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RESEARCH ARTICLE **OPEN ACCESS**

The Attitudes of Dentists towards Patient Care during COVID-19 Endemic: A Study in Indonesia

Sri Ratna Laksmiastuti[1,*], Harryanto Wijaya[2] and Tri Erri Astoeti[3]

[1]*Department of Pediatric Dentistry, Faculty of Dentistry, Universitas Trisakti, Jakarta, Indonesia*
[2]*Department of Orthodontics, Faculty of Dentistry, Universitas Trisakti, Jakarta, Indonesia*
[3]*Department of Dental Public Health, Faculty of Dentistry, Universitas Trisakti, Jakarta, Indonesia*

Abstract:

Background: Dentists are susceptible to COVID-19 transmission during patient care. Therefore, health protocols were recommended for dental practice during the COVID-19 pandemic. The pandemic restrictions have been lifted, yet the awareness of COVID-19 transmission in dental care is still necessary. However, it remains unclear whether or not the health protocol is still implemented by dentists.

Objectives: The present study aimed to assess the attitudes of dentists towards patient care after COVID-19 became pandemic.

Materials and Methods: A cross-sectional study was conducted among 302 general dentists and dental specialists in Indonesia. Data were collected using an online questionnaire through Google Forms. The questionnaire was reviewed by clinical experts. It consists of 15 statements assessing the attitudes of dentists towards patient care, along with descriptive statistics, followed by the Mann-Whitney U test or Kruskal-Wallis H test, Post hoc Dwass, Steel, Critchlow, and Fligner analysis when significant differences were observed in the bivariate analysis.

Results: Female dentists were more likely to show a positive attitude towards COVID-19 patients' screening in clinical practice ($p = 0.008$). Different attitudes were also observed regarding the use of a negative-pressure room to prevent potentially contaminated air from entering the room and flowing outside ($p = 0.012$). Dental attitude in terms of COVID includes a) COVID-19 screening using rapid antigen test, especially for patients with COVID-19-like symptoms, b) the operator wearing PPE and washing hands properly according to the WHO's six steps, and c) using negative pressure room since it is the best dental practice room type to prevent air contamination differed by geographical area ($p = 0.001$, $p = 0.001$, and $p = 0.009$) respectively.

Conclusion: A difference in the attitudes of dentists towards patient care was observed. The differences included COVID-19 patient screening before dental procedures, the use of negative-pressure rooms, and the implementation of dentists' health protocol and personal protective equipment.

Keywords: Attitude, Dentist, Endemic, Indonesia, Patient's care, COVID-19.

*Address correspondence to this author at the Department of Pediatric Dentistry, Faculty of Dentistry, Universitas Trisakti, Jl. Kyai Tapa No. 260 Grogol Jakarta Barat, Indonesia; E-mail: sri.ratna@trisakti.ac.id

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1. INTRODUCTION

COVID-19 is an infectious disease spreading worldwide with high transmission. Since its initial identification in Wuhan, China, COVID-19 was declared a pandemic by the World Health Organization (WHO) on March 11th, 2020. COVID-19 spread to more than 170 countries and regions globally. The pandemic affected healthcare sectors both directly and indirectly, including dental healthcare. The crisis was worse on the already overburdened health systems in many countries [1-3].

Dental procedures require dentists to work closely with patients' mouths. In addition, dentists are prone to be exposed to saliva or blood during the procedures. Many dental procedures generate aerosol, and the risk of airborne infection is considered high [4-6]. Moreover, the angiotensin-converting enzyme II (ACE2), which is likely to be the cell receptor for the new coronavirus SARS-CoV-2, has a high expression in oral tissues, including tongue, oral mucosa, and gingival tissues. This indicates that the oral cavity is a potential reservoir and route of transmission for COVID-19. Therefore, dentists seem to be amongst the highest-risk group for SARS-CoV-2 virus transmission among healthcare providers [7-10].

Dental management during COVID-19 to prevent viral transmission has been recommended. The recommendations include patients' screening, appointment booking, room occupancy, social distancing, mouth rinse (using 0.12% or 0.20% chlorhexidine or 0.2% povidone-iodine) before dental procedure, and the use of Personal Protective Equipment (PPE) [11].

Since January 2023, the COVID-19 mortality rate has been decreasing. COVID-19 is no longer a Public Health Emergency of International Concern (PHEIC) or global emergency status, according to WHO, since May 5th, 2023. However, the WHO Director-General, Tedros Adhanom Ghebreyesus, stated that the virus can still cause severe symptoms and mutation is likely to occur [12]. In Indonesia, the government ended the Community Activities Restrictions Enforcement *(Pemberlakuan Pembatasan Kegiatan Masyarakat*) in all regions on December 30th, 2022. Treating COVID-19 as an endemic disease can be achieved when herd immunity has been formed in the population. Herd immunity will be achieved through vaccination or immunity gained from past infection. Thereafter, the government declared COVID-19 endemic in Indonesia on June 21st, 2023. The status change from pandemic to endemic impacts patients' care, including dental patients [13-15].

During the pandemic, dentists generally have a high awareness of health protocol in patient management. As the restrictions and pandemic status change, the attitudes and practices of dentists towards health protocol in patient care may change. However, the change, if any, may differ person to person. COVID-19 awareness is still necessary, based on the statement from the WHO Director-General. Therefore, this study aimed to investigate the attitudes and practices among dentists in Indonesia during the COVID-19 endemic (*i.e.*, after the pandemic restrictions were lifted).

2. MATERIAL AND METHODS

This study was approved by the Ethical Committee of Health Research, Faculty of Dentistry, Universitas Trisakti, Jakarta, Indonesia (036/S3/KEPK/FKG/9/2023).

2.1. Study Design and Participants

A cross-sectional study was conducted between October and November 2023. Two-stage cluster random sampling was applied. The inclusion criteria were general dentists and dental specialists who had carried out independent practice in Indonesia. Participants who were unable to fill out the questionnaire due to any reasons (*e.g.*, poor internet connection, unwillingness to participate, incomprehension) were excluded.

2.2. Sample Size Calculation

The sample size was calculated using G*power, with an estimated margin of error of 55, 95% confidence intervals, response distribution of 50%, medium effect size, and the total population of dentists of 42.601 individuals. Based on the calculation, the minimum sample size was 220 individuals.

2.3. Questionnaire Development and Data Collection

A questionnaire was used as the study instrument. It was constructed based on a literature review, experts' discussion, and relevant previous studies. The questionnaire consisted of demographic data (*i.e.*, sex, age, dentist competence according to acquired formal education, and place of clinical practice) and 15 questions assessing the attitudes and beliefs of dentists towards patient care in the era of COVID-19 endemic. The questions included consideration of wearing a facemask, patients' COVID-19 screening before dental procedure, appointment arrangement, room occupancy, postponement of dental care if patients had any COVID-19-related symptoms, health protocol before a procedure, povidone iodine use, regular sterilization of the dental unit and room, the use of negative room, HEPA filter, and laminar airflow system. The questionnaire was reviewed by experts through comprehensive discussions and validated in a subsample of the study population subsequently. The questionnaire items were considered reliable if Cronbach's alpha > 0.7. The validity and reliability of the questionnaire were assessed by a statistician. The responses of the participants were measured on the Likert scale, the most used scale in assessing opinions, beliefs, and attitudes. In each question, the answer options were "strongly agree", "agree", "neutral/ undecided", "disagree", and "strongly disagree". The participants were instructed to choose one answer for each question. They filled out the questionnaire through Google Forms. The estimated time to complete the questionnaire was 10 minutes.

2.4. Statistical Analysis

Data cleaning and tabulation were performed using Google Forms, which were then exported to the statistical software Statistical Package for Social Sciences (IBM SPSS Statistic for Windows software version 25.0). Descriptive statistics were performed. To assess whether

dentists' attitudes differ by gender and competence, the Mann-Whitney U test was applied. To assess whether the attitude differs by geographical areas of clinical practice, the Kruskal-Wallis test was applied, followed by the post hoc Dwass, Steel, Critchlow, and Fligner analysis if the Kruskal-Wallis test detected any differences.

3. RESULTS

A total of 302 participants completed the questionnaire. Of them, 102 participants were male and 200 were female. According to competence, 187 participants were general dentists, and 115 participants were dental specialists. A gender difference was found in response to the third item of the questionnaire, "screening in the era COVID-19 endemic is necessary for dental practice" ($p = 0.008$), whereby female dentists were more likely to respond with "agree" or "strongly agree" than male dentists (Table **1**). The other responses within the questionnaire items did not differ by gender.

When the responses between general dentists and dental specialists were compared, the only difference was observed in item 14: "Negative room is the best dental practice room type to prevent potentially contaminated air from inside the room flow to the outside area" ($p = 0.012$), by which general dentists were more likely to respond with "agree" or "neutral" (Table **2**).

Geographical area differences (Western, Middle, Eastern Indonesia) were observed in the response of three items (Table **3**), namely item 4 ($p = 0.001$), item 10 ($p = 0.001$), and item 14 ($p = 0.009$). Post hoc analysis for item 4 ("COVID-19 screening using rapid antigen test is necessary, especially for patients with COVID-19-like symptoms") showed that dentists working in Middle and Eastern Indonesia were more likely to agree upon this statement, compared to dentists working in Western Indonesia. On the contrary, item 10 ("Operator must wash hands properly according to the WHO's six steps of handwashing and wear PPE") and item 14 ("Negative pressure room is the best dental practice room type to prevent potentially contaminated air from inside the room flow to outside area"), showed that a higher proportion of dentists working in Western Indonesia agreed upon these statements than those working in the Middle or Eastern Indonesia.

4. DISCUSSION

To the best of our knowledge, this was the first study assessing the attitudes of dentists toward clinical care in Indonesia after the pandemic status was changed and the country entered the era of COVID-19 endemic. The pandemic affected society and the healthcare system, causing changes in health protocols.

Table 1. Difference in responses to each item of the questionnaire by gender.

Item	1	2	3	4	5	6	7	8	9	10	11	12	1 3	14	15
P-value	.864	.222	.008	.979	.874	.674	.331	.097	.382	.544	.059	.877	.442	.838	.519

Table 2. Differences in responses to each item of the questionnaire by competencies.

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
P-value	.303	.792	.919	.545	.529	.109	.216	.768	.656	.089	.554	.418	.325	.012	.399

Table 3. Difference in responses to each item of the questionnaire by geographical areas of clinical practice.

S.No	-	χ^2	df	p
1.	Consideration to wear facemask.	2.387	2	0.303
2.	No screening, no COVID-19 patients detected.	1.730	2	0.421
3.	COVID-19 screening is necessary in clinical practice.	5.098	2	0.078
4.	COVID-19 screening using rapid antigen test is necessary, especially for patients with COVID-19-like symptoms.	17.164	2	< .001
5.	Arrangement of appointment -patients flow – room occupancy is required.	0.859	2	0.651
6.	PPE in endemic is level 2.	0.813	2	0.666
7.	Dental care should be postponed if patients have symptoms.	1.193	2	0.551
8.	Dental practice should be postponed if the dentist has symptoms.	0.622	2	0.733
9.	PPE for patients is needed.	1.776	2	0.411
10.	Operator must wash hands properly according to the WHO's six steps of handwashing and wear PPE.	13.211	2	0.001
11.	Patients should rinse their mouth using povidone iodine.	0.629	2	0.730
12.	Dental practice room should be sterilized regularly.	2.521	2	0.284
13.	Laminar airflow and HEPA filter is beneficial for maintaining good air quality in dental practice room.	1.073	2	0.585
14.	Negative room is the best dental practice room type to prevent potentially contaminated air from inside the room flow to outside area	9.351	2	0.009
15.	Aerosol suction machine in dental practice room is useful to remove droplets and aerosol particles.	2.534	2	0.282

Dental practices have a high risk of COVID-19 transmission. During the first months of the COVID-19 pandemic, many elective care, including dental care, applied limitations in their service. Hence, measures to reduce the risk of nosocomial coronavirus infection were recommended. Dental association modified their standard operating procedure in clinical practice to accommodate the recommendations. However, the responses of dentists were heterogeneous. Some countries restricted dental care only for emergency or urgent cases, whereas other countries continued dental care practices as usual. However, no global data regarding dental care during the pandemic were available.

When COVID-19 emergency status was lifted and the country entered the endemic phase, two possibilities for the attitudes and practices of dentists were suggested. Either the dentists continued to implement the same health protocol as in the pandemic, or they implemented health protocol with some relaxation. In general, the professionalism of dentists is affected by various factors, such as gender, culture, age, competence, and educational level. In a particular circumstance (*e.g.*, post-pandemic), there are some factors that may impact dentists' attitudes and practices in patient care, such as (1) the health and safety of dentists and their patients, (2) financial reasons, and (3) dentists' self-efficacy [16].

Female dentists in this study tended to agree or strongly agree upon COVID-19 screening for patients in the era of the COVID-19 endemic. This suggests a higher awareness of COVID-19 transmission risk among female dentists. This finding was in line with a study by Dominika Guzek (2022) showing that females had higher knowledge and compliance with health protocol compared to males [17]. Moreover, a study by Mohammed Saif Anaam (2023) also found that females had better knowledge, attitudes, and practices toward COVID-19 than males [18].

Compared to dental specialists, general dentists were more likely to respond with "agree" or "neutral" upon negative pressure room to prevent potentially contaminated air from inside the room from flowing outside. This indicates uncertainties regarding the attitude toward negative pressure rooms among general dentists. Knowledge competence may contribute to the response to the questionnaire. This research is in line with research by Niraj *et al.*, which stated that dental specialists have a significantly higher level of knowledge and awareness about the transmission of COVID-19 than general dentists. The level of education influences the ability of a person to think and understand. The level of knowledge is closely related to education, where the higher a person's education, the broader their knowledge [19-21].

Dental knowledge was improved significantly during the COVID-19 pandemic in order to reduce transmission, incidence, and severity of COVID-19. An improvement in dental care is negative room, which has been considered the most effective room to prevent transmission during the pandemic [22]. Nevertheless, negative pressure rooms are not widely available in dental rooms yet, given the high price and high technology requirements. Today, negative pressure rooms are mostly available in modern specialized dental clinics in urban areas in Western Indonesia, particularly Java Island especially Jakarta, where the population is denser with a higher economic growth. Jakarta is the capital city of Indonesia, and according to the Indonesian Dentist Association, it has the highest number of dentists in Indonesia, including general practitioners and dentists in various specialties [23].

This may be a reason for more positive responses to negative pressure rooms among dentists in Western Indonesia compared to those in Middle or Eastern Indonesia. Different attitudes of dentists by geographical practice areas were also observed in the questionnaire items on COVID-19 patient screening as well as on handwashing and PPE. These differences might be related to economic factors and practicality, given that COVID-19 screening using rapid antigen tests is much cheaper than creating a negative pressure room.

CONCLUSION

The attitudes of dentists towards patient care in the era of the COVID-19 endemic differed from the attitudes during the pandemic. These differences included COVID-19 patient screening before dental procedures, the use of negative pressure rooms, health protocol, and PPE implementation by dentists.

AUTHORS' CONTRIBUTIONS

It is hereby acknowledged that all authors have accepted responsibility for the manuscript's content and consented to its submission. They have meticulously reviewed all results and unanimously approved the final version of the manuscript.

LIST OF ABBREVIATIONS

WHO	=	World Health Organization
ACE2	=	Angiotensin-Converting Enzyme II
COVID-19	=	Coronavirus Disease 2019
SARS-CoV-2	=	Severe Acute Respiratory Syndrome-Corona Virus-2
PPE	=	Personal Protective Equipment

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study was approved by the Ethical Committee of Health Research, Faculty of Dentistry, Universitas Trisakti, Jakarta, Indonesia (036/S3/KEPK/FKG/9/2023).

HUMAN AND ANIMAL RIGHTS

All procedures have been performed as per the ethical guidelines laid down by the Declaration of Helsinki 2013.

CONSENT FOR PUBLICATION

Informed consent was obtained from all participants of this study.

STANDARDS OF REPORTING

STROBE guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

The data and supportive information are available within the article.

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None.

CONFLICT OF INTEREST

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

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