry of Health and that of education was

a challenge (Wasonga *et al*., 2014). Probably this could be the missing gap in both sources of information and subsequently health communication which results in lack of paying attention to details. Contrary to the findings of this current study, a previous study of a community in Brazil reveals that treatment campaigns through barazas are necessary as a way of creating awareness and transmission control (Rollinson *et al.,* 2012). This observation is comparable to another study on communication campaign, in which it was shown that an increased communication campaign lead to enhanced MDA reports uptake (Omedo *et al.,* 2012). Whereas the community has preference to campaigns as source of information for drug uptake, the teachers preferred source of information as the health professionals. From the FGDs, it was felt that much had not been done in relation to other diseases that are a burden to humanity. For example, it was noted that HIV and AIDS in Kenya is still pandemic among the youth and there is still need for the Ministry of Health to integrate HIV and AIDS education programs in the existing curricula (Waruiru *et al.,* 2014). The WHO advocates for community strengthening and health education as a way of creating awareness and capacity building for health promotion (WHO, 2006). As the Ministry of Health tries to promote capacity building in this area, there is also need to address the participants' impression that the most relevant information on control can only be gotten first hand from the Ministry of Health professionals who handle disease surveillance. Probably a survey into health workers perception of source of information would help leverage this puzzle.

5.5 HEALTH-SEEKING BEHAVIOUR

The outcome from the current study demonstrated that health teachers (study participants) were recognized and majority did state they were responsible for health education in schools. The results also revealed that respective school administration supported school health activities by providing funds while health professionals provided training. It was clear that supervision by health professionals was poor (4.36%). Probably this could explain the reason for knowledge gap since there is evidence of lack of supervision. In addition, the participants showed that more of school health activities are reported to school administration rather than health facility. It is important to note that 27.73% (53) of the respondents indicated that they did not know where to report school health activities. This is critical as it demonstrates that even though school is leveled to tier one health care in Kenya, sensitization by Ministry of Health as an institution is

lacking hence health-seeking behaviour for schistosomiasis control by health teachers is not a priority.

Although participants acknowledged diseases' susceptibility that anyone could be infected, and that bilharzia was a problem in the area, they expressed low severity perception hence low adaptation to health-seeking behaviour. Generally the participants reported that they would seek treatment only when very sick. This is consistent with logistic regression results that demonstrated although anybody was at risk of bilharzia infection 71.02% were more likely not to observe health-seeking behaviour compared to fishermen and others who are more at risk (OR, 1.7102, 95% CI, 0.4521-6.4699, *P*=0.429). Similarly a previous study in Ghana, states that schistosomiasis is not perceived as a health problem (Danso-Appiah, A. *et al.*, 2010), which is the same picture with findings in the current study. Other than low severity perception, accessibility to health care (cost, time taken at the hospital, lack of drugs) which was reported at 33.1% was seen as a key barrier to health-seeking behaviour as reported in other studies (Danso-Appiah, A *et al.*, 2004; Danso-Appiah, A. *et al.*, 2010). In these studies, it is reported that that lack of funds, higher cost and unavailability of health services greatly affected health-seeking behaviour of both children and adults from the communities. The current study demonstrates that the respondents were comfortable with over-the-counter medicines instead of hospital prescription. In relation to individual and school prevention which hoped to identify health-seeking behaviour it was observed that sanitation 41.26% (use of toilets) was preferred for individual prevention while health education (35.44%) was top for school prevention measures. This confirms the need to equip health teachers with the necessary information on bilharzia control. A study by Njenga in Kwale admits that once a year deworming is not adequate for bilharzia control as such health-seeking behavior would strengthen its control (Njenga *et al.*, 2014). These results could be attributed to the findings on knowledge on signs and symptoms (34.38%) and mode of transmission (51.47%) (OR, 0.6592, 95% CI, 0.2652-1.6235, *P*=0.362) and (OR, 0.4853, 95% CI, 0.1581-1.4898, *P*=0.206) as exhibited Table 4.8. There is evidence that knowledge on schistosomiasis has not achieved health-seeking behaviour for bilharzia control. Given that the study focused on health teachers, the prevention measures can only be validated by carrying out a survey among pupils as well.

Previous studies indicated that some factors that influenced teachers commitment for a health promotion program in schools included programmes that make sense to teachers' educational perspectives, respond to school needs and are cognisant of the internal tensions that programme implementation can engender among the whole staff, some of whom may be committed to the program in their school, while others, may not value it in the same way (Jourdan *et al.*, 2011). This could be a silent reaction from these participants given that they could be trained to take care of pupil's health issues without necessarily training them to take care of their own issues. More efforts should be towards adopting trainings that incorporate both pupils and teachers interests in the context of disease control.

The current study supports previous view that perhaps it is time to set agenda for schistosomiasis control besides MDA (Rollinson *et al.*, 2012). Whereas participants agreed that they were susceptible, their perception of severity was low hence no motivation for health-seeking behaviour. In as much as benefits of sanitation and health education was preferred to MDA self-efficacy to help influence and sustain health-seeking behavior was lacking So in regard to HBM as a concept (Rimer & Glanz, 2005) , the study confirms that determinants for health-seeking behaviour are more than just knowledge and source of information (Helman, 2001). Collectively, these findings reveal that health-seeking behaviour for schistosomiasis control remains an uphill task for schistosomiasis control. Therefore there is need to review content of knowledge on schistosomiasis in schools and strengthen the sources of information.

CHAPTER SIX: SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

6.1 SUMMARY OF FINDINGS

This study was performed to assess knowledge, sources of information and health-seeking behaviour for schistosomiasis control by primary school health teachers in Kisumu West District. Results demonstrate that knowledge of signs and symptoms and mode of transmission on bilharzia have a gap in knowledge content. Whereas teachers got most information from media and print, they still preferred information from health professionals to show bilharzia as a public health concern. Schistosomiasis is not perceived as a serious disease and together with cost of treatment facilities at the health centers; availability of traditional and spiritual treatment makes it impossible to adapt health-seeking behaviour. Largely it was observed that source of information is a key player schistosomiasis control. Health teachers have not adapted any health-seeking behavior for schistosomiasis control, a fact that is attributed to knowledge and sources of information for the very schistosomiasis.

6.2 CONCLUSIONS

1. The knowledge for schistosomiasis control by health teachers in Kisumu West District (currently Seme Sub-County), Kenya reveals gaps in understanding of the disease despite training and involvement in MDA.
2. Although print and media play a big role in information, the teachers preferred health professionals as main source of information for bilharzia control
3. Health-seeking behaviour for schistosomiasis control is lacking among health teachers in Kisumu West District.

6.3 PROGRAMMATIC RECOMMENDATIONS FROM THE STUDY

1. There is need to review and strengthen the knowledge content used for training health teachers on schistosomiasis control so that focus is not on Mass Drug Administration alone. Training for soil transmitted helminthes and schistosomiasis should be done

separately for impact. This will enhance the teachers' understanding of schistosomiasis as a public health problem.

2. Health professionals need to take an upper hand in creating awareness and enhance follow up and supervision for health teachers to strengthen the need for health-seeking behaviour and also evaluate trainings given to paramedics to ensure quality and validity.
3. There is need to assess what factors would strengthen health-seeking behavior for schistosomiasis control by health teachers since they are key players for MDA.

6.4 RECOMMENDATIONS FOR FUTURE RESEARCH

1. More research is needed to identify factors that would strengthen health-seeking behaviour for schistosomiasis control besides knowledge and source of information which is only a part of other determinants of health promotion.
2. Further research on health workers perception of teachers conducting MDA in schools would help provide information on impact of MDA programs.
3. Further research is needed to assess health-seeking behavior by school pupils to ascertain gaps for sustainability of schistosomiasis control following MDA in schools.

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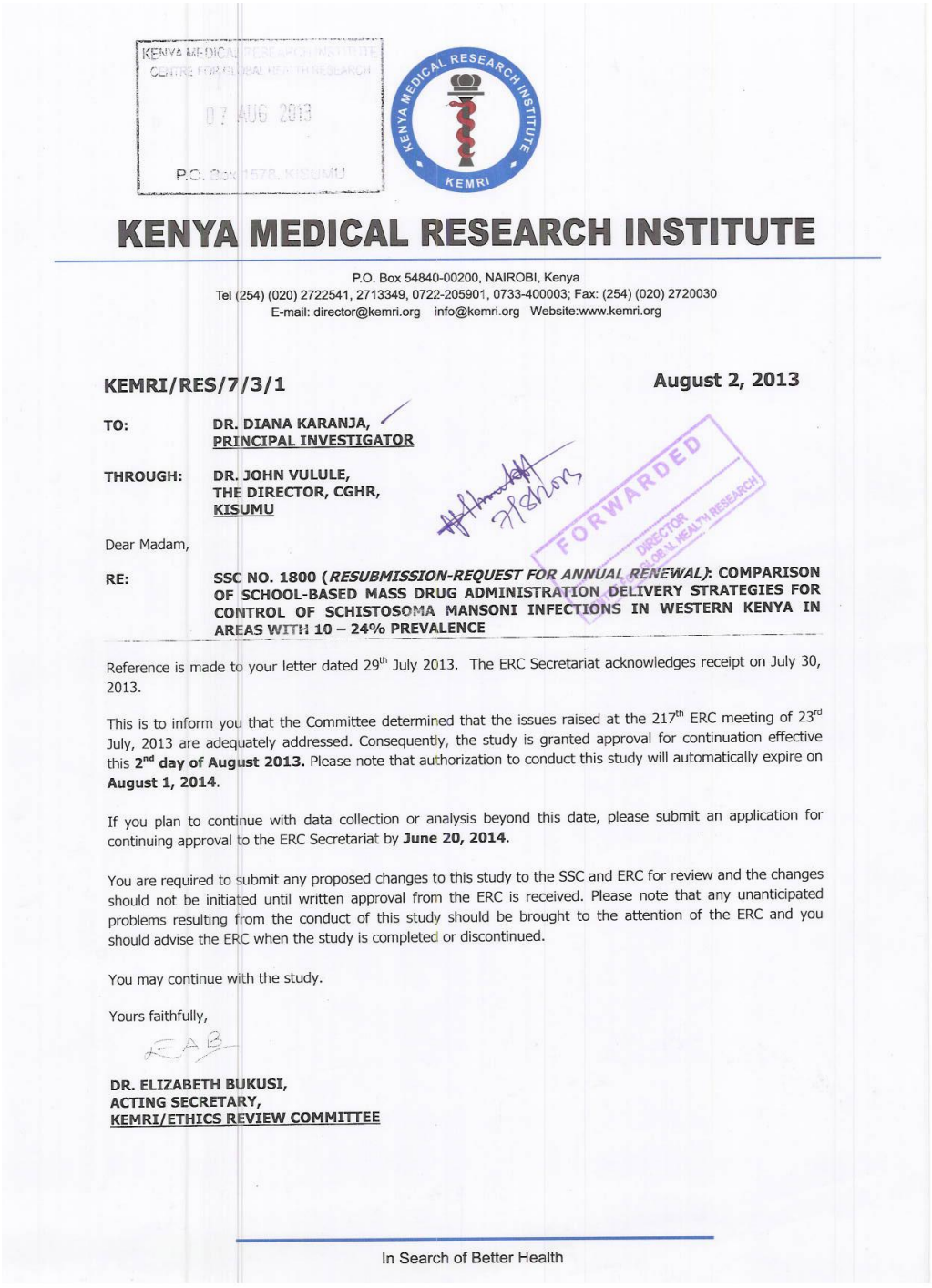
APPENDICES:

Appendix 1: Ethical approval



KENYA MEDICAL RESEARCH INSTITUTE

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E-mail: director@kemri.org info@kemri.org Website:www.kemri.org

KEMRI/RES/7/3/1 **August 2, 2013**

TO: **DR. DIANA KARANJA,**
PRINCIPAL INVESTIGATOR

THROUGH: **DR. JOHN VULULE,**
THE DIRECTOR, CGHR,
KISUMU

Dear Madam,

RE: **SSC NO. 1800 (*RESUBMISSION-REQUEST FOR ANNUAL RENEWAL*): COMPARISON OF SCHOOL-BASED MASS DRUG ADMINISTRATION DELIVERY STRATEGIES FOR CONTROL OF SCHISTOSOMA MANSONI INFECTIONS IN WESTERN KENYA IN AREAS WITH 10 – 24% PREVALENCE**

Reference is made to your letter dated 29th July 2013. The ERC Secretariat acknowledges receipt on July 30, 2013.

This is to inform you that the Committee determined that the issues raised at the 217th ERC meeting of 23rd July, 2013 are adequately addressed. Consequently, the study is granted approval for continuation effective this **2nd day of August 2013.** Please note that authorization to conduct this study will automatically expire on **August 1, 2014**.

If you plan to continue with data collection or analysis beyond this date, please submit an application for continuing approval to the ERC Secretariat by **June 20, 2014**.

You are required to submit any proposed changes to this study to the SSC and ERC for review and the changes should not be initiated until written approval from the ERC is received. Please note that any unanticipated problems resulting from the conduct of this study should be brought to the attention of the ERC and you should advise the ERC when the study is completed or discontinued.

You may continue with the study.

Yours faithfully,

DR. ELIZABETH BUKUSI,
ACTING SECRETARY,
KEMRI/ETHICS REVIEW COMMITTEE

In Search of Better Health

.Appendix 2: School of Graduate Studies approval

MASENO UNIVERSITY
SCHOOL OF GRADUATE STUDIES

Office of the Dean

Our Ref: PG/MPH/0158/2011

Private Bag, MASENO, KENYA
Tel:(057)351 22/351008/351011
FAX: 254-057-351153/351221
Email: sgs@maseno.ac.ke

Date: 16th October, 2013

TO WHOM IT MAY CONCERN

RE: PROPOSAL APPROVAL FOR EMMY KAVERE AWINO— PG/MPH/0158/2011

The above named is registered in the Master of Public Health Programme of the School of Public Health and Community Development, Maseno University. This is to confirm that his research proposal titled "Factors Influencing Health-Seeking Behaviour for Schistosomiasis Control by School Health Teachers in Kisumu West District, Kenya" has been approved for conduct of research subject to obtaining all other permissions/clearances that may be required beforehand.

MASENO UNIVERSITY DIRECTOR 18 OCT 2013 SCHOOL OF GRADUATE STUDIES

Prof. P.O. Owuor
DEAN, SCHOOL OF GRADUATE STUDIES

Appendix 3: Research approval from Ministry of Education

MINISTRY OF EDUCATION SCIENCE AND TECHNOLOGY
STATE DEPARTMENT OF EDUCATION

Telegrams:
Telephone: Kisumu (057) 2022626
When replying please quote

REPUBLIC OF KENYA

SUB-COUNTY EDUCATION OFFICE,
SEME SUB-COUNTY,
P.O. BOX 19,
PAW-AKUCHE.

13/1/2014

RE: KWD/GA/23/8 VOL.I/96

All Head Teachers
Seme Sub - County

RE: AUTHORITY TO CONDUCT SURVEY

The bearer of this letter, ***EMMY K. AWINO*** is a student at Maseno University, pursuing a Master of Public Health Degree. She is hereby authorized to visit our schools to conduct a survey on ***"Factors Influencing Health – Seeking behaviour for Schistosomiasis Control by School Health Teachers in Kisumu West District"***

Kindly accord her the necessary assistance.

Thank you.

SUB-COUNTY DIRECTOR OF EDUCATION
SEME SUB-COUNTY
P. O. Box 19
PAW AKUCHE

OTIENO BEATRICE (MRS)
SUB - COUNTY DIRECTOR OF EDUCATION
SEME SUB-COUNTY.

Appendix 4: Questionnaire

QUESTIONAIRRE FOR ASSESSMENT OF KNOWLEDGE AND HEALTH-SEEKING BEHAVIOUR FOR SCHISTOSOMIASIS CONTROL BY HEALTH TEACHERS IN KISUMU WEST DISTRICT

Introduction

Good day.

My name is.....and i am a student at Maseno University pursuing Masters in Public Health. I am conducting a survey about health-seeking behaviour for schistosomiasis control among health teachers. You are being invited to take part in this research because i feel your experience as a health teacher can contribute much to the control of schistosomiasis. If you do not wish to answer any of the questions included in the survey, you may skip them and move on to the next. The information recorded is confidential, your name is not being included on the forms, and only a number will identify you.

The survey may take 20-30 minutes and participation is voluntary however your views are very important in the strengthening of schistosomiasis control measures.

Would you like to ask me anything about the survey?

May i with your permission begin the interview?

Interviewee signature.....

Interviewers' signature.....

Date of interview.....

SERIAL NO.....

School name.....

Age-.....

Sex-M F

1. For how long have you been a teacher?

2. What training have you received in relation to school health? .....

.....

3. Other than teaching what other source of income do you have?

a. Business
b. Fisherman
c. Farmer
d. None
e. other (specify)

4. What is the qualification for a school health teacher from Ministry of Education?

.....

SCHISTOSOMIASIS: KNOWLEDGE AND MODE OF TRANSMISSION

5. Have you ever heard of Bilharzia? YES/NO

6. What are the signs and symptoms of Bilharzia? .....

.....

7 How does a person get Bilharzia?

a. through unsafe sex
b. drinking infected water
c. Swimming/ bathing/walking in infected water
d. Bitten by a mosquito
e. Don't know

8. What is the local name for schistosomiasis? .....

SOURCE OF INFORMATION

9. Where did you first learn about Bilharzia?

a. Newspaper/magazine
b. Radio/TV/Billboard

c. Posters/other printed material
d. Professionals(CHW, Public health officer, hospital)
e. Barazas
f. Others(specify)

10. Where would you prefer to get information from? .....

HEALTH-SEEKING BEHAVIOUR

11 Do parents and the community recognize you as a health teacher in the school? Yes No

12. Who is responsible for health education in the school?

a. Deputy head teacher
b. Health teacher
c. Teacher on duty
d. school head-girl/ head-boy
e. Community health worker

13. What support do you receive from school as a health teacher?.....

.....

14. What support do you receive from the health professionals in your area?

a. Training
b. Supervision
c. None
d. Others(specify)

15 How often do you generally seek health care at a clinic or hospital?

a) Only when i am sick
b) When there is an outbreak
c) I am generally healthy
d) None of the above

16 Who is at risk of getting Bilharzia?

a. Only school going children
b. Fishermen
c. Anybody

17. How can you prevent Bilharzia?
    a. Periodic de-worming
    b. Ensure safe environmental hygiene
    c. Safe drinking water
    d. Health education
    e. Do not know
    f. Others (specify)
18. How would you prevent schistosomiasis as:
    a. An Individual.....
    b. In school.....
19. In your opinion, is schistosomiasis a health problem in your area? Yes / No
20. As a teacher do you think you can get Bilharzia? Yes/No
    - If No, kindly explain.....
      .....
    - If yes, kindly explain.....
      .....
21. What would you do about your illness if you had Bilharzia?
    a. Would go to hospital
    b. Would pray
    c. Would go buy medicine at a pharmacy
    d. Don't know
    e. Would work hard to prevent it

22. If you would choose not to go to hospital what would be your reason for not going?
    - Not sure which facility to go to
    - Cost
    - Health facility too far
    - Too busy at work
    - Bilharzia cannot be treated

- Would take traditional medicine
- Do not trust hospital treatment

23. What symptoms of Bilharzia would make you go to the health facility? Kindly list

.....

24 As a teacher do you feel well informed about schistosomiasis? Yes No

Appendix 5: Focus Group Discussion consent

Health-seeking behaviour for schistosomiasis Control among school health teachers in Kisumu West District

Date.....

Participants: School health teachers **Where?** Kisumu West District, Kenya

Name of school.....

Purpose of the study:

To explore factors; level of knowledge and sources of information influencing health-seeking behaviour for schistosomiasis control among primary school health teachers in Kisumu West District, Kenya.

What is required: You will be asked to take part in a group discussion of 8-12 people. A trained person will ask for your opinion and thoughts on health-seeking behaviour for schistosomiasis control but not anything personal. Another person will help take notes and tape the discussion on a recorder for the purpose of accuracy in report writing. The discussion will last 45 minutes to 1 hour.

Confidentiality: The information you provide will be kept confidential and only used to improve Bilharzia control**.** During the discussion a number tag will be used as an identity and not your name.

Risks and benefits: You may learn about health-seeking behaviour for schistosomiasis control. You will be paid transport reimbursement of Ksh.200 for travel to the discussion place. There are no risks in this discussion unless your opinions are not kept private by someone from the group. The group members are requested to respect everyone else's opinions.

Questions/concerns: If you have any concerns kindly contact Dr. Diana Karanja-0733822331 or Prof Ouma-0722381214 –Maseno University.

Participant consent: I have been told about the survey and i understand what will take place. I agree to take part in the discussion and to be audio taped. I understand that my name will not be used to identify me in the report.

Name..... Signature.....

Appendix 6: Focus Group Discussion guide

Schistosomiasis (Bilharzia) knowledge and awareness

1. Have you ever heard of Bilharzia?
Probe for:

- Local name, Presence of any MDA in the school.

2. Where did you first learn about Bilharzia? What would be your preferred source of information?
Probe for:

- Newspapers and magazines
- Mass media: Radio; TV; Billboards
- Brochures, posters and other printed materials
- Professionals: Health workers; Teachers
- Family, friends, neighbours and colleagues
- Leaders: At Baraza; Religious leaders
- Other (please explain):

3. What are the signs and symptoms of Bilharzia?

4. How does a person get Bilharzia?
Probe for:

- Perceived Cause of Bilharzia
- How it spreads

5. What kinds of people are likely to get Bilharzia?
Probe for;

- What populations are most likely to contract Bilharzia?
- What are the reasons which make you think so?
- Gender?

6. How can a person avoid getting Bilharzia?
Probe for:

- Current interventions by community, government, others.

7. Is Bilharzia curable?
Probe for:

- How can someone with Bilharzia be cured?
- Herbal remedies
- Home rest without medicine
- Praying

- Specific drugs given by health centre
- Any other method.

8. What do you think can be done to control schistosomiasis? (Ensure control measures are mentioned not just cure)

Probe for:

- Please list all interventions you are aware of.
- For each intervention listed: What do you understand it to mean, or how do you think it works?
- Understanding of the campaigns.
  Acceptability
  Accessibility / Reach (define) Affordability

9. What would you say about Bilharzia mass drug administration in schools?

Probe for:

- Acceptability
- Time taken
- Affordability- cost
- Effectiveness
- Perception from other teachers

10. In your opinion, how serious is Bilharzia as a disease in schools?

Probe for:

- Recognition of bilharzia as a health problem
- Presence of the disease in the area

11. Earlier at the beginning of our discussion you listed some of your sources of information about Bilharzia. Do you feel well informed about Bilharzia?

Probe for

- What are your other sources of information about Bilharzia?
- Any health training
- Support from ministry of Education and Ministry of Public Health and Sanitation
- How adequate do you think these sources are for information about Bilharzia?

- If you could get more information about Bilharzia, what additional information would you wish to get?
- Preferred source of information.
- Most accessible source. What makes you say this source is more accessible?

Bilharzia and Health-seeking behaviour

12. Do you think you can get Bilharzia?

Probe for:

- What makes you feel you are either at risk, or not at risk of getting Bilharzia?
- Who is at risk

13. What would be your reaction if you found out that you have Bilharzia?

Probe for and explore why they may have any of these reactions (probe for each):

- Fear
- Surprise
- Shame
- Embarrassment
- Nothing

14. Where would you seek help from for treatment of bilharzia?
Probe for:

- Hospital (public)
- Private hospital or clinic
- Buy medicine from pharmacy
- Prayer
- Traditional treatment
- Others

15. (a) Where do you usually go if you are sick, or to treat a general health problem?
Probe for:

Private clinic
Government clinic or hospital
Traditional or homeopathic healer
Clinic run by nongovernmental organization or church
Other

(b) What prompts you to seek treatment at the places you have mentioned?

16. What do you think should be done in schools to control bilharzia?
Probe for:

Responsibility as health teachers
Health-seeking behaviour
Role modelling from teachers
Enhanced environmental hygiene

- Access to safe water

17. Would you go to the health facility if you suspect you have bilharzia?
18. What symptoms will make you seek treatment?
19. If you would not go to the health facility, what is the reason?
Probe for:

- Not sure where to go
- Cost
- Difficulties with transportation/distance to clinic
- Do not trust medical workers
- Do not like attitude of medical workers
- Cannot leave work (overlapping work hours with medical facility working hours)
- Do not want to find out that something is really wrong
- Pursue other self-treatment options (herbs, etc.)
- Go to pharmacy
- Go to traditional healer

23. What worries you the most when you think about Bilharzia?
Thank you for your participation
Do you have any comments?