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ORIGINAL ARTICLE

Teddy Bear Hospital: the impact of knowledge about childhood health to combat iatrophobia

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Abstract

Introduction: The "Teddy Bear Hospital" project aims to familiarize children with the medical environment, reducing fear and increasing acceptance of medical care through a hospital simulation with toys. **Objectives:** To improve the relationship between children and the medical environment, redefining the image of healthcare professionals. Method: Conducted by Medical students in schools in Curitiba, the project engaged 182 children aged 2 to 7 years in a simulated hospital circuit. **Results:** The project revealed changes in childrens feelings toward doctors before and after participating in the circuit. Initially, negative feelings such as sadness and fear predominated. However, after the intervention, there was a significant reduction in these emotions, with sadness decreasing by almost 20 percentage points (pp) and fear by 14 pp. Otherwise, happiness increased by 30 pp after the event. Questions such as "What does a doctor do?" and "Why should we get vaccinated?" had a significant increase by the end of the activity, indicating improved knowledge about medical roles and vaccines. While knowledge about the number of Serviço de Atendimento Móvel de Urgência (SAMU) showed a slight increase, the volunteers approach encouraged students to share this information at home or with other children, fostering a culture of prevention and responsibility in first aid. **Conclusion:** The results suggest that this experience can transform medical care into a more welcoming and educational practice, benefiting children and future healthcare professionals.

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INTRODUCTION

Iatrophobia, known as the fear of doctors, is a condition that can have serious implications for children's public health. Among its most common manifestations is the "white coat syndrome," characterized by a negative emotional reaction to the medical environment and healthcare professionals, especially when they wear white coats.[1] In children, this syndrome may present through anxious behaviors such as crying, physical or verbal resistance during consultations, as well as physical symptoms like increased blood pressure.[2]

According to the author, between 15% and 30% of children may develop white coat syndrome, particularly those with previous traumatic medical experiences or who have witnessed family members in poor health conditions.[3] The anxiety triggered by contact with healthcare professionals, often set off by the sight of the white coat, makes the diagnostic process difficult and compromises adherence to prescribed treatments. A child with this phobia may grow up with a distorted and negative perception of medical care, leading to avoidance of routine consultations and neglect of their own health throughout adulthood.[4]

The impact of this syndrome in adulthood is significant. Individuals who do not overcome the fear of doctors during childhood tend to be more reluctant to seek preventive medical care, increasing the risk of diseases being left undiagnosed and treated only in advanced stages. Studies indicate that adults who suffered from white coat syndrome in childhood are more likely to develop hypertension and cardiovascular problems due to untreated chronic stress.[5] Avoidance of medical care may lead to higher morbidity and mortality from preventable and treatable diseases, further burdening public health systems.[6]

In this context, initiatives aimed at mitigating the impact of iatrophobia and white coat syndrome in children become necessary. The "Teddy Bear Hospital" is a playful and educational project developed by medical and other healthcare students to demystify the hospital environment for children.[7] The proposal involves simulating a hospital where children bring their toys to be "treated" by students acting as doctors. By reproducing the care process in a light and didactic manner — from the consultation to the "treatment" of the toy — the project facilitates familiarization with medical procedures, reducing fear and anxiety.[8]

The author highlights the positive impact of the Teddy Bear Hospital in reducing children's anxiety regarding medical care. By promoting understanding of the process and creating a more welcoming and less intimidating environment, the project fosters a healthier relationship between children and healthcare.[9] Furthermore, the initiative has the potential to reduce absenteeism rates and increase adherence to treatments, particularly among vulnerable populations.[10]

Therefore, the Teddy Bear Hospital stands out as an effective intervention, benefiting both children and healthcare students. For children, the project offers a unique opportunity to reduce fear and anxiety toward the hospital environment, promoting a more welcoming and calm care experience. For students, the initiative provides practical experience in humanized care, developing communication skills, empathy, and patient relations — all essential for professional training.

This study aims to analyze iatrophobia and white coat syndrome in children, discussing their impacts on child public health and consequences in adulthood. In addition, it seeks to present the Teddy Bear Hospital project as a playful and effective initiative to reduce fear of doctors and hospital procedures, fostering a healthier relationship between children and medical care, and promoting Public Health.

METHODOLOGY

This individualized, observational, and cross-sectional study is based on a playful and educational dynamic carried out in a school setting, simulating hospital flow and providing children with an interactive experience. Medical undergraduate students conducted the *Teddy Bear Hospital* activity in private schools in Curitiba, Paraná. A total of 182 children aged 2 to 7 years participated. Tables, chairs, and other materials crafted by the students — such as playful X-ray and tomography devices — were used. The *Teddy Bear Hospital* was organized to allow children to follow a path simulating the traditional flow of a real hospital.

The activity began in the classroom with a dramatization highlighting the importance of the SAMU (Mobile Emergency Care Service), emphasizing the number 192. Children were then guided to the "waiting room," where they stayed for a few minutes, reproducing the common waiting experience in hospitals. Next, they took part in a "circuit" beginning at reception, where medical records were filled out, symptoms were created for the teddy bear "patients," and an initial questionnaire was completed about their perceptions of healthcare professionals, prior knowledge of vaccination, and plaster casting.

At triage, data such as height, weight, temperature, and oximetry were collected. In the medical office, children had the opportunity to "auscultate" the teddy bears' hearts with a stethoscope, measure blood pressure, and perform other procedures. The imaging room was equipped with X-ray and tomography devices that, with the aid of artificial intelligence, simulated visualization of bones and organs. Other circuit areas included the dressing room (where children simulated dressing wounds and applying splints), the vaccination room (where the importance of vaccines was addressed), and the blood test station, finishing with the awarding of a "bravery certificate" recognizing each child's active participation in all stages of the activity.

This simulation was meticulously planned to create a hospital-like environment for children aged 2 to 7 years, allowing them to take on the roles of doctors and patient

companions while experiencing various stages of medical care. At the end of the activity, a final round of data collection was conducted using questionnaires, where children reported their perceptions of the hospital environment and medical procedures experienced.

Data analysis was conducted using qualitative content analysis, which, according to Bardin (2011), is a systematic method of interpreting textual data that allows the identification of explicit and implicit meanings. It follows three stages: pre-analysis, material exploration, and interpretation of results. Its goal is to categorize and understand discursive patterns, assisting in communication analysis.[11]

The sampling method used was exhaustive, including all children aged 2 to 7 who participated in the activity, ensuring that each contributed to the study's analysis and results. However, we acknowledge that comprehension of the questionnaires may vary according to age and cognitive development, representing a study limitation. To mitigate this and ensure greater precision in data analysis, results were divided into two groups: preschool (2–4 years) and school-aged (5–7 years), respecting differences in interpretation and perception capacities. This division is based on Jean Piaget's theory of cognitive development, which establishes that during this period, children are in the preoperational stage (2–7 years), characterized by the emergence of symbolic function, enabling imitation, symbolic play, and language development, although thought remains egocentric, intuitive, and based on object appearance. Understanding these differences is essential to interpreting the data appropriately, considering Piaget's view that development occurs in sequential stages driven by both biological maturation and environmental interaction.[12]

Since they are in an active learning phase through practical and playful activities and belong to the age group most vulnerable to iatrophobia, these children were able to reduce fears and anxieties related to medical environments such as hospitals, procedures, and instruments.[13] Although younger children (aged 2–3) have limitations in understanding abstract concepts, the simulation was carefully adapted to the developmental level of each age group. Playful resources such as teddy bears, interactive materials, and adult support ensured that even the youngest participants could actively engage in the activity.

The outcome obtained is fundamental for evaluating the impact of the intervention, especially regarding the reduction of anxiety and the increase in knowledge about how a hospital works and the importance of emergency services.

RESULTS

The expected outcomes of implementing the *Teddy Bear Hospital* are largely focused on children's cognitive and emotional development, with an emphasis on reducing fears and anxieties related to the hospital environment, as well as promoting familiarity with medical procedures and reinforcing understanding of the importance of healthcare and emergency services. One of the main expected results is the reduction of iatrophobia, also known as "white coat syndrome," characterized by the fear of doctors.

To assess the success of the activity in mitigating iatrophobia, children were asked about their teddy bear's feelings toward the doctor before and after the activity. The questionnaire results are presented in Table 1. In addition, 25.9% of the children expressed their desire to pursue a career in healthcare in the future.

Table 1. Teddy bear's feelings towards the doctor.

Feelings	Pre -event Results	Post-event Results
Sadness	34.1%	14.6%
Fear	28.7%	14%
Happiness	31.3%	67.4%
Anger	2.3%	1.1%
Disgust	2.8%	1.1%
Surprise	1.7%	1.7%

The activity provided children with a positive and playful experience, demystifying contact with the hospital environment. By having the opportunity to interact directly with volunteers simulating the roles of doctors, nurses, and other professionals, and by observing or participating in procedures such as dressings, injections, imaging exams, and splint application, children gained a better understanding of these processes and consequently felt safer. The activity aims to promote knowledge about the basic functioning of a hospital, highlighting the flow of healthcare services and the importance of each stage of care. The "hospital circuit," which included triage, medical consultation, imaging exams, and vaccination, was designed to give children a clear and practical view of what happens in a hospital, thereby facilitating their understanding of processes that might often seem abstract or confusing to them.

For this purpose, children's knowledge about healthcare was assessed before and after completing the circuit. Due to the cognitive differences between preschool and school-aged children, their results were analyzed separately. The results are presented in Table 2.

Another important outcome observed is the increase in awareness about emergency services, particularly SAMU (Mobile Emergency Care Service). The dramatization that introduces the activity aims to teach, in a playful way, the importance of the number 192 and pre-hospital care, as well as to explain when and how this service can be activated. Knowledge about SAMU is essential for children and for the community in general, as proper understanding of the service can save lives in emergency situations.

To assess whether the information about the number 192 was effectively assimilated, children were asked what the

Table 2. Children's knowledge about health.

Questions	Pre -event Responses	Post-event Responses
"What does a doctor do?"	Preschool hits 43.5% School hits 52.3% Preschool errors 20.3% School errors 12.1% Didn't know how to answer preschool 36.2% Didn't know how to answer school 35.5%	Preschool hits 69.6% School hits 79.2% Preschool errors 4.3% School errors 0% Didn't know how to answer 26.1% preschool Didn't know how to answer 20.8% school
"Why should we get vaccinated?"	Preschool hits 43.5% School hits 63.6% Preschool errors 17.4% School errors 10.3% Didn't know how to answer preschool 39.1% Didn't know how to answer school 26.2%	Preschool hits 71% School hits 79.2% Preschool errors 4.3% School errors 8.3% Didn't know how to answer 24.6% preschool Didn't know how to answer 12.5% school
"What is the X-ray for?"	Preschool hits 37.7% School hits 55.1% Preschool errors 18.8% School errors 18.7% Didn't know how to answer preschool 43.5% Didn't know how to answer school 26.2%	Preschool hits 62.3% School hits 82.6% Preschool errors 17.4% School errors 1.8% Didn't know how to answer 20.3% preschool Didn't know how to answer 15.6% school
"Can you wet the cast?"	Preschool hits 46.4% School hits 60.7% Preschool errors 11.6% School errors 6.5% Didn't know how to answer preschool 42% Didn't know how to answer school 32.7%	Preschool hits 66.7% School hits 66.7% Preschool errors 4.3% School errors 12.5% Didn't know how to answer 29% preschool Didn't know how to answer 20.8% school
"Can you put toys inside the cast?"	Preschool hits 62.3% School hits 77.6% Preschool errors 5.8% School errors 1.9% Didn't know how to answer preschool 31.9% Didn't know how to answer school 20.6%	Preschool hits 78.3% School hits 87.5% Preschool errors 1.4% School errors 12.5% Didn't know how to answer 20.3% preschool I didn't know how to answer 0% school

SAMU number was. Due to the cognitive differences between preschool and school-aged children, their results were analyzed separately. The results are presented in Table 3.

At the end of the *hospital circuit*, the awarding of a "certificate of courage" aims to recognize and value each child's active participation and effort during the simulation. This recognition strengthens their sense of achievement and of overcoming fears, contributing to emotional development and the self-perception of courage when facing challenging situations.

Table 3. Children's knowledge of the emergency number 192.

Responses	Pre-event Results	Post-event Results
Preschool hits	41.2%	52.9%
School success	42.6%	45%
Preschool mistakes	17.6%	11.8%
School mistakes	9.8%	9.8%
I didn't know how to answer preschool	41.2%	35.3%
I didn't know how to answer school	47.5%	45.2%

DISCUSSION

Overcoming Iatrophobia

Through the dynamics carried out by the *Teddy Bear Hospital* project, children were introduced to the hospital environment and guided through issues related to preventive and therapeutic care. Medical students had the opportunity to enrich their skills and knowledge in pediatric care. The project aimed to identify and address children's negative perceptions, assessing the impact on clarifying the physician's role, the importance of preventive care, and understanding therapeutic care.

Analyzing Table 1, we identified that the most prevalent negative feelings among children were sadness (34.1%) and fear (28.7%), while happiness was present in 31.3% of responses. These results highlight a significant portion of the child population with aversive feelings toward the hospital environment and healthcare professionals.

When children were asked again about their feelings after completing the activity, the prevalence of negative feelings decreased while positive ones increased, showing the contribution of the dynamics in overcoming aversive emotions. The positive effect was reflected in the reduction of sadness from 34.1% to 14.6% and fear from 28.7% to 14%, while happiness in relation to doctors rose to 67.4%. These findings are consistent with the results of Matos, M.V., where sadness, fear, and happiness after the activity corresponded to 2%, 14%, and 70%, respectively, confirming the project's effectiveness in overcoming iatrophobia.[14]

The interest in pursuing a medical career, expressed by 25.9% of children at the end of the activity, further supports the overcoming of White Coat Syndrome. This shows that, beyond reducing fear of hospital interventions, the project also fostered an interest in healthcare.

Knowledge About Health

A study with 61 healthy children suggested that children's fear is not entirely related to physicians' appearance but mainly to medical actions.[15] In this context, raising awareness about the role of doctors is essential.

When analyzing Table 2 results, we observed that the number of children correctly identifying the physician's role in the post-event questionnaire increased by 26.1% in preschoolers and 26.9% in school-aged children compared to pre-event results. Although discrepancies between younger and older children represent a study limitation, the overall decrease in errors confirms the event's effectiveness in clarifying the medical role. Many incorrect answers were due to confusion with veterinarians or vaccination practices.

Participants were also asked about vaccines and their purpose, as fear often acts as a major barrier to vaccination, negatively impacting public health.[16] In pre-event results (Table 2), 17.4% of preschoolers and 10.3% of school-aged children did not know the exact purpose of vaccines, showing a knowledge gap that could trigger non-vaccination. In the post-event questionnaire, however, 71% of preschoolers and 79.2% of school-aged children answered correctly about why vaccines should be taken. Still, some children confused vaccines with treatment rather than prevention.

Regarding imaging exams, particularly X-rays, before the event 37.7% of preschoolers and 55.1% of school-aged children (Table 2) answered correctly about their purpose. This increased by 24.6% and 27.5%, respectively, after the event. Among those who remained incorrect, confusion persisted between X-rays, CT scans, and ultrasound, despite these having been addressed and explained during the activity.

Knowledge about orthopedic casts also showed improvements. Correct answers increased by 20.3% (preschoolers) and 6% (school-aged) regarding whether a cast could get wet — an important point, since moisture compromises its ability to stabilize fractures. Correct responses also rose by 16% (preschoolers) and 9.9% (school-aged) when asked if toys could be placed inside the cast, a common behavior to relieve itching but one that can cause serious complications such as pressure ulcers.

Knowledge About First Aid

According to a 2022 study, Brazil ranks third worldwide in child deaths caused by choking accidents.[17] However, the population is largely unprepared to recognize early signs of choking, often intervening only when the condition has progressed to cyanosis, apnea, or loss of consciousness — stages with higher mortality risk. This underscores the importance of teaching first aid to children.

Although only a modest increase in correct answers about the SAMU number was observed (Table 3), both preschool and school-aged children showed improvement. Volunteers' approach also encouraged children to share this knowledge at home and with peers, fostering a culture of prevention and responsibility in first aid. The spontaneous repetition of the number 192 at the end of the activity indicated that the information had been effectively assimilated. Thus, the project helped prepare children to identify and appropriately respond to emergency situations.

Final Considerations

The collected data showed an increase in children's knowledge about the hospital environment and emergency services, along with a significant reduction in previously reported fears and anxieties. Therefore, the *Teddy Bear Hospital* stands out as an effective pedagogical tool to demystify the hospital environment, promoting better responses in health promotion and disease prevention, encouraging health education from childhood, and preparing children to face medical care situations throughout life with greater confidence and calm.

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