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Risk perception of behavioural adaptation recommendations towards COVID-19 and its related factors in Indonesia

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ABSTRACT

Background: The number of coronavirus disease 2019 (COVID-19) cases in Indonesia keeps increasing even though the Indonesian government continuously communicates mitigation strategies. This study aimed to estimate the proportion of risk perception towards COVID-19 behavioural adaptation recommendations and examine its sociodemographic determinants in Indonesia.

Methods: An online-based cross-sectional study was conducted among 1,007 individuals aged 15-60 years old. Our primary outcome was risk perception towards COVID-19 behavioural adaptations. Independent variables included sociodemographic factors such as sex, age, educational level, type of occupation, family size, economic status, and regions. Descriptive statistics, univariate logistic regression, and multiple logistic regression were performed to analyse the data.

Results: Around 78% of participants had a high level of risk perception related to COVID-19 behavioural adaptation recommendations. Among the participants, being females (AOR= 2.40; 95% CI: 1.76-3.27) and health professionals (AOR= 1.42; 95% CI: 0.64-4.44) were significantly associated with higher risk perceptions. In contrast, residing in Kalimantan and Sulawesi (AOR= 0.43; 95% CI: 0.23-0.79) and Eastern Indonesia (AOR= 0.43; 95% CI: 0.21-0.88) were significantly associated with lower risk perceptions.

Conclusions: Despite the high levels of risk perceptions among the Indonesian population, sociodemographic variations drove the risk perception of behavioural adaptation recommendations concerning COVID-19.

Keywords: Behavioural adaptation, COVID-19, Indonesia, Risk perception, Preventive measure

INTRODUCTION

During the last eight months, the coronavirus disease 2019 (COVID-19) pandemic has continually devastated countries around the world. Over 88 million confirmed

cases worldwide, including 1,914,378 deaths reported by the World Health Organization (WHO) early on 10th January 2021. Correspondingly, Indonesia is also struggling with COVID-19. According to the Indonesian Ministry of Health's update, Indonesia has recorded

828,026 confirmed cases of COVID-19 nationwide, 9,640 daily COVID-19 case, and 24,129 deaths identified.²

Numerous factors play their part in Indonesia's current COVID-19 condition, including government policy and community role. The Indonesian government has adopted mitigation strategies, including case tracking, treating patients, and isolating contacts.³ The government is also communicating New Behavioral Adaptations for preventive health protocols to the community.⁴ In such an extreme condition, the government has also prevented the spread of COVID-19 by restricting population movement or large-scale social restriction in the high transmission area.⁵ This ensures that school, work, and social activities must be carried out from home. Any task involving physical presence must be performed in a limited number of people or in shifts, where certain places require the payment of fines for those who do not wear masks. To date, novel coronavirus vaccine development in Indonesia is also undertaken in parallel by domestic researchers and continues to cooperate with international institutions.⁶

Indonesia poses several challenges in the mitigation of COVID-19. Despite ongoing government efforts to alleviate the pandemic, the trend of confirmed cases continues to rise. With an increasing number of confirmed cases, hospitals in Indonesia are at risk of being overcapacity. Another issue regarding healthcare workers has also emerged. Indonesia had the highest number of healthcare professional death caused by COVID-19. Moreover, the government has to tackle misinformation regarding COVID-19 and address cultural disagreement.^{7,8}

Community participation is essential in responding to the government's COVID-19 mitigation strategy and plan.⁹ Preventive public health adaptations such as frequent hand washing, physical distancing, and wearing a mask may contribute significantly to the prevention of COVID-19 transmission yet rely heavily on public contribution. However, the public's willingness to cooperate and adopt new preventive health measures depends on the public's accurate risk perception towards the pandemic.¹⁰

Previous studies have found that individual risk perception towards the disease is vital to determine preventive behavioural adaptations regarding COVID-19.¹⁰⁻¹² Risk perception is commonly defined as an individual's view or belief towards threat, which in this case, is related to the COVID-19 pandemic.⁸ Based on previous studies, the public's risk perception is essential to effectively change health behaviour, which will lead to successful COVID-19 mitigation.¹⁰ Meanwhile, risk perception is influenced by demographic characteristics such as education level, socioeconomic status, and gender.^{11,13,14} Therefore, this study aimed to estimate the proportion of risk perception towards COVID-19 behavioural adaptation recommendations and to analyse its sociodemographic determinants in Indonesia. The findings of this study can support policymakers and public health professionals in designing interventions that are widely acceptable and

more practical, thus improve the effectiveness of implementing behavioural adaptations related to the COVID-19 pandemic.

METHODS

Design, setting, and study participants

The online-based cross-sectional study design was conducted during two consecutive weeks, between June and July 2020, to rapidly examine risk perception among the Indonesian population. The study participants' inclusion criteria were individuals with internet access and aged 15-60 years old. A total of 1,007 participants were asked for their willingness to participate in this study by clicking the online informed consent embedded in the questionnaire.

Measures

The primary outcome of this study was the risk perception of behavioural adaptation recommendations concerning COVID-19. In this study, we assessed participants' perceived risk of exposure to COVID-19 when behavioural adaptations were not implemented. We followed the behavioural adaptations recommended by the Indonesian Ministry of Health. These included wearing a mask, applying hand sanitiser, washing hands with soap, physical distancing, staying at home, and covering nose and mouth when sneezing and coughing.¹⁵

A total of six items were assessed as risk perception containing statements about behavioural adaptations related to COVID-19 with responses based on yes-no coding. We then categorised the risk perception into two categories based on the median value: high, if risk perception scores were equal to or above the median score (>6), and low, if risk perception scores were below the median score (<6).

Dependent variables included sociodemographic factors such as sex, age, education, occupation, household economic status, geographical location, and family size. Household economic status was based on the self-reported household monthly income. Then, we divided it by the family's size, resulting in the household members' income per capita. We then categorised these incomes into three quintiles: poor, middle, and rich.

Data collection

We developed a structured online questionnaire that consisted of questions on sociodemographic characteristics and risk perception of behavioural adaptations toward COVID-19 and constructed an online questionnaire using Google Forms. After that, we shared a brief description of the study with the potential participants via social media such as WhatsApp and Instagram. We also included the link to the online questionnaire and the

letter requesting them to reshare this message to other potential participants within the message.

Statistical analysis

We describe the characteristics ¹⁷ participants using descriptive statistics. Univariate logistic regression was performed to analyse the association between each independent variable and risk perception. The associated factors with a $p < 0.25$ were included in multiple logistic regression analysis. We selected the final model using stepwise backward elimination. The level of significance

was set at 0.05, and odds ratios were produced. These analyses were done using Stata 14.2 version.

RESULTS

Completed data from a total of 1,007 participants were analysed. Most of the samples were women (68%), aged 30 years and above (67%), completed an undergraduate study (57%), and were not health professionals (69%). Around seventy-three per cent of participants resided in Java and Bali. Table 1 presents the detailed characteristics of participants.

Table 1: Characteristics of study participants (n=1007).

Characteristics	N	%
Sex		
Male	321	31.9
Female	686	68.1
Age (in years)		
<30	330	32.8
≥30	677	67.2
Education level		
Secondary school or below	188	18.7
Undergraduate degree	574	57.0
Master's degree or above	245	24.3
Occupation type		
Not working or nonformal work	446	44.3
Formal work	561	55.7
Health profession		
No	694	68.9
Yes	313	31.1
Family size		
≤4	710	70.5
>4	297	29.5
Economic status		
Poor	347	34.5
Middle	337	33.5
Rich	323	32.0
Region		
Java and Bali	730	72.5
Sumatera	189	18.7
Kalimantan and Sulawesi	51	5.1
Eastern Indonesia	37	3.7
Risk perception		
Low	223	22.1
High	784	77.9

Table 2: Determinants of risk perceptions of behavioural adaptations towards COVID-19 in Indonesia.

Variables	10 adjusted OR	95% CI	P	Adjusted OR	95% CI	P
Sex						
Male	Ref			Ref		
Female	2.52	1.85-3.42	<0.001*	2.40	1.76-3.27	<0.001**
Age (in years)						
<30	Ref					

Continued.

Variables	Unadjusted OR	95% CI	P	Adjusted OR	95% CI	P
≥30	0.97	0.71-1.34				
Education level						
Secondary school or below	Ref					
Undergraduate degree	1.03	0.70-1.53	0.869			
Postgraduate degree	1.25	0.79-1.99	0.337			
Occupation type						
Not working or nonformal	Ref					
Formal	0.94	0.69-1.27	0.673			
Health profession						
No	Ref			Ref		
Yes	1.45	1.04-2.04	0.030*	1.42	0.64-1.44	0.049**
Family size						
≤4	Ref					
>4	0.80	0.58-1.10	0.171*			
Economic status						
Poor	Ref					
Middle	1.10	0.77-1.58	0.599			
Rich	1.12	0.78-1.61	0.539			
Geographical area						
Java and Bali	Ref			Ref		
Sumatera	0.96	0.65-1.43	0.852	0.96	0.64-1.44	0.847
Kalimantan and Sulawesi	0.44	0.24-0.79	0.006*	0.43	0.23-0.79	0.006**
Eastern Indonesia	0.43	0.18-0.85	0.015*	0.43	0.21-0.88	0.022**

*Level of significance at $p < 0.05$. **Level of significance at $p < 0.01$.

Table 2 shows factors associated with risk perception of behavioural adaptation recommendation towards COVID-19 mitigation strategies. In the univariate logistic regression, risk perception was significantly related among females (OR=2.52; 95% CI: 1.85-3.42), health practitioners (OR= 0.97; 95%CI: 0.71-1.34), and those who resided in the Kalimantan and Sulawesi (OR= 0.44; 95%CI: 0.24-0.79) and Eastern part of Indonesia (OR= 0.43; 95% CI: 0.21-0.85). These variables and variables with a $p < 0.05$, such as family size, were entered in the multiple logistic regression analysis.

The multivariate analysis (see Table 2) reported that the highest odds were among female participants (AOR= 2.40; 95% CI: 1.76-3.27). Participants who worked as health practitioners had 42% (AOR= 1.42; 95%CI: 0.64-1.44) greater odds of acquiring a higher level of risk perception toward COVID-19 behavioural adaptations. Meanwhile, the odds of having high-risk perception in Kalimantan and Sulawesi and Eastern Indonesia (Maluku, Papua, Nusa Tenggara Barat, and Nusa Tenggara Timur) were 43% lower compared with those who lived in Java and Bali.

DISCUSSION

This study estimated the risk perception level of behavioural adaptation recommendations concerning COVID-19 among the Indonesian population. The majority of participants had a high level of risk perception.

Nonetheless, although most participants were aware that COVID-19 susceptibility risk could be reduced by applying personal preventive measures (example- wearing a mask, washing hands with soap), around 22% had a poor perception of behavioural adaptation recommended by the governments. Any low-risk perception should not be ignored because it may contribute to risk-taking behaviours, thus, a second COVID-19 wave.¹⁷

Given the importance of public risk perception on COVID-19 prevention and that perception of risk could be influenced by social and cultural dimensions, we also examined sociodemographic factors associated with the risk perception of behavioural adaptations. Females were more likely to have a high level of risk perception compared to males.^{10,18,19} This study was in line with a previous study conducted in China.¹⁷ Females perceived more risks to health than males.^{20,21} Meanwhile, men often argued to have a better immune system than women and only looked for medical intervention at developed infection phases.²⁰ The active cases and the death rates were higher among the Indonesian male population, around 51% and 59%, respectively.²

Health practitioners were more likely to be concerned about getting infected by COVID-19 when they did not apply behavioural adaptations compared to the general population.³⁷ A Portuguese study revealed that healthcare workers had a higher level of risk awareness because they

worked closely with COVID-19 suspected and confirmed cases.²² Nevertheless, despite the higher risk of infection, healthcare workers accept this risk because it is part of their job responsibilities, in which they reacted by applying preventive measures.²³ Our findings suggest that COVID-19-related perceptions among the general Indonesian population should be improved to be more willing to practice COVID-19 preventive measures. It means that government and scientific bodies should establish evidence-based decision-making and effective communication between the government, researchers, and the public.²⁴

Among regions in Indonesia, Kalimantan and Sulawesi and Eastern Indonesia had a lower risk perception towards COVID-19. As seen in China 17, the lower perception of risk could be explained by the essence that these regions were not at the outbreak epicenter and had less crowded public services and space so that the community could minimize the community's contact with the suspected cases. Kalimantan, Sulawesi, and Eastern Indonesia were geographically far from Java Island, where the outbreak was clustered. By the end of October 2020, the total proportion of confirmed cases from these regions was around 22% of Indonesia's total COVID-19 cases.² It is not surprising that most of the provinces that applied local lockdown or large-scale social restriction were located on the island of Java, where the Indonesian population and public services were concentrated.²⁵ Conversely, the epidemic situation was quite relaxing outside Java, especially in the eastern part of Indonesia, which none of its provinces implemented the local lockdown. Therefore, government and public health professionals should design and implement COVID-19 reduction programs that consider societal contexts.

Our study is the first in Indonesia to analyse the risk perception of behavioural adaptations towards COVID-19. However, the online survey design may contain several limitations in terms of the variety of study participants and self-reported data by the respondents compared to face-to-face interviews. Further research should consider a well-defined inclusion criterion of the participants before the study begins, for example, by setting the number of samples that proportionally represent the study location.

Program implications

Although the pandemic has been long going on, it remains vital to promote COVID-19 related behavioural adaptations to the Indonesian population. While there are nationwide policies and programs to control the pandemic, policymakers and public health actors should consider the community's characteristics in different settings, including their social context. Strengthening the collaboration with the local community leaders and religious leaders can be beneficial for program delivery. Since female has higher risk perception related to COVID-19, public health programmers should target local women and female adolescents as change agents at the village and household

levels. Additionally, health practitioners should not only focus on clinical care but also empower individuals and communities to take preventive actions.

CONCLUSION

Most of the Indonesian population had a high level of risk perception towards COVID-19. Being males, having fewer years of attending formal education, and living in Eastern Indonesia, were significantly associated with the likelihood of acquiring a low perception of risk related to COVID-19. Indonesia's government and scientific bodies are urged to effectively disseminate evidence-based decision-making to the community to reduce misunderstanding on COVID-19 related recommendations, thereby enhancing public awareness of the disease.

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