

# Chapter 1

## Emerging Trends and Future Perspectives in Digital Dentistry for Rural Areas: An Update

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### **ABSTRACT**

*This chapter examines how digital dentistry can enhance access to oral care in rural areas. Besides, it looks into the latest trends in teledentistry and 3D printing, and the uses of artificial intelligence and mobile dental clinics. The results indicate that advancements in technology could considerably reduce the disparities in oral care for rural populations. A narrative review of articles published in both English and Spanish was carried out using reliable databases like Pubmed and Google Scholar from 2020 to October 2024. The results emphasize the importance of reforming public policies and enhancing access to financing. These changes are important for promoting the widespread adoption of digital dentistry in these regions. This strategy can help promote a healthier future by enhancing oral health in these communities.*

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## INTRODUCTION

The World Health Organization (2021<sup>a</sup>) estimates that nearly half of the global population resides in rural areas. Projections suggest that by 2050, approximately one in three individuals worldwide will continue to live in these environments. Nevertheless, access to oral care in these regions encounters substantial challenges due to a shortage of resources and a lack of qualified professionals, which greatly hampers the ability to provide adequate care to these communities.

With fast advancements in technology, digital dentistry is becoming a revolutionary solution for oral care. Recent research (Nayyar et al., 2020; Alauddin et al., 2021; Németh et al., 2023; Cueto, 2023) emphasizes the possible advantages of improving individuals' quality of life. This is especially important in rural areas where access to dental services is often limited, as noted by Northridge et al. (2020) and Rubinstein & Butinof (2022).

Emerging technologies like teledentistry, 3D printing, and AI, alongside mobile dental units, offer a remarkable opportunity to improve oral health services in rural regions, as suggested by Alauddin et al. (2021). In addition, Kanani et al. (2024) suggest that this approach promotes a more equitable and accessible healthcare system by tackling the geographic and financial obstacles commonly faced by these communities.

According to Schierz et al. (2024) and Ahumada-Servant et al. (2024), mobile dental units that incorporate digital technologies offer care model that is both flexible and efficient. These units allow professionals to improve clinical procedures and offer more personalized follow-up for their users, which helps reduce inequalities in oral health and improves overall care quality. Malpe et al. (2024) emphasize the concept that merging digital technology with mobility has the potential to improve accessibility to oral health services for vulnerable communities, encourage innovation, and raise the quality of life for individuals living in rural regions.

The implementation of digital dentistry in rural regions improves dental health and greatly boosts overall well-being. It assists access to both preventive and restorative care, which results in a reduction of oral diseases in these communities. This initiative supports the goal of equitable access to technological advancements, as emphasized by Martínez-Asanza et al. (2024<sup>a</sup>) and Adaka et al. (2024).

This chapter examines how digital dentistry can enhance access to oral health services for communities that are underserved. It emphasizes teledentistry as a viable solution for remote consultations, offering important advantages to those who often struggle to receive oral care. Besides, it will explore the innovative collaborative possibilities that these technologies offer to different healthcare professionals, encouraging a more unified approach to oral health care. This analysis aims to pro-

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