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The awareness and perception of teledentistry among Malaysian dental professionals in universities and private practices

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Abstract

The unexpected outbreak of COVID-19 has caused the temporary collapse and suspension of dental practices around the world. With the emergence of teledentistry, this incident unwittingly pushes for a revolutionary modification in the usual provision of dental care. The purpose of the study was to determine the level of awareness and perception of teledentistry among university and private-sector dental practitioners. This descriptive cross-sectional study used a pre-validated 27-item questionnaire with a 5-point Likert scale to assess the perceptions of university-based and private dental practitioners regarding teledentistry in four domains: the usefulness of teledentistry for patients, its benefits to dental practices, the potential improvements it can bring to dental practices, and concerns about the adverse effects of teledentistry. 150 dental practitioners participated in the research (30% overall response rate). More than 70% of respondents agreed that teledentistry can benefit both dentists and patients by improving communication and treatment monitoring. However, 45–80% of dentists had doubts regarding the technology's dependability, diagnostic accuracy, and patient data privacy. In conclusion, the results of this study suggest that Malaysian dentists are well-informed and prepared to implement teledentistry in their practices. However, additional research is necessary to determine the viability of commercial usage of teledentistry, both in Malaysia and internationally.

Keywords: *awareness, perceptions, private practice, teledentistry, university*

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Introduction

The sudden surge of COVID-19 has led to suspended dental practices around the globe, and this has forced a novel change to the traditional medium in oral healthcare services, seeking the best possible way to resume the needed care while preventing the spread of infection. Most dental procedures create aerosols that are full of saliva and blood. These are the biggest risks for airborne infections in dentistry because they can stay in the air longer and could get into a person's lungs.

Telemedicine is the process of giving diagnoses and treatment suggestions over long distances using videoconferencing (Aquilanti *et al.*, 2020; Jampani *et al.*, 2011). In the 1980s, teledentistry was first introduced as a type of telemedicine (Hung *et al.*, 2022; Jampani *et al.*, 2011). Since its introduction, teledentistry has managed more patients remotely. Jampani *et al.* (2011) saw teledentistry as a mode to help people in rural areas who do not have easy

access to specialists, which can improve communication between dentists and increase the number of consultations that can be done by sharing images, x-rays, and clinical data. Teledentistry became popular before the pandemic to triage patients and provide long-distance care (Hung *et al.*, 2022; Wu *et al.*, 2020). Although the benefits of the technology are well recognised, its usage in dentistry has been slow and has taken longer than in other fields to become a common practice tool.

Though not novel, the use of telemedicine in the medical and dental fields has gained popularity as a means of improving public access to healthcare. This is especially true when more research is done in many parts of the world to gauge the knowledge, awareness, perception, attitude, and practice of tele-technology, and many report that plenty of benefits can be gained from it, especially in dentistry. In Malaysia, however, the incorporation of telemedicine into the current healthcare system has faced many obstacles, with many medical professionals reporting high costs, privacy concerns, and a lack of technical knowledge as the main factors restricting its use (Oh *et al.*, 2006).

Surveys based on respondents' knowledge, attitude, awareness, and perception provide a deeper insight into the population's perspective on the topic or issue at hand. The purpose of these surveys is to uncover knowledge gaps and behavioural patterns among sociodemographic subgroups in order to conduct effective public health interventions (Almohammed *et al.*, 2021; Khokhar *et al*., 2022). These surveys can quantify the breadth of a known problem, validate or refute a hypothesis, and provide new perspectives on the reality of a condition. In addition, they can be used to set a baseline for future evaluations and to monitor the effectiveness of health education efforts in changing health-related behaviours. Aside from that, perception studies might offer an intervention strategy that reflects specific local circumstances and the cultural variables that influence them, aiding in the planning of activities that are suited to the group in question.

Although a handful of studies can be found on the topic of telemedicine and teledentistry, the actual numbers of these studies done in Malaysia are still scarce. Even the most convincing published evidence on the efficacy of teledentistry to date was mainly provided by studies on paediatric dentistry, orthodontics, and oral medicine (Estai *et al.*, 2016, 2018). Therefore, this study is designed to assess the awareness and perception of teledentistry among Malaysian private and university-based dental practitioners and the influence of sociodemographic background on the practice of teledentistry in their daily routine. Khokhar *et al.* (2022) quoted the findings from a PHD thesis at the University of Malaya (Wan Abdul Ghani, 2019) that evaluated the feasibility of teledentistry as a strategy for early detection of diseases, specifically oral cancer. They concluded that the sensitivity and specificity of teledentistry in detecting lesions were high. In addition, this technology was able to differentiate between malignant and non-malignant lesions (Wan Abdul Ghani, 2019).

Materials and Methods

Questionnaire preparation

This was a cross-sectional survey of general dental practitioners and dental specialists working in local universities and private practices. Ethical approval was obtained from the International Islamic University Malaysia Research Ethics Committee (IREC) (ID: IREC 2021-325) before commencing the study. Permission was also granted via email from the authors of a similar study (Al-Khalifa & AlSheikh, 2020) to use their pre-validated questionnaire in this study and to modify the survey to fit our population. The questionnaire has two sections, with the first section capturing the subjects' demographic information, professional background, and preferred communication channels. The second section of the questionnaire consists of a total of 27 five-point Likert scale questions. The questions were divided into four categories: practitioners' data security concerns, the capability of teledentistry to improve dental services in Malaysia, the

benefits of teledentistry for a dental practice, and the impact of teledentistry on patients.

A pilot study was conducted with randomly selected lecturers from the Kulliyyah of Dentistry at the International Islamic University of Malaysia to revalidate the modified questionnaires. After receiving the properly completed survey and constructive feedback from the subjects, additional modifications were made to the questions.

Questionnaire distribution

The Malaysian Dental Council (MDC) database, local universities' dental teaching staff databases, and the alumni association of Kulliyyah of Dentistry were accessed to gather and compile a list of 500 active Malaysian dental practitioners and specialists based in local universities and private settings. All collected data was handled with care to ensure confidentiality and anonymity. To ensure that the sample represents the true generalisation of the Malaysian dental practitioner workforce, the sample was stratified based on demographic characteristics, professional qualifications, and gender. The questionnaire was then emailed to each subject, along with a brief explanation of the study's purpose and an informed consent form for participation in the study. Subjects who have not responded within the stipulated time frame will receive a three-weekly email reminder.

Data collection and statistical analysis

The completed questionnaires were downloaded from Google Forms, and the data was manually entered into Microsoft Excel (Office 365, Microsoft Corp., USA). These data were then transferred for statistical analysis to IBM® SPSS® Statistics Version 28 (IBM Corporation, Armonk, USA).

Result and Discussion

Between January and November 2020, 500 surveys were emailed to dental practitioners, and 150 respondents were recorded, indicating a 30% response rate.

Most of the respondents were in the range of 20–44 years old cumulatively. More than half of the respondents were female (67.3%) and specialists in their practice (61.3%). Only a small number of the respondents were from rural or remote areas of Malaysia (6.7%). Many of the respondents served in academic settings (76.7%), which were followed by private practitioners (23.3%) (Table 1).

The most popular methods of communication chosen by the respondents were as follows: in-person (27.5%), phone (19.4%), and email (18.6%). The results of the survey showed that communication through letters or faxes and the adoption of a forum were the least preferred methods of communication among the respondents. Figure 1 displays the results of the most preferred methods of communication among the subjects. It was noted that the respondents were free to choose more than one answer, which led to a wide range of answers.

Domain of teledentistry: Teledentistry confidentiality and security issues

When data is exchanged over the internet, the possibility of forged digital data raises concerns about patient confidentiality, raises doubts about obtaining patient consent, causes software and hardware compatibility issues, and affects the reliability of the equipment used. These issues were supported by the findings of this study, where over 80% of respondents expressed concern about the possibility of digital forgeries. In addition, concerns regarding patient confidentiality were also high, as over 85% of respondents expressed their doubts about the technology's ability to protect every patient's personal data.

Table 1. Demographic and professional background of respondents.

Characteristics	Frequency	(%)
Age (years)		
20-34	57	38.0
35-44	60	40.0
45-54	27	18.0
55-64	6	4.0
Gender		
Male	49	32.7
Female	101	67.3
Qualification		
Consultants/Specialists	92	61.3
General dental practitioner	42	28.0
Resident/Graduate research	9	6.0
Others	7	4.7
Work experience		
0-5 years	35	23.3
6-10 years	37	24.7
11-15 years	39	26.0
>16 years	39	26.0
Location of the main job		
City/town/urban area	140	93.3
Remote/rural area	10	6.7
Work setting of your current main job		
Private	35	23.3
Academic/universities	115	76.7

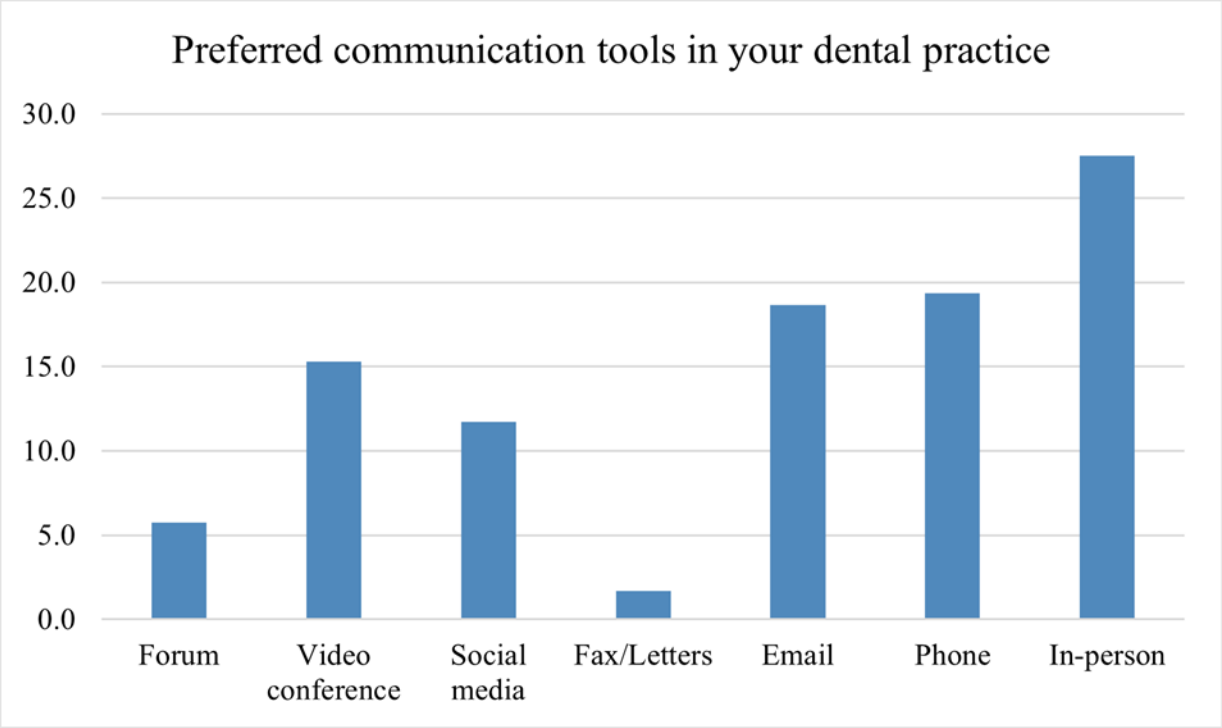

Figure 1. Preferred communication tools among dental practitioners (%).

The issues of unreliable tele-dental equipment and incompatible software and hardware accounted for approximately 78% of respondents' severe reservations, whereas a little more than 80% of participants expressed their concern about obtaining patient consent for teleconsultations, both of which showed a relatively high degree of concern (Table 2).

Kruskal-Wallis analysis has highlighted the statistical importance of the participants' age concerning confidentiality and security issues ($p = 0.028$) (Table 6). On the other hand, there was no statistical significance between the participants' gender, qualification, work experience (in years), location of the dental practice, and work setting.

Table 2. Teledentistry confidentiality and security issues.

Questions	VC (%)	LC (%)	NA (%)	NP (%)	NC (%)
Gaining patient consent for teleconsultation	54.0	28.7	10.0	3.3	4.0
Confidentiality when data are sent online	68.7	16.7	8.0	3.3	3.3
Potential for digital forgery	69.3	18.0	9.3	1.3	2.0
Incompatible hardware and software	50.0	28.0	13.3	6.0	2.7
Reliability of tele-dental equipment	46.0	32.0	13.3	4.7	4.0

VC=very concerned; LC=less concerned; NA=not feeling either way; NP=not particularly concerned; NC=not concerned at all

Domain of teledentistry: Teledentistry benefits in practice improvement.

Most participants believed that teledentistry would enhance dental practice in several ways. More than 65% of respondents concurred that teledentistry will shorten waiting lists and wait times at dental offices and create a safer working environment for practitioners and patients, which was crucial during the COVID-19 pandemic outbreak. Furthermore, 74% of respondents agreed that teledentistry will benefit dental practices by improving communication and referral among peers. However, only a very small portion of the participants (25%) believed that patients could receive an accurate diagnosis through teleconsultation, and the remaining respondents were either neutral or had serious doubts about the validity of the diagnosis when it was made using teledentistry in a clinical setting (Table 3). Referring to the Kruskal-Wallis test done, it shows that there is no statistical significance between practitioners' sociodemographic background and their perceptions of tele-dental benefits in practice improvement (Table 6).

Table 3. Practitioners' perceptions of teledentistry's benefits in practice improvement.

Questions	AS (%)	A (%)	N (%)	D (%)	DS (%)
Teledentistry would provide accurate diagnosis in a clinical setting	6.7	18.7	30.0	30.0	14.7
Teledentistry would help shorten the waiting list	24.7	44.7	19.3	8.0	3.3
Teledentistry would help to enhance oral care advice or post-operative care to the patients remotely	44.7	40.7	10.0	2.0	2.7
Teledentistry would provide a safe atmosphere for practising dentistry	32.0	34.7	28.0	3.3	2.0
Teledentistry would make patient referral more efficient	26.0	48.7	20.0	2.7	2.7

AS=agree strongly; A=agree; N=neutral; D=disagree; DS=disagree strongly

Domain of teledentistry: Usefulness of teledentistry in dental practice.

According to most respondents, teledentistry would benefit dental practice by improving ongoing education and clinical training and making it more time-efficient than a traditional referral method. More than half of the total respondents believed that the adoption of teledentistry would significantly lower dental practice costs, and about 20% of the respondents think that the cost of setting up the necessary infrastructure and equipment is high; however, this could be a topic of debate. On the other hand, only 29% of the respondents believed that teledentistry would shorten the time spent treating the patient. This is debatable, however, in situations where additional appointments must be made to support the diagnosis or treatment monitoring, such as dental photos or radiographs (Table 4). In addition to that, data analysis shows that there is no statistical significance between practitioners' sociodemographic backgrounds and their perceptions of the usefulness of teledentistry for dental practice (Table 6).

Table 4. Practitioners' perception of the usefulness of the teledentistry for dental practice.

Questions	AS (%)	A (%)	N (%)	D (%)	DS (%)
Teledentistry would enhance clinical training and continuing education	31.3	40.0	20.0	6.7	2.0
Teledentistry would reduce the cost of dental practices	22.0	29.3	38.0	8.7	2.0
Teledentistry would increase treatment time spent with the patient	10.7	22.0	38.7	20.0	8.7
Teledentistry would be too expensive to set up	5.3	16.7	46.0	24.0	8.0
Teledentistry would provide adequate diagnostic information	7.3	16.0	30.7	36.7	9.3

Domain of teledentistry: Usefulness of teledentistry for patients

Approximately 75% of respondents concurred that teledentistry is especially beneficial for people who reside in remote or rural areas. Additionally, 82% of respondents thought that this technology was useful in terms of remote delivery of oral health advice and post-operative monitoring to their patients. Although only 56% of respondents agreed on the improvement of doctor-patient communication, with all these advantages, the majority (more than 70%) agreed that using this technology in healthcare should be covered by insurance policies. The remaining questions examined the cost-effectiveness of teledentistry for patients, and more than 60% of respondents agreed that using teledentistry for oral health care would allow patients to save money (Table 5). There is no statistical significance between practitioners' sociodemographic background and their perceptions of the usefulness of teledentistry for patients, as shown in Table 6.

Table 5. Practitioners' perceptions on the usefulness of teledentistry for patients.

Questions	AS (%)	A (%)	N (%)	D (%)	DS (%)
Teledentistry would save money for patients	17.3	44.7	30.7	5.3	2.0
Teledentistry would improve communication with patients	17.3	39.3	32.0	9.3	2.0
Teledentistry would be helpful in monitoring a patient's condition	32.0	50.0	11.3	5.3	1.3
Teledentistry would be useful for patients in remote areas	38.7	34.7	18.0	6.0	2.7
Teledentistry would be covered by dental insurance plans	33.3	38.0	26.0	0.7	2.0

AS=agree strongly; A=agree; N=neutral; D=disagree; DS=disagree strongly

Preferred dental specialty for teledentistry application.

The majority of the respondents (90%) agreed that community dentistry and dental hygiene specialties are perfect for the application of teledentistry, followed by oral medicine (65%). Other specialties, such as prosthodontics, restorative dentistry, orthodontics, periodontics, paediatrics, and oral radiology, have an average of 40% agreement among participants. Oral surgery and endodontics are the least preferred specialties for teledentistry. About 30% of respondents agreed with this statement.

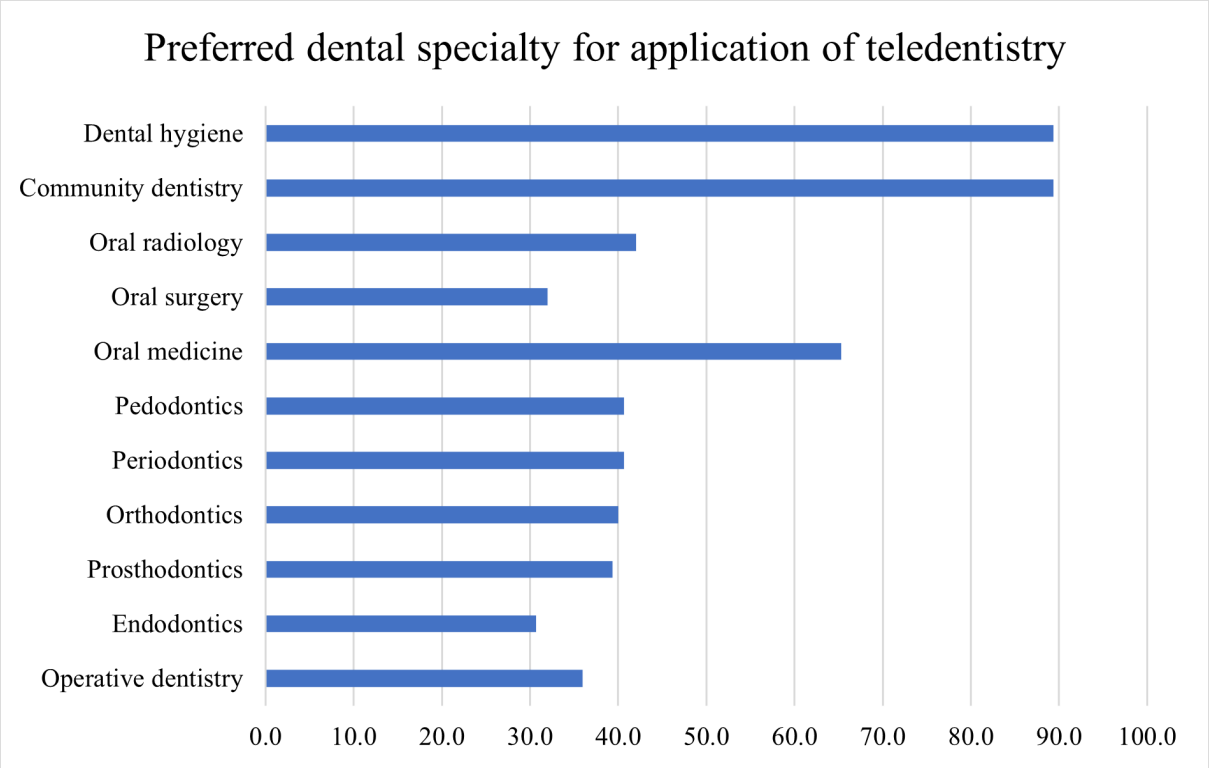

Figure 2. Preferred dental specialty for application of teledentistry.

Statistical significance between the demographic variables of the respondents with four domains of teledentistry

The Kruskal-Wallis test only shows the statistical importance of the participants' age with questions regarding confidentiality and security issues ($p = 0.028$) (Table 6). On the other hand, there was no statistical significance between the participants' gender, qualification, work experience (in years), location of the dental practice, and work setting. Meanwhile, the other three domains of teledentistry have shown no significant association with participants' demographic backgrounds.

Table 6. Statistical significance between the demographic variables of the respondents with the four domains of teledentistry.

Variable	Data security and patient consent (*p*-value)	The capability of teledentistry to improve practice (*p*-value)	The usefulness of teledentistry for dental practice (*p*-value)	The usefulness of teledentistry for patients (p-value)
Age	0.028*	0.399	0.885	0.120
Gender	0.342	0.868	0.408	0.474
Qualification	0.446	0.855	0.971	0.784
Work experience (in years)	0.117	0.481	0.894	0.708
Location of current main job	0.663	0.843	0.932	0.572
Work setting of your main job	0.053	0.294	0.641	0.120

*Significant *p*-value

Discussion

A recent study of a similar design (Khokhar *et al*., 2022) was published while the current researchers were still collecting data, providing a good comparison of the results. The study was done on Malaysian dentists, including those who worked for the government, and used the same questionnaire that had already been validated in a study by Al-Khalifa & Al Sheikh (2020). As far as the literature search goes, it was considered the first study that was done on Malaysian dental practitioners, and therefore the findings from the previous studies were compared to see if there was any difference in terms of the awareness and perception of the similar samples on teledentistry during the peak period of the COVID-19 pandemic and the post-pandemic or endemic period.

One of the ways to prevent the unnecessary contact of patients with asymptomatic carriers of COVID-19, including healthcare workers, is by limiting the movement of patients in the clinic, which can be achieved using remote healthcare delivery. Through the application of teleconsultations and virtual clinics during the pandemic period, overcrowding of dental clinics will be greatly minimised, and it will also reduce unnecessary visits, which increase the risk of COVID-19 transmission and prevent the downfall of healthcare systems. This improvement is crucial when routine dental care has been largely discontinued during the pandemic, either by the respective regulating medical or dental bodies or by practitioners themselves (Coulthard, 2020; Khokhar *et al*., 2022; Sabino-Silva *et al*., 2020; Wadia, 2020).

One of the biggest advantages of teledentistry is the convenience it offers dental practices overall. More than 78% of dental practitioners in this study believed that the use of this technology is beneficial not only to the patients but also to the dental practitioners in the long run, and this result was in agreement with the result from the previous study (Khokhar *et al*., 2022), where they also reported that the majority of practitioners (70%) thought that teledentistry would benefit the patients. This is particularly important where, in

many rural areas, there may be limited access to dental services due to a shortage of dentists. Teledentistry can help address this issue by providing remote access to dental care and enabling patients to receive virtual consultations with dentists, even if they are located far from dental clinics. This can lead to earlier detection and treatment of oral health problems, reducing the risk of more serious and expensive problems in the future.

Teledentistry has the potential to greatly impact the way dental care is delivered, especially for people with disabilities or mobility issues who may face difficulties travelling to a dental clinic. Teledentistry can also be beneficial for people who have difficulty taking time off from work or school for appointments, as virtual consultations can be scheduled outside of traditional business hours. This can help increase access to care for people who may have previously been unable to receive the dental care they need. Moreover, teledentistry can also help increase patient engagement and education by providing real-time access to oral health information and resources. For instance, patients can use telecommunication technology to receive educational materials, such as videos and presentations, which can help them have a better understanding of their oral health and the treatments they are receiving. This can improve patient satisfaction and increase patient adherence to treatment plans, leading to better outcomes and improved oral health.

Another important aspect of teledentistry is the ability to leverage technology to improve the efficiency of dental services. For example, electronic health records (EHRs) can be used to store patient information and facilitate the sharing of information among dental professionals. This can help reduce the risk of errors, improve the accuracy of diagnosis, and streamline the delivery of care. In addition, teledentistry helps automate routine tasks, such as appointment scheduling, which can free up time for dental professionals to focus on more complex and time-sensitive tasks. By utilising remote technologies, dentists can also access information and resources that may not be available in their local area. Teledentistry is also cost-effective, as it eliminates the need for physical office space, reduces the cost of supplies, and allows for greater patient volume. This can result in lower costs for both patients and dental practices. They can also consult with specialists and other dental professionals, allowing for a higher level of collaboration and improving patient outcomes.

Despite the many benefits of teledentistry, some challenges must be addressed to ensure its success. One challenge is ensuring the privacy and security of patient information, as telecommunication technology can expose sensitive information to unauthorised individuals. This is evident when the majority of participants expressed significant worries about hardware being incompatible, digital forgery (90%), digital security (85%), and equipment dependability (80%). A study done in Saudi Arabia also expressed the same concern, where 50.9% of the participants agreed that dentists are afraid of making inaccurate diagnoses through teledentistry due to several reasons such as lack of training and expertise, which account for 24.7% of them; poor internet access for 37.5%; hardware shortage for 25.5%; and high costs for 12.3% of respondents (Khan *et al*., 2022). Thus, it is very important to use compatible hardware and software as well as strict security protocols to make sure that the integration of technological parts and the encryption of their databases are completely safe. In addition, the right infrastructure and design will also significantly reduce expenses in the long term, as these will prevent or minimise technical faults in digital operations (Hartvigsen *et al.*, 2007; Palmer *et al.*, 2005). Another challenge is ensuring the quality of care delivered through teledentistry. While virtual consultations can be a valuable tool for providing dental care, they may not always be as effective as in-person consultations. This requires dental professionals to be properly trained and certified in the use of telecommunication technology, as well as the development of quality control measures to ensure the delivery of high-quality care. Lack of standardisation in telehealth regulations can

lead to varying levels of quality and patient safety. To address these challenges, it will be important for governments, dental organisations, and healthcare providers to collaborate on developing and implementing standards for telehealth and establish clear regulatory and legal frameworks to ensure the protection of patients and the provision of proper dental care. As Khan *et al.* (2022) stated in their study in Saudi Arabia, where 400 of their respondents were ready to support government initiatives, patients could receive consultation via teledentistry (Khan *et al*., 2022).

With regards to the Kruskal-Wallis test performed earlier in this study, there is no significant relationship between patients' demographics and all four domains of teledentistry, probably owing to the smaller number of participants. However, a recently published systematic review study in Malaysia has agreed that work experience, postgraduate qualification, and internet access were found to be significantly important in the implementation of teledentistry (Lin *et al*., 2022). It was also reported that studies done in India and Pakistan have proven that junior dental practitioners and those with a postgraduate degree showed a better level of knowledge of teledentistry (Ramesh *et al*., 2013; Zahra *et al.*, 2020). This could be because teledentistry is a relatively new concept, and senior dental practitioners may not have received sufficient exposure to and training in the innovative technology.

With regards to which dental specialty could benefit the most from teledentistry, 90% of respondents chose community dentistry, dental hygiene, or dental public health as the preferred specialty, followed by oral medicine (65%). Only an average of 40% chose the remaining specialties, including prosthodontics, restorative dentistry, orthodontics, periodontics, paediatrics, and oral radiology. Oral surgery and endodontics were the least chosen specialties, indicating that these fields benefit the least from teledentistry. This represents a very narrow perspective for practitioners, with the usual notion of teledentistry deployment restricted only to screening, diagnosis, or patient education. From late 2020 to early 2021, many dental practitioners worldwide have improvised their practices, focusing on tele-education and tele-consultation, primarily to deal with the COVID-19 epidemic (Almohammed *et al*., 2021; Aquilanti *et al*., 2020; Carvalho, 2020; Khan *et al.*, 2022; Mandall *et al*., 2005; Wang *et al*., 2020; Zahra *et al.*, 2020).

However, recent improvements have shown that teledentistry has the potential for successful treatment, postoperative care, and effective treatment planning when used effectively. This is also proven by a study done in Saudi Arabia, where 429 of the respondents were seeing patients through teledentistry, with 208 of them using it for teleconsultation, 84 for telediagnosis, 70 for teletriage, and 67 for telemonitoring. Although it is relatively small in number, the study has proven the capability of tele-technology to deliver proper and better dental care (Khan *et al*., 2022). Another study from Italy also proved the implementation of teledentistry is possible, especially in telediagnosis, where a male patient has been diagnosed with sialolithiasis through the analysis of medical history and patient photos (Giudice *et al.*, 2020). He was then followed up by his dentist through the sharing of photos, and the patient's full recovery after 2 weeks was observed. This study has proven that when teledentistry is used for postoperative care and effective treatment planning, it ensures successful treatment and a better prognosis for patients.

As shown in this study, oral surgery is the least preferred dental specialty for teledentistry to be implemented. However, the study by Giudice *et al.* (2020) has proven otherwise, where the patients can benefit, not in terms of dental procedures but as a method to monitor post-operative conditions. Through photo collection and teleconsultation, patients can report to their respective dentists regarding pain improvement and functional recovery without the need to return to the clinic. The benefits are applied to both patients and the dentist, who can monitor the surgical site, the patient's oral hygiene, and the

improvement of oral function. Consequently, targeted teledentistry campaigns are required to broaden practitioners' perceptions by presenting the full scope of teledentistry and its applications. In such cases, an excellent foundation is laid for the usage and advancement of teledentistry in dental practices to assure the continuity of adequate dental care for patients while also ensuring pandemic safety.

The authors agree with Khokhar *et al.* (2022) regarding the lengthy items in the pre-validated questionnaires, which could be one of the factors that hampered the number of responses with the targeted samples. Instead, a more concise and specific questionnaire may yield a better response rate. The comparatively low response rate can also be attributed to the fact that the data for this study was collected just after the pandemic was over, with many countries having declared COVID-19 endemic and dental services returning to their normal operations worldwide (September 2022 to November 2022). Another weakness of the study was the use of a 5-point Likert scale, as several studies have found that respondents tend to choose the middle value as a safe, moderate choice rather than any value on either end of the spectrum. This may have an impact on the respondents' real awareness and perception levels (Mircioiu & Atkinson, 2017; Norman, 2010). A questionnaire-based study performed by Khan *et al. (*2021) has only used the 'yes' or 'no' answer in most questions regarding knowledge and attitude towards teledentistry implementation. This has proven to be more effective, as the result has mirrored a better understanding for the readers regarding the knowledge and attitude of dental practitioners regarding teledentistry.

The findings of this study revealed that Malaysian dental professionals have a favourable impression and attitude towards teledentistry. However, additional research on the efficacy of patient screening, data collection, diagnosis, and referral via teledentistry is required. Similarly, to examine the viability of teledentistry deployment, a study on the preparedness and willingness of Malaysian dental patients should be conducted. As technology continues to advance and telehealth becomes more widely adopted, we will likely see a growing number of dentists and patients embrace telemedicine and take advantage of its many benefits.

Comparing this study with a similar study done by Khokhar *et al.* (2022), the difference is that this study comprises both descriptive and statistical analysis, whereas the other study focuses solely on descriptive analysis. With a higher number of respondents (310), more than 50% of their respondents were aged 25–34 with work experience of 0–5 years. This study has 150 respondents, of whom more than half are specialists, and the age distribution among the respondents is even. The results are similar to the study, where it shows dental practitioners in Malaysia are ready to implement teledentistry in their practice; however, professional training and security issues are the main concerns among them.

Conclusion

The current study revealed that, in general, Malaysian dental professionals have a high level of awareness and a positive perception of teledentistry. They also believe that this technology would benefit both dental professionals and patients because of its convenience, cost-effectiveness, and potential to raise the standard of oral care. While expressing a few concerns, most respondents supported the concept of teledentistry and demonstrated a high comprehension of the limitations of the technology, particularly in the aspects of ethics, data privacy, and technical constraints. For the technology to be fully commercialised and incorporated into the standard of oral care in Malaysia, proper guidelines and professional training should be established, and this would require the collaboration of the key relevant parties in Malaysia's healthcare sectors.

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Conflict of Interest

The authors declare that there are no conflicts of interest regarding the publication of this article. We affirm that this research was conducted in an unbiased manner, without any financial or personal relationships that could influence the objectivity or integrity of the findings presented. There are no financial or other associations that might pose a conflict of interest with regard to the content of this study.

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