Global Advanced Research Journal of Medicine and Medical Sciences (ISSN: 2315-5159) Vol. 7(8) pp. 160-164, October, 2018
Available online http://garj.org/garjmms


*Full Length Research Article*

# Age and Gender Differences in Prevalence and Pattern of Parasitic Helminthes among Students Living in Hostels of a Tertiary Institution in South Eastern Nigeria

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Accepted 14 September, 2018

**This study determined the pattern and prevalence of parasitic helminthes among students living in the hostel of Alvan Ikoku Federal College of Education in Southwestern Nigeria. This school based descriptive cross sectional study was part of the large data collection during the student's periodic examination screening of students between June and September 2016. A total of 45 students who were positive for the diagnosis of helminthiasis were assessed for the type, prevalence and gender and age difference in the distribution of these parasitic helminthiasis. Using direct saline smear and formol-ether concentration methods, we microscopically examined stool specimens for the presence of eggs, cysts and trophozoites of intestinal parasites. Data was analyzed using the SPSS software. Out of a total of 132 students who were screened, 45 (34.1%) had parasites. Out of this, 18.9% had single infection. The ova of tapeworm constituted the least while Ascaris and hookworm constituted the highest among the parasites. The age group 21 to 40 years had the highest prevalence (about 42.0%) among the male and (about 70.0%) among the females. Generally, female were more infected (Figure 1) across all age groups compared to males according, though the difference in age with parasite prevalence was not statistically significant (p-0.341). For gender, E. Histolytica had the highest prevalence among both male and female, and the least with Tapeworm. Except for E Histolytica and Giardia Lamblia, females also had a higher parasite prevalence compared to male though the difference was also not statistically significant (p-0.016). A significant prevalence of intestinal parasites were found among studied respondents, Measures such as health education, personal hygiene, environmental sanitation, and improvement in water supply should be put in place to reduce disease prevalence.**

**Keywords:** Intestinal parasites, students, prevalence, socio-demographic factors, Nigeria

## INTRODUCTION

Stool parasites and helminthes are the most devastating and the most dreadful of all diseases afflicting mankind. It is obvious that the existence of these parasites is becoming so serious at the locality of Alvan Ikoku Federal College of Education Hostels in Owerri. The highest and most serious in wide spreading among the parasites is the nematodes (Udensi, 2013).

The year 2010 AD was set aside globally as the target for the elimination of helminthes and other deadly

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diseases of public health importance, Nigeria inclusive. This target though desirable still eluded Nigeria despite several efforts of stakeholders. The development of a rapid assessment method for community diagnosis of helminthes diseases few years ago, and subsequent enhancement of the efficiency of large-scale distribution of Mectizan was innovative, and a valuable and timely intervention (Cheesbrough, 2009). Despite the yearly distribution of Mebendazole and other anti-helminthes, the problem of worm infestation is far from over.

Globally about two billion individuals got infected with intestinal parasites; mostly in resource poor settings. Apart from causing morbidity and mortality, infections with intestinal parasites have been associated with stunting and poor educational performance in schools. Helminthes are a polyphyletic group of eukaryotic parasites (Bar, 2009). They are worm-like organisms living in and feeding on living hosts, receiving nourishment and protection while disrupting their hosts' nutrient absorption, causing weakness and diseases (Dunn, 2011). However intestinal parasites live inside the digestive tract (Peters, 2010; WHO, 2009) and they are large multi-cellular organisms that are generally visible to the naked eye in their adult stages. Like protozoa, helminthes can either be free-living or parasitic in nature and in their adult form; helminthes cannot multiply in humans (William *et al.*, 2014).

Entamoeba histolytica is a typical example of a parasitic helminthes infecting about 50 million people Worldwide (Taiwo, 2009). Some of the factors contributing significant prevalence of the resulting Amoebiasis range from inadequate diets, poor environmental sanitation, overcrowding to poor personal hygiene among students in dormitories. This study would provide evidence based findings that could improve the standard of living of students as well as provision of adequate basic amenities in the student's hostels. If the present trend continued unabated, symptomatic E Histolytical infection usually presents as amoebic dysentery or amoebic liver abscess, fulminating dysentery, bloody diarrhea, weight loss, fatigue, abdominal pain and amoeboma while other organs such as the lungs, brain, spleen are sometimes involved (Suswan et al., 2012). Being a neglected disease to an extent, most de-worming programmes targeted young school children in primary and secondary schools while adults were being neglected. The objective of this study was to determine the pattern and prevalence of parasitic helminthes among students living in the hostel of Alvan Ikoku Federal College of Education in Southwestern Nigeria.

## METHODS

### Study Area

The study area was Alvan Ikoku Federal College of Education hostels in Owerri Municipal Local Government Area of Imo State. It is located between latitudes of 50 and $60^{N}$longitude of 60 and $70^{E}$. The rainfall of the area varies from 2000mm to 2500mm per annum with a very high relative humidity. The area has a temperature range of $20^{oc}$. Owerri Municipal Local Government Area is populated by indigenes of the area and stranger. The population of the School was about 3000 students. There were separate hostels for boys and girls, with an average of six students formally allocated to a room, however most rooms have significant number of students not allocated but managing within the hostel and thus constituting overcrowding. There are toilet facilities and several markets where food and food products are sold. In addition to the institutional health centers, there is a teaching hospital, a general hospital, numerous PHCs and some private health facilities within the study area.

### Study Population

The reference population constitutes all students registered and formally allocated rooms within the hostels of the College. Those who directly participated in the study constituted the study population.

### Study design

**D**escriptive cross sectional study among selected students from the various hostels in Alvan Ikoku Federal College of Education Owerri

### Sampling

This is a subset of a larger study that screened students for the periodic medical examinations in the institution's health center. A total sampling of all students who had positive parasite results on screening was carried out. Efforts were made to ensure that all eligible students were recruited into the study and their consent obtained after detailed counseling on the rationale for the study.

### Survey instruments

**A** checklist was used to collect basic socio-demographic data related to age and sex of respondents. It was ensured that these personal data corresponds with the

labeling of the stol; samples before and after specimen analysis. Equipments and procedures used in identifying the parasites were standard and according to manufacturer's recommendations.

**Stool Analysis**

The respondents were given labeled collection cups and applicator sticks and were instructed on how to collect the samples. About 2g of fresh stool was collected from each respondent A portion each of the stool samples was processed with a direct microscopic technique to detect cysts, trophozoites, eggs and larva of intestinal parasites immediately. The remaining part was preserved in 10% formalin solution and stool examinations were performed using the formal-ether concentration technique .Two trained senior medical laboratory technologists examined the samples microscopically. Both the 10× and 40× objectives were used for detection of eggs and larvae of helminthes and cysts and trophozoites of protozoan parasites. Iodine solution was used to detect and identify cysts of protozoan parasites.

**Ethical consideration**

The ethical approval to conduct this study was obtained from the Federal Medical Centre, Owerri. Written permission were obtained from the management of the College of Education as well as individual students who participated in the study.

**Data analysis**

Data collected were entered into the SPSS software version 17.0 after data cleaning, and ensuring data validity through random manual checks. Data were presented in tables and charts. The Chi squared test was used to demonstrate association between relevant variables while p value was set at <0.05 as significant values.

## RESULTS

Out of a total of 132 students who were screened, 45 (34.1%) had parasites. Out of this, 18.9% had single infection while the rest had multiple infections. Table 1 showed the types and distribution of the common parasite isolated in relation to gender. The ova of tapeworm constituted the least while Ascaris and hookworm constituted the highest among the parasites.
The age group 21 to 40 years had the highest prevalence (about 42.0%) among the male and (about 70.0%) among the females according to Figure 1. Generally, female were more infected (Figure 1) across all age groups compared to males according, though the difference in age with parasite prevalence was not statistically significant (p-0.341).

**Table 1.** Gender differences in ova of parasitic helminthes recovered from respondent's stoll samples

| Ova of parasitic helminthes | Female | Male |
|---|---|---|
| Ova of S. mansoni | 10.0 | 20.0 |
| Ova of E. Histolytica | 10.0 | 9.0 |
| Ova of Fasciola | 9.0 | 10.0 |
| Ova of Ascaris | 24.0 | 15.0 |
| Ova of Hookworms | 13.0 | 10.0 |
| Ova of TapeWorm | 4.0 | 6.0 |

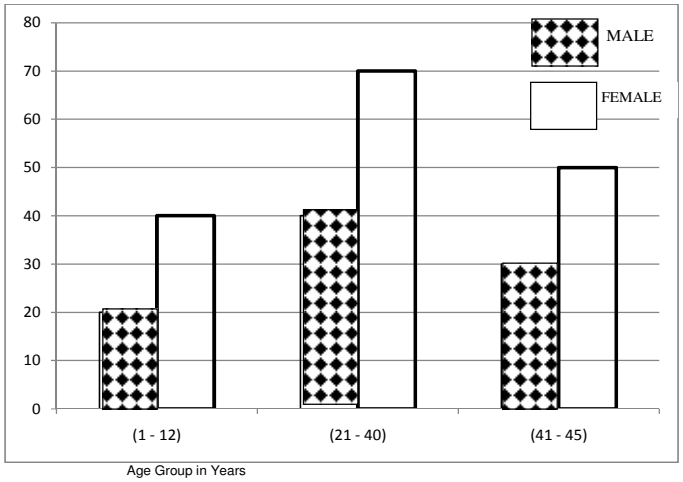



**Figure 1.** Age and Gender differences in Prevalence of stool infection among the respondents

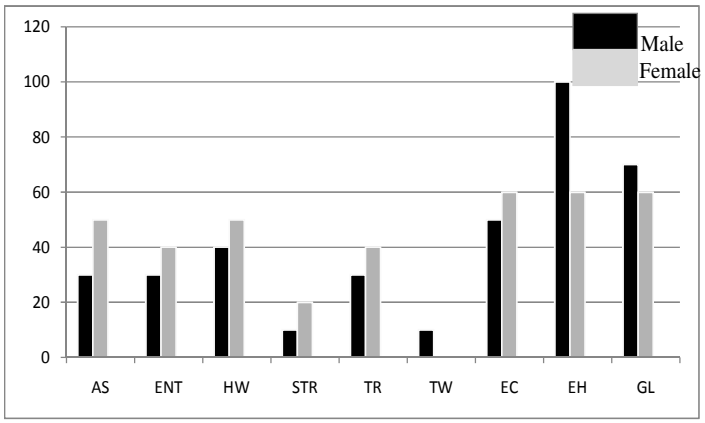


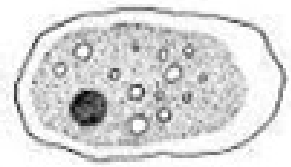

**Figure 2.** Gender differences in distribution of intestinal parasites among the students

AS = Ascaris lumbricoides, ENT = Enterobius vernicularis.
HW = Hookworm. STR = Stronglyoides
TR = Trichuris trichuria, TW = Tapeworm, EC = Entanoeba coli,
EH = Entamoeba histolytica,

For gender, E. Histolytica had the highest prevalence among both male and female, and the least with Tape worm according to Figure 2. Except for E Histolytica and Giardia Lamblia, females also had a higher parasite prevalence compared to male though the difference was also not statistically significant (p-0.016).

*Hookworm*

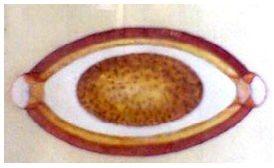
*E. coli*



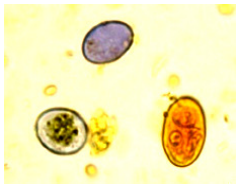
*E. histolytica*


*Taenia solum*

*Enterobus vernicularis*



*Trichuris trichuria*



*Garidia lombellia*

**= Parasitic Helminthes as seen under microscope.**

## DISCUSSIONS

The present study attempted to assess the prevalence of different intestinal parasitic infections in the institution under study. This still appear a problem of public health importance in this locality. Our study reported that about one third of the students screened had parasites. This pattern agreed with another study (Naachar *et al*., 2013) but far lower when compared with reports of a similar study that reported 72.9% in Gondar, Azezo (Gee law, 2013). The differences may not be unconnected with a higher risk posed by respondents in the poor and developing countries most especially in the absence of adequate environmental, water and food sanitation.

The ova of tapeworm constituted the least while Ascaris and hookworms were more common. The fact that the highest and most serious in wide spreading among the parasites is the nematodes (Sah *et al*., 2013).This however disagreed with a study in which the the prevalence of *Ascaris lumbricoides, hookworm* and *Schistosoma mansoni* were lower compared to a school-based study done in Azezo, Gondar, about two fifths having single infection in our study agreed with another study conducted within the same country (Wright *et al*., 2015).

Our study reported higher prevalence among females s.While many studies reported that both males and females agreed have the same chances of being infected by these parasites Ibrahim *et al.* (2014); Obiukwu *et al*. (2008); and Mazigo *et al.* (2010);, and that helminthic infections were not sex dependent Agbolade *et al*. (2004) and Taiwo and Agbolade (2000), some local studies reported otherwise. In a similar study by Adeyeba and Akinlabi (2002) and Baldo *et al.* (2004), infection rates for intestinal parasites were higher in males than females. The none significant association between age and gender and prevalence of the parasites supports other studies (Adhikari *et al*., 2010; Sah *et al*., 2013).

Possible contributory factors (most especially among girls) includenot wearing of shoes or footwear when walking around at home since this expose the skin to penetration by soil transmitted helminths infective larvae,**i**ndiscriminate defection around all the corners of their hostels , Poor environmental sanitation ((Ayalew *et al*., 2011), Poor personal hygiene, eating of raw or unprepared vegetable (Ayalew *et al*., 2011). Poor food hygiene making flies accessible, Poor hand washing practices, Bad drinking water, Poor toilet facilities, Overcrowding in female hostels which is usually worse and helped in contributing a lot of their ill health. One major limitation to this study in the sense that the study was non-blinded.

## CONCLUSION

A significant prevalence of intestinal parasites were found among studied respondents, Measures such as health education, personal hygiene, environmental sanitation, and improvement in water supply should be put in place to reduce disease prevalence. It was recommended that school based deforming using albendazole and metronidazole, combined with hygiene promotion and improved sanitation be carried out.

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