

# PREVALENCE OF GASTROINTESTINAL PARASITES AMONG CHILDREN IN SOME SELECTED PRIMARY SCHOOLS IN KACHIA LOCAL GOVERNMENT AREA OF KADUNA STATE

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## ABSTRACT

Gastrointestinal parasitic infections remain a significant public health burden, especially among school-aged children in resource-limited settings. This cross-sectional study investigated the prevalence, species distribution, and associated risk factors of these infections among 330 pupils from six primary schools in Kachia Local Government Area, Kaduna State, Nigeria. Stool samples were analyzed using direct smear and formal-ether concentration techniques. The overall prevalence was 24.5%, with helminths (18.8%) predominating over protozoa (5.76%). *Ascaris lumbricoides* was the most common helminth (7.89%), followed by hookworm (5.45%), *Trichuris trichiura* (2.73%), *Strongyloides stercoralis* (1.52%), and *Taenia* species (1.21%). *Entamoeba histolytica* (3.64%) and *Giardia lamblia* (2.12%) were the identified protozoa. Infection was significantly associated with older age, male gender, lower socio-economic status, poor hygiene practices, and inadequate sanitation. The findings underscore the urgent need for integrated control strategies, including routine school-based deworming, improved water, sanitation, and hygiene (WASH) infrastructure, and sustained health education programs to reduce the burden of parasitic infections in this vulnerable population.

**Keywords:** Gastrointestinal parasites, School children, Prevalence, Deworming, Nigeria, Sanitation, Health education.

## INTRODUCTION

Intestinal parasites are among the most common health concerns in poor and resource-limited countries, contributing significantly to morbidity and mortality, especially in children (Harhay *et al.*, 2010; Gizaw *et al.*, 2019; Banjo *et al.*, 2022). Parasitic infections remain endemic in many developing nations due to poverty-related factors such as inadequate sanitation, overcrowding, poor hygiene practices, limited latrine availability, unsafe water sources, and malnutrition (Sitotaw, Mekuriaw, & Dantie, 2019; Amisu *et al.*, 2023; Bisetegn *et al.*, 2023). Common intestinal parasites include *Ascaris lumbricoides*, *Trichuris trichiura*, hookworms (*Ancylostoma duodenale*/*Necator americanus*), *Strongyloides stercoralis*, *Schistosoma mansoni*, *Taenia* spp., *Hymenolepis nana*, *Enterobius vermicularis*, *Entamoeba histolytica*, and *Giardia lamblia* (Cheesbrough, 2006; Mukhtar *et al.*, 2024). Soil-transmitted helminths (STH) notably *A. lumbricoides*, *T. trichiura*, and hookworms remain the most widespread, affecting over two billion people globally (W. H. O, 2015; Usang *et al.*, 2020; Feleke, 2018). Although *S. stercoralis* infects an estimated 30–100 million people, it remains one of the most neglected tropical parasites (Olsen *et al.*, 2009; Al-Mekhlafi *et al.*, 2019). Schistosomiasis is endemic in 78 countries, with more than 261 million people

requiring treatment in 2013, most of whom are school-aged children in Africa (W. H. O, 2015; Banjo *et al.*, 2022). Intestinal protozoal infections also pose a major public health burden in developing countries (Harhay *et al.*, 2010). *Giardia lamblia* is a leading cause of diarrheal disease worldwide, with zoonotic potential (Feng & Xiao, 2011), while *E. histolytica* causes severe morbidity, infecting millions annually and resulting in substantial mortality (Baxt & Singh, 2008; Banjo *et al.*, 2022). Chronic or heavy parasitic infection can impair growth, cognitive development, nutrient absorption, and academic performance in children (Brooker, 2014; Hadiza *et al.*, 2019; Sitotaw & Shiferaw, 2020). Studies from various parts of Kaduna State and Nigeria have highlighted the continued burden of intestinal parasitic infections among school-aged children (Adamu & Haruna, 2017; Hadiza *et al.*, 2019; Hosea *et al.*, 2021; Saleh *et al.*, 2024). Continuous monitoring of prevalence and associated risk factors remains essential. Therefore, this study aims to investigate the prevalence of gastrointestinal parasites among pupils in selected primary schools in Kachia Local Government Area of Kaduna State. Understanding the magnitude of the problem is crucial for designing effective prevention and control strategies to reduce the burden of parasitic infections in children (Amisu *et al.*, 2023; Usip *et al.*, 2023; Mukhtar *et al.*, 2024).

## MATERIALS AND METHODS

### Study Area

This study was conducted in Kachia Local Government Area (LGA), located in the southern part of Kaduna State, Nigeria. Geographically, Kachia LGA lies approximately between latitudes 9°52'0"N and 10°15'0"N and longitudes 7°45'0"E and 8°15'0"E, encompassing a total land area of about 4,570 km<sup>2</sup> (Figure 1). It shares administrative boundaries with Chikun LGA to the northwest, Kajuru to the northeast, Jaba to the southeast, Zangon Kataf to the south, and Kagarko to the southwest, the latter extending into Niger State. The region is characterized by a tropical savanna climate, with distinct wet (April–October) and dry (November–March) seasons, which influence local agricultural practices and environmental sanitation conditions.

According to the Kaduna State Bureau of Statistics (2022), Kachia LGA has an estimated population of 373,100 inhabitants. The area is ethnically diverse, with indigenous groups including the Adara, Gbagyi, Ham, Bajju, and Atyap, alongside significant Hausa settler communities and other Nigerian ethnic groups. The local economy is predominantly agrarian, relying on subsistence farming of crops such as maize, millet, and groundnuts, alongside small-scale livestock rearing and petty trading.

Three communities were purposively selected for this study to ensure representation across varying settlement patterns, sanitation infrastructure, and socio-economic profiles:

**Kachia Urban:** The administrative headquarters of the LGA, characterized by higher population density, better road networks, and more developed public infrastructure, including healthcare and educational facilities.

**Gumel:** A peri-urban settlement located on the outskirts of Kachia town, representing transitional socio-economic conditions with moderate access to public amenities.

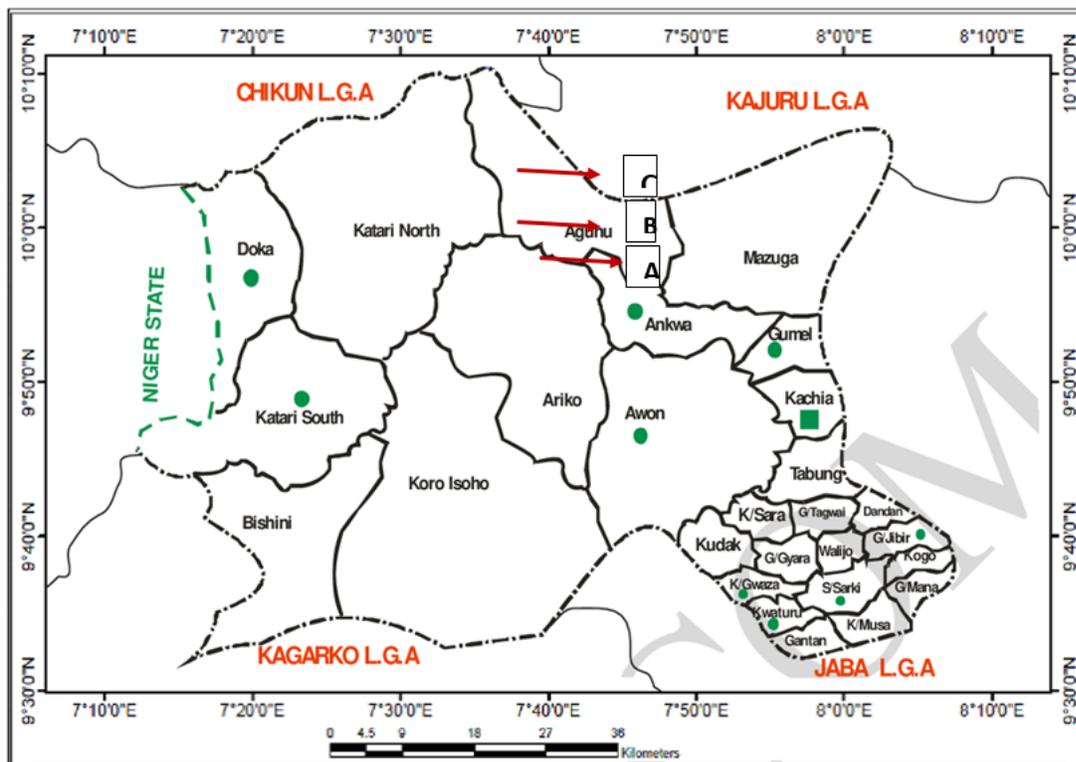
**Kurmin Mazuga:** A rural community where traditional living conditions prevail, with limited access to improved sanitation, potable water, and formal healthcare services.

From each of these communities, two primary schools were

selected based on the following criteria: pupil enrollment size, accessibility, administrative cooperation, and representation of both public and state-supported educational models. This resulted in the inclusion of six schools:

- **Kachia Urban:** Model Primary School and LEA II Primary School Kachia
- **Gumel:** LGEA Primary School Gumel and UBE Primary School Sarahu
- **Kurmin Mazuga:** LGEA Primary School Kurmin Mazuga and UBE Primary School Ungwan Akau

This multi-stage selection process was designed to capture a cross-section of environmental, sanitary, and socio-economic conditions that influence exposure to and transmission of gastrointestinal parasites among school-aged children in Kachia LGA. The geographic distribution of the selected schools is illustrated in Figure 1.



**Fig 1:** Map of Kachia Local Government Area, Kaduna State showing the Three (3) selected study communities and schools (Source: Adapted from Kaduna State Ministry of Lands & Survey, 2020)

**Study Design**

A cross-sectional study design was used to determine the prevalence and associated risk factors of gastrointestinal parasites among children. Stool samples was collected from children attending six selected primary schools in three different communities of Kachia Local Government Area of Kaduna State.

**Population of the Study**

The study population comprised of primary school-aged children (approximately 5–14 years) from six selected primary schools across three communities Kachia urban (Kachia Model Primary

School; LGEA II Primary School Kachia), Gumel (LGEA. Primary School Gumel; UBE Primary School Sarahu), Mazuga (LGEA primary school Kurmin mazuga; UBE primary school Ungwan Akau) to capture geographic, demographic, and socio-economic variability across Kachia Local Government Area of Kaduna State, Nigeria. These pupils constituted the accessible population of primary school-aged children, a group particularly susceptible to gastrointestinal parasitic infection due to environmental and sanitation-related risk factors. The total eligible population across the selected schools was 330 pupils who met the following inclusion criteria: Enrolment in one of the selected schools, age

between 5 and 14 years, provision of informed consent by a parent/guardian, and presence on the day of sample collection. This population was chosen to provide a representative estimate of gastrointestinal parasite prevalence among school-aged children Kachia LGA. According to the Kaduna State Bureau of Statistics (2022), Kachia Local Government Area had an estimated population of approximately 373,100.

#### Sample Size of the Study

The sample size for the study was determined using the following formula (Cochran, 1963) and was calculated based on the prevalence of 28 % (0.28) according to Hadiza *et al.*, (2019). Prevalence of internal parasites among children attending daycare and orphanage centers in Kaduna metropolis, Kaduna

$$n = \frac{z^2 pq}{E^2}$$

Where;

n = Desired Sample size  
z = Standard normal distribution at 95 % confidence interval = 1.96

p = Expected prevalence 28 % (0.28) (Hadiza *et al.*, 2019)

q = (1 - P)

E = Margin of error at 5 % (0.05)

The formula was applied as follows:

$$n = \frac{1.96^2 \times 0.28 \times (1 - 0.28)}{0.05^2}$$

$$= \frac{3.8416 \times 0.28 \times (0.72)}{0.0025}$$

$$= \frac{0.77446656}{0.0025}$$

$$n = 309.78 \approx 310 \text{ samples}$$

The results from the calculation revealed a sample size of 310 approximately. Accordingly, questionnaires were administered to a sample size of 330 respondents that catered for invalid responses and non-returned questionnaires.

#### Ethical Consideration

Before the study commenced, ethical approval was obtained from the Kaduna State Ministry of Health (Ethical Clearance Number: MOH/ADM/744/VOL.1/111060. Informed consent was secured from the parents or guardians of all participating school children. The confidentiality and anonymity of the participants was strictly maintained throughout the study.

#### Sampling Technique

A simple random sampling was used in the selection of pupils that participated were folded pieces of papers were labelled with either YES or NO and was displayed before the pupils. Those that picked papers labelled YES were selected while those with NO were not selected.

#### Data Collection

Data were collected through a two-pronged approach: parasitological laboratory analysis and a structured questionnaire. The primary data was the parasitological status, determined by microscopic examination of stool samples using direct smear and formal-ether concentration techniques. Secondary data on socio-demographic and risk factors were collected using a pre-tested, structured questionnaire administered to the parents/guardians of participating children. The questionnaire captured:

- **Demographics:** Age and sex of the child.
- **Socio-economic indicators:** Parental occupation and education level were used to classify socio-economic status (Low, Middle, High) based on a simplified scoring system.
- **Risk factors:** Source of drinking water, type of household toilet facility, frequency of handwashing with soap, and history of routine deworming in the past six months. Questionnaires were translated into Hausa, the local language, and administered face-to-face by trained research assistants to ensure clarity and consistency in responses.

#### Stool Samples Collection

Stool samples were collected from 330 pupils across six selected primary school, averaging 55 samples per school. Each participant received a clean, labelled specimen container and a short wooded stick for transferring a portion of stool. Detailed instructions were provided to pupils, their teachers and parents to ensure proper collection and prevent contamination. Pupils were instructed to wash their hands before and after handling the sample, transfer a small portion into the container and securely close it. Samples were collected at home in the morning and returned to the school. To preserve the samples, 3 - 4 drops of 10 % formalin were added to each container and the samples were transported in a thermos box to the laboratory in Kachia General Rural Hospitals for analysis.

#### Parasitological Analysis of Stool Sample

Parasitological analysis of stool samples was conducted using the direct smear method and the formol-ether concentration technique, following the procedure described by Arora and Arora (2010). The direct smear method was performed by mixing a pea size amount of feces (approximately 2 mg) in a drop of normal saline on a clean glass slide. The fecal material was emulsified and large particles were removed. The emulsified smear was then covered with a coverslip, taking care to avoid air bubbles by lowering one edge of the coverslip into the suspension before gently placing it on the slide. The prepared slide was examined under microscope using x 10 and x 40 objectives lenses (Arora and Arora, 2010).

#### Formal Ether Concentration Methods

Formol Ether concentration method one gram (1 g) of feces was emulsified in 4 ml of 10 % formal saline in a screw-cap tubes using a rod and shaken for 20 seconds. The resultant mixture was sieved with 350 to 450 micrometer mesh and the filtrate was collected in a beaker. The sieved suspension was transferred into a 15 ml conical centrifuge tube made of polypropylene and 4 ml of diethyl ether was added. The tube was capped, mixed briefly to homogenize and centrifuged at 3000 rpm for 1 minute. After centrifugation, parasites sedimented at the bottom of the tube while fecal debris formed a layer between the ether and formal saline. The upper layers were discarded by rapidly inverting the tube, allowing residual fluid to drain back to the bottom and sediment was thoroughly mixed. Using a Pasteur pipette, the sediment was transferred onto a clean slide and covered with a coverslip. Microscopic examination was performed using x 10 objectives with the condenser iris adjusted for optimal contrast and x 40 objective was used to identify small cyst and eggs. The number of each parasite type was counted to estimate the approximate parasite load per gram of feces (Cheesbrough, 2006).

### Identification of Parasites

Parasites were identified and taxonomically classified based on their morphological characteristics using conventional parasitological methods. Microscopic examination was conducted with the support of experienced laboratory technicians and identification were cross-referenced with standard parasitological manuals (Cheesbrough, 2006). Diagnostic criteria, including size, shape, structural features and internal contents of eggs, cysts and adult stages, were employed to differentiate parasite species. Multiple microscopic fields were examined where necessary to ensure accurate detection, identification and classification.

## RESULTS

### Prevalence of Gastrointestinal Parasites among Primary School Children

A total of 330 pupils from three communities (A, B, and C) were examined for gastrointestinal parasites. The overall prevalence was 24.5% (81/330). Helminths were more common (18.8%) than protozoa (5.76%). *Ascaris lumbricoides* was the most prevalent parasite overall followed by hookworm, *Trichuris trichiura*, *Strongyloides stercoralis*, *Taenia* spp., *Entamoeba histolytica*, and

*Giardia lamblia*. Community-level prevalence varied significantly, with Community A having the highest infection rate (35.45%), followed by Community C (20.00%) and Community B (18.18%). The species-specific distribution across communities is shown in Table 1.

The overall prevalence of 24.5% aligns closely with findings by Banjo *et al.* (2022), who reported 21.9% in Kaduna State, but is lower than rates in Bauchi (36%; Mukhtar *et al.*, 2024) and Kogi (35.8%; Saleh *et al.*, 2024) States. The higher burden of helminths (18.8%) compared to protozoa (5.76%) is consistent with patterns observed in other Nigerian studies (Usip *et al.*, 2023; Saleh *et al.*, 2024). *Ascaris lumbricoides* was the most prevalent parasite (7.89%), corroborating its status as the most common soil-transmitted helminth in tropical, resource-limited settings due to environmental and sanitation factors (Sitotaw *et al.*, 2020; Banjo *et al.*, 2022). The significant variation in prevalence across communities ( $\chi^2$ ,  $p = 0.0047$ ) underscores the influence of local socio-environmental conditions, such as disparities in sanitation infrastructure and hygiene practices, on transmission dynamics (Usang *et al.*, 2020; Amisu *et al.*, 2023).

**Table 1:** Prevalence of Gastrointestinal Parasites among Primary School Children

Parasite Class	Species	Occurrence (%) of Parasites/ Locality		
		Community A	Community B	Community C
Helminths	<i>Ascaris lumbricoides</i>	12 (10.91%)	6 (5.45%)	8 (7.30%)
	Hookworm	7 (6.36%)	7 (6.36%)	4 (3.63%)
	<i>Trichuris trichiura</i>	5 (4.55%)	3 (2.73%)	3 (2.73%)
	<i>Strongyloides stercoralis</i>	3 (2.73%)	2 (1.82%)	0 (0.00%)
	<i>Taenia</i> spp.	1 (0.91%)	0 (0.00%)	2 (1.82%)
<b>Subtotal</b>	—	28 (25.45%)	17 (15.45%)	17 (15.45%)
Protozoa	<i>Entamoeba histolytica</i>	7 (6.36%)	2 (1.82%)	3 (2.73%)
	<i>Giardia lamblia</i>	4 (3.64%)	1 (0.91%)	3 (2.73%)
<b>Subtotal</b>	—	11 (10.00%)	3 (2.73%)	6 (5.45%)
<b>Total</b>	—	39 (35.45%)	20 (18.18%)	22 (20.00%)

### Prevalence of Gastrointestinal Parasites Infection in Relation to Gender of Pupil

Infection status showed a significant association with gender, as detailed in Table 2. Male pupils had a considerably higher prevalence (30.6%) compared to females (17.3%). The significantly higher infection rate among males ( $p < 0.0080$ ) is a common finding in similar studies and is often attributed to

gender-based differences in behavior. Boys are more likely to engage in outdoor play, go barefoot, and have less consistent handwashing practices, thereby increasing their exposure to contaminated soil and environments harboring parasite eggs and larvae (Hosea *et al.*, 2021; Usip *et al.*, 2023). This behavioral risk factor underscores the need for gender-sensitive health education campaigns within school health programs.

**Table 2:** Prevalence of Gastrointestinal Parasites Infection in Relation to Gender of Pupil

Gender	No. of Pupil Screened	Positive No. Infected (%)	Protozoans (%)	Helminths (%)
Male	180	55 (30.6)	14 (7.78)	41 (22.8)
Female	150	26 (17.3)	5 (3.33)	21 (14.0)
<b>Total</b>	<b>330</b>	<b>81 (24.5)</b>	<b>19 (5.76)</b>	<b>62 (18.8)</b>
<b>P- value</b>	<b>&lt; 0.0080</b>			

**Prevalence of Gastrointestinal Parasites Infection in Relation to Age of Pupil**

A strong positive correlation was found between age and infection prevalence, with the oldest age group ( $\geq 10$  years) showing the highest infection rate (46.4%), as shown in Table 3.

The dramatic increase in prevalence with age ( $p < 5.58 \times 10^{-11}$ ) is a critical finding. It suggests a cumulative effect of exposure, where older children have had more time and opportunity to encounter

and become infected by parasites in their environment (Sitotaw *et al.*, 2020). This pattern reinforces the importance of sustained, rather than one-off, interventions. While younger children benefit from initial deworming, the data indicates that without ongoing prevention, they remain at high risk as they age, highlighting the necessity for regular, school-based deworming programs throughout primary education (Amisu *et al.*, 2023).

**Table 3:** Prevalence of Gastrointestinal Parasites Infection in Relation to Age of Pupil

Age (years)	No of Pupil Screened	Positive No. Infected (%)	Protozoans (%)	Helminths (%)
3-5	110	8 (7.27)	1 (0.91)	7 (6.36)
6-9	110	22 (20.0)	8 (7.27)	14 (12.7)
10 above	110	51 (46.4)	10 (9.10)	41 (37.3)
<b>Total</b>	<b>330</b>	<b>81 (24.5)</b>	<b>19 (5.76)</b>	<b>62 (18.8)</b>
<b><math>\chi^2</math> value</b>		<b>47.84</b>	<b>7.26</b>	<b>27.46</b>
<b>P- value</b>		<b><math>&lt; 5.58 \times 10^{-11}</math></b>		

**Prevalence of Gastrointestinal Parasites Infection in Relation to Socio-economic Status of Pupil's Parent**

A clear inverse relationship was observed between socio-economic status and infection prevalence, with the low socio-economic status group having the highest burden (40.4%), as presented in Table 4. The strong association between low socio-economic status and high infection prevalence ( $p < 8.72 \times 10^{-8}$ ) is a well-documented driver of health inequity in parasitic diseases (Gizaw *et al.*, 2019;

Bisetegn *et al.*, 2023). Low socio-economic status often correlates with overcrowded living conditions, lack of access to improved sanitation and clean water, and poor nutrition all of which increase susceptibility to and propagation of intestinal parasites (Amisu *et al.*, 2023). This finding stresses that control strategies must be integrated with broader poverty alleviation and public infrastructure development efforts to be sustainable and effective.

**Table 4:** Prevalence of Gastrointestinal Parasites Infection in Relation to Socio-economic Status of Pupil's Parent

Socio-economic Status	No of Pupil Screened	Positive No. Infected (%)	Protozoans (%)	Helminths (%)
Low	136	55 (40.4)	12 (8.82)	43 (31.6)
Middle	154	23 (14.9)	7 (4.54)	16 (10.4)
High	40	3 (7.50)	0 (0.0)	3 (7.50)
<b>Total</b>	<b>330</b>	<b>81 (24.5)</b>	<b>19 (5.76)</b>	<b>62 (18.8)</b>
<b><math>\chi^2</math> value</b>		<b>32.59</b>	<b>5.05</b>	<b>20.66</b>
<b>P- value</b>		<b><math>&lt; 8.72 \times 10^{-8}</math></b>		

**Prevalence of Gastrointestinal Parasites Infection in Relation to Environmental Elements and Personal Hygiene Habits of Pupils**

Key environmental and behavioral risk factors were significantly associated with infection status. The strongest associations were found with handwashing frequency and toilet type, as detailed in Table 5.

The data in Table 5 quantifies the profound impact of WASH (Water, Sanitation, and Hygiene) factors. The extremely high odds ratios for infrequent handwashing (OR=77.4) and use of unimproved sanitation like pit latrines (OR=50.8) or open fields confirm these as primary transmission pathways (Sitotaw *et al.*, 2019; Usip *et al.*, 2023). The strong protective effect of routine deworming (OR=86.6 for non-dewormed children) validates mass drug administration as a cornerstone of control, though its high p-

value suggests the need for larger sample sizes in future studies to precisely measure its impact. The use of stream water, associated with a 7-fold higher risk than borehole water, points to fecal contamination of surface water as a significant environmental

reservoir (Banjo *et al.*, 2022). These findings collectively argue for an integrated control strategy that combines periodic deworming with sustained investments in community-led total sanitation and hygiene behavior change communication.

**Table 5:** Prevalence of Gastrointestinal Parasites Infection in Relation to Environmental Elements and Personal Hygiene Habits of Pupils

Environmental Factor	No of Screened Pupil	No. infected (%)	Protozoan (%)	Helminths (%)	Odd ratio	P- value
Access to Clean Water Source						
Yes	117	15 (12.8)	1 (0.85)	14 (11.9)		<0.00041
No	213	66 (30.9)	18 (8.45)	48 (22.5)	0.328 (0.120 – 0.884)	
Proper Sanitation Facilities						
Water source					2.26 (0.889 – 5.746)	
Well	164	41 (25.0)	15 (9.15)	26 (15.9)	7.09 (2.873 – 17.485)	<1.21×10 <sup>-6</sup>
Stream	49	25 (51.0)	3 (6.12)	22 (44.9)	-	
Bore hole	117	15 (12.8)	1 (0.85)	14 (11.9)		
Handwashing Frequency					-	
Always	189	3 (1.58)	0 (0.0)	3 (1.58)	77.4 (10.1 – 585.5)	< 0.0001
Not always	141	78 (55.3)	19 (13.5)	59 (41.8)		
Toilet facility					24.4 (6.49 – 91.08)	
Pit	104	44 (42.3)	6 (5.76)	38 (36.5)	50.8 (15.31 – 167.2)	<4.60×10 <sup>-22</sup>
Open field	53	32 (60.4)	11 (20.8)	21 (39.6)	-	
Water closet	173	5 (2.89)	2 (1.16)	3 (1.73)		
Routine deworming					-	
Yes	175	2 (1.14)	1 (0.57)	1 (0.57)	86.6 (14.43 – 524.4)	<0.669
No	155	79 (50.9)	18 (11.6)	61 (39.4)		

## DISCUSSION

### Prevalence and Distribution of Intestinal Parasites among School Children

The overall prevalence of gastrointestinal parasitic infections among the 330 primary school pupils was 24.5 %, with helminths accounting for 18.8% and protozoa 5.8 %. Helminth infections were more common than protozoan infections, consistent with previous studies in Nigeria (Usip *et al.*, 2023; Saleh *et al.*, 2024) and Ethiopia (Tegen & Damtie, 2021).

Seven parasite species were identified. *Ascaris lumbricoides* was the most prevalent, followed by hookworm, *Trichuris trichiura*, *Strongyloides stercoralis*, *Taenia* spp., *Entamoeba histolytica*, and

*Giardia lamblia*. The predominance of *A. lumbricoides* aligns with reports from Kaduna (Banjo *et al.*, 2022), Bauchi (Mukhtar *et al.*, 2024), and Calabar (Usang *et al.*, 2020), reflecting the conducive tropical conditions favoring its transmission. Hookworm prevalence (6.36 %) was comparable to findings in Kaduna (Hosea *et al.*, 2021) and Ogun State (Uthman *et al.*, 2024), but lower than in Ethiopia (22.3 %; Feleke, 2018) and Kano State (72.5 %; Adamu & Haruna, 2017). *Trichuris trichiura* (4.55 %) and *Strongyloides stercoralis* (2.73 %) were less prevalent, likely influenced by ecological conditions and hygiene practices. Among protozoa, *E. histolytica* was more common than *G. lamblia*, consistent with findings in Kaduna (Sitotaw & Shiferaw, 2020), though local variations exist. Community-level analysis revealed significant variation in

prevalence ( $p = 0.0047$ ). Community A had the highest prevalence (35.4 %), followed by Community C (20.0 %) and Community B (18.2 %). These differences likely reflect disparities in sanitation, water access, hygiene behaviors, and school infrastructure. Schools with poor waste management, open defecation practices, or proximity to refuse dumps showed higher parasite prevalence, consistent with previous studies (Usang *et al.*, 2020; Usip *et al.*, 2023).

### Conclusion

From the results of this study, the following conclusions were drawn: School aged children within the selected communities were infected with gastrointestinal parasites, with a prevalence of 24.5 %; the infections were due to helminths (18.8 %) and protozoa (5.76 %). Seven species of helminths accounted for the infections, namely *Ascaris lumbricoides* (7.89 %), Hook worm (5.45 %), *Trichuris trichiuria* (2.73 %), *Strongyloides stercoralis* (1.52 %), and *Taenia sp.* (1.21 %); two species of protozoa were also identified, *Entamoeba histolytica* (3.64 %) and *Gardia lamblia* (2.12 %); The prevalence of infections with intestinal parasites was correlated with sampling location.

### Recommendation

Health Education and Hygiene Promotion: Conduct community-based awareness campaigns to educate pupils, parents, and teachers on the prevention of gastrointestinal parasitic infections through proper hygiene and sanitation practices. Routine School Deworming Programs: Implement regular deworming programs in schools to minimize the prevalence of helminthic infections among pupils. Periodic Screening and Monitoring: Establish regular screening in schools to identify infections early, monitor trends, and assess the impact of interventions.

### Acknowledgement

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