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## RESEARCH ARTICLE

### Knowledge of Legal Aspects in Teledentistry among Dental Practitioners in Padang, West Sumatera, Indonesia

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#### Abstract:

##### Background:

The outbreak of coronavirus disease 2019 (COVID-19) has caused Indonesia to take several actions and strategies in controlling the spread of infection. Padang is one of the cities in West Sumatera, Indonesia that has the highest number of COVID-19 cases. The usage of technology as a tool to minimize contact with infection in dental health care has been proven effective. However, teledentistry as an implementation of this technology is often hampered by legal issues, especially in data security.

##### Aim:

The purpose of this study is to determine dental practitioners' understanding of legal elements of teledentistry in Padang, West Sumatera, Indonesia.

##### Methodology:

An electronic questionnaire survey with 10 questions was developed by Google Forms, validated, and distributed electronically by zoom to 168 dental practitioners before and after the intervention.

##### Statistical Analysis:

Collected data were analyzed for statistical significance by using SPSS software (Version 16.0).

##### Result:

There is a lack of prior knowledge of teledentistry in legal aspects among dental practitioners. A significant level of percentage of participants' knowledge regarding the teledentistry legal aspects has increased after the intervention.

##### Conclusion:

The majority of the respondents in this survey lacked adequate information and understanding of the legal aspects of teledentistry. Seminars and training are needed to increase dental practitioners' knowledge of the legal issue in teledentistry.

**Keywords:** Teledentistry, Legal, Knowledge, COVID-19, Dental health care, Infection.

#### Article History

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## 1. INTRODUCTION

The novel coronavirus as a respiratory disease has spread and infected millions of people around the world [1]. COVID-19 has caused an ongoing problem including in Indonesia where the fatality rate reached 8.9% by the end of March 2020 [2]. West Sumatera is one of the provinces among the 10 highest COVID-19 cases in Indonesia [3]. As time goes by, the number of people who get infected or died due to this

disease has increased. That is why the exact time when the pandemic will be over in Indonesia is still unknown, even though a lot of experts are trying to predict through articles or journals [4].

The government has announced the increasing number of COVID-19 cases daily in all 34 provinces in Indonesia and has taken several actions to overcome the problems. Some of them are performing PCR and antigen testing, contact tracing, quarantining the infected people, and limiting people mobilization in and out of the city/province [4, 5]. The idea of lowering the COVID-19 peak cases, by performing regional

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quarantine as another concept of lockdown, has been taken to avoid collapse in healthcare facilities [1]. WHO recommends physical distancing to minimize COVID-19 transmission and constrain the community to stay at home and not go out until it's not necessary. This action was followed by closing the school, offices, and public places including transportation and tourism objects. People were considered to work, study, and do school from home [6].

This situation not only affected economic and education sector but also the healthcare sector which as consequence must give selective treatment in hospitals for emergencies only [7]. Dentists at the same time are considered at the frontline in the current pandemic because they are susceptible to infection through various airborne and contact routes [8]. For these reasons, dentists were advised to change their practice management to contain the spread of the virus and decrease the risk of infection for dentists and their patients. While closing dental offices during an outbreak may lower the number of affected persons, however, it would be trouble for those who require urgent dental treatment [9].

Healthcare systems including dental treatment must formulate a new strategy to provide treatment over distance so that the patient could access health facilities even from home [10]. Teledentistry, as a combination between telecommunication and dentistry, becomes potential technology to be used in this pandemic era to overcome this problem. It is an efficient way to facilitate dentist and patient communication so that only the emergency cases reach the hospital to get treatment [11, 12]. Teledentistry has been reported by articles and journals as having many benefits such as reducing the cost of time and transportation, increasing access to the remote area, and creating effectiveness in reaching dental specialist consultation [13, 14]. Dental treatment, due to its aerosol production, becomes one of the highest-risk procedures to get infected by the COVID-19 virus. The use of teledentistry could mitigate the risk by limiting patient visits to the dental office [15].

The challenge in dentistry is complex and quite challenging. Dental practitioners must adapt to the new situation and accept teledentistry. Since not all dentists are familiar with the use of technology in teledentistry, there is a need for willingness to study and educate themselves to cope with it [16]. There are multiple articles about dental professionals' understanding and awareness of teledentistry in various countries but limited to Indonesia. Since WHO declared COVID-19 a pandemic all over the world, the number of cases in Indonesia has increased and became the highest mortality rate in Southeast Asia [10]. Indonesia is an archipelago country with over 34 provinces and thousand of islands, which faces challenge due to the uneven distribution of health workers and limited medical facilities. Teledentistry could be a solution because some of the areas need several hours or days to reach the nearest healthcare facilities [17]. Since Sumatera is one of the big islands, therefore the author evaluated the knowledge of teledentistry among dental professionals in Padang the capital city of West Sumatera, Indonesia.

## 2. MATERIALS AND METHODS

The researcher used qualitative methodology to know whether the dental practitioner in Padang, West Sumatera were aware of the legal aspects of teledentistry during the COVID-19 pandemic. The research team consisted of several male and female lecturers, from Andalas University Faculty of Dentistry, with various educational backgrounds including doctorate, Masters, and Bachelor degree in Dentistry along with a professor from the Faculty of Law, Andalas University. The team created 10 questions in the form of Google Forms and gave them online to the subjects. The subjects were 168 dental practitioners under the supervision of the Indonesian Dental Association (PDGI) branch in Padang, West Sumatera. The survey was held in the teledentistry seminar presented by cooperation between the Faculty of Dentistry, Andalas University, and the Indonesian Dental Association (PDGI) branch in Padang which was held online in Padang, West Sumatera, Indonesia.

The subjects were seminar participants that consciously agreed to fill out the questionnaire form and were informed that their answers will be collected and analyzed for the research. None of the participants disagree to fill out the survey form. Neither the researchers nor the participants knew each other personally. The survey was given online twice as a pre and post-test to all participants (Table 1). The pre-test was held before the seminar started to know prior knowledge of the participants about the legal issue in teledentistry. The electronic survey was distributed via a link in the zoom meeting. The questions were delivered in *Bahasa Indonesia* to ensure the participants understand the proper meaning. Post-test was given after the seminar ended to see the degree of understanding of the participants after the intervention in form of a teledentistry seminar.

The questions of the questionnaire were taken from the previous teledentistry journal [18] and modified to make it suitable for the study. The validity and reliability of the questionnaire were previously tested using SPSS Version 16.0 and the results were valid and reliable to be applied to dental practitioner participants. The minimum number of respondents to be tested for this questionnaire was at least 50 respondents following the provisions used by Sapnas and Zeller (2020) [19]. The total number of respondents for the validity and reliability test for the questionnaire was 68 respondents, all of whom were dentists outside the Padang area. The respondents were given their agreement statement to be involved in research on the Google survey form. A total number of 168 respondents in the study group completed the survey, which was ready to be analyzed. The respondents in the study group were from the Padang area and were different from the respondents in the validity and reliability tests. The answers were analyzed and not returned to the participants. All the complete surveys obtained were entered into an Excel spreadsheet and analyzed using SPSS (Version 16.0).

## 3. RESULTS

Based on the frequency distribution table for each question above, it can be concluded that the percentage of knowledge ranges from 28.6-93.5% in the pre-test to 74.4-95.2% in the

post-test after the intervention. We can see that there is an increase between the pre-test and post-test in the score of around 1.7-59.5%.

From Table 2 above we could see, there is an increase in respondents' knowledge from  $5.69 \pm 2.286$  in the pre-test increased to  $9.18 \pm 1.287$  in the post-test. The results of statistical tests obtained a p-value of .000 which means there is a significant relationship between pre-test and post-test knowledge.

To assess the effectiveness of the intervention, the N-Gain test was carried out. Gain score index in this study:

$\geq 0,7$ : The effectiveness of the intervention is high

$0,7 > g \geq 0,3$ : The effectiveness of the intervention is average

$< 0,3$ : The effectiveness of the intervention is low

Based on the results of the N-Gain test, the score was 0.8. So it can be concluded that the intervention given has high effectiveness (Table 3).

#### 4. DISCUSSION

There is a good response towards teledentistry which shows in Question number 1,2,3, and 10. The result shows that 61.3% of respondents (Question no 1) ever had experienced teledentistry. Question number 2 shows that there is 93.5% of respondents think that teledentistry is helpful during the pandemic. A total of 70.2% of respondents think that the teledentistry application is handfull to use (Question no 3) and 81% of respondents will use this service again in the future (Question no 10). According to Balsarav and Chole's (2015) study, 85% out of 142 dentists as respondents in their study have heard about teledentistry, 73% answered it applies from diagnosis to treatment and 66% said it will be useful in the future [20]. This is consistent with Ghai's (2020) study that teledentistry is the most promising practice in this current pandemic [21]. According to the latest research, due to the

increased fear of the pandemic, to avoid physical consultations would lead to the abnegation of direct dental services [22]. Hereby teledentistry would be a great choice for dental treatment.

Less percentage of responses could be seen in question number 4, 5, 6, 7, and 8. We can see that Table 1 pre-test question number 4 shows that only 35.1% of dental practitioners know the regulations in teledentistry. Question number 5 shows only 42.3% of respondents know what cases could be treated by teledentistry. Question number 6 shows that only 28.6% of respondents know the limitations of using teledentistry. Question number 7 shows only 43.5% feel that teledentistry is effective to serve dental treatment. Question number 8 shows only 50% of the respondents know that the drug prescription is allowed on teledentistry. However, despite the promising concept of teledentistry, it is not yet popularly used by the general population, especially in regions outside the metropolitan cities.

This result shows that dental professionals' knowledge of the legal issue in teledentistry is still low. Knowledge about teledentistry before the pandemic is relatively low due to a lack of proper resources, the absence of national regulations about teledentistry implementation, and some barriers (such as internet access, lack of computer skills, lack of human resources, etc.) [11, 23, 24]. This is in line with a study by Zakirulla *et al.*, (2019), which found that the majority of dental professionals had limited awareness of various aspects of teledentistry [25]. Nagarajappa *et al.*, (2013) show that dentists with more than 10 years of experience had less knowledge than those who had less than 5 and up to 10 years of experience [26]. Mamatha Boringi *et al.*, (2015) also stated that knowledge and awareness are very low among postgraduates [27]. This is consistent with Zayabalaradjane *et al.*, (2016) which shows out of 120 dentist volunteers, none of them had attended any seminars or conferences to get information related to teledentistry. Adding this study, only dentists with age less than 45 years old had shown more interest in teledentistry [28].

**Table 1. Percentage distribution of responses pre and post test.**

S.No.	Questions	Pre Test		Post Test		Increasing %
		Yes-Answer	%	Yes- Answer	%	
1	Have you ever used teledentistry in daily practice?	103	61.3	125	74.4	13.1
2	Do you think teledentistry is helpful during the COVID-19 pandemic?	157	93.5	160	95.2	1.7
3	Do you think a teledentistry application is handfull to do?	118	70.2	154	91.7	21.5
4	Do you know the regulations for teledentistry?	59	35.1	159	94.6	59.5
5	Do you know what cases could be treated using teledentistry?	71	42.3	158	94	51.7
6	Do you know the limitation of providing teledentistry?	48	28.6	159	94.6	66
7	Do you feel teledentistry is effective to serve dental treatment?	73	43.5	129	76.8	33.3
8	Do you think drug prescription is allowed using teledentistry?	84	50	152	90.5	40.5
9	Do you think examination using photo or video via teledentistry is allowed?	106	63.1	147	87.5	24.4
10	Do you want to use the teledentistry service again in the future?	136	81	154	91.7	10.7

**Table 2. Mean distribution between pre-test and post-test.**

Questions	Mean	SD	SE	n	P-value
Pre-Test	5.69	2.286	.179	163	.000
Post-Test	9.18	1.287	.101	163	

**Table 3. Interpretation of NGain.**

<b>Gain Score = post-test score-pre test score / max score-pre test score</b>
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Apart from the fact that teledentistry (as part of telemedicine) promises great opportunities to provide better health services in the pandemic era, the potential legal issue could be another challenge [29]. The universal use of teledentistry has raised pieces of information about legal concerns [14]. Many dentists still lack information on teledentistry training programs and difficult to adapt to the new strategy of oral health services [24]. Even with the high standard of prevention in knowledge and practice, dental practitioners are still living with anxiety due to the pandemic [30]. Therefore all dental practitioners need to understand teledentistry technology and its potential problem. Dentists must stay updated on new information in this rapidly changing sector to enhance knowledge and awareness of COVID-19 [10].

Question number 9 shows 63.1% of respondents know that examination using photo or video via teledentistry is allowed. The urgency to understand the technology and its implications become one of the concerns. Dental practitioners must understand the use of technology and its legal ramifications to avoid the problem in the future [14]. Telemedicine including teledentistry by its nature has been associated with a legal issue. One of them is about the security of patient data [28]. The users must be careful during data transmission due to security and privacy issues. If a problem such as lost data or medical error occurs, the entire teledentistry process could be discontinued and cause misdiagnosis that leads to malpractice [31]. According to Kinariwala *et al.*, (2020), 75.5% of 403 dentist respondents are concerned about the medicolegal implications of post-pandemic dental care. 87.8% believe the government and non-profit organizations will implement rules to protect dentists during and after the pandemic [32].

The Indonesian government started to pay attention to telemedicine since the COVID-19 pandemic entered this country. The Minister of Health replied by issuing Permenkes No. 20 of 2019 on Telemedicine Implementation Between Health Service Facilities [33, 34]. This rule outlines the kind of legal and professional responsibilities that doctors have while providing telemedicine services to healthcare facilities [34]. In addition, the Indonesian Medical Council (KKI) also issued KKI Regulation No. 74 of 2020 concerning the Clinical Authority and Medical Practice through Telemedicine during the of Corona Virus 2019 (COVID-19) Pandemic in Indonesia which provides a legal basis and permission for doctors and dentists to provide healthcare services through electronic system platforms commonly known as telemedicine [35]. Those regulations are then further followed by Large Scale Social Distancing (PSBB as a restriction for community

activities to prevent the spread of the disease. Since the case of COVID-19 continues to rise, on February 2021 the government implemented the Enforcement of Restrictions on Community Activities (PPKM), then changed again to PPKM Mikro [36]. Currently, the PPKM emergency policy is taken as another effort to reduce the transmission rate of COVID-19 [37].

Padang is one of the cities in West Sumatera affected by COVID-19. It has not only the highest confirmed COVID-19 cases in the province and a high risk of COVID-19 infection but also a high rate of the elderly population and comorbidity diseases. Therefore preventing the transmission of infectious diseases to patients and protecting healthcare professionals must be a top priority every day. Teledentistry could be an effective tool to prevent and break the chain of distribution of COVID-19 in dental health aspects. Even though teledentistry provides several benefits such as improving access and being cheaper at cost, however ethical and legal challenges need to be taken into account while implementing this program [38]. A critical concern is data privacy. The Indonesian government only permits telemedicine to be conducted via the internet system at registered health facilities to ensure data security [39, 40]. Patients should be informed about data security and the potential risk of failure in transferring data to avoid legal issues [14]. This might vary from verbal policy explanation to written informed consent [39]. The pandemic has challenged dental practitioners to educate themselves about the legal issue in teledentistry so that they could ensure the appropriate guardrails are in place for building a better dental health system in the future [20].

**CONCLUSION**

The lack of knowledge of teledentistry in legal aspects among dentists in Padang, West Sumatera Indonesia has suggested the need for awareness-raising programs to improve dental practitioners’ knowledge of the legal issue. Our study shows that while there is a need for teledentistry and a positive attitude among dentists towards using teledentistry, the legal concern is not a common issue among health professionals. This may be due to the lack of knowledge about the use of teledentistry. This can be improved by increasing seminars or training for dental health professionals on ethicolegal aspects of teledentistry. The limitation of this study is the characteristics of the respondents involved and filling out the survey form. This study only focuses on general dentist practices rather than dental specialties. The authors suggest increasing the variable of the respondents for further study.

**ABBREVIATION**

**COVID-19** = Corona Virus 2019

**ETHICS APPROVAL AND CONSENT TO PARTICIPATE**

The Ethical approval for this study is not required, as there is no direct involvement of humans.

**HUMAN AND ANIMAL RIGHTS**

Not applicable.

**CONSENT FOR PUBLICATION**

Informed consent both for the validity test and the research was taken electronically by using Google Forms. The respondents stated agreed to fill out the questionnaire and their answers to be analyzed and use in the research.

**STANDARDS OF REPORTING**

COREQ guidelines were followed.

**AVAILABILITY OF DATA AND MATERIALS**

The data that support the findings of this study are available from the corresponding author [N.K], on special request by email.

**FUNDING**

None.

**CONFLICT OF INTEREST**

The authors declare no conflict of interest, financial or otherwise.

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