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Short Communication

Enhancing dental education in Iran: Strategies and innovations for improved oral health outcomes

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Abstract
Dental education in Iran has undergone significant changes in recent years. However, dental education in Iran has faced challenges such as outdated curricula, insufficient funding, and inadequate training facilities, impacting the quality of education and preparedness of dental graduates. This article presents a mixed-methods study that identifies strategies to enhance dental education in Iran, drawing from international literature and insights from dental educators. Key strategies include curriculum revision prioritizing hands-on clinical experience, technology integration through artificial intelligence (AI), VR, and nanotechnology, utilization of social media for engagement, and implementation of mentoring programs. These strategies offer unique opportunities to improve educational quality, student preparedness, and oral health outcomes. By implementing these recommendations, dental education in Iran can evolve to meet the needs of the population and produce skilled professionals capable of delivering high-quality oral healthcare services. It is imperative for dental schools in Iran to prioritize the adoption of these strategies to elevate the standard of dental education and promote better oral health outcomes nationwide.

Introduction

Dental education plays a crucial role in preparing dental professionals to provide high-quality oral health care services. In Iran, dental education has undergone significant changes in the past decade, with an increase in the number of dental schools and graduates. The corona era has indeed highlighted some weaknesses in the general dentistry education system in Iran, as it has in many other educational systems around the world. However, it is important to note that these weaknesses existed before the corona era, and the pandemic has only exacerbated them. The general dental education system in Iran has long faced challenges such as outdated curricula, insufficient funding, and inadequate training facilities and equipment. These issues have impeded the quality of education and preparedness of dental graduates for the workforce. As such, it is important to identify strategies for enhancing dental education in Iran to meet the needs of the population and to promote improved oral health outcomes.[1-5] This study aims to examine the evolution of dental education in Iran over the past decade, particularly in response to challenges highlighted by the corona era. This research seeks to identify and propose strategies to address these weaknesses and improve the quality of dental education in Iran, ultimately enhancing oral health outcomes and better preparing graduates for the workforce.

Materials and Methods

This study used a mixed-methods approach to identify strategies for enhancing dental education in Iran. A comprehensive review of international literature was conducted, focusing on current practices and recommendations for improving dental education.

The search methodology involved examining articles related to research on "Enhancing Dental Education" by conducting a search in reputable databases including Medline, Scopus, Nature, PubMed, and Google Scholar. The search was performed using keywords such as "Dentistry," "Education," "Improvement," and "Health Care," with a publication date range starting from the year 2020. A total of 13 articles were selected for study and data extraction.

Results

The review of international literature revealed several strategies for improving dental education, including curriculum revision, incorporation of technology, and collaboration among dental schools. The survey of dental educators in Iran supported these strategies and

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provided additional insights into current practices and recommendations for improvement. Specifically, dental educators in Iran highlighted the need for curriculum revision to incorporate more hands-on clinical experience, as well as the need for faculty development in areas. Additionally, dental educators in Iran recommended the incorporation of technology, such as virtual patient simulators, to enhance clinical training.[1,2]

Adjusting dental school admission capacity and implementing fair acceptance policies are crucial. Actions needed include setting course standards, restructuring formats, optimizing schedules, and combining theory with hands-on training for better retention. Changing how professors and students approach education is key for health-focused treatment planning and educational reforms. Students can be empowered through innovative teaching, active participation in treatment, improved patient care monitoring, and upholding dignity. Encouraging experiential learning, patient follow-up, and personalized evaluations are vital for systemic enhancement. Instilling social responsibility in students is effective. Understanding community oral health needs, filling service gaps, and providing tailored patient care can benefit overall oral health outcomes.[3]

Enhancing Dental Education in Iran through social media can be achieved by creating educational content (videos, infographics, blog posts), facilitating interactive learning (live Q&A sessions, webinars), encouraging networking and collaboration, sharing information on professional development programs, highlighting research initiatives, using social media for patient education, and gathering feedback to improve quality. This makes dental education in Iran more engaging and accessible for all stakeholders.[4,5]

Using VR in dental education in Iran involves simulating dental procedures, visualizing anatomy, interactive case studies, virtual patient encounters, remote learning and collaboration, pain management training, and research and development. This enhances students' skills, knowledge, and adaptability in modern dental practices.[6,7]

Improving dental education in Iran through mentoring offers benefits like skill development, professional guidance, career counseling, research support, personal and professional development, and emotional support. Integrating mentoring ensures personalized guidance, enhancing the educational experience and future dental practitioners' quality in Iran.[8,9]

Improving dental education in Iran through the use of artificial intelligence (AI) can be a transformative approach that enhances teaching methodologies, student learning outcomes, and overall educational quality. AI offers personalized learning by analyzing individual learning behaviors, facilitates hands-on practice through virtual simulations, aids in diagnosing dental conditions accurately, provides instant feedback for skill development, analyzes research data for evidence-based content, overcomes language barriers, and streamlines administrative tasks. By leveraging AI technologies effectively, educators can improve instructional quality, offer innovative learning experiences, and better prepare students for successful dental careers. By integrating AI into dentistry education in Iran, educators can enhance the quality of instruction, provide innovative learning experiences, and better prepare students for successful careers in dentistry. It is essential to invest in AI technologies and provide training for educators to effectively leverage these tools for the benefit of dental education in Iran.[10,11]

Integrating nanotechnology concepts into general dental education in Iran is highly beneficial. It offers advanced materials and techniques that enhance dental treatments, such as nanocomposites and nanoparticles for drug delivery. This equips students with the skills to effectively utilize these advancements. Nanotechnology also improves treatment outcomes by enhancing mechanical properties and reducing infection risks. It encourages interdisciplinary collaboration, fostering creativity and expanding students' understanding of dental research. Introducing nanotechnology prepares students for future changes, promoting adaptability and lifelong learning. It inspires research and innovation, allowing students to contribute to dental science. Overall, teaching nanotechnology provides a strong foundation, empowering students to improve patient care and drive innovation in dentistry.[12,13]

Discussion

This article highlights strategies to enhance dental education in Iran. These strategies include curriculum revision, technology integration, social media utilization, mentoring programs, AI implementation, VR usage, and incorporation of nanotechnology concepts. They offer unique opportunities to improve educational quality, student preparedness, and oral health outcomes.

Curriculum revision prioritizes hands-on clinical experience and practical training to better prepare students for professional practice. Technology integration, such as virtual simulators and AI tools, enhances learning with interactive and personalized opportunities. Virtual reality complements this by offering immersive training and enhancing adaptability in modern dental practices.[3]

Social media is important for engagement and accessibility. It can be used for content creation, interactive learning sessions, networking, and research dissemination, reaching a wider audience and fostering collaboration.[4]

Mentoring programs provide guidance and support, facilitating skill development, professional growth, and emotional well-being. Mentorship improves the quality of future dental professionals in Iran.[8]

AI integration transforms teaching methodologies, learning outcomes, and educational quality. It enables personalized learning, aids skill development through

virtual simulations, and streamlines administrative tasks. Investing in AI technologies and providing training helps educators innovate instruction and prepare students for successful dental careers.[11]

Incorporating nanotechnology introduces advanced materials and techniques that revolutionize dental treatments. Nanotechnology fosters interdisciplinary collaboration, research, and innovation, driving advancements in patient care and dental science development.

Conclusion

The multifaceted strategies discussed in the text offer a comprehensive framework for enhancing dental education in Iran, addressing the existing challenges and paving the way for improved educational quality, student readiness, and oral health outcomes. By effectively implementing these strategies and promoting a culture of innovation and ongoing improvement, dental education in Iran can better meet the evolving needs of the population and produce skilled dental professionals capable of delivering high-quality oral healthcare. It is recommended that Iranian dental schools prioritize the development and execution of these strategies to elevate the standard of dental education and ultimately improve oral health across the country.

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Competing Interests

The authors declare no conflict of interest.

Ethical Approval

Considering the type of article that was a letter to the editor, the study had no special ethical considerations.

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References

1. Asadi M, Amirpour Haradasht S, Shahraki M. Challenges of dental education in the post-COVID-19e era, the positive and negative effects of COVID-19 pandemic on the dental education system. Iran J Med Educ. 2023;23:92-3. doi: 10.48305/23.0.92.
2. Salmani A, Keshavarz H, Akbari M, Kharrazifard MJ, Varmazyari S, Khami MR. Evaluation of national dental curriculum in Iran using senior dental students' feedback. BMC Oral Health. 2023;23(1):45. doi: 10.1186/s12903-023-02757-x.
3. Gholipour Belgo H, Shahraki M, Amirpour Haradasht S. The weaknesses of the Iranian dental education system, suggestions, and improvement methods. J Med Educ Dev. 2023;18(3):608-10. doi: 10.18502/jmed.v18i3.14130. [Persian].
4. Shahraki M, Ebrahimzade N, Amirpour Haradasht S. The use of social media (communication applications) in the training of medical students, especially oral and maxillofacial surgery residents in Iran. 2024;13(1):1. doi: 10.34172/rdme.2024.33157.
5. Al-Obaidi R. Use of social media by dental students: a comparative study. Clin Epidemiol Glob Health. 2024;26:101559. doi: 10.1016/j.cegh.2024.101559.
6. Koolivand H, Shooreshi MM, Safari-Faramani R, Borji M, Siyah Mansoory M, Moradpoor H, et al. Comparison of the effectiveness of virtual reality-based education and conventional teaching methods in dental education: a systematic review. BMC Med Educ. 2024;24(1):8. doi: 10.1186/s12909-023-04954-2.
7. Moussa R, Alghazaly A, Althagafi N, Eshky R, Borzangy S. Effectiveness of virtual reality and interactive simulators on dental education outcomes: systematic review. Eur J Dent. 2022;16(1):14-31. doi: 10.1055/s-0041-1731837.
8. Khehra A, Steinberg N, Levin L. The role of educators, mentors, and motivation in shaping dental students to become life-long learners: a pan-Canadian survey. J Dent Educ. 2022;86(10):1369-81. doi: 10.1002/jdd.12935.
9. Lim M, Liberali SA, Calache H, Parashos P, Borromeo GL. Mentoring of oral health professionals is crucial to improving access to care for people with special needs. PLoS One. 2022;17(4):e0266879. doi: 10.1371/journal.pone.0266879.
10. Khazaei AH, Amirpour Haradasht S, Shahraki M. Artificial intelligence and dental education in Iran: current situation and challenges. Development Strategies in Medical Education. 2022;9(4):8-11. doi: 10.32598/dsme.9.4.499.1.
11. Thurzo A, Strunga M, Urban R, Surovková J, Afrashtehfar KI. Impact of artificial intelligence on dental education: a review and guide for curriculum update. Educ Sci. 2023;13(2):150. doi: 10.3390/educsci13020150.
12. Amirpour Haradasht S, Shahraki M. Necessity of teaching nanotechnology concepts in dentistry, checking the upcoming conditions due to the high speed of changes. J Med Educ Dev. 2023;18(1):443-5. doi: 10.18502/jmed.v18i1.12753.
13. Glowacka-Sobotta A, Ziental D, Czarczynska-Goslinska B, Michalak M, Wysocki M, Güzel E, et al. Nanotechnology for dentistry: prospects and applications. Nanomaterials (Basel). 2023;13(14):2130. doi: 10.3390/nano13142130.