



## ORIGINAL ARTICLE

# Improving Access to dental care through teledentistry

Natalia Czołpińska<sup>1</sup>, Wojciech Warmuz<sup>2</sup>, Jakub Rudzki<sup>3</sup>, Jakub Szczygiał<sup>1</sup>, Kacper Solarz<sup>4</sup>, Joanna Brzoza<sup>4</sup>, Zuzanna Kata<sup>5</sup>, Monika Chlipała<sup>6</sup>, Łukasz Dylewicz<sup>7</sup>, Kinga Bylica<sup>8</sup>

<sup>1</sup> Student of medicine at the Faculty of Medical Sciences of the Silesian Medical University in Katowice-Ligota, Silesia, Poland ul. Medyków 18 40-752 Katowice

<sup>2</sup> Doctor of Dental Medicine, Independent Author, Kościuszki 17b, 34-130 Kalwaria Zebrzydowska, Poland

<sup>3</sup> Doctor of Medicine, Andrzej Mielęcki Independent Public Clinical Hospital in Katowice, Francuska 20/24, 40-027 Katowice, Poland

<sup>4</sup> Doctor of Medicine, Leszek Giec Upper-Silesian Medical Centre of the Medical University of Silesia in Katowice, Ziołowa 45-47, 40-635 Katowice, Poland

<sup>5</sup> Doctor of Dental Medicine, Independent Author, Piotra Skargi 6, 40-086 Katowice, Poland

<sup>6</sup> Doctor of Medicine, St. Luke's Voivodeship Hospital in Tarnów, Lwowska 178A, 33-100 Tarnów, Poland

<sup>7</sup> Doctor of Medicine, Szpital Murcki Sp. z o.o., Sokołowskiego 2, 40-749 Katowice, Poland

<sup>8</sup> Doctor of Medicine, Independent Public Health Care Centre of the Ministry of the Interior and Administration in Kraków, Kronikarza Galla 25, 30-053 Kraków, Poland

Corresponding author: Natalia Czołpińska

e-mail: [S88500@365.sum.edu.pl](mailto:S88500@365.sum.edu.pl)

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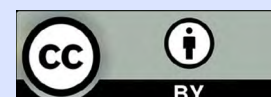
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## ABSTRAKT

**Background:** Oral diseases remain a major public health problem and are unevenly distributed across populations. Limited access to dental care is particularly visible among rural populations, children, older adults, people with disabilities and socioeconomically disadvantaged groups. Teledentistry has been proposed as a digital health approach that can reduce distance barriers, support remote screening and triage, facilitate patient education and direct patients toward appropriate in-person dental treatment. Aim: This narrative review analyzes the role of teledentistry in improving access to dental care, identifies its main clinical and organizational applications, and discusses the clinical, equity-related and implementation conditions that determine whether remote dental care produces real improvement in access.

**Materials and Methods:** A narrative literature review was conducted using PubMed and Google Scholar. English-language publications from 2015 to June 2026 were selected when they addressed teledentistry, dental access, oral health inequalities, remote consultation, screening, triage, patient satisfaction, diagnostic accuracy, digital health or implementation barriers. Priority was given to systematic reviews, umbrella reviews, policy documents, intervention studies, diagnostic accuracy studies and research focused on underserved populations.

**Results:** The reviewed literature suggests that teledentistry improves access most convincingly when it is embedded in a broader care pathway. Its value is clearest in practical situations such as school-based screening followed by referral, rural triage before long-distance travel, and remote follow-up for patients with mobility problems. The most promising applications are remote screening, teletriage, oral health education, follow-up consultations, and support for rural or remote communities. Evidence for diagnostic use is strongest for structured screening tasks, such as caries detection based on standardized photographs, but performance varies with image quality, personnel training, and the clinical condition assessed.

**Conclusions:** Teledentistry should be treated as a complementary access model rather than a low-cost substitute for full dental services. It can shorten the route between patients and oral health professionals, make in-person appointments more targeted, and support prevention. However, it cannot remove the need for clinical examination or operative treatment when these are required. The most realistic model is hybrid care, in which remote assessment leads to prevention, monitoring, referral, or definitive in-person treatment instead of ending as a stand-alone consultation.

## KEYWORDS

teledentistry, dental care access, oral health, digital health, telehealth, dental public health

## 1. Introduction

Oral health is an essential component of general health, but access to dental care remains uneven. The World Health Organization reports that oral diseases affect nearly 3.7 billion people worldwide and that untreated dental caries in permanent teeth remains one of the most prevalent health conditions globally [1]. The burden is not distributed equally. Populations living in rural areas, people with low income, children from underserved communities, older adults, and people with reduced mobility may experience delayed diagnosis, irregular preventive care and higher treatment needs.

The problem is not only the biological prevalence of dental disease. It is also the way dental care is organized. Dental treatment usually requires physical presence, appropriate equipment, radiographs, instruments and trained personnel. This makes dentistry more dependent on location, time, transport and local workforce availability than many other areas of health advice. When the nearest clinic is distant, expensive, unavailable after working hours or difficult to reach for a patient with limited mobility, a preventable oral problem may become an urgent problem.

Digital health approaches have therefore attracted increasing interest in oral health policy. The WHO and the International Telecommunication Union have described mobile technologies as tools that can complement oral health initiatives by supporting health promotion, training, detection of oral conditions, epidemiological data collection and monitoring of quality of care [2]. Teledentistry belongs to this broader digital health agenda, but it has a specific role: it can connect patients, dental professionals, auxiliary staff and specialists before, between or after traditional dental visits.

The American Dental Association states that examinations performed using teledentistry can extend the reach of dental professionals and increase access by reducing distance barriers [3]. The American Academy of Pediatric Dentistry also recognizes teledentistry as a modality that can support access to oral healthcare for children, adolescents and individuals with special healthcare needs, while stressing that care delivered remotely should be consistent with evidence-based dentistry and legal requirements [4].

Teledentistry should therefore be evaluated at the point where it changes the patient's pathway. A video call will not place a filling, extract a tooth, complete endodontic therapy or provide periodontal instrumentation. Its real usefulness is earlier assessment, better prioritization and clearer referral. In practice,

this may mean that a parent receives advice after sending photographs from a school screening program, that a rural patient avoids a long trip for a non-urgent concern, or that an older adult in a care home is referred quickly when remote examination suggests a problem requiring direct treatment.

The aim of this narrative review is to analyze the role of teledentistry in improving access to dental care, identify its main clinical and organizational applications, and discuss the barriers, risks and implementation challenges that limit its effective use.

The main research question is: How can teledentistry improve access to dental care, and what barriers limit its effective implementation?

## 2. Materials and Methods

A narrative literature review was conducted using PubMed and Google Scholar. The final literature search was conducted in June 2026, and the reference list was checked again in June 2026. The search covered publications from January 2015 to June 2026, which allowed the review to include recent evidence published after the expansion of digital health and telehealth, while also capturing earlier foundational work on teledentistry. Google Scholar was used mainly to identify policy documents, institutional statements, full-text sources and recently published articles that might not have been easily captured through PubMed alone.

The search focused on teledentistry, dental access, oral health inequalities, remote consultation, screening, triage, remote monitoring, patient satisfaction, digital health and implementation challenges. The following keywords and combinations were used: „teledentistry“, „dental care access“, „oral health inequalities“, „rural dental care“, „remote consultation“, „triage“, „store-and-forward“, „remote patient monitoring“, „children“, „elderly“, „patient satisfaction“, „diagnostic accuracy“, „digital divide“, and „implementation barriers“. An example PubMed query was: „teledentistry“ AND („access to care“ OR „dental care access“ OR screening OR triage OR rural OR underserved OR „diagnostic accuracy“).

Titles and abstracts were first screened for relevance to the review question. Full texts were then reviewed when the publication addressed access to dental care, teledentistry models, clinical applications, underserved populations, diagnostic accuracy, patient or provider experience, cost considerations, legal or ethical issues, or implementation barriers. Twenty core sources were included in the final synthesis. Because

Table 1. Search strategy and selection approach used for the narrative review.

| Review step                  | How it was handled in this paper                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Review design                | Narrative literature review focused on access to dental care, clinical uses of teledentistry and implementation barriers.                                                                                                                                                                                                                                                                                            |
| Databases searched           | PubMed and Google Scholar were used as the main sources of records. Google Scholar was used mainly for policy documents, institutional statements and full-text sources.                                                                                                                                                                                                                                             |
| Example search string        | The PubMed search combined: „teledentistry” AND („access to care” OR „dental care access” OR screening OR triage OR rural OR underserved OR diagnostic accuracy). Additional searches combined teledentistry with patient satisfaction, elderly, children, remote monitoring and digital divide.                                                                                                                     |
| Search period                | English-language publications from January 2015 to June 2026 were considered. The final search and reference check were conducted in June 2026.                                                                                                                                                                                                                                                                      |
| Selection approach           | Titles and abstracts were screened for relevance, followed by full-text assessment of publications directly related to access, screening, triage, diagnostic accuracy, patient experience, costs, legal issues or implementation. Because this was a narrative review and Google Scholar was used iteratively, no PRISMA-style record count is presented. Twenty core sources were retained for the final synthesis. |
| Sources given most attention | Systematic reviews, umbrella reviews, policy documents, diagnostic studies, intervention studies and publications focused on underserved groups were prioritized.                                                                                                                                                                                                                                                    |
| Basis for inclusion          | Papers were included when they addressed teledentistry as a tool for access, remote consultation, screening, patient experience, diagnostic accuracy, implementation or oral health equity.                                                                                                                                                                                                                          |
| Material not used            | General telemedicine papers without dental relevance, purely technical digital dentistry papers, isolated case reports and opinion papers without analytical value were not used as core sources.                                                                                                                                                                                                                    |
| Quality appraisal            | No formal risk-of-bias score was recalculated. Instead, methodological caveats reported by review authors, including heterogeneity, risk of bias and limitations of diagnostic accuracy studies, were incorporated narratively.                                                                                                                                                                                      |
| Synthesis approach           | The selected literature was grouped thematically rather than pooled statistically, which is consistent with the narrative-review design.                                                                                                                                                                                                                                                                             |

the review was narrative rather than systematic, and because Google Scholar was used iteratively to identify institutional and policy material, a formal PRISMA flow diagram was not prepared. This is a limitation of the review and means that the findings should be interpreted as a structured thematic synthesis rather than as a complete estimate of the effect size of tele-dentistry.

The inclusion criteria were publication in English; publication between 2015 and 2026; clear relevance to teledentistry or digital oral health; and sufficient methodological or practical value for answering the research question. Eligible sources included systematic reviews, umbrella reviews, scoping reviews, narrative reviews, randomized or quasi-experimental studies, diagnostic accuracy studies, policy documents and institutional reports.

The exclusion criteria were studies focused on general telemedicine without a dental component; publications limited to CAD/CAM, digital impressions, intraoral scanning or prosthetic workflows without relevance to access to care; purely technical papers without clinical or public health relevance; case reports without broader relevance; duplicate records; and opinion articles without sufficient analytical value.

No formal risk-of-bias score was recalculated across the included literature. Instead, methodological concerns described by the original authors were considered during synthesis. This was particularly important for diagnostic accuracy studies, where image acquisition methods, reference standards, examiner training and population characteristics strongly influence the interpretation of results.

A narrative design was chosen because the aim was not to calculate pooled diagnostic or intervention effects, but to integrate evidence from policy documents, systematic reviews, umbrella reviews, clinical studies, diagnostic accuracy research and implementation-focused literature. The included sources were grouped into six thematic areas: oral health burden and access barriers, definitions and models of teledentistry, impact on access to care, clinical applications and diagnostic potential, benefits for patients and health systems, and limitations and implementation challenges.

### 3. Results and Literature Synthesis

#### 3.1. Oral health burden and access barriers

The access problem that justifies teledentistry is broader than remote geography. WHO data show that oral diseases are highly prevalent worldwide, but the practical ability to receive prevention and treatment depends on income, service availability, insurance coverage, transport, mobility and health literacy [1]. A patient can live close to a city and still have poor dental access if appointments are unaffordable, if waiting times are long, or if disability makes travel difficult.

Teledentistry reduces some barriers while leaving others untouched. It can save a journey, support earlier advice, and bring screening into schools, care homes or rural clinics; it cannot lower the price of a filling, create additional dental workforce or perform an

extraction. A remote consultation counts as improved access only if it changes the next step for the patient - for example, reassurance and prevention, a routine appointment, an urgent referral or follow-up after treatment.

The WHO implementation guide on mobile technologies for oral health is useful because it frames digital tools as complements to existing oral health systems rather than standalone replacements [2]. This approach fits teledentistry. A remote interaction may identify a patient who needs urgent care, provide preventive guidance to someone at low risk, or support follow-up after a procedure. In these situations, technology is valuable because it organizes access and supports decision-making.

#### 3.2. Teledentistry: definition and models of care

Teledentistry is not a single service. The ADA policy distinguishes several modalities, including synchronous real-time communication, asynchronous store-and-forward communication, remote patient monitoring and mobile health [3]. The AAPD uses a similar classification and emphasizes that teledentistry may involve real-time interaction, asynchronous exchange of clinical information, mobile health tools and electronic transmission of health data for monitoring and surveillance [4].

The practical implications of these models differ. In a synchronous consultation, the dentist can see the patient, ask clarifying questions and decide whether swelling or trauma requires urgent attendance. In a

Table 2. Main models of teledentistry and their access-related value.

| Model                          | How it works                                                                   | Main access-related value                                        | Main limitation                                                          |
|--------------------------------|--------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| Synchronous consultation       | Real-time video or audio contact between patient and dental professional.      | Immediate advice, urgency assessment and patient reassurance.    | Limited examination and dependence on real-time availability.            |
| Asynchronous store-and-forward | Images, histories or radiographs are sent for later professional review.       | Efficient screening and specialist consultation across distance. | Depends heavily on image quality and completeness of information.        |
| Remote patient monitoring      | Patient data or images are transmitted after treatment or during ongoing care. | Supports follow-up without unnecessary travel.                   | Requires clear escalation rules when deterioration is detected.          |
| Mobile health                  | Apps, messages and mobile tools support education and prevention.              | Improves engagement, reminders and oral health behavior support. | May exclude patients with low digital literacy or limited device access. |

store-and-forward model, a nurse, hygienist or school staff member can upload standardized photographs for later review, which may be more realistic in population screening. Remote monitoring is useful only when there is an agreed escalation rule, such as when postoperative pain or orthodontic appliance problems require in-person review. Mobile health is least diagnostic, but it can support prevention through reminders and simple oral-hygiene messages.

The FDI evidence-based teledentistry resource highlights benefits for both patients and dental professionals, including faster access to advice, improved communication, specialist consultation, cost reduction and support for oral health education [5]. These benefits are plausible, but they are not automatic. Each model requires a different workflow, different data quality and different rules for referral to face-to-face care.

### 3.3. Teledentistry and access to dental care

Recent reviews support teledentistry as an access tool, but they support different claims. Talla et al. [6] provide

a broad overview of systematic reviews and are useful for mapping access and quality outcomes, although their conclusions depend on the quality of the included reviews. Alavi et al. [7] focus more directly on whether patients actually reach dental care. Reading these two reviews together suggests that the evidence is strongest for access processes - screening, triage, communication and referral - and weaker for claims of full clinical equivalence.

Alavi et al. [7] are especially relevant for this review because they treat access as more than a video consultation. The key question is whether remote contact increases service use, improves patient flow or leads to appropriate in-person care. This shifts attention from the technology itself to the pathway built around it.

Al-Buhaisi et al. [8] and Scheerman et al. [9] add a useful caution. The former highlights broad agreement about early detection, access in remote areas and time or cost savings, whereas the latter stresses heterogeneity in economic and oral-health outcomes. Together, they support a balanced conclusion: teledentistry is convincing as a way to reach patients, but less settled

**Table 3.** Comparative reading of key sources used in the synthesis

| Source                     | Evidence type                        | Focus or scope                                                    | Main contribution                                                                                  | Important limitation for this review                                                  |
|----------------------------|--------------------------------------|-------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Talla et al. [6]           | Overview of systematic reviews       | Access to and quality of oral healthcare.                         | Supports teledentistry as an effective and efficient option in selected contexts.                  | Conclusions depend on the methodological quality of included reviews, which the       |
| Alavi et al. [7]           | Systematic review                    | Access to and use of dental services.                             | Shows that teledentistry can improve access when embedded in care pathways.                        | Heterogeneity and variable outcome measures.                                          |
| Al-Buhaisi et al. [8]      | Umbrella review                      | Oral health outcomes and access to dental care.                   | Supports teledentistry for early detection, access and cost savings.                               | Evidence is strongest for process outcomes and weaker for clinical outcomes.          |
| Scheerman et al. [9]       | Umbrella review                      | Costs and oral-health outcomes.                                   | Provides economic and outcome evidence on teledentistry.                                           | Cost and outcome evidence is limited and difficult to compare across studies.         |
| Kargozar and Jadidfar [10] | Systematic review of in-vivo studies | Caries diagnosis using extraoral photography.                     | Provides diagnostic accuracy estimates for caries detection.                                       | No meta-analysis performed because of study heterogeneity.                            |
| Casas et al. [11]          | Systematic review and meta-analysis  | Teledentistry versus in-person examinations for caries detection. | Provides quantitative diagnostic accuracy estimates.                                               | Sensitivity and specificity vary widely, so results must be interpreted with caution. |
| Azimi et al. [12]          | Cluster randomized controlled trial  | Preventive care and access to oral care.                          | Adds interventional evidence for teledentistry in preventive pathways.                             | Generalizability depends on setting and implementation.                               |
| Nakao and Kotani [13]      | Scoping review                       | Use of teledentistry in rural areas.                              | Supports teledentistry for screening, diagnosis, referral and specialist advice in rural settings. | Scoping review methodology does not allow assessment of effect size.                  |

as a source of long-term cost savings or measurable disease reduction.

The access outcomes should therefore be separated. A program may improve access to advice, access to screening, access to specialist opinion, or access to definitive treatment. Only the last of these changes the patient's clinical endpoint directly. For this reason, studies that report satisfaction or remote contact rates should not be read as equivalent to studies reporting treatment completion or oral-health improvement.

### 3.4. Patient groups that may benefit most

Rural and remote populations are the clearest group because distance affects even basic assessment. Nakao and Kotani [13] describe rural teledentistry used for screening, pathological diagnosis, oral health support and specialist referral. A practical example would be a patient in a remote community sending photographs to a regional dental service before deciding whether a full-day journey to a clinic is necessary. In this setting, the value is not virtual treatment but better targeting of scarce travel and appointment resources.

Children are a second group in which teledentistry has a clear organizational rationale. In a school-based model, photographs or screening data can be collected at school, reviewed remotely and used to identify children who need preventive advice or referrals. The cluster randomized trial by Azimi et al. [12] is important because it moves the discussion beyond feasibility and shows that teledentistry can be embedded in preventive care pathways.

Older adults and people with reduced mobility face another type of barrier. Aquilanti et al. [14] hi-

ghlight the relevance of teledentistry for elderly populations, particularly in domiciliary and community settings. In practical terms, a care-home resident with a sore denture area, suspected caries or postoperative concern may first need a decision about whether transport to a clinic is necessary. Remote assessment can support that decision, provided that a clear route to in-person treatment exists when required.

Patient satisfaction evidence is particularly relevant in rural and remote settings. Emami et al. [15] found that patients often value e-oral health care because it reduced travel time, lost working days and delays in initial care. Satisfaction should not be confused with clinical effectiveness, but it is still important: a service that reduces the practical burden of seeking advice may be more acceptable to patients who otherwise postpone dental care.

### 3.5. Clinical applications and diagnostic potential

Clinically, the safest applications are those where the remote encounter answers a focused question. Estai et al. [16] and Irving et al. [17] describe benefits for remote screening, consultation, treatment planning and mentoring. These findings are most persuasive when the task is bounded: deciding whether a lesion should be referred to, whether a postoperative site looks normal, whether orthodontic monitoring can continue remotely, or whether a child should receive preventive care at school.

Diagnostic accuracy is one of the most debated areas. Gurgel-Juarez et al. [18] reviewed systematic reviews on the accuracy and effectiveness of teleden-

Table 4. Patient groups that may benefit from teledentistry.

| Patient group              | Main access barrier                                                    | Possible teledentistry benefit                                 | Important caution                                                     |
|----------------------------|------------------------------------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------------------------|
| Rural or remote patients   | Distance, shortage of providers and travel costs.                      | Remote screening, triage and referral to appropriate services. | Remote contact must be linked to actual treatment options.            |
| Children                   | Need for early prevention and dependence on parents or school systems. | School-based screening, education and early referral.          | Consent, follow-up and treatment completion must be organized.        |
| Older adults               | Mobility limitations, frailty and dependence on caregivers.            | Domiciliary consultation, monitoring and                       | Digital support from caregivers may be necessary.                     |
| Patients with disabilities | Transport, accessibility and communication barriers.                   | Reduced need for unnecessary travel and earlier advice.        | Services must remain accessible and not replace needed clinical care. |
| Low-income patients        | Delayed care, costs and difficulty taking time off work.               | Earlier low-threshold assessment and targeted referral.        | Digital exclusion and treatment affordability may remain.             |

tistry, while Kargozar and Jadidfar [10] focused on caries detection using extraoral photography methods. Kargozar and Jadidfar included 19 in-vivo studies and reported sensitivity ranging from 48% to 98.3% and specificity from 83% to 100%. However, they did not perform a meta-analysis because of heterogeneity among studies. This caution is important: a teledentistry examination based on standardized photographs taken by trained personnel is not equivalent to an unstructured set of blurred images sent by a patient.

Casas et al. [11] provide a more quantitative estimate for caries detection in a separate systematic review and meta-analysis. They included twelve studies and reported sensitivity ranging from 45.6% to 88.3%, specificity from 55.2% to 98.3%, positive predictive value from 79% to 92%, negative predictive value from 48% to 97%, and overall accuracy from 70% to 96%. The kappa scores ranged from 0.46 to 0.89, and heterogeneity was relatively low, with Higgins's  $I^2$  of 24%. These figures support teledentistry as a useful screening tool for caries detection, but the wide sensitivity range also shows why remote diagnosis should be linked to referral rules and clinical judgement.

These numbers make teledentistry useful for screening but not for every diagnostic decision. Remote caries assessment may be acceptable for identifying children who need referral, especially when photographs are standardized, but it is not a substitute for the complete clinical work-up required before restorative treatment. The same logic applies to swelling, trauma or oral lesions: the remote encounter should sort urgency and direction of care, not pretend to deliver the full examination.

During COVID-19, remote dental consultation became a practical necessity rather than an innovation project. Ghai [19] describes teledentistry as part of the response to disrupted face-to-face care. That experience is useful because it shows both speed and weakness: remote triage can be deployed quickly, but emergency advice becomes a durable service only when linked to documentation, referral and reimbursement.

### 3.6. Benefits for patients and health systems

At the patient level, the immediate benefit is often mundane but important: fewer journeys, less uncertainty and a faster decision about urgency. A parent may not need to take a child out of school for a low-risk query; a rural patient may avoid a long trip when advice and monitoring are sufficient; an older adult may be transported only when a direct examination is genuinely needed. These examples explain why access

gains can occur even when teledentistry does not replace treatment [12,14,15].

At the system level, the main benefit is better sorting of demand. If remote screening separates preventive advice, routine care and urgent treatment, appointments can be reserved for patients who need direct examination or procedures. The goal is not simply fewer visits. In underserved settings, a good screening program may increase the number of appropriate visits by revealing previously unmet need.

There is also an educational benefit. Mobile health and remote communication can reinforce oral hygiene instructions, dietary advice, fluoride-related prevention, orthodontic monitoring or post-treatment instructions. The value of education is often underestimated because it does not look like treatment, yet it may be one of the most scalable applications of teledentistry. In this sense, teledentistry connects clinical dentistry with public health prevention [2,5].

The economic argument should remain modest. Reviews suggest possible time and cost savings, especially through reduced travel and better triage [8,9]. However, the balance changes if software, secure storage, staff training, image capture, reimbursement administration and follow-up coordination are included. A program may save patients money while still requiring investment from clinics or public health agencies.

### 3.7. Limitations, risks, and implementation challenges

The main clinical limitation is the absence of full physical examination. A dentist cannot palpate tissues, test tooth vitality, probe periodontal pockets, assess occlusion fully or perform operative procedures through a screen. For this reason, teledentistry should be designed around decision support and care navigation rather than around the assumption that all dental diagnosis can be virtual.

Image quality is another practical limitation. A photograph taken by a trained dental assistant with a cheek retractor, adequate lighting and a defined sequence of views is very different from a blurred smartphone image sent from a bathroom mirror. The diagnostic accuracy literature should therefore be interpreted in relation to how images were obtained, who took them, and whether the remote examiner had enough clinical context [10,11,18].

Digital exclusion is not an abstract risk. A patient may live in a rural area, have the greatest travel burden and still be unable to benefit from teledentistry because of weak internet, no smartphone, low digital literacy or lack of privacy at home. Older adults may

depend on caregivers, and low-income families may share one device. Equity-oriented services therefore need assisted models, such as school programs, community hubs or support from dental auxiliaries.

Provider readiness is another barrier. Lin et al. [20] found high awareness and positive attitude toward teledentistry among dental practitioners during the COVID-19 pandemic, but knowledge and actual practice were lower. This gap between positive attitudes and routine use is important. It suggests that implementation depends not only on acceptance, but also on training, reimbursement, legal clarity, integration with records and confidence in remote decision-making.

Legal and ethical issues include privacy, informed consent, documentation, licensure, liability and quality standards. The AAPD emphasizes security measures, privacy protection and compliance with applicable regulations [4]. These requirements may appear administrative, but they are essential for trust. A remote system that is clinically useful but legally unclear may not be adopted by cautious practitioners or institutions.

The most serious implementation failure would be to count a remote contact as access even when no care follows. A virtual consultation should end with a defined outcome: preventive advice, monitoring, referral, urgent appointment, specialist opinion or documented reassurance. Without that next step, teledentistry may improve communication statistics while leaving disease untreated.

## 4. Discussion

The evidence supports teledentistry, but mainly for a precise purpose: moving patients from unassessed need toward an appropriate next step. Its value lies earlier in the care pathway than conventional dentistry. It helps identify who needs prevention, who needs monitoring and who need a chairside visit; it does not remove the biological need for examination and operative care.

In-person dentistry remains stronger when diagnosis and treatment must happen together. A dentist can examine, radiograph, anesthetize, restore, extract or refer during the same visit. Teledentistry is stronger when the main problem is reach patients who would otherwise wait, travel unnecessarily or not seek care at all can receive an initial assessment. This difference explains why hybrid models are more credible than purely virtual ones.

The comparison between reviews is informative. Talla et al. [6] and Alavi et al. [7] both support tele-

dentistry as a means of improving access, while Al-Buhaisi et al. [8] and Scheerman et al. [9] show that cost, outcomes and quality evidence remain variable. The overall message is that teledentistry is most defensible when it is presented as an access pathway with measurable outcomes, not as a universally superior method of care.

Access to contact and access to treatment should be kept separate. A remote message, photograph or video call may represent contact, but treatment access requires a complete next step: advice that is understood, referral that is attended, monitoring that is acted upon, or operative care that is delivered. This distinction is particularly important for evaluating success; a service with many online consultations may still fail if referral completion remains low.

A practical hybrid pathway might look as follows: a school nurse captures standardized intraoral photographs, a dentist reviews them asynchronously, children with suspected caries receive referral letters and preventive advice, and only those needing treatment attend the clinic. A similar pathway can be imagined for a care home, where remote assessment helps distinguish denture irritation that can be managed conservatively from lesions or pain that require urgent examination. These examples show why the remote step should be linked to a physical pathway.

Teledentistry may also reshape the measurement of access. Access should not be measured only by whether a patient can speak to a dentist remotely. A more meaningful measure would include whether the patient received an appropriate preliminary assessment, whether urgent cases were prioritized, whether preventive advice was understood, whether referral was completed, whether treatment was delivered, and whether the patient avoided unnecessary travel or delay. This broader definition prevents overestimating the value of remote contact alone.

Equity is the main policy test. A digital service designed for confident smartphone users will mainly help patients who already navigate health systems relatively well. To reach the groups described in access-focused reviews, implementation may need assisted image capture, community access points, caregiver involvement, multilingual instructions and options for patients who cannot use video calls. Otherwise, teledentistry may narrow geographic distance while widening digital distance.

The clinical limitations of remote diagnosis also require careful communication. A remote assessment may be sufficient to decide that a child needs caries referral, that a postoperative wound looks satisfactory, or that a swelling requires urgent care. It may be in-

sufficient to determine the full treatment plan, vitality status, periodontal diagnosis or need for operative intervention. Patients should understand that a teledentistry encounter may be an entry point rather than the final answer.

Long-term implementation is less about buying a platform than about redesigning workflow. Clinics need to decide who collects images, who reviews them, where records are stored, how consent is documented, how urgent cases are escalated and how remote encounters are paid for. The COVID-19 experience showed that remote triage can be launched quickly [19], but the post-pandemic question is whether it can improve treatment completion, waiting times and prevention outside an emergency context.

This review has several limitations. First, it was designed as a narrative review and did not use a registered protocol, duplicate screening, a formal PRISMA flow diagram or quantitative meta-analysis. Second, the literature included different types of sources, including policy documents, reviews, diagnostic studies and intervention studies, which limit direct comparison. Third, the search was limited to English-language publications from 2015 to 2026, so older or non-English studies may have been missed. Fourth, Google Scholar searches are less reproducible than database searches and may introduce selection bias. Fifth, many studies assess feasibility, satisfaction or diagnostic accuracy rather than long-term treatment completion and oral health improvement. Therefore, the conclusions should be interpreted as a structured synthesis of current themes rather than as a definitive estimate of effect size.

Despite these limitations, literature points to a consistent condition for success: teledentistry must shorten the path from need to appropriate care. When it produces only a virtual conversation, its benefit is limited. When it identifies unmet need, directs patients to the right service and supports follow-up, it becomes a meaningful access tool. Future studies should therefore report referral completion, treatment delivery, patient-reported experience, costs and oral-health outcomes, not only feasibility or satisfaction.

## 5. Conclusions

Teledentistry is best understood as an access-enhancing component of dental care, especially for patients facing distance, mobility, socioeconomic or organizational barriers. Its main value is not virtual treatment itself, but earlier screening, triage, education, monitoring and referral. A school screening program, a rural store-and-forward pathway or remote follow-up for an older adult can improve access when the remote encounter leads to a clear clinical next step.

Hybrid care is the most defensible implementation model. Remote assessment should help classify patients into prevention, monitoring, routine referral, urgent care or direct in-person treatment. In this way, teledentistry can make chairside appointments more targeted without pretending that the screen can replace the dental chair.

The main limitations include variable diagnostic accuracy, dependence on image quality, inability to perform physical examination, privacy requirements,

**Table 5.** Practice-oriented recommendations for implementing teledentistry as an access tool.

| Practical message                      | Why it matters                                                                                                                    | Who it mainly concerns                   | Key sources |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------------|
| Use teledentistry as a gateway to care | Remote contact should lead to advice, monitoring, referral or treatment, not end as an isolated conversation.                     | Dental service organizers and clinicians | [3,6,7]     |
| Match the model to the problem         | Video, store-and-forward, monitoring and mobile health solve different access problems.                                           | Clinics and digital health planners      | [3-5]       |
| Prioritize underserved populations     | Rural patients, children, older adults and low-income groups may benefit most if support systems exist.                           | Public health teams and policymakers     | [12-15]     |
| Protect diagnostic safety              | Remote diagnosis depends on image quality, training and clear criteria for in-person examination.                                 | Dentists and dental auxiliaries          | [10,11,18]  |
| Address digital exclusion              | Online care can reduce distance barriers while creating barriers for patients without technology or digital literacy.             | Policymakers and community providers     | [2,13,15]   |
| Evaluate real outcomes                 | The success of teledentistry should be measured by access, referral completion, treatment, satisfaction and oral health outcomes. | Researchers and healthcare organizations | [6,8,9]     |

reimbursement uncertainty, legal responsibilities and the digital divide. These limitations do not make teledentistry unsuitable, but they define the conditions under which it should be used.

Future implementation should focus on equity, clinical safety, professional training, data protection, clear referral protocols and evaluation of real outcomes such as waiting times, treatment completion, patient satisfaction and oral health improvement. Teledentistry should therefore be developed as a structured access-enhancing component of dental care, not as a low-cost substitute for full dental services.

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