

Assessing Mother's General and Oral Health Awareness on COVID-19 Pandemic in Family: A Study in Indonesia

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Abstract

Being initially detected in December 2019, COVID-19 has been declared as a global pandemic. In mid-July 2021, the number of positive COVID-19 cases in Indonesia (i.e., 56.757 patients) was the highest in South-East Asia and the fourth highest in Asia. COVID-19 is a preventable infectious disease that spreads rapidly. A healthy body is the main capital to fight against the virus. Oral cavity plays an important role in disease transmission and act as potential reservoirs of the virus, therefore improving oral health may contribute to reducing COVID-19 transmission. Family is the smallest unit in communities. A mother is an important figure in the family as prime mover to take prevention measures. Mother's awareness on general and oral health is the one of key factor.

To assess general and oral health awareness among Indonesian mothers during COVID-19 pandemic and its association with age, education, and employment.

An analytic cross-sectional study of 499 mothers was conducted. Data were collected using questionnaires through Google Forms platform.

Good awareness was observed in 61.5% of the study participants, whereas the other 38.5% had poor awareness. Neither age, education, nor employment was associated with general and oral health awareness.

Most mothers in Indonesia have good oral health awareness during COVID-19.

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Introduction

Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) was first reported in Wuhan, Hubei Province, China in December 2019. The World Health Organization (WHO) identified the disease as a public health problem and raised the contamination status, then declared Coronavirus Disease 2019 (COVID-19) as a global pandemic on March 11th, 2020, given the growing number of cases.^{1,2}

Coronavirus spread rapidly around the world, resulting in long-term range global limitations that is currently burdening healthcare systems around the world.^{1,3} According to WHO, COVID-19 is a highly transmissible disease.

Droplets, when ejected from an infected person, carry virus and transmit infection. Asymptomatic patients may also transmit the virus. Considering the mode of transmission, oral cavity seems to have an important role in spreading the disease. The new coronavirus increases the contagion capacity of ACE 2 receptors with high expression in oral tissues such as tongue, oral mucosa, gingival tissues, indicating that the oral cavity is a potential reservoir and risk route for COVID-19 infection.⁴⁻⁷ Similar with influenza virus, coronavirus causes respiratory disease with comparable symptoms and same route of transmission. However, compared to influenza virus, coronavirus leads to a poorer outcome and more unpredictable.⁸

The first COVID-19 case in Indonesia was announced on March 2, 2020, with the highest cases occurring on July 15th 2021 whereby 56.757 cases in total were detected. The infection rate started to decrease in August 2021. WHO later considered Indonesia as one of the countries with a good COVID-19 management.

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The Indonesian government established a national task force for COVID-19. The task force determined referral hospitals for COVID-19 and recommended public health regulations, such as proper masks wearing, physical distancing, handwashing, crowds avoidance, staying at home, avoiding eating in groups, and mass vaccination. A target of COVID vaccination covering 70% of the total population was determined by the government.

COVID-19 is a preventable communicable disease. General health, including oral health, plays an important role in COVID-19 prevention since it contributes to optimal immune system. In addition, good health behaviour is also essential in the disease prevention.

Family is the smallest unit in a community, and mother is generally a role model in a family. Mother's knowledge, attitude, and practice on oral and general health is essential in COVID-19 prevention in the family. Knowledge can be obtained through formal and informal education, work, age, interest, experience, culture, and information. Attitude is an individual act according to his/her comprehension, knowledge, and activities. Moreover, attitude is also influenced by beliefs, norms, and behaviour. Behaviour is an assessment of an object based on obtained information, knowledge, emotions, and appropriate attitude. Good attitude on oral health among mothers can have a good effect in the children's oral health. Yang Zhang et al (2020) reported that children's oral health status (OHS) can be influenced by their oral health practices and many parental factors. In a family, parents may affect their children's oral health behaviors (OHB) and OHS via their oral health knowledge, attitudes, and behaviors.¹⁰

Good knowledge, behaviour, and attitude on COVID-19 among mothers may benefit family and community. Furthermore, adequate support and awareness in the community strengthen implementation of governmental programs on COVID-19. Therefore, it is necessary to assess awareness (including knowledge, behaviour, and attitude) on oral health among mothers during the pandemic. This study can contribute to improve public policy in COVID-19 control and prevention by empowering society, particularly mothers.

Materials and methods

Ethical consideration

This study was approved by the Ethical Committee of Health Research, Faculty of Dentistry, Trisakti University, Jakarta, Indonesia. Written informed consent was obtained from each study participant at the beginning of the study (No: 018/S3/KEPK/FKG/3/2022; March 24th, 2022).

Sample size calculation

A minimal sample of 350 participants was estimated to fulfil an adequate power of the study. A total of 499 individuals finally participated in the study.

Study design and population

An analytical cross-sectional study was conducted in Indonesia between July 2022 and August 2022. Data through questionnaires were collected online using Google form given the pandemic circumstances. Participants were recruited from Indonesian government employees and wives' community of the Indonesian Military Forces (Armed Force, Navy Force, and Air Force). Purposive sampling and total sampling techniques were applied. Inclusion criteria were mothers who resided in the same household as the husband and children. We excluded participants who were unable to fill out the questionnaire due to any reasons (e.g., poor internet connection, unwillingness to participate, incomprehension, etc).

Questionnaire development and data collection

As the research instrument, a 22-item questionnaire on health awareness during COVID-10 pandemic was developed based on expert panel discussion, literature review, and cultural atmospheres. Participants' awareness was measured in Likert scale, a scale most used in assessing opinions, beliefs, and attitudes.

Questionnaire validation was conducted in a subsample of study participants. Validity and reliability were examined using correlation coefficient and Cronbach's alpha. Correlation coefficient > 0.4 was considered as valid. Cronbach's alpha > 0.7 was considered as reliable. Given the pandemic circumstances, the validated questionnaire was filled out by the study participants online using google form.

Statistical analyses

Data management was performed using Google form and exported to the software

Statistical Package for Social Sciences (IBM SPSS version 25.0). Univariate, bivariate, and multivariate analyses were performed to assess mothers' awareness on oral and general health during the pandemic, and its association with mothers' characteristics.

Results

Participation rate of this study is 100%. A total of 499 participants filled out the questionnaire completely. The association between maternal education level, employment status and awareness are shown in Table 1.

		n	%	Poor	Good	p
Education	Primary-Junior High School	6	1.20	3	3	0.06
	Senior High School	133	26.70	40	93	
	Diploma/Bachelor	360	72.10	149	211	
Employment	Employed	297	59.50	119	178	0.38
	Unemployed	202	40.50	73	129	

Table 1. Association between education level, employment status and awareness.

The obtained p value indicates no significant association between maternal education level and awareness of general, dental, and oral health. Both unemployed and employed participants tended to have good awareness. The proportion of good awareness among employed participants was 59.9% (n = 178) and among unemployed participants was 63.9% (n = 129).

Further, the analysis showed that the age of the study participants ranged between 19.75 and 60.21 years. Mean age was 41.8 years. The awareness of the participants was divided into 5 types of responses: strongly disagree, disagree, neither agree nor disagree, agree, and strongly agree. The similar age between mothers with good awareness and mothers with poor awareness was also found. In other words, age did not affect awareness. The analysis also showed that the mean age of mothers with poor awareness vs. good awareness were 42.2 years vs. 41.2 years.

Variable	B	S.E	p	OR	95%CI	
					Min	Max
Education levels						
Elementary – junior high school	0.84	0.84	0.32	0.43	0.83	2.23
Diploma/Bachelor	-0.46	0.22	0.03	0.63	0.41	0.97
Employment	-0.146	0.19	0.45	0.87	0.59	1.26
Age	-0.11	0.01	0.28	0.99	0.97	1.009
Constant	1.35	0.47	0.004	3.87		

Table 2. Multivariate logistic regression analysis.

Multivariate analysis was performed to assess the association between characteristics and mothers' awareness. Table 2 perform that most characteristic variables were not associated with awareness (p-value > 0.05). The significant variable was education level (p-value = 0.035), meaning awareness among mothers with diploma/bachelor education differed from awareness among mothers with high school education.

Then, the result shows that mean awareness on general and oral health was 3.67 (the scale ranged from 1 to 5). When analysed as categorical variables, 61.5% of study participants had good awareness (i.e., score ≥ mean score) and 38.5% had poor awareness (score < mean score).

Discussion

COVID-19 pandemic that has occurred since late-2019 caused massive changes in human life, including general and oral health. Proper management of general and oral health is essential.

Family, as the smallest unit in a community, can be empowered for initiating beneficial things, including health. Mother is a main figure and a role model in the family, who is usually responsible for family daily care, including health.

Previous studies have shown children's general and oral health are associated with mothers' general and oral health. It has suggested that general and oral health among mothers and children should be considered as an entity.^{11,12} Oredugba et al (2014) investigated instruments to measure mothers' knowledge and examine mothers' dental and oral health. The result of the study can be used as a guideline for promotion and prevention of oral disease in particular areas.¹³

The present study aimed to assess mothers' general and oral health care awareness during COVID-19 pandemic. Mothers' awareness (knowledge, attitude, practice) on health protocol during COVID-9 pandemic was assessed. The items included COVID-19 transmission, mouth cavity as virus reservoir handwashing using soap, hand sanitizer, COVID-19 vaccination, proper face mask, physical distance, toothbrushing, tongue brushing, COVID-19 survivors should replace toothbrush with the new one, gargling

with povidone iodine, dental visit, dental emergency case.

Handwashing using soap or hand sanitizer has been proven to kill SARS-CoV-2, virus causing COVID-19. Hands are critical vector for transmitting microorganisms. Handwashing using soap and running water for at least 20 seconds or using of alcohol-based hand sanitisers when soap and water are not available, is the first line of defence in preventing transmission¹⁴

COVID-19 vaccination has significantly improved the pandemic circumstances and saved te millions of lives worldwide. The vaccination has been estimated to prevent 14.4 million deaths due to COVID-19 in 185 countries and territories between Dec 8, 2020, and Dec 8, 2021. To reduce COVID-19 transmission, WHO has recommended to apply social distance. For instance, by avoiding crowded public areas and maintaining at the minimum of two-meter distance, particularly when someone coughs or sneezes. In addition, wearing medical mask (especially N95) or a respirator (especially FFP3) has been recommended.⁶

Eduardo et al found that antimicrobial toothpastes reduced saliva viral load of patients with COVID-19 immediately after brushing.¹⁶ On the contrary, inappropriate use of dental equipment in household could contribute to indirect transmission of COVID-19 among family members. To minimize transmission risk within a household, family members should understand appropriate use of equipment in oral care, including not sharing same toothpaste or toothbrush, not putting all toothbrushes in the same cup or holder, closing the toilet lid before flushing, disinfecting the toothbrush after use, and changing to new toothbrush after recovering from COVID-19.¹⁷

Oral viral load of SARS-CoV-2 has been shown to be associated with COVID-19 severity. Therefore, reduction in oral viral load may contribute to reducing the disease severity. Reduction in oral viral load may also reduce the risk for transmission. Antiseptic agents can be used to reduce oral viral load.¹⁸ It has been suggested that mouthwash containing of 1 – 0.2% povidone iodine are effective and potential to reduce oral viral load of COVID-19. A two-minute toothbrushing with toothpaste twice a day is recommended for individuals at high risk for being exposed to COVID-19. In addition to

toothbrushing with toothpaste, gargling with medicated mouthwash or water is beneficial to to physically remove the accumulated viral nucleic acid in oral cavity.^{19,20}

Poor oral hygiene has been suggested to be correlated with hyperinflammation. Taken together, it is possible that a more severe form of COVID-19 infection is associated with poorer oral health status. Poor oral hygiene and problems such as periodontitis, gingivitis, cavities, abscesses create appropriate environments for COVID-19 to have a severe picture. Good oral hygiene reduces the morbidity and severity of COVID-19.^{5,21}

During the pandemic, access to dental facility has been relatively limited due to lockdown and health protocols applied in dental care. Moreover, there has been fear of transmission of infection among parents and among dental staffs. Dental visit is only recommended only for emergency cases. We determined items in the questionnaire according to these considerations.

The result of our study showed that mean age of the participants was 41.8 years. Mothers with good and poor awareness had similar mean age. Maternal age is often considered as a substance and theoretical and counselling intervention that has an emphasis on the meaning of mothers regardless of age, but rather on their most effective and strategic role in changing their child's general and dental health behaviour. Some studies reported younger mothers (<30 years of age) had better practice on oral and dental health than older mothers. The other reported that younger mothers tended to give less care on children's oral and dental health.²²⁻²⁵ In other side, our study indicates that age did not affect awareness of the mothers.

Most participants had a diploma or bachelor's educational background. However, education level was not associated with awareness. Setyaningsih and Prakoso (2016) found that education level, socioeconomic status, and parents' knowledge explained 47.3% of oral and health status among children under 5 years, while the other 52.7% were explained by other factors. This implies a lot of unmeasured factors other than those investigated factors also affect oral and dental health.⁹

Unemployed and unemployed participants in this study had good awareness. The massive information technology based on

big data, internet, and artificial intelligence has brought fundamental changes to human patterns and lifestyles, especially after the COVID-19 pandemic. The pandemic hit globally, has added to a large and complex problems for parents, as well as demanding people to take care of their children.²⁶ In such a situation, parents naturally would protect the children's health. Some widely spread information (such as children are susceptible to COVID-19 infection, and individuals below 18 years of age are not entitled to have vaccine booster) worried parents. In general, most parents have good awareness on general and oral health.

Conclusions

The most mothers have good awareness on general, oral, and dental health. It is necessary for mothers, as an important figure in the family, to have sufficient knowledge, attitude, and awareness so that they can contribute to prevent COVID-19 in the family.

Declaration of Interest

The authors declare that there is no conflict of interest.

References

1. Ferrazzano GF, Ingenito A, Cantile T. COVID-19 Disease in Children: What Dentists Should Know and Do to Prevent Viral Spread. The Italian Point of View. *Int. J. Environ. Res. Public Health* 2020;17:3642.
2. Laureano ICC, Farias L, Khomyn NG, et al. Mental Health of Dentists during The COVID-19 Pandemic: A Critical Literature Review. *J Int Dent Med Res* 2021;14(1):192-202.
3. Kasuma N, Nurwidayastuti P, Lestari C, et al. The Application of Teledentistry: An Alternative Dental Service in Pandemic Era. *J Int Dent Med Res* 2022;15(2):699-706.
4. Sanche S, Ling YT, Xu C, et al. High Contagiousness and Rapid Spread of Severe Acute Respiratory Syndrome Coronavirus 2. *Emerg Infect Dis* 2020;26(7):1470-77.
5. Arouja MM. The Importance of Reducing The Viral Load in The Oral Cavity. Short Report. *Int J Oral Dent Health* 2021;7(124).
6. Lotfi M, Hamblin MR, Rezaei N. COVID-19: Transmission, Prevention, and Potential Therapeutic Opportunities. *Clin Chim Acta* 2020;508:254-266.
7. Troeltzsch M, Berndt R, Troeltzsch M. Is The Oral Cavity A Reservoir for Prolonged SARS-CoV-2 Shedding? *Medical Hypotheses* 2021;146:110419.
8. Uthman AT, Al-Rawi NN, Othman B, et al. COVID-19: Unravelling 10 Most Significant Answers about The Current Pandemic. *J Int Dent Med Res* 2021;14(1):394-403.
9. Setyaningsih R, Prakoso I. Correlation between Education, Socio-Economic, and Parental Knowledge about Dental Care with the Incidence of Dental Caries in Toddlers in Mancasan Baki Village, Sukoharjo. *Kosala Nursing High School. J of Health Sc* 2016;4(1):13-24.
10. Zhang Y, Li KY, Lo ECM, et al. Structural equation model for

- parental influence on children's oral health practice and status. *BMC Oral Health* 2020;20(56):1-10.
11. Mi Lee S, Na Kim H, Bom Kim J. Association between Maternal and Child Oral Health and Dental Caries in Korea. *J of Public Health* 2019;27:219-27.
 12. Premkumar S. *Manual of pediatric dentistry*. 1st ed. New Delhi : Jaypee Brothers Medical Publishers; 2014:171-220.
 13. Oredugba F, Agbaje M, Ayedun O, et al. Assessment of Mother's Oral Health Knowledge : Towards Oral Health Promotion for Infant and Children. *J Sc Res Health* 2014;6:908-15.
 14. Alzyood M, Jackson D, Aveyard H, et al. COVID-19 Reinforces The Importance of Handwashing. *J Clin Nurs* 2020; 29(15-16):2760-2761.
 15. Watson OJ, Barnsley G, Toor J, et al. Global Impact of The First Year of COVID-19 Vaccination: A Mathematical Modelling Study. *The Lancet Infectious Disease* 2022; 22(9):1293-1302.
 16. Eduardo FP, Correa L, Mansur F, et al. Effectiveness of Toothpaste on SARS-CoV-2 Viral Load in Saliva. *Int Dent J* 2022;72(6):825-31.
 17. Gonzales-Olmo MJ, Delgado-Ramos B, Ruiz-Guillen A, et al. Oral Hygiene Habits and Possible Transmission of COVID-19 among Cohabitants. *BMC Oral Health* 2020; 2(286): 1-7.
 18. Herrera D, Serrano J, Roldan S, Sanz M. Is The Oral Cavity Relevant in SARS-CoV-2 Pandemic? *Clin Oral Investig* 2020;24(8):2925-30.
 19. Warabi Y, Tobisawa S, Kawazoe T, et al. Effects of Oral Care on Prolonged Viral Shedding in Coronavirus Disease 2019 (COVID-19). *Spec Care Dentist* 2020;40(5):470-4.
 20. Ather A, Parolia A, Ruparel NB. Efficacy of Mouth Rinses Against SARS-CoV-2: A Scoping Review. *Front. Med. Dent* 2021;2:1-11.
 21. Kamel AHM, Basuoni A, Salem ZA, Abubakar N. The Impact of Oral Health Status on COVID-19 Severity, Recovery Period and C-reactive Protein Values. *Br Dent J* 2021;24:1-7.
 22. Kumar S, Kroon J, Laloo R, et al. Relationship between Body Mass Index and Dental Caries in Children, and The Influence of Socio-Economic Status. *Int Dent J* 2017;67:91-7.
 23. Nourijelyani K, Yekaninejad MS, Eshraghian MR, et al. The Influence of Mother's Lifestyle and Health Behavior on Their Children : An Exploration for Oral Health. *Iran Red Crescent Med J* 2014;16(2):e16051.
 24. Moimaz SAS, Fadel CB, Lolli LF. Social Aspects of Dental Caries inThe Context Mother-Child Pair. *J Appl Oral Sci* 2014;22(1):73-8.
 25. Foxman B, Davis E, Neiswanger K, et al. Maternal Factor and Risk of Early Childhood Caries: A Retrospective Cohort Study. *Community Dent Oral Epidemiol* 2022;00:1-13.
 26. Khomaeny EFF, Kusumaputri ES. Parental Anxiety and Form of Parenting during The COVID-19 Pandemic. *Int J of Child Care and Edu Policy* 2022; 16(1):1-16.