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Soci-Demographic Factors Influencing Intestional Parasitic Infection among Children in Bauchi Local Government Area, Bauchi State

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ABSTRACT

The study was conducted to investigate the socio-demographic factors influencing intestinal parasite infection among children in Bauchi metropolis, Bauchi state. The objectives of the study were to determine the prevalence of human intestinal parasite infection in the area of study, determine the influence of demographic of age of the infected children. Stool samples were collected from five hundred and sixty-two children. The samples were treated and examined microscopically for ova, cyst and eggs of intestinal parasite. The socio-demographic factorss were determined using questionnaire and anthropometric measurement. The result reveals that many children (28.11%) are infected with intestinal parasite. Ascaris lumbricoida, Trichuris trichura, Hookworms and eterobias vermicularis are the common prevailing parasites. While Giadia lamblia is the least common occuring parasite It was also discovered that there is no discrimination of infection among sexes. However, the infection is found to be more common among certain age group (0-4 years). It was concluded that the prevalence of intestinal parasite infection among children is increasing compared to previous studies and the increase is related to poor socio-demographic factors of the children. It is therefore, recommended that there is need to embark on health education on prevention and control measures of intestinal parasite and government should strengthen and support WHO program of providing free antihelminthes drugs to children.

KEYWORDS: Intestinal parasites, socio-demographic factors, prevalence, infection.

INTRODUCTION

Intestinal parasitic infections are globally endemic illness especially in tropical and subtropical countries. It is estimated that more than two billion people are infected with intestinal parasites. The majority are children and nearly 300 million infected patients are severely ill (Sitotaw, Mekuriaw, & Damtie, 2019). Parasitic infections are regarded as a serious public health problem, as they cause iron deficiency anaemia, growth retardation and other physical and mental health problems. School children are the prime victims of intestinal parasitism that affect their physical development, school attendance and ability to learn. Epidemiological researches in different countries have shown that the socio-demographic, sanitary and environmental conditions are important underlying causes in the endemicity of parasitic infections (Living-Jamala, Eze, & Nduka, 2018).

Parasite is an organism that is entirely dependent on another organism; refer as its host for all part of its life cycle and metabolic requirement. Strictly speaking, the term parasite can be applied to any infections caused by protozoa and helminthic excluding the viruses, bacteria and fungi (Arora, 2010).

Parasite could be ectoparasite or endoparasite. Ectoparasite consists of organisms which live on the surface of the body e.g pedicules humanus. While the endoparasite, consists of organisms that live within the body of the host. All protozoa and helminthic parasite of man are endoparasite. Endoparasite can be further subdivided into obligate and facultative parasite (Sitotaw, et al., 2019). They can live throughout the body, but most prefer the intestinal wall. The two main types of intestinal parasites are helminthes and protozoa, but not all helminthes and protozoa parasites are intestinal. The common intestinal protozoan parasites of human are Entamoeba histolytica/ dispar, Giardialamblia/ intestinalis, Cryptosporidium pavumand Cyclospora species. The medically important helminthes are nematodes (roundworms), cestodes (tapeworms) and trematodes (flukes) (Sitotaw, & Shiferaw, 2020).

Intestinal parasites produce a variety of symptoms most of which manifest in gastro-intestinal complications and general weakness (Bunza, & Abdullahi, 2013). Gastro-intestinal complication includes diarrhea, nausea, dysentery and abdominal pain. These have negative impacts on nutritional status, including decreased absorption of micronutrients, loss of appetite, weight loss, hepatomegaly, spleenomegaly and intestinal blood loss that can often result in amemia. They may also cause mental and physical disability, growth retardation in children and skin irritation around the anus (Sitotaw, et al., 2020). The most prevalent and important helminthes in developing countries are the soil-transmitted helminthes such as: Ascaris lumbricoides, Trichuris trichiura, hookworms and Hymenolepis nana (Living-Jamala, Eze, & Nduka, 2018). In addition, children between ages of 3 to 13 years are more susceptible to A. lumbricoides infection than grown up individual. Thus, as age increases exposure to intestinal parasitic infection decreases possibly due to improved personal hygiene. The worldwide prevalence of intestinal infections caused by pathogenic protozoan species is also reported to be high (Sitotaw, et al., 2020). The main transmission route for most intestinal parasites is fecal–oral either. Intestinal parasites can infect humans through food, water and environmental contamination. They are more prevalent among the poor, who are negatively affected by low socio– economic conditions, poor personal and environmental hygiene, overcrowding and limited access to clean water (Danladi, et al, 2015).

STATEMENT OF THE PROBLEM

Human intestinal parasites are among the most common infections occurring throughout the developing world. It is estimated that more than one billion people in the world are infected annually by intestinal helminthes, mainly *Ascaris lumbricoides*, Hook worms and *Tricuris tricura*. There have been several reports from various parts of Nigeria on human intestinal Parasite, including those of Hailegebriel, (2017) who recognizes intestinal Parasite as important health problems especially among children. Also several epidemiological studies have indicated a high prevalence rate of intestinal infection of helminthes among Nigerian children (Sitotaw, et al., 2019). Although the prevalence of intestinal helminthes infection is high, it is often overlooked especially among children who are the most vulnerable groups at risk of suffering nutritional deficit, co-gnative impairment, serious illness and death (Ibrahim,Tawfik., Aboulmagd, Refaat,., & Omar, 2010).). This is what makes an investigation into the Living condition and prevalence of intestinal parasites among these vulnerable groups in a place where such an important baseline data is not established an imperative research endeavor. The purpose of the study is to investigate soci-demographic factors influencing intestinal parasitic infection among children in the study area.

MATERIAL AND METHODS

Bauchi state is located in the North-Eastern part of Nigeria, sharing borders with Gombe, Plateau, Jigawa and Yobe state. The state lies between latitude of 9.3 and 12.3 North of equator, and longitude 8.5 and 11East of the Greenwich meridian with a total population of 4,653,066 (2006 National census). Bauchi town is located on latitude 10.315833, longitude 9.844167 with total population of 316,173. The inhabitants are mostly civil servants, famers and traders.

This study is a cross-sectional survey conducted in some areas of Bauchi metropolis (Federal lowcost, Ilelah and Bayan railway) situated in the center and peripheral parts of the town. Illela is an old settlement and densely populated with old housing design. Federal low cost is moderately populated with modern housing design. While Bayan railway is a new settlement comprising of an elite habitat and moderately populated with averagely modern housing design. The study population include all children age 0-12 years that live in the three areas of the metropolis. 562 stool samples will be collected from 562. The sample size was determined using the fishers expression for cross sectional design.

$$n = \frac{z^2\, p\,(1-p)}{d^2}$$

Prior to sampling the study area was visited so as to make arrangement toward collection of samples. A total of five hundred and sixty-two samples were collected from the study area using clean containers which were provided to the parent of the children and were educated to pick a portion of the stool as the child passes the stool on the newspapers. Age and sex recorded on the specimen battles and then transported to ATBU laboratory parasitoge for examination as described by Arora

Direct smear is a quantitative method of stool examination. One drop of normal saline was added to a clean microscope slide using an applicator stick. A portion of stool was picked with the tip of the applicator stick and emulsified with the saline water. A thin smear was made and covers with cover slives, and examine under x10 objectives lens to give a good background. Presence of trophozoides and cyst of protozoa, and ova/eggs and adult worms were examined and recorded.

Closed-ended questionnaires were used to collect information from the parent of subject regarding child and house hold socio-demographic, housing, water and sanitation characteristics. These items included subject age, family size and composition, house contraction and water, sanitation and waste disposal, educational level and economic status.

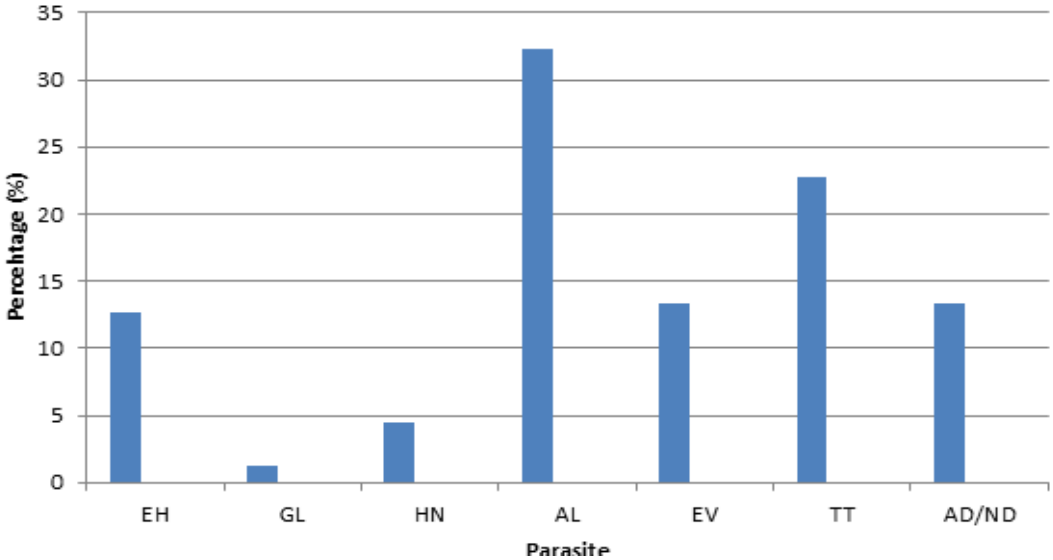
The anthropometric data collected include height, or recumbent length (for children less than 24 month), mid-upper arm and thigh circumference. Weight was measured using a portable scale. Standing height in children age greater than 24 months was measured using a portable standio meter, measurement of the mid-upper arm circumference and mid-thigh circumference were measured using a semi flexible insertion tape measure, shoes, socks, soiled diapers and other

heavy items were removed before all measurement were made.

The data collected was analyzed using simple percentages to show the rate of infected cases and. Results lose presented in frequency distribution tables. The association were determined by chi-square and t test analysis at pa 0.05.

RESULTS

Figure 1: Distribution of intestinal parasite found in stool sample of the children



NB: Eh= *E. histolytica*, Gl= *Giardia lamblia*, Hn= *Hymenolepis nana*, Al= *Ascaris lumbricoides*, Ev= *Enterobius vermicularis*, Tt= *Trichuris trichuria*, *Ad/Nd = Ancydostoma Duodenale/Necatir Americanus*

The chart above indicates that *Ascaris lumbricoide* has the highest occurrence (38.61%) followed by *Trichuri trichura* (27.22%) *Ancyclostoma duodenale/Necator Americanus* (13.9%), *enterobium vermicularies* (13.9%) and *Entamoeba histolytica* (13%). The list occurring intestinal parasite is *Giardia lambilia* (1.27%)

Table 1: Prevalence of infection with intestinal parasite in relation to source of drinking water

Source of drinking Water	Number examined	Number infected	Percentage
Well	188	80	50.6
Tap water	188	70	44.3
Package water	186	08	5.1
Total	562	158	100

From the table above, the result indicates that 50.6% of the infected individual used well water as source of drinking water 44.3% use Tap water as source of their drinking water while only 5.1% use package water. This indicate that the rate of infection with intestinal parasite has significant in relationship with source of drinking water.

Table 2: Prevalence of infection with intestinal parasite in relation to types of toilet facility

Type of Toilet	Number examined	Number infected	Percentage
Pit latrine	281	130	82.28
Water system	281	28	17.72
Total	562	158	100

The result indicates that 82.28% of the infected individual sampled used pit latrine and 17.72% used water system. This shows that there is a significant relationship between infection with intestinal parasite and type of toilet facilities used.

Table 3: Prevalence of infection with intestinal parasites in relation to area of residence.

Residence	Number examined	Number infected	Percentage
Upper class area	186	28	17.72
Middle class area	188	40	25.32
Lower class area	188	90	56.96
Total	562	158	100

Majority (56.98%) of the infected sampled individual lives in a lower-class area, 25.32% live-in middle-class area and 17.72% live-in upper-class area. This indicate that the prevalence rate of intestinal parasite has a significant relationship with the class of area the individual sampled live.

Table 4: Prevalence of infection with intestinal parasite according to age

Age	Number examined	Number infected	Percentage
0-4 years	188	85	53.80
5-8 years	188	51	32.28
9-12 years	186	22	13.92
Total	562	158	100

The result indicate that majority of the infected sampled individual age range from 0-4years, 32.28% age range from 5-8years and 13.92% age ranges from 9-12years. This shows a relationship between age and prevalence of intestinal parasite.

Table 5: Prevalence of infection with intestinal parasite according to population in the houses.

Population in the house	Number examined	Number infected	Percentage
3-5	186	21	13.29
6-8	188	41	25.95
9 and above	188	96	60.76
Total	562	158	100

Majority (60.76%) of the infected sampled individual lives in families of 9 people and above, 25.95% live in families of 6-8 people and 13.2% live in families of 3-5 people. These suggest a significant relationship between population in the house and prevalence rate of intestinal parasite infection.

Table 6: Prevalence of infection with intestinal parasite in relation to weight, height and arm circumference.

Population in the house	Number examined	Number abnormal findings	Percentage
Weight	158	140	65.82
Height	158	99	62.66
Arm circumference	158	101	63.92
Total			158

The result in table above indicate that majority (65.82%) of the infected sampled individual are under weight, 62.66% are stunted and 63.92% have smaller than normal size of arm circumference. This signifies a relationship between nutrition

status of the infected individuals and prevalence rate of intestinal infection.

DISCUSSION

Distribution of intestinal parasite found in stool sample collected.

The prevalence rate of human intestinal parasite has been observed to increase. The study revealed an increase in the overall prevalence rate especially compared to some studies like Abdi., Nibret, & Munshea, (2017) findings who postulated that intestinal parasite infection will continue to prevail in Nigeria because of low level of living standard poor environmental sanitation and ignorance of health practices. *Ascaris lumbricoides* infection has the highest prevalence rate followed by *Trichuris Trichria*. The findings is in agreement with (Hailegebriel, 2017). The least occurring intestinal parasites are Giardia lambilia, Hymenolepsis nana and Enterobius Vermicalaris. The findings is line with Choi & Kim (2017) reported that from several parts of Nigeria on intestinal parasite which recognized intestinal parasite infection as one of the most important public health problems. The high prevalence of Ascaris lubricodes infection may be attributed to unhygienic practices of the children and ability of the *A. lumbricodes* eggs to survive outside the host for years. This provides chances for children to contaminate their hands. Similarly, infection can be contacted through eating fresh vegetables that are not properly washed. Uncovered food can also be contaminated by wind blowing sand containing the eggs of *A. lumbricoides* into the food (Sitotaw, et al., 2020).).

Prevalence of infection with intestinal Parasite in relation to source of drinking water

The sources of drinking water for the infected children were mostly well and tap water. Only very few of the infected children have package water as source of drinking water. The high prevalence among the children taking well and tap water could be attributed to contamination of the water with fecal matter and lack of proper treatment before consumption. The findings agree with (Sitotaw, et al., 2019). Children age 0-4years have higher rate of intestinal parasite infection, followed by children age 5-8years. The least prevalence was recorded in children aged 9-12 years. This shows that the susceptibility to intestinal parasite infection decreases as the age advances. The high rate among the group could be attributed to their tendency to play with soil, eat food without washing hand and other poor hygiene practices. The finding is comparable with (Danladi, Ugbomoiko, Babamale, 2015).

Socio-demographic factors associated with prevalence of intestinal parasite

The infection was found to be high among children living in lower living conditions. It was discovered that many of the infected children use pit latrine and live in the lower-class area. This could be attributed to poor personal and environmental hygiene that exposes their drinking water and food to contamination with fecal matter. The finding agrees with (Sitotaw, et al., 2020). The study further indicates that overcrowding can increase the chances of contacting intestinal parasite infection. Many children living in the household of 9 people and above are infected with human intestinal parasite. This could be attributed to inability to maintain personal and environmental hygiene in the overcrowded house where more than ten people utilize one toilet. Infection with human intestinal parasite has been observed to have effect on the growth of children. It was discovered that many of the infected children are underweight and the children's heights are below the normal level. Also, many of the infected children's arm circumferences are thinner than normal compared to World Health Organization Standard. The infections have effect on the children nutrition due to the fact that parasite share nutrients with the host and some of them cause loss of appetite, nausea and vomiting. The finding agrees with (WHO, 2017). who link intestinal parasite infection with reduction in linear growth of children. Similarly, Galamaji, Attah, and Usman (2018) reported that children infected with intestinal parasite have double the risks for stunted growth. The rate of the infection is generally of public health importance. Persistence occurrence of intestinal helminthes resulting into malnutrition may affect not only the physical development but may subsequently affect their talent and their performance academically.

SUMMARY

Survey study on living condition and prevalence of intestinal parasite among children in Bauchi metropolis was conducted in three areas of the metropolis. The aim of the study was to provide a base line data that can be used for effective control of human intestinal parasite. Stool samples were collected from children of Kofar Fada, Kobi Primary Schools and Academy. Questionnaires were used to assess the living condition of the children. Anthropometric measurements were used to assess nutritional status of the children. Five hundred and sixty two children were examined. The prevalence rate of 28.11% was recorded among the children. The parasite recorded includes *E. histolytica*, *G. Lambelia*, *H. nana*, *A. lumbricoidesm E.Vermicularis* and *T. Trichuria* Some of the factors associated with the infection includes: poor personality/ environmental hygiene and overcrowding. The most prevailing parasite infection recorded in the area of study is *A. lumbricoides*. The infected children were found to have poor nutritional status manifested by stunted growth low weight and thinner arm circumference.

CONCLUSION

In conclusion, the study revealed that the prevalence of human intestinal parasite infection has increased from 9.10 to 28.11% in two years and poor living condition such as poor environmental, hygiene, overcrowding and poor socio-

economic status are related to the increased prevalence of the parasite in the area. The most common prevailing parasite is *A. lumbricoides* infection. Human intestinal parasite infection can lead to impairment of physical growth and development of the infected children. The chances of intestinal parasites infection decrease with age.

RECOMMENDATION

Based on the findings the following recommendations are made:

1. The increasing prevailing indicates the need to embark on health education on prevention and control measures of human intestinal parasite.
2. Government should strengthen and support the WHO program of providing free anti-helminthes drugs to children
3. Conduct research on the efficiency of anti – helminthes and protozoa drugs used in treatment of intestinal prasite.

REFERENCES

1. Abdi M., Nibret, E. &. Munshea, A. (2017). Prevalence of intestinal helminthic infections and malnutrition among schoolchildren of the Zegie peninsula, northwestern Ethiopia," *Journal of Infection and Public Health*, vol. 10, pp. 84–92,
2. Arora D. R. & Arora B. B. (2010) Medical Parasitology (3rd Edittion) New Delhi. CBS Publishers and Distributor PVT Limited
3. Bunza, M.D.A. & Abdullahi, K. (2013). Major helminth dseas agents. A.B.U press limited Zaria, Kaduna state, Nigeria.
4. Choi, B. & Kim,B (2017).Prevalence and risk factors of intestinal parasite infection among schoolchildren in the peripheral highland regions of Huanuco, Peru," *Osong Public Health and Research Perspectives*, vol. 8, no. 5, pp. 302–307,
5. Danladi Y. K, Ugbomoiko U. S. Babamale O. A. (2015). prevalence and socio-enviromental predictors of cryptosporiosis in Kebbi state, Nigeria. American journal of bioscience and bioengineering.Vol. 3, No. 6, 2015. Pp 149-157.
6. Erismann,S. Diagbouga, S. Odermatt, P.,(2016), Prevalence of intestinal parasitic infections and associated risk factors among schoolchildren in the Plateau Central and Centre-Ouest regions of Burkina Faso," *Parasites & Vectors*, vol. 9, no. 1, p. 554.
7. Galamaji, M. M., Attah, D. D. & Usman, A (2018). *Socio-Environmental Predictors Associated with The Prevalence of Intestinal Parasites Among School-Aged Children in Nigeria. ATBU, Journal of Science, Technology & Education (JOSTE);* Vol. 6 (1),
8. Hailegebriel, T. (2017). Prevalence of intestinal parasitic infections and associated risk factors among students at Dona Berber Primary school, Bahir Dar, Ethiopia," *BMC Infectious Diseases*, vol. 17, no. 1, p. 362,
9. Ibrahim, H. A., Tawfik, T. A., Aboulmagd, E. Refaat, H. H., Omar B.Z. (2010). Prevalence of intestinal parasitic infections and its relationship with socio-demographics and hygienic habits among male primary schoolchildren in Al-Ahsa, Saudi. Asian *Pacific Journal of Tropical Medicine*,1 (4).906-912
10. Living-Jamala, U. Eze, U. & Nduka, F. O. (2018). Prevalence and intensity of intestinal helminth infections and associated risk factors among school-aged children in Abua/Odual local government area, Rivers state," *Journal of Applied Life Sciences International*, vol. 16, no. 2, pp. 1–7.
11. Sitotaw, B. & Shiferaw, W. (2020). Prevalence of Intestinal Parasitic Infections and Associated Risk Factors among the First-Cycle Primary Schoolchildren in Sasiga District, Southwest Ethiopia. Volume 20
12. Sitotaw, B., Mekuriaw, H., & Damtie, D. (2019). "Prevalence of intestinal parasitic infections and associated risk factors among Jawi primary school children, Jawi town, north-west Ethiopia," *BMC Infectious Diseases*, vol. 19, no. 1, p. 341.
13. World Health Organization (2017). *Control of tropical diseases*. WHO, Geneva.