PREVALENCE OF SOIL-TRANSMITTED HELMINTH INFECTIONS AMONG SCHOOL-AGED CHILDREN IN TWO LOCAL GOVERNMENT AREAS OF OSUN STATE, NIGERIA

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Abstract
Soil-transmitted helminth (STH) infections continue to pose significant public health challenges in developing countries, especially among school-aged children. The purpose of this research was to evaluate the distribution and prevalence of STH infections in Ilesa-West and Olorunda Local Government Areas (LGAs) of Osun State, Nigeria's. Children were randomly selected from ten public primary schools (PPSs) using a multistage sampling technique. The formol-ether concentration method was used to analyse stool samples. Pre-tested and structured questionnaires assessed the knowledge, attitudes, and practices of school-aged children. The data were analysed using descriptive statistics and chi-square tests. A total of 520 children aged 4–14 years (51.5% male, 48.5% female) were sampled. Ascaris lumbricoides, hookworm, and Trichuris trichiura ova were found in the faecal samples. The overall prevalence of infection was 13.8% with the highest prevalence (16.5%) in age group 7-9 years. Females (14.1%) were more infected than males (13.6%). Ascaris lumbricoides had the highest prevalence (16.1%) among pupils from Ilesa west. Co-infection of Ascaris and Hookworm was the most prevalent (12.9%). Overall, the mean intensity of STH infections was 0.15±0.02 epg of faeces. Based on World Health Organization (WHO) thresholds, the overall STH prevalence of 13.8% places the study areas within the moderate-risk category (10–20%), while mean infection intensity (0.15 ± 0.02 epg) indicated light infections. Sustained annual deworming, improved Water,Sanitation and Hygiene (WASH) infrastructure, targeted school interventions, and health education and surveillance are crucial to reduce STH burden and prevent reinfections.

Keywords: Soil-transmitted helminths, School-aged children, Co-infections, Osun State, Nigeria

Introduction
Soil-transmitted helminths (STHs) are a group of parasitic worms that infect individuals by contact with contaminated soil, primarily in areas with insufficient sanitation and hygiene. These infections flourish in warm, humid tropical and subtropical climates and rank among the most prevalent neglected tropical diseases globally. The most prevalent species include *Ascaris lumbricoides* (roundworm), *Trichuris trichiura* (whipworm), and hookworms (*Necator americanus* and *Ancylostoma duodenale*). *Strongyloides stercoralis* is also increasingly recognised as a significant STH in certain endemic areas, although its global burden is likely underestimated due to diagnostic limitations (Jember *et al.,* 2022). In spite of continuing control efforts, there is a dearth of current, location-specific data on the prevalence, intensity of infection of STHs, particularly among school-aged children in many endemic communities in Nigeria. This gap limits precise assessment of recent transmission dynamics and hinders evidence-based planning and assessment of deworming and WASH interventions.

Soil transmitted helminth infections affect approximately 1.5 billion people globally, accounting for over 24% of the population (WHO, 2023). Sub-Saharan Africa, the Americas, China, and East Asia are the regions with the highest prevalence of these illnesses. With over 267 million young children and 568 million older children living in regions of active transmission, school-aged children are disproportionately impacted (Chopra *et al.,* 2022). The enduring prevalence

of STH infections is attributed to insufficient access to clean water, poor hygiene habits, inadequate sanitation infrastructure, and underlying socioeconomic inequalities (Ekpo *et al.,* 2008).

School-aged children are the main focus of worldwide preventative chemotherapeutic programmes because of their sensitivity and the long-term effects of infection, including malnourishment, anaemia, and poor cognitive development. The mainstay of control measures has been routine deworming with albendazole or mebendazole, bolstered by supplementary initiatives including health education and advancements in water, sanitation, and hygiene (WASH) (Speich *et al.,* 2012; Gitore *et al.,* 2020).

In Nigeria, STHs remain endemic across many regions, including the southwestern Osun State (Oyeyemi & Okunlola, 2023). As part of national efforts, Mass Drug Administration (MDA) campaigns targeting school-aged children have been implemented for over six years in this region. However, the effectiveness of these programmes must be regularly assessed through surveillance to identify persistent hotspots and evaluate the need for continued interventions.

This study addresses the paucity of recent, locality-specific data on soil-transmitted helminth infections among school-aged children in Ilesa-West and Olorunda Local Government Areas of Osun State, chiefly with respect to present prevalence, infection intensity, and co-infection patterns in the situation of current control programmes. By providing effective epidemiological evidence, the study add to a clearer understanding of the local transmission dynamics of STHs and supports informed public health planning and targeted control plans.

Methods

Study Area

This study was conducted in Osun State, located between latitudes 7.0°N and 8.0°N and longitudes 4.0°E and 5.5°E in southwestern Nigeria. The State is bordered by Ekiti, Ondo, Ogun, Oyo, and Kwara States and comprises 30 LGAs. Osun has a tropical climate and an agriculturally driven economy. The population speaks mainly Yoruba and English and practises Islam, Christianity, and traditional religions. The study focused on Ilesa-West and Olorunda LGAs, selected for their high population density and limited prior studies on STHs. Ilesa-West lies in the eastern part of the State, while Olorunda is centrally located in Osogbo, the State capital (Owolabi *et al.,* 2018).

Study Population and Selection of Schools for Survey

Primary school pupils were recruited from Ilesa West and Olorunda LGAs in Osun State (Fig. 1). The two LGAs have the highest school numbers in Osun State, except for Osogbo LGA (where several studies have been conducted before now) (SUBEB, 2018). Five primary schools were selected from each LGA, resulting in a total of 10 schools sampled for the research.

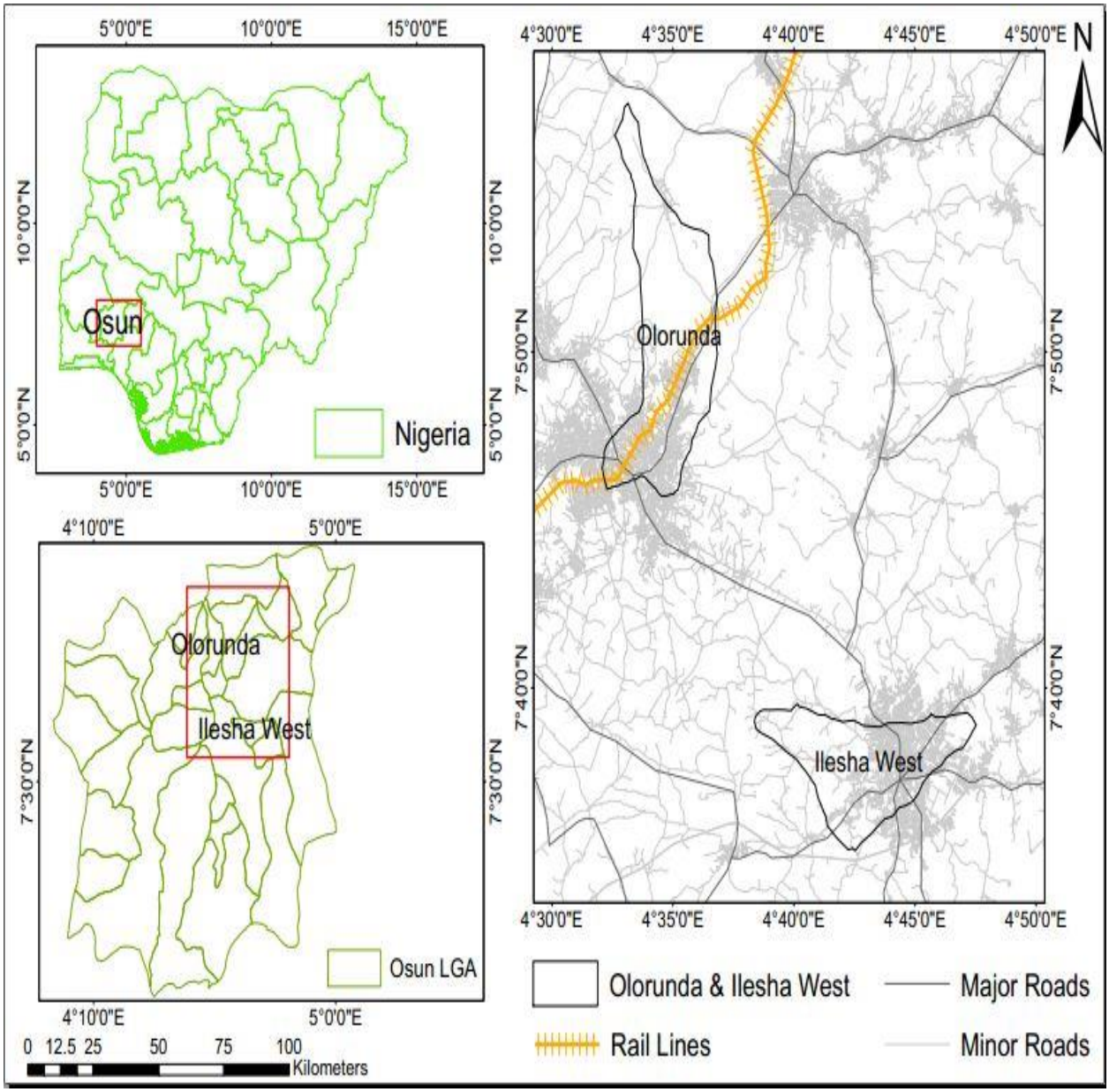

Figure 1: Map of Osun State showing the two study LGAs

Ethical Clearance/Mobilisation: The study secured necessary approvals and consents from multiple stakeholders, including Ladoke Akintola University of Technology Teaching Hospital, Osogbo Research Ethical Review Committee (now UNIOSUN Teaching Hospital Ethical Review Committee) LTH/EC/2019/04/412, State Universal Basic Education Board (SUBEB) of Osun State, Zonal Educational Officers, and Educational Secretaries of each LGA. Additionally, the study obtained informed consent from parents/guardians through signed consent forms and informed written assent from the pupils themselves to ensure voluntary participation and consent before collecting stool samples.

Selection of participating schools and children: Ten public primary schools were selected using a multistage random sampling technique. First, five schools were each randomly selected from the Ilesa-West and Olorunda LGAs using the list of schools provided by the SUBEB. Sixty pupils were enrolled from each selected school based on World Health Organization guidance, which considers the assessment of about 50–60 school-aged children per ecological context sufficient for obtaining dependable estimates of soil-transmitted helminth prevalence and

infection intensity without compromising fieldwork feasibility (WHO, 2002). Pupils were selected proportionally across Primary 1 - 6 classes, with ten pupils randomly chosen per class to ensure balanced representation. This approach accounted for potential non-compliance or absenteeism during stool collection.

Questionnaire Administration: An organised, interviewer-administered questionnaire culled from previously published studies on soil-transmitted helminth infections was used to collect data on students' knowledge, attitudes, and hygiene-related behaviours (Brooker *et al.*, 2006; Pullan *et al.*, 2014). The questionnaire was translated into Yoruba to enhance comprehension among participants. Skilled field assistants administered the questionnaire to ensure reliability and precision of responses.

Collection and transportation of Stool Samples: Clean, labelled plastic containers with screw lids and supplied applicator sticks were used to collect fresh faeces samples. Assistance was provided to younger pupils. Samples were kept in iceboxes immediately after collection and transported to the Parasitology Laboratory of Osun State University Teaching Hospital, Osogbo, within four hours of collection to ensure sample integrity.

Parasitological Analysis: Approximately 1 gram of each stool specimen was processed using the Formol-ether Concentration method as delineated by (Khurana and Sethi, 2017). Samples were examined within six hours of collection under a compound microscope at 10x and 40x magnifications for identification and quantification of helminth eggs. Egg counts were recorded and converted to eggs per gram (epg) of faeces. Duplicate blinded microscopic readings of selected samples by trained personnel was done to ensure consistency, after which egg counts were recorded and expressed as eggs per gram (epg) of faeces.

Data Analysis: Microsoft Excel was used to input the data, while SPSS version 23 was used for analysis. Descriptive statistics (frequencies, percentages, and means ± standard error of mean (SEM)) were used to summarise demographic characteristics, infection prevalence, and intensity. Associations between infection status and variables such as age, sex, and school were assessed using Chi-square (χ^2) tests. All statistical tests were two-sided, and p-values less than 0.05 were considered statistically significant.

Results

A total of 520 pupils were examined for STHs in the two LGAs, of which 262 (50.4%) were from Ilesa-West LGA and 258 (49.6%) were from Olorunda LGA. Most of the pupils, 265 (51%), were male, comprising 135 (51.5%) from Ilesa-West and 130 (50.4%) from Olorunda LGA. In addition, 255(40.0%) were female, comprising 127 (48.5%) from Ilesa-West and 128 (49.6%) from Olorunda LGA. The majority of the pupils, 194 (37.3%), were within the age range 7-9 years, while the age group > 13 years had the lowest, 41 (7.9%). A total number of 140 (26.3%) and 145 (27.9%) pupils were within the age groups 4-6 years and 10-12 years, respectively (Table 1).

The overall prevalence of STH infections was 72 (13.8%). *Ascaris lumbricoides* was the most prevalent species, affecting 52 pupils (10.0%), followed by hookworm (15 pupils; 2.9%) and *Trichuris trichiura* (5 pupils; 1.0%). The prevalence was somewhat greater in males (14.1%) compared to females (13.6%), although this disparity lacked statistical significance ($\chi^2 = 0.03$, df = 1, p = 0.860). Pupils aged 7–9 years had the highest prevalence at 16.5%, whilst those aged 4–6 years demonstrated the lowest at 10.7%, with no statistically significant difference detected ($\chi^2 = 2.397$, df = 3, p = 0.497). At the school level, in Ilesa-West LGA, Faith Academy had the highest prevalence (22.0%), while NUD Moroko recorded the lowest (8.0%). In Olorunda LGA, Saint Michael School reported the highest prevalence (17.6%) and AUD Sabo

the lowest (8.0%). Infections were predominantly due to *Ascaris lumbricoides* across all schools. However, differences in prevalence across schools and between LGAs were not statistically significant ($p > 0.05$) (Table 2).

Based on World Health Organization (WHO) intensity classification criteria, all soil-transmitted helminth infections identified in this study were of light intensity. The mean infection intensity was 0.15 ± 0.02 eggs per gram (EPG) of faeces, with *Ascaris lumbricoides* accounting for the greatest contribution (0.11 ± 0.01 EPG), followed by hookworm (0.03 ± 0.01 EPG) and *Trichuris trichiura* (0.01 ± 0.01 EPG). Infection intensity was similar between males and females and remained within the light-intensity classification for all species. Minor variations were observed across age groups and schools, with pupils aged 7–9 years recording relatively higher mean intensities, while those aged 4–6 years showed the lowest values. *Ascaris lumbricoides* intensity was more *more* evident among pupils aged 7–9 and >13 years, whereas hookworm intensity was higher among the 4–6 and 10–12-year age groups. At the school level, Faith Academy (Ilesa-West LGA) and Saint Michael School (Olorunda LGA) recorded higher mean infection intensities, while NUD Moroko and AUD Sabo schools showed lower values (Table 3).

Among pupils infected with at least one soil-transmitted helminth, three main types of co-infections were identified: *Ascaris lumbricoides* and hookworm (Asc+Hk), *Ascaris lumbricoides* and *Trichuris trichiura* (Asc+Tri), and *Trichuris trichiura* and hookworm (Tri+Hk). The most common co-infection was Asc+Hk, occurring in 67 pupils, representing 12.9% of infected pupils, followed by Asc+Tri (57 pupils; 11.0%) and Tri+Hk (20 pupils; 3.8%).

Sex-based analysis displayed comparable co-infection patterns between males and females, with no statistically significant differences detected ($p > 0.05$). Pupils aged 7–9 years recorded relatively higher co-infection prevalence; however, no significant association was found between age group and co-infection status ($p > 0.05$). At the school level, Faith Academy (Ilesa-West LGA) and Saint Michael School (Olorunda LGA) recorded higher co-infection prevalence, while NUD Moroko and AUD Sabo schools exhibited lower levels.Overall, mixed infections were relatively common but did not differ significantly by sex, age, or school ($p > 0.05$ across all categories) (Table 4).

Table 5 shows the association between hygiene-related behaviours and STH infections among pupils. Higher infection rates were observed among students who did not wash their hands before eating and those who involved in nail-biting, with the latter significantly associated with *Trichuris trichiura* infection ($p < 0.05$). No significant associations were observed for hand-washing after defecation or walking barefoot.

Table 1: Sex and age distribution of study participants across LGAs and schools

		Sex (%)		Age in years			
LGA/School	NE	Male	Female	4-6	7-9	10-12	>13
Ilesa-West LGA							
Faith Academy	50	38(76.0)	12(24.0)	10(20.0)	20(40.0)	10(20.0)	10(20.0)
NUD Moroko	50	24(48.0)	26(52.0)	22(44.0)	13(26.0)	14(28.0)	1(2.0)
NUD Odo-ona	56	23(41.1)	33(58.9)	10(20.0)	14(28.0)	9(16.1)	4(7.1)
The Sincere	50	28(56.0)	22(44.0)	8(16.0)	22(44.0)	19(25.3)	1(2.0)
Zumura	56	22(39.3)	34(60.7)	9(16.1)	22(39.3)	23(41.1)	2(3.6)
Total	262	135(51.5)	127(48.5)	69(26.3)	100(38.2)	75(28.6)	18(6.9)
X^2, df, p-value		18.450, 4, 0.001		41.242, 12, 0.000			
Olorunda LGA							
AUD Sabo	50	25(50.0)	25(50.0)	12(24.0)	22(44.0)	16(32.0)	0(0)
Abdul-azeezAsalafy	52	23 (44.2)	29(55.8)	18(34.6)	11(21.2)	15(28.8)	8(15.4)
Faozul-wajanat	56	30(53.6)	20(46.4)	17(30.4)	16(28.6)	17(30.4)	6(10.7)
Saint Micheal	51	28(54.9)	23(45.1)	14(27.5)	28(54.9)	9(17.6)	0(0)
Surajudeen	49	24(49.0)	25(51.0)	10(20.4)	17(34.7)	13(26.5)	9(18.4)
Total	258	130(50.4)	128(49.6)	71(27.5)	94(36.4)	70(27.1)	23(8.9)
X^2, df, p-value		1.473, 4, 0.831		31.089, 12, 0.002			
Overall total	520	265(60.0)	255(40.0)	140(26.9)	194(37.3)	145(27.9)	41(7.9)

NE: Number Examined

Table 2: Prevalence of STH infections in relation to sex, age group in Ilesa-West and Olorunda LGAs

Categories	NE	*A. lumbricoides* NP (%)	*T. Trichiura* NP (%)	Hookworm NP (%)	Aggregated STH Infection NP (%)
Sex					
Male	265	27(10.2)	3(1.1)	6(2.3)	36(13.6)
Female	255	25(9.8)	2(0.8)	9(3.5)	36(14.1)
Total	520	52(10.0)	5(1.0)	15(2.9)	72(13.8)
X^2, Df, p-value		0.021,1,0.884	0.165,1,0.685	0.743,1,0.389	0.031, 0.860
Age group in years					
4-6	140	9(6.4)	1(0.7)	5(3.6)	15(10.7)
7-9	194	23(11.9)	4(2.1)	5(2.6)	32(16.5)
10-12	145	15(10.3)	0(0)	4(2.8)	19(13.1)
>13	41	5(12.2)	0(0)	1(2.4)	6(14.6)
Total	520	52(10.0)	5(1.0)	15(2.9)	72(13.8)
X^2, Df, p-value		2.965,3, 0.397	4.362,3,0.225	0.338,3,0.953	2.380,3,0.497
Ilesa-west LGA					
Faith Academy	50	9(18.0)	1(2.0)	1(2.0)	11(22.0)
NUD Moroko	50	1(2.0)	1(2.0)	2(4.0)	4(8.0)
NUD Odo-ona	56	9(16.1)	0(0.0)	0(0.0)	9(16.1)
The Sincere	50	6(12.0)	1(2.0)	0(0.0)	7(14.0)
Zumura	56	6(10.7)	0(0.0)	3(5.4)	9(16.1)
Total	262	31(11.8)	3(1.1)	6(2.3)	40(15.3)
X^2, df, p-value		7.490, 4, 0.112	2.266,4,0.687	5.511, 4, 0.239	3.911,4,0.418
Olorunda LGA					
AUD Sabo	50	2(4.0)	1(2.0)	1(2.0)	4(8.0)
Abdul-azeezAsalafy	52	5(9.6)	0(0.0)	2(3.8)	7(13.5)
Faozul-wajanat	56	4(7.1)	0(0.0)	2(3.6)	6(10.7)
Saint Micheal	51	6(11.8)	0(0.0)	3(5.9)	9(17.6)
Surajudeen	49	4(8.2)	1(2.0)	1(2.0)	6(12.2)
Total	258	21(8.1)	2(0.8)	9(3.5)	32(12.4)
X^2, df, p-value		2.268, 4, 0.687	3.238,4,0.519	1.523,4, 0.823	2.385,4,0.665
Overall prevalence	520	52(10.0)	5(1.0)	15(2.9)	72(13.8)
X^2, df, p-value		12.535, 9, 0.185	5.495,9,0.789	6.898, 9, 0.648	7.308, 9, 0.605

NE: Number Examined
NP**:** Number of Pupils

Table 3: Intensity (Mean ± SE) of Ascaris, Trichuris and Hookworm infections in relation to sex, age group in Ilesa-West and Olorunda LGAs

Categories	NE	*A. lumbricoides* Mean EPG±SE	*T. Trichiura* Mean EPG±SE	Hookworm Mean EPG±SE	Overall prevalence Mean EPG±SE
Sex					
Male	265	0.11±0.02	0.01±0.01	0.04±0.01	0.15±0.02
Female	255	0.11±0.02	0.01±0.01	0.03±0.01	0.15±0.02
Total	520	0.11±0.01	0.01±0.01	0.03±0.01	0.15±0.02
Age (in years)					
4-6	140	0.07±0.02	0.01±0.01	0.04±0.02	0.12±0.03
7-9	194	0.13±0.02	0.02±0.01	0.03±0.01	0.17±0.03
10-12	145	0.12±0.03	0.00±0.00	0.04±0.02	0.16±0.03
>13	41	0.13±0.05	0.00±0.00	0.03±0.03	0.16±0.06
Total	520	0.11±0.01	0.01±0.00	0.03±0.01	0.15±0.02
Ilawe-west LGA					
Faith Academy	50	0.19±0.06	0.02±0.02	0.03±0.03	0.24±0.07
NUD Moroko	50	0.03±0.03	0.02±0.02	0.05±0.03	0.09±0.05
NUD Odo-ona	56	0.17±0.05	0.00±0.00	0.00±0.00	0.17±0.05
The Sincere	50	0.14±0.06	0.02±0.02	0.00±0.00	0.16±0.06
Zumura	56	0.12±0.05	0.00±0.00	0.06±0.03	0.18±0.06
Total	262	0.13±0.02	0.01±0.01	0.03±0.01	0.17±0.02
Olorunda LGA					
AUD Sabo	50	0.05±0.03	0.02±0.02	0.02±0.02	0.09±0.04
Abdul-azeezAsalafy	52	0.11±0.05	0.00±0.00	0.04±0.03	0.15±0.05
Faozul-wajanat	56	0.07±0.04	0.00±0.00	0.04±0.03	0.11±0.04
Saint Micheal	51	0.12±0.05	0.00±0.00	0.07±0.04	0.19±0.06
Surajudeen	49	0.09±0.04	0.02±0.02	0.03±0.03	0.14±0.05
Total	258	0.09±0.02	0.01±0.01	0.04±0.01	0.14±0.02

NE: Number Examined

EPG ± SE = Mean eggs per gram of stool ± Standard error

Table 4: Prevalence of soil transmitted helminthiasis co-infection across the study LGAs

LGA/School	NE	*Asc+Hk* NP (%)	*Asc+Tri* NP (%)	Tri+Hk NP (%)
Sex				
Male	265	34(12.8)	27(10.2)	11(4.2)
Female	255	33(12.9)	30(11.8)	9(3.5)
Total	520	67(12.9)	57(11.0)	20(3.8)
		0.09,1,0.76	0.07,1,0.78	0.296,1,0.587
Age (in years)				
4-6	140	14(10.0)	10(7.1)	6(4.3)
7-9	194	28(14.4)	27(13.9)	9(4.6)

10-12	145	19(13.1)	15(10.3)	4(2.8)
>13	41	6(14.6)	5(12.2)	1(2.4)
Total	520	67(12.9)	57(11)	20(3.8)
X^2, Df, p-value		1.570,3,0.666	3.949,3,0.267	1.086,3,0.780
Ilawe-west LGA				
Faith Academy	50	10(20.0)	10(20.0)	2(4.0)
NUD Moroko	50	3(6.0)	2(4.0)	3(6.0)
NUD Odo-ona	56	9(16.1)	9(16.1)	0(0.0)
The Sincere	50	6(12.0)	7(14.0)	1(2.0)
Zumura	56	9(16.1)	6(10.7)	3(5.4)
Total	262	37(14.1)	34(13.0)	9(3.4)
X^2, df, p-value		4.681, 4, 0.322	6.527,4,0.163	3.966, 4, 0.411
Olorunda LGA				
AUD Sabo	50	3(6.0)	3(6.0)	2(4.0)
Abdul-azeezAsalafy	52	7(13.5)	5(9.6)	2(3.8)
Faozul-wajanat	56	6(10.7)	4(7.1)	2(3.6)
Saint Micheal	51	9(17.6)	6(11.8)	3(5.9)
Surajudeen	49	5(10.2)	5(10.2)	2(4.1)
Total	258	30(11.6)	23(8.9)	11(4.3)
X^2, df, p-value		3.652, 4, 0.455	1.382,4,0.847	0.428,4, 0.980
Overall prevalence	520	67(12.9)	57(11.0)	20(3.8)
X^2, df, p-value		9.121, 9, 0.426	10.899,9,0.283	4.271, 9, 0.893

NE: Number Examined
Asc: *Ascaris lumbricoides*
Tri: *Trichuris trichura*
Hk: Hookworm
NP (%) = number positive (percentage)
χ^2 = Chi-square test; *df* = degrees of freedom

Table 5: Prevalence of Soil Helminth Infections in Relation to Attitude and Practices of School-Aged Children

	NE	*A. lumbricoides* NP (%)	*T. trichiura* NP (%)	Hookworm NP (%)	Any STH NP (%)
Wash hands before eating					
Yes	424	38(9.0)	4(0.9)	12(2.8)	54(12.7)
No	96	14(14.6)	1(1.0)	3(3.1)	18(18.8)
Total	**520**	**52(10.0)**	**5(1.0)**	**15(2.9)**	**72(13.8)**
X^2, Df, p-value		2.748,1,0.097	0.008,1,0.929	0.024,1,0.876	2.373,1,0.123
Wash hands after defecating					
Yes	338	35(10.4)	2(0.6)	10(3.0)	47(13.9)
No	182	17(9.3)	3(1.6)	5(2.7)	25(13.7)
Total	**520**	**52(10.0)**	**5(1.0)**	**15(2.9)**	**72(13.8)**
X^2, Df, p-value		0.135,1,0.713	1.387,1,0.239	0.019,1,0.891	0.003,1,0.958
Walk barefooted at home/school					
Yes	311	29(9.3)	2(0.6)	10(3.2)	41(13.2)
No	171	21(12.3)	3(1.8)	3(1.8)	27(15.8)
No response	38	2(5.3)	0(0.0)	2(5.3)	4(10.5)
Total	**520**	**52(10.0)**	**5(1.0)**	**15(2.9)**	**72(13.8)**
X^2, Df, p-value		2.093,1,0.351	1.829,2,0.401	1.669,2,0.434	1.007,2,0.604
Bite fingernails					
Yes	152	16(10.5)	4(2.6)	4(2.6)	24(15.8)
No	200	20(10.0)	0(0.0)	6(3.0)	26(13.0)
No response	168	16(9.5)	1(0.6)	5(3.0)	22(13.1)
Total	**520**	**52(10.0)**	**5(1.0)**	**15(2.9)**	**72(13.8)**
X^2, Df, p-value		0.089, 2, 0.956	6.630, 2, 0.036	0.049, 2, 0.976	0.681, 2, 0.712

NE: Number Examined
NP (%) = number positive (percentage)
χ^2 = Chi-square test; df = degrees of freedom
Any STH = positive for at least one soil-transmitted helminth

Discussion

This study evaluated the present prevalence of STH infections among children in two LGAs in Osun State, Nigeria. STH infection rates were 13.8% overall, with
Ilesa-West recording 15.3% and Olorunda 12.4%. These figures reflect a moderate endemicity, aligning with WHO's 10–20% prevalence category, which recommends annual preventive chemotherapy (PC) for at least five years, alongside routine surveillance (WHO, 2012).

This current finding reveals a considerable decrease in the prevalence of soil-transmitted helminth (STH) infections compared with earlier reports from Osun State, where prevalence values exceeding 35% were earlier documented. The lower prevalence detected in the present school-based survey likely reflects long-term trends related with sustained implementation of mass drug administration (MDA) and school-targeted deworming programmes, in divergence to earlier community-based studies conducted prior to common preventive chemotherapy.

According to World Health Organization (WHO) thresholds, both Ilesa-West (15.3%) and Olorunda (12.4%) LGAs fall within the moderate-risk category, supporting the continuous need for annual deworming. Despite general decreases, school-level disparity was evident, with some schools recording higher prevalence values, suggesting focal transmission that may require targeted interferences within otherwise lower-burden LGAs.

Ascaris lumbricoides remained the most often detected species, consistent with established epidemiological patterns in endemic settings. Higher prevalence detected among pupils aged 7–9 years followed frequently reported age-related trends, although these differences were not statistically significant and should therefore be interpreted cautiously. No significant sex-related differences in infection prevalence were identified.

The overall mean infection intensity was low (0.15 ± 0.02 EPG), reflecting light infections and implying that current deworming efforts are effective in reducing worm burden. Overall, the findings indicate meaningful improvement in STH control; however, sustained MDA, improved school sanitation, hygiene promotion, and focused surveillance remain essential to consolidate gains and move toward further reduction of transmission.

The low overall mean infection intensity (0.15 ± 0.02 epg) reflects light infections and is consistent with the standard impact of sustained mass drug administration (MDA) in reducing worm burden without fully intersecting transmission (WHO, 2017 and Jourdan *et al*., 2018). Similar patterns of reduced intensity alongside persistent prevalence have been reported in other school-based studies following repeated deworming (Campbell *et al*., 2016).

Despite this overall decline, higher prevalence and co-infection rates were identified in specific school-level hotspots, notably Faith Academy and Saint Michael School, highlighting micro-epidemiological variation within treated populations. Such clustering has been linked to localised sanitation deficiencies and inconsistent hygiene practices (Pullan *et al*., 2014; Strunz *et al*., 2014).

The absence of significant differences across sex, age, and school groups may reflect the collective equalising effect of prior MDA and limited statistical power, as reported in similar prevalent settings (Truscott *et al*., 2014; Brooker *et al*., 2015). Co-infections persisted in spite of routine deworming, emphasising the limitations of chemotherapy-only approaches and the need for integrated water, sanitation, and hygiene (WASH) interventions (Freeman *et al*., 2014; WHO, 2020).

The significant association between nail-biting and *Trichuris trichiura* infection supports previous evidence identifying hand-to-mouth behaviours as key transmission routes (Oluwole *et al*., 2018). Other hygiene behaviours showed non-significant trends, consistent with reports of behavioural variability and reporting bias in school-based surveys (Khan *et al*., 2021). Overall, these findings support sustained MDA supplemented by targeted WASH improvements and school-based health education to achieve further decreases in STH transmission.

Conclusion

This study found a moderate prevalence (13.8%) of soil-transmitted helminth infections among schoolchildren in Ilesa-West and Olorunda LGAs, aligned with WHO moderate-risk classification. in spite of persistent prevalence, infection intensity was low (0.15 ± 0.02 EPG), indicating mainly light infections. Notable variation occurred at the school level, with Faith Academy and Saint Michael School identified as transmission hotspots. No significant differences in infection prevalence were observed by sex or age group. Nail-biting was significantly associated with *Trichuris trichiura* infection, highlighting the role of specific hygiene behaviours. These findings support continued annual school-based deworming. Targeted WASH interventions and strengthened school-level surveillance are required to address persistence transmission.

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