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UNDERSTANDING PUBLIC COMPLIANCE WITH COVID-19 HEALTH PROTOCOLS IN INDONESIA: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: The Coronavirus Disease 2019 has become a global pandemic, affecting many countries, including Indonesia. The number of COVID-19 cases in Indonesia, particularly in Jakarta, continues to increase. **Purpose:** This study aimed to identify the factors influencing compliance with the COVID-19 prevention protocol among Jakarta's residents. **Methods:** An accidental sampling technique was used in this study, with the calculation of hypothesis testing of the difference between two proportions, resulting in a total sample of 440 respondents. Data was collected through an online survey using Google Forms. **Results:** The study found that education level (p-value=0.003; OR=1.818), knowledge (p-value=0.01; OR=6.669), attitude (p-value=0.01; OR=7.789), perception of vulnerability to COVID-19 (p-value=0.01; OR=3.307), social support (p-value=0.01; OR=3.733), and supervision (p-value=0.01; OR=3.435) had a significant relationship with compliance with the COVID-19 prevention protocol. However, facilities and infrastructure (p-value=0.341; OR=0.453) had no significant relationship with compliance. From the odds ratio data, knowledge and attitude significantly influence adherence to COVID-19 preventive measures. Individuals well-informed about COVID-19 are 6.6 times more likely to comply, and a positive attitude increases this likelihood by 7.8-fold. This underscores the strong link between awareness and adherence to recommended protocols. **Conclusion:** This study highlights the importance of understanding the factors affecting adherence to COVID-19 prevention protocols. It guides policymakers and public health professionals in devising effective strategies to curb the spread of the disease.

Keywords: implementation of health protocols, COVID-19, jakarta, COVID-19 pandemic

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INTRODUCTION

Since December 2019, the COVID-19 pandemic caused by the SARS-CoV-2 virus began to spread rapidly globally (World Health Organization, 2020). The virus is highly contagious and can be transmitted by symptomatic and asymptomatic individuals (Bai *et al*., 2020). Its transmission rate is higher than that of the influenza virus (Pan *et al*., 2020). As a result, many public health organizations have recommended measures to slow down the virus's spread, ranging from total isolation of entire regions, as seen in Wuhan, China, to physical separation, stringent personal hygiene, and wearing masks in public areas in several countries, such as Canada, the United States, and some European nations.

In a mitigation scenario approach, many countries use social isolation measures to lower transmission rates among the general population to avoid overwhelming their healthcare systems (Anderson *et al*., 2020). These measures may include avoiding travel, minimizing physical contact with individuals outside one's family, and keeping a two-meter distance from others in public places. High-risk groups, such as older people and individuals with pre-existing medical conditions, may need stricter measures like complete quarantine and isolation (Kissler et al., 2020). However, these measures rely on the general public's compliance with public health policies, which may not always reflect actual behavior patterns, such as social distancing (Lewnard and Lo, 2020). In Indonesia, public health policies have been implemented, but many people still ignore and violate health protocols, as evidenced by the increase in the number of positive COVID-19 cases (BPK RI, 2021).

Indonesia's healthcare system has been severely affected by the COVID-19 pandemic, significantly impacting the country's economy, despite various measures, such as general health protocols in the community. Cases continue to surge, particularly in densely populated regions like West Java and Jakarta, highlighting the need to address shortages of hospital beds, medical supplies, and testing and tracing initiatives (Tadesse, 2020; Mahendradhata *et al*., 2021). The government provides tax exemptions, low-interest loans, and financial assistance to vulnerable households to mitigate the pandemic's economic impact. The World Health Organization and the International Monetary Fund as international organizations offer support and assistance (Caraka *et al*., 2020). The government must continue to take a proactive approach to address these challenges and ensure the safety and well-being of its citizens.

Noncompliance increase established health protocols increases the risk of disease transmission and undermines government and health authorities' efforts to manage the outbreak. It is critical to recognize that adhering to health protocols is a personal and social obligation to protect others from infection (Baloch *et al*., 2020). Therefore, educating and raising public awareness about the significance of adhering to health protocols, such as wearing masks, physical distancing, good hygiene practices, and avoiding crowds, is crucial. Government and health authorities should also provide the infrastructure and resources to implement and enforce health protocols (Onyema *et al*., 2020).

During Eid al-Fitr, the end of Ramadan, people's mobility toward shopping centers increases, driven by the desire to buy new clothes for the holiday (Utomo, 2021). This tradition adds to the importance of shopping during this time, especially when many stores offer discounts and attractive product promotions. However, in the current COVID-19 pandemic, adherence to health protocols is crucial, and health experts and the government are calling on the public to be vigilant and comply with measures such as physical distancing, wearing masks, hand washing, and avoiding crowds. Large crowds gathering in cities like Jakarta, Bandung, and Surabaya during the lead-up to Eid al-Fitr can trigger the virus's spread, causing concern. Therefore, the government and relevant parties must increase socialization and supervision to ensure that health protocols are still being implemented and that people do not gather in large numbers when shopping. The public also has a crucial role to play (Hasyim, 2020).

The Government of Indonesia has implemented several measures to handle the COVID-19 pandemic, including an increase in COVID-19 vaccinations (Muhyiddin and

Nugroho, 2021). These efforts include social campaigns and outreach to increase public awareness, as well as increasing vaccine availability and expanding access to vaccinations (Evans and French, 2021; Schoch-Spana *et al.*, 2021). In addition, the government has involved the community in surveys and volunteer vaccination programs to promote community participation. To increase public compliance with health protocols, the government has also applied sanctions to violators. These efforts are expected to help control the spread of COVID-19 in Indonesia, increase vaccination coverage, and achieve herd immunity to reduce the adverse effects of the COVID-19 pandemic on health and the economy (Arifin and Anas, 2021). By working together, these measures can ultimately contribute to a healthier and safer future for all.

Analyzing factors that influence public compliance with COVID-19 preventive measures is crucial for addressing noncompliance and devising strategies to reinforce adherence to health protocols. Jakarta, a region in Indonesia heavily impacted by the pandemic, has seen significant effects not only on health but also on key sectors such as the economy and education. This situation highlights the urgent need for a targeted approach to promote compliance and mitigate the multifaceted challenges posed by the virus within the community. Overall, this research is essential for devising more effective strategies to ensure public health safety and manage the ongoing COVID-19 pandemic.

The research's novelty lies in its specific focus on Indonesian compliance behaviors and its potential to influence local public health strategies. By examining factors that affect public adherence to health protocols, the study offers tailored insights that can enhance the effectiveness of health interventions and policies in Indonesia. Focusing on Jakarta between October and December 2021, the research contributes to the COVID-19 literature by offering a localized perspective on pandemic effects, enhancing understanding of societal responses during crises. The robust sample size bolsters statistical power, enabling the exploration of intricate patterns often overlooked in smaller studies. Methodological rigor and adaptability underscore the research's resilience, providing valuable insights into Jakarta's context and broader crisis adaptation. This approach situates the research at the forefront of pandemic-related knowledge. This study aimed to identify the factors influencing compliance with the COVID-19 prevention protocol among Jakarta's residents.

METHOD

Research Design

This research project is a cross-sectional quantitative study focusing on Jakarta residents' compliance with COVID-19 health protocols. The sample for this study comprises individuals aged between 18 and 64 who reside in Jakarta, and it was calculated using a hypothesis test on the difference between two proportions through accidental sampling, which resulted in a total of 440 respondents. To collect data, the responders completed an online Google Form.

Variables and Questionnaire

The study encompasses various independent variables that impact compliance with COVID-19 health protocols. These variables include the level of education, knowledge, attitude, perception of COVID-19 vulnerability, social support, supervision, and infrastructural facilities (Green and Kreuter, 2005). Social support may be procured from surrounding individuals such as family members, friends, colleagues, and healthcare professionals.

Compliance with health protocols is assessed through 14 questions using the Likert scale. The results are divided into 'non-compliant' for values of $x \leq 42.857$ and 'Compliant' for $x > 42.857$. This categorization aids in succinctly evaluating adherence to health guidelines within the examined population, through cross-tabulation with other independent dependent variables.

The education level of the respondents is evaluated through a single question and is divided into two distinct categories. The 'Low education level' category encompasses respondents who either have not attended school or have completed elementary school, junior high school, or high school. Conversely, the 'High education level' category includes those respondents who have graduated from a higher education institution.

Knowledge regarding COVID-19, encompassing aspects such as transmission,

prevention, and health protocols, is assessed among respondents through seven questions. The responses are quantified using the median, resulting in two categories: a 'Low knowledge level,' classified when the value of x is less than or equal to 71.428, and a 'High knowledge level,' categorized when the value of x is greater than 71.428. This categorization aids in evaluating the respondents' understanding and awareness of COVID-19-related matters.

The attitude toward health protocols for COVID-19 prevention is assessed among respondents through seven questions using questionnaires. Based on the Likert scale, the responses are categorized into two groups: a 'Negative attitude,' identified when the value of x is less than or equal to 57.142, and a 'Positive attitude,' distinguished when the value of x is greater than 57.142. This distinction aids in understanding the respondents' stance on adherence to COVID-19 prevention measures and contributes to further insights into public perception.

The perception of vulnerability to COVID-19 is evaluated among respondents through seven questions, employing the Likert scale for assessment. Respondents are classified into two categories: 'Not Vulnerable' if the value of x is less than or equal to 50, and 'Vulnerable' if the value of x is greater than 50. This categorization allows for an in-depth understanding of how respondents perceive their risk and susceptibility to COVID-19, a critical aspect in shaping preventive strategies and health policies.

Social support, a vital component in COVID-19 prevention, is evaluated through a series of eight questions. This encompasses the encouragement and guidance offered by different sources, including family, friends, community leaders, and other influential figures in the local environment. Respondents' level of support is gauged using a scoring system in which affirmative responses are marked with a score of 1, and negative responses are scored as 0. The cumulative score then categorizes individuals into two distinct groups: 'Low support' if the total score is less than 5, and 'High support' if the total score equals 5. This assessment helps to discern the social structures and relationships that may influence adherence to health protocols and preventive measures against COVID-19.

Supervision of the implementation of COVID-19 health protocols is measured through seven questions, reflecting the oversight carried out by military, police, or civil authorities. Respondents' perceptions are quantified using a median score, and then divided into two categories: 'Low supervision' if the value of x is less than or equal to 100, and 'High supervision' if it exceeds 100. This evaluation aims to understand the effectiveness of regulatory enforcement and its potential impact on adherence to safety measures within the community.

The availability of infrastructure and facilities to support COVID-19 prevention is evaluated through four questions. These public facilities include provisions for handwashing, alcohol-based hand sanitizers, temperature checks, and the dissemination of information. The assessment is conducted by scoring 1 for 'Yes' and 0 for 'No' responses, leading to two distinct categories: 'Inadequate' if the total score is less than 3, and 'Adequate' if the total score equals 3. This categorization serves as an essential measure to gauge the accessibility and sufficiency of preventive resources in the community.

Data Analysis

Univariate and bivariate analyses were the two primary methods of data analysis used in this study. Initially, the univariate analysis was used to describe and analyze the distribution of each variable in the study. After that, the bivariate analysis was used to establish the relationship between the independent and dependent variables. The chi-square test was used in the bivariate analysis for variables with two categories, with a 95% confidence level of 0.05. The null hypothesis was rejected if the p-value from the bivariate analysis was less than 0.05, indicating that the independent and dependent variables had a statistically significant relationship.

Ethical Clearance

This study adheres to ethical principles and guidelines, as it received approval from the Health Research Ethical Commission of UIN Syarif Hidayatullah Jakarta (Approval Number Un.01/F.10/ KP.01.1/KE. SP/05.08.026/2021).

RESULT

The characteristics of the respondents in this study were measured based on their gender, age group, residential area, and occupation. The data presented in Table 1 show that, out of the 440 respondents, 296 respondents (67.3%) were female. Most of the respondents (56.6%) belonged to the adult age category, ranging from 24 to 64 years. The respondents were found to be living in different areas of Jakarta, with the highest percentage being from East Jakarta (24.3%), followed by North Jakarta (19.1%), South Jakarta (18.2%), Central Jakarta (18.2%), West Jakarta (18%), and Thousand Islands (2.3%).

Table 1. Distribution of Respondents' Characteristics

Characteristic of Respondents	n	%
Gender		
Male	144	32.70%
Female	296	67.30%
Age Group		
Teenagers (15-22 years old)	191	43.40%
Adults (23-64 years old)	249	56.60%
District/City		
East Jakarta	107	24.30%
South Jakarta	80	18.20%
Central Jakarta	80	18.20%
North Jakarta	84	19.10%
West Jakarta	79	18.00%
Thousand Islands	10	2.30%
Occupation		
Unemployed	210	47.70%
Civil servants	12	2.70%
Military/Police personnel	7	1.60%
Private employees	146	33.20%
Entrepreneurs	23	5.20%
Others	42	9.50%
Compliance		
Non-compliant	212	48.20%
Compliant	228	51.80%

Regarding the occupation distribution, the study found that 47.7% of the respondents were unemployed, while 33.2% worked as private employees. Self-employed individuals represented 5.2% of the respondents. Additionally, 9.5% of the respondents had other jobs. Table 1 also shows that 48.2% of the respondents are non-compliant with COVID-19 preventive health protocols, whereas 51.8% comply.

The analysis, informed by Table 2 and subsequent statistical evaluation, highlights significant correlations (p-value 0.05) between compliance with COVID-19 preventive health protocols and education level, knowledge, attitude, perception of COVID-19 vulnerability, social support, and supervision. However, facility and infrastructure variables lack substantial correlation (p-value > 0.05). Notably, knowledge emerges as a standout factor, exhibiting a 6.6-fold increase in adherence for those well-informed about COVID-19. Additionally, a positive attitude reflects a substantial 7.8-fold likelihood of compliance with preventive measures. These findings emphasize the potency of informed knowledge and positive attitudes in promoting adherence to COVID-19 protocols.

Table 2. Distribution of the Relationship between Independent and Dependent Variables

Variable	Non-Compliant	Compliant	Total	%	Odds Ratio	95% CI	p-value
Education Level							
Low	115	90	205	46.59	1.818	(1.245 - 2.655)	0.01
High	97	138	235	53.41	Reference		
			440	100.00			
Knowledge							
Low	186	118	304	69.09	6.669	(4.103-10.839)	0.01
High	26	110	136	30.91	Reference		
			440	100.00			
Attitude							
Negative	155	59	214	48.64	7.789	(5.096 - 11.096)	0.01
Positive	57	169	226	51.36	Reference		
			440	100.00			
Perception of Vulnerability							
Not vulnerable	135	79	214	48.64	3.307	(2.237 - 4.888)	0.01
Vulnerable	77	149	226	51.36	Reference		
			440	100.00			
Social Support							
Low	56	20	76	17.27	3.733	(2.151 - 6.478)	0.01
High	156	208	364	82.73	Reference		
			440	100.00			
Supervision							
Low	65	26	91	20.68	3.435	(0.2080-5.675)	0.01
High	147	202	349	79.32	Reference		
			440	100.00			
Facilities							
Inadequate	3	7	10	2.27	0.453	(0.116-1.776)	0.34
Adequate	209	221	430	97.73	Reference		
			440	100.00			

DISCUSSION

This research provides valuable insights into the respondents' characteristics and can help inform future research and policies to improve compliance with COVID-19 health protocols. Respondents with higher education levels, better knowledge about COVID-19, a positive attitude toward preventative measures, a higher perception of vulnerability to COVID-19, more substantial social support, and better supervision are more likely to comply with COVID-19 preventive health protocols (Ferdous *et al.*, 2020; Hossain *et al*., 2020; Onyema *et al.*, 2020).

The facility and infrastructure variables do not significantly correlate with compliance with COVID-19 preventive health protocols. This suggests that the availability or quality of facilities and infrastructure may not be the primary factor affecting compliance with COVID-19 preventive health protocols. Instead, other variables such as education level, knowledge, attitude, perception of vulnerability, social support, and supervision may play a more significant role in determining compliance with COVID-19 preventive health protocols (Ferdous *et al*., 2020; Kwok *et al.*, 2020; Ning *et al*., 2020).

This analysis provides a comprehensive overview of the factors influencing compliance with COVID-19 preventive health protocols among respondents. The findings highlight the significant role of education level, knowledge, attitude, perception of vulnerability, social support, and supervision in determining adherence to COVID-19 preventive health protocols. Respondents with higher education levels, better knowledge, positive attitudes, a higher perception of vulnerability, more substantial social support, and better supervision are more likely to comply with COVID-19 preventive health protocols.

Individuals who perceive themselves as vulnerable to COVID-19 are more likely to comply with health protocols (González-Castro *et al*., 2021; Hanna *et al*., 2023). This is because they understand the risks associated with the virus and believe that these actions can help protect them from COVID-19. On the other hand, individuals who do not perceive themselves as vulnerable to COVID-19 are less likely to comply with health protocols as they may not consider preventative measures

necessary. Therefore, it is important to raise awareness about the risks of COVID-19 and communicate the importance of following health protocols to encourage compliance among individuals.

Furthermore, the research provides a comprehensive examination of the intricate effects of misinformation, adverse beliefs, and financial considerations on adherence to preventive health protocols for COVID-19. By delving into these aspects, the study uncovers how erroneous information can skew public perception, how negative attitudes can hinder compliance, and how economic factors may play a pivotal role in shaping individual and community responses to the preventive measures laid out to combat the spread of the virus.

Misleading information concerning COVID-19 can lead to negative perceptions and attitudes, which can decrease compliance (Nasir *et al*., 2020). Economic factors, such as reduced income due to the pandemic, may also affect adherence to COVID-19 preventive health protocols (Ahmad *et al*., 2020; Olivia *et al., 2020*). Reduced income due to the pandemic can impact an individual's ability to adhere to COVID-19 preventive health protocols. This may lead to a decreased likelihood of purchasing personal protective equipment and healthy food and an increased risk of exposure to the virus. Financial stress can also lead to mental health issues that further impact adherence to preventive health protocols. It is crucial to consider the economic impact of the pandemic when developing public health policies and interventions to ensure accessibility for all individuals regardless of their financial situation.

Furthermore, social support is crucial during the COVID-19 pandemic as it can improve individuals' physical and mental health, increase adherence to preventive health protocols, and mitigate the negative effects on vulnerable populations. It can come in various forms, including family support, testimonies from people, friends, and threats or imposition of fines in public health interventions and policies are very important to ensure that individuals carry out health protocol activities during the difficult times of the pandemic (Galende *et al*., 2022).

Social support can also help mitigate the negative effects of COVID-19 on vulnerable populations, such as older people, individuals with pre-existing conditions, and low-income households. These populations may face additional challenges during the pandemic, such as difficulty accessing healthcare or obtaining essential supplies. Respondents who receive support from friends and family or are monitored by authorities are more likely to comply with COVID-19 preventive health protocols (Icke, 2021). The cross-sectional design, however, limits the study of causal inference.

Lastly, while the availability of health protocol facilities in public spaces does not significantly impact compliance, their accessibility without adequate oversight can decrease adherence to COVID-19 preventive health protocols. Overall, these findings can guide policymakers in designing effective strategies to improve compliance with COVID-19 preventive health protocols and control the spread of the virus.

CONCLUSION

In conclusion, this study examined the characteristics of respondents in relation to their compliance with COVID-19 preventive health protocols. The data showed that education level, knowledge, attitude, perception of vulnerability, social support, and supervision significantly correlated with compliance with COVID-19 preventive health protocols. The availability or quality of facilities and infrastructure did not significantly correlate with compliance. Perception of vulnerability to COVID-19 was found to be an essential factor in determining compliance. It is crucial to raise awareness about the risks of COVID-19 and communicate the importance of following health protocols to encourage compliance among individuals. Additionally, the study shed light on the impact of misinformation, negative perceptions, and economic factors on compliance with COVID-19 preventive health protocols. Social support is crucial during the pandemic and prioritizing it in public health interventions and policies is essential to mitigate the negative effects of COVID-19 on vulnerable populations.

SUGGESTION

Policymakers can use these findings to design effective strategies to improve compliance with COVID-19 preventive health protocols and control the spread of the virus.

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CONFLICT OF INTEREST

The authors declare no conflict of interest that might have affected this study.

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Not applicable.

AUTHOR CONTRIBUTION

Baequni Boerman and Nada Karisma Oktavia conceptualized the study and created the methodology. Baequni Boerman, Nada Karisma Oktavia, Narila Mutia Nasir wrote, reviewed, and edited the manuscript and wrote the original draft. Shafira Salsabila Samara reviewed and edited the manuscript.

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