

The Role of Mobile Health Applications in Dentistry: A Review

Ameya Tripathi¹, Vishal Kulkarni², Vikram Karande³, Ritik Kashwani^{4*},
Ajimol Theresa Jose⁵

¹Department of Periodontology, Dental College Azamgarh, Azamgarh, Uttar Pradesh, India, ²Army Dental Centre Research and Referral, Delhi Cantt., India, ³Department of Oral & Maxillofacial Surgery, D.Y. Patil Dental School, Lohegaon, Pune, Maharashtra, India, ⁴Department of Oral Medicine and Radiology, School of Dental Sciences, Sharda University, Greater Noida, Uttar Pradesh, India, ⁵Department of Prosthodontics & Implantology, Faculty of Dentistry, AIMST University, Kedah, Malaysia. *Corresponding Author's Email: docritikkashwani@yahoo.com

Abstract

The rapid advancement of mobile technology has a significant impact on many facets of healthcare, including dentistry. In the realm of digital oral healthcare, mobile health (mHealth) apps designed for mobile devices to deliver health services and information have emerged as transformative tools. Nowadays, these apps are being utilized more and more to support a variety of tasks, including improving communication between patients and providers, assisting with early diagnosis and treatment planning, encouraging oral health education, and enabling remote monitoring via teledentistry platforms. To critically analyze the function of mHealth applications in contemporary dentistry practice, this review synthesizes recent data from academic literature. It draws attention to the ways in which modern technologies enhance dental services' efficiency and accessibility, especially for underprivileged or remote populations. But in addition to encouraging advancements, the paper discusses a number of restrictions and difficulties related to mHealth integration, including worries about data privacy, a lack of regulatory supervision, technical inequalities, and the requirement for evidence-based validation. The integration of artificial intelligence (AI), interoperability with electronic health records (EHRs), and the creation of customized digital care models are among the new trends and future directions that are examined in this study. This review seeks to advance knowledge of how mobile technology is changing the delivery of oral healthcare and enhancing patient experiences and clinical outcomes by providing a thorough overview of the functional applications, advantages, limitations, and future prospects of mHealth in dentistry.

Keywords: Dentistry, Digital Health, Mobile Health (mHealth), Periodontics, Remote Monitoring.

Introduction

One of the most revolutionary advances in contemporary medicine is the incorporation of mobile technologies into healthcare systems, which has made it possible to shift from reactive, episodic care to proactive, ongoing, and personalized health management. This change is especially noticeable in the field of mobile health (mHealth), which is the application of wireless and mobile technology, including wearables, smartphones, tablets, and mobile apps, to support public health and medical procedures (1). Due to the exponential rise in smartphone ownership and internet availability globally in recent years, mHealth has become increasingly popular. Over 70% of people worldwide are anticipated to own a smartphone by 2025, and mobile internet services will be available in even the most distant areas, according to a report by the GSM Association (2). mHealth is now positioned as a crucial enabler in closing gaps in healthcare delivery, particularly in

underserved or rural areas, especially to this unparalleled access to technology.

mHealth has emerged as an effective addition to traditional clinical care in the dental industry. Oral health-specific mobile applications have expanded quickly, providing features like medication reminders, appointment scheduling, patient education, oral hygiene training, and real-time dental health status monitoring (3). These applications promote a collaborative approach to dental treatment by being made for patients' self-care and involvement as well as for use by practitioners and dental students. Furthermore, mHealth applications now enable remote triage of dental emergencies, digital transmission of radiographs, and virtual consultations with the advent of teledentistry. These features were especially important during the COVID-19 pandemic, when access to in-person dental care was extremely restricted (4).

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Beyond teleconsultation, some programs use artificial intelligence (AI) to enhance diagnosis, while others use individualized oral health tracking and gamified brushing habits to encourage behavior modification. As a result, the use of mHealth technology in dentistry signifies a paradigm change toward patient-centered, preventive, and customized oral healthcare, which is consistent with international initiatives to enhance health outcomes via digital innovation. The goal of this study is to summarize the body of research on the use of mobile health apps in dentistry, describing their present functions, advantages, drawbacks, and prospects.

Background of the Study

The delivery of healthcare in all fields, including dentistry, has been profoundly altered by the quick development of digital health and mobile technology. A key breakthrough in advancing accessible, individualized, and preventative care is mobile health (mHealth), which uses mobile and wireless technology to support the accomplishment of health objectives (1). Global adoption of smartphones is predicted to reach over 7 billion users by 2025, making mobile applications' contribution to healthcare easier than ever (5).

From a clinical perspective, dental mHealth apps that incorporate artificial intelligence (AI) and image processing algorithms have demonstrated potential in supporting the identification of illnesses such as oral lesions, periodontal diseases, dental caries, and malocclusion (6). These intelligent systems improve decision-making, particularly in environments with limited resources and limited access to experts. By promoting consistent brushing, flossing, and food awareness through interactive feedback, gamification, and reminders, mHealth also helps with behavioral adjustment. Instilling good oral practices, especially in kids and teenagers, is the goal of apps like Brush DJ, Oral-B app, and Colgate Connect etc. (7). Nevertheless, despite its advantages, mHealth adoption in dentistry is still in its infancy. There are still a number of issues with data security, clinical efficacy, user engagement, regulatory compliance, and interaction with the current healthcare infrastructure (8). These difficulties highlight the necessity of interdisciplinary cooperation,

standardization, and evidence-based development in the development and validation of apps.

Functional Applications of mHealth in Dentistry

Patient Education and Behavior Modification

One of the most important contributions of mobile health (mHealth) applications in dentistry lies in the field of patient education and behavior modification, which are essential for the prevention of oral illnesses. The World Health Organization (WHO) highlights that although appropriate self-care behaviors can prevent oral diseases to a considerable extent, global adherence to recommended oral hygiene practices is still below ideal levels (9). Through the direct delivery of interactive, real-time, and accessible educational information to users' cellphones, mHealth applications provide a scalable and entertaining way to close this gap.

These applications are made to affect behavior using a variety of behavioral science-based processes in addition to spreading information. For example, frequent features that support the reinforcement of favorable dental health behaviors like twice-daily brushing, flossing, and consuming less sugar include the inclusion of reminders, progress tracking, gamification, rewards systems, and visual feedback (10). This strategy is best demonstrated by apps such as Brush DJ, an award-winning NHS-supported software. In addition to providing visual and written reminders to brush, floss, use mouthwash, and attend dental appointments, it plays two minutes of music to encourage users to brush for the appropriate amount of time. The app also provides age-appropriate advice and instructional videos (11). Similarly, brushing becomes an interactive and customized experience with the Oral-B mobile app, which pairs with smart toothbrushes that support Bluetooth and provides users with real-time feedback on brushing coverage, pressure, and duration. The effectiveness of such therapies is supported by data from clinical research. In comparison to a control group, teenagers who utilized a mobile app for oral health education showed noticeably higher plaque scores and adherence to oral hygiene practices, according to a randomized controlled experiment (12). These results demonstrate how mHealth tools can lead to

long-lasting behavioral change, particularly among younger and more tech-savvy populations. Furthermore, by addressing groups that might not have regular access to dental education or treatments, like those living in rural areas or low-resource environments, these applications significantly contribute to the reduction of oral health inequities. These applications can improve oral health literacy among a variety of user groups by providing culturally relevant content in a number of languages and forms (such as text, audio, and video).

Clinical Decision Support and Diagnostics

In furtherance of patient education, clinical decision-making and diagnostic procedures in dentistry are increasingly being supported by mobile health (mHealth) applications. These digital tools can improve a clinician's capacity to recognize, evaluate, and treat oral health issues, especially in the early stages of illness diagnosis when prompt action can have a major impact on results. Artificial intelligence (AI) and machine learning (ML) capabilities are being added to contemporary dental mHealth applications, allowing them to process clinical data, decipher diagnostic imaging, and suggest treatments.

Mobile platforms have the ability to detect dental caries, periodontal problems, and even oral potentially malignant disorders (OPMDs) like erythroplakia or leukoplakia by analyzing intraoral photos or radiographs taken with smartphone cameras or connected imaging devices (13). One such instance is DentalXrai, an AI-based diagnostic system that can be used on mobile devices and is taught to assess dental radiographs for bone loss, cavities, and root canal fillings. These apps also provide useful second views and minimize diagnostic oversight while achieving diagnosis accuracy on par with skilled clinicians in particular jobs (14). Similar to this, consumers may take excellent intraoral photos using smartphone apps like OralCam and Toothpic. These images can then be analyzed by integrated AI for initial evaluations or examined remotely by dentists. These decision support tools are especially helpful in remote or resource-constrained environments where access to experts or cutting-edge imaging technology may be restricted. Task-shifting can be facilitated by mHealth solutions, which enable general

healthcare or auxiliary dental staff to efficiently screen patients and refer only those with positive results for additional testing. In low- and middle-income nations, this can greatly increase the effectiveness of public oral health screening programs (15). Additionally, by integrating clinical guidelines and risk assessment calculators, these tools improve evidence-based treatment, standardize care, and decrease inter-practitioner variability. To help doctors measure the severity of the illness and monitor patient progress over time, several programs incorporate caries risk assessment techniques such as CAMBRA (Caries Management by Risk Assessment) or periodontal charting templates (16).

Notwithstanding the potential, it is crucial to remember that the majority of these diagnostic tools are currently undergoing validation and are intended to supplement professional judgment rather than replace it. To guarantee clinical reliability and patient safety, problems like regulatory approval, data privacy, and accuracy across a variety of patient populations must be resolved.

Teledentistry and Remote Monitoring

The incorporation of Teledentistry into mobile health (mHealth) platforms has become a potent tool in revolutionizing the delivery of dental treatment, especially when it comes to follow-up care, remote access, and patient-provider contact. Teledentistry, a subset of telehealth, is the practice of providing dental care, consultation, education, and treatment remotely via electronic information, imaging, and communication technology, including smartphones, tablets, and web-enabled devices (17). A wide variety of teledentistry features are now available through mobile applications, such as real-time image sharing, asynchronous case reviews (store-and-forward), and video consultations. In order to facilitate prompt triage, second opinions, or treatment planning from distant places, patients can utilize their smartphones to take intraoral photos, upload radiographs, or engage in live video chats with dental specialists (4). mHealth-enabled teledentistry can link patients with specialists like orthodontists, periodontists, or oral surgeons, avoiding care delays and needless travel. Additionally, these platforms can be used by community health workers or auxiliary dental staff to gather patient information and consult with

doctors who are not on-site; this type of teleconsultation is referred to as "hub-and-spoke" (18). Teledentistry has been very helpful for remote monitoring and follow-up care, especially in orthodontics and post-operative dentistry.

The COVID-19 pandemic increased the global adoption of teledentistry, emphasizing its function in maintaining continuity of care in times. More than 70% of dentists in a number of countries had implemented some kind of remote consultation, many of them continue provide these services even after the post-pandemic situation because of their convenience and patient acceptance (19).

Crucially, the ethical use of teledentistry depends on safe platforms that adhere to laws governing the privacy of health information (such as HIPAA and GDPR). Patient and provider confidence and safety are increased via mobile apps that include password protection, encrypted texting, and permission paperwork. To sum up, teledentistry via mobile platforms provides an affordable, scalable, and patient-focused method of providing dental healthcare. It is a crucial part of contemporary digital dentistry because of its capacity to lessen inequities, enhance access, and expedite follow-up care.

Appointment Management and Patient Engagement

Modern dental treatment requires good appointment scheduling and ongoing patient involvement, which have a direct impact on clinical results, patient happiness, and the operational efficiency of dental facilities. Both of these areas have significantly improved since the advent of mobile health (mHealth) applications. In addition to streamlining the administrative process, these apps encourage a more proactive and engaged patient-provider interaction.

Digital scheduling interfaces are now available in a variety of dental mHealth applications, allowing patients to make, confirm, reschedule, or cancel appointments without requiring a phone call or in-person visit. Dental practice management systems are integrated with apps like Doctible, Zocdoc, and Dental Anywhere to guarantee real-time availability and automated calendar syncing, which lowers overbooking and human error (20). The automated reminder system, which can send push alerts, SMS, or emails to patients about impending appointments, is one of the most useful aspects of these apps. Studies show that these

reminders dramatically lower dental clinic no-show rates. Automated mobile reminders can help improve scheduling predictability and resource allocation by reducing missed appointments by as much as 30% (21). mHealth systems improve care continuity and post-visit communication in addition to appointment management. Several apps let dentists submit digital prescriptions, dental hygiene instructions, and post-treatment instructions straight to the patient's app interface. This reduces the possibility that patients will misplace paper instructions and boosts the probability that they will adhere to therapeutic advice, especially following endodontic or surgical operations when recovery depends on compliance (22).

Additionally, these platforms are increasingly being made to facilitate two-way communication, enabling patients to post images of their healing sites, voice concerns, or ask follow-up inquiries. By fostering an ongoing engagement loop, this lowers patient anxiety and avoids needless in-office visits for minor issues. Several applications include loyalty programs, training materials, and patient satisfaction surveys to assist clinics in getting feedback and fostering enduring partnerships. From the provider's point of view, these engagement tools result in improved practice efficiency, higher treatment acceptance rates, and improved patient retention. Better oral health results can be achieved by clinicians using analytics dashboards to track adherence to treatment programs, identify patients with past-due exams, and customize preventative care reminders. These tools are not only enhancing clinic operations but also helping to create a patient base that is more educated, involved, and empowered by increasing adherence, decreasing no-shows, and promoting timely communication.

Benefits of mHealth Applications in Dentistry

Numerous advantages emerged from the incorporation of mHealth applications into dental treatment, changing the conventional patient-provider dynamic to one that is more data-driven, accessible, efficient, and personalized. In addition to patients, dental professionals, researchers, and entire healthcare systems also benefit from these advantages. Some of the main benefits backed by recent research are listed below.

Accessibility

The ability of mHealth applications to close the accessibility gap in dental care, especially in underserved, rural, or distant communities, is one of its most significant effects. Mobile apps can help with remote consultations, health education, appointment scheduling, and referral pathways in areas where access to oral health services is hampered by geographical limitations, a lack of dental professionals, or inadequate clinical infrastructure. Research has demonstrated that by enabling patients to communicate with professionals virtually, teledentistry-based mHealth systems can considerably lessen inequities in access to care (23).

Convenience

Dental mHealth apps are becoming more popular due to their convenience and time-saving capabilities. With these capabilities, users can use their cellphones to schedule follow-up consultations, upload clinical photos, get reminders, and schedule appointments. This lessens the strain of regular in-person appointments, particularly for people undergoing orthodontic treatment or those with long-term dental issues. Additionally, because of its flexibility and on-demand availability, mobile-based care coordination is frequently preferred by caregivers and busy professionals (19).

Patient Empowerment

The foundation of preventative dentistry is patient autonomy and self-care, which are fostered by mHealth technologies. Patients are encouraged to actively manage their oral health through features including interactive feedback, instructive videos, gamified brushing applications, and oral hygiene tracking. Notable apps such as Brush DJ and Oral-B SmartSeries that offer timers, progress tracking, and real-time brushing feedback (24).

Continuity of Care

Continuous observation and upkeep are frequently necessary for effective dental treatment, especially in the areas of orthodontics, prosthodontics, and post-operative recuperation. This is made possible by mHealth apps, which allow for quick contact between patients and dentists as well as remote check-ins and progress tracking. Patients receiving orthodontic treatment can exchange pictures of their teeth's alignment over time, which enables doctors to modify treatment regimens without needing to see patients frequently. Better

therapeutic results and increased patient satisfaction are the results of this (18).

Data Collection and Research

The ability to generate useful clinical and behavioral data is an additional benefit of mHealth applications. These platforms collect anonymized data, including oral hygiene practices, treatment adherence, symptom tracking, and demographic information, which can be aggregated for epidemiological studies, public health surveillance, and clinical research with patient consent and compliance with privacy regulations. These statistics can be used by researchers to analyze the efficacy of therapies, spot changes in the frequency of oral diseases, and create risk assessment prediction models (25).

Challenges and Limitations of mHealth Applications in Dentistry

Although mobile health (mHealth) applications have the potential to revolutionize dentistry, there are a number of obstacles and restrictions that must be overcome before they can be widely adopted and effectively used. For digital interventions to successfully and morally supplement traditional dental treatment, developers, practitioners, and legislators must be aware of these limitations.

Digital Divide and Accessibility Issues

Even while smartphone adoption is increasing globally, there are still large gaps in internet access and technology literacy. People in low-income, elderly, or rural areas might not have access to smartphones, dependable internet connectivity, or the knowledge needed to use mobile apps. Rural users frequently encountered obstacles because of infrastructure and digital illiteracy, which limited the egalitarian reach of such platforms in dental treatment, whereas metropolitan users quickly embraced mHealth tools (26).

Data Privacy and Security Concerns

Data privacy and cybersecurity become significant issues when dental mHealth apps gather and preserve private medical data. Identity theft, clinical record misuse, or a loss of trust could result from breaches of personal health data. Strong data protection laws like the General Data Protection Regulation (GDPR) in Europe and the Health Insurance Portability and Accountability Act

(HIPAA) in the United States are not followed by many apps. Many health apps lack sufficient data encryption or clear privacy policies, which raises ethical questions about user consent and information security (27).

Clinical Reliability and Quality

Assurance

Dental professional bodies do not regulate or validate many of the mHealth applications that are now available. This raises questions about the safety of the suggestions made, the precision of the diagnostic instruments, and the content's reliance on evidence. AI-powered diagnostic tools, for instance, could misidentify dental cavities or lesions in photos, resulting in inaccurate self-diagnosis or a delay in seeking treatment. In order to guarantee therapeutic relevance and prevent misinformation, the necessity for app developers to work in conjunction with dental specialists is required (28).

Integration with Existing Dental Systems

The inability of mHealth apps to seamlessly integrate with current dental practice management software or electronic health record (EHR) systems is another significant drawback. Platform fragmentation may lead to redundant records, data silos, and administrative strain for dental practitioners. Many apps now operate independently and do not facilitate integration with practice databases, which limits their usefulness for patient tracking, continuous care, or multi-provider coordinated therapy (29).

User Engagement and Long-Term Adherence

Maintaining use of mHealth tools is still difficult. After downloading health applications for the first time, many users stop using them because of the lack of customization, the complexity of the interface, or the diminishing novelty. In dentistry, where long-term behavior modification including better brushing habits or orthodontic adherence is essential, this is also troublesome. After two weeks, user retention in health-related apps drastically declines, highlighting the significance of gamification, feedback loops, and customized content in sustaining interest (30).

Regulatory and Legal Ambiguities

Regulatory frameworks have not kept up with the rapid expansion of digital health instruments,

particularly in poor nations. The extent of dental teleconsultations, jurisdiction for cross-border guidance, and liability for malpractice through mHealth platforms are still up for debate. Legal requirements for mobile interventions and teledentistry are still developing, and unregulated practices may put patients and clinicians at danger (19).

Future Directions

The use of mobile health (mHealth) technology in dentistry has enormous potential to change the way oral healthcare is delivered in the future as these technologies advance. Dental mHealth solutions of the future will probably focus on intelligent integration, customisation, and interdisciplinary collaboration rather than just basic functionalities. This section examines new innovations and trends that are expected to improve the usefulness and influence of mHealth applications in dentistry.

Integration with Electronic Health Records (EHR)

The integration of mHealth platforms with dental practice management systems and Electronic Health Records (EHRs) is one of the most important developments anticipated in the near future. At the moment, the majority of dental applications function independently, which restricts data exchange and continuity of care between patients and providers. EHR systems will be able to get real-time updates on treatment progress, medication adherence, and diagnostic results thanks to seamless interconnection. More coordinated and effective care may be made possible by this integration, particularly for patients who have comorbid conditions that call for interdisciplinary care. This is an essential step for dental mHealth scalability since integrated health IT systems improve patient outcomes, provider coordination, and documentation accuracy (31).

AI-Powered Diagnostics

Diagnostic capacities are being revolutionized by the integration of machine learning (ML) and artificial intelligence (AI) algorithms into mHealth applications. Emerging technologies can identify early indicators of caries, periodontal disease, or oral cancer—often before outward symptoms manifest—by analyzing intraoral photos, speech inputs, and wearable sensor data. Convolutional

neural networks (CNNs), for instance, have demonstrated potential in detecting dental caries with accuracy on par with human specialists (32). These AI-powered diagnostics, when embedded in mobile apps, could empower general users and practitioners in remote or underserved areas with decision-support tools, enabling early intervention and timely referrals.

Customized and Adaptive Care Plans

Personalization algorithms that create customized oral hygiene regimens based on clinical history, patient feedback, and behavioral analytics are probably going to be used in future dental mHealth applications. Users will receive adaptive content—like product recommendations, food advice, or brushing reminders—based on their own needs and habits rather than static recommendations. To improve user adherence, app frameworks can incorporate behavioral science concepts like habit tracking, gamification, and nudging. Tailored digital interventions are more successful than generic ones at altering health-related behaviors (33). This finding is particularly pertinent when it comes to encouraging preventative dental care.

Cross-Disciplinary Collaboration in App Development

Future development initiatives must include multidisciplinary teams comprising software engineers, behavioral scientists, dentists, UX/UI designers, and health policy specialists in order to optimize the impact and usability of mHealth solutions in dentistry. Apps will be technically sound, therapeutically relevant, user-friendly, and morally compliant thanks to this cooperative approach. For instance, adding psychological knowledge helps improve behavioral adherence characteristics, and clinical input guarantees the content's scientific validity. The value of interdisciplinary cooperation in the creation of health technology, pointing to enhanced functionality and user involvement as results (34).

Cost-Effectiveness of Mobile Health Adoption in Dentistry

Incorporating cost-effectiveness models into mHealth adoption in dentistry highlights potential savings through reduced in-person visits, streamlined scheduling, and improved preventive care. Tele dentistry and mobile apps can lower transportation and administrative costs while enhancing patient adherence. Although initial

investments are needed, long-term savings from fewer emergencies and improved outcomes can outweigh costs (35).

Conclusion

By improving accessibility, engagement, and clinical innovation, the incorporation of mobile health (mHealth) applications into dentistry is changing the conventional oral healthcare environment. These tools enable scalable solutions that close the gap between dental clinicians and patients, especially in distant, underserved, or resource-constrained situations, as cellphones become more and more common and digital literacy rises across populations. mHealth applications promote both preventive and therapeutic interventions by enabling features like appointment scheduling, oral hygiene education, remote diagnostics, and post-treatment monitoring. By providing timely reminders and tailored interventions, these technologies enable patients to take control of their oral health, facilitate continuity of care, and encourage adherence to dental care routines. Nevertheless, there are important constraints and difficulties that need to be resolved in spite of the encouraging trend. There is currently a lack of thorough clinical validation for many applications, which raises concerns about their overall efficacy and diagnostic accuracy. Concerns about the digital divide, data privacy, and compatibility with Electronic Health Records (EHRs) continue to be major obstacles to widespread use. User-centered design frameworks, regulatory monitoring, and evidence-based development are critically needed to fully realize the potential of mHealth in dentistry. To guarantee that future apps are not only scientifically sound but also user-friendly, accessible, and flexible enough to accommodate various cultural and socioeconomic circumstances, physicians, technologists, and end users should collaborate on their development. Furthermore, we can anticipate a new era of predictive and individualized dental treatment as wearable sensors, cloud-based analytics, and artificial intelligence (AI) continue to develop. When appropriately incorporated, these advances could make dentistry a more proactive, patient-centered, and data-driven field. To sum up, mHealth applications are revolutionizing contemporary dentistry. Even if there are still a number of

obstacles in the way of their complete integration into clinical practice, their ongoing development has enormous potential to enhance oral health outcomes, lessen care inequities, and create a patient population that is more involved and knowledgeable.

Abbreviation

None.

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Author Contributions

All authors contributed equally.

Conflict of Interest

The authors declare no conflict of interest.

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References

1. WHO Global Observatory for eHealth. mHealth: new horizons for health through mobile technologies: second global survey on eHealth. World Health Organization. 2011. <https://iris.who.int/handle/10665/44607>
2. GSM Association. The mobile economy 2020. 2020. https://www.gsma.com/solutions-and-impact/connectivity-for-good/mobile-economy/wp-content/uploads/2020/03/GSMA_MobileEconomy2020_Global.pdf
3. Krishna S, Boren SA, Balas EA. Healthcare via cell phones: a systematic review. *Telemedicine and e-Health*. 2009 Apr 1;15(3):231-40.
4. Estai M, Kanagasingam Y, Tennant M, Bunt S. A systematic review of the research evidence for the benefits of teledentistry. *Journal of telemedicine and telecare*. 2018 Apr;24(3):147-56.
5. Taylor P. Forecast number of mobile users worldwide 2020-2025. Nov 16, 2023. <https://www.statista.com/statistics/218984/number-of-global-mobile-users-since-2010/>
6. Negi S, Mathur A, Tripathy S, Mehta V, Snigdha NT, Adil AH, Karobari MI. Artificial intelligence in dental caries diagnosis and detection: an umbrella review. *Clinical and Experimental Dental Research*. 2024 Aug;10(4):e70004.
7. Ajay K, Azevedo LB, Haste A, Morris AJ, Giles E, Gopu BP, Subramanian MP, Zohoori FV. App-based oral health promotion interventions on modifiable risk factors associated with early childhood caries: a systematic review. *Frontiers in oral health*. 2023 Mar 10;4:1125070.
8. Jimenez, A. The Use of Mobile Healthcare Clinics to Expand Access to Underserved Populations: A Rapid Review. Undergraduate Honors Theses. 2019. 14. https://digitalcommons.cwu.edu/undergrad_honortheses/14
9. World Health Organization. Oral health. 2020. <https://www.who.int/news-room/fact-sheets/detail/oral-health>
10. Patil S, Hedad IA, Jafer AA, Abutaleb GK, Arishi TM, Arishi SA, Arishi HA, Jafer M, Gujar AN, Khan S, Raj AT. Effectiveness of mobile phone applications in improving oral hygiene care and outcomes in orthodontic patients. *Journal of oral biology and craniofacial research*. 2021 Jan 1;11(1):26-32.
11. Underwood B, Birdsall J, Kay E. The use of a mobile app to motivate evidence-based oral hygiene behaviour. *British dental journal*. 2015 Aug 28;219(4):E2-E2.
12. Murariu A, Bobu L, Gelețu GL, Stoleriu S, Iovan G, Vasluianu RI, Foia CI, Zapodeanu D, Baci ER. The Impact of Mobile Applications on Improving Oral Hygiene Knowledge and Skills of Adolescents: A Scoping Review. *Journal of Clinical Medicine*. 2025 Apr 23;14(9):2907.
13. Joda T, Gallucci GO, Wismeijer D, Zitzmann NU. Augmented and virtual reality in dental medicine: A systematic review. *Computers in biology and medicine*. 2019 May 1;108:93-100.
14. Schwendicke FA, Samek W, Krois J. Artificial intelligence in dentistry: chances and challenges. *Journal of dental research*. 2020 Jul;99(7):769-74.
15. Petersen PE, Ogawa H. The global burden of periodontal disease: towards integration with chronic disease prevention and control. *Periodontology 2000*. 2012 Oct;60(1):15-39.
16. Rindal DB, Mabry PL. Leveraging clinical decision support and integrated medical-dental electronic health records to implementing precision in oral cancer risk assessment and preventive intervention. *Journal of Personalized Medicine*. 2021 Aug 25;11(9):832.
17. Catalan B. An Exploration of Oral Care Provided by Dental Hygienists Using Teledentistry (Master's thesis, Idaho State University). <https://www.proquest.com/openview/b265921073bf37d45aa7ff05988c8792/1?pq-origsite=gscholar&cbl=18750&diss=y>
18. Daniel SJ, Kumar S. Teledentistry: a key component in access to care. *Journal of evidence based dental practice*. 2014 Jun 1;14:201-8.
19. Ghai S. Teledentistry during COVID-19 pandemic. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*. 2020 Sep 1;14(5):933-5.
20. Kruse CS, Bolton K, Freriks G. The effect of patient portals on quality outcomes and its implications to meaningful use: a systematic review. *Journal of medical Internet research*. 2015 Feb 10;17(2):e44.
21. Hasvold PE, Wootton R. Use of telephone and SMS reminders to improve attendance at hospital appointments: a systematic review. *Journal of telemedicine and telecare*. 2011 Oct;17(7):358-64.
22. Brands MR, Gouw SC, Beestrum M, Cronin RM, Fijnvandraat K, Badawy SM. Patient-centered digital health records and their effects on health outcomes: systematic review. *Journal of medical Internet research*. 2022 Dec 22;24(12):e43086.
23. Estai M, Kanagasingam Y, Mehdizadeh M, Vignarajan J, Norman R, Huang B, Spallek H, Irving M, Arora A,

- Kruger E, Tennant M. Teledentistry as a novel pathway to improve dental health in school children: a research protocol for a randomised controlled trial. *BMC oral health*. 2020 Jan 14;20(1):11.
24. Scheerman JF, van Meijel B, van Empelen P, Verrips GH, van Loveren C, Twisk JW, Pakpour AH, van den Braak MC, Kramer GJ. The effect of using a mobile application ("WhiteTeeth") on improving oral hygiene: A randomized controlled trial. *International journal of dental hygiene*. 2020 Feb;18(1):73-83.
 25. Joda T, editor. *Big Data in Dental Research and Oral Healthcare*. MDPI; 2021.
<https://www.mdpi.com/books/reprint/3566-big-data-in-dental-research-and-oral-healthcare>
 26. Lopez de Coca T, Moreno L, Alacreu M, Sebastian-Morello M. Bridging the Generational Digital Divide in the Healthcare Environment. *J Pers Med*. 2022 Jul 26;12(8):1214. doi: 10.3390/jpm12081214. PMID: 35893307; PMCID: PMC9394326.
 27. Martínez-Pérez B, De La Torre-Díez I, López-Coronado M. Privacy and security in mobile health apps: a review and recommendations. *Journal of medical systems*. 2015 Jan;39(1):181.
 28. Boudreaux ED, Waring ME, Hayes RB, Sadasivam RS, Mullen S, Pagoto S. Evaluating and selecting mobile health apps: strategies for healthcare providers and healthcare organizations. *Translational behavioral medicine*. 2014 Dec 1;4(4):363-71.
 29. Boyle DA. Diversity, Equity, Inclusion, and Accessibility in Cancer Care: A Synopsis of Literature From 2021 Through April 2023. *Clinical Journal of Oncology Nursing*. 2023 Jun 1;27(3).
 30. Baumel A, Muench F, Edan S, Kane JM. Objective user engagement with mental health apps: systematic search and panel-based usage analysis. *Journal of medical Internet research*. 2019 Sep 25;21(9):e14567.
 31. Birkhead GS, Klompas M, Shah NR. Uses of electronic health records for public health surveillance to advance public health. *Annual review of public health*. 2015 Mar 18;36(1):345-59.
 32. Esteva A, Kuprel B, Novoa RA, Ko J, Swetter SM, Blau HM, Thrun S. Dermatologist-level classification of skin cancer with deep neural networks. *nature*. 2017 Feb 2;542(7639):115-8.
 33. Coughlin SS, Whitehead M, Sheats JQ, Mastromonico J, Smith S. A review of smartphone applications for promoting physical activity. *Jacobs journal of community medicine*. 2016 Feb 11;2(1):021.
 34. Pagliari C. Design and evaluation in eHealth: challenges and implications for an interdisciplinary field. *Journal of medical Internet research*. 2007 May 27;9(2):e614.
 35. Ankit A, Ruchi J, Shreya S, Sahil R, Ishika P, Richa W. Enhancing Patient Care with Teledentistry and Smart Diagnostic Tools: A Review. *Oral Sphere J Dent Health Sci*. (2025); 1(2): 116-122.