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ORIGINAL ARTICLE

Prevalence of schistosomiasis and associated risk factors in endemic communities: cross-sectional study, Patioba and Colônia Miranda, Sergipe, 2022-2023

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Abstract

Objectives: To determine the prevalence of schistosomiasis and identify risk factors that influence disease transmission in endemic communities in the state of Sergipe. **Methods:** A cross-sectional study was conducted in the Patioba and Colônia Miranda communities, located in the municipalities of Japaratuba and São Cristóvão, respectively. An epidemiological and parasitological survey of schistosomiasis was conducted using a sociodemographic questionnaire and the Kato-Katz method. Pearson's Chi-squared test and correlation coefficients were used to determine associations between categorical and continuous variables, respectively. Prevalence ratio (PR), odds ratio (OR) and 95% confidence intervals (95%CI) measured the strength of associations. **Results:** A total of 721 participants were included in the study. Schistosomiasis prevalence was 33.6% (118/351) in Patioba and 25.7% (95/370) in Colônia Miranda. The male sex (n=62, 52.5%; p-value 0.008), low level of education (n=65, 55.1%; p-value 0.034), fishing activities (PR 1.69; 95%CI 1.35; 2.11; p-value 0.002) and bathing/personal hygiene in freshwater (PR 1.48; 95%CI 1.17; 1.87; p-value 0.027) were associated with infection. Being of the male sex was also a predictor of infection (OR 1.41; 95%CI 1.01; 1.96; p-value 0.040), as was contact with freshwater (OR 0.40; 95%CI 0.28; 0.58; p-value<0.001). **Conclusions:** Patioba and Colônia Miranda have high schistosomiasis prevalence, as well as *Schistosoma mansoni* infection risk factors that vary between the two communities studied.

Keywords: Schistosomiasis Mansoni; *Schistosoma mansoni*; Risk Factors; Prevalence; Health Surveys.

Ethical aspects

This research respected ethical principles, having obtained the following approval data:		
Research ethics committee	**Opinion number**	**Approval date**
Comissão Nacional de Ética em Pesquisa	6,590,838	26/12/2023
Universidade Federal de Sergipe	6,044,220	8/5/2023
Informed consent form	Obtained from all participants prior to data collection.	

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Introduction

Schistosomiasis is a neglected tropical disease that affects approximately 250 million people in 78 countries. The endemic nature of the disease is directly associated with economic and social vulnerability, lack of access to drinking water and precarious basic sanitation in rural and/or peri-urban areas (1).

The schistosomiasis epidemiological model is complex, and its manifestation as a disease in the community is conditioned by a combination of different factors (2), aggravated by a scenario of significant social inequalities (3). Its endemicity is directly associated with poor socioeconomic conditions and the presence of an intermediate host in water bodies (3).

Occurrence of schistosomiasis in Brazil is attributed solely to the *Schistosoma mansoni* species, the transmission of which is reported in all regions of the country (4). The proportion of schistosomiasis positivity is high in several states, especially in the Northeast region of Brazil, where approximately 72.0% of the total cases of the disease are concentrated (4,5). Some states are considered endemic, namely: Alagoas, Bahia, Pernambuco, Rio Grande do Norte, Paraíba, Sergipe, Espírito Santo, and Minas Gerais. Of these, Sergipe has the highest percentage of positivity for the disease in the country (8.0%), exceeding the regional and national averages, which are approximately 2.0% (4). In the other states, namely Pará, Maranhão, Piauí, Ceará, Rio de Janeiro, São Paulo, Santa Catarina, Paraná, Rio Grande do Sul, Goiás and the Federal District, transmission is focal (4).

Preventive measures performed by the Schistosomiasis Control Program, focused on actively identifying patients and treating those infected in endemic areas of the country, have led to a significant reduction in morbidity and severe forms of schistosomiasis in recent decades (6,5). However, high prevalence rates persist in several areas of the country, continuing to be a public health problem (4). In Sergipe, schistosomiasis is widespread, affecting 68.0% of its municipalities, recognized as endemic areas of the disease (7,8,4). Therefore, studies that address and identify risk factors responsible for driving schistosomiasis transmission in endemic regions of the state, which has a high percentage of the disease in relation to the rest of the country, are of paramount importance.

This study aimed to determine the prevalence and identify risk factors that influence schistosomiasis transmission in two communities located in endemic areas of Sergipe, in Northeast Brazil.

Methods

This cross-sectional study was conducted from August 2022 to April 2023 in two communities in the state of Sergipe, in the Northeast region of Brazil:

- Patioba: a community certified as a remnant *quilombo* community, inhabited by 632 residents, located in a rural area of Japaratuba (latitude: -10.5953, longitude: -36.9399 10° 35′43″ South, 36° 56′24″ West), a municipality in the east of Sergipe;
- Colônia Miranda: a fishing community inhabited by 622 residents, located in São Cristóvão (latitude: -11.0135, longitude: -37.2224 11°0′49″ South, 37°13′21″), a municipality within the Greater Aracaju region. Aracaju is the capital city of the state of Sergipe.

A talk was given in both communities to provide information about schistosomiasis and the objectives of the research. All residents of both communities were invited to participate in the study.

Residents of both communities, of both sexes and aged ≥4 years, who provided written consent regarding their participation in the study and provided all data and biological materials (stool samples) requested for carrying out the research were included in the research.

Study participants were registered and interviewed during home visits. The instrument used was a structured questionnaire designed to collect data related to sociodemographic and behavioral factors, as well as freshwater contact patterns. During this phase, we relied on the participation of community health and endemic disease workers from the Japaratuba and São Cristóvão Municipal Health Departments, as well as the support of local community leaders, who collaborated in mapping the communities studied and leading the field teams, thus ensuring that all study participants were visited.

To determine the prevalence of the disease in both communities, we conducted a parasitological survey of schistosomiasis. Each study participant provided two stool samples for analysis, collected on consecutive days using the Kato-Katz method, following the methodology described by Katz et al. (9). Experienced technicians prepared two slides from each collected sample, totaling four slides per study participant. The intensity of *S. mansoni* infection was categorized according to eggs per gram of feces (EPG) and defined as mild (1-99 EPG), moderate (100-399 EPG), or heavy (>400 EPG). Treatment with praziquantel was provided to all individuals who tested positive for *S. mansoni*. The Sergipe State Health Department participated in this phase via the teams of the Endemic Diseases Unit of its Epidemiological Surveillance service.

The data were analyzed using SPSS (Statistical Package for the Social Sciences) version 23.1. Categorical data were expressed as absolute (n) and relative (%) frequencies, including: sex, age group (years), education level, occupation, income (minimum wage), receipt of government benefits, solid and liquid waste disposal, garbage collection and source of water supply. Participants were categorized according to contact with freshwater sources and the reasons for contact with them. Discrete numerical variables included age, number of bathrooms, and number of inhabitants per household. *S. mansoni* infection diagnosis, obtained using the Kato-Katz method, was analyzed using two approaches: discrete quantitative variables (number of eggs per sample) and categorical variables, based on test positivity or infection intensity (mild, moderate or heavy parasite load). Associations between categorical variables were determined using Pearson's chi-square test. The magnitude of the association between variables was calculated using prevalence ratio (PR) or odds ratio (OR), where appropriate, as well as their 95% confidence intervals (95%CI). Pearson's correlation coefficient (r) was used to analyze the relationship between continuous variables. Categorical variables and infection status were predicted using binary logistic regression. In all analyses, "did not answer" responses were disregarded. Statistical significance was set at p-value<0.05.

Results

A total of 721 participants from both locations were included in the study. Schistosomiasis positivity was 33.6% (118/351) in Patioba and 25.7% (95/370) in Colônia Miranda. The intensity of *S. mansoni infection* was predominantly mild in the communities, accounting for 81.4% (96/351) and 85.3% (81/370) of positive cases in Patioba and Colônia Miranda, respectively. There was no difference in the frequency of individuals with mild, moderate or heavy intensity infection in the two locations (Table 1).

Table 1. Absolute frequencies (n) and relative frequencies (%) of prevalence and intensity of *Schistosoma mansoni* infection in the Patioba and Colônia Miranda communities. Japaratuba and São Cristóvão, 2022-2023 (n=721)

	Prevalence	Infection intensity			
Community	**n (%)**	**Mild n (%)**	**Moderate n (%)**	**Heavy n (%)**	**p-value**
Patioba (n=351)	118 (33.6)	96 (81.4)	16 (13.6)	6 (5.1)	0.503
Colônia Miranda (n=370)	95 (25.7)	81 (85.3)	12 (12.6)	2 (2.1)	

In Patioba, 57.3% (n=201) and 42.7% (n=150) of participants were female and male, respectively, with ages ranging from 4 to 90 years and a mean age of 37.58 ±21.38 years. In Colônia Miranda, 53.5% (n=198) and 46.5% (n=172) were female and male, respectively, with ages ranging from 4 to 96 years and a mean age of 33.98±20.12 years.

The data in Table 2 show that in both communities there was significant association between *S. mansoni* infection and certain sociodemographic characteristics. In Patioba, occurrence of infection was significantly associated with the male sex (n=62, 52.5%; p-value 0.008) and low schooling levels (p-value 0.034), with 55.1% (n=65) of those infected having only elementary education. This community had no access to drinking water supply or sewage services, with 99.2% (n=117) of those infected consuming water from wells and cisterns. It should be mentioned that, for this variable, it was not possible to apply the statistical method due to the number of cells equal to zero. Furthermore, in Patioba, there was association between the use of indoor toilets and negative diagnosis for infection (n=218, 93.6%; p-value 0.005).

In Colônia Miranda, 52.6% (n=50) of those infected were female; however, there was no significant association between sex and *S. mansoni* infection (p-value 0.841). There were significant differences among participants who tested negative for *S. mansoni*, which was more frequent among individuals living in households with fewer than five inhabitants (n=189, 68.7%; p-value 0.041) and among those who did not receive government benefits (n=143, 52,0%; p-value 0.041). These individuals were 45.4% more likely to become infected with *S. mansoni* compared to individuals living in households with more than five inhabitants (OR 0.45; 95%CI 0.19; 1.06). Age group, occupation, minimum wage income, number of toilets, garbage collection, solid and liquid waste disposal and source of water supply were not associated with *S. mansoni* infection (Table 2).

In Patioba, 74.6% (n=88) of those who tested positive for *S. mansoni* reported having contact with freshwater sources. The main reasons for exposure to these water sources were related to bathing and personal hygiene activities (n=69, 58.5%), washing clothes/dishes (n=53, 44.9%), and fetching water (n=33, 28.0%). Fishing activities (n=26, 22.0%) was the only water contact variable that showed significant association with *S. mansoni* infection (PR 1.69; 95%CI 1.35; 2.11; p-value 0.002) (Table 3).

In Colônia Miranda, 77.9% (n=74) of those infected accessed freshwater, with bathing and personal hygiene (n=37, 38.9%) being the most frequent activity and the only one associated with schistosomiasis (PR 1.48; 95%CI 1.17; 1.87; p-value 0.027) (Table 4). There was a higher frequency of individuals who tested negative for *S. mansoni* among those who reported no contact with freshwater. Participants who reported contact with these water sources were 2.75 times more likely to become infected (OR 2.75; 95%CI 1.57; 4.82).

Table 2. Absolute frequencies (n) and relative frequencies (%) of *Schistosoma mansoni* infection and of the sociodemographic characteristics in the Patioba and Colônia Miranda communities. Japaratuba and São Cristóvão, 2022-2023 (n=721)

Variables	Patioba Community			Colônia Miranda Community		
	Positive[a] n (%)	Negative[b] n (%)	p-value	Positive[c] n (%)	Negative[d] n (%)	p-value
Sex			0.008			0.841
Female	56 (47.5)	145 (62.2)		50 (52.6)	148 (53.8)	
Male	62 (52.5)	88 (37.8)		45 (47.4)	127 (46.2)	
Age group (years)			0.461			0.118
0-14	20 (16.9)	41 (17.6)		19 (20.0)	67 (24.4)	
15-59	83 (70.3)	151 (64.8)		69 (72.6)	170 (61.8)	
≥60	15 (12.7)	41 (17.6)		7 (7.4)	38 (13.8)	
Schooling			0.034			0.729
Illiterate	7 (5.9)	23 (9.9)		12 (12.6)	40 (14.5)	
Elementary education	65 (55.1)	104 (44.6)		51 (53.7)	143 (52.0)	
High school education	41 (34.7)	76 (32.6)		29 (30.5)	78 (28.4)	
Higher Education	1 (0.8)	17 (7.3)		-	10 (3.6)	
Did not answer	4 (3.4)	13 (5.6)		3 (3.2)	4 (1.5)	
Profession			0.227			0.574
Rural activities	9 (7.6)	13 (5.6)		1 (1.1)	2 (0.72)	
Fisherman	-	1 (0.4)		28 (29.5)	63 (22.90)	
Housewife	25 (21.2)	53 (22.7)		5 (5.3)	16 (5.81)	
Unemployed	4 (3.4)	8 (3.4)		-	-	
Student	37 (31.4)	44 (18.9)		35 (36.9)	75 (27.3)	
Other	33 (28.0)	76 (32.6)		18 (19.0)	95 (34.5)	
Did not answer	10 (8.5)	38 (16.3)		8 (8.4)	24 (8.7)	
Income (minimum wages)			0.145			0.498
<1	42 (35.6)	68 (29.2)		24 (25.3)	61 (22.2)	
1-3	63 (53.4)	139 (59.7)		22 (23.2)	81 (29.5)	
>3	2 (1.7)	12 (5.2)		1 (1.1)	5 (1.8)	
Did not answer	11 (9.3)	14 (6.0)		48 (50.5)	128 (46.5)	
Receives benefit from the government			0.546			0.041
Yes	43 (36.4)	76 (32.6)		43 (45.3)	91 (33.1)	
No	72 (61.0)	147 (63.1)		40 (42.1)	143 (52.0)	
Did not answer	3 (2.5)	10 (4.3)		12 (12.6)	41 (14.9)	
Number of dwellers			0.065			0.041
≤5	108 (91.5)	203 (87.1)		59 (62.1)	189 (68.7)	
>5	7 (5.9)	29 (12.4)		23 (24.2)	40 (14.5)	
Did not answer	3 (2.5)	1 (0.4)		13 (13.7)	46 (16.7)	
Number of bathrooms			0.075			0.412
None	-	-		2 (2.1)	2 (0.7)	
1	102 (86.4)	192 (82.4)		58 (61.1)	181 (65.8)	
>1	13 (11.0)	40 (17.2)		20 (21.1)	43 (15.6)	
Did not answer	3 (2.5)	1 (0.4)		15 (15.8)	49 (17.8)	
Type of bathroom			0.005			0.371
Inside	105 (89.0)	218 (93.6)		87 (91.6)	253 (92.0)	
Outside	8 (6.8)	3 (1.3)		3 (3.2)	3 (1.1)	
Community	-	-		-	-	
None	-	-		2 (2.1)	4 (1.5)	
Did not answer	5 (4.2)	12 (5.2)		3 (3.2)	15 (5.5)	
Garbage collection			0.991			0.443
Public	116 (98.3)	229 (99.0)		90 (94.7)	256 (93.1)	
Other	1 (0.8)	2 (0.9)		4 (4.2)	7 (2.5)	
Did not answer	1 (0.8)	2 (0.9)		1 (1.1)	12 (4.4)	
Solid and liquid waste disposal			0.055			0.523
Connected to sewer system	-	-		33 (34.7)	98 (35.6)	
Open sewer/channel	54 (45.8)	137 (58.8)		44 (46.3)	128 (46.5)	
Cesspit	63 (53.4)	93 (39.9)		17 (17.9)	39 (14.9)	
Did not answer	1 (0.9)	3 (1.3)		1 (1.1)	10 (3.6)	
Source of water supply			-			0.445
Water company	-	-		83 (87.4)	245 (89.1)	
Well and/or cistern water	117 (99.2)	221 (94.8)		6 (6.3)	12 (4.4)	
Other	-	3 (1.)		5 (5.3)	8 (2.9)	
Did not answer	1 (0.8)	9 (3.9)		1 (1.1)	10 (3.6)	

[a]n=118; [b]n=233; [c]n=95; [d]n=275.

Table 3. Absolute frequencies (n) and relative frequencies (%) of schistosomiasis, with prevalence ratio (PR) and respective 95% confidence intervals (95%CI), regarding contact of study participants with freshwater in the Patioba community. Japaratuba, 2022-2023 (n=351)

Variables	Positive[a] n (%)	Negative[b] n (%)	PR (95%CI)	p-value
Contact with freshwater				0.077
Yes	88 (74.6)	151 (64.8)	1.35 (1.08; 1.69)	
No	29 (24.6)	78 (33.5)		
Did not answer	1 (0.8)	4 (1.7)		
Reasons for contact				
Fetching water	33 (28.0)	47 (20.2)	1.30 (1.04; 1.63)	0.100
Washing clothes/dishes	53 (44.9)	96 (41.2)	1.09 (0.87; 1.37)	0.506
Bathing and personal hygiene	69 (58.5)	122 (52.4)	1.16 (0.93; 1.45)	0.277
Swimming (leisure)	21 (17.8)	37 (15.9)	1.08 (0.86; 1.35)	0.648
Fishing	26 (22.0)	24 (10.3)	1.69 (1.35; 2.11)	0.002
Crossing	23 (19.5)	28 (12.0)	1.41 (1.13; 1.76)	0.060
Rural activities	15 (12.7)	25 (10.7)	1.12 (0.90; 1.40)	0.580
Other	1 (0.8)	6 (2.6)	-	-
Did not answer	17 (14.4)	81 (34.8)	-	-

[a]n=118; [b]n=233.

Table 4. Absolute frequencies (n) and relative frequencies (%) of schistosomiasis, with prevalence ratio (PR) and respective 95% confidence intervals (95%CI), regarding contact of study participants with freshwater in the Colônia Miranda community. São Cristóvão, 2022-2023 (n=370)

Variables	Positive[a] n (%)	Negative[b] n (%)	PR (95%CI)	p-value
Contact with freshwater				<0.001
Yes	74 (77.9)	154 (56.0)	2.19 (1.73; 2.77)	
No	19 (20.0)	109 (39.6)		
Did not answer	2 (2.1)	12 (4.4)		
Reasons for contact				
Fetching water	30 (31.6)	68 (24.7)	1.28 (1.01; 1.61)	0.191
Washing clothes/dishes	23 (24.2)	46 (16.7)	1.39 (1.10; 1.75)	0.106
Bathing and personal hygiene	37 (38.9)	74 (26.9)	1.48 (1.17; 1.87)	0.027
Swimming (leisure)	27 (28.4)	68 (24.7)	1.14 (0.1; 1.45)	0.477
Fishing	17 (17.9)	36 (13.1)	1.30 (1.03; 1.64)	0.249
Crossing	3 (3.2)	3 (1.1)	1.97 (1.26; 2.49)	0.169
Rural activities	2 (2.1)	-	-	-
Other	2 (2.1)	1 (0.4)	-	-
Did not answer	5 (5.3)	6 (2.2)	-	-

[a]n=95; [b]n=275.

The findings of binary logistic regression indicated being of the male sex (OR 1.41; 95%CI 1.01; 1.96; p-value 0.040) and having contact with freshwater (OR 0.40; 95%CI 0.28; 0.58; p-value<0.001) as potential predictive factors for infection. Age was not a predictive factor (Table 5).

Table 5. Binary logistic regression analysis of association between *Schistosoma mansoni* infection and age, sex and contact with freshwater, with odds ratio (OR) and respective 95% confidence intervals (95%CI) and the Patioba and Colônia Miranda communities. Japaratuba and São Cristóvão, 2022-2023 (n=721)

Variable	p-value	OR (95%CI)
Age[a]	0.136	1.00 (0.99; 1.01)
Male sex[b]	0.040	1.41 (1.01; 1.96)
Contact with freshwater[c]	<0.001	0.40 (0.28; 0.58)

[a]The reference category was age <60 years; [b]The reference category was female sex; [c]The reference category was individuals who had no contact with natural waters.

Discussion

The survey we conducted showed that the Patioba and Colônia Miranda communities had high rates of *S. mansoni* infection, which, according to the Ministry of Health (6), characterizes them as highly endemic for schistosomiasis, since the positivity rate for the disease was greater than 1.00% and the infection rate was heavy (≥400 EPG), greater than 10.0%. In Patioba, the positivity rate was higher than in Colônia Miranda. The different risk factors associated with *S. mansoni* infection identified in the two communities highlights structural singularities existing in both of them.

This study has some methodological limitations. First, the sociodemographic variables were based on self-reported information, thus being subject to biases inherent to self-reported data. This limitation is compounded by the fact that some questionnaire questions were not answered by some participants. Furthermore, failure to conduct a malacological study in water bodies of epidemiological interest made it impossible to determine infection risk points (transmission foci) within the communities studied. Finally, the Kato-Katz method, used to determine prevalence in the communities studied, has limited sensitivity for individuals with low parasite loads. Therefore, the positivity rates obtained here may have been underestimated, considering that mild infection intensity exceeded 80.0%.

The positivity rate recorded in this study was higher than that reported in a previous study conducted in the same municipalities, Japaratuba and São Cristóvão (8). Previously, Japaratuba was part of a group of municipalities considered to have a low prevalence, while São Cristóvão stood out, reaching a prevalence of 32.0%. This discrepancy between the studies may be due to differences in study design, the diagnostic method used, and the number of biological samples and slides analyzed (10). Furthermore, the diversity in lifestyle and social and cultural organization may also influence the levels of causality that determine the genesis of the disease (10,11). Indeed, in this study, the factors that contributed to *S. mansoni* infection varied between the two communities studied.

The significant association between male gender and *S. mansoni* infection found in Patioba can be explained by the carrying out of activities inherent to the community's local economy, driven by subsistence farming production and production and sale of handicrafts. Patioba residents are more involved in food cultivation, which requires greater contact with freshwater sources, while activities related to food sales at open-air markets and production and sale of handicrafts are more common among females. Being of the male sex also proved to be an important predictor of infection in the binary logistic regression analysis, based on combined data from both communities. Higher risk of infection attributed to the male sex has also been

found in other endemic locations in the state (Sergipe) and also on the African continent (12,13,14).

Low schooling was also associated with infection in Patioba, demonstrating that this socioeconomic variable is strongly related to the occurrence of schistosomiasis in rural and poor areas, as previously described (15). This endemic disease has plagued the Northeast for decades, and between 1980 and 2017, people with low educational attainment were the most affected by *S. mansoni* in the region (5).

Regions covered by the *Bolsa Família* cash transfer program tend to have higher levels of social vulnerability, this being a condition associated with *S. mansoni* infection (8). In contrast, families not eligible for this social benefit tend to have better living and working conditions, as well as greater access to factors that have a protective effect on disease processes, such as sanitation, health services and education (16). This may explain why participants in Colônia Miranda, not covered by the *Bolsa Família* program, were significantly less affected by schistosomiasis. This protective effect was also observed among participants living in households with fewer than five inhabitants, which corroborates the results of studies conducted in rural communities in Brazil (15) and Kenya (17), which showed association between higher disease incidence and household overcrowding. This scenario reinforces the positive influence that better socioeconomic and housing conditions can have on the dynamics of schistosomiasis transmission.

Contact with freshwater proved to be an important predictor of *S. mansoni* infection in both communities studied. Significant association was found between infection and fishing activities in Patioba, as well as with bathing/personal hygiene activities in Colônia Miranda. Fishermen and bathers become more vulnerable to infection due to frequent exposure of body parts to water bodies containing infective forms of *S. mansoni* (18,19). Bathing in freshwater is reported as a route of contamination via water bodies containing parasite eggs, either through direct defecation in the water or by these eggs being present due to hygienic bathing (washing the perianal region) and/or handwashing after defecating in the open (20,21). Community practices and forms of contact with freshwater determine the risk of people being infected (20).

Regarding sanitary conditions, use of indoor toilets was significantly associated with the absence of *S. mansoni* infection in Patioba. Absence or lack of access to toilets is reported as a risk factor for the disease, with infection rates rising due to the practice of open defecation (22), which leads to fecal contamination of water supplies. Lack of sanitary facilities combined with lack of access to drinking water exposes entire populations to the risk of acquiring schistosomiasis (1).

It is important to note that due to non-compliance with a parameter required for the application of the statistical method—in this case, the absence of zero cells—it was not possible to evaluate the "Source of water supply" variable for the Patioba community. However, the community lacks a treated water supply, and consumes water from wells and cisterns. In the absence of sewage collection, the alternative for residential sewage disposal for those infected is open-air disposal or cesspits. On the other hand, Colônia Miranda has water supply coverage; however, only part of the infected participants reported having sewage coverage. Basic sanitation is an indispensable health-based service for the population, recognized by the United Nations as a human right, along with access to drinking water (23). Its inclusion and expansion in the Patioba and Colônia Miranda communities will contribute to reducing the disease burden. Drainage and management of rainwater are essential for the elimination of schistosomiasis as a public health problem in the locations studied.

Other important recommendations include health education initiatives in schools and community

spaces to: (i) disseminate information about the risk of infection; (ii) instruct workers on the use of personal protective equipment when working near freshwater sources; and (iii) instruct residents on the importance of maintaining cesspits, avoiding the risk of infection in the area surrounding human dwellings through contact with puddle water and contamination of freshwater sources with *S. mansoni* eggs. The challenges related to reporting, frequency and effectiveness of schistosomiasis control measures in Sergipe must be overcome in order to reduce the disease's positivity rates to levels compatible with the health quality of the affected communities.

Development metrics for Brazilian municipalities assessed using the municipal human development index show that Japaratuba and São Cristóvão have a median index of 0.7 and 0.6, respectively, below the average for Brazil (0.8 - high) and Sergipe (0.7 - high) (24,25,26). The figures also highlight that these two municipalities still face inherent obstacles to human development and quality of life that need to be overcome, and that both are characterized by significant social inequality. In addition to this, the high prevalence of schistosomiasis is noteworthy, confirming that this disease is strongly linked to social vulnerability (27). In this sense, we emphasize the importance of integrating actions to address schistosomiasis, including interventions focused on sanitation, health education and raising public awareness of habits that pose a risk of infection, in order to mitigate the potential for infection and reduce the prevalence of the disease, which will result in improvements in the quality of life of these populations.

To conclude, Patioba and Colônia Miranda have high schistosomiasis prevalence, in addition to *S. mansoni* infection risk factors. The results of this study provide important information for understanding the schistosomiasis scenario and the risk factors that influence its transmission. This information can contribute to improvements in strategic planning for disease prevention and control, as well as to prioritizing the most vulnerable locations for implementing control actions, such as the municipalities studied.

Conflicts of interest

None to declare.

Data availability

The database used in this research is available at: https://1drv.ms/x/c/1beeaf4836884b10/EahyH9Xl4o-ZIpgkU7GExg40B6dNb5SS_KmH1pOx9tAXhMw?e=MDdqdO.

Use of generative artificial intelligence

Not used.

Authorship credit

RLFG: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Supervision, Visualization, Writing - original draft, Writing - review & editing. MCCP: Conceptualization, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Visualization, Writing - review & editing. AMS: Investigation, Methodology, Validation, Writing - review & editing. SLCSS: Investigation, Methodology, Resources, Supervision, Writing - review & editing. LB: Investigation, Methodology, Visualization, Writing - review & editing. TLS: Formal analysis, Writing - original draft, Writing - review & editing. FSMB: Conceptualization, Data curation, Funding acquisition, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Visualization, Writing - review & editing.

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Prevalência da esquistossomose e fatores de risco associados em comunidades endêmicas: estudo transversal, Patioba e Colônia Miranda, Sergipe, 2022-2023

Resumo

Objetivos: Determinar a prevalência da esquistossomose e identificar fatores de risco que influenciam a transmissão da doença em comunidades endêmicas de Sergipe. **Métodos:** Estudo transversal conduzido nos povoados Patioba e Colônia Miranda, localizados nos municípios de Japaratuba e São Cristóvão, respectivamente. Um inquérito epidemiológico e parasitológico da esquistossomose foi realizado a partir da aplicação de questionário sociodemográfico e da realização do método de Kato-Katz. Qui-quadrado e coeficiente de correlação de Pearson foram utilizados para a associação entre variáveis categóricas e contínuas, respectivamente. Razão de prevalência (RP), razão de chances (*odds ratio*, OR) e intervalo de confiança de 95% (IC95%) mediram a força entre as associações. **Resultados:** Um total de 721 participantes foi incluído no estudo. A prevalência da esquistossomose foi de 33,6% (118/351) em Patioba e de 25,7% (95/370) em Colônia Miranda. Foram associados à infecção o sexo masculino (n=62, 52,5%; p-valor 0,008), o baixo nível de escolaridade (n=65, 55,1%; p-valor 0,034), as atividades de pesca (RP 1,69; IC95% 1,35; 2,11; p-valor 0,002) e o banho/a higiene pessoal em águas naturais (RP 1,48; IC95% 1,17; 1,87; p-valor 0,027). O sexo masculino também foi um preditor da infecção (OR 1,41; IC95% 1,01; 1,96; p-valor 0,040), assim como o contato com águas naturais (OR 0,40; IC95% 0,28; 0,58; p-valor<0,001). **Conclusões:** Patioba e Colônia Miranda apresentam uma alta prevalência da esquistossomose, bem como fatores de risco para a infecção por *Schistosoma mansoni* que variam entre os dois povoados estudados.

Palavras-chave: Esquistossomose Mansoni; *Schistosoma mansoni*; Fatores de Risco; Prevalência; Inquéritos Epidemiológicos.

Prevalencia de esquistosomiasis y factores de riesgo asociados en comunidades endémicas: estudio transversal, Patioba y Colonia Miranda, Sergipe, 2022-2023

Resumen

Objetivos: Determinar la prevalencia de esquistosomiasis e identificar los factores de riesgo que influyen en la transmisión de la enfermedad en comunidades endémicas de Sergipe. **Métodos:** Se realizó un estudio transversal en las aldeas de Patioba y Colônia Miranda, ubicadas en los municipios de Japaratuba y São Cristóvão, respectivamente. Se realizó un estudio epidemiológico y parasitológico de esquistosomiasis mediante un cuestionario sociodemográfico y el método de Kato-Katz. Se utilizaron la prueba chi-cuadrado y coeficientes de correlación de Pearson para determinar las asociaciones entre las variables categóricas y continuas, respectivamente. La fuerza de las asociaciones se midió mediante razones de prevalencia (RP), razones de momios (*odds ratios*, OR) e intervalos de confianza del 95% (IC95%). **Resultados:** Se incluyeron 721 participantes en el estudio. La prevalencia de esquistosomiasis fue del 33,6% (118/351) en Patioba y del 25,7% (95/370) en Colonia Miranda. El sexo masculino (n=62, 52,5%; p 0,008), el bajo nivel educativo (n=65, 55,1%; p 0,034), la actividad pesquera (RP 1,69; IC95% 1,35; 2,11; p 0,002) y el baño/higiene personal en aguas naturales (RP 1,48; IC95% 1,17; 1,87; p 0,027) se asociaron con la infección. El sexo masculino también fue un predictor de infección (OR 1,41; IC95% 1,01; 1,96; p 0,040), al igual que el contacto con aguas naturales (OR 0,40; IC95% 0,28; 0,58; p<0,001). **Conclusiones:** Patioba y Colonia Miranda presentan una alta prevalencia de esquistosomiasis, así como factores de riesgo para la infección por *Schistosoma mansoni* que varían entre las dos localidades estudiadas.

Palabras clave: Esquistosomiasis Mansoni; *Schistosoma mansoni*; Factores de Riesgo; Prevalencia; Encuestas Epidemiológicas.