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PREVALENCE OF SCHISTOSOMIASIS AMONG THE SCHOOL PUPILS ATTENDING COMMUNITY PRIMARY SCHOOLS EBUTE-IGBOORO, YEWA NORTH LOCAL GOVERNMENT OF OGUN STATE, NIGERIA.

***Adewole Adekanmi, Faparusi Foluso and Fantola Fatimah**
Dept of Science Lab. Technology,Biology Unit,Federal Polytechnic,Ilaro.
*Corresponding Author: adewolejak@gmail.com

adekanmi.adewole@federalpolyilaro.edu.ng; fatimah.abdussalam@federalpolyilaro.edu.ng

ABSTRACT

Urinary schistosomiasis is one of the public health problem facing developing countries with school age children at greater risk. The study was aimed at assessing prevalence of Schistosomiasis among pupils of Local Authority and St. Johns' Primary schools in Ebute-Igbooro. A total of 384 pupils were selected by simple random sampling method from each school. Questionnaire was used to collect data on socio demographic characteristics, water contact habit and the history of the infections among the students. Urinary examinations were carried out using RDT kit (DUS 10 and URO-DIP 10) and the microscopic examination was done to detect and estimate the number of eggs in the infected Pupils. The statistical analysis was done using SPSS version 16.0. The result indicated that 34.5% of the students examined were confirmed both by microscopical examination and RDT kit while 38% were positive with RDT kit alone and 34.6% were positive for microscopic examination alone. The water contact practices which exposes the pupils to infection is very high (66.1%) and the prevalence of the infection is higher in male pupils (70.30%) than in female. It was concluded that infection is endemic in the community and constant contacts with Yewa River regularly exposing them to the infection and re-infection. Therefore adequate provision of safe drinking water in the community is necessary and effort should be made to prevent the infection through integrated control methods like the vector eradication.

Keywords: Schistosomiasis, Prevalence, Pupils, Infection.

INTRODUCTION

Schistosomiasis is one of the most common neglected tropical diseases, especially in the developing countries in Africa, Asia and South America, with Nigeria having the greatest number of cases of schistosomiasis worldwide (Dawaki *et al*., 2015). It ranked the highest in terms of public health importance (Van der Warf *et al*., 2003). This is being increasingly recognized, particularly in developing countries, where poverty, poor nutrition, inadequate sanitation, lack of clean drinking-water and minimal health care prevail (WHO, 2013). In sub-Saharan Africa alone, it is estimated that 70 million individuals experience heamaturia, 32 million with difficulty in urinating (dysuria), 18 million with bladder-wall pathology, and 10 million with major hydronephrosis from infection

caused by *Schistosoma haematobium*.(Ekpo *et al*., 2010). There are five schistosome species known to infect humans: *S. haematobium S. japonicum S. mansoni*, *S. intercalatum), and S. mekongi* (WHO, 2013).

Schistosoma eggs are excreted from the human host into a fresh water environment through urine or feces. Once an egg comes in contact with fresh water, it hatches and releases a miracidium, a free-living and ciliated form, which remains infective for 6–12 hours. The miracidium swims by ciliary movement toward the snail intermediate host and penetrates its soft tissue. The Schistosoma species are transmitted by different fresh water snails that serve as their intermediate hosts: Biomphalaria, Bulinus, and *Oncomelania* for *S. mansoni, S. haematobium*, and *S. japonicum*, respectively (Grysells, 2012).

Several methods can be used to assess schist some morbidity with each has varying validity and efficiencies. Morbidity assessment using several or combinations of all these methods might enable the proper assessment of morbidity status in schistsome infection. The severity of *Schistosoma haematobium* infection and risk of complications depends in general on the intensity and duration of infection (Leutscher *et al*., 2000)

The usual routine diagnostic procedure for urinary schistosomiasis is the examination of urine for the presence of schistoome eggs but the the intensity of infection alone parasitological might not be an optimal parameter to identify those that at risk of severe morbidity (Smith and Christine, 1986). According to World Health organization(WHO, 1985), a case at risk of *S.haematobium* has been defined as any individual excreting $\geq$ 50 eggs per 10ml of urine.

The cornerstone of schistosomiasis control to date has been mass drug administration with 40 mg/kg of praziquantel. The drug has been established in several contolled trials a safe and effective drug for the treatment of infection with all human Schistosome species (Koukounari *et al*., 2007). Integrated control, targeting the life cycle, is been currently view as the only approach that will lead to sustainability and future elimination (Inobaya *et al*., 2016).

The aim of the study is to assess the prevalence of schistosomiasis among the school pupils attending community primary schools *Ebute-igbooro*, Yewa North Local Government of Ogun State, Nigeria and factors responsible for it. The prevalence of the parasite can be associated with many factors as reported by many authors; some of these factors are Age, sex, occupation and education. These factors could influence contacts habits and practices. The prevalence of urinary schistosomiasis in Nigeria can also be attributed to some natural factors like weather or climate, which directly affects the proliferation of the second or intermediate species of the infection.

MATERIALS AND METHODS

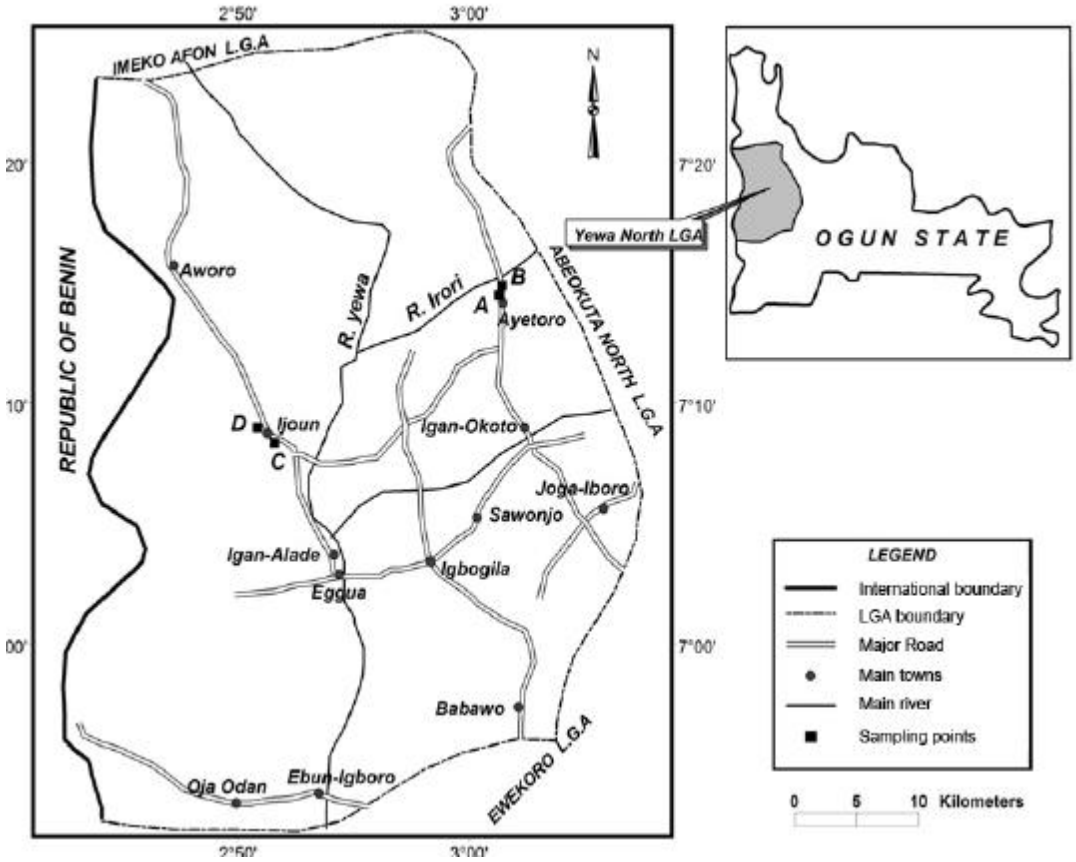
STUDY DESIGN

The study is designed as a cohort study to include a baseline examination before treatment and follow up examination 6 and 12 months post treatment. Baseline examination includes 383 school children with age range between 5-12 years in Primary schools. To prevent circadian variation of egg excretion, urine samples were collected between 10:00am and 2.00pm and examined to determine intensity of infection and ECP levels according to the method of Reimert *et al*. (2000).

STUDY AREA.

The study was conducted in *Ebute Igbooro* (Latitude: 6.8833 - Longitude: 3.0167) in *Yewa North* local government of Ogun state with the estimated population of about 2500.

The village is about ten kilometers from Ilaro, the headquarter of *Yewa South* local government and about fifteen kilometers to the Nigeria-Benin Republic Remote boarder village. Yewa River is a popular inland river that flow the year round serve the village for both domestic and agricultural activities. The river has weeds along its bank which provide a favorable habitat for the proliferation of the intermediate snail's host. Transmission may therefore takes place during activities like bathing, fetching water for domestic purpose, swimming and fishing.



Source: Google map 2017

Target Population

The respondents are pupils of St John's Anglican Primary school and Yewa North Local Authority Primary school both in the village will be recruited for the study. The school '**A**' has the total enrolment of 353 excluding Primary six and the school '**B'** has regular enrolment of 195 also excluding primary six. In each class random selection of 70% of the pupils of both sexes will be made to make the total of 322 participants. The average age of the pupils are 10.5years for the school A and 11.8 years attending school B.

Ethical clearance

Ethical clearance to conduct the research was obtained from the Olabisi Onabanjo University, Health Research Ethics Committee in conjunctions with Yewa South local government area. Verbal consent was also sought from the village heads and the respondents

Sampling technique

A minimum sample size of 322 was determined based on a 95% confidence level, 5% margin of error and a previous study finding that estimated that 70% of the children living in the local government are infected with the parasite. The number ws increased to 378 to cater for missing values

$$N = \frac{z^2 pq}{d^2}$$

Where;

n=minimum Sample size

z= Standard normal deviation, usually set at 1.96, which corresponds the 95% confidence level.

p= Proportion in the target population expected to be exposing infants and preschool-aged children to schistosomiasis infection.

d=Degree of accuracy desired or maximum allowable margin of error. It was set at 5 %

$$\frac{1.96^2 x 0.7 x 0.3}{0.05^2}$$

Sampling procedure

Selection of study participants was through random sampling of 70% of all eligible respondents in each class Primary1 –Primary 5, the terminal class of primary six was excluded since they would have finished the elementary school before the follow up study. Urine samples were collected from the respondent before administered the questionnaire to each of them. Each selected respondents blindfolded and made to answer the question independently with the assistance of the class teachers.

Data were collected from selected child using a purpose designed, interviewer-administered, open and pre-coded questionnaires that will be originally prepared in English and translate into local language and back translate into English to the check the consistency.

This questionnaire sought information on respondents' socio-demographic variables, knowledge of schistosomiasis (Symptoms will be mentioned), prevention and treatment. The questionnaires were pre-tested earlier in some selected schools in the LGA.

Parasitological investigation

a) Urine Collection

Dark (black), sterile, plastic universal containers (labelled) were given to the parents/guardians of the children to collect urine samples. This will be done between the hours of 10.00 am to 2.00 pm. The urine collected will then be immediately taken to the laboratory for analysis.

b) **Examination of Urine for Micro-haematuria**

A reagent strips (Urine-10 parameters, Cyress Diagnostics (3201 Langdorp-Belgium) were carefully dipped into the dark sterile bottle containing the urine for 5 seconds. The resulting change in colour of the strips was then compared with manufacturer's colour chart to estimate the amount of blood in the urine.

c) Examination for *Schistosoma haematobium* ova

10 ml of the urine sample was centrifuged at 5000 rpm for 5 minutes. The supernatant then discarded to leave sediment which will be transferred to the centre of a clean grease-free glass slide to which cover slip was added. This will be mounted on a light microscope and examined at ×40 objective to identify *Schistosoma haematobium* ova which is characterized with a terminal spine. The eggs will be counted and recorded as eggs/10 ml of urine

Treatments

Treatment of all infected member followed the baseline survey and all infected pupils will receive a single dose of 40 mg/kg of praziquantel (Prazivin, Alpha Laboratories Ltd, India).

RESULTS AND DISCUSSION

Table 1: Socio-democratic Characteristic of Respondents (N= 378)

		Weight				
Socio-democratic Characteristics	**Total (%)**	**<=10kg (%)**	**11-20kg (%)**	**>20kg (%)**	**Chi-square**	**p-value**
Age-group						
<=5yrs	**73 (100.0)**	30 (41.1)	42 (57.5)	1 (1.3)		
6-10yrs	**220 (100.0)**	9 (4.1)	101 (45.9)	110 (50.0)	177.438	0.000
>10yrs	**85 (100.0)**	0 (0.0)	7 (8.2)	78 (91.8)		
Sex						
Male	**156 (100.0)**	22 (9.8)	89 (39.6)	114 (50.7)	0.209	0 .901
Female	**266 (100.0)**	17 (11.1)	61 (39.9)	75 (49.0)		

The respondents' ages are associated with their weights but the sex and weight are significantly associated. The largest of the respondents are between the ages 6-10years.

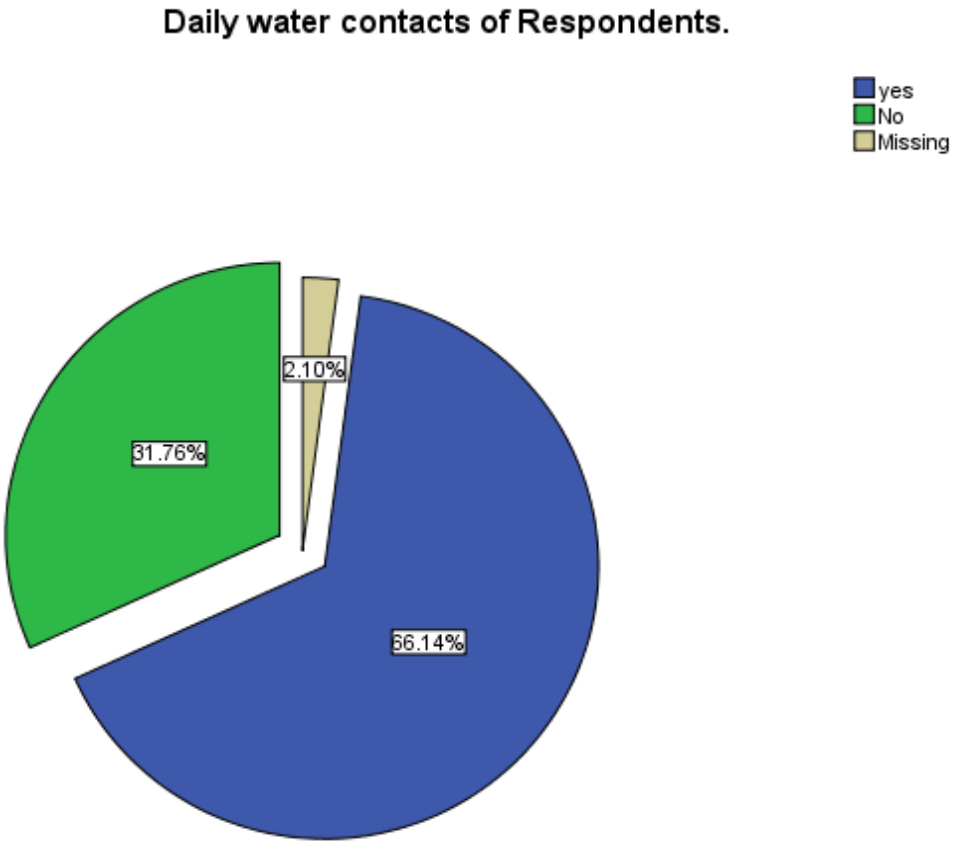


Fig. 1. Percentages of respondents who have daily contact with waters from Yewa stream show very high percentages (56.14%) of the respondents have daily water contacts with Yewa stream while only 31.7% have contacts irregularly and only. About 2.1% were unable to define their water contacts precisely.

Table 2: Respondents' Knowledge Assessments. Socio-democratic Characteristics'			Do you think this is normal for children of that age group,			
Total (%)	**Yes (%)**	**No (%)**	**I don't know (%)**		**Chi-square**	**p-value**
What do you think can cause Blood in urine					50.343	0.000
Normal	**99 (100.0)**	54 (54.5)	44 (44.4)	1 (1.1)		
Disease	**260 (100.0)**	47 (18.1)	212 (81.5)	1 (0.4)		
Maturity	**7 (100.0)**	2 (28.6)	5 (71.4)	0 (0.0)		
Affliction	**8 (100.0)**	2 (25.0)	6 (75.0)	0 (0.0)		
I don't know	**4 (100.0)**	0 (0.0)	4 (100.0)	0 (0.0)		

The knowledge and awareness of the diseases shows that, 54% of the respondents consider the disease to be normal, 47% considered it to be an ailment while was 2% considered to be a sign of maturity in a certain age group and 2% said it is an affliction.

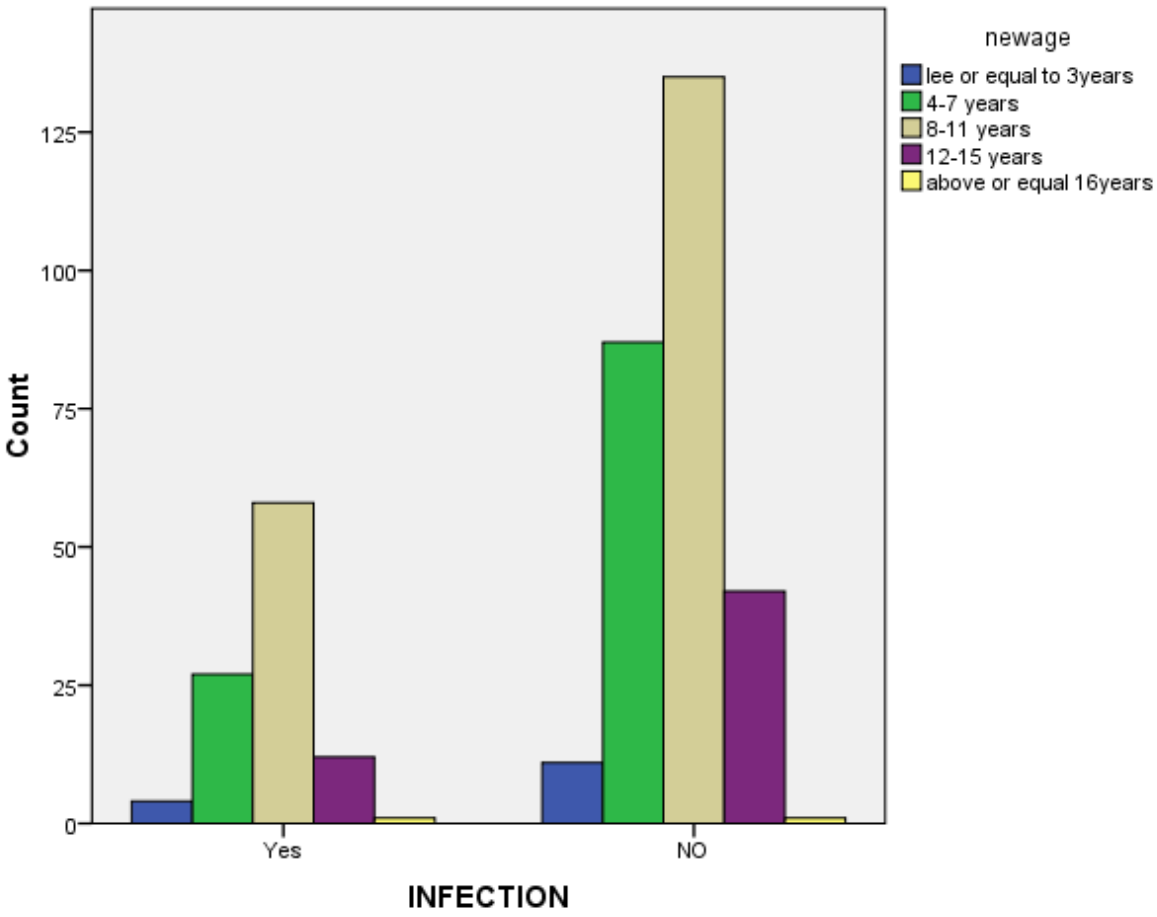


Fig 2 shows the association of Age and the infection is significant
$\chi 2=3.824$, p= 0.000

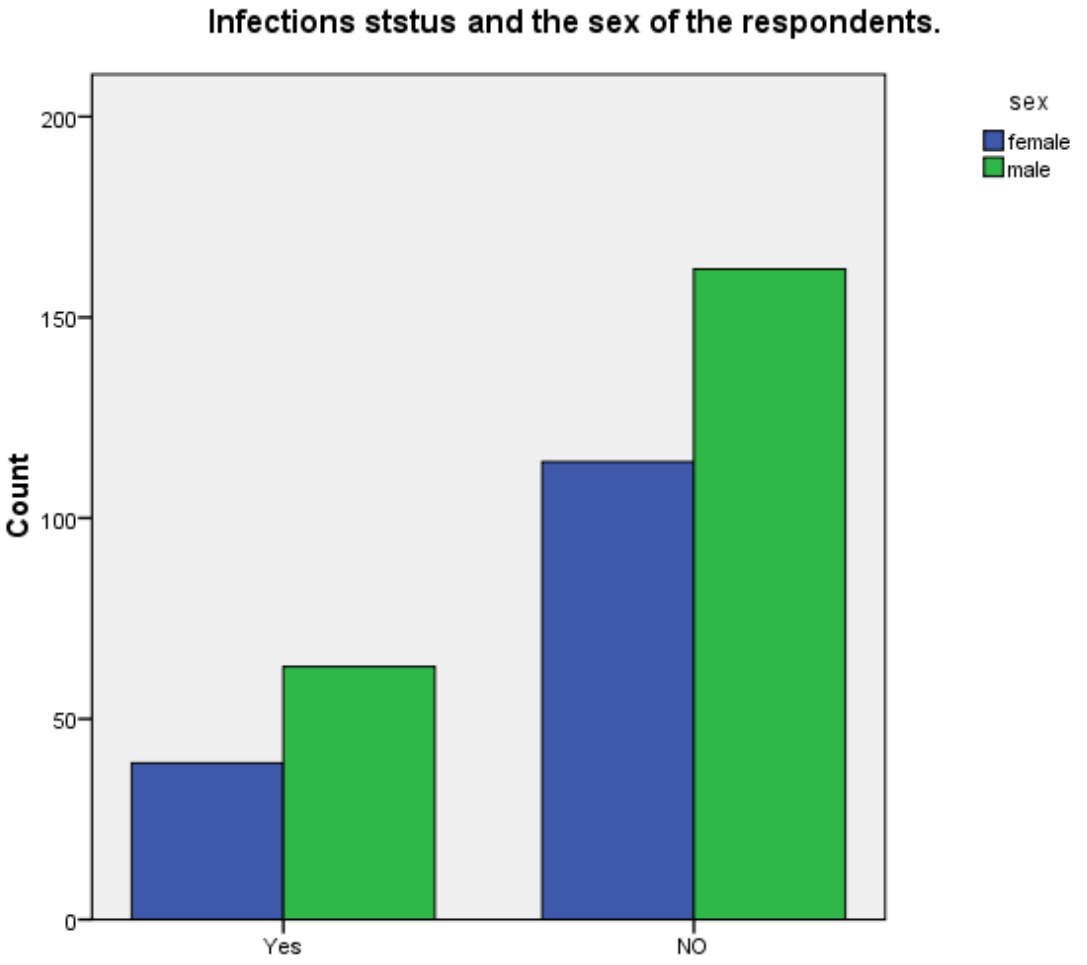


Fig 3 shows the association between the sex and the infection status is significant. χ_2 =3.813,p=0.000

DISCUSSION

The results of the research showed that the number of males that are infected with the schistosome is higher than that of females, This finding was consistent with the previous studies of Dawaki *et al*. (2016); Duwa *et al*. (2009); Abdullahi *et al*. (2009). Males have a more intense exposure to the sources of infection compared to females. Fishing, sand mining and swamp farming which are more dispose occupations to the infection are common among men than women. Apart from crop farming the major occupation of the villagers is fishing which most of the school pupils especially the boys claimed to be engaged- in along with their fathers but this is contrary to another report obtained elsewhere where the prevalence has been shown to be higher in female this could be as a result of regular laundry in the river and plate washing; and females accompany their mothers for these activities

Also, in this study there was a statistically significant association between mean egg count of urinary schistosomiasis and sex, age group. This report was also similar to the study conducted by Geleta *et al*. (2015). Other factors that could increase the prevalence include; distance from the river and use of river for drinking and washing, and swimming habit.

Yewa River is very abundant in different species of snails that can transmit schistosome (Odaibo and Salawu, 2014). Therefore the prevalence of the infection could be greatly linked to this. The geographic distribution of each *Schistosoma* species is closely dependent on the presence of appropriate freshwater snails that serve as the obligatory molluscan hosts (Ivoke *et al*., 2014; Akinwale *et al*., 2011).

CONCLUSION

In conclusion, the impacts of socio-economic roles in transmission of schistosomiasis in Africa can never be underestimated. Among these factors are poverty poor sanitation and hygiene, and non-availability of potable water for domestic use. The awareness about the disease is poor, while most respondents associated it with maturity hence the little apprehension about the symptoms. Therefore, health education, regular treatment and provision of clean treated pipe, borne water will alleviate the problem and prevents the re-infection of the diseases. Integrated snails vector control program should also be considered as an option.

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