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Research Article

The Dental Students' Compliance To The Covid-19 Health Protocols In Private Universities In Indonesia: Cross-Sectional Survey

Lisa Prihastari[1]*, Rozalinda[2], Adzkia Dheyatika Asri[2], Riki Wira Laksana[2], Vio Nica Fisri[2], Sonya Priyadharsini[1]

[1]Dental Public Health and Prevention Department, Faculty of Dentistry, Universitas Yarsi, Central Jakarta, DKI Jakarta, Indonesia
[2]Postgraduate student, Faculty of Medicine, Universitas Yarsi, Central Jakarta, DKI Jakarta, Indonesia
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Abstract

The COVID-19 pandemic has brought about extensive changes in human lifestyles as individuals adopt preventive measures through health protocols. Dental students, playing a pivotal role in society, are particularly instrumental in implementing these protocols within their families and communities. This study aims to evaluate the compliance of dental students with COVID-19 protocols at five private universities in Indonesia and explore associated factors. This study was carried out by distributing validated online questionnaires to college students enrolled in undergraduate and professional dental programs. The questionnaire encompassed five questions assessing the adherence to COVID-19 preventive measures gained from 706 participants and was analyzed using statistical methods, including chi-square and multivariate logistic regression. Descriptive analysis revealed that 51.1% of students adhered to COVID-19 protocols. Notably, female students exhibited significantly higher compliance, with an odds ratio of 2.361 ($p < 0.001$). On the contrary, variables such as student group, academic year, parental education levels, family size, and the presence of vulnerable family members showed no significant associations ($p \geq 0.05$). Gender and students' comorbid disease history emerge as influential factors affecting their compliance with COVID-19 protocols.

Keywords: COVID-19, compliance level, protocol, dental students, preventive measures

INTRODUCTION

COVID-19 virus first emerged in Wuhan, Hubei Province, China, in December 2019 and has now impacted almost every country, including Indonesia. The effectiveness of curbing the virus's spread hinges significantly on the extent to which communities adhere to government-mandated health guidelines.[1] Younger members of society, such as students, tend to exhibit more reluctance in adhering to these preventive measures, often perceiving themselves as less vulnerable.[2,3] Studies conducted in China have revealed that students played a significant role in propagating the virus. In Indonesia, a survey involving medical students unveiled concerning statistics—only 51.5% of students held a positive attitude towards COVID-19[4], with merely 29.8% possessing adequate knowledge about the disease.[5] These findings raise concerns that a substantial proportion of healthcare students may not be fully complying with COVID-19 protocols, potentially posing a threat to their surrounding communities.

In this case, dental students, as part of the healthcare community, face an elevated risk of contracting and transmitting diseases, including COVID-19, due to the virus's transmission through droplets and airborne particles.[7] Research conducted on dental students in Tehran has

* Corresponding author, e-mail: lisa.prihastari@yarsi.ac.id

revealed that these students possess a reasonable level of general knowledge regarding protocols to combat viral infections, particularly with regard to practices such as hand hygiene, mask-wearing, sanitation, and recognizing clinical symptoms in potentially infected patients. However, a deeper understanding of these guidelines is lacking among many students, highlighting the importance of incorporating comprehensive health protocols into their educational curriculum.[8] The adherence of dental students to COVID-19 protocols during their educational activities, including interactions with instructors, peers, and patient care in hospitals, plays a crucial role in preventing virus transmission within the broader community.[9] The compliance factor among dental students may contribute to the spread of COVID-19 in the community, as they are an important and already educated group. There is currently a dearth of research examining the compliance levels of dental students, particularly at private universities in Indonesia. Hence, researchers aim to assess their compliance levels and identify the factors influencing their adherence to these protocols. This information can be instrumental in planning and implementing effective prevention strategies among the younger generation, guided by relevant institutions.

MATERIALS AND METHODS

Research Subjects

For this research, a sample size of 706 students was selected from five private dental universities in Indonesia, namely YARSI University, UNJANI, UNBRAH, UMY, and UNISSULA. The determination of the sample size followed the infinite population descriptive research formula, employing non-probability quota sampling techniques. The selection of universities was carried out using purposive sampling. The estimated proportion of dental students exhibiting compliance with the protocol was set at 60%, with a margin of error of 5% and a two-sided 95% confidence interval. The inclusion criteria encompassed all active students enrolled in the Faculty of Dentistry at the five universities who also resided with their parents during the COVID-19 pandemic. Exclusion criteria applied to subjects who failed to complete the questionnaire in its entirety or submitted duplicate responses.

Research Procedures

A cross-sectional survey research design was employed for this study, conducted from December 2020 to December 2021. The research involved the distribution of questionnaires through Google Forms to active dental students at five private universities, encompassing both undergraduate and professional stages of education. The questionnaire comprised a total of five questions aimed at assessing personal compliance as well as compliance according to the student's parents. Each respondent was initially asked to complete a consent form, followed by providing comprehensive sociodemographic information, and finally, filling out the questionnaire pertaining to their adherence to the COVID-19 protocol.

Measurement

The questionnaire used in this study was originally adapted from prior research and subsequently refined by the researchers. It underwent a rigorous translation process, first into Indonesian by a certified translator and then back into English by another translator to ensure accuracy. Validity assessment using Pearson's r correlation test yielded consistently significant results ($p < 0.001$) with p-values surpassing the established threshold for each question.

Reliability, as measured by Cronbach's Alpha, indicated satisfactory consistency with a score of 0.725. The questionnaire encompassed sections concerning the sociodemographic characteristics of both students and their parents, including family size and health-related information, notably the presence or absence of comorbid conditions. Self-adherence was assessed through four questions gauging personal compliance and one question evaluating adherence from the parent's perspective, employing a Likert scale ranging from 1 to 5 (never, rarely, sometimes, often, and always). Self-adherence scores were computed as the sum of these questions and subsequently categorized into two levels using the mean score as the delineation point, distinguishing between "compliance" (scores > mean) and "non-adherence" (scores ≤ mean).

RESULTS

In this study, a total of 706 students, consisting of 278 males and 428 females, participated and completed valid questionnaires. These students were categorized into two groups: the undergraduate group (377 students) and the dental profession group (329 students). Analysis of compliance levels revealed that 361 students (51.1%) demonstrated adherence, while 345 (48.9%) did not comply (as detailed in Table 1). Table 2 presents the compliance questionnaire, including responses on a scale from "never" to "always." Table 2 shows that the most frequently followed protocol is wearing a mask, while the least followed is maintaining physical distance. To explore the relationship between adherence levels and various sociodemographic factors, family-related variables, and the presence of comorbid diseases, chi-square analysis was performed, with the results outlined in Table 3. Gender was found to be a significant factor influencing adherence levels, with female students showing higher levels of compliance compared to male students.

Analysis

Following the data collection phase, the collected data underwent processing and analysis utilizing IBM Statistics version 25. The analysis involved both univariate and bivariate approaches. Univariate analysis was employed to elucidate the frequency distribution of each variable. Given the categorical nature of the variables, a Chi-Square comparative test of proportions was used for this purpose. Additionally, to assess the strength and nature of the relationship between student compliance variables and parental compliance, a Spearman's correlation test was conducted. This choice was made due to the non-normal distribution of the data, making Spearman's correlation a suitable method for this analysis.

Table 1. Frequency distribution by sociodemographic profile

Variable	Number	Percentage (%)
Age		
18-23	564	79.9
24-28	142	20.1
Sex		
Male	278	39.4
Female	428	60.6
Student group		
Bachelor	377	53.4
Professional (internship)	329	46.6
Enrollment Year		
Theoretical semester (2019-2020)	252	35.7
Pre-clinical semester (2017-2018)	169	23.9
Clinical semester (2015-2016)	206	29.2
Dental internship (after 2014)	79	11.2
Education background (Father)		
Elementary	26	3.7
Middle	178	25.2
High	502	71.1
Education background (Mother)		
Elementary	43	6.1
Middle	203	28.8
High	460	65.2
Number of family members		
1-3 persons	413	58.5
>4 persons	293	41.5
Number of family members older than 60 years old in the house	512	72.5
No	194	27.5
Yes		
Number of family members younger than 12 years old in the house	360	51.0
No	346	49.0
Yes		
Having comorbidities that can worsen COVID-19 symptoms (Diabetes/Hypertension/Autoimmune diseases/Respiratory system disorders/Heart conditions/Immunosuppressive conditions)	166	23.5
Yes	540	76.5
No		
Families with comorbidities that can exacerbate COVID-19 symptoms (Diabetes/Hypertension/Autoimmune diseases/Respiratory system disorders/Heart		

conditions/Immunosuppressive conditions)	274	38.8
Yes	432	61.2
No		
Students' Compliance		
Compliant	361	51.1
Non-compliant	345	48.9

Table 2. Responses to the questionnaires on COVID-19 protocol compliance among dental students

No	Item	Never	Rarely	Sometimes	Often	Always
1	I wear a mask when I have to leave my house.	0	0.1	0.3	5.7	93.9
2	I regularly clean my hands with soap and running water or use hand sanitizer.	0	0.8	7.2	27.2	64.7
3	I maintain a distance from others (at least 2 meters) when I leave my house.	1.3	2.0	24.8	39.8	32.2
4	I stay at home and only go out if it is absolutely necessary.	0.8	2.4	21.5	34.7	40.5
5	According to my parents, I adhere to COVID-19 prevention health protocols during the pandemic.	0	0.6	5.9	33.7	59.8

Table 3. Analysis of Chi-Square test results on students' compliance based on sociodemographic profile

Variable	Level of Students' Compliance		p-value
	Non-compliant	Compliant	
Sex			
Male	87 (68.0%)	41 (32.0%)	0.0001*
Female	274 (47.4%)	304 (52.6%)	
Student group			
Bachelor	195 (51.7%)	182 (48.3%)	0.794
Professional	166 (50.5%)	163 (49.5%)	
Enrollment Year			
Theoretical- Pre-clinical	221 (52.8%)	200 (47.5%)	0.422
Clinical-Dental internship	140 (49.1%)	145 (50.9%)	
Education background father			
Elementary	18 (69.2%)	8 (30.8%)	0.146
Middle	93 (52.2%)	85 (47.8%)	
High	250 (49.8%)	252 (50.2%)	
Education background mother			
Elementary	31 (72.1%)	12 (27.9%)	0.011*
Middle	96 (47.3%)	107 (52.7%)	
High	234 (50.9%)	226 (49.1%)	
Number of family members living in one household (excluding yourself)			0.984
≤ 3 persons	108 (51.4%)	102 (48.6%)	
> 3 persons	253 (51.0%)	243 (49.0%)	
Family members living in the same household over 60 years old:			0.446
No	259 (50.6%)	253 (49.4%)	
Yes	102 (52.6%)	92 (47.4%)	
Family members living in the same household under 12 years old			0.123
No	174 (48.3%)	186 (51.67%)	
Yes	187 (54.02%)	159(45.9%)	
Students having comorbidities that can worsen COVID-19 symptoms			
No	98 (59.0%)	68 (41.0%)	0.025*
Yes	263 (48.7%)	277 (51.3%)	
Families have comorbidities that can worsen COVID-19 symptoms:			
No	132 (48.2%)	142 (51.8%)	0.054
Yes	175(40.5%)	257 (59.5%)	

The analysis of the relationship between the independent variables, specifically gender and students' history of comorbidities, in relation to the level of adherence, is presented in Table 4. The results of logistic regression indicate that gender exerted a significant influence, with female students

demonstrating notably higher adherence to COVID-19 prevention protocols compared to male students (OR = 2.361; 95% CI = 1.571-3.547; P = 0.001). Moreover, students with a history of comorbidities that could exacerbate COVID-19 symptoms exhibited better adherence to these protocols in contrast to those without such a medical history (OR = 0.656; 95% CI = 0.459-0.937; P = 0.020).

Table 4. Variables that correlate with students' compliance

Variable	Odds Ratio	95%CI	p-value
Sex Male* Female	2.361	1.571-3.547	<0.001
Students have comorbidities that can worsen COVID-19 symptoms: No* Yes	0.656	0.459-0.937	0.020

DISCUSSION

The outcomes of the Chi-Square test conducted in this study revealed no statistically significant relationship between student compliance levels and various sociodemographic factors, including student groups, year of study, mother's last education, number of family members in one household, family members aged over 60, family members under 12, respondents with comorbid diseases (those that can worsen COVID-19 symptoms), and respondents whose families have comorbid diseases. However, significant relationships were observed based on student compliance levels with respect to the mother's gender and educational background, as well as the presence of comorbidities that could exacerbate COVID-19 symptoms in students.

The non-significant test results concerning student groups and class year are likely attributable to the extensive dissemination of information about the COVID-19 pandemic through various media channels, given the widespread coverage and accessibility of COVID-19 information from sources like social media, television, and radio.[10] Distinctions between undergraduate and professional students, as well as different student year cohorts, may no longer significantly impact student compliance levels.11 It is worth noting that approximately 40% of students reported obtaining COVID-19 information from such media outlets, which likely contributed to a relatively uniform level of knowledge among students.[10] However, it is important to acknowledge which suggests that students at higher academic levels tend to possess greater knowledge and exhibit higher compliance levels.[12] This underscores the nuanced relationship between academic progress and COVID-19 awareness and adherence among students.[12]

The level of education among parents, particularly mothers, as indicated in this study, can indeed significantly influence student compliance. This suggests the crucial role that mothers often play in family

dynamics, including adherence to disease prevention measures. A similar concept has been expounded within the realm of education, where education levels contribute to individuals' understanding of disease control and the implementation of appropriate preventive measures.[13] Higher education levels can empower individuals with more opportunities to access information about various methods to prevent COVID-19, thereby enabling them to adopt suitable practices.[14] Furthermore, increased education tends to enhance one's comprehension of control measures and prevention strategies pertaining to COVID-19 protocols. On the other side, a majority of students (85.1%) expressed concerns about their family members contracting COVID-19.4 This concern stemmed from the belief that parents and older family members might have a poorer prognosis if infected with COVID-19. Consequently, students tended to prioritize the health and well-being of their parents and older family members over their own. These differing perspectives underscore the complex interplay between education, family dynamics, and COVID-19-related worries among students.[4]

The results also revealed that only 51.1% of students adhered to the COVID-19 protocol. This finding resonates with a similar study conducted in Jakarta, Indonesia, where only 55.9% of UIN Syarif Hidayatullah Jakarta students were observed to implement effective COVID-19 protocols, particularly with regard to social distancing.[15] This percentage may be indicative of the persistently high rate of COVID-19 transmission in Indonesia. Despite being a cohort of educated young adults with significant mobility, it is apparent that the health education imparted during their academic pursuits does not consistently translate into compliance with established regulations. This discrepancy warrants attention from educational and health institutions in Indonesia, urging a reevaluation of the strategies employed to enhance adherence to vital health protocols in this demographic.

In this research, females exhibited 2.361 times better compliance with COVID-19 protocols compared to male students. These results align closely with research conducted by Yuki et al. (2020), which indicated that approximately 50% of females are more inclined to engage in practices such as handwashing, mask-wearing, and avoiding crowded settings compared to males.[16] Furthermore, this trend is substantiated, which highlighted that females tend to possess greater knowledge and adopt more appropriate practices for COVID-19 control measures.[13] Other studies have also underscored that females' preventive practices are twice as high as those of males. This may be attributed to the fact that females often engage in tasks such as childcare and food preparation, leading to heightened awareness of precautions as a means of safeguarding both themselves and others from potential infection.[17]

This research has several limitations. Firstly, data collection was conducted through an online questionnaire due to the prevailing pandemic conditions, potentially allowing for subjective responses despite efforts to validate and ensure the reliability of the questionnaire. Secondly, online questionnaires, including this one, may not always capture the true real-time conditions of the respondents and are inherently cross-sectional, providing a snapshot of information at a single point in time. Additionally, further research is warranted to explore various other factors associated with adherence levels to COVID-19 prevention protocols, including behaviors related to

vaccination. Employing a combination of questionnaire surveys and direct interviews may offer a more comprehensive approach to obtaining more precise and in-depth result.

CONCLUSION

Based on the conducted research, it can be concluded that approximately 51.1% of students adhere to the COVID-19 health protocol. Two key factors significantly associated with the level of student compliance are gender and a history of comorbidities among the students.

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