Original Research Article

Prevalence and risk factors of urinary schistosomiasis among school-aged children in Devego Sub-municipal, Ketu North Municipality, Volta Region, Ghana

ABSTRACT

Background

Schistosomiasis is estimated to affect about 250 million individuals globally with 85% of cases occurring in Sub-Saharan Africa. The WHO estimates over 200,000 annual deaths from schistosomiasis. Although progress has been made in controlling the disease, information on its incidence in many areas not previously endemic zones is scarce. This study assessed the prevalence and risk factors of urogenital schistosomiasis among people aged 6 to 25 in the Devego sub-municipality of the Ketu North Municipal Volta region, Ghana.

Methods

A community based cross-sectional study design was used to conduct the study among 335 respondents. Data was collected using a semi-structured questionnaire. Urine samples were examined microscopically to identify *S. haematobium* ova. The data was analyzed and descriptive statistics summarized and presented as percentages or frequencies. The continuous variables were also summarized in means, medians and standard deviations. Chi-square/Fishers Exact test was used to determine the associations between the independent and dependent variables. P-value less than 0.05 was considered statistically significant.

Results

The study found a 34.6% (116/335) prevalence rate of urinary schistosomiasis among the 335 participants studied. The prevalence rate was 58.6% (68/116) in male respondents and 41.4% (48/116) among female respondents. Respondents aged 11-15 years recorded the highest (41.4%) prevalence. Major risk factors associated with urinary schistosomiasis were; swimming, fetching of water, bathing and washing of cloths ((χ^2=21.207, *P*-value < .02); frequency of exposure to fresh water (χ^2 = 14.684, *P* = .005, CL = 95%). However source of fresh water (river, stream, dam), (χ^2=2.939, *P*-value = .230) sex (χ^2 = .120, *P*-value = .729) and age (χ^2=5.490, *P*-value = .139) were not associated with urinary schistosomiasis.

Conclusion

Schistosomiasis is endemic in remote communities with fresh water sources. Chemoprevention as a control intervention should be made available to communities with fresh water sources not known to be endemic.

Key words: Schistosomiasis, Chemoprevention, Endemic, Prevalence, Outbreak, Control

ABBREVIATIONS

CDC: Centers for Disease Control and Prevention; CHPS: Community-based Health Planning and Services; DALY: Disability Adjusted Life Years; DPDx: Division for Parasitic Diseases; EPI: Expanded Program on Immunization; ERC: Ethical Review Committee; GHS: Ghana Health Service; GIMPA: Ghana Institute of Management and Public Administration; HIV: Human Immune Virus; MDA: Mass Drug Administration; MDHS: Municipal Director of Health

Services; NTD: Neglected Tropical Diseases; RA: Research Assistant; SAC: School-Aged Children; SPSS: Statistical Package for Social Sciences; WASH: Water Sanitation and Hygiene; WHO: World Health Organization; YLD: Years Lived with Disability

1.0 INTRODUCTION

Schistosomiasis is still a major public health concern, particularly in developing countries. The disease is endemic in many places of the world, including Sub-Saharan Africa, according to available data. Human schistosomiasis according to Bradley as cited by Thompson and Cairncross is a water-based parasitic disease caused by worms called trematodes [19]. People are infected during routine agricultural, domestic, occupational and recreational activities which expose them to infested water. These worms grow within the blood vessels of the human body producing eggs which migrates to the bladder in the case of urogenital schistosomiasis, causing damages to tissues of the bladder and urethra [3].

Schistosomiasis accounts for about 250 million infections across 78 countries worldwide. It is estimated that about 85% of these cases are in the Sub-Saharan African region [21]. Chronic and repeated schistosomiasis infection can result in major health and economic consequences including, growth failure, disability and death with children and young adults being the most vulnerable [22]. According to the WHO, schistosomiasis kills over 200,000 people worldwide each year. The good news is that with adequate and quick treatment, most of the complications associated by schistosomiasis can be avoided [21].

Globally, there have been several public health approaches towards combating the disease Chemoprevention through Mass Drug Administration (MDA) using Praziquantel is one of the major interventions in controlling and elimination of the disease. Report from the World Health Organization (WHO) indicates that, over 102.3 million people were given chemoprophylaxis against schistosomiasis in 2017 out of over 220.8 million people that needed to be treated. According to the report, more than 90% of the people that needed to be treated come from Africa. Available records show that the total proportion of school-aged children treated were 70.8% in 2017. The report further indicates that, only 52 of the 78 countries in the World with cases of schistosomiasis are meso-endemic and hyper endemic and require large scale preventive chemotherapy for control [21]. Ghana is one of these endemic countries, however, treatment is restricted to only selected districts due to limited data on the prevalence of the disease in the country. For instance, Anim-Baidoo et al in their study among children in a community along the Volta River in the Eastern region reported a high prevalence of 76% of the disease among the inhabitants of these communities [1]**.** A similar study by Kulinkina et al revealed an estimated schistosomiasis prevalence rate of 23.3%, in Ghana [8]. In the Volta region, regular community-based praziquantel preventive treatment is limited to only few districts recognized as schistosomiasis endemic areas. This is so because of limited data on the prevalence of the disease in many areas in the country most especially among school-age children.

In 2018, a schistosomiasis outbreak among basic school pupils in the study settings resulted in 138 confirmed cases. This is an indication that disease transmission may be going on in many additional areas unobserved [10].

Travel, both domestic and international, is a major factor in the spread of schistosomiasis from endemic to non-endemic places around the world. According to the Centers for Disease Control and Prevention (CDC), many travelers frequent fresh water locations such as rivers and dams for recreational and other tourist purposes [4]. The WHO proposes an integrated approach based on infection prevalence rates for efficient schistosomiasis control. Furthermore, the recommended treatment technique is determined by whether the infection prevalence is low, moderate, or high [20], which can only be determined through research on the disease among the affected age groups. Despite the fact that schistosomiasis has been studied in several parts of Ghana, there is little information on its incidence among SAC and young adults in the Volta region, with no single study undertaken in the Ketu North Municipality where this study was conducted.

Furthermore, the few studies conducted in the region pay little attention to community-based contributory factors to the disease burden among the research's participants, emphasizing the importance of this investigation. As a result, our study was required to provide disease prevalence data and associated risk factors among people aged 6 to 25 who were in basic school or of school-going age. The study's purpose was to provide a foundation for scaling up chemoprevention treatment against the disease, as required by the WHO.

2.0 METHODS

2.1 Study site description

The study was conducted in Devego sub-municipality in the Ketu North municipal of the Volta region. Devego sub-municipal is located in the southeastern part of the municipal capital, Dzodze. Devego which is the sub-municipal centre is about 16.5 kilometers away from Dzodze the municipal capital. The sub-municipal has a total estimated population of 17,705 with an annual estimated growth rate of 2.5% per annum based on the 2010 population and housing census. This represents 14.4% of the total population of the Municipality. There are three health facilities (Zones) in the sub-municipality, namely; Devego health center, Dekpor CHPS compound and Klenormadi CHPS compound. The sub-municipal also has thirteen (13) basic schools comprising of ten (10) public and three (3) private schools with a total enrollment of

2,739 pupils in the 2019/2020 academic year. The major occupation of the people is agriculture with a couple of them engaging in petty trading, kente weaving and the formal sector. The main sources of water supply include pipe-borne, dam, stream, bore-hole, well and rain waters [11]. The following communities were selected in the Devego sub-municipality for the study; Doekope, Lave, Dekpor-horme and Dekpor-Yia. The maps below are illustration of the study location in the country.

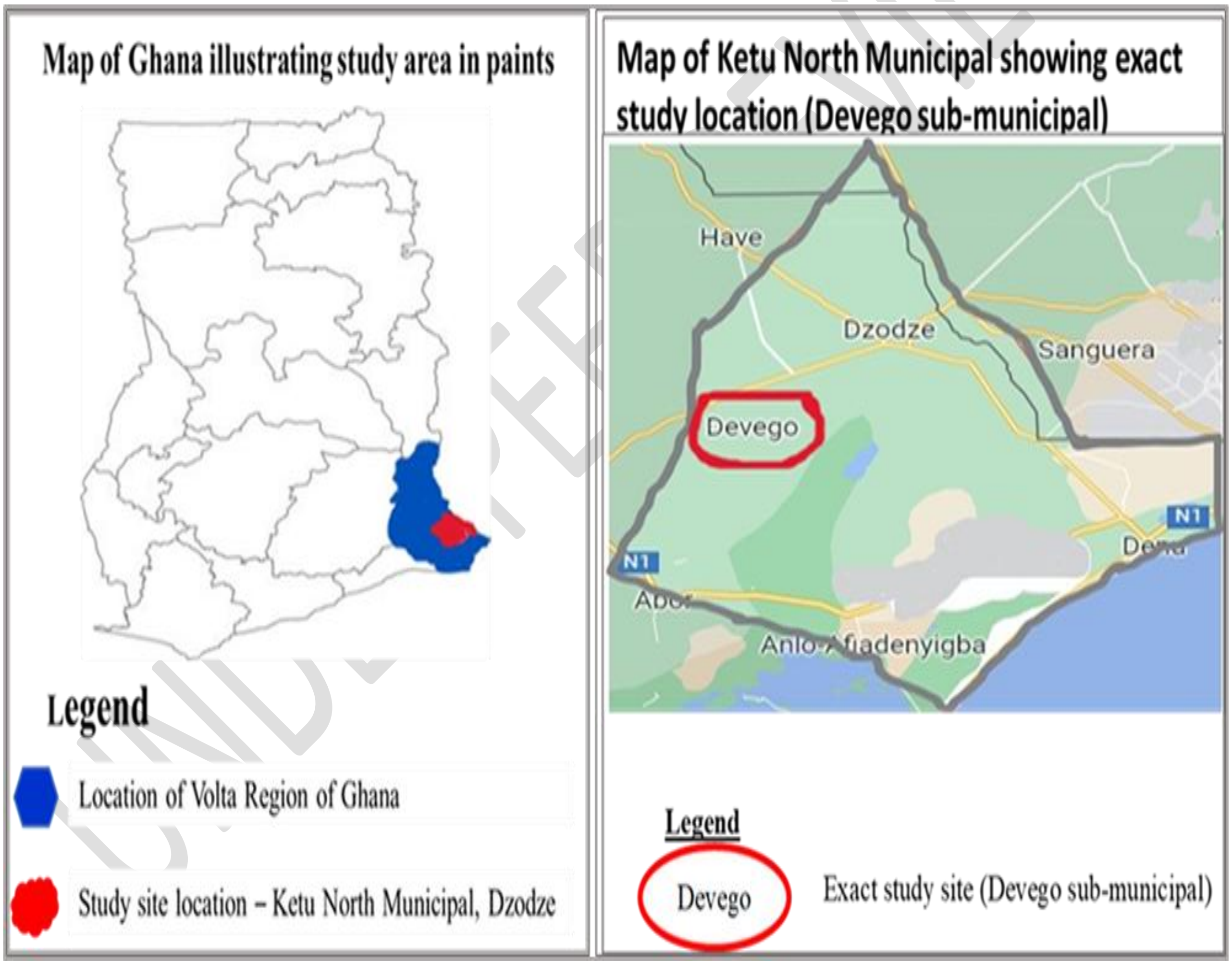

Figure 1 : Map showing study location

2.2 Study population

The study population was composed of persons of school going age (6-25 years old) who were either in basic school or out of school.

2.3 Study design

A descriptive cross-sectional study design was employed for the study in 2020. A semi-structured questionnaire was administered through face-to-face interview to the participants. Parents/guardians of very young participants were granted the interview on behalf of their children who were unable to appropriately respond to the questionnaire. Data captured from participants included demographic variables of the respondents, activities that predispose the respondents to schistosomiasis and prevalence of schistosomiasis among the respondents.

2.4 Sample Size Determination

Using Krejcie and Morgan (1970*)* statistical sample size calculation table [7], a sample size for the study was determined. The table was propounded with the formula below at a confidence level of 95% (z = 1.96) for easy sample size determination.

$s = X^2NP(1-P) \div d^2(N-1) + X^2P(1-P).$

Where; N = Population size, P = population proportion, d = degree of accuracy expressed as a proportion (0.05). Therefore, with a total population of 2,739 school-aged children within the Devego Sub-municipal, the corresponding sample size for the study was **335** on the statistical table. Thus, a total of **335** sample size of persons aged 6-25 years who were either in basic school or out of school were recruited for the study.

2.5 Sampling Technique

Devego sub-municipality was purposively selected out of the five sub-districts because of the reported outbreak of schistosomiasis in the area in 2018. A list of the 22 communities was made and three (Devego zone, Dekpor Zone and Klenormadi Zone) randomly selected by ballot. A proportionate to population size of the community was used to determine the number of participants to be interviewed per community. From the list of households obtained in each of the communities, a systematic sampling techniques was used to select the household. A sampling interval of two was used in the selection of the household to sample, starting from the last house on the list and followed in the straight line until the desire sample size was obtained for each of the communities. Participants aged 6-25 years with blood in urine in the selected households and attends basic school were considered admitted to the study. In a situation where there was more than one eligible participant, only one was selected by a ballot. A 100% response rate was recorded by the study. A written informed consent was sought from parents and their wards taking part in the study.

2.6 Data collection

Data from the study was captured using a pretested semi-structured questionnaire. The questionnaire was administered to respondents in households of the selected communities by trained Research Assistants. The questionnaire was designed to collect information on the study variables which included demographic information of respondents, prevalence of urinary schistosomiasis and risk factors associated with urinary schistosomiasis. The instrument was administered in the dialect of the respondents and in English to respondents who did not understand the local dialect.

2.7 Urine Sample Collection and Examination

Urine specimens were collected from each of the respondents in the study for laboratory examination to determine the prevalence of schistosomiasis among the participants in the study area. A clean wide mouth container with a tight lid was given to each participants and instructed to collect about 60 ml of urine after a brisk exercise. All collected specimen were closed tightly, packaged in plastic zip-lock bags and placed in a box with an absorbent to prevent spillage. The specimens were labelled with the identity number of the each of the participants. The specimens were then stored in a shaded place away from direct sunlight and transported to the laboratory daily within four hours after collection. Ten (10) millilitre of urine was centrifuged at 1000rpm (revolutions per minute). After draining the supernatant, a drop of sediment was transferred to a microscope slide and a cover slip applied. A microscopic examination was then performed on the sample by focusing and scanning with objective lens (X10) and further with objective lens (X40) for the presence of *Schistosoma haematobium* eggs and results documented.

2.8 Data analysis

Data from the study respondents was double entered into a Statistical Package for Social Sciences (SPSS) version 20 database. The data was validated and analyzed with the SPSS version 20. Demographic characteristics of the respondents such as sex, level of education, religion and other categorical variables were summarized and presented as percentages or frequencies. The continuous variables such as age was also summarized in means, medians and standard deviations. The prevalence of urinary schistosomiasis was also presented as proportions. A Chi-square (χ^2)/Fishers Exact test was used to establish the associations between urinary schistosomiasis and demographic characteristics or exposure status of respondents. A p-value of 0.05 was be considered as statistically significant.

3.0 RESULTS

3.1 Background characteristics of study respondents

A total of 335 respondents were recruited for the studied. Out which 54.6% were males and 45.4% females). The age of the respondents ranged between 6 to 25 years with mean age of 11.7 ± 4.0 years. Majority 150 (44.8%) of the respondents were between the ages of 6 to10 years. Three-quarters (87.5%, 293) of the respondents were Christians. Three hundred and eighteen (94.9%, 318) of the respondents were in school where as 17 (5.1%) were out of school. A significant difference was observed between the educational status and age ($\chi 2=46.589$, *P*-value < .01) or religion ($\chi 2=4.650$, *P*-value = .031) of the respondents were found to be associated with educational status as shown in table 1.

Table 1: Demographic characteristics of primary respondents

	Basic educational Status		Total		
	In school	Not in school			
	n = 318 (%)	n =17 (%)	N = 335(%)	χ^2	P-value (P)
Respondents' Age (Mean age = 11.7 ± 4.0)					
6-10years	145 (45.6)	5 (29.4)	150 (44.8)		
11-15years	129 (40.6)	3 (17.6)	132 (39.4)	46.589	<0.01
16-20years	39 (12.2)	4 (23.6)	43 (12.8)		
21-25years	5 (1.6)	5 (29.4)	10 (3.0)		
Sex of Respondents					
Male	174 (54.7)	9 (52.9)	183 (54.6)	0.021	0.886
Female	144 (45.3)	8 (47.1)	152 (45.4)		
Religion of respondents					

Christianity	281 (88.4)	12 (70.6)	293 (87.5)		
Traditional	37 (11.6)	5 (29.4)	42 (12.5)	4.650	0.031
Islamic	0 (0.0)	0 (0.0)	0 (0.0)		
Community of respondents					
Dekpor Horme	144 (45.3)	9 (52.9)	153 (45.7)		
Lave	35 (11.0)	1 (5.9)	36 (10.7)	3.077	0.380
Doekope	38 (11.9)	0 (0.0%)	38 (11.3)		
Dekpor Yia	101 (31.8)	7 (41.2)	108 (32.2)		

χ^2 = *Pearson Chi-square test, p-value is significant if P < .05*

3.2 Prevalence of urinary schistosomiasis among respondents (6-25 years)

The results in table 2, shows the prevalence of schistosomiasis to be 34.6% (166/335) among respondents. Among those who reported with past history of blood in the urine 37.1% (43/116) had urinary schistosomiasis. Also, 67.2% (78/116) of respondents who presented with clinical signs and symptoms had urinary schistosomiasis. The age group mostly affected 41.4 % (48/116) were in from 11 to 15 years. With respect to sex, more males 58.6% (68/116) were affected than their female 41.4 % (48/116) counterparts. In the four communities studied; Dekpor-Yia was reported more schistosomiasis cases (43.1%, 50), with the least in Doekope reporting the least (6.9%, 8). A significant association was found between urinary schistosomiasis and past history of blood in urine (χ^2=17.573, p-value < .01) or presence of signs and symptoms (χ^2 = 49.697, *P*-value < 0.01) or age of respondent (χ^2 =12.177, *P*-value = .007) or community of respondents (χ^2 = 10.886, p-value = .012). Sex of respondent was however, not statistically associated with urinary schistosomiasis (χ^2 =1.142, p-value = .285).

Table 2: Prevalence of schistosomiasis among persons of school going age

	Test results		Total	χ^2	P-value (P)
	Positive n = 116 (%)	**Negative n = 219 (%)**	**N = 335 (%)**		
Past history of blood in urine					
Blood in urine	43 (37.1)	37 (16.9)	80 (23.9)		
No blood in urine	69 (59.5)	176 (80.4)	245 (73.1)	17.573	<0.01
Don't know	4* (3.4)	6 (2.7)	10 (3.0)		
Presence of signs/symptoms					
Symptomatic	78 (67.2)	60 (27.4)	138 (41.2)	49.697	<0.01
Asymptomatic	38 (32.8)	159 (72.6)	197 (58.8)		
Age of respondents					
6-10years	40 (34.5)	110 (50.2)	150 (44.8)		
11-15years	48 (41.4)	84 (38.4)	132 (39.4)	12.177	0.007
16-20years	23 (19.8)	20 (9.1)	43 (12.8)		
21-25years	5 (4.3)	5 (2.3)	10 (3.0)		
Sex of respondents					
Male	68 (58.6)	115 (52.5)	183 (54.6)		
Female	48 (41.4)	104 (47.5)	152 (45.4)	1.142	0.285
Community of respondents					
Dekpor-Horme	47 (40.5)	106 (48.4)	153 (45.7)		

Lave	11 (9.5)	25 (11.4)	36 (10.7)	10.886	0.012
Doekope	8 (6.9)	30 (13.7)	38 (11.3)		
Dekpor-Yia	50 (43.1)	58 (26.5)	108 (32.2)		

*χ^2 = Pearson Chi-square test, *Fishers Exact Test, p-value is significant if $p < 0.05$*

3.3 Risk factors associated with schistosomiasis among primary respondents (6-25years)

The study as indicated in table 3, observed that 325 (97.0%) of the 335 respondents studied were exposed to risk factors (fresh water bodies) of schistosomiasis with 35.7% of those exposed testing positive for urinary schistosomiasis. Most (44.0%) of the respondents were exposed to water from the dam than the other water sources. The difference between exposure status of respondents and positive urinary schistosomiasis was statistically significant (χ^2 = 5.460, *P*-value = .019). On frequency of exposure, it was observed that majority 51 (43.9%) of the respondents who tested positive were exposed on daily basis. There was a statistically significant association between frequency of exposure to fresh water and test results of respondents. (χ^2 = 14.684, *P*-value = .005).

Table 3: Exposure status of respondents to schistosomiasis

	Status of exposure		**Total**	**χ^2**	**P-value (P)**
	Exposed n = 325 (%)	**Not exposed n = 10 (%)**	**N = 335 (%)**		
Sex of respondents					

Male	177 (54.5)	6 (60.0)	183 (54.6)	0.120	0.729
Female	148 (45.5)	4*(40.0)	152 (45.4)		
Age of respondents					
6-10years	142 (43.7)	8(80.0)	150 (44.8)		
11-15years	131 (40.3)	1*(10.0)	132 (39.4)		
16-20years	42 (12.9)	1*(10.0)	43 (12.8)	5.490	0.139
21-25years	10 (3.1)	0* (0.0)	10 (3.0)		
Test results					
Positive	116 (35.7)	0* (0.0)	116 (34.6)		
Negative	209 (64.3)	10 (100.0)	219 (65.4)	5.460	0.019

	Test results		**Total**		
	Positive	**Negative**			
	n = 116 (%)	**n = 209 (%)**	**N = 325 (%)**		
Reasons of exposure					
Swimming	40 (34.5)	42 (20.1)	82 (25.2)		
Washing	21 (18.1)	36 (17.2)	57 (17.5)		
Fishing	2* (1.7)	9 (4.3)	11 (3.4)		
Agriculture	1* (0.9)	3* (1.4)	4* (1.2)	21.207	<0.02
Bathing	26 (22.4)	83 (39.7)	109 (33.5)		
Fetching	26 (22.4)	36 (17.2)	62 (19.1)		
Frequency of exposure					
Daily	51 (43.9)	124 (59.3)	175 (53.8)		
Weekly	32 (27.6)	46 (22.0)	78 (24.0)	14.684	0.005

Monthly	6 (5.2)	12 (5.7)	18 (5.5)		
Occasionally	27 (23.3)	27 (12.9)	54 (16.6)		
Source of fresh water	**Positive n = 116 (%)**	**Negative n = 219 (%)**	**Total N= 335 (%)**		
River	37 (31.9)	79 (36.1)	116 (34.6)		
Stream	28 (24.1)	36 (16.4)	64 (19.1)	2.939	0.230
Dam	51 (44.0)	104 (47.5)	155 (46.3)		

*χ^2 = Pearson Chi-square test, *Fisher Exact Test, p-value is significant if $P < .05$*

Table 4 : Data statistics results

4.0 DISCUSSION

Despite various national and international programs aimed at preventing and controlling schistosomiasis, it continues to be a major public health problem in many rural communities. This is due to the lack of data on its transmission in some locations, which is needed to scale up control actions as suggested by the World Health Organization. This study was therefore conducted to provide data on prevalence and risk factors associated with the urinary schistosomiasis among persons from 6-25 years.

The study findings reveal the urinary schistosomiasis prevalence to be 34.6% among the respondents who were aged 6 to 25 years. Findings from a study by Kabuyaya et al were not different from the above findings as they observed S. haematobium infection prevalence of 37.5% in a base line study among 320 primary school children aged 10-15years [6]. Our findings can also be compared with those reported by Anim-Baidoo et al in a study of 100 children in a community along the Volta River in the Eastern region of Ghana which found a prevalence rate of urinary schistosomiasis of up to 76.0% among the study participants of communities within these environs. In their study they associated age of respondents to infection with urinary schistosomiasis [1]. A similar study conducted by Kulinkina and colleagues in the southern part of Ghana observed a *Schistosoma haematobium* prevalence rate to be 23.3% [8] whereas Orish et al reported 10.4% prevalence among 383 participants in three districts of the Volta region of Ghana [13]. Tettey et al also found an overall prevalence rate of 20.9% [18]. These findings justify our assertion that schistosomiasis is very endemic in many remote communities and transmission goes on unreported hence no intervention to mitigate the plight of those afflicted by the disease.

The age group of 11 to 15 years old had the highest prevalence of urinary schistosomisis in this investigation. Tettey and colleagues discovered a higher prevalence rate of 14.0% in children aged 10-15 years, and these findings were strongly related, emphasizing the age at which most infections occur [18]. Our findings also depicts that males had a higher rate of urinary schistosomiasis than females. In contrast, Banhela et al. found 53.0% and 56.0% prevalence rate of the infection in males and females, respectively, in uThungulu health district. Their findings further reported 37.0% and 39.0% prevalence in male and female sexes, respectively, in ILembe health district. In all cases no significant association was found between sex and urinary schistosomaisis [2]. The mentioned differences and similarities in prevalence rates between our study and other studies could be ascribed to sample sizes, study sites, and age ranges of study participants. Studies undertaken in areas with multiple fresh water bodies and a lower sample size, for example, are likely to provide a greater prevalence rate than those conducted in areas with a large sample size and restricted fresh water sources. Regardless, the findings revealed that schistosomiasis is endemic in the studied area, as it may be in some other undetected geographic place.

This necessitates additional research in communities with water bodies, as well as the scaling up of control efforts to reduce transmission in the study area. Some respondents were also at risk of reinfection, according to the findings of the study. This was because the Municipal Health Directorate administered Praziquantel to pupils of some basic schools during an outbreak of schistosomiasis in the sub-municipality more than three months before the study. As a result, in addition to chemoprevention, community-based initiatives to minimize community members' exposure to contaminated fresh water bodies are critical to preventing reinfection.

This current study in addition sought to identify any risk indicators for schistosomiasis infection among the participants. Thus, the study evaluated their status of exposure to fresh water bodies in relation to the rate of schistosomiasis infection. The majority of the participants in this study (97.0%) were exposed to fresh water sources, with males out numbering females. This is consistent with the findings of Mupakeleni et al., who found that 96.8% of schistosomiasis patients were exposed to water from canals and ponds for both domestic and recreational uses [12].

The factors or activities that contributed to the spread of the schistosomiasis infection were also assessed. Respondents' exposure to fresh water sources was explained by swimming, washing, bathing, fishing, agriculture, and water fetching. These risk exposures were highly associated to the presence of *S. haematobium* eggs in the subjects' urine.

In addition, respondents' daily, weekly, and monthly exposure to schistosomiasis was strongly linked to urinary schistosomiasis. The findings corroborates a study by Anim-Baidoo et al., who showed 95.0% of infected participants had contact with fresh water through washing, bathing, fetching, swimming, and other domestic activities [1]. Our findings are similarly consistent with those of Hajisa et al, who found that schistosomiasis infection was largely due to the participants' proximity to major sources of fresh water that harbour the parasites [5]. As described by Socolo et al., practices such as fetching water from streams/rivers, fishing, open space defecation, harvesting hippo grass from fresh water sources, washing of clothes, washing of utensils, bathing, and other risky practices, among others, make one highly susceptible to this infection and aid in its spread [14].

These factors, according to the study, are well-known risk factors for schistosomiasis infection in people who have been exposed to it. As a result, if people in the study region continue to participate in these harmful behaviours without intervention, the area is at risk of becoming a schistosomiasis hyper-endemic zone. Apart from that, the disease will continue to affect people, particularly infected people, resulting in a variety of life-threatening complications, including death. Aside from the disease's incapacitating effects, the economic ramifications for individuals, families, and the community as a whole are disastrous.

Also, infected persons with schistosomiasis will function as infection reservoirs not only in their communities, but also in other locations to which they may travel, as they will excrete urine and faeces directly into rivers, dams, streams, and other fresh water sources. Efforts at prevention and control will be substantially hampered as a result of this. To decrease exposure, population and community sensitization on preventive actions is critical. It is also recommended that water taken from fresh water sources (river, dam, springs, ponds, streams) be stored for at least 48 hours before bathing, as the schistosoma parasite cannot survive in water for more than two days outside of the water source [3]. Water from these sources can also be heated or left in the sun for a long period of time.

5.0 CONCLUSION AND RECOMMENDATION

The study observed 34.6% urinary schistosomiasis infection prevalence rate among persons of school going age (6-25 years) in the Devego sub-municipality of the Ketu North Municipality. The prevalence was higher (41.4%) among children between the ages of 11-15 years old than the other age groups. Also, the prevalence rate of the infection was higher (58.6%) in male respondents than female. Major activities that exposed respondents to the infection were swimming, fetching of water, bathing and washing of cloths.

The findings of this study will help the Ghana Health Service's Neglected Tropical Disease (NTD) Control Program make policy decisions on reassessing the country's schistosomiasis endemic zones. It will be used as a roadmap for expanding community-based mass drug administration programs to include places such as the study area, in accordance with WHO recommendations.

The findings will also be used to inform preventive activities such as larval and snail control, as well as environmental change by key actors, in order to break the disease's transmission chain.

Finally, the findings will serve as a baseline for further research across the municipality and other communities having access to fresh water.

LIMITATIONS OF THE STUDY

1. Laboratory investigation was limited to *Schistosoma haematobium* species as such other species that cause schistosomiasis could not be investigated.

2. Water samples could not be obtained from the various fresh water bodies for laboratory testing to determine the presence of larvae of the organism.

3. The study was limited to only one sub-municipality in the Ketu North Municipal hence the findings do not reflect the prevalence of schistosomiasis in the entire municipality**.**

ETHICAL APPROVAL

Ethical clearance for the study was obtained from the Ethical Review Board of the Ghana Institute of Management and Public Administration (GIMPA) before the study with the following identification number; 25667395710. Also, permission was sought from the Ketu North Municipal Health Directorate and community leaders of the various communities. Written informed consent was obtained from study participants. For participants who were children, the parents or legal guardians consented for them after oral assent was obtained.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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