

# KNOWLEDGE, PRACTICE, ATTITUDE, AND BARRIERS RELATED TO THE USE OF TELEHEALTH IN COVID-19 PANDEMIC

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## ABSTRACT

**INTRODUCTION:** Recommendations to restrict social activities to avoid the transmission of COVID-19 virus results innovative ways to provide services to patients. Telehealth is an opportunity for patients to stay connected with dentists or doctors.

**OBJECTIVES:** The purpose of this study was to assess the respondents' knowledge, practice, attitude, and barriers related to telehealth.

**MATERIAL AND METHODS:** Cross-sectional studies with snowball sampling were conducted among Indonesian society, with a criteria of being aged 18 years and over and not medical staff. Sample size obtained included 320 participants, who were requested to complete an online questionnaire about their socio-economic status, knowledge, and practice questions with yes and no answer option. Questions on attitudes and barriers were included in 5-point Likert scale.

**RESULTS:** The study showed an inter-class correlation coefficient (ICC) score of questionnaires that indicated good (0.671) and excellent agreement (0.839). A total of 429 respondents were willing to completed the questionnaire via a Google form. Most of the respondents were women (72%), aged 18-29 years (73.3%), with non-college education (59%), and living in Java Island (71.6%). More than 50% of respondents had never read or heard about telemedicine and teledentistry. Most of them agreed about the simplicity of contacting a dentist or doctor and the convenience of using telehealth.

**CONCLUSIONS:** Although most of the respondents did not hear, read, and use telehealth, most respondents' attitude towards the use of teledentistry or telemedicine was positive and had no barrier. Infrastructure and regulations need to be prepared by the government to be able to implement telehealth.

**KEY WORDS:** knowledge, practice, attitude, telemedicine.

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## INTRODUCTION

It's been more than a year from the coronavirus or COVID-19 pandemic and the World Health Organization (WHO) official declaration in late January 2020 as a global public health emergency [1]. The spread of the virus has been identified through respiratory droplets

and sneezes from infected patients, contact with objects contaminated with air, and saliva from infected patients. This disease can be transmitted through contact with positive COVID-19 patients and asymptomatic carriers within the incubation period (range, 0-14 days) [2].

This pattern of spread has made dental treatment a high-risk procedure for transmission. The source of noso-

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comial spread in healthcare facilities is because some dental treatments produce aerosols that can pose a high-risk to practitioners. After all, there is a possibility of cross-infection, and they can acquire the disease or be potential carriers [3].

So far, there is no definitive treatment for COVID-19. Preventive measures taken include vaccination, social distancing, wearing masks, and not being in crowds. This limitation of social activities results in a person being reluctant to leave the house if it is not urgent [4]. Regarding the risk of transmission, the WHO and dental association have postponed socializing and going to the dentist unless it is an emergency [5]. This causes someone who may routinely visit the dentist to be hampered.

In conditions where social activities are limited, which has an impact on health services, innovative ways are needed so that people can still get good health services [6]. The use of technology plays an important role in addressing this situation, namely using telehealth. Although in practice, where there are pros and cons, telehealth is the best way to address the community's need for health services, while minimizing human-to-human contact to prevent the transmission of COVID-19 [7, 8].

Telehealth is a remote facility of healthcare, guidance, education, or treatment via information technology rather than through direct face-to-face contact with patient. Teledentistry and telemedicine are sub-units of telehealth [9]. Currently, telehealth has developed as an effort to keep health workers closer to patients, while providing protection benefits to the community, patients, and health workers [6]. Telemedicine requires several requirements to be used safely; the community, health workers, and health facilities need to have tools that can be connected to the Internet, a good Internet network, and the existence of regulations or security guarantees from the government [8]. This requirement in developed countries is certainly not a problem, and the situation is different in developing countries, such

as Indonesia. In Indonesia, the Internet network has not been spread evenly to remote areas, and not all people have the tools to connect to the Internet [10]. Indonesian government regulations related to telemedicine are still between healthcare facilities, not between individual doctors and patients [11].

## OBJECTIVES

Studies on the use of telehealth are still limited, especially in Indonesia. This study aimed to discover the knowledge and practice of Indonesian people to use teledentistry/telemedicine, and attitudes and barriers towards using it.

## MATERIAL AND METHODS

This cross-sectional study with an e-survey was conducted using a Google form, and had received ethical approval from the Health Research Ethics Committee Poltekkes Depkes Malang, with registration No.: 013/KEPK-POLKESMA/2020. Results of calculation of the sample size using G power analysis obtained a total of 320 respondents. Criteria for respondents were: 18 years of age and over, having social media, not health workers, and willing to complete e-survey. The questionnaire comprised questions on respondent's socio-demography, knowledge, practice, attitudes, and barriers towards using telehealth. In the knowledge domain, they were asked whether they had read or heard anything related to telemedicine and teledentistry, giving an answer of 'yes' or 'no'. The practice domain was asked whether they had consulted a dentist through social media or commercial applications, with a 'yes' or 'no' answer. In the attitude domain, questions were asked on the convenience, benefits and costs of using telehealth. The barrier domain was related to the comforts and concerns that arise when

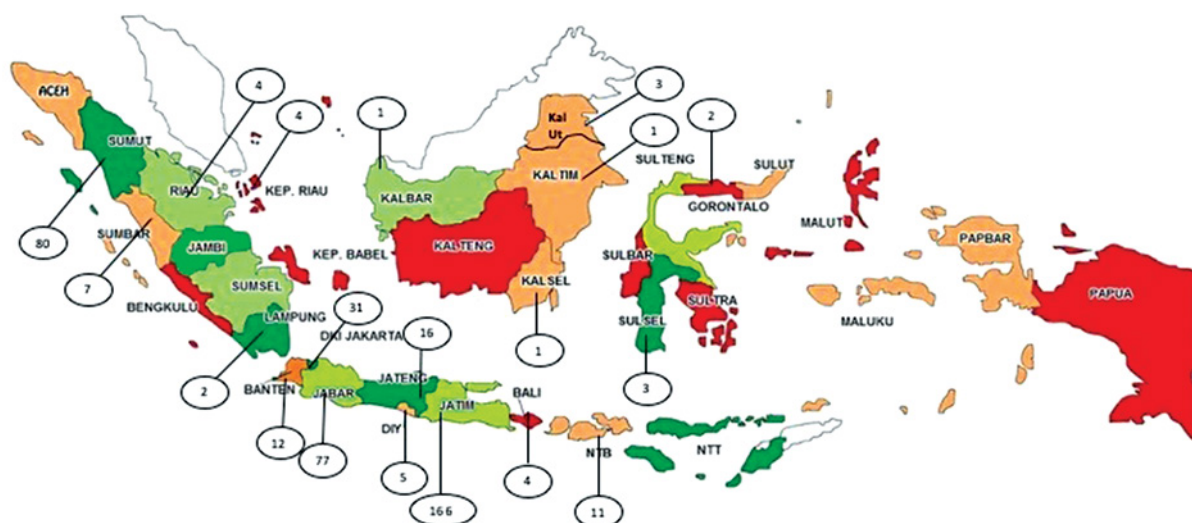


FIGURE 1. Distribution of respondents' locations

using telehealth. Both domains used a 5-point Likert scale answers, including 'strongly agree', 'agree', 'neither agree nor disagree', 'disagree', and 'strongly disagree'. Total score attitude added barriers was minimum 9 and maximum 45. A high score indicated a positive attitude and no barrier to the use of telehealth. The questionnaire regarding knowledge and attitude-barrier has been tested for validity and reliability with face validity and test re-test with ICC.

The designed questionnaire was compiled and distributed through social media using snowball technique. On the first page of the Google form, informed consent was written. If respondents agree, they could continue to answer the questions, and if they did not agree, they could skip it. The questionnaire was closed after meeting the number of sample sizes. All data obtained from respondents were analyzed descriptively to summarize percentage and frequency. Mann-Whitney and Kruskal Wallis tests were applied to see the difference in attitude-barrier scores on respondents' socio-demography.

## RESULTS

There were 431 respondents who were willing to complete the on-line questionnaire. Two people were excluded because they worked as health workers. The reliability test for the knowledge and attitude-barrier questionnaire resulted from 30 respondents, obtained an ICC score of 0.671 and 0.839, which indicated good and excellent agreement, respectively. Figure 1 shows that most of the respondents live on the Java island, i.e., 307 respondents (71.6%). Table 1 illustrates that most of the respondents were women (72.0%), aged 18-29 years (73.3%), with non-college education (59.0%) and undergraduate status (33.8%), and having no income (48.2%). Significant differences in attitude-barrier scores were found in age and income categories ( $p \leq 0.05$ ).

**TABLE 1.** Respondents' characteristics and results of the difference test based on attitude-barrier score

Variable/Category	<i>n</i> (%)	Median (min.-max.) attitude- barrier score	<i>p</i> -value
Gender			
Male	120 (28.0)	31 (19-41)	0.858
Female	309 (72.0)	31 (19-42)	
Age (years)			
18	20 (4.7)	29 (45-39)	0.05**
19-29	298 (69.0)	31 (20-41)	
30-39	33 (7.7)	31 (23-42)	
40-49	37 (8.6)	29 (19-37)	
≥ 50	43 (10.0)	31 (19-39)	
Education			
College	174 (40.4)	31 (19-42)	0.310
Non-college	255 (59.6)	30 (21-41)	
Occupation status			
Unemployed	145 (33.8)	31 (19-40)	0.688
Student	32 (7.5)	29 (24-39)	
Undergraduate	145 (33.8)	31 (21-42)	
Businessman	15 (3.5)	30 (24-35)	
Private employee	54 (12.6)	31 (20-39)	
Government employee	38 (8.9)	31 (19-39)	
Income (million IDR per month)			
No income	207 (48.2)	30 (20-41)	0.027**
< 2	66 (15.4)	30 (23-36)	
2-5	99 (23.1)	31 (19-42)	
5-10	41 (9.6)	32 (23-40)	
> 10	16 (3.7)	30 (24-36)	

\*Mann-Whitney test, significant at  $p < 0.05$ . \*\*Kruskal-Wallis test, significant at  $p < 0.05$

**TABLE 2.** Knowledge and practice related to telemedicine and teledentistry

	Yes		No	
	n	%	n	%
<b>Knowledge</b>				
Heard about teledentistry	107	24.9	322	75.1
Read about teledentistry	68	15.9	361	84.1
Heard about telemedicine	185	43.1	244	56.9
Read about telemedicine	128	29.8	301	70.2
<b>Practice</b>				
Consulted a dentist by phone or social media	77	17.9	352	82.1
Consulted a dentist through a commercial application	46	10.7	383	89.3
Consulted a doctor by phone or social media	178	41.5	251	58.5
Consulted a doctor through a commercial application	154	35.9	275	64.1

**TABLE 3.** Attitudes and barriers related teledentistry

	Strongly agree		Agree		Neither agree nor disagree		Disagree		Strongly disagree	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Attitude</b>										
Communication with a dentist over telephone or social media can help with health problems	105	24.5	216	50.3	89	20.7	18	4.2	1	0.2
Easy to contact a dentist via telephone or social media	98	22.8	211	49.2	85	19.8	35	8.2	0	0.0
Communication with a dentist over phone or social media is an addition before visiting a doctor	123	28.7	256	59.7	37	8.6	11	2.6	2	0.5
A visit to a dentist is still necessary	114	26.6	247	57.6	45	10.5	23	5.4	0	0.0
Consultation with a dentist over telephone or social media is convenient	31	7.2	200	46.6	147	34.3	50	11.7	1	0.2
Consultation with a dentist by telephone or social media has cost consequences	15	3.5	158	36.8	111	25.9	122	28.4	23	5.4
<b>Barrier to communication with a dentist over telephone or social media</b>										
Difficulty understanding what the dentist/doctor said	0	0.0	99	23.1	75	17.5	208	48.5	47	11.0
A dentist/ doctor has difficulty in understanding your explanation	2	0.5	89	20.7	90	21.0	195	45.5	53	12.4
Confidentiality of the information you provide is low	18	4.2	216	50.3	69	16.1	91	21.2	35	8.2

Table 2 shows that more than 50% of the respondents had never heard or read about teledentistry or telemedicine, more than 80% of them had never consulted a dentist, and more than 50% had never consulted a doctor through social media or commercial applications. However, the number of respondents who had heard or read about telemedicine and who were consulted through telemedicine was higher than teledentistry.

Table 3 presents that respondents had a positive attitude towards teledentistry by stating 'strongly agree' and 'agree' more than 50% of the time when communicating with dentists over the telephone or social media, except for the consequences of costs experienced, for which less than 40% agreed. For the barrier, difficulty in understanding of what the doctor/dentist said, and the doctor/dentist difficulties to understanding the patient explanation appeared in more than 50% of participants, with answers of 'strongly disagree' and 'disagree'. However, the confidentiality of information that the patient provided was low. Most of the respondents answered, 'strongly agree' and 'agree'.

## DISCUSSION

Most of the respondents in this study were residing on the Java Island. According to the Indonesian Central Statistics Agency in 2020, the composition of the largest population in Indonesia (56.1%) is on the Java Island [12]. This study indicated that there is a significant difference between age and income in

attitude-barrier scores. Respondents with age ranging between 19 and 39 years, and an income of 5-10 million presented a high attitude-barrier score, which is probably because within that age range, people are accustomed to using social media and within that income range, they have no financial constraints. A study on behavior in social media among adults in the United States found that individuals of 18-48 years old with an income of less than \$30,000 per year were the most frequent users of social media [13].

Most of the respondents had never heard, read, or consulted dentists or doctors through social media or commercial platforms. This result is similar to a study in Canada, which found that 79% of respondents had never had an experience using telehealth during the COVID-19 pandemic [1]. A study among dental students in Saudi Arabia revealed that only 17.2% of them had previously heard of teledentistry [14]. Some respondents are more familiar with telemedicine than teledentistry. This is because teledentistry is a relatively new adjunct in the modern trend of telehealth [15].

The results of this study showed that most of the respondents had a positive attitude towards telehealth. Most agreed that it is easy and convenient way to communicate with a dentist over the telephone or social media, and it can help to solve health problems. Most of the respondents also did not feel that they have a barrier related to confidentiality and have difficulty communicating with each other when interacting with a dentist over the telephone or social media. The only

barrier is the cost of these activities. Previous studies on patients' perceptions of telemedicine visits before and after the COVID-19 pandemic have found that, overall, patients are satisfied with using telemedicine; however, for new users, and both healthcare providers and patients, it requires adaptation [16].

Changing the behavior of consultation from being accustomed to face-to-face to talking over the phone, sending messages, or via video calls is not easy. However, during the COVID-19 pandemic, on-line consultation with dentists became an unavoidable option [17]. Many benefits can be obtained when teledentistry is implemented, when regulations of social activities to reduce transmission of COVID-19 are applied on both the patient and health worker. From the patient's perspective, they can be consulted instantly at any time [18]. Health condition is monitored, so that when an emergency case is indicated, the treatment is on time, has a benefit in waiting times, and is cost-efficient [19]. For dentists, the implementation of teledentistry would help them to screen COVID-19 patients and triage dental cases [20]. However, studies showed that there are barriers on the part of patients and dentists when implementing teledentistry. From the patient side, there is an extra budget required to spend, and guarantee the security of information provided. From the dentist's perspective, they need to prepare the infrastructure and a team to run the system, which can increase operational costs. They also have to add skills to be able to operate it. Some of them fear it could influence the accuracy of diagnosis [21].

A qualitative study on the acceptability, usefulness, and effectiveness of evaluating pediatric telemedicine programs according to perceptions of health workers reported that, although statements were found that this technology took too long, or the use of this technology was frustrating, all respondents acknowledged the recognition of many benefits of using this technology for consultations. The most important beneficial aspect of telemedicine is the improvement of doctors' communication with patients' families [22].

It is necessary to prepare human resources, finances, infrastructure, and regulations when teledentistry is considered in health system in a country. For developed countries, internet networks are certainly not a problem. However, developing countries, such as Indonesia, need a large budget to provide a network that can reach all corners of the region. Besides the basic, which is also important is the existence of regulations that guarantee data security, legal aspects, and service policies [23]. The Indonesian government in its long-term development plan, has launched digitalization to remote areas of Indonesia, which can be the beginning of telehealth preparation. The results of this study can be used as data showing that some Indonesian people have a positive attitude towards teledentistry.

The limitation of this research is the balanced representation of the respondents' area, gender, age, and

income; therefore, future studies are needed to obtain greater number of respondents regarding these aspects. It is also necessary to find out under what conditions they contacted dentists or doctors on-line as well as their expectations and satisfactions when communicating over the telephone or social media with a dentist or doctor.

## CONCLUSIONS

Even though few respondents knew and had experience of using telehealth, their attitude showed agreement, and they had no barrier to on-line communication with a dentist or doctor. The only barrier was related to the cost. This data can be an opportunity for the Indonesian government to provide supporting facilities and regulations for immediate implementation of telehealth.

## CONFLICT OF INTEREST

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## References

1. Rahman N, Nathwani S, Kandiah T. Teledentistry from a patient perspective during the coronavirus pandemic. *Br Dent J* 2020; 229: 1-4.
2. World Health Organization. Coronavirus disease 2019 (COVID-19): situation report, 73. 2020. Available at: <https://apps.who.int/iris/handle/10665/331686>.
3. Bhanushali P, Katge F, Deshpande S, Chimata VK, Shetty S, Pradhan D. COVID-19: changing trends and its impact on future of dentistry. *Int J Dent* 2020; 2020: 8817424. doi: 10.1155/2020/8817424.
4. World Health Organization. Coronavirus disease (COVID-19) advice for the public. Available at: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public>.
5. World Health Organization. Considerations for the provision of essential oral health services in the context of COVID-19. Available at: <https://www.who.int/publications/i/item/who-2019-nCoV-oral-health-2020.1>.
6. Chauhan V, Galwankar S, Arquilla B, et al. Novel coronavirus (COVID-19): leveraging telemedicine to optimize care while minimizing exposures and viral transmission. *J Emerg Trauma Shock* 2020; 13: 20-24.
7. Wax RS, Christian MD. Practical recommendations for critical care and anesthesiology teams caring for novel coronavirus (2019-nCoV) patients. *Can J Anesth* 2020; 67: 568-576.
8. Monaghesh E, Hajizadeh A. The role of telehealth during COVID-19 outbreak: a systematic review based on current evidence. *BMC Public Health* 2020; 20: 1193. doi: 10.1186/s12889-020-09301-4.
9. Ghai S. Teledentistry during COVID-19 pandemic. *Diabetes Metab Syndr* 2020; 14: 933-935.
10. Donny B; ICT Watch Team. A brief overview of Indonesia internet landscape. *ICT Watch*; 2014.
11. Indonesian Ministry of Health. Peraturan menteri kesehatan Republik Indonesia nomor 20 tahun 2019 tentang penyelenggaraan pelayanan telemedicine antar fasilitas pelayanan kesehatan; 2019.
12. Indonesian Central Statistics Agency. Population census results 2020. Available at: <https://www.bps.go.id/website/images/Hasil-SP2020-ind.jpg> (Accessed: 20.11.2020).



13. Hruska J, Maresova P. Use of social media platforms among adults in the United States – behavior on social media. *Societies* 2020; 10: 27. doi: 10.3390/soc10010027.
14. Aboalshamat KT. Awareness of, beliefs about, practices of, and barriers to teledentistry among dental students and the implications for Saudi Arabia vision 2030 and coronavirus pandemic. *Int Soc Prev Communit Dent* 2020; 10. doi: 10.4103/jispcd.JISPCD.
15. Agrawal R, Singh RK, Agarwal A, Chandra A. Teledentistry: now and then. *Journal of Dentofacial Sciences* 2013; 2: 35-38.
16. Holtz BE. Patients perceptions of telemedicine visits before and after the coronavirus disease 2019 Pandemic. *Telemed J E Health* 2021; 27: 107-112.
17. Macapagal J. Applications of teledentistry during the COVID-19 pandemic outbreak. *Appl Med Informatics* 2020; 42: 133-141.
18. de Toledo Telles-Araujo G, D'Aquino Garcia Caminha R, Samaan Kallás M, da Silva Santos PS. Teledentistry support in covid-19 oral care. *Clinics (Sao Paulo)* 2020; 75: e2030. doi: 10.6061/clinics/2020/e2030.
19. Giudice A, Barone S, Muraca D, et al. Can teledentistry improve the monitoring of patients during the Covid-19 dissemination? A descriptive pilot study. *Int J Environ Res Public Heal* 2020; 17: 3399. doi: 10.3390/ijerph17103399.
20. Wakhloo T, Reddy GS, Chug A, Dhar M. Relevance of teledentistry during the COVID-19 pandemic. *J Family Med Prim Care* 2020; 9: 4494-4495.
21. Mishra G, Gupta V, Kumar S, Malhotra S, Agarwal K. Role of teledentistry during COVID-19 pandemic: a review. *Uttar Pradesh State Dent J* 2020; 1: 25-29.
22. Sauers-Ford HS, Hamline MY, Gosdin MM, et al. Acceptability, usability, and effectiveness: a qualitative study evaluating a pediatric telemedicine program. *Acad Emerg Med* 2019; 26: 1022-1033.
23. 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 (Berl)* 2020; 51: 672-677.