



Raising awareness about worms for students at the public school in the city of Formiga-MG

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ABSTRACT

Introduction: Parasitic diseases, including helminth infections, are among the neglected tropical diseases and represent a serious public health issue in emerging countries such as Brazil. Several factors such as lack of basic sanitation, poor hygiene conditions, and lack of awareness about the subject can be the cause of the problem. Objectives: The purpose of this project was to carry out an extension action aimed at raising awareness about parasitic diseases, specifically targeting students in the lower secondary education level. Methodology:

Due to the prevalence of parasitic infections among school-age children, the extension project on the theme of "parasitic diseases" was developed in a primary school in the municipality of Formiga, Minas Gerais. The project involved students from the 6th to 9th grades. The activity was carried out in two stages: in the first stage, Biomedicine students from UNIFOR gave an informative lecture using audiovisual resources about the main parasitic infections in the region. In the second stage, preserved specimens of worms and videos showing live parasites were presented. Results: The elementary school students remained attentive and curious throughout the entire presentation, and at the same time, they were also somewhat apprehensive when they had the opportunity to see the parasites beyond the screens. This experience provided them with valuable knowledge that they can share with their friends and family, especially regarding the prevention of intestinal parasitic infections. Conclusion: This project provided all participants with relevant scientific knowledge about parasitic infections, creating a network for spreading awareness about the subject to more people. In this way, the extension activity contributed to the development of more conscious and informed citizens regarding the topic at hand, potentially assisting in the reduction of local cases of parasitic infections. For the supervising undergraduate students, the activity offered scientific deepening about parasitic infections, as well as a greater understanding of the socioeconomic and sanitary issues that affect the community at large.

Keywords: University Extension, Parasitosis, Education, Public health.

1 INTRODUCTION

Verminoses represent a serious public health problem in developing countries such as Brazil and are among the neglected tropical diseases of the World Health Organization. Socioeconomic status is one of the main factors associated with contamination by these parasites, and school-age children are the most affected³. The symptoms of parasitic diseases can vary from mild to severe and constitute

one of the main debilitating factors of the population, often associated with chronic diarrhea and malnutrition, which impair physical and intellectual development⁴.

In the American continent, including Brazil, the parasite with the highest infection rate is *Ascaris lumbricoides*, affecting 30% of the population. And the main cause is still the lack of basic sanitation, socioeconomic and behavioral factors and the climatic conditions of the country⁵.

From the study of the symptoms of most pathologies originating from parasitosis, a series of prophylactic measures for the preservation of the health of the population can be listed. The main means of transmission of these pathologies is the oral-fecal route, as they are associated with direct contact with contaminated feces or the ingestion of contaminated food and water⁷.

There are several prophylactic measures that can and should be adopted, especially in emerging countries, which have high endemic rates of parasitosis, either because of the low existing infrastructure or because of the difficulty in developing socio-educational actions in health that access the general population in order to clarify about preventive measures, among which, the following stand out: encouraging the use of footwear, adequate hygiene of fruits and vegetables, treatment of water for consumption and hygiene of residences⁸. However, it is unanimous among experts that the best way to avoid contamination by parasitic diseases is prevention, especially health education programs that encourage individuals in communities to pay attention to the risk of enteroparasitosis infections.

In this sense, the university extension exerts a unique function with society, returning the scientific knowledge acquired in the academic space through concrete actions and establishing a link between the undergraduates and the population served. Extension is a social commitment that provides the overcoming of inequality and exclusion in society through dialogues and socio-educational actions⁹. In addition, the extension brings the opportunity for multidisciplinary teaching, with benefits for students and the community¹⁰.

This project was conceived because the prevalence of parasitosis is considered the main cause of morbidity among school-age children in emerging countries¹¹.

The objective of this study was to carry out an extension action to raise awareness about worms, aimed at elementary school students from a public school in the municipal school system of Formiga-MG.

2 METHODOLOGY

The extension project was developed in an elementary school in the city of Formiga-MG, with the participation of students from the 6th to the 9th grade. The activity consisted of two stages: at first, students of the Biomedicine course of UNIFOR-MG gave an informative lecture, using audiovisual resources. Important parasites such as schistosomiasis, taeniasis, yellowing and ascariasis were

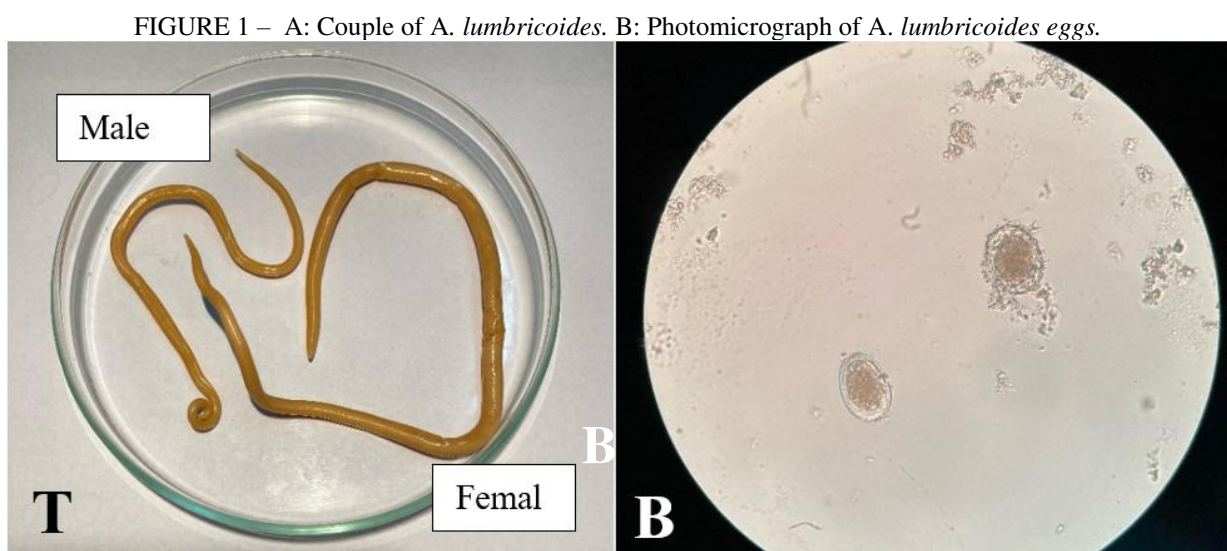
detailed, emphasizing the causative agents (*Schistosoma mansoni*, *Taenia* sp., *Ancylostoma* sp. and *Ascaris lumbricoides*), the morphology of parasites, biological cycle, transmission, treatment and prophylaxis.

In the second moment, videos were shown that presented the parasites *in vivo*. With the aid of an anatomical doll, the migration of parasite larvae inside the human body was demonstrated. To further enrich the activity, the students were given the opportunity to handle, by means of tweezers, some parasites fixed in appropriate solutions.

3 RESULTS AND DISCUSSIONS

The extension activity sought to clarify for a group of students from the 6th to the 9th Year of Elementary School about verminosis, the dangers of these types of diseases, the forms of prevention and possible treatments. The actions began with a lecture by the undergraduates of the 7th period of the Biomedicine course, in which the various types of verminosis, its biological cycle, forms of transmission and treatments were exemplified to the elementary school students.

During the explanation about the ascariasis parasitosis, each student had the opportunity to observe the parasite eggs under a microscope and visualize a pair of *A. lumbricoides* that was arranged in a petri dish (**FIGURE 1**), in order to morphologically differentiate the two individuals.

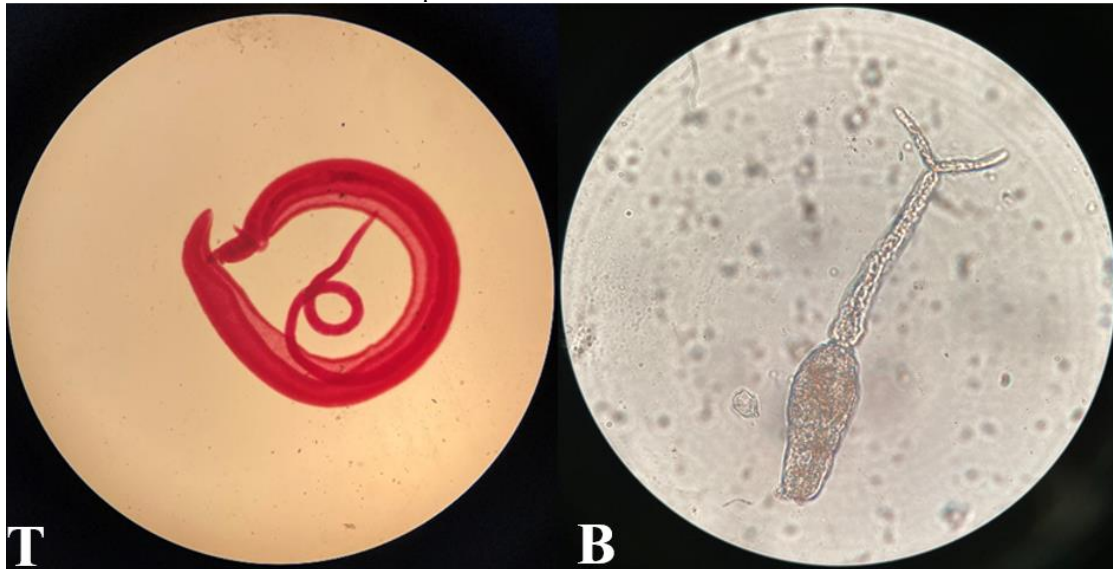


Source: the authors.

In the approach to schistosomiasis, a video was presented with each stage of the biological cycle of the parasite, which allowed the visualization of each evolutionary form parasitizing both the vector of the disease and the definitive host. Another resource made available to the students was the observation under the microscope of permanent slides of a couple of *S. mansoni* (**FIGURE 2A**) so that they could identify their structures and have a first contact with the species already in the

adult form and a slide containing cercariae (FIGURE 2B), which are the infective forms of the human being.

FIGURE 2 – A: Couple of *S. mansoni*. B: Cercarias of *S. mansoni*.



Source: the authors.

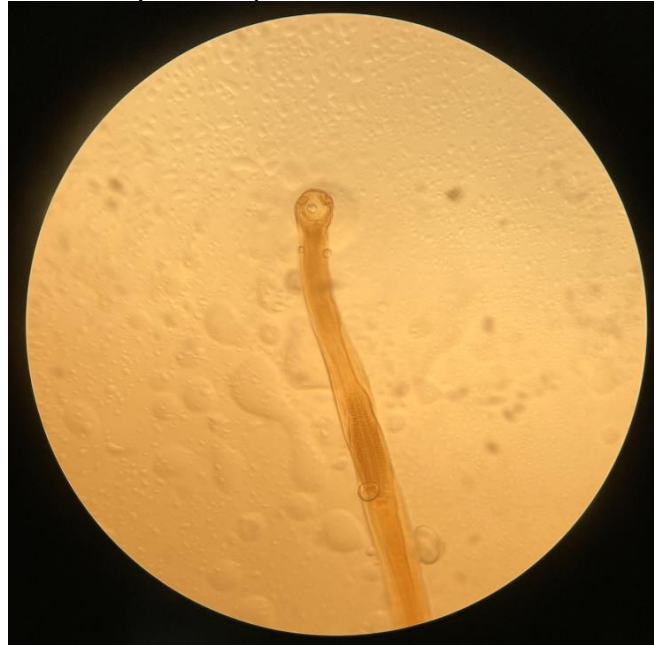
For taeniasis verminosis, the approach used was the display of a video of an endoscopy performed in a patient with the *Taenia* parasite as an adult *infecting the small intestine*, in addition to the audiovisual resource, an adult specimen of *Taenia sp.* was made available, fixed in an appropriate container (FIGURE 3), so that the students could have dimensions of the size that the parasite can reach, as well as allow the visualization of the proglottids that are eliminated next to the feces.

FIGURE 3 - *Taenia sp. nov.* fixed in 70% alcohol. Source: the authors.



For the approach on hookworm was presented a video showing the infection in a human being. The helminth fixed on a microscopy slide (**FIGURE 4**) was also used, where the morphology of the worm was detailed for the students.

FIGURE 4 - *Ancylostoma* sp. nov. fixed on blade. Source: the authors.



At the end of the activity, a discussion session was opened, where the students asked questions, put their curiosities, clarified doubts about the tests available for the diagnosis of parasitosis and how to proceed in case of suspicion of parasitic infection.

It was possible to identify the engagement and enthusiasm of the students in the activities carried out. They were interested, especially with regard to the means of contamination and the evolutionary forms of parasites. Many of them had the opportunity to expose their doubts on the subject, creating a relaxed, fun and extremely instructive moment for everyone.

The students had the opportunity to deepen their knowledge about verminosis, which enables the creation of a transmission network that can reach other people in their life such as friends and family, and this aspect is of fundamental importance so that the central theme of verminosis can be better understood and administered by society, reducing its occurrence.

Therefore, the event brought an important gain of knowledge both for the school community served and for the undergraduate students of the Biomedicine course, who were able to experience a unique professional experience, enabling the transmission of the knowledge acquired in the university environment to the local community.

4 FINAL CONSIDERATIONS

The university extension, specifically with regard to verminosis, is a valuable tool in order to disseminate to children and adolescents, scientific knowledge about parasites, means of contamination and prevention of infections. By learning about basic personal hygiene practices, these individuals can share their experiences and knowledge, becoming multipliers of information. This approach contributes to the formation of more aware and educated citizens about the importance of access to quality basic sanitation.

University extension offers direct benefits to undergraduate students, in particular those studying biomedicine. This approach provides undergraduates with a deeper understanding of relevant topics such as worms, as well as a broader understanding of the socioeconomic and health problems that affect the community in which the university campus is inserted. In addition, university extension contributes to the development of critical skills and thinking about human dignity, helping students to become more qualified professionals and committed to improving the quality of life of the population.

Of these, the university extension offers opportunities for students to broaden their academic experiences, contributing to the development of future professionals in their respective areas of training. By participating in social intervention initiatives, students also have the opportunity to contribute to the communities served, providing solutions to local problems and promoting the improvement of the quality of life of the people involved.

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