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Editorial

(Digital)Science in Dentistry: Challenges, Innovations, and the Path Forward

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Abstract: Dentistry is undergoing a transformative era, driven by rapid advancements in digital technology and evidence-based research. Innovations such as intraoral scanners, 3D printing, and computer-aided design/manufacturing (CAD/CAM) are revolutionizing diagnostics, treatment planning, and patient care, offering unprecedented precision and efficiency. Artificial intelligence (AI) is emerging as a pivotal tool in oral radiology, enhancing diagnostic accuracy and treatment prediction while raising ethical and data security concerns. The COVID-19 pandemic underscored the urgency of addressing health disparities through initiatives like teledentistry and mobile clinics. This editorial highlights the critical role of integrating digital technologies in dental practice and education, the importance of equitable care delivery, and the value of research in advancing the field. As dentistry evolves, continuous innovation, collaboration, and ethical implementation are essential to improve outcomes and accessibility in oral healthcare.

Keywords: Digital Dentistry; Artificial Intelligence; CAD/CAM; 3D Printing; Teledentistry; Oral Healthcare; Health Disparities; Evidence-Based Practice.

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Dear authors,

The field of dentistry is undergoing a transformative era, driven by rapid advancements in technology and an ever-growing body of evidence-based research. As we approach 2025, the integration of digital innovations into dental practice and education is not just a trend but a necessity. This editorial aims to highlight the critical importance of embracing these changes and the role of scientific research in shaping the future of oral healthcare.

One of the most significant developments in recent years has been the proliferation of digital dentistry. Tools such as intraoral scanners, 3D printing, and computer-aided design and manufacturing (CAD/CAM) have revolutionized the way we approach diagnosis, treatment planning, and patient care [1]. These technologies offer unprecedented precision, efficiency, and customization, enhancing both clinical outcomes and patient satisfaction. However, their successful implementation requires not only financial investment but also a commitment to continuous learning and adaptation.

Another essential area of innovation is artificial intelligence (AI). In oral radiology, AI algorithms are being increasingly employed to assist in the detection of pathologies, prediction of treatment outcomes, and even the automation of routine tasks [2]. While promising, these tools also raise critical questions about ethical considerations, data privacy, and the need for rigorous validation. As researchers and

practitioners, it is our responsibility to ensure that these technologies are applied in a manner that prioritizes patient safety and adheres to the highest standards of clinical excellence.

Beyond technology, the dental profession faces a pressing challenge: addressing health disparities and ensuring equitable access to care [3]. The COVID-19 pandemic exposed significant gaps in oral healthcare delivery, particularly among underserved populations. As we rebuild, there is an urgent need to leverage innovative approaches to bridge these gaps, whether through teledentistry, mobile clinics, or public health initiatives aimed at prevention and education.

In this issue of the **Brazilian Journal of Dentistry and Oral Radiology**, we present a selection of articles that exemplify the dynamic interplay between innovation and clinical practice. From groundbreaking studies on biomaterials to explorations of AI applications in diagnostics, these contributions underscore the pivotal role of research in advancing our field. We are particularly proud to feature research that addresses global challenges, such as antimicrobial resistance and the development of sustainable dental materials, reflecting our commitment to both local and international impact.

As authors, you play a critical role in this ongoing evolution. Your research, case reports, and critical reviews not only expand our collective knowledge but also inspire new generations of dental professionals. We encourage you to continue pushing boundaries, questioning norms, and exploring uncharted territories in oral healthcare. Finally, the future of dentistry is being shaped today by the decisions we make and the research we pursue. Let us embrace this era of transformation with curiosity, collaboration, and a shared commitment to improving oral health for all.

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