Teledentistry in Palestine: challenges and prospects

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ABSTRACT

In the rural areas of Palestine, where access to dental services is limited, teledentistry emerges as a promising solution to address oral healthcare challenges, especially in remote or underserved areas. However, the successful implementation of teledentistry depends on addressing various factors crucial for overcoming barriers and realizing its full potential. This paper aims to highlight these challenges and underscore the importance of addressing them to facilitate the successful implementation of teledentistry in Palestine.

Keywords: Teledentistry, Palestine, Challenges, Telehealth

INTRODUCTION

The dental field has experienced significant technological advancements in recent years. These include innovations in computers, telecommunication technology, digital diagnostic imaging services, specialized devices, and software for analysis and follow-up purposes.

During the late 1990s, teledentistry emerged as a specialized area within telemedicine focused on dental care [1]. Teledentistry represents "the uses of information, digital and telecommunication technology to provide remote oral healthcare services between an oral healthcare provider and a patient/recipient or other healthcare providers, who are separated by distance [2]."

Teledentistry has found application across various disciplines within dentistry, including preventive dentistry, endodontics, orthodontics, and oral medicine, among others, showing promising outcomes [3,4]. In pediatric and preventive dentistry, teledentistry can be used for initial

triage, remote assessment, reinforcement of prevention, implementing initial management, and building rapport [5]. Within endodontics, teledentistry allows endodontists to remotely assess patient symptoms, review radiographs, and provide initial diagnosis and treatment recommendations [6]. In orthodontics, teledentistry supports virtual initial assessment, consultations, referrals, pre-orthodontic treatment, and monitoring of treatment progress [7–9]. In prosthodontics, teledentistry could be used for diagnosis and for making treatment plans for patients requiring prosthetic or oral rehabilitation treatment [10]. Furthermore, teledentistry enables remote examination and consultation for various oral health conditions in oral medicine and oral surgery, facilitating early diagnosis, management, and follow-up [11–14]. Teledentistry enhances interdisciplinary dentistry by facilitating distant consultations, teamwork, and coordination among dental professionals and specialists. By expanding access to comprehensive dental treatments across various specialties, teledentistry ultimately improves patient-centered care, convenience, and satisfaction [15].

Since the onset of the COVID-19 pandemic, teledentistry has gained increased attention due to its ability to facilitate remote patient assistance and management and eliminate unnecessary interpersonal interactions [16,17]. Teledentistry has been implemented at various levels together or separately, and includes teleconsultation, telediagnosis, teletriage, and telemonitoring. Teleconsultation, the most common type of teledentistry [18–20], refers to the appointment where the patient converses with an oral health care provider using either one of two primary forms of teleconsultation: real-time (synchronous) or store-and-forward (asynchronous) consulting, each offering unique advantages in facilitating teleconsultations [21]. According to the International Association of Dental Research e-Oral Health Network (e-OHN), the real-time approach involves live, two-way, audio-visual conferencing interactions. In contrast, the store-and-forward approach entails transmitting recorded health data through electronic communication for later evaluation and treatment recommendations [2]. The real-time approach suits solo dental practices, requiring minimal training and existing resources. The store-and-forward approach is ideal for group practices and public health settings, promoting better communication among dental professionals,

but may require additional setup and training. Telediagnosis may follow teleconsultation to diagnose an oral condition or identify a chief complaint [22]. Teletriage then informs on the best course of action in a timely manner [23,24]. Lastly, telemonitoring is utilized to replace recurrent dental visits aimed mainly at information-seeking or prescription of medications.

Solo practices can start with slight infrastructure modifications, using affordable, secure applications like MS Teams, Skype for Business, or Google G Suite. Larger practices and public health settings may opt for comprehensive packages like TeleDent, Teledentix, or Dentulu, offering various features such as encrypted chat and scheduling [25].

BENEFITS

Teledentistry has many benefits. It improves access to dental services, particularly in remote or underserved areas where traditional dental care may be limited or inaccessible. It enables underserved patients to find specialists, receive consultations and guidance remotely, reducing the need to travel long distances to dental clinics [26,27]. In emergencies, teledentistry provides a fast and convenient method for individuals to consult dental professionals for guidance before deciding on the need for an in-person visit and the appropriate level of care [24]. Teledentistry also promotes continuity of care, enhances patient monitoring and follow-up, facilitates effective case management and treatment sequencing, facilitates multidisciplinary training and education, and encourages interdisciplinary research and data exchange [28]. It significantly expands access to specialized dental care, particularly benefiting individuals with busy schedules who struggle to attend in-person appointments [29–31]. Through teledentistry platforms, patients gain access to personalized guidance, educational resources, and interactive tools allowing them to enhance their self-care practices and oral health knowledge, thus elevating overall oral health and quality of life. However, it's essential to note that while teledentistry offers numerous advantages, it cannot replace all dental procedures. Thus, a comprehensive

approach integrating teledentistry with traditional in-person dental visits is often recommended to ensure optimal patient care.

CHALLENGES

Despite its potential benefits, teledentistry faces several challenges, more research on patients' acceptance of teledentistry services, inadequate training for practitioners, language barriers, data security concerns, privacy concerns, and technological limitations [32]. Moreover, issues such as lack of technical support, sustainable funding, reimbursement structures, regulatory frameworks, liability considerations, and bureaucratic difficulties impede the integration of Teledentistry into existing healthcare systems [33].

Areas of teledentistry research that have received relatively less attention in the scientific literature include medico-legal considerations, patient privacy, malpractice issues, and guidelines for remote consultations [34]. Malpractice and legal concerns present significant barriers to the widespread adoption of teledentistry, especially across borders. While teledentistry enables professionals to offer services over vast geographic areas, it also brings forth intricate ethical, legal, and regulatory challenges.

Patients must be informed about the risks associated with potential misdiagnosis or treatment failure due to technological limitations. Patients should be made aware that their information is stored and transferred electronically and that the possibility exists that the information is vulnerable to unapproved access and interception, despite maximum efforts to maintain security [33,35–38].

SCOPE IN PALESTINE

Palestine is typically classified as a developing country. It faces challenges commonly associated with developing nations, including economic, social, and infrastructural development issues. It faces a scenario where a substantial portion of its populace resides in underserved and rural areas with limited access to basic healthcare facilities. However, the advent of modern telecommunication and information technology has significantly improved

various facets of life, fostering a unique opportunity for Palestinians to embrace the concept of teledentistry for patient care [33]. The successful establishment and implementation of a sustainable teledentistry model in Palestine is a complex and collaborative process that requires consideration of various factors at individual, infrastructure, and organizational levels [32,39,40]. Exploring teledentistry practices in other countries can offer valuable insights into addressing these factors and may allow for identifying potential collaborations, resource-sharing, and developing targeted initiatives in Palestine [34].

1. Personal considerations
   A. Patients

Patient acceptance might poses one of the most significant challenges in implementing teledentistry in Palestine, as it does in other regions. Therefore, an exploration of cultural and contextual factors that influence patient attitudes toward remote dental consultations in the Palestinian context is needed. Various studies in the existing literature show mixed attitudes towards teledentistry, with some patients frequently expressing dissatisfaction with online consultations and feeling uncomfortable about describing their symptoms remotely [32,41–43]. For instance, a survey conducted among dentists and patients in Turkey revealed varying perspectives: 51.0% of 447 patients believed that follow-up through teledentistry would not suffice, 62.2% expressed doubts about the accuracy of interviews conducted via teledentistry applications compared to face-to-face interviews, and 24.8% expressed concerns about potential privacy violations regarding personal information [43]. Griffeth et al.[41] investigated the patient perspectives on teledentistry and face-to-face doctor interaction during orthodontic treatment. Most patients placed high value on face-to-face interaction with the orthodontist and preferred to be seen face-to-face.

Strategies to enhance patient education and awareness about the benefits and safety of teledentistry could be vital in addressing this challenge and fostering greater acceptance among the population [44]. Educational and digital literacy initiatives and campaigns

targeting laypeople, students, teachers, and social workers at various levels might help enable them to engage teledentistry platforms effectively [45].

B. Practitioners

Education of oral health care professionals is essential to implementing teledentistry. However, studies investigating teledentistry in dental undergraduate and hygiene curricula are limited and often fail to fully address the extent of content delivery [15,46–49].

Dentists in Palestine and other countries typically lack formal training in teledentistry. This lack of training poses significant risks, as highlighted by Berndt et al. [7], who emphasized the potentially disastrous consequences and adverse effects of practicing teledentistry without proper certification and training. Without adequate training, untrained dentists may be unable to effectively support dental patients, potentially compromising patient care and safety. Integration of teledentistry into undergraduate and postgraduate dental education is urgently needed to ensure competence and proficiency among practitioners [50].

Successful utilization of dental allied health professionals, such as dental hygienists, has been documented, demonstrating their effective use of teledental technology, including tasks like caries detection. In a particular study that evaluated the role of dental hygienists it was found that there were no significant difference in caries detection between a dental hygienist using teledentistry and a dentist using a clinical exam. This demonstrates the effective use of teledental technology by dental hygienists [51].

Continuous education programs, including lectures and workshops, are highly recommended to equip oral health care providers with necessary skills for teledentistry operation, troubleshooting, and maintenance. However, existing studies reveal significant gaps in knowledge and training among dental practitioners in various countries, indicating a need for comprehensive education and training initiatives to enhance teledentistry implementation globally.

Giraudeau et al.[52] conducted a study to assess the knowledge, attitudes, and practices of teledentistry among dentists in private practice in France. They found that out of 5056

respondents, 57.1% of dentists in private practice claimed to have never heard of teledentistry. A mere 1.5% (n = 76) of respondents reported attending a telemedicine or teledentistry training module during their university studies. Furthermore, among those who did receive training, 75.2% (n = 57) felt that their training was inadequate. Nassani et al.[53] conducted a study to evaluate the knowledge, attitudes, and practices of teledentistry among dental practitioners in Saudi Arabia. The findings revealed insufficient knowledge, training, and utilization of teledentistry among dental practitioners. Specifically, 79.8% of the 603 participants reported a lack of training in using and applying teledentistry. Raucci-Neto et al.[54] conducted a study to assess teledentistry's level of knowledge, perception, and experience among Brazilian dentists. Their findings indicate that Brazilian dentists are not adequately prepared to implement teledentistry.

2. Technological considerations

The state of internet service might directly impact teledentistry initiatives in Palestine, as it is crucial for audio-visual conferencing and data sharing between dental practitioners and patients. In contrast to urban areas, rural and underserved areas may complain of limited or unreliable internet access. This affects patients' access to online consultations and transmits diagnostic materials, compromising care quality [31]. Hence, improving internet infrastructure and access across Palestine is essential for teledentistry's success. Investments in upgrading connectivity, especially in rural areas, can extend the reach and effectiveness of teledentistry services, ensuring equitable access to essential dental care.

Primary health centers and community oral health facilities must have telehealth capabilities to promote the adoption of teledentistry. This entails deploying user-friendly technology suited to local needs, featuring simplified interfaces and mobile compatibility [55]. Collaborative efforts among stakeholders are essential for securing long-term sustainable funding, recruiting experts, and creating tailored solutions to warrant accessibility to a broader patient base particularly in underserved areas.

3. Organizational considerations

National policies and guidelines for teledentistry are essential to establish and regulate the practice of teledentistry. Collaborative efforts by regulatory authorities and stakeholders to develop policies and guidelines that assist the integration of teledentistry into the healthcare system while addressing ethical, regulatory, financial, and logistical concerns is required. Different stakeholders drive teledentistry initiatives in different countries. For instance, in Iran and France, the research communities and academic led the process by launching projects and assessing the relevant feedback. In contrast, in Finland and Canada, local health centers headed the implementation of teledentistry programs. Meanwhile, in Saudi Arabia, Qatar, and the UK, the national governments developed the system, whereas in Zimbabwe and Egypt, private companies ran the teledentistry systems [56]. In the context of Palestine, the specific stakeholders involved in driving teledentistry initiatives are not explicitly identified. Potential stakeholders critical for shaping the development and implementation of teledentistry programs in Palestine may involve local academic institutions, healthcare organizations, governmental bodies, and potentially private companies. Involving these stakeholders in the development and implementation of teledentistry programs will help tailor the programs to address the needs of Palestine's population and ensures that the initiatives are well-aligned with the local context and are more likely to be effective and sustainable [56].

In Palestine, specific guidelines are not yet available. Therefore, in the absence of universal guidelines from organizations such as the WHO or other regulatory bodies [56], utilizing knowledge about national policies, guidelines, and processes governing the incorporation of teledentistry into healthcare systems from various countries and contexts can significantly contribute to the development of frameworks for teledentistry practice in Palestine. For instance, countries like the USA, Finland, and Saudi Arabia have implemented policies or strategies for teledentistry [38,56]. However, given Palestine's constraints in funding and expertise, directly replicating the comprehensive systems established in these countries may

not be immediately feasible. Nonetheless, these examples can serve as valuable foundations for developing and implementing teledentistry initiatives within our own context, eventually aiding in the institutionalization of teledentistry programs at a national level, as reported in some countries [56].

CONCLUSION

While challenges exist, lessons learned from other countries and contexts can serve as valuable foundations for developing and implementing teledentistry initiatives in Palestine. By addressing these considerations and leveraging existing resources and expertise, Palestine can work towards establishing a robust teledentistry infrastructure that improves access to dental care for all its citizens.

CONFLICT OF INTEREST

The author declares no conflict of interest

REFERENCES

1. Cook J, Austen G, Stephens C. Videoconferencing: What are the benefits for dental practice? *Br Dent J*. 2000;188(2):67–70.

2. Marino R, Uribe S, Chen R, Schwendicke F, Giraudeau N, Scheerman J. Terminology of e-Oral Health: Consensus Report of the IADR's e-Oral Health Network Terminology Task Force. *BMC Oral Health*. 2023;24:1–12.

3. Jampani ND, Nutalapati R, Dontula BSK, Boyapati R. Applications of teledentistry: A literature review and update. *J Int Soc Prev Community Dent*. 2011;1(2):37–44.

4. Tella AJ, Olanloye OM, Ibiyemi O. Potential of teledentistry in the delivery of oral health services in developing countries. *Ann Ibadan Postgrad Med*. 2019;17(2):115–23.

5. Wallace CK, Schofield CE, Burbridge LAL, O'Donnell KL. Role of teledentistry in paediatric dentistry. *Br Dent J*. 2021;1–6.

6. Brüllmann D, Schmidtmann I, Warzecha K, d'Hoedt B. Recognition of root canal orifices at a distance - a preliminary study of teledentistry. *J Telemed Telecare*. 2011;17(3):154–7.

7. Berndt J, Leone P, King G. Using teledentistry to provide interceptive orthodontic services to disadvantaged children. *Am J Orthod Dentofac Orthop*. 2008;134(5):700–6.

8. Maspero C, Abate A, Cavagnetto D, El Morsi M, Fama A, Farronato M. Available technologies, applications and benefits of teleorthodontics. A literature review and possible applications during the COVID-19 pandemic. *J Clin Med*. 2020;9(6):1–15.

9. Mandall NA, O'Brien KD, Brady J, Worthington H V., Harvey L. Teledentistry for screening new patient orthodontic referrals. Part 1: A randomised controlled trial. *Br Dent J*. 2005;199(10):659–62.

10. Ignatius E, Perãlãt S, Mãkelã K. Use of videoconferencing for consultation in dental prosthetics and oral rehabilitation. *J Telemed Telecare*. 2010;16(8):467–70.

11. Flores-Hidalgo A, Collie J, King S, Grant FT, Beasley NE, Moss ME, et al. The use of teledentistry in clinical oral and maxillofacial pathology practice: an institutional experience. *Front Oral Heal*. 2023;4(July):1–7.

12. Bradley M, Black P, Noble S, Thompson R, Lamey PJ. Application of teledentistry in oral medicine in a Community Dental Service, N. Ireland. *Br Dent J*. 2010;209(8):399–404.

13. Herce J, Lozano R, Salazar CI, Rollon A, Mayorga F, Gallana S. Management of impacted third molars based on telemedicine: A pilot study. *J Oral Maxillofac Surg*. 2011;69(2):471–5.

14. Aziz SR, Ziccardi VB. Telemedicine Using Smartphones for Oral and Maxillofacial Surgery Consultation, Communication, and Treatment Planning. *J Oral Maxillofac Surg*. 2009;67(11):2505–9.

15. Irving M, Stewart R, Spallek H, Blinkhorn A. Using teledentistry in clinical practice as an enabler to improve access to clinical care: A qualitative systematic review. *J Telemed Telecare*. 2018;24(3):129–46.

16. Brian Z, Weintraub JA. Oral Health and COVID-19: Increasing the need for prevention and access. *Prev Chronic Dis*. 2020;17:1–10.

17. Talla PK, Levin L, Glogauer M, Cable C, Allison PJ. Delivering dental care as we emerge from the initial phase of the COVID-19 pandemic: teledentistry and face-to-face consultations in a new clinical world. *Quintessence Int*. 2020;51(8):672–7.

18. McLaren SW, Kopycka-Kedzierawski DT. Compliance with dental treatment recommendations by rural paediatric patients after a live-video teledentistry consultation: A preliminary report. *J Telemed Telecare*. 2016;22(3):198–202.

19. Tynan A, Deeth L, McKenzie D, Bourke C, Stenhouse S, Pitt J, et al. Integrated approach to oral health in aged care facilities using oral health practitioners and teledentistry in rural Queensland. *Aust J Rural Health*. 2018;26(4):290–4.

20. Saccomanno S, Quinzi V, Sarhan S, Laganà D, Marzo G. Perspectives of tele-orthodontics in the COVID-19 emergency and as a future tool in daily practice. *Eur J Paediatr Dent*. 2020;21(2):157–62.

21. Kanani H, Khubchandani M, Dangore-khasbage S, Pandey R. Teledentistry : A Comprehensive Review and Its Application in Pediatric Dental Care. 2024;16(1):1–7.

22. Ghai S. teledentistry during COVID-19 pandemic. Diabetes. *Metab Syndr Clin Res Rev*. 2020;14:933–5.

23. Chopra SS, Sahoo NK. Protocol for teledentistry during COVID-19 in Armed Forces dental establishments. *Med J Armed Forces India*. 2020;76(3):356–9.

24. Ali SA, Al-Qahtani AMA, Al Banai SR, Albaker FJ, Almarri AE, Al-Haithami K, et al. Role of Newly Introduced Teledentistry Service in the Management of Dental Emergencies During COVID-19 Pandemic in Qatar: A Cross-Sectional Analysis. *Telemed e-Health*. 2022;28(11):1623–32.

25. Iyer P, Anantha S, Griffith A, Farrand C. Teledentistry 101: A Primer for Dental Professionals for the New Normal. *J Calif Dent Assoc*. 2020;48(10):547–53.

26. Fricton J, Chen H. Using Teledentistry to Improve Access to Dental Care for the Underserved. *Dent Clin North Am*. 2009;53(3):537–48.

27. Arora P, Kaur J, Kaur J, Arora A. Teledentistry: An innovative tool for the underserved population. *Digit Med*. 2019;5(1):6.

28. Madhavan K, Ganesh R, Jeyamarthan S, Selvamani B. Knowledge, awareness, and attitude regarding teledentistry among undergraduate dental students: A descriptive study. *J Interdiscip Dent*. 2023;13(2):73.

29. Torul D, Kahveci K, Kahveci C. Is Tele-Dentistry an Effective Approach for Patient Follow-up in Maxillofacial Surgery. *J Maxillofac Oral Surg*. 2023;22(3):620–6.

30. Chatterjee S, Lakshmi KG, Khan AM, Moothedath M. Evaluating the Impact of Teledentistry on Patient Outcomes , Diagnostic Accuracy , and Satisfaction in a Prospective Observational Analysis. *Cureus*. 2024;16(2):6–13.

31. Wolf TG, Schulze RKW, Ramos-Gomez F, Campus G. Effectiveness of Telemedicine and Teledentistry after the COVID-19 Pandemic. *Int J Environ Res Public Health*. 2022;19(21):1–11.

32. Fahim A, Saleem Z, Malik KA, Atta K, Mahmood R, Alam MK, et al. Exploring challenges and mitigation strategies towards practicing Teledentistry. *BMC Oral Health*.

2022;22(1):1–9.

33. Bhargava A, Sabbarwal B, Jaggi A, Chand S, Tandon S. Teledentistry: A literature review of evolution and ethicolegal aspects. *J Glob Oral Heal*. 2020;2(February):128–33.

34. Valeri C, Quinzi V, Di Giandomenico D, Fani E, Leonardi R, Marzo G. Teledentistry: A bibliometric analysis of the scientific publication's trend. *Digit Heal*. 2023;9.

35. Jain A, Bhaskar DJ, Gupta D, Agali C, Mark R. Dental Hand for Rural Population: Teledentistry. *J Contemp Dent*. 2014;4(1):27–9.

36. Estai M, Kruger E, Tennant M, Bunt S, Kanagasingam Y. Challenges in the Uptake of Telemedicine in Dentistry. *Rural Remote Health*. 2016;16(4):1–5.

37. Dhyani VS, Krishnan JB, Mathias EG, Hossain MM, Price C, Gudi N, et al. Barriers and facilitators for the adoption of telemedicine services in low-income and middle-income countries: a rapid overview of reviews. *BMJ Innov*. 2023;9(4):215–25.

38. Nichols K. Teledentistry Overview: United States of America. *J Int Soc Telemed eHealth*. 2019;7:1–6.

39. Estai M, Kruger E, Tennant M. Optimizing patient referrals to dental consultants: Implication of teledentistry in rural settings. *Australas Med J*. 2016;9(7):249–52.

40. Mariño R, Ghanim A. Teledentistry: A systematic review of the literature. *J Telemed Telecare*. 2013;19(4):179–83.

41. Griffeth JK, Shroff B, Carrico C, Cook P, Lindauer SJ. Patient perspectives on teledentistry and face-to-face doctor interaction during orthodontic treatment. *Am J Orthod Dentofac Orthop*. 2023;163(3):328–37.

42. Gleeson HB, Kalsi AS. Remote clinical consultations in restorative dentistry—A survey. *J Dent*. 2022;117:103914.

43. Özveren N, Sevinç B, Güngör AS, Baltacı E, Serindere G, Özgür Ö. Evaluation of knowledge and awareness about teledentistry among dentists and patients living in Turkey. *Dent Med Probl*. 2023;60(4):593–9.

44. Alshammari A, Almaktoom I. Teledentistry Awareness and Knowledge Among Dental

Practitioners and Patients in Jeddah, Saudi Arabia. *Clin Cosmet Investig Dent*. 2023;15:321–31.

45. Almazrooa SA, Mansour GA, Alhamed SA, Ali SA, Akeel SK, Alhindi NA, et al. The application of teledentistry for Saudi patients' care: A national survey study. *J Dent Sci*. 2021;16(1):280–6.

46. McFarland KK, Nayar P, Chandak A, Gupta N. Formative evaluation of a teledentistry training programme for oral health professionals. *Eur J Dent Educ*. 2018;22(2):109–14.

47. Spearin TA, Ayers CL. Instructional strategies and challenges for implementing teledentistry in dental hygiene curricula: A qualitative study. *J Dent Educ*. 2024;

48. McLeod CD. Knowledge, attitudes, and applications of teledentistry among dental and dental hygiene students. 2020;6(11):951–2.

49. Bakhshaei A, Ramachandran S, Brondani M. Teledentistry within oral health care providers' training: A scoping review. *Eur J Dent Educ*. 2024;

50. Aktas N, Palaz ZH, Akal N. Teledentistry in pediatric dentistry: Postgraduate dental students' knowledge, practice, and attitudes. *Digit Heal*. 2023;9.

51. Daniel SJ, Kumar S. Comparison of dental hygienists and dentists: clinical and teledentistry identification of dental caries in children. *Int J Dent Hyg*. 2017;15(4):e143–8.

52. Giraudeau N, Bauer M, Tramini P, Inquimbert C, Toupenay S. A national teledentistry study on the knowledge, attitudes, training and practices of private dentists. *Digit Heal*. 2022;8:1–7.

53. Nassani MZ, Al-Maweri SA, Alsheddi A, Alomran A, Aldawsari MN, Aljubarah A, et al. Teledentistry—knowledge, practice, and attitudes of dental practitioners in saudi arabia: A nationwide web-based survey. *Healthc*. 2021;9(12):1–9.

54. Raucci-Neto W, de Souza Pereira M, Cerqueira NM, Louzada VG, de Castro Raucci LMS, Leoni GB. Knowledge, Perception, and Experience of Dentists About Teledentistry. *Int Dent J*. 2022;72(4):456–62.

55. Fazio M, Lombardo C, Marino G, Marya A, Messina P, Scardina GA, et al. LinguAPP: An

m-Health Application for Teledentistry Diagnostics. *Int J Environ Res Public Health*. 2022;19(2).

56.   El Tantawi M, Lam WYH, Giraudeau N, Virtanen JI, Matanhire C, Chifamba T, et al. Teledentistry from research to practice: a tale of nineteen countries. *Front Oral Heal*. 2023;4(June):1–15.