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ORIGINAL ARTICLE

ENTERIC PARASITES AND SOCIO-EPIDEMIOLOGICAL VARIABLES IN AN ACADEMIC COMMUNITY

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ABSTRACT

Studies linking human health to environmental conditions are essential since parasitic diseases are connected to environmental and sanitary aspects. This study identified the prevalence of enteric parasites in an academic community in the municipality of Santo Antônio de Jesus, Bahia, Brazil. The purpose was to determine the existence, or not, of links between infections and socio-epidemiological variables, such as personal hygiene habits, the presence of sewage systems and the environment. Participants answered a questionnaire and received universal collectors for fecal samples. Spontaneous sedimentation methods and Rugai were used for diagnosis. One hundred twenty-one samples were analyzed, in which a 38.8% parasite prevalence was detected as well as a 61.7% rate of monoparasitism, as well as a predominance of protozoa *Endolimax nana* (78.7%) and *Giardia duodenalis* (21.3%). Among parasitized individuals, 97.9% lived in the Recôncavo Baiano region. The following statistical significance stands out in the findings, with $p<0.05$: individuals who had already bathed in the local river were more likely to be parasitized than those who had not ($p = 0.034$) and individuals who washed their hands more frequently before meals proved to be less prone to intestinal parasitic infections ($p = 0.018$). Results evidenced the presence of enteric parasites in a number of participants in spite of their being university students. The socio-epidemiological variables analyzed brought to light characteristics that favor the establishment of the epidemiological infection triad, such as improper packaging of household waste on disposal and no records of regular domestic water tank cleaning.

KEY WORDS: enteric parasites; environment; diagnosis; health education.

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INTRODUCTION

Enteric parasitic infections are a major global health problem, and notoriously higher among populations in areas lacking basic sanitation, causing serious health problems for the host (Silva et al., 2014).

The Brazilian National Basic Sanitation Plan (Brazil, 2019), shows that 57.7% of the Brazilian population is supplied with clean drinking water and 48% has adequate sanitation, yet the prevalence of parasitic infections is still high. This confirms the need for health education, focusing on water storage and food handling and preparation. Despite the data mentioned, Visser et al. (2011) state that the lack of serious policies regarding health education in Brazil leads to even worse problems involving enteric parasites.

According to Ferreira et al. (2000), there are still few and scattered studies on the prevalence of enteric parasitosis in our environment and the development of parasites seems to be directly connected to environmental and health aspects, requiring further studies linking human health to environmental conditions.

Homes and the domicile environment can clarify the dynamics of incidence and prevalence of parasitic infection, since its endemicity may be related to fomite and environmental contamination (Ignacio et al., 2017).

Zoonoses must not be overlooked either considering that dogs, cats and other animals and humans have enteric parasites in common and environmental contamination favors transmission between species (Rosales & Malheiros, 2017). It is noteworthy that parasites with zoonotic potential can also cause specific parasitic diseases in humans, such as Cutaneous Larva Migrans, a dermatitis commonly known as "beach worm" (caused by cutaneous migration of hookworm infective larvae). Another disease is Visceral Larva Migrans (due to ingesting food contaminated with *Toxocara* spp. eggs, mainly causing hepatic damage) (Alves et al., 2016). Both of these are caused by pathogens from dogs and/or cats that can infect humans who will then develop these parasitic diseases.

The prevalence of intestinal parasite infections is one of the best indicators of the socioeconomic status of a population (Astal, 2004). A number of other determinants are also relevant, such as inadequate sanitary facilities, fecal pollution of water and food, sociocultural factors, contact with animals, lack of basic sanitation, in addition to host age and the type of infectious parasite (Gamboa et al., 2003). Despite students and other members of the academic community being perfectly aware of risk factors related to contamination by parasites, specific surveys performed with this public, presented positive results (Garcia et al., 2011; Odwyer et al., 2011; Santos, 2019). The relevance of this type of research is clear since the presence of individuals infected with potentially pathogenic parasites in the university environment highlights the need for permanent health education to ensure prevention within this group (Santos, 2019).

Santos (2019) evaluated the presence of intestinal parasites in students from a public university in the municipality of Ituiutaba (MG) analyzing student habits regarding food and alcohol intake as well as hygiene. The study showed that 93% of the participants took their meals away from home, 43.8% did not wash hands regularly and 60.2% did not remember having parasitological exams. Positive samples were found for *Endolimax nana* cysts (58.8%), *Entamoeba coli* cysts (17.6%) and *Cryptosporidium* sp. (28.5%).

In view of this scenario, the present study determined the prevalence of enteric parasites in an academic community at a university, correlating the findings with the participants' places of origin and residence, considering sanitary and hygiene aspects of this population.

MATERIAL AND METHODS

This study was approved by the Ethics Committee for Research with Humans under registration n. 023/2015, at the Federal University of Recôncavo of Bahia. Students gave written consent for fecal sample collection and questioning. Participants answered a questionnaire and received universal collectors for fecal samples. The structured questionnaire included variables regarding sanitary profile of the residence, personal hygiene habits, bedroom cleanliness, and health care.

A convenience sampling was carried out in the academic community of the Health Sciences Center of the Federal University of Recôncavo Baiano (CCS-UFRB), in the municipality of Santo Antônio de Jesus, Bahia, Brazil from February 2018 to March 2020. The sample consisted of students, professors and technicians. This population was chosen due to positivity in the students' parasitological exams, frequently performed by the Group of Studies in Human Parasitology (GEPaH) of the CCS/UFRB.

The Hoffmann, Pons and Janer coproscopic method (spontaneous sedimentation) was used for the parasitological analysis of the samples, which were previously stored in a polystyrene box with chemical ice. This method was chosen due to its wide spectrum in the identification and observation of parasitic species (identifying helminth eggs and larvae and protozoan cysts) as well as its low cost. The Rugai method was also utilized consisting in the principle of larvae thermo-hydrotropism leaving the material and migrating to water at a temperature of 45° C (Carvalho et al., 2005). Three slides per sample were used to identify the parasites. A sample was considered positive if there were parasites on a slide in at least one of the methods.

Of the 157 respondents in the survey, 121 delivered fecal samples, which corresponded to a 77% adherence rate.

The results obtained by microscopic analysis of stool samples and the answers to the questionnaires were organized in simple contingency tables. The data were tabulated, processed and analyzed by the IBM SPSS Statistics 20 program, using the chi-square test to compare the prevalence of enteric parasites according to socio-epidemiological variables. The evaluation of possible associations between the prevalence of intestinal parasitic infections and risk factors was performed using the chi-square test or Fischer's exact test, depending on the characteristics of the data found. The statistical significance of the associations was 95% ($p \leq 0.05$).

The location map was based on the work by Silva et al. (2006), considering in this study the distribution of the frequency of enteric parasitic infection in the residential neighborhoods of the group studied. This map was prepared using Microsoft Word 97/2000/XP/2003, edited with the aid of data from the municipality of Santo Antônio de Jesus through Google Maps (available at https://goo.gl/maps/SJw1wv32AgwD7My77), adapted to the purpose of the study.

RESULTS AND DISCUSSION

Research in the field of Human Parasitology still faces a number of challenges. This study took place in a community where the researchers were closely involved which may have made some participants uncomfortable about delivering fecal material, even though the principle of research confidentiality and the ethical issues involved were explained. The study by Ferreira et al. (2013) corroborates this embarrassing aspect expressed by the participants on providing fecal material for analysis.

The coproparasitological analysis of the 121 samples showed that 38.8% were positive for at least one parasite species. Among the positive results, 61.7% were monoparasitic, with a higher prevalence of protozoa than helminths (Figure 1A). The higher prevalence of protozoan infection in regard to helminth infection is consistent with other studies in Brazilian municipalities. Namely, that by Bosqui et al. (2016) with the population of Londrina (PR), and the study by Santos (2019) with students from a public university in the municipality of Ituiutaba (MG), and also with the findings of Behailu et al. (2019) with university students in Ethiopia.

The non-pathogenic protozoan *Endolimax nana* presented a higher prevalence corresponding to 78.7%, a human intestinal commensal protozoa that can sometimes cause diarrhea, cramps and nausea, although offering no real risk to human life (Cimerman & Cimerman, 2012). Regarding pathogenics, the prevalence of *Giardia duodenalis* (21.3%) and *Entamoeba histolytica / Entamoeba dispar* (14.9%) stood out. There were also positive samples for geohelminths *Trichostrongylus* sp and hookworms (Figure 1).

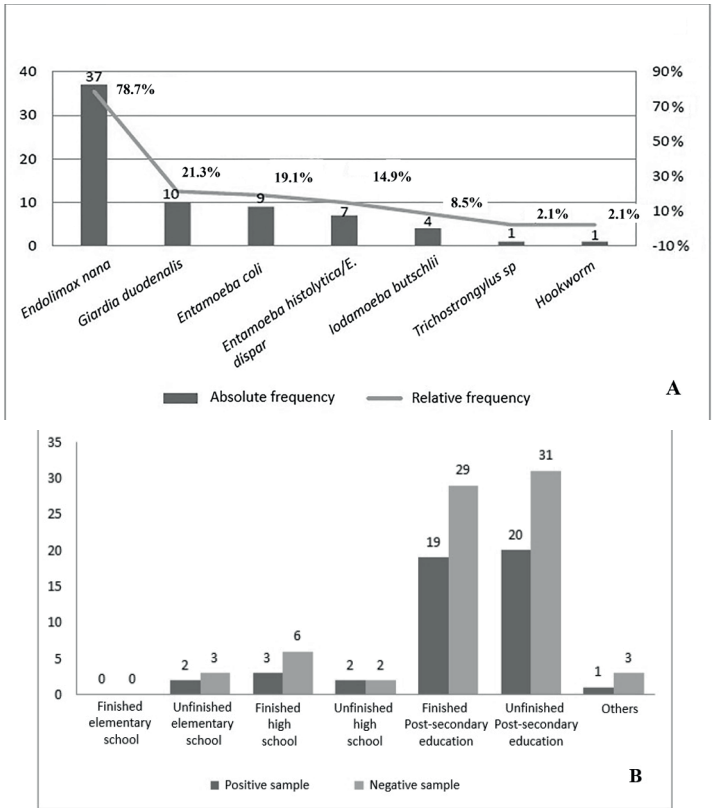

Figure 1. Parasitological analysis and distribution of positive samples: A. For parasites found in positive samples; B. By level of education and frequency of parasitism.

Despite not being pathogenic, *E. nana* can indicate poor hygiene and health. Cysts verified in the stool test indicate exposure to and possible ingestion of water or food contaminated with fecal contaminants, thereby validating the test as a sanitary and environmental indicator (Cimerman & Cimerman, 2012).

Considering the findings for *G. duodenalis*, the etiologic agent of giardiasis, and for *E. histolytica*, the etiologic agent of amebiasis, globally neglected protozoan diseases, the global load of intestinal infections by protozoa remains unacceptably high, despite enormous advances in the prevention of communicable diseases. Currently, approximately 50 million people present *E. histolytica* worldwide, while another 3 million are infected with *G. duodenalis*. In spite of occurring worldwide, infection prevalence is more common in the tropics and subtropics where there is deficient sanitation (Behailu et al., 2019).

In Brazil, these protozoa, mainly *G. duodenalis*, have been common in human samples for years, and the endemicity of giardiasis in several states is evident, requiring control programs focused on these protozoa. High frequencies can be found within states located in all Brazilian regions, such as Mato Grosso in the Midwest (Freitas et al., 2014), Paraná in the South (Bosqui et al., 2016), Bahia in the Northeast (Andrade et al., 2018), Minas Gerais in the Southeast (Belo et al., 2012) and Amazonas in the North of the country (Visser et al., 2011).

As pointed out by Souza and Amor (2010), there is no method capable of diagnosing all parasitic forms at the same time. Some are general methods, allowing the diagnosis of various intestinal parasites, in addition to being inexpensive and easily performed, which is why they are used routinely. However, the use of specific techniques in the laboratory routine is essential to reduce false-negative results, since some species of parasites are only evidenced by special techniques. In addition, the production of cysts, eggs or larvae is not uniform throughout the day or the parasite cycle so the material should be analyzed as soon as possible. Therefore, in spite of the relevance of this type of research, the use of only one fecal sample per participant, the use of non-sensitive or specific diagnostic methods, as well as the intermittent release of parasitic forms, may have contributed to the underestimation of data regarding the prevalence of intestinal parasites in this study.

The low prevalence of helminths can also be explained by the fact that the population has easy access to medication, mainly to fight intestinal nematodes. The indiscriminate use of anthelmintic drugs can mask the real health and socioeconomic situation of the population since the prevalence of helminths is reduced without improvement in living conditions, meaning the population is still vulnerable to reinfections (Belo et al., 2012).

In Brazil there are few reports on the frequency of *Trichostrongylus*, and its prevalence may be underestimated. This fact is probably due to the difficulty in distinguishing *Trichostrongylus* spp from hookworm eggs and even other nematodes. Although the treatment is the same as for other geohelminths, the sources of infection are not eliminated with the reduction of infection in humans, thus confirming the need for health education, addressing aspects of food, water and environmental hygiene as well as parasitized animals. Official geohelminth control policies do not address human trichostrongylosis. Despite the low prevalence, it is appropriate to discuss human trichostrongylosis in this population. It is a zoonosis with a cycle dependent on infected animals (ruminants, birds and rodents), the environment and susceptible humans (Souza et al., 2013).

The authors talked to a participant who presented a positive stool sample for *Trichostrongylus* sp in order to understand better how the epidemiological triad of this infection was established in practice, that is, contact of the parasite with the host in the environment. During the interview, the person related constant visits to the rural area of the municipality of Laje, located in Bahia's

Recôncavo. The infected person habitually used bovine feces as fertilizer for a vegetable garden there. The life cycle of *Trichostrongylus* spp occurs precisely when eggs are eliminated through the feces of infected animals releasing the larvae into the environment under favorable conditions. The handling of this fertilizer and soil occurred without the use of gloves or boots. This may have meant that there was direct contact with the bovine feces, contamination of the environment and human infection. Subsequently stool samples from the family, soil and feces used as fertilizers were analyzed to complete the parasitic cycle.

With the positivity identified, the life cycle of *Trichostrongylus* sp in the environment was outlined and preventive measures were discussed with this family. Through this work, the infection triad at the site was evidenced, showing how the environment was directly related to the maintenance of the parasitic cycle in question. In addition, this work also emphasized the importance of building lifelike models of parasitic cycles, contributing to the adoption and / or establishment of prophylactic measures (Ribeiro et al., 2019), bringing to the fore the cycle based on the habits of those infected, as was done in this study. In this way, aspects of this parasitic continuance were evidenced with the infected bovine probably excreting feces contaminated with eggs that hatch into rhabditoid larvae and differentiate into filarioid larvae of *Trichostrongylus* spp in the environment. Contaminated feces used as fertilizer in a vegetable garden for example, without the use of protective equipment / clothing cause direct infection, with active penetration of the larva. It should also be noted that both humans and animals can release feces with evolutionary forms that mature into infectious forms in the environment, perpetuating the parasitic cycle.

The level of educational of the population in the present study may have contributed to the low rate of pathogenic parasites. However, the percentage of pathogenic and non-pathogenic protozoa evidenced parasite circulation in this public. This high rate of protozoa can be multifactorial, and can be a bio indicator of fecal-oral contamination (contaminated food and drinks) and sanitary conditions, since drinking water is the main cause of this infection (Freitas et al., 2014). Additional guidelines should be devised on with the researched public, such as cleaning the places where they eat, proper handling of food and hygiene (Behailu et al., 2019).

The level of education is an important factor in understanding diseases, their forms of transmission and prevention (Visser et al., 2011). Of the 121 participants who had their samples analyzed, 39.7% (n=48) reported having completed post-secondary education, 42.1% (n=51) had incomplete post-secondary education, 7.4% (n=9) had only finished high school, 3.3% (n=4) incomplete high school and, 4.1% (n=5) incomplete elementary school. Figure 1B describes the level of education and the frequency of parasitism. Regarding the occupation of the participants, 4.1% (n=5) were professors, 76% (n=92) students, 4.1% (n=5) administrative technicians and 15.7% (n=19) were employees of outsourced companies.

Among individuals with positive samples, 100% (n=47) lived in Recôncavo da Bahia. Of these, 2.1% (n=1) in the capital (Salvador); 91.4% (n=43) lived in the city of Santo Antônio de Jesus, 2.1% (n=1) in Conceição do Almeida; 2.12% (n=1) in Laje and 2.1% in Cruz das Almas (Figure 2). In the municipality of Santo Antônio de Jesus, the distribution of participants with positive samples is shown by the neighborhood in Figure 2B. The higher prevalence of positive samples in the Cajueiro neighborhood is due to the large number of students residing in this location as it is near the CCS-UFRB campus on the outskirts of the city. There is considerable real estate speculation in the area, with overpricing by both developers and large property owners, as well as the local population itself (Santana & Marengo, 2012). Carvalho et al. (2016) detected this poor infrastructure and basic sanitation in this neighborhood, which may have led to triad of infection. Small markets and numerous similar establishments in the neighborhood serve a relevant population, namely the university public, and need to be attentive to local health issues so as not to compromise the health of all involved.

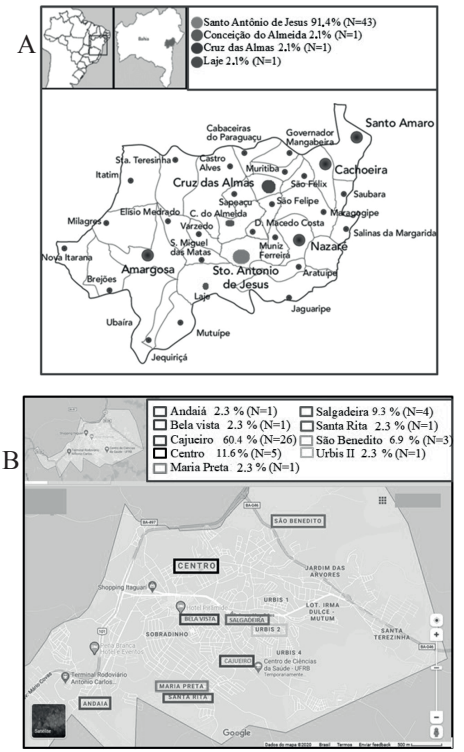

Figure 2. Parasitological analysis and distribution of positive samples: A. According to the city where the participants live; B. According to districts in Santo Antônio de Jesus-BA. Source: Adapted from Silva et al., 2006.

Table 1 shows that the residential aspects were not statistically significant, but certain variables contributed to characterize the epidemiological profile of the population studied. The highest prevalence of parasites occurred when the residence had the following characteristics: unpaved street; garbage not packed in plastic bags or in bins with lids; garbage only collected once a week; annual incidence of rodents and presence of mosquitoes in the afternoon.

The analyses of questions related to the hygiene habits of the participants, correlated to the result of the coproparasitological examination, showed a higher prevalence of parasites when: there was piped water drunk directly from the tap; the water tank in the residence was not cleaned regularly; the participant reported having swim in the river; irregular or no hand washing after using the toilet; irregular hand washing before meals (Table 1). The analysis also allowed the inference of statistical significance in the correlations: individuals who had bathed in the river ($p = 0.034$) and individuals according to the frequency of hand washing before meals ($p = 0.018$) with positive sample data for enteric parasites.

Such results corroborate Soares and Cantos (2005) in their assertion that hygiene conditions are reflected in the control of enteric parasites, since elements such as air, water, hands and food are foremost in the transmission of enteric parasites as they are part of their epidemiological chain. Cavagnolli et al. (2015) also agree that personal hygiene, food consumption, and the use and manipulation of water in households, are related to the transmission of enteropathogens. Furthermore, personal hygiene habits presented by the researched public are not the only elements reflected in this discussion. The infrastructural deficiencies related to the environment / residences of the academic community are also linked to infection by enteric parasites, such as unawareness regarding cleaning of the water tank in their homes, water that has not been filtered or cleaned in some other way, among other factors.

Considering the current world situation, undergoing the SARS-Cov-2 / Covid-19 pandemic, it is hoped there will be a post-pandemic world with better hygiene conditions for the population. A few of the prophylactic measures are also vital in regard to the new coronavirus: frequent hand washing, paying attention to careful cleaning of fingers, nails, wrist, palms and back of hands, and also using 70% alcohol, ensuring asepsis not only of the hands, but also of personal objects (Brazil, 2020) and food (Anvisa, 2020). Such habits coincide with the preventive measures of the main enteric parasites and can lead to a probable decrease in their prevalence. Therefore, investments and equitable public policies that recognize health as a right and that prioritize the needy as an essential category before justice are indispensable (Miranda et al., 2017).

Table 1. Correlation of aspects of the residence, hygiene habits and parasitological analysis.

Variable		N	n (%) Positive result of parasitological analysis	p-value	OR	95%CI
Sewage	Yes	104	43 (41.3)	0.16	2.3	0.7 – 7.5
	No	17	4 (23.5)			
Pavement	Yes	110	40 (36.4)	0.08	0.3	0.1 – 1.2
	No	11	7 (63.6)			
Plastic bags or buckets with lids for garbage	Yes	116	45 (38.8)	0.84	1.0	0.2 – 5.9
	No	5	2 (40)			
Daily garbage collection	Yes	108	41 (38)	0.42	0.7	0.2 – 2.3
	No	13	6 (46.2)			
Domestic animals	Yes	89	33 (37.1)	0.51	0.8	0.3 – 1.7
	No	32	14 (43.8)			
Presence of Mosquitoes exclusively in the night	Yes	61	24 (39.3)	0.72	1.1	0.5 – 2.2
	No	60	23 (38.3)			
Presence of Rodents - Semesterly	Yes	11	4 (36.4)	0.52	0.9	0.2 – 3.2
	No	110	43 (39.1)			
Have ever taken a bath in the river	Yes	104	44 (42.3)	0.03*	3.4	0.9 – 12.6
	No / Not informed	17	3 (17.6)			
Washing hands before meals	Yes (Always)	87	27 (31)	0.02*	0.3	0.1 – 0.7
	No / Sometimes	34	20 (58.8)			
Washing hands after using the toilet	Yes (Always)	112	41 (36.6)	0.08	1.0	0.5 – 2.3
	No / Sometimes	9	6 (66.7)			
Washing hands before using the toilet	Yes (Always)	33	13 (39.4)	0.77	0.3	0.1 – 1.2
	No / Sometimes	88	34 (38.6)			
Water source - Cistern well / Rainwater / Piped	Yes	49	19 (38.8)	0.55	1.0	0.5 – 2.1
	No	72	28 (38.9)			
Frequency of cleaning water storage tank - Annually	Yes	23	9 (39.1)	0.27	1.0	0.4 – 2.6
	No (Not informed)	48	24 (50)			

*$p<0.05$: result considered statistically significant.

Regarding the participants' bedrooms, the frequency of the following variables characterized the parasite prevalence profile: mold/moisture stains on walls/ceiling; sweeping or vacuuming the dust or use of a damp cloth; sleeping on a mattress with a cover or antiallergic material; pillow with an anti-allergic cover or material; bed linen changed once a week; bed and pillow cleaning (Table 2). In spite of no statistical significance, such characterization also contributed to the epidemiological profile of the studied group, with other variables mentioned above.

Table 2. Correlation of bedroom aspects and parasitological analysis.

Variable		N	n (%) Positive result in parasitological analysis	p-value	OR	95%CI
Mold/moisture stains on walls/ceiling	Yes	61	29 (47.5)	0.12	2.1	1.0 – 4.5
	No	60	18 (30.5)			
Methods to clean the bedroom - Sweep + damp cloth	Yes	98	36 (36.7)	0.52	0.6	0.2 – 1.6
	No	23	11 (47.8)			
Sleeps on mattress with cover or anti-allergic material	Yes	31	14 (45.2)	0.40	1.4	0.6 – 3.2
	No	90	33 (36.7)			
Pillow with cover or anti-allergic material	Yes	29	11 (37.9)	0.09	1.0	0.4 – 2.2
	No	92	36 (39.1)			
Frequency of bed linen change - Weekly	Yes	80	29 (36.2)	0.50	0.7	0.3 – 1.6
	No	41	18 (43.9)			
Mattress cleaning method - Sunlight exposure	Yes	28	8 (28.6)	0.68	0.6	0.2 – 1.4
	No	93	39 (41.9)			
Pillow cleaning method - Sunlight exposure	Yes	50	16 (32)	0.47	0.6	0.3 – 1,3
	No	71	31 (43.7)			

As for the participants health habits, the positive data from the coproparasitological exams are related to time elapsed since the last exam; positive parasitological history of feces and taking home remedies (Table 3). Participants who underwent their last stool analysis more than a year ago had a higher prevalence of positive samples and this result showed statistical significance (p=0.013). Another interesting fact refers to whether they used antiparasitic medication after the previous parasitological stool examination results, showing an important prevalence of positive results, even after treatment. Data that approached the statistical significance, presenting a value of

p=0.054. This shows that, despite treatment, reinfection can occur. Therefore, other actions may be more effective than just the prescription of a drug, such as integrated strategies for information, education, health communication and community mobilization (Rodrigues et al., 2016).

In summary, Tables 1 and 3, which present the analyses of factors associated with infection by enteric parasites, showed that bathing in the river, the frequency of hand washing before meals and the time interval between parasitological stool examinations are vital factors for the control of this type of infection in the studied academic community.

Table 3. Correlation between health habits and parasitological analysis.

Variable		N	n (%) Positive result in parasitological analysis	p-value	OR	95%CI
Time since the last coproparasitological analysis - More than 1 year	Yes	58	28 (48.3)	0.01*	2.2	1.0 – 4.6
	No	63	19 (30.2)			
Positivity in the last coproparasitological analysis	Yes	56	27 (48.2)	0.12	2.1	1.0 – 4.4
	No	65	20 (30.8)			
Use of antiparasitic drug	Yes	37	18 (48.6)	0.05**	1.8	0.8 – 3.9
	No	84	29 (34.5)			
Use of homemade medicine	Yes	68	29 (42.6)	0.33	1.4	0.7 – 3.0
	No	53	18 (34)			
Knowledge of any antiparasitic homemade medicine	Yes	36	16 (44.4)	0.41	1.4	0.6 – 3.1
	No	85	31 (36.5)			

*p<0.05: result considered statistically significant.
**Result close to statistical significance

Studies have shown that health education is an extremely important tool when facing this problem and a very precise strategy to address the issue of enteric parasites, as it results in health improvement, since knowledge can engender prevention (Rodrigues et al., 2016). At the end of the study, in addition to the delivery of the examination reports, the researchers presented the results to the community in the form of an interactive health fair. This consisted of four stations focusing on presentation of the research results with parasite viewing under the microscope, presentation of the symptoms of parasitoses, use of posters with

parasitic cycles and preventive measures and a board game with questions related to enteric parasites. This fair also concluded the health education stage, informing research participants of preventive measures related to enteric parasites (Passos et al., 2019).

This research reports the prevalence of enteric parasites in an academic community in Recôncavo of Bahia and correlates these findings with the sanitary aspects and hygiene conditions of this community. The relevance of this study is mainly due to the lack of epidemiological studies focused on enteric infections in the interior of Bahia. The data presented in addition to other studies developed by this group in the Recôncavo of Bahia region (Carvalho et al., 2016; Andrade et al., 2018) can serve as subsidies for individual and / or collective public health interventions.

The study allowed the authors to develop research skills and take part in the university extension program, since in addition to applying the questionnaire, processing and performing laboratory analysis of fecal samples; they also held a fair focusing on data feedback, thus performing health education activities regarding enteric parasites. Considering this is a neglected subject, the involvement in the research and study group related to the theme enabled the students to develop a wider and differentiated view of the problem, feeling, therefore prepared to deal with issues involving enteric parasites during their undergraduate studies and in the future as working professionals.

Result feedback and participation in the interactive fair on the subject of this research was a rewarding experience for the entire group. In addition, the development of the study also contributed to the epidemiological data of the population residing in Santo Antônio de Jesus-Bahia-Brazil.

The present study evidenced intestinal parasites in the academic community of CCS-UFRB. The coproparasitological survey of university students was of paramount importance for the provision of epidemiological information necessary to promote intervention measures, since the presence of potentially pathogenic individuals in the academic environment is distressing. Therefore, it is necessary to develop permanent health education actions to encourage group prevention.

In this scenario, the results indicated that the main factors related to the transmission of these parasites may be inadequate hygiene habits, such as not washing hands regularly before meals or after using toilets or allowing long periods to elapse between parasitological feces examinations. Therefore more health promotion activities that encourage prevention and fight these infections are necessary, aiming at community involvement, in the development of programs within the university environment itself. The results show that the circulation of pathogenic and non-pathogenic parasites still occur despite the university profile of the researched community. They also highlight the need for research and actions to control, eliminate and/or minimizing occurrence, both in the university environment and in the municipality of Santo Antônio de Jesus, carrying out specific measures in the Cajueiro neighborhood where most of the participants live.

CONFLICT OF INTERESTS

We declare that we do not have, a conflict of interest of a personal, commercial, academic, political and / or financial nature in the manuscript.

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