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SOCIO-ENVIRONMENTAL DETERMINANTS AND PREVALENCE OF INTESTINAL PARASITOSIS IN CHILDREN FROM A BRAZILIAN RURAL SETTLEMENT

DETERMINANTES SOCIOAMBIENTALES Y PREVALENCIA DE PARASITOSIS INTESTINAL EN NIÑOS DE UN ASENTAMIENTO RURAL BRASILEÑO

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ABSTRACT

Introduction: Intestinal parasitosis, caused by helminths and protozoa, can lead to various health issues. These infections disproportionately affect underdeveloped and developing countries, particularly in areas with inadequate sanitation. Transmission is more prevalent in some regions, such as peripheral communities, peri-urban zones, and rural settlements, thereby negatively impacting the population's quality of life. **Objectives:** To determine the prevalence of intestinal parasites in children aged 0-12 living in a peri-urban/rural settlement and identify associated factors. **Methods:** A cross-sectional study, which analyzed 142 fecal samples from 50 children. Also, socioeconomic, environmental, and behavioral data from families were collected. **Results:** A 54% prevalence of intestinal parasites was observed, with Entamoeba coli, Giardia lamblia, and Ascaris lumbricoides being the most common, with monoparasitism occurring in 48%. All families had income class E. Ninety-four percent of the children's water source was from an artisanal well (without chlorination). 94% of the children consumed raw vegetables; 66% of children used water alone to clean their vegetables, and 63% of these children had intestinal parasitosis. The adapted Ecomapa model allows for a qualitative representation of the relationship between socioenvironmental determinants and the presence of parasites. **Conclusions:** The study highlights the multifactorial causes of the high prevalence of intestinal parasites in children living in settlements, requiring analysis at various levels. Effective policy action at the federal, state, and municipal levels is crucial to ensure adequate sanitation, healthcare, and education for this vulnerable group, particularly children, who require comprehensive care, quality services, and promotion of healthy habits to support their growth and development.

Keywords: intestinal parasites, *Entamoeba coli, Giardia lamblia, Ascaris lumbricoides*, sanitation, childhood

RESUMEN

Introducción: Las parasitosis intestinales causadas por helmintos y protozoos, puede provocar diversos problemas de salud. Estas infecciones afectan de manera desproporcionada a los países subdesarrollados y en vías de desarrollo, especialmente en zonas con condiciones sanitarias inadecuadas. La transmisión es más frecuente en algunas regiones, como comunidades periféricas, zonas periurbanas y asentamientos rurales, lo que repercute negativamente en la calidad de vida de la población. **Objetivos:** El objetivo de este estudio fue

determinar la prevalencia de parásitos intestinales en niños de 0 a 12 años que viven en un asentamiento periurbano/rural e identificar los factores asociados. **Métodos:** Se realizó un estudio transversal en el que se analizaron 142 muestras fecales de 50 niños. También se recopilaron datos socioeconómicos, ambientales y comportamentales de las familias. **Resultados:** Los resultados mostraron una prevalencia del 54 % de parásitos intestinales, siendo *Entamoeba coli*, *Giardia lamblia* y *Ascaris lumbricoides* los más comunes. Se diseñó un modelo de Ecomapa adaptado para representar cualitativamente la relación entre los determinantes socioambientales y la aparición de parásitos. Es probable que la alta prevalencia esté relacionada con condiciones de vida deficientes, como la falta de higiene, la insuficiencia de los servicios de salud y la falta de infraestructura. **Conclusiones:** El estudio destaca las causas multifactoriales de la alta prevalencia de parásitos intestinales en los niños que viven en asentamientos, lo que requiere un análisis a varios niveles. Es fundamental adoptar medidas políticas eficaces a nivel federal, estatal y municipal para garantizar el saneamiento, acceso a servicios de salud y a educación adecuada, para comunidades vulnerables, en particular los niños, que necesitan una atención integral, servicios de calidad y la promoción de hábitos saludables para estimular su adecuado crecimiento y desarrollo.

Palabras clave: parasitosis intestinales, *Entamoeba coli, Giardia lamblia, Ascaris lumbricoides*, saneamiento, infancia.

INTRODUCTION

Intestinal parasitosis are infections caused by a relationship of endoparasitism, whereby protozoa and/or helminths use the environment of a host's digestive system as a shelter and food source, which can reduce their quality of life. These diseases are prevalent in tropical and subtropical regions, posing a significant public health challenge. With an estimated 3.5 billion people infected worldwide, they can impair nutritional status and physiological development, while also incurring substantial economic costs for treatment and management (1).

These infections are often neglected, disproportionately affecting underdeveloped and developing countries with limited investment in health promotion, disease prevention, and control measures. Their transmission and maintenance are influenced by the epidemiological triad, the interplay between the etiological agent, host, and environment, and can also be facilitated by vectors, particularly insects (2).

According to the World Health Organization in 2024 (1), over 24% of the global population is affected by intestinal helminth infections, primarily caused by *Ascaris lumbricoides*, *Trichuris trichiura*, *Necator americanus*, and *Ancylostoma duodenale* and most common protozoal infections are triggered by *Giardia lamblia*, *Cryptosporidium spp*., and *Entamoeba histolytica*, together representing an underestimated 357 million global cases.

The potential of these parasites to provoke specific responses, whether serious or not, depends on their resistance to the host organism's immune system, as well as the infecting dose and their ability to lodge, multiply, and adapt (3). Thus, infected people can be asymptomatic, but when symptomatic, they can manifest diarrhea, vomiting, headache, asthenia, irritability, apathy, intestinal obstruction, epigastric and abdominal pain, including anaemia, rectal prolapse, and impaired physical and mental development, which can lead to death (4). The child population is more susceptible to becoming ill because, in addition to not having a fully developed immune system, children have behaviors that facilitate exposure, such as not knowing proper hygiene practices, increasing contact with contaminated surfaces, soils and objects more frequently (5, 6).

Helminthic and protozoan intestinal diseases are significant causes of morbidity and mortality, affecting both urban and rural areas. However, transmission is more prevalent in regions lacking adequate sanitation, such as peripheral communities, peri-urban zones, and rural settlements, thereby negatively impacting the population's quality of life (4). Thus, this study aimed to determine the prevalence of intestinal parasites in children aged 0-12 living in a peri-urban/rural settlement and identify associated factors.

METHODS

Type of Study and Location

This descriptive-exploratory, cross-sectional study was conducted in the settlement Fazenda da Barra Sustainable Development Program (7), spanning approximately 1,500 hectares in a rural area of Ribeirão Preto municipality, São Paulo state, Brazil. This settlement was officially set up in 2007 to conserve biodiversity by granting land to people who base their livelihoods on family farming and other activities with a low environmental impact, by Ordinance Nº 477/1999 of the National Institute for Colonization and Agrarian Reform (8).

According to the Integrated Primary Health Care Information System (e-SUS APS), the area is home to 2,875 settlers, including approximately 400 children aged 12 and under. The local population lives in housing that lacks structural and sanitary conditions, as illustrated in Figure 1.

FIGURE 1
IMAGES OF THE FAZENDA DA BARRA SETTLEMENT, LOCATED IN THE MUNICIPALITY OF RIBEIRÃO PRETO - SP, BRAZIL

Source: authors.

Ethical Aspects

The study was approved by the Research Ethics Committee (CEP) of the Ribeirão Preto School of Nursing of the University of São Paulo under CAAE number 28984320.1.0000.539378.

Sample Collection and Parasitological Analysis

Following informed consent from parents or guardians, obtained through the signing of a Free and Informed Consent Form (FICF), children aged 0-12 years were enrolled in the study. Each person responsible was given a kit containing three faecal collection bottles, gloves, and instructions on the sample collection and conservation procedure. The samples, duly identified, were collected on previously scheduled dates and transported under refrigeration to the Environmental Ecotoxicology and Parasitology Laboratory (LEPA) at the Ribeirão Preto School of Nursing (EERP) at the University of São Paulo (USP). A total of 142 faecal samples were obtained, 34 of which were in triplicate, 14 in duplicate, and 12 single samples.

The Hoffman, Pons, and Janer method (spontaneous sedimentation) was used for parasitological analyses. In addition, the Faust Method (centrifugation-flotation in 33% zinc sulphate) was used to detect cysts and oocysts of protozoa, as well as light eggs. The parasite forms were identified using light microscopy (5).

Collection of Socio-economic, Environmental, and Behavioral Data

To identify the socioeconomic, environmental, and behavioral factors associated with the transmission of intestinal parasites, guardians completed a structured questionnaire. The survey included questions on family income, educational level, water source, sewage disposal, hygiene practices, presence of animals, and other relevant variables. The questionnaire was adapted and validated by Fregonesi (9).

Inclusion Criteria

The study included children of both sexes with family members able to answer the questionnaire and collect at least one of the three faecal samples.

Data Analysis

The data was analyzed using Jamovi statistical software version 1.6.23, using Pearson's chi-square test and Fisher's exact test to verify the association between intestinal parasitosis and the socio-economic, environmental, and behavioral aspects experienced by the children. The significance level adopted was 5% ($p < 0.05$). Additionally, to better understand the socio-environmental determinants related to intestinal parasitosis, an Ecomap was developed using the Calgary Family Assessment Model as a framework (5). The instrument was adapted to reflect rural reality, considering the number of families with parasitized children (nfp) and the number of parasitized children (ncp) as its core, including the most prevalent parasitosis. Based on the answers, a diagram was constructed that qualitatively represents the relationships between socio-environmental determinants and the occurrence of parasites.

RESULTS

Fifty children participated in the parasitological examination, consisting of 29 males (58%) and 21 females (42%). Of these, 27 children (54%) tested positive for intestinal parasites, with varying parasitic conditions, as detailed in Table 1.

TABLE 1
DISTRIBUTION OF PARASITIC CONDITIONS IN CHILDREN (N=50) FROM THE FAZENDA DA BARRA PDS SETTLEMENT IN THE MUNICIPALITY OF RIBEIRÃO PRETO, SP, BRAZIL, BY SEX

	MALE		FEMALE		TOTAL	
	Frequency n	Percentage %	Frequency n	Percentage %	Frequency n	Percentage %
Absence	15	30	08	16	23	46
Monoparasitism	13	26	11	22	24	48
Biparasitism	01	2	02	94	03	6
	29	58	21	42	50	100

Table 2 presents the frequencies and co-occurrence patterns of intestinal parasites identified in this study. Protozoa were predominant, accounting for 80% of the cases, compared to 20% for helminths, both in terms of variety and quantity. The most commonly detected species were *Entamoeba coli*, *Giardia lamblia*, and *Ascaris lumbricoides*. Among these, *Entamoeba coli* was the species most frequently found in co-infections with other parasites.

TABLE 2
FREQUENCY AND INTERCOURSE OF INTESTINAL PARASITES IN CHILDREN PARTICIPATING IN THE STUDY IN THE FAZENDA DA BARRA PDS SETTLEMENT, MUNICIPALITY OF RIBEIRÃO PRETO, SP, BRAZI

PARASITE	Frequency n	Percentage %
Helminths		
Ascaris lumbricoides	06	20
Protozoa		
Balantidium coli	01	3
Entamoeba coli	12	40
Entamoeba histolytica/Entamoeba dispar	02	7
Giardia lamblia	09	30
Total	30	100
Intercourse between Species		
Entamoeba coli + *Ascaris lumbricoides*	01	33
Entamoeba coli + *Entamoeba histolytica/Entamoeba dispar*	02	67
Total	03	100

The socio-economic profile of participating families is presented in Table 3, revealing that low family income and limited education are associated with a higher prevalence of enteroparasitosis.

TABLE 3
SOCIO-ECONOMIC PROFILE OF THE FAMILIES PARTICIPATING IN THE STUDY IN THE FAZENDA DA BARRA PDS SETTLEMENT, RIBEIRÃO PRETO MUNICIPALITY, SP, BRAZIL

VARIABLE[1]	CHILDREN		NUMBER OF PARASITIZED CHILDREN	
	Frequency n	Percentage %	Frequency n	Percentage %
Sex				
Female	21	42	13	48
Male	29	58	14	52
Total	50	100	27	100
Age Group				
0 to 4 years old	19	38	7	26
5 to 8 years old	18	36	11	41
9 to 12 years old	13	26	9	33
Total	50	100	27	100
Monthly Family Income				
Class A (above 20 minimum wages)	0	0	0	0
Class B (between 5 to 9 minimum wages)	0	0	0	0
Class C (between 2 to 4 minimum wages)	0	0	0	0
Class D (between 1.5 to 3 minimum wages)	0	0	0	0
Class E (below 1.5 minimum wage)	50	100	27	100
Total	50	100	27	100
Father's Level of Education				
None	03	6	02	7
Middle school incomplete	29	58	18	67
Middle school complete or high school incomplete	10	20	05	19
High school complete or undergraduate degree incomplete	05	10	02	7
Undergraduate degree complete	0	0	0	0
No reply	03	6	0	0
Total	50	100	27	100
Mother's Level of Education				
None	03	6	01	4
Middle school incomplete	25	50	14	52
Middle school complete or high school incomplete	12	24	06	22
High school complete or undergraduate degree incomplete	05	10	02	7
Undergraduate degree complete	0	0	0	0
No reply	05	10	04	15
Total	50	100	27	100

[1]IBGE, 2022

Regarding sanitation conditions, there is a predominance of consumption of untreated water after collection (60%), contrary to recommendations in urban areas, probably contributing to the high prevalence of parasitic infections among children (63%).

TABLE 4
HOUSING SANITATION CONDITIONS OF THE FAMILIES PARTICIPATING IN THE STUDY IN THE FAZENDA DA BARRA PDS SETTLEMENT, RIBEIRÃO PRETO MUNICIPALITY, SP, BRAZIL

VARIABLE	CHILDREN		NUMBER OF PARASITIZED CHILDREN	
	Frequency n	Percentage %	Frequency n	Percentage %
Water Source				
Artesian well (without chlorination)	48	96	26	96
Cistern	02	4	01	4
Total	50	100	27	100
Domestic Water Treatment				
Filtration	08	16	5	19
Filtration and boiling	01	2	0	0
Boiling	03	6	02	7
Domestic chlorination	04	8	02	7
No treatment	30	60	17	63
No reply	04	8	01	4
Total	50	100	27	100
Sewage Disposal				
Septic tank	47	94	25	92
Backyard	02	4	01	4
No reply	01	2	01	4
Total	50	100	27	100
Domestic Solid Waste Disposal				
Burning	15	30	11	41
Community bucket	35	70	16	59
Total	50	100	27	100

Table 5 shows the data on the consumption, origin, and hygiene aspects of the vegetables consumed locally by the settlement's children. The results show that the highest incidence of parasites among the children participating in the study occurs when they consume raw vegetables that have only been sanitized with water, 63%.

TABLE 5
CONSUMPTION, ORIGIN, AND HYGIENE ASPECTS OF THE VEGETABLES CONSUMED BY THE CHILDREN PARTICIPATING IN THE STUDY IN THE FAZENDA DA BARRA PDS SETTLEMENT, RIBEIRÃO PRETO, SP, BRAZIL

VARIABLE	CHILDREN		NUMBER OF PARASITIZED CHILDREN	
	Frequency n	Percentage %	Frequency n	Percentage %
Consumption of Raw Vegetables				
Yes	47	94	26	96
No	03	6	01	4
Total	50	100	27	100
Vegetable Source				
Kitchen garden	23	46	14	52
Community fair	27	54	13	48
Total	50	100	27	100
Hygienization of Vegetables				
Water	33	66	17	63
Disinfectant	03	6	03	11
Soap	10	20	06	22
Sponge	04	8	01	4
Total	50	100	27	100

Table 6 presents behavioral aspects of children's daily life that may influence the risk of parasitic infections. Eighty-nine percent of children who play in the dirt carry parasites, while those who have contact with domestic or farm animals are also found to be infected, as are 82% of those who walk barefoot. These behavioral aspects are associated with a higher prevalence of parasitic infections.

TABLE 6
DAILY BEHAVIORAL HABITS OF THE CHILDREN PARTICIPATING IN THE STUDY IN THE FAZENDA DA BARRA PDS SETTLEMENT, MUNICIPALITY OF RIBEIRÃO PRETO, SP, BRAZIL

VARIABLE	CHILDREN		NUMBER OF PARASITIZED CHILDREN	
	Frequency n	Percentage %	Frequency n	Percentage %
Recreation on Land or Sand				
Yes	44	88	24	89
No	06	12	03	11
Total	50	100	27	100
Habit of Walking Barefoot				
Yes	39	78	22	82
No	11	22	05	18
Total	50	100	27	100
Contact with Domestic or Farm Animals				
Yes	45	90	24	89
No	05	10	03	11
Total	50	100	27	100

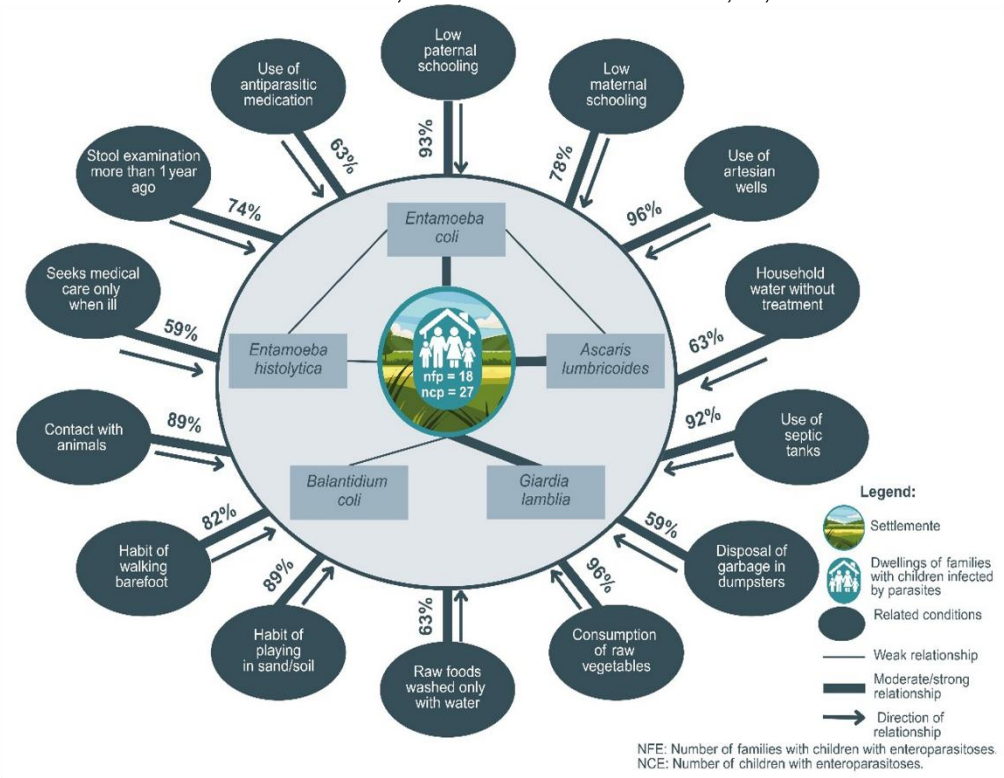
Table 7 presents data on the clinical follow-up of the children participating in the study. The findings indicate that low demand for care at the local health unit (sporadic visits to the care unit) is associated with 59% of children with parasites, and that a delay of more than 12 months in performing parasitological tests leads to 74% of children with intestinal parasitosis. Even among children who received some antiparasitic treatment in the previous 12 months, 63% had a positive response for enteroparasitosis, indicating that medication, regardless of adequate socioenvironmental conditions, is not sufficient to prevent infection. The data did not reveal statistically significant differences, despite the observed relationships.

TABLE 7
ASPECTS RELATING TO THE CLINICAL FOLLOW-UP OF THE CHILDREN PARTICIPATING IN THE STUDY IN THE FAZENDA DA BARRA PDS SETTLEMENT, RIBEIRÃO PRETO MUNICIPALITY, SP, BRAZIL

VARIABLE	CHILDREN		NUMBER OF PARASITIZED CHILDREN	
	Frequency n	Percentage %	Frequency n	Percentage %
Visit to the Health Unit				
Monthly	03	6	0	0
Half-yearly	09	18	05	19
Yearly	12	24	06	22
Sporadic	26	52	16	59
Total	50	100	27	100
Parasitological Testing				
Less than 6 months	03	6	02	7
Between 6 and 12 months	02	4	01	4
More than 12 months	33	66	20	74
None	12	24	04	15
Total	50	100	27	100
Anti-parasitic Treatment in the last 12 Months				
Yes	27	54	17	63
No	22	44	10	37
No reply	01	2	0	0
Total	50	100	27	100

Based on the results, a diagram adapted from the Ecomap (Figure 2) was created, using the families of parasitized children and the prevalent parasitosis as the central focus (10). This diagram summarizes the influence of socio-economic, environmental, and behavioral factors on the prevalence of parasites among the children in the settlement, drawing on data collected from questionnaires completed by the families.

FIGURE 2
ECOMAP FROM THE SOCIO-ECONOMIC, ENVIRONMENTAL, AND BEHAVIORAL CONDITIONS RELATED TO THE OCCURRENCE OF INTESTINAL PARASITES IN CHILDREN PARTICIPATING IN THE STUDY IN THE PDS FAZENDA DA BARRA SETTLEMENT, RIBEIRÃO PRETO MUNICIPALITY, SP, BRAZIL.



Source: Authors

The results highlight the multiple socio-environmental determinants influencing the prevalence of intestinal parasitosis in children, particularly in peri-urban and rural settings like the Fazenda da Barra PDS Settlement, where this study was conducted.

DISCUSSION

Brazil's settlement situation is complex, with mixed progress and challenges in areas like production, employment, income, and infrastructure, which significantly impact community health outcomes. The lack of investment and public policies in sanitation in settled communities with a peri-urban interface determines the epidemiological profile of the population, with the worsening spread of waterborne diseases, including enteroparasitosis, perpetuating the transmission cycle (11).

This study identified a high prevalence of intestinal parasites (54%) in children aged 0 to 12 years in the Fazenda da Barra PDS settlement (Table 1), corroborating the findings of Silva et al.(12) who found 57.1% positivity when analyzing the parasitological exams of 21 settled children in the same age group; and Alves et al.(13) who detected a higher value (68%) in a study of 50 settled children aged 0 to 13 years, among the parasites identified, *Entamoeba coli* had the highest frequency (40%) in the children examined. *Entamoeba* coli is a non-pathogenic protozoan whose presence serves as an indicator of hygiene conditions, highlighting the need for improved sanitary practices to prevent the transmission of pathogenic organisms. This explains the biparasitic associations observed between *Entamoeba coli* and *Ascaris lumbricoides*, as well as between *Entamoeba coli* and *Entamoeba histolytica* (Table 2), both waterborne species commonly found in communities with compromised water quality, such as settlements (5). *Giardia lamblia* was the second most frequent protozoan in the samples analyzed in this study (30%). Considering its capacity for zoonotic transmission, the presence of *Giardia lamblia* may be related to children's contact with domestic and farm animals (14).

When evaluating the socioeconomic profile of the families participating in the study, low monthly family income and the parents' low level of schooling were

found to be critical aspects, justifying the prevalence of enteroparasitosis, given that lack of knowledge of proper hygiene practices and little insight into the transmission mechanisms of enteroparasites put children in this community at risk (15).

About the sanitation aspects of the houses, it is known that the settlement, like the urban area of the municipality of Ribeirão Preto, is entirely supplied by the Guarani Aquifer. Although this reservoir has excellent water quality, after extraction from artesian wells, it is necessary to chlorinate the water. Table 4 shows that 96% of the study population relies on water from artesian wells without chlorination, a proportion significantly higher than the 73.4% of households using untreated water in villages and rural settlements reported by Harvey et al. (16).

Furthermore, during the study period, water distribution via polyethylene hoses exposed to the ground was observed. Mechanical pressures from transportation caused ruptures, leaks, and infiltrations (Figure 3), likely contributing to water contamination and the high parasite rate. Additionally, domestic and farm animals had unrestricted access to the water distribution pipes, increasing the risk of contamination by pathogenic organisms, as noted by Portal et al. (17). Notably, 60% of families did not treat their water through filtration, boiling, or chlorination, a practice that could minimize parasite transmission (18). This finding is consistent with Nakano et al. (19), who detected helminth larvae in 20.8% of tap water samples from the same area, suggesting a link to the high prevalence of waterborne enteroparasites in local children (19).

FIGURE 3
IMAGES OF POLYETHYLENE HOSES AND LEAKS IN THE FAZENDA DA BARRA SETTLEMENTS, RIBEIRÃO PRETO, SÃO PAULO, BRAZIL, 2024

Source: Authors.

Regarding sewage disposal, 94% of the homes in the studied population had septic tanks, consistent with findings by Dornfeld et al. in a settlement in northwest São Paulo (20). Although septic tanks are a low-cost, easy-to-construct solution that can reduce water contamination in rural areas, the data suggest they are largely palliative measures. This is due to the risk of sewage infiltrating the soil and potentially failing to meet environmental legislation standards for effluent release (21, 22).

Further discussing environmental sanitation, the absence of household solid waste collection services was noted until mid-2022, when municipal community bins were installed for alternative waste disposal, used by 70% of the settled families (Table 4). It is known that inadequate solid waste disposal practices can favor the biological cycle of intestinal parasites, consequently increasing the prevalence of verminosis and even mechanical vectors, such as flies and cockroaches, which can carry protozoan cysts and helminth eggs after contact with human and/or animal feces (23).

Table 5 reveals that most parasitized children consume raw vegetables (96%) often without proper sanitization (63%), consistent with published data showing that settlers typically wash raw food with water only (12). Study also detected high levels of parasitic contamination in raw vegetables. These findings suggest that inadequate food hygiene contributes to enteroparasite infections, potentially exacerbated by poor water quality used for washing and irrigation (24). Notably, Ascaris lumbricoides eggs can easily adhere to food due to their morphology, and this study found a significant prevalence of this parasite (20%), similar with reported data in a rural settlement (13).

Regarding behavioral habits (Table 6), most parasitized children in this study (82%) reported walking barefoot. Similarly, it was reported that walking barefoot facilitates the transmission of intestinal parasites, which can be present in soil contaminated by animal or human feces, especially in areas lacking adequate sanitation, as observed in the community studied (12, 25). In addition to walking barefoot, parasitized children often play in the dirt or sand. It should be noted that, in addition to *Ascaris lumbricoides*, among the parasites that can be present in the soil are *Strongyloides stercoralis* and *Ancylostoma spp*., which have percutaneous transmission and were not found in the samples in this study. The exclusive use of the Faust and

Hoffman, Pons, and Janer methods without employing more specific diagnostic techniques for geohelminths may have led to an underestimation of their true prevalence, representing a limitation of this study.

Concerning the clinical follow-up of parasitized children, 59% of families sought medical attention sporadically, i.e., only when they fell ill, and 74% had their last parasitological examination more than a year ago (Table 7). Thus, based on these aspects, it can be seen that the characteristics of the biomedical care model are still ingrained in the settlers, where the focus is on interventions aimed only at the subject and their sick body, leaving aside the complexities of the health-disease process, that is, the social and environmental determinants and their influences on health (26). Allied to this situation, it was found that although most of the parasitized children had used antiparasitic drugs in the last 12 months (63%), their samples tested positive in the analyses carried out in this study. Given the parasitic occurrences, it's clear that medication alone is insufficient for control; a broader approach is needed, one that considers the population's living conditions and promotes effective preventive measures, health promotion, and behavioral changes (26, 27, 28).

The Ecomap (Figure 3) revealed that parasitized children live in environments that facilitate the spread of intestinal parasites, given the frequency of factors such as poor sanitation, inadequate food hygiene, limited education, and healthcare access, as well as behavioral habits and animal contact. These factors likely contribute to the high prevalence of infections in this community.

CONCLUSION

The study highlights the multifactorial causes of the high prevalence of intestinal parasites in children living in settlements, requiring analysis at various levels. Effective policy action at federal, state, and municipal levels is crucial to ensure adequate sanitation, healthcare, and education for this vulnerable group, particularly children, who require comprehensive care, quality services, and promotion of healthy habits to support their growth and development.

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CONFLICT OF INTEREST

No conflicts of interest are declared.

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