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Playful approach to hand washing and prevention of giardiasis in schoolchildren

EXPERIENCE REPORT

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DECLARATION OF THE EXISTENCE OR NOT OF CONFLICT OF INTEREST: THERE IS NO CONFLICT OF INTEREST.

Abordagem lúdica sobre lavagem das mãos e prevenção da giardíase com escolares

ABSTRACT

Introduction: Giardiasis is an underreported parasitic disease that offers numerous negative consequences, especially for children. The transmission of this parasite is oro-fecal and is related to incorrect washing of hands and food. **Objective:** To report the experience of students in the third period of a medical course in the development of an educational intervention on giardiasis and hand washing, for children at a school in Belo Horizonte, Minas Gerais. **Method:** The educational intervention included the development of playful activities for children aged between 10 and 11 years, on the prevention of giardiasis. The strategies used were: the elaboration of posters, the application of activities with questions and answers and the dynamics of correct cleaning of hands with ink. **Result:** Medical students noticed that the children obtained an increase in knowledge about the aforementioned pathology and that the use of paint simulating hand washing was effective in keeping the children attentive to the explanations. In addition, it was noticed, through active observation, the change in behavior of children in relation to the practice of hand washing. **Conclusion:** The educational intervention allowed the joint construction

of knowledge among the participants of the action and reached the proposed objective, achieving the behavioral change of the target audience and the improvement of knowledge about giardiasis.

Keywords: Child; Giardiasis; Giardia lamblia; Hand Disinfection

RESUMO

Introdução: A giardíase é uma doença parasitária subnotificada que oferece inúmeros desdobramentos negativos, principalmente, às crianças. A transmissão desta parasitose é oro-fecal e está relacionada à lavagem incorreta das mãos e dos alimentos. **Objetivo:** Relatar a experiência de alunos do terceiro período de um curso de Medicina no desenvolvimento de uma intervenção educativa sobre giardíase e lavagem das mãos, para crianças de uma escola em Belo Horizonte, Minas Gerais. **Método:** A intervenção educativa contou com a elaboração de atividades lúdicas para crianças com idade entre 10 e 11 anos, sobre a prevenção da giardíase. As estratégias utilizadas foram: a elaboração de cartazes, a aplicação de atividades com perguntas e respostas e a dinâmica de limpeza correta das mãos com tinta. **Resultado:** Os acadêmicos de medicina perceberam que as crianças obtiveram um aumento do conhecimento sobre a patologia citada e que o uso de tinta simulando a lavagem de mãos foi eficaz para manter as crianças atentas às explicações. Além disso, percebeu-se, por meio de observação ativa, a mudança de comportamento das crianças em relação à prática de lavagem das mãos. **Conclusão:** A intervenção educativa permitiu a construção conjunta de conhecimentos entre os participantes da ação e atingiu o objetivo proposto, alcançando a mudança comportamental do público-alvo e a melhora do conhecimento sobre a giardíase.

Palavras-chave: Crianças; Desinfecção das mãos; Giardíase; Giardia lamblia

INTRODUCTION

Giardiasis is a parasitological disease caused by the flagellated protozoan *Giardia Duodenalis*[1]. According to epidemiological data, this is the most common enteric infection caused by protozoa in the world, affecting approximately 2% of adults and 8% of children in developed countries, in addition to reaching approximately 33% of the population of developing countries[2,3].

It is also worth highlighting that giardiasis is an underreported and marginalized disease. In this perspective, despite being of great importance for public health, as it is associated with a lack of basic sanitation and little health education for a large part of the population, there is a lack of recent epidemiological data and more concrete information about giardiasis and several other transmitted fecal-oral parasites[4]. In this regard, the perspective of 2030 Agenda influences and serves as a foundation for the notion of Global Health, mainly for developing countries, and the action proposed in this article is relevant as it is related to three of the 17 sustainable development goals of the United Nations (UN): "good health and well-being", "quality education" and "clean water and sanitation"[5].

In Brazil, in the last five years, the prevalence of this disease varied from 18% to 58.45%, depending on the

region and age group studied, being mostly in children. Therefore, children who attend Municipal Early Childhood Education Centers are more susceptible to infections than those who are kept at home[6,7,8].

As for the pathophysiological aspects, it is known that the life cycle of *Giardia lamblia* has two distinct states, an infectious state in the form of a cyst and a proliferative state in the form of a trophozoite. The infection is transmitted oro-fecally, through the ingestion of cysts, which may be present in contaminated water and food. After ingestion, the parasite "decysts" occurs in the duodenum, the initial portion of the small intestine, releasing trophozoites, a phase in which the symptoms of the disease start to manifest themselves. The adherence of the parasite to the wall of the small intestine causes damage to the intestinal mucosa, causing the "carpeting" of the microvilli, which are responsible for the absorption of nutrients[9].

To confirm the parasitosis, the diagnosis is usually performed using fecal parasitology, which detects eggs, larvae or, sometimes, adult worms or their segments. Recent studies prove that detection rates with immunological tests are higher than parasitological fecal tests (with around 12% discrepancy)[10]

Moreover, regarding symptoms, most *Giardia lamblia* infections are asymptomatic, therefore, many patients have the cysts and trophozoites of this parasite, which they transmit, but are unaware of the infection. However, when there is a symptomatic form, there is the presence of steatorrhea, which is the presence of fat in the feces, weight loss, greenish-colored feces with a foul odor and malaise[11]. Although, giardiasis may become a chronic disease or present post-parasitic infection sequelae[12].

Giardiasis causes numerous negative consequences for infants, as the damage to the intestinal mucosa caused by "carpeting" leads to a reduction in the absorption of nutrients and, consequently, there is a delay in the cognitive and physical development of children[14,15,16,17]. Therefore, it is important to develop educational interventions with children in socially vulnerable contexts, focusing on building knowledge about correct handwashing practices.

The treatment of giardiasis must be established in both endemic and non-endemic areas to prevent complications, chronic diseases, and the spread of the infection. The first line of medicines for the treatment of parasitosis are nitroimidazoles and derivatives (such as metronidazole, tinidazole and secnidazole). As a second line, the combination of drugs from different classes has also shown to be effective, such as the combination of albendazole with metronidazole (it was shown to be 90% effective in a small randomized clinical trial in Italy), though monotherapy with albendazole was not as effective.[18]. Metronidazole reduction product has cytotoxic properties that interact with DNA and inhibit nucleic acid synthesis, causing cell death[1].

Children are especially affected by *Giardia lamblia* due to lack of adherence to correct hand hygiene practices and constantly touching their mouth[13]. Hand hygiene aims to remove dirt, sweat, oil, scaly cells, and microbiota from the skin, being essential to prevent the spread of diseases, mainly gastrointestinal infections with oro-fecal transmission and, consequently, reduc-

ing mortality and the negative consequences caused by pathologies spread by incorrect hand hygiene[8].

In this way, investment in educational interventions on correct hand washing and giardiasis prevention measures are essential to protect children from possible contamination and health damage. One of the suitable environments for educating children is the school itself, which, according to the Curricular Parameters for Elementary Education, must provide students with a series of knowledge related to taking care of their own health.

The National Curricular Parameters for Elementary Education aim to indicate which axes, procedures and attitudes students need to be able to apply from Elementary School onwards, there is a specification in relation to health, namely: "knowing your own body and taking care of it, valuing and adopting healthy habits as one of the basic aspects of quality of life and acting responsibly in relation to your health and collective health"[20]

This parameter advocates disease prevention and not just the disease itself. This premise inspired medical students to develop an educational intervention that aimed to educate children from a school in Belo Horizonte, Minas Gerais, about the prevention of giardiasis and the correct practice of hand washing. Among the teaching strategies used in the intervention, the use of didactic games and playful activities stands out.[21,22], which will be described in the next section of the article.

EXPERIENCE REPORT

The present work is an experience report on an educational intervention carried out on the pathophysiology of giardiasis with 5th grade children, aged between 10 and 11 years old, at a State School in Belo Horizonte, Minas Gerais. The intervention approach was supported by elements of interactionist theory, involving children and students from *Faculdade de Ciências Médicas de Minas Gerais* (FCMMG)

The intervention was a proposal for the Community Training Practice (CTP) discipline, mandatory in the Medicine course curriculum from the first to the eighth period of the course, with a workload of 40 hours/semester. This discipline aims to keep undergraduate students close to the community and encourage them to develop interventions focused on social transformation.

DESCRIPTION OF THE INTERVENTION

Initially, the extension students discussed with the participants, 40 children between 10 and 11 years old, about the pathophysiology of giardiasis. The activity was carried out through a poster about what the disease is, how it is transmitted, its symptoms, its cycle and how the pathology is diagnosed. (Figure 1).

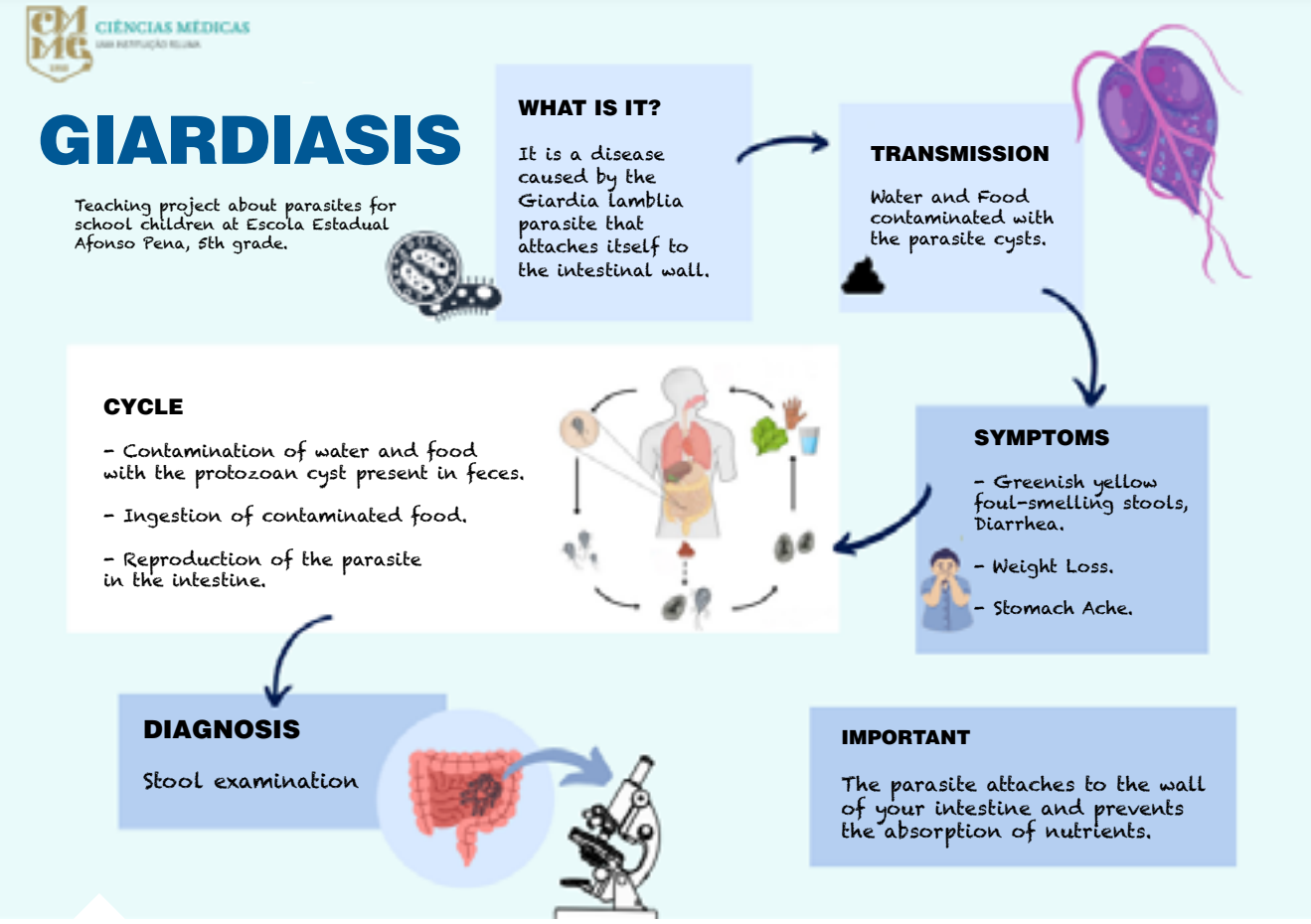

FIGURE 1: POSTER SHOWN TO CHILDREN ABOUT GIARDIASIS. SOURCE: ELABORATED BY AUTHORS.

Then, a playful activity compatible with the child's cognitive phase was carried out to teach them the correct way to wash their hands, since giardiasis is a disease transmitted fecal-orally. In this way, the medical students sealed the children and then poured a small amount of colored gouache paint on their hands, telling them that it was alcohol, as shown in Figure 2. In this perspective, the children were unable to identify that it was, in fact, paint. Then, the children were instructed to wash their hands. In the end, when removing the blindfold, the medical students showed the children the places on their hands that were not completely colored by the paint, thus creating an analogy with inadequate hand hygiene.

FIGURE 2: IMAGE OF HAND WASHING DYNAMICS. SOURCE: AUTHORS' ARCHIVE.

Afterwards, the children were shown the correct method of cleaning their hands using the following words: *"wet your hands with water, apply soap, rub your palms together, the right palm against the back of the left hand, interlacing the fingers and vice versa, the back of the fingers of one hand with the palm of the opposite hand, the thumbs, digital pads and nails, rinse well with water and dry with disposable paper towel".*

There was also a moment for children to ask their questions about hygiene and the aforementioned pathology.

As a way for researchers to check whether there was an improvement in children's understanding of giardiasis, questions were asked before and after the in-

tervention focusing on symptoms, transmission, and treatment, integrating learning about washing hands, food and parasitosis. Thus, it was possible to verify the children's learning about new knowledge and their enjoyment of the activity.

Regarding the first question, which asked "What is a parasite?", in the pre-test, most children answered correctly, a protozoan, an answer that remained in the questionnaire after the class (post-test). Although, many ones did not know what this microorganism was, which was later explained to them.

The second question was based on the form of transmission of giardiasis, before, the majority answered, "contaminated water and food", however, many also opted for the option "through saliva", however the improvement in answers after the explanation was significant, in which the vast majority marked the correct answer.

In the third question, "where are *giardia* housed in the body?", there was a predominance of the answer "in the stomach", before the class, after it, the majority marked "in the intestine". In addition to, it was seen that many of them did not know the difference between these two organs, so this explanation was also given to them. Subsequently, the fourth question was about the diagnosis of the disease, "how to find out if you have *giardia*", there was a predominance of the answer "blood tests" previously.

After the explanation, this result was reversed for "stool tests", which generated non-compliance among the children, as they did not understand how this test was performed. Regarding the fifth question, "how to avoid getting giardiasis?", before and after class most of the answers were "wash your hands and food correctly".

The sixth question was "what are the symptoms of giardiasis?" and a little more than half of the answers were "diarrhea" in the pre-test, in the post-test, the vast majority gave the correct answer. At last, the seventh question, which dealt with the correct washing of food, "is it right to wash vegetables and fruits with?", the predominance of answers was: "soap" and "vinegar" before the explanation, in the post-test, most of them opted for "bleach", causing great uproar among the students, who questioned a lot about the safety of the method, as they believed this substance would harm the body, however, after the step-by-step explanation of how to carry out this cleaning, the children understood.

Additionally, the dynamics of washing simulated hands with paint offered benefits to the children in that, after the volunteers' blindfolds were removed, they were able to see the parts that were not correctly sanitized by their colleagues. Therefore, the students learned in a playful way the appropriate way to sanitize their hands, considering that after this activity, there was a demonstration by the medical students about how it should be done properly.

DISCUSSION

The experience report presented is the result of an academic extension activity of the Community Training Practice discipline held in Belo Horizonte on the importance of hand washing as a way of preventing the

spread of diseases, especially those of oro-fecal transmission, such as *Giardiasis*.

Playfulness can contribute significantly to the children's teaching-learning process.[21,22] The dynamics demand attention, imitation, memory, and imagination, being a tool that facilitates educational stimuli. When playing, children develop physical, emotional, social, and moral aspects, in addition to awakening creativity, enabling greater participation and retention of formal content while working on emotional intelligence. This is very relevant considering the social role of education, as it can enhance the individual's contributions to society and according to the philosopher Jürgen Habermas, extensive prior information is needed to achieve the concept of communicative action which consists of a person's ability to defend their interests and demonstrate what they think is best for the community[21,22].

In this context, to carry out the activity, extension students needed to deepen the theoretical basis to reproduce complex themes in a playful and practical way, with the aim of being an interactive dynamic with what is experienced in children's daily lives. And this format contributed to an increased internalization of what was presented to the infants, a fact that contributed to improving their health and well-being and consequently their entire living environment.

Furthermore, this methodology is in line with the Law of Guidelines and Bases of National Education (LDB No. 9,394/96), article 2, which declares that Education is a duty of the family and the State, with the purpose of guaranteeing the overall development of the child, as well as the exercise of citizenship. From this perspective, teaching about parasitosis through games contributes to learning and provides children with the skills to play an active role in the health promotion process, for example by demanding basic sanitation and other related prophylactic measures in the future. to oro-fecal diseases[22].

When faced with a health condition such as giardiasis, a neglected disease that affects many children, a proactive, continuous, and integrated social response is necessary. To this purpose, health literacy in a playful way at school proposed in this project is an alternative to promote health, following the principles of primary care, which contributes to raising awareness among individuals from a young age about the importance of individual and collective prophylaxis measures. This will contribute to greater awareness among the population about the parasitosis and possibly lower health system expenditure on this disease[23].

This type of extension intervention encourages participation with a community focus in which medical students have the opportunity to deal with managerial, health and democratic practices, and aspects of the disease in question, such as clinical, epidemiology and sociocultural insertion in that context.

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