Performance of an extension program in a peripheral community in the northeast region of Brazil

Atuação de um programa de extensão em uma comunidade periférica na região nordeste do Brasil

Realización de un programa de extensión en una comunidad periférica de la región noreste de Brasil

Nayade Raihanne dos Santos Lima[1], Silvane Maria Braga Santos[2], Érica Maria Granjeiro[3], Simone Souza de Oliveira[4]

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REVISA

1. State University of Feira de Santana, Department of Biological Sciences. Feira de Santana, Bahia, Brazil. https://orcid.org/0009-0000-4002-5569

2. State University of Feira de Santana, Department of Biological Sciences. Feira de Santana, Bahia, Brazil. https://orcid.org/0000-0002-4226-3074

3. State University of Feira de Santana, Department of Biological Sciences. Feira de Santana, Bahia, Brazil. https://orcid.org/0000-0002-6436-751X

4. State University of Feira de Santana, Department of Biological Sciences. Feira de Santana, Bahia, Brazil. https://orcid.org/0000-0002-4462-6684

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RESUMO

Objetivo: Inquérito coproscópico para reavaliar na população do estudo a frequência de parasitos intestinais identificados numa primeira etapa e investigar mudanças nos fatores de risco, adesão ao tratamento e às ações de prevenção e controle de enteroparasitoses. **Método:** Realização de exames coproscópicos e aplicação de um formulário estruturado para determinar a prevalência de enteroparasitoses e o perfil socioeconômico e sanitário da população de três microáreas do bairro Mangabeira na cidade de Feira de Santana, Bahia. **Resultados:** Em 2013 (primeiro período do estudo) a prevalência de enteroparasitos foi de 44,3% com maior frequência para *Ascaris lumbricoides* (32,3%), *Trichuris trichiura* (25,8%), *Schistosoma mansoni* (9,7%) e *Giardia intestinalis* (9,7%). No segundo período (2016) observou-se aumento da frequência do *S. mansoni* (19,3%) e *G. intestinalis* (16,1%), além do diagnóstico de *Entamoeba histolytica/dispar* (3,2%) não identificadas no inquérito anterior. Não foram observadas alterações das variáveis socioeconômicas e sanitárias na população reavaliada. Atividades educativas foram realizadas levando em consideração o perfil epidemiológico da população. Os portadores positivos foram encaminhados para tratamento, porém as taxas de curas foram baixas. **Conclusão:** Observou-se a necessidade de intensificação da promoção das ações de educação em saúde de forma continuada, associada à melhoria das condições sanitárias e ambientais da comunidade.

Descritores: Saúde e Educação; Enteroparasitos; Fatores de risco; Tratamento.

ABSTRACT

Objective: Coproscopic survey to reassess in study population the frequency of intestinal parasites identified in a first stage and investigate changes in risk factors, adherence to treatment and prevention and control for enteroparasitosis **Method:** Carrying out coproscopic exams and applying a structured form to determine the prevalence of enteroparasitosis and the socioeconomic and health profile of the population of three micro-areas of the Mangabeira neighborhood in city of Feira de Santana, Bahia. **Results:** In 2013 (first period) the prevalence of enteroparasites was 44.3%, with a higher frequency for Ascaris lumbricoides (32.3%), Trichuris trichiura (25.8%), Schistosoma mansoni (9.7%) and Giardia intestinalis (9.7%). In the second period (2016), an increase in the frequency of S. mansoni (19.3%) and G. intestinalis (16.1%) was observed, in addition to the diagnosis of Entamoeba histolytica/dispar (3.2%) not identified in the previous survey. No changes were observed in socioeconomic and health variables in the reevaluated population. Educational activities were carried out considering the epidemiological profile of the population. Positive carriers were referred for treatment, but cure rates were low. **Conclusion:** There was a need to intensify the promotion of health education actions on an ongoing basis, associated with improving the sanitary and environmental conditions of the community.

Descriptors: Health and Education; Enteroparasites; Risk factors; Treatment.

RESUMEN

Objetivo: Encuesta coproscópica para reevaluar la población de estudio la frecuencia de parásitos intestinales identificados en una primera etapa e investigar cambios en los factores de riesgo, adherencia al tratamiento y acciones de prevención y control de enteroparasitosis. **Método:** Realización de exámenes coproscópicos y aplicación de un formulario estructurado para determinar la prevalencia de enteroparasitosis y el perfil socioeconómico y de salud de la población de tres microáreas del barrio Mangabeira de la ciudad de Feira de Santana, Bahía. **Resultados:** En 2013 la prevalencia de enteroparásitos fue 44,3%, con mayor frecuencia para Ascaris lumbricoides (32,3%), Trichuris trichiura (25,8%), Schistosoma mansoni (9,7%) y Giardia intestinalis (9,7%). En el segundo período se observó un aumento en la frecuencia de S. mansoni (19,3%) y G. intestinalis (16,1%), además Entamoeba histolytica/dispar (3,2%) no identificado en la encuesta anterior. No se observaron cambios en las variables socioeconómicas y de salud en la población reevaluada. Las actividades educativas se realizaron teniendo en cuenta el perfil epidemiológico de la población. Los portadores positivos fueron remitidos para tratamiento, pero las tasas de curación fueron bajas. **Conclusión:** Necesario intensificar la promoción de acciones de educación en salud de manera continua, asociadas al mejoramiento de las condiciones sanitarias y ambientales de la comunidad.

Descriptores: Salud y Educación; Enteroparásitos; Factores de riesgo; Tratamiento.

Introduction

The wide geographical distribution of diseases caused by enteroparasites, together with the deficiencies they produce in the organism of affected individuals, has given these infections a prominent position among the main health problems of the population. Enteroparasitosis is present in practically all tropical and subtropical areas of the world and it is believed that one third of the population of underdeveloped countries lives in environmental conditions conducive to its spread.[1]

The accentuated socioeconomic inequality, combined with the disorderly process of urbanization, lead portions of the population to live in precarious living conditions. The occupation of peripheral areas of cities, in which sanitation conditions are deficient, favors the transmission and establishment of focal areas of intestinal parasitosis. In Brazil, due to the multiplicity of factors involved in their occurrence, these diseases still represent a serious public health problem, despite the scientific knowledge and technological advances available for their treatment and prevention.[2]

The difficulties in combating intestinal parasitosis are recognized, both due to the high financial costs required for basic sanitation and the use of chemotherapy drugs, as well as the reluctance to change erroneous behavioral practices, observed mainly in population strata of lower socioeconomic and cultural levels and with difficult access to health services. In this way, the control of these parasitic diseases could be boosted through the implementation of integrated measures that involve continuous partnerships between academic institutions, health authorities and especially the community.[3]

Despite being prevalent in the Brazilian population, intestinal parasitosis is little studied, especially with regard to the evaluation of patients' adherence to the proposed health education actions and treatment after diagnosis. In this context, the present study aimed to conduct a new coproscopic survey of enteroparasite carriers diagnosed in the first period of the study and to determine the frequency of intestinal parasites and possible changes in socioeconomic and environmental risk factors in a population from three microareas of the Mangabeira neighborhood, in the municipality of Feira de Santana, Bahia. In addition, the present study also aimed to produce information that can contribute to the planning of health care actions and the continuity of interventions aimed at the prevention and control of enteroparasitosis in the area studied.

Method

This study began in September 2013, linked to an Extension Program of the State University of Feira de Santana (UEFS) entitled Program of Parasitological Studies of the Microregion of Feira de Santana, Bahia (FSA/BA). This project consisted of performing coproscopic examinations and applying a structured form to determine the prevalence of enteroparasitosis and the socioeconomic and health profile of the population of three micro-areas of the Mangabeira neighborhood in the city of Feira de Santana, Bahia.

The municipality of Feira de Santana-Bahia has a territorial unit of 1,337,993 km2 and a population density of 416.03 inhabitants/km2. It is located

108 km from the state capital, has a hot and humid climate and is divided into 49 neighborhoods and eight districts. Three micro-areas of the Mangabeira neighborhood, considered one of the most populous peripheral neighborhoods in the city, were selected for the study. Due to its large territorial extension, the municipality's health department divided it into 15 micro-areas, assisted by Community Health Agents (CHA), with the Basic Health Unit (UBS) as a reference.

The study was conducted in two periods. In the first period (from September 2013 to May 2014), the activities were carried out in three micro-areas after the project was presented to the UBS team. The sample consisted of families registered in the Community Health Agents Program (PACS) and who showed interest in participating in the study. Thus, the beginning of the activities was carried out in micro-area 1 and later in micro-areas 2 and 3. The final sample consisted of the population of all ages and both sexes, who were available and agreed to participate in the study.

Data collection was carried out after acceptance of the participation of the population of the micro-areas with the signing of the Free and Informed Consent Form (ICF). This study was approved by the Research Ethics Committee of UEFS (CAAE: 15329113.0.0000.0053), opinion number 306.283.

To survey the socioeconomic and health profile, the CHAs and the team of the Laboratory of Clinical and Parasitological Analysis of UEFS (LAC-UEFS) applied a structured form to be answered by the head of the family and/or guardian, in order to obtain the following information: I. socioeconomic and demographic data; II. housing conditions; III. access to basic sanitation goods and services.

After the application of the form, containers were delivered for the collection of fecal material from family members. The data collection was carried out on a day and time previously scheduled by the project team and the samples were sent to the LAC/UEFS for analysis.

To determine the prevalence of enteroparasites, each sample was examined using the Hoffman, Pons and Janer (spontaneous sedimentation) and Kato-Katz methods.[4] All test results were delivered to the CHAs, who directed the positive patients to the UBS in the Mangabeira neighborhood.

The educational interventions were carried out during the collection of fecal samples, using the methodology of conversation circles, where the community dialogued with the program team, clarifying doubts and curiosities about the transmission of enteroparasitosis. The delivery of the test results, in turn, took place at the Social Assistance Reference Center (CRAS) in the Mangabeira neighborhood, located in the city of FSA/BA, with the participation of the community in the study area. In addition, a scientific bazaar was held, which included dialogued lectures on the forms of transmission, symptomatology and control of enteroparasites identified in the population evaluated. In this activity, blood typing, blood pressure measurement, peripheral blood glucose measurement and distribution of clothing objects, toys and children's books donated by the university community were also carried out, as a way to motivate the participation of the population.

The second period, which is the object of the present study, was carried out from January to June 2016 and consisted of reassessing the frequency of enteroparasites of carriers previously diagnosed as positive and referred for

treatment and investigating possible changes in environmental and socioeconomic risk factors in the community. The instruments used for data collection, fecal material and techniques to determine the frequency of enteroparasites followed the same pattern used in the first period of the study. The structured form included questions related to the referral of positive patients to the neighborhood UBS, recommended medical conduct, and treatment. This form was also applied to the head and/or head of the families of the positive carriers diagnosed in the first period of the study and still living in the three micro-areas of the Mangabeira neighborhood.

Based on the results, a comparative analysis of the data obtained in the first (2013/2014) and second (2016) periods was carried out, taking into account the socioeconomic and sanitary aspects and the positivity of the carriers of enteroparasites identified. Interventions of an educational nature were again carried out with the participation of the community based on the results of the coproscopic survey and the socioeconomic and health profile of the study population, using conversation circles, dialogued lectures and distribution of informative material.

The descriptive analysis was performed using the Microsoft Excel 2013 program and the data presented in the form of tables and graphs. Statistical analysis was performed using the Epi Info 7 software, and Pearson's Chi-square test (X2) or Fisher's exact test was used to associate the variables studied, adopting a significance level of 0.05 (p-value).

Results

Figures 1 and 2 illustrate the percentage of positivity of the different species of enteroparasites diagnosed in patients in the first and second evaluation periods.

In the first period of the study, 204 fecal samples were obtained for analysis in the three micro-areas of the Mangabeira neighborhood. The study population consisted of 115 (56.4%) females and 89 (43.6%) males. Most of them were adults, aged between 18 and 59. At this stage, 70 positive carriers were identified and the frequency of intestinal parasites was 34.3%. In the second period, 31 (44.3%) of the 70 positive carriers in the first period were reassessed. The frequency for enteroparasites was 58.1%. Of the patients reassessed, 16 (51.6%) were female, 15 (48.4%) were male, aged between 18 and 59 years.

In the first period, the main helminths identified in the reassessed individuals were Ascaris lumbricoides (32.3%), Trichuris trichiura (25.8%), Schsitosoma mansoni (9.7%), Enterobius vermiculares and Hookworms sp. (both 3.2%). In the second period, there was a decrease in the percentage of A. lumbricoides and T. trichiura (3.2% and 12.9%, respectively) and an increase in the percentage of S. mansoni (19.3%). There was no change in the percentage of positivity for E. vermiculares and Hookworms sp.

Regarding the protozoa, as shown in Figure 02, an increase in the percentage of positivity for Giardia intestinalis was observed from the first to the second period (from 9.7% to 16.1%), in addition to the finding of amoebas of the histolytica complex (Entamoeba histolytica/disparate, 3.2%), not previously diagnosed. It is worth noting the presence of commensal amoebas such as Entamoeba coli, Endolimax nana and Iodoameba butschlli in both periods.

Polyparasitism, i.e., the presence of more than one parasite in the fecal sample of the 31 individuals examined, was found in 10 (32.3%) in the first period and in 7 (38.9%) in the second period.

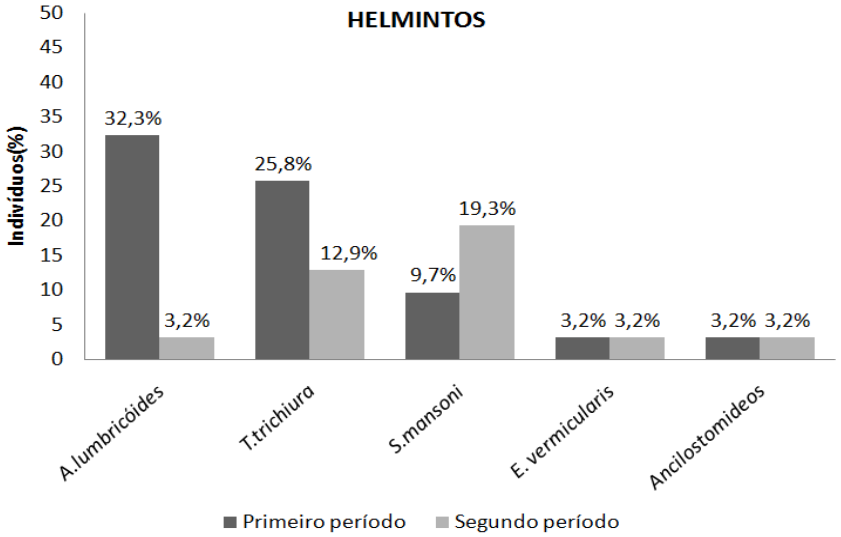


Figure 1. Frequency of helminths in 31 enteroparasite-positive carriers from 3 microareas of the Mangabeira neighborhood, Feira de Santana, Bahia, identified in the first period (2013/2014) and reevaluated in the second period (2016).

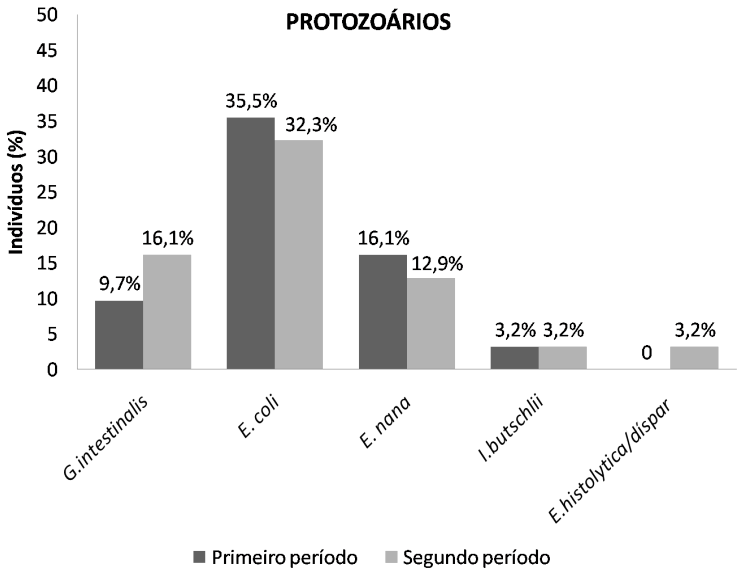


Figure 2. Frequency of protozoa in 31 enteroparasite-positive carriers from 3 micro-areas of the Mangabeira neighborhood, Feira de Santana, Bahia, identified in the first period (2013/2014) and reevaluated in the second period (2016)

In the first period of the study, the heads of households had incomplete primary education (44.6%), were illiterate (20%) and most families had an income of only one minimum wage (67.7%). The data on the basic sanitation infrastructure of the households showed that 96.9% of the residents consumed water from the public network of the Bahian Water and Sanitation Company S.A. (EMBASA) and only one family used water from artesian wells. Regarding the discharge of sanitary sewage, it was observed that 61.5% of the households used

a cesspool as a disposal of waste, 49.2% of the sewage was open (mainly in micro-area 1, which has ponds and streams close to the households) and 7.7% of the households did not have a toilet and the feces were destined for public garbage collection or were disposed of in a "little balloon". A common practice in the locality where residents would put their feces in plastic bags and release them into the environment.

Regarding the distribution of socioeconomic and health variables and the frequency of enteroparasite carriers evaluated in the second study period, no statistically significant differences were observed for the variables studied, as can be seen in Table 1. In this period, the highest percentage of individuals who remained positive for enteroparasites and enterocommensals belonged to families with an income of one minimum wage (66.7%) and the head and/or guardian was not literate (62.5%). More than half of the individuals reassessed, diagnosed as having enteroparasites, stated the presence of open sewage (66.7%) and the existence of streams and/or ponds in the vicinity of their homes (71.4%).

Table 1. Socioeconomic and health variables of 31 carriers positive for enteroparasites from 3 microareas of the Mangabeira neighborhood, Feira de Santana, Bahia and reassessed in the second period of the study (2016).

Variables	Positive n (%)	Negative n (%)	*P*
GENDER			
Male	9 (60,0%)	6 (40,0%)	1,0
Female	9 (56,3%)	7 (43,7%)	
SCHOOLING OF THE HEAD OF THE FAMILY			
Illiterate	10 (62,5%)	6 (37,5%)	0,72
Primary and secondary education	8 (53,3%)	7 (46,7%)	
FAMILY INCOME (Minimum wage)			
> 1	8 (66,7%)	4 (33,3%)	0,48
≤ 1	10 (52,6%)	9 (47,4%)	
NUMBER OF RESIDENTS IN THE HOUSEHOLD			
From 1 to 5	13 (59,1%)	9 (40,9%)	1,0
From 6 to 10	5 (55,6%)	4 (44,4%)	
PRESENCE OF ANIMALS			
No	6 (66,7%)	3 (33,3%)	0,69
Yes	12 (54,6%)	10 (45,4%)	
OPEN SEWER NEAR THE HOME			
Yes	14 (66,7%)	7 (33,3%)	0,24
No	4 (40,0%)	6 (60,0%)	

PONDS OR STREAMS NEAR THE HOME			
Yes	10 (71,4%)	4 (28,6%)	0,27
No	8 (47,1%)	9 (52,9%)	

The results of the fecal material analysis were delivered to the CHAs of the three micro-areas, who were instructed to refer the carriers positive for enteroparasites to the UBS in the neighborhood. Of the 31 individuals reassessed, 8 (25.8) reported that they did not seek the health service after receiving the result and 23 (74.2%) reported that they went to the health service and the medical treatment indicated was the use of antiparasitic medications. Among those who sought the health service, two (8.7%) did not start treatment, 20 (64.51%) started treatment but did not complete it, and only one individual (3.2%) underwent complete treatment.

Discussion

In the analysis of the actions of the Program of Parasitological Studies of the Microregion of FSA/BA, carried out in three microareas of the Mangabeira neighborhood, it was observed the maintenance of the high percentage of positivity for enteroparasites in the positive population reevaluated in the present study, configuring the importance of intestinal parasitosis as a relevant public health problem in our environment. In the present study, although there was no statistical significance between the socioeconomic and environmental variables, with the frequency of patients in the second period of the study, it was observed that the percentage of positivity was higher for individuals who belonged to a family whose head and/or guardian was illiterate, with an income of one minimum wage.

According to Macedo,[5] the higher the level of education, the greater the understanding of the importance of personal hygiene, food preparation and control of parasitic infections, and the frequencies of intestinal parasitosis are observed at higher rates in families with a lower level of education. With regard to environmental conditions, the presence of open sewage near households, the absence of toilets and the raising of domestic animals (dogs and cats) were higher in positive carriers in the second period. According to Basso,[6] housing and sanitation conditions (water supply and sanitary sewage), hygiene and health care are also conditioning factors for this situation, together with the presence of domestic animals, in view of the zoonotic potential of some species that may be related to the prevalence of enteroparasites. Vasconcelos[7] reports that: "The main mechanism of diffusion of helminthiasis is fecal contamination of the soil." This involves the importance of the presence of toilets in homes as a way to avoid the exposure of feces in the environment and contamination not only of the soil, but of the population.

An increase in the frequency of S. mansoni, the etiological agent of schistosomiasis mansoni, an important endemic disease, whose prevalence remains high in some regions, including urban areas in northeastern Brazil8. This fact is probably related to the presence of streams and ponds and open sewage in the vicinity of the residences and the presence of intermediate hosts, snails of the genus Biomplalaria, positive for cercariae, observed in the area.

The increase in the prevalence of the protozoan G. intestinalis, the maintenance of the percentage of commensal amoebas and the appearance of the pathogenic E. histolytica/dispara may be related to the inadequate use and conservation of water. The protozoan G. intestinalis is recognized as a contaminating agent, recorded in about 40% of the worldwide cases of outbreaks associated with waterborne transmission caused by intestinal parasites. The serious problem of enteroparasitosis is not limited to the state of Bahia, but is a broad problem that affects different regions of the country. The frequency of G. intestinalis (16.1%) was similar to that found in the study by Marques[9], conducted in the city of Concórdia, Santa Catarina, with a percentage value of 15.9%, evidencing the need for monitoring of health conditions. The identification of commensal amoebas such as *Entamoeba coli* and *Endolimax nana*, as they have the same mechanism of transmission of pathogenic protozoa, is a good indicator of inadequate socio-sanitary conditions, signaling a situation of risk of contamination of diseases of oral-fecal transmission.[6] According to Neves[4], the detection of these amoebas in a coproparasitological diagnosis may indicate the consumption of water contaminated by human excreta, which generates a risk, since pathogenic protozoa also use feces as a means of transmission (oral-fecal route). According to Marques[9], the treatment of diseases is often simple and individual, but occasionally involves the entire community, both for epidemiological reasons and to keep the cost of treatment low. Perfectly developed primary health care programs have already demonstrated the effectiveness of this treatment in controlling parasites. However, according to the World Health Organization (WHO)[10], the control of intestinal parasitosis is not successful in underdeveloped countries due to the high financial cost (sanitation and use of chemotherapy) and the lack of community participation in control programs, a fact observed in the small number of individuals who were available to participate in the present study. Most patients reported that the indicated medical treatment was the use of antiparasitic drugs, but the population's lack of interest in treatment adherence was identified, evidenced in the abandonment of the use of antiparasitic drugs.

Another important aspect observed in the present study was the non-completion of the treatment. According to Freitas[11], when medications are taken in disagreement with the prescribed dosage, they can cause changes in terms of reduced benefits, increased risks, or both. Non-adherence to treatment, according to Saturnino,[12] may have occurred due to the fact that some diseases present few symptoms (asymptomatic pathogenic mechanisms), or present nonspecific clinical symptoms or are confused with those of other diseases, leaving individuals parasitized for many years. It is known that the phenomenon of non-adherence or abandonment of treatment is universal, observed in rich and poor countries, to some degree, even for potentially life-threatening diseases.[11]

The WHO,[13] states that poor adherence to treatment is the main factor responsible for the lack of blood pressure control in more than two-thirds of hypertensive patients. A qualitative study was carried out to identify the factors of non-adherence to antihypertensive treatment and a complex network of questions was found, ranging from aspects related to fear and the negative image reported by patients to antihypertensive medications, to the lack of basic clarification about the disease and dissatisfaction due to the few explanations given by the physician. as well as the lack of interaction between doctor and

patient. Corroborating the results found in this research, the study carried out in a municipality located in the Triângulo Mineiro, Alto Paranaíba region of the State of Minas Gerais, found among hypertensive patients that the main reason for non-adherence to drug treatment for Systemic Arterial Hypertension (SAH), both in rural and urban areas, was the "absence of symptoms". For many researchers, the asymptomatic characteristic of the disease and the need for lifelong treatment are striking events that contribute to non-adherence to treatment.[14]

According to Santa Helena[15], improving treatment adherence is not easy and requires a systematic review of interventions based on the technological, educational and behavioral resources of the population and the health service, in order to be adapted to the characteristics and needs of the broader population. Collective educational actions are a great work tool for professionals, as they help in the process of treatment adherence, which consequently promotes improvements in the quality of life of patients. Citizens who are properly informed and integrated into democratically constructed health education practices collaborate for the efficiency, efficacy and effectiveness of such actions.[3] In the present study, activities were carried out reinforcing the importance of treatment and follow-up, in addition to the parasitological reassessment of enteroparasite carriers, which was reinforced due to the observation of non-adherence to treatment of many positive carriers. In this context, educational workshops, involving lectures, conversation circles, use of posters and distribution of informative materials were carried out taking into account the epidemiological profile of the population after the presentation of the research results. Information on the main parasites identified and the main prevention and control measures to be adopted by the population, especially with regard to the handling and preparation of food, conduct in relation to contact with water, whether from ponds, streams or open sewage and care with the water to be consumed, listing the main symptoms, clinical signs and complications that these parasites could cause in the human body.

Conclusion

After the diagnosis, it is necessary for the patient to correctly follow the guidelines and the medical prescription, which goes beyond the administration of medications. Although there is currently a wide spectrum of highly efficient formulations with few side effects for the treatment of parasitic diseases, some particularities of the control and prevention of parasitic diseases should be considered, such as early diagnosis, removal of the patient from concomitant morbid conditions, correct use of the medication, access to basic sanitation services and subsequent performance of a coprological examination to prove the negative parasitological. One of the limitations of this study was the small participation of enteroparasite carriers diagnosed in the first period, due to change of address, reorganization of the CHAs' area of activity and lack of interest in participating in the study. Although the population of this study was relatively homogeneous in terms of socioeconomic indicators, it was possible to detect an increase in the prevalence of enteroparasites related to the level of education of the head of the family and/or head of household, family income,

presence of open sewage, absence of toilets in the home and the raising of domestic animals.

The transmission of enteroparasites is directly related to the living conditions and hygiene of the population, for this reason it is important that the practice of health education is carried out continuously, aiming at the development and improvement of the quality of life, so that educational actions in health have as their objective not only the prevention of diseases, but also the prevention of diseases. behavior change through the awakening of a critical consciousness. Health education actions encompassing prophylactic hygiene measures become great allies in the fight against and prevention of intestinal parasitosis. Therefore, investments are needed to improve the environmental situation as well as the socioeconomic conditions of the population. Sectoral actions combined with structural interventions aimed at risk factors need to be adopted to improve the epidemiological profile of peripheral urban areas.

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Correspondent Author
Simone Souza de Oliveira
Universidade Estadual Feira de Santana.
Transnordestina Avenue, s/n. Novo Horizonte.
ZIP: 44036-900. Feira de Santana, Bahia, Brazil.
ssoliveira@uefs.br