

Simulation as an educational bridge between medical humanities and pediatric dentistry

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ABSTRACT

Training in pediatric dentistry requires balancing technical instruction with a humanistic approach, as clinical success largely depends on child behavior management and the relationship with parents. This essay reflects on the role of medical humanities in pediatric dental education and proposes clinical simulation as a central pedagogical strategy. A narrative literature-based analysis is developed addressing the value of medical humanities in dentistry, the particularities of child behavior management, and the potential of simulation to train communication, empathy, and ethical skills in safe environments. Furthermore, the recent experience of the Centro Interdisciplinario de Simulación Avanzada [Interdisciplinary Center for Advanced Simulation] at Universidad Peruana Cayetano Heredia is highlighted as a regional benchmark. It is concluded that humanistic simulation in pediatric dentistry is a relevant tool for training professionals who are both technically and humanly competent.

Keywords: pediatric dentistry; medical humanities; dental education; patient simulation; behavior and behavioral mechanisms.

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INTRODUCTION

Dental education has historically prioritized technical and biomedical expertise, with an emphasis on clinical procedures and manual skills. However, professional experience demonstrates that successful dental care also depends on humanistic competencies, such as empathy, communication, and ethical sensitivity (1). In this regard, incorporating the medical humanities into dental education seeks to balance technical training with a comprehensive and human-centered approach.

Although this perspective is valuable across all areas of dentistry, it takes on an even more decisive role in pediatric dentistry. Successful dental treatment in children requires empathetic behavior management and the establishment of trust with the patient and his or her parents (2). While in many areas of dentistry technique precedes treatment, in pediatric dentistry it is human interaction that makes the technique possible.

Within this framework, clinical simulation emerges as a pedagogical strategy capable of integrating technical

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and humanistic competencies. By recreating scenarios involving children and parents, simulation allows students to practice behavior management skills in a safe and reflective environment (3). Therefore, integrating medical humanities into pediatric dental education through simulation is not only relevant but essential for training dentists to become technically and humanistically competent.

This manuscript is a teaching contribution presented as a reflective essay. The argument is based on a narrative, nonsystematic analysis of recent literature on the humanities in healthcare, pediatric dental education, and clinical simulation, to contextualize the proposal and provide a foundation for the discussion.

MEDICAL HUMANITIES IN DENTAL EDUCATION AND THEIR IMPORTANCE IN PEDIATRIC DENTISTRY

Medical humanities have demonstrated their value in healthcare education by enriching professional training through ethics, philosophy, history, and the arts (3). In dentistry, incorporating narratives and reflective activities has been shown to help students develop empathy and patient-centered care (4).

However, in various areas of dentistry, technique comes before the clinical procedure; in pediatric dentistry, by contrast, it is the bond with the child and his or her family that makes it possible. A child experiencing anxiety will not cooperate with treatment, no matter how skilled the clinician may be; only communication, empathy, and emotional management enable technical skills to be applied positively. Therefore, humanistic training is not an add-on in pediatric dentistry but rather the foundation that enables the application of technical skills.

In Latin America, humanistic education still occupies a secondary position in dental curricula. In pediatric dentistry, this situation may translate into challenging clinical experiences for children and dental students, reinforcing the need to incorporate these competencies into preclinical training.

THE DISTINCTIVE NATURE OF PEDIATRIC DENTISTRY: BEHAVIOR MANAGEMENT AS A CORE COMPONENT

Pediatric dentistry requires a more pronounced humanistic approach than other areas of dentistry for three main reasons. First, dental anxiety in children is a decisive factor: between 10% and 20% of children experience high levels of fear or anxiety during dental care (5). In adults, this anxiety can usually be managed;

however, in children, it can completely prevent them from receiving care. Second, pediatric patients are still developing, and their behavior therefore varies according to age, maturity, and cognitive development. Whereas an adult may understand the need for a procedure, a child depends on the pediatric dentist's communication skills to guide their behavior. Third, the role of parents introduces an additional relational dimension, as caregivers directly influence the child's cooperation and the dynamics of the dental visit (6).

In this context, behavior management techniques, such as tell-show-do, distraction, and positive reinforcement, form the foundation of pediatric dentistry (2). Without them, no technical procedure can even begin. In this specialty, the humanistic approach does not complement the technical aspect; rather, it *enables* it.

Despite this, in many training programs, these techniques are learned informally during clinical training, creating a significant educational gap. The lack of prior training may lead to student insecurity and result in negative experiences for the child, their family, and the clinician. This is where simulation becomes the most appropriate educational response.

CLINICAL SIMULATION: A BRIDGE BETWEEN TECHNICAL SKILLS AND MEDICAL HUMANITIES IN PEDIATRIC DENTISTRY

Clinical simulation has emerged as an effective tool in healthcare education by providing opportunities for practice in controlled environments. In dentistry, its use has primarily focused on technical skill development through dental manikins or haptic simulators. However, in pediatric dentistry, its greatest potential lies in teaching communication and behavior management skills, which are essential for caring for pediatric patients (7).

Various scenarios can be used for educational purposes. An anxious child accompanied by a concerned mother provides an opportunity to practice techniques such as tell-show-do, language modulation, and emotional support. A defiant adolescent allows students to practice negotiation, positive reinforcement, and autonomy-centered strategies. In the case of neurodivergent children, such as those with autism spectrum disorder or sensory processing disorders, simulation makes it possible to practice visual communication techniques, anticipation of procedures, or gradual desensitization before actual clinical contact.

Recent literature supports this strategy. Santhakumar and Vidhya (8) demonstrated that standardized patients increase students' confidence in managing

pediatric behavior. Karkoutly et al. (9) and Zhang et al. (10) found that simulation-based games can reduce children's anxiety more effectively than traditional techniques. Strub (11), in turn, reported that simulation can elicit sufficiently realistic emotional responses to train communication skills in pediatric settings.

Thus, whereas simulation in other areas of dentistry focuses on refining technical skills, in pediatric dentistry it is a key tool for teaching the humanistic dimension that makes clinical practice possible.

A NEW NATIONAL REALITY: THE EXPERIENCE OF CLINICAL SIMULATION AT UNIVERSIDAD PERUANA CAYETANO HEREDIA

In Peru, Universidad Peruana Cayetano Heredia (UPCH) has progressively integrated clinical simulation into its dental education program. Since August 2025, the School of Dentistry has had an interdisciplinary simulation center that incorporates technologies such as haptic simulators and actor-based scenarios, enabling training experiences that more closely resemble real-world clinical practice (12).

In pediatric dentistry, simulation activities include behavior management and communication skills involving both pediatric patients and their caregivers, and these activities have been formally integrated into undergraduate courses. This implementation is particularly relevant in the Latin American context, where simulation in dentistry has historically focused primarily on technical skills training.

This experience suggests that it is feasible to incorporate the humanistic dimension of pediatric dentistry into preclinical education through simulation, reducing reliance on improvised learning during clinical training and promoting the development of essential communication competencies.

DISCUSSION

The implementation of simulation with a humanistic focus in pediatric dentistry faces several challenges. First, resources represent a significant barrier, as high-fidelity simulators are expensive. However, more accessible educational alternatives, such as actors, standardized patients, or role-play activities, can be used to develop communication and behavior management skills (7).

Second, dental curricula are heavily loaded with technical content, making it difficult to add additional courses. In this regard, a feasible strategy is to integrate pediatric simulation scenarios into existing courses, thereby avoiding additional curricular burden.

Third, faculty training represents a critical component. Many faculty members have strong technical expertise but may not necessarily be trained to teach humanistic skills. Faculty development programs in simulation pedagogy, aligned with graduate profiles that recognize behavior management as an essential competency, may help address this gap.

Beyond the economic and curricular considerations, the challenge is also cultural: recognizing that pediatric dentistry is grounded in humanistic competencies and that their teaching cannot be left to clinical improvisation. Moving toward educational models that integrate technical and humanistic dimensions from the preclinical stages may promote safer, child-centered pediatric dental care.

This essay has limitations inherent to its genre and context. The available regional evidence on humanistic simulation in pediatric dentistry is still emerging, and the experience described lacks studies that evaluate long-term results; therefore, its implications should be interpreted as illustrative.

CONCLUSIONS

Pediatric dentistry needs to balance the technical and humanistic dimensions, as pediatric clinical practice depends on behavior management and the empathetic relationship established with children and parents.

Clinical simulation emerges as a relevant educational strategy for teaching these skills by providing a safe environment in which students can practice communication and behavior management techniques. The recent experience at Universidad Peruana Cayetano Heredia (UPCH) illustrates that this model is already being implemented and may help reduce reliance on improvised learning during clinical training.

In conclusion, pediatric dental education can benefit from viewing simulation not as a supplementary resource, but as a training environment in which technical skills and humanity are integrated. Ultimately, training pediatric dentists means developing professionals with strong clinical skills and human sensitivity to care for both children and their families.

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