Sahel Journal of Life Sciences FUDMA (SAJOLS)
June 2024 Vol. 2(2): 238-242
ISSN: 3027-0456 (Print)
ISSN: 1595-5915(Online)
DOI: *https://doi.org/10.33003/sajols-2024-0202-31*

Research Article

Prevalence of Gastrointestinal Parasites among Student of Nasarawa State University, Keffi Nasarawa State, Nigeria

***Aliyu, A.A., Reuben, S. E. and Abubakar, B.S.**

Department of Zoology Science Nasarawa State University, Keffi, Nasarawa State
****Corresponding Author's email*: binmalikone@nsuk.edu.ng; Phone:** +2348036054930

ABSTRACT

Gastrointestinal parasites are significant agents of intestinal infection with public health implications worldwide. This study aimed to ascertain intestinal parasites among students of Nasarawa State University, Keffi, Nasarawa State. A total of 138 Stool samples were collected from students in hostels and off campus and examined using the direct wet preparation and formol-ether concentration techniques. The overall prevalence of 18.84% was recorded with a higher prevalence of gastrointestinal parasites in samples collected from male subjects (23.61%) compared to the female individuals (13.63%) however, there was no statically significant difference (P>0.05) in prevalence between males and females subjects. The intestinal parasites species identified and their respective prevalence were: two species of nematodes; hookworm (26.92%) and *Ascaris lumbricoides* (46.15), a species of cestode- *Taenia saginata* (15.38%) and trematode- *Schistosoma mansoni* (11.58%). Gastrointestinal parasitic infection was higher in male hostel (50.00%) followed by female hostel (13.46%) and the least was recorded from the student village that is those students who live off campus (11.58%) although statistically, there is no significant difference between the location (P>0.05). The study showed that there is a high prevalence of gastrointestinal parasites in the study area (especially male hostel) therefore, there is a need to encourage adequate personal hygiene and sanitation. Also, further study should be carried out on the impact of parasitic infection on academic performance of the student.

Keywords: Gastrointestinal parasites; Keffi; Public Health; Students

Citation: Aliyu, A.A., Reuben, S. E. and Abubakar, B.S. (2024). Prevalence of Gastrointestinal Parasites among Student of Nasarawa State University, Keffi Nasarawa State, Nigeria. *Sahel Journal of Life Sciences FUDMA*, 2(2): 238-242. DOI: *https://doi.org/10.33003/sajols-2024-0202-31*

INTRODUCTION

Parasites are organism that lives in or on other organisms and takes its nourishment from them. It is widely distributed throughout the world. Intestinal parasitic infections are primarily caused by protozoans and helminths (Tay *et al.,* 2017). They are frequently transmitted via consumption of contaminated food and water with faeces containing the cyst of protozoans or eggs/larvae of helminths and spread from person to person through fecal and oral contact. This owes to the fact that they are prevalent in areas where there is overcrowding, limited access to water and poor personal hygiene (Wakesa *et al.,* 2020). The mortality and morbidity rates of these infections are significant in developing countries. The common parasite causing intestinal infection are protozoa and helminths (Hadiza, 2019). Among helminthic parasite; *Ascaris lumbricoides*, *Trichuris trichuria*, and hookworm are the most prevalent and affect about one-sixth of the world population (Wakesa *et al.,* 2020).

Intestinal parasitic infections are endemic and widespread in socio-economically deprived communities in the tropics and subtropics (Nothayati *et al.,* 2021). Globally, about 3.5 billion people are affected with gastrointestinal parasites of which 450 million people are infected by this parasitic agents, most of which are children and students (WHO, 2017). Prevalence of intestinal parasites in a specific country depends on environmental, socioeconomic and

demographic factors, including health-related behavior of the population and access to hygienic latrines and to treated water (Tadesse, 2019). Policies for the control of intestinal parasites should be based on epidemiological data such as infection prevalence and associated risk factors, however up-to-date, data are not sufficient for many countries (Merid *et al.,* 2018).

Students in must Nigeria public higher institutions share common toiletries and laundries in their hostels hence have greater chances to have contact with contaminated food and water (Obadiah, 2019). Prevalence of Gastrointestinal Parasites in Nasarawa State University students' hostels was conducted last in 2016 by Ngwai *et al.* (2016). Therefore there is need to know the current status of intestinal parasite among Nasarawa State Main Campus, Keffi.

MATERIALS AND METHODS

Study Area: Nasarawa State University main campus is located in Keffi Local Government Area of Nasarawa State. In this study, 138 consented students were randomly selected representing both sexes from the month of September to November, 2022. Ethical approval was obtained by the University Health Services through head, Department of Zoology and Dean Faculty of natural and Applied Sciences, Nasarawa State University Keffi.

Sample Collection: Single faecal specimen from each consented student. The participants were instructed to collect fresh stool specimen into labelled specimen bottle (which is clean screw-capped containers) and was submitted less than one hour after collection. Demographics gathered included age, sex, either on or off campus were noted. The samples were immediately transported to Zoology department, Nasarawa State University in an ice box and examined within open hour after collection (Tadesse, 2019).

Macroscopic examination: The visual assessment of collected stool samples was carried out for color, shape, consistency (watery, soft, and formed), mucus, pus, smell and presence of blood macroscopically (Tadesse, 2019).

Microscopic examination: Wet mount: One gram (1g) of stool sample was picked using a applicator stick, and mixed with seven millilitre (7ml) of formal saline or clean glass microscopic slide which was emulsified for 2 to 3 seconds to produce a homogenate and a cover slip was placed on it. This was mounted on microscope stage for observation using times forty (40x) objective, as previously done by Karagiannis-Voules, 2016 in order to locate the egg, cyst, ova and live parasites.

Sedimentation method: One gram (1g) of stool to seven millilitre (7ml) of distilled water (1:7) were mixed in a centrifuge tube, after which it was emulsified with a stick for two to three seconds. The suspension was centrifuged at 2000rpm for five minutes (5min) to separate sediment from supernatant, and the supernatant was discarded. The sediments were smeared on two different slides, each containing normal saline and Lugol's iodine. The prepared slides were observed using (x4, x10 and x40) of the microscope for eggs, ova, cysts of different parasites as previously done by Karagiannis-Voules (2016). The eggs, ova and cysts of parasites were identified using standard morphological keys such as size, shape, thickness of the egg, color, and presence of special features e.g., spine, plugs, hooks and polar filament (Eassa, 2016).

Statistical Analysis: The analytical and descriptive statistics were carried out using SPSS 24.0 software (SPSS Inc., Chicago IL, USA). Simple percentage was to calculate the prevalence of infection. Comparative analysis of the results was done using one way analysis of variance and student-test. A p-value less than 0.05 ($P<0.05$) was considered statistically significant.

RESULTS AND DISCUSSION

A total of 138 stool samples collected and examined and prevalence of parasites in respect to the locations was presented in Table 1 below. Male hotel (20.69) recorded the highest in prevalence, followed by female hostel (13.46) and least (21.43) was recorded from off campus (student village).

The results of the present study revealed an overall prevalence (18.84%) of the infection which is high and is comparable to those of Hadiza (2019) and Kabiru *et al.* (2018), who conducted their research in Kaduna, and Northwestern Nigeria respectively. The study was conducted during high humid condition (late wet season) of the year (September to November). Such conditions do favour the hatching of parasitic eggs or the survival of infective larvae (Obadiah, 2019). Using public latrines/toiletries in students' hostels (their responds during sample collection) could as well be accounted for the high prevalence of intestinal parasitic infections among the students (Esiet *et al*., 2017). The higher prevalence of helminthic infections compared to protozoan infections observed during this study may be attributed to the multiple routes of helminthes infection (oral and dermal) compared with the single route for protozoan infection (oral). *Ascaris lumbricoedes* was the most prevalent intestinal helminth recovered in this study. The prevalence of *Ascaris* infection is directly related to exposure to contaminated water or food where the infective larvae live in and gain access to human body (Tay *et al.,* 2017). Thus, poor personal hygiene and sanitation observed in some of these study sites and hence increased the risk of ascaris infection as

previously reported by Karagiannis *et al*. (2016). And Abossie & Seid (2014).

The intestinal parasites species recovered and their respective prevalence have presented in Table 2 below, where two species of nematodes; hook worm (26.92%) and *Ascaris lumbricoides* (46.15), a species of cestode- *Taenia saginata* (15.38%) and trematode - *Schistosoma mansoni* (11.58%) respectively and the only protozoa (*Giardia lamblia*) recorded in one location at off campus (14.28%).

The presence of tape worm (*Taenia saginata*) and *Giardia lamblia* observed in the study area was indicative of water/food contamination (fecal-oral transmission) which may be related to non-washing of feacal contaminated hands after the use of their toilets or eaten undercooked beef infected with the parasite, Waldram (2017). Intestinal parasites, have been reported to occur mostly in the high humid tropical regions of the world, Nigeria inclusive. The climatic conditions over these regions favour the survival and transmission of these parasites. Other factors such as low income, poor environmental sanitation and personal hygiene, lack of potable drinking water and inadequate healthcare, and poor educational awareness, encourage the high prevalence rates of these infections at any given time/place. In places where there is increased public sensitization and awareness programmes coupled with good sanitation and proper personal hygiene, very low incident rates of gastrointestinal infections with parasites are usually recorded (Abah *et al*., 2015).

Table 3 below presented the prevalence of intestinal parasites in relation to sex where the records shows higher prevalence of gastrointestinal parasites in samples collected from male subjects (23.61%) compared to the female individuals (13.63%) however, there was no statiscal significant difference (P>0.05) in prevalence between males and females subjects.

The overall prevalence of intestinal parasites was comparable between male and females, with no significant difference between prevalence rate of infection and gender of students. The absence of statistically significant difference in infection rates between males and females has also been reported by Sah *et al*. (2013), Udensi *et al*. 2015) and Achi *et al*. 2017). These observations may be due to the exposure of these students to the relatively same maintenance conditions in both the on and off campus and between male /female hostels. Furthermore, the result indicates that male and female students are equally susceptible to infection with intestinal parasites.

Thus, with high prevalence rate recorded in this study, efforts should be made to inculcate in students the maintenance of proper personal hygiene. These efforts may help to further reduce the prevalence rate of intestinal parasitic infection among the study subjects.

Table 1: Prevalence of Intestinal Parasites in Respect to Location in the Study Area

Location	Number of samples examined	Number Infected	Prevalence (%)	ANOVA
Male Hostel	48	11	22.92	0.090
Female Hostel	48	8	16.67	
Student Village	42	7	16.67	
Total	**138**	**26**	**18.84**	

P>0.05

Table2: Distribution of Helminthic and Protozoan Parasites collected from the Study Areas

Parasites	Species	Student Villages	Male Hotel	Female Hostel	Total	Infection Rate (%)
PROTOZOAN	*Giardia. lamblia*	1(14.28%)	0(0.00%)	0(0.00%)	**1**	3.84
Helminths	Hookworm	4(57.14%)	2(16.66%)	1(14.28%)	**7**	26.92
	Ascaris lumbricoides	1(14.28%)	7(58.33%)	3(42.85%)	**11**	32.30
	Taenia saginata	1(14.28%)	2(16.66%)	1(14.28%)	**4**	15.38
	Schistosoma mansoni	0(0.00%)	1(8.33%)	2(28.57%)	**3**	11.53
	Total	**7**	**12**	**7**	**26**	**100**

Table 3: Prevalence of Intestinal Parasites in Relation to Sex of the Subjects

Sex	No. Examined	No. Infected	Percentage (%)	T-test
Male	72	17	23.61	0.287
Female	66	9	13.63	
Total	**138**	**26**	**18.84**	

P>0.05

CONCLUSION

Inadequacy of proper hygiene in the study area (student hostels exclusively) could be one of the factor contributing to high prevalence of the infection (especially helminths infection). Health education (public awareness) will go along way in sensitising the students and even the management on the importance of environment and personal hygiene. The finding of this study have help in achieving a better understanding of the epidemiology of the infection in Nasarawa State University main campus, Keffi and this is a pre-requisite for sustainable gastrointestinal parasites control programs and public enlightenment.

REFERENCES

Abah, A.E., & Arene, F. O. J. (2015). Staus of intestinal infections among primary school children in Rivers State, Nigeria. *Journal of Parasitology Research,* 2(9):7-11.

Abossie, A. & Seid. (2014). Assessment of the Prevalence of Intestinal Parasitosis and Associated Risk Factors Among Primary School Children in Chencha Town, Southern Ethiopia. *Journal of Parasitology Research,* **3**(2):9-10.

Achi, E.C., Njoku O.O., Nnachi A.U., Efunshile A.M., Mbah J.O., Aghanya I.N.& Nnemelu P.O. (2017). Prevalence of Intestinal Parasitic Infections Among Under Five Children in Abakaliki Local Government Area of Ebonyi State. *European Journal of Pharmaceutical and Medical Research,* **4**(4): 218-222.

Bowley, D.M., Loveland, J., Omar, T. & Pitcher, G.J. (2006). Human immunodeficiency virus infection and amebiasis. *Pediatrial Infection Disease Journal,* **25**(12):1192-1100.

Eassa, S.M., Abd El-Wahab, E. W., Lotf, S.E., El, Masty, S.A., Shatat, H.Z. & Kotkat, A.M. (2016). Risk factors associated with parasitic infection among municipality solid-waste workers in an Egyptian community. *Journal Parasitology,* **102**(2):214-221.

EElsie, P.L. U. & Ita A. (2017) Comparative Prevalence of Intestinal Parasites Among Children in Public and Private Schools in Calabar South, Calabar, Cross River State, Nigeria. *American Journal of Research Communication,* **5**(1): 80-97.

Hadiza, M.K., Maikaje, D.B. & Ijah, U.J.J. (2019). Prevalence of Intestinal Parasites Among Children Attending Daycare and Orphanage Centers in Kaduna Metropolis, Kaduna. *Science World Journal,* **14(**3*)*5-9.

Kabiru, M., Mohamed, R, A. & Julia, O. (2018). Intestinal Parasitic Infection & Assesement of risk factors in North Western, Nigeria, A community based study, *International Journal of Pharma medicine & Biological Science*. **4**(2):141-145.

Karagiannis-Voules, D.A., Odermatt, P., Biedermann, P., Khieu, V. & Scha, F. (2016). Geostatistical modelling of soil-transmitted helminth infection in Cambodia: Do socioeconomic factors improve predictions. *Acta Tropical,* 141:201-212.

Merid Y, Hegazy, M, Mekete, G. & Teklemariam, J.D. (2018). Intestinal helminthic infection among children at Lake Awassa area, South Ethiopia. **15**(1). *International Journal of Pharma medicine & Biological Science*. **4**(3):18-23.

Nothayati, M., Fatmah, M.Y. Usof, S. & Edariah, A. (2021). Intestinal parasitie infections in man: Areview. *Medical* Journal, Malaysia, **58**: 296-305.

Nwaneri, D.U.& Omuemu, V. O. (2013): Intestinal helminthiasis and nutritional status of children living in orphanages in Benin City, Nigeria. *Nigerlan Jurnal of CliniCal Practice*; 16:243-8.

Obadiah, H. (2019). A Review of the Survey of Entamoeba historica in Children a Brief Focus on"Nigeria Situation". *Journal of Physiology and Pharmacology Advances*. **23**:130-157.

Pinella, A.E., Lopez, M.C. & Viasus, D.F. (2008). History of Entamoeba histolytica Protozoan. *Revised Medical Chi,*. **136**(1):118-124.

Sah, R. B., Bhattarai S., Yadav S., Baral R., Jha N. & Pokharel P. K. (2013): A study of prevalence of intestinal parasites and associated risk factors among the school children of Itahari, Eastern Region of Nepal. *Trop Parasitol*, 3:140 -144.

Tadesse, G. (2019). The prevalence of intestinal helminthic infections and associated risk factors among school children in Babile town, eastern Ethiopia. *Ethiopian Journal of Health Development*, **19**(2):140–147.

Tay, S.C., Agbeko, E. & Walana, W. (2017). Parasitic Information and Maternal Anaemia Among Expectant Mothers in the DangmeEast District of Ghana. *Journal of Microbial Research,* 4 (16):1700-1713.

Udensi J. U., Mgbemena I. C., Emeka N. I., Ugochukwu M. G. & Awurum I. N. (2015): Prevalence of Intestinal Parasites Among Primary School Children in Three Geopolitical Zones of Imo State, Nigeria. *Science Journal of Public Health*. **3**(5-1): 25-28.

Wakesa, A.W., Mulambala, C.L. & Odhiambo, R. (2020). Intestinal Helminths Infection in Pregnant Women Attending Antenatal Clinic at Kitale Distric Hospital, Kenya. *Journal of Applied Parasitology,* 7 (5):1-5.

Waldram, A., Vivancos, R., Hartley, C., & Lamden, K. (2017). Prevalence of Giardia infection in households of Giardia cases and risk factors for household transmission. *BMC infectious diseases*, ***17***(1), 486.

World Health Organization (2004).Prevention and Control of Intestinal Parasites Infections. W*orld Health Organization Technical Report Series*, **749**:121-130.

World Health Organization (WHO). (2017). Kenya Hosts African Regional Workshop on co-ordinted approaches to pneumonia and diarrhea prevention and control. An information bulletin for WCO Kenya. 1:1-4.