

**Children's drawings as an instrument for evaluating learning in a health educational activity about leprosy****Desenho infantil como instrumento de avaliação de aprendizado de uma atividade educativa em saúde sobre hanseníase****Dibujo infantil como herramienta de evaluación del aprendizaje de una actividad de educación en salud sobre enfermedad de Hansen**** Dafne Raquel Silva<sup>1</sup>,  Vânia Del Arco Paschoal<sup>1</sup>,  Susilene Maria Tonelli Nardi<sup>2</sup>****Received:** 23/05/2023 **Accepted:** 21/07/2023 **Published:** 30/09/2023

**Objective:** to evaluate the effects before and after a health educational activity on leprosy for elementary school students. **Methods:** field study carried out in 2022, targeting students aged between 8 and 10 years old. The activity was divided into three stages. In the first stage, students were asked to draw what they believed to be the meaning of the word leprosy, with no prior explanation. In the second stage, an educational activity took place and in the third, students were asked again to draw about leprosy. **Results:** 46 children participated, 19 (41.31%) from the 3<sup>rd</sup> year of , 20 (43.47%) from the 4<sup>th</sup> year and 7 (15.22%) from the 5<sup>th</sup> year of Elementary School, totaling 92 sheets of drawings, 46 before and 46 after. Skin sores, transmission and the word "leprosy" were the most frequent interpretations later. When comparing the main concepts taught, an evolution was observed in relation to the previous moment. **Conclusion:** the impact of this research shows us that it is important that all health education has validation of the learning generated and children's drawings proved to be an effective form of evaluation.

**Descriptors:** Drawing; Child; Leprosy; Learning.

**Objetivo:** avaliar os efeitos em momentos antes e depois de uma atividade educativa em saúde sobre hanseníase para alunos do ensino fundamental. **Método:** estudo de campo realizado em 2022, tendo como público-alvo os alunos com idade entre 8 a 10 anos. A atividade foi dividida em três etapas. Na primeira etapa solicitou-se que alunos desenhassem o que eles acreditavam o que fosse o significado da palavra hanseníase, sem uma explicação prévia, na segunda etapa foi realizada a atividade educativa e na terceira foi solicitada novamente que os alunos desenhassem sobre a hanseníase. **Resultados:** participaram 46 crianças sendo 19 (41,31%) do 3<sup>o</sup> ano, 20 (43,47%) do 4<sup>o</sup> ano e 7 (15,22%) do 5<sup>o</sup> ano do ensino fundamental, totalizando em 92 folhas de desenhos, sendo 46 antes e 46 depois. Mancha na pele, transmissão e a palavra "hanseníase" foram as interpretações mais frequentes, no momento posterior. Ao se comparar os conceitos principais ministrados, observou-se uma evolução em relação ao momento anterior. **Conclusão:** O impacto desta pesquisa nos mostra que é importante que toda educação em saúde tenha uma validação do seu aprendizado gerado e o desenho infantil mostrou-se uma forma eficaz de avaliação.

**Descritores:** Desenho; Criança; Hanseníase; Aprendizagem.

**Objetivo:** Evaluar los efectos antes y después de una actividad de educación en salud sobre la enfermedad de Hansen para alumnos de escuela primaria. **Método:** Estudio de campo realizado en 2022, dirigido a alumnos de entre 8 y 10 años. La actividad se dividió en tres fases. En la primera etapa, se pidió a los alumnos que dibujaran lo que creían que significaba la expresión enfermedad de Hansen, sin explicación previa; en la segunda etapa, se llevó a cabo la actividad educativa; y en la tercera etapa, se volvió a pedir a los alumnos que dibujaran sobre la enfermedad de Hansen. **Resultados:** Participaron 46 niños, 19 (41,31%) de 3<sup>o</sup> grado, 20 (43,47%) de 4<sup>o</sup> grado y 7 (15,22%) de 5<sup>o</sup> grado de primaria, totalizando 92 hojas de dibujos, 46 antes y 46 después. La mancha cutánea, la transmisión y la palabra "enfermedad de Hansen" fueron las interpretaciones más frecuentes después. Al comparar los principales conceptos enseñados, se observó una evolución en relación con el momento anterior. **Conclusión:** El impacto de esta investigación muestra que es importante que toda educación sanitaria sea validada, y los dibujos de los niños demostraron ser una forma eficaz de evaluarlo.

**Descriptor:** Dibujo; Niño; Lepra; Aprendizaje.

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## INTRODUCTION

**L**eprosy is a disease caused by *Mycobacterium leprae*. It is a disease with high disabling and disfiguring potential, regardless of gender and age, and can affect adults and children<sup>1-3</sup>.

The World Health Organization (WHO) creates the “Don’t forget leprosy” campaign, especially due to the overload and weakening of health services caused by the pandemic, as the diagnosis of new cases of leprosy decreased in Brazil in 2020 and 2021. In 2019, Brazil registered 27,864 new cases of the disease, while this number fell to 17,979 in 2020, and to 15,155 in 2021, and this situation may be related to the difficulties in accessing health services due to the pandemic and the management of the pandemic in Brazil. For that reason, new cases were no longer registered and, therefore, people who should have been undergoing treatment still do not even have a diagnosis<sup>4</sup>.

The learning process never ends, and learning is what generates a change in response<sup>5</sup>. And school is an environment for building knowledge, thus being an important space for health practices and experiences, such as activities related to health promotion<sup>6</sup>.

In the Ottawa Charter, health promotion “is the name given to the process of empowering the community to act to improve their quality of life and health, including greater participation in the control of this process”. One of the ways to promote health is educational activities, which is a theoretical-practical process that aims to integrate various types of knowledge, whether scientific or popular<sup>7-9</sup>.

Playful activity has historically been the main activity in child development. Drawing is used as a way of building knowledge. The effectiveness of children's drawings has already been the subject of scientific research and the results have shown that it is potentially significant for the process of knowledge construction. An example of this, in research with children in a rural school, drawing was used with the aim of evaluating values and knowledge about water. Children's drawings are considered a form of expression, and pencil and paper are tools currently widely used by children in this process to acquire knowledge<sup>10-13</sup>.

Therefore, this research aims to evaluate the effects before and after a health educational activity on leprosy for elementary school students.

## METHODS

Quantitative and analytical field study<sup>14</sup> carried out in 2022, in a public school in a large municipality, in the interior of the state of São Paulo, Brazil, and whose target audience were students from the 3<sup>rd</sup> to 5<sup>th</sup> year of elementary school.

The health educational activities were carried out in the school classroom, during school hours, in a span of eight days, in two periods in the morning and the afternoon, which were stipulated by the school management.

All students in the grades participated in the educational action, but the inclusion criteria for the study included students whose parents or guardians signed the online FICF (Free and Informed Consent Form), and the exclusion criteria was students who did not want to participate or were absent from school on the day of the lecture.

A data collection instrument divided into two parts was created. The first has multiple choice questions about the child's name initials, and the class and year to which the students belonged. This data was provided by the school. The researcher filled out the second part as a way of guiding the evaluation of the fixation of the main concepts understood by the students in the teaching activity, through drawings, when they appeared: skin sores, skin insensitivity, ideas about the transmission of the disease, contact contagion with the family, health professionals, cure, the word leprosy, treatment and any other aspect related to the topic, a significant database for the disease<sup>15</sup>. If the child drew or presented one of these options in writing or otherwise, it was also noted on the questionnaire. This was completed in two moments, before and after the educational action, through observation of the drawings created.

This instrument developed by the authors of this research was previously evaluated as a pilot project tested by 10 children, applied in this research and the subsequent intention is to validate it.

The activity was divided into 3 stages. In the first, students were asked to draw what they believed the meaning of the word Leprosy was, with no prior explanation. An A4 white sheet of paper was given with space for the initials of the name and the date of the activity, colored pencils and/or colored pens. The estimated time for this activity was approximately 10 minutes. Then, the first drawings produced by the children were separated.

In the second stage, an educational activity about leprosy was carried out in a conversational manner, with playful strategies, audiovisual resources and a video about leprosy for children, entitled: Mickey and Friends in: Learning about Leprosy<sup>16</sup>, on the YouTube platform ([www.youtube.com](http://www.youtube.com)). It was taught to eight elementary school classrooms for approximately 20 minutes, following the proposed lesson plan, which sought to assess prior

knowledge, describe what leprosy is, how the disease is transmitted, identify the signs and symptoms, what should be done if the person presents symptoms and evaluate acquired knowledge, based on the concepts recommended by the Brazilian Ministry of Health, WHO and other publications<sup>15-19</sup>.

Initially, the lecture presented a story about leprosy through a video, and then a class took place, where the main concepts discussed were: What is leprosy? How is it transmitted? How can someone catch it? To reinforce the concepts, there was a talk about the disease, the bacillus, transmission and treatment, signs and symptoms in a language accessible to children.

In the third stage, students were asked again to draw about leprosy. Again, material relevant to the drawing was given. The estimated time was approximately 10 minutes. Again the drawings were separated and after the end of the meeting, the before and after sheets of each child were put together for evaluation.

After the educational activity, an explanatory folder, created by the researchers, was delivered, based on the Fundação Paulista contra a Hanseníase<sup>19</sup> serial album, about leprosy, to be delivered to families. The folder contained 4 pages with a drawing and contained content relating to the disease, its contagion, the main signs and symptoms and who to ask for help if symptoms were detected in someone in the family.

After tabulating the collected data, two statistical analysis functions were performed: descriptive and inferential. Data analysis was carried out using the mean, median, mode, standard deviation, standard error, maximum value, minimum value, significance. The result was considered significant when  $p < 0.05$ , and Pearson's Chi-square was used as an instrument. This study was approved by the Research Ethics Committee of the School of Medicine of São José do Rio Preto, SP (FAMERP) and approved by no. 5,461,445.

## RESULTS

46 (100%) children participated in this study, 19 (41.31%) from the 3<sup>rd</sup> year, 20 (43.47%) from the 4<sup>th</sup> year and 7 (15.22%) from the 5<sup>th</sup> year of elementary school, totaling 92 sheets of paper with children's drawings, 46 before and 46 after.

When evaluating the number of images before the educational practice, in all 46 sheets, 24 images were obtained that represented some concept related to leprosy, as shown in Table 1. In relation to prior knowledge, 17 children revealed that they knew something about leprosy.

Likewise, after the development of the pedagogical action, the return was 88 figures (on 46 sheets) whose concepts were related to the disease, reaching a number of drawings greater

than triple that of before the educational practice (Figure 1). All 46 children presented a drawing with the theme.

In Table 1 it can be seen that the ideas that possibly stuck most after the educational activity were: skin sores, followed by the word leprosy. It was observed that regarding skin insensitivity, the transmission and cure of the disease, there was no data in the previous drawings. "Other aspects" that had not been listed in the collection instrument before, but that appeared later were: health unit, bacteria, teacher, tingling in the hands and feet, mother telling a story about the disease in Jesus' time and loss of body hair.

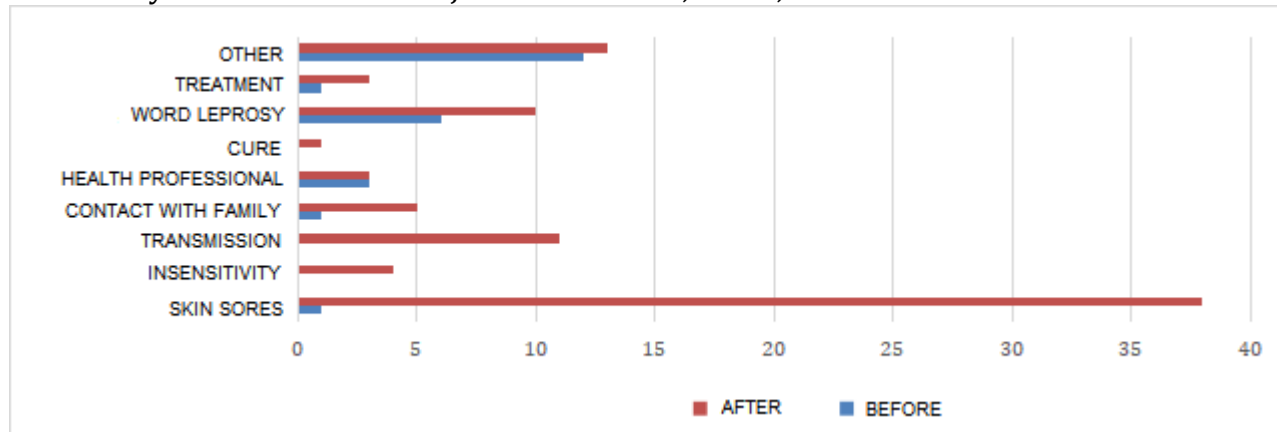
**Table 1.** Responses in relation to the study variables, which appeared in the drawings of elementary school students, before and after the health educational activity. São José do Rio Preto, Brazil, 2022.

Health Educational Activity					
Variables	BEFORE		AFTER		P Value*
	No	%	No	%	
<b>Skin sores</b>	1	2.2	38	82.6	0.643
<b>Skin insensitivity</b>	0	0.0	4	8.7	-
<b>About transmission</b>	0	0.0	11	23.9	-
<b>Contact with family</b>	1	2.2	5	10.9	0.004
<b>Health professionals</b>	4	8.7	3	6.5	0.000
<b>Cure</b>	0	0.0	1	2.2	-
<b>Word leprosy</b>	6	13.0	10	21.7	0.460
<b>Treatment</b>	1	2.2	3	6.5	0.789
<b>Other aspects</b>	12	26.1	13	28.3	0.230

\* Pearson Chi-square

Figure 1 shows the evolution of what may have remained in the children's memory about the health educational activity, comparing before and after. It is observed that all concepts were remembered and transcribed by the drawings.

**Figure 1.** Assessment before and after the educational activity on leprosy through drawings by elementary school children. São José do Rio Preto, Brazil, 2022.



For interpretative understanding of the various drawings returned (before and after) three were brought as an example. In the drawing in Figure 2, made by a 3<sup>rd</sup> year student, it can be seen that only one concept was presented by the child - writing the word leprosy. After the educational action, he presented four concepts in the drawing: skin sores and insensitivity, the word leprosy and medications as a reference to treatment, demonstrating an evolution between the first drawing and the second.

**Figure 2.** Drawing by a 3<sup>rd</sup> year elementary school student before and after the educational activity on leprosy. São José do Rio Preto, Brazil, 2022.



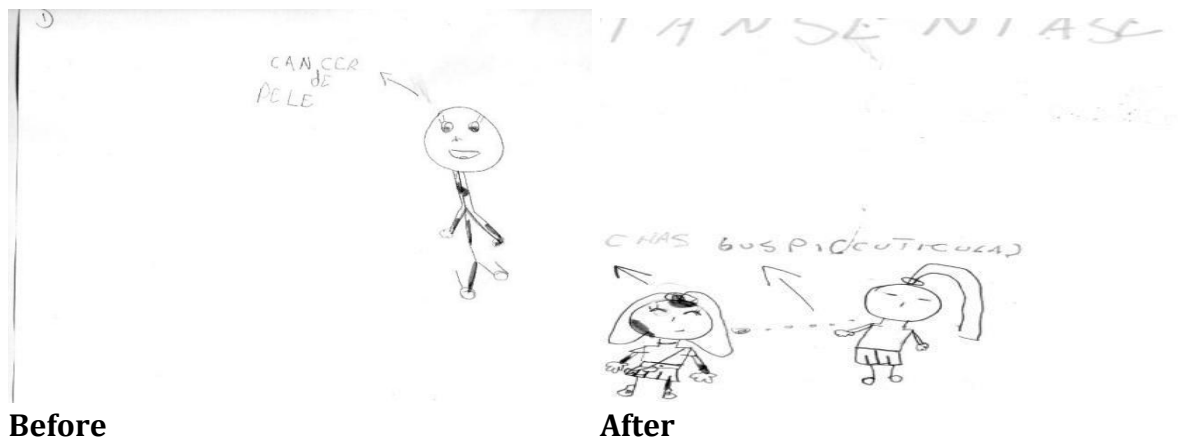
In Figure 3, with a drawing made by a 4<sup>th</sup> year student, it can be seen that previously no concept linked to the theme was presented. Afterwards, four concepts were reached: skin sores, cure, the word leprosy and the image of a health center.

**Figure 3.** Drawing by a 4<sup>th</sup> year elementary school student before and after the educational activity on leprosy. São José do Rio Preto, Brazil, 2022.



The drawing (Figure 4) was made by a 5<sup>th</sup> year student, in which it was observed that only one concept was revealed before: skin sores, but referring to skin cancer; and in the drawing afterwards three concepts were presented: skin sores, word leprosy and transmission.

**Figure 4.** Drawing by a 5<sup>th</sup> year elementary school student before and after the educational activity on leprosy. São José do Rio Preto, Brazil, 2022.



All children who participated in the activity were given a folder explaining the disease, mainly focusing on the skin signs of leprosy and where they could be seen if they suspected the disease.

## DISCUSSION

In this study, we sought to understand whether a drawing made by a child would be capable of expanding the understanding of theoretical concepts about a disease.

Evaluate the knowledge and learning generated after an educational action in health and considering that the learning acquired is that which generated changes in the responses found

in the learners and taking into account that recovering prior knowledge helps in the construction of new learning<sup>20</sup>. It was observed that it was important to ask the children to draw what they thought was leprosy without giving any prior explanation, as this provided a basis for this knowledge. Of the 46 children, 17 presented some concept related to leprosy.

From this point onwards, educational practice was carried out, where new information was linked to existing knowledge, expanding its quality, observing the evolution of children's drawings. After the educational practice, all 46 new drawings were found to have some association with the concept of the disease, this number being three times higher than in the drawings before the health pedagogical action.

In the results found in the children's drawings before and after the educational activity, it can be observed that in the drawings prior to the activity, only one child associated the concept of the disease, being this: skin sores, but referring to skin cancer, however, after the health educational practice, 38 children related the disease to skin sores, this time correctly.

Another important concept is that no child associated skin insensitivity with diseases, but after being told about leprosy, 4 children associated it with the disease. Even though the number of children who drew the concept of insensitivity is small, it made it possible to reflect that there is possibly still a need to focus more on this characteristic of the disease in educational practices. A similar situation also occurred in another research where it was possible to highlight changes in the response through drawings where images were also used to identify what students knew about a certain topic. A pre-test was carried out with the drawings before the activity, and then the drawing was used again to check what the students learned after the activity<sup>21</sup>.

In the present study, curiosity was also used as a teaching strategy, which is a characteristic of human beings, regardless of their age. Curiosity is more expanded and alive during childhood and adolescence, so we must take advantage of this opportunity and stimulate this questioning instinct, and use curiosity to know the world. Developing curiosity in children is one of the best ways to open their horizons to knowledge<sup>22</sup>. In this way, when it was used as a pedagogical method that was initially requested to draw what leprosy was without giving any prior explanation, this aroused the children's curiosity and increased the level of attention in relation to the educational activity.

Drawing is an important tool in the learning process, as since prehistoric times man has used drawing as a way of communicating and keeping records. Therefore, it is possible to realize this relationship between children's drawing and the productions of primitive peoples, because from prehistory to contemporary times we can see that human beings appropriate



drawing to express values, feelings and moments of their daily lives. day. And children also use drawing as a resource to express their experiences and learning<sup>23</sup>.

Also keeping in mind that leprosy is considered one of the oldest diseases in the world, it is important to intensify health actions, especially educational ones, when it comes to children. The Health in Schools Program (*Programa Saúde nas Escolas - PSE*) was published by the Brazilian government in 2008, with the aim of recognizing school spaces “as privileged spaces for practices that promote preventive health and health education.” (BRAZIL, 2009, p.12)<sup>24</sup>. In this sense, the school as a teaching space is a favorable environment for the development of health education practices among children, as it is through school that they begin their knowledge that extends for the rest of their lives.

Health education is important as a guiding policy for ongoing educational processes in the different care arrangements of the SUS. Popular health education recognizes that knowledge is constructed through interaction between subjects, integrating scientific and popular knowledge, generating learning<sup>24-26</sup>.

Health education provides the opportunity for children or adolescents to learn about behaviors that pose a risk to their health and development, as well as that of their family<sup>27</sup>. The teaching of health education is not very representative in Brazilian schools, as found in a recent study in a public school, where 87.8% of basic education students had never participated in training on basic life support<sup>28</sup>, or on the obstruction of airways in a choking situation, the result of which was the improvement of students' training in maneuvers to eliminate the aspirated object<sup>29</sup>.

For the efficiency of child and youth health education, it is essential to master the topic, as well as evaluate the effectiveness of actions, as a way of developing a critical-reflective awareness regarding the strategies applied<sup>27,29-30</sup>. In the context of this study, applying drawing as a learning assessment tool proved to be a good option, as it was possible to carry out an evaluation of the educational action, presenting a basis of knowledge acquired by children after the educational action about the disease.

When carrying out the evaluation of the action, through which children's drawing proved to be an important methodological strategy for evaluating learning, it was found that before they presented 24 drawings that were considered related and, after the educational action, 88 drawings were obtained, reaching three times the variables set by the students, showing that the children were possibly able to assimilate the information, generating learning. In view of this, it is important not only to develop health education strategies, but also to evaluate the effectiveness of actions.

## CONCLUSION

When comparing the evolution of the main concepts about leprosy disclosed in the health educational action, an evolution was obtained, allowing us to say that the pedagogical activity was successful.

The feedback of the drawings, individually and collectively, showed that the children in the grades studied learned the main concepts taught.

Among the limitations of this study, it was observed that there are few scientific studies that evaluate the effectiveness of a children's drawing as an instrument for evaluating learning, thus, an instrument was created to guide this evaluation of the fixation of the content taught, which will be validated later.

The impact of this research shows that every educational activity in health must have its goals consistently validated, and that the free design method used proved to be effective.

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**Dafne Raquel Silva** and **Vânia Del Arco Paschoal** collaborated in the conception of the study and its design, data collection and analysis, writing and revision. **Susilene Maria Tonelli Nardi** contributed to data collection and analysis, writing and revision.

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