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ORIGINAL ARTICLE

Indonesian Community Risk Perception of COVID-19 in 2022

Mila Tejamaya, Amelia Anggarawati Putri, Ira Safhira, Sapto Budi Nugroho
Department of Occupational Health and Safety, Faculty of Public Health, University of Indonesia, Indonesia
Building C, 1st Floor Faculty of Public Health Universitas Indonesia, Depok, West Java 16424, Indonesia

ABSTRACT

Introduction: In line with the increasing number of COVID-19 cases from July to early August 2022, this paper aimed to analyze the perception of COVID-19 among Indonesians. **Methods:** A cross-sectional online study on COVID-19 risk perception was conducted in the first week of July 2022. A questionnaire adapted from ECOM (Effective Communication in Outbreak Management for Europe) was distributed online through social media to obtain information about the respondents' knowledge, behavior, and risk perceptions on COVID-19. **Results:** There were 775 respondents. Most of them were female (61.3%), lived in the eight most targeted areas (84.1%), were unmarried (52.5%), held a bachelor's degree (38.5%), and were Muslims (80.8%). The percentages of respondents who had been infected with COVID-19 were (43.8%). Most participants believed that their knowledge level of the disease was average and above average (>91%). Of the respondents, 83.6% perceived the seriousness of COVID-19 as serious and very serious. However, the anxiety level among these respondents was moderate (slightly and quite anxious). This indicates that even though most respondents still see COVID-19 as a serious disease, their level of fear is decreasing. Compared to a previous study, most respondents in the current study were more confident of their ability to control the risks associated with the transmission of the virus. Nevertheless, they still believe that outdoor activity and not using a face mask can significantly increase the probability of getting infected. **Conclusion:** The risk perception of COVID-19 in Indonesian community among our study population was appropriate.

Keywords: COVID-19, ECOM standard, Indonesia, online questionnaire, risk perception

Corresponding Author:
Mila Tejamaya
Email: tejamaya@ui.ac.id
Telephone: +628111810100

INTRODUCTION

China first reported having found a cluster of new pneumonia cases in Wuhan, Hubei Province—caused by the SARS-CoV-2 virus—on December 31st, 2020 (Schulman, 2020). On March 31st, 2020, COVID-19 was declared a pandemic (WHO, 2020). In Indonesia, the first case of COVID-19 was confirmed on March 2nd, 2020 (Natalia, 2020). After this case, Indonesian's COVID-19 cases began to gradually increase, which can be tracked through Indonesia's COVID-19 task force portal (Satuan Tugas Penanganan COVID-19, 2022).

Behavior change in the community plays a crucial role in reducing the transmission of the SARS-CoV-2 virus and preventing future pandemics (Betsch, Wieler and Habersaat, 2020; Seale *et al*., 2020; West *et al*., 2020). According to Health Belief Model, changes in health behavior is significantly influenced by each individual's risk perception over health issues (Gaube, Lermer and Fischer, 2019). Thus, to be able to understand the ability of Indonesian society in changing their health behavior and following health protocol, risk perception on COVID-19 amongst Indonesian society needs to be explored. There are several studies on COVID-19 risk perception in Indonesia and this study is a follow up study from Tejamaya (2021).

Risk perception studies people's ability to recognize health-related choices for themselves and society as a whole. Risk perception for the public that affects their health behavior can be shaped by the media rather than epidemiological evidence. A study in the early COVID-19 period indicated a critical relationship between the higher use of media and the higher rate of trust, which are linked with higher COVID-19 risk perception (Vai *et al*., 2020).

Risk perception is widely accepted as a main concept in navigating people toward achieving

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suitable health behavior. At the same time, however, risk tolerance, a feeling of individual capability to control the risks, may lead to optimism bias and cause a person to become more relaxed toward an unsafe behavior. Hence, balancing the levels of risk perception and risk tolerance is crucial in controlling risk.

METHODS

This study was conducted using a self-administered online questionnaire. The study participants were Indonesian residents aged 18 years and above. The questionnaire was developed based on standardized questionnaires from ECOM (Effective Communication in Outbreak Management for Europe) and was used to obtain information about the respondents' knowledge, behavior, and risk perceptions. The link to the questionnaire was distributed through the researchers' social media. The sampling method used for this survey was snowballing.

The study population was 112,200 confirmed cases of COVID-19 in July 2022 that were from all Indonesian provinces (34 provinces). Of these, 97,714 confirmed cases were from DKI Jakarta (61,096), West Java (21,993), and Banten (14,625). By applying Slovin's formula (assuming 112,200 population, 95% CI, and 5% error margin), the minimum sample size for the present study was 399 participants.

The differences in the group prevalence of responses to all questions were assessed using the chi-square test. The level of significance was set at $p < 0.05$. All statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS) version 23.0. This study has been ethically reviewed by The Research and Communitee Engagement Ethical Committee Faculty of Public Health Universitas Indonesia Number 545/UN2.F10. D11/PPM.00.02/2022.

RESULT

The survey results are described in the following paragraphs, and the associations between perceptions and sociodemographic variables are provided in Supplementary Materials.

Characteristics of the Survey Respondents

A total of 775 respondents, spread across 28 of the 34 provinces in Indonesia, participated in this study. Most of them resided in West Java (20.6%), DKI Jakarta (19.2%), and South Sulawesi (15.7%). Out of the 775 respondents, 38.7% (n = 300) were male and 61.3% (n = 475) were female. In terms of their marital status, 47.5% (n = 368) were married and 52.5% (n = 408) were unmarried. In terms of their occupational status, 32.3% (n = 250) were working at a private company, 28.3% (n = 219) were working as students, 19.9% (n = 154) were working as civil servants, 5.7% (n = 44) were housewives, and 7.9% (n = 108) chose "not working" and "others" options. Most of the respondents were Muslims [80.8% (n = 626)], followed by Hindus [10.3% (n = 80)], Protestants [6.1% (n = 47)], Catholics [1.9% (n = 15)], and Buddhists [0.3% (n = 2)]; some of them decided not to reveal their religion [0.6% (n = 5)]. More details about the sociodemographic characteristics of the respondents are presented in Table 1.

Level of Knowledge about COVID-19

The respondents were grouped into four categories according to their knowledge levels of COVID-19: not knowing at all, know a little, know enough, and know a lot. Most respondents chose "know enough" [66.8% (n = 518)], followed by "know a lot" [24.8% (n = 192)], "know a little" [8.1% (n = 63)], and "not knowing at all" [0.3% (n = 2)]. There was a significant relationship between sex and the level of knowledge about COVID 19 ($p < 0.05$). Likewise, occupation and the level of knowledge about COVID-19, as well as the history of being infected with COVID-19 and the level of knowledge about COVID-19 ($p < 0.05$) (Tables S1 and S2).

Source of Information

Most of the respondents knew about COVID-19 from social media (87.2%, n = 676) and online news (79.2%, n = 614), followed by television (58.8%, n = 456) and word of mouth (58.7%, n = 455). Less than 20% of the respondents retrieved information about COVID-19 from newspapers (13.7%, n = 106) and radio (11.6%, n = 90). A questionnaire asking about the source of information about COVID-19 was prepared, and the respondents were allowed to select multiple answers for each question. Sex and social media as the source of COVID-19 information were related ($p < 0.05$). Similarly, marital status and online media, social media, and word of mouth as the sources of COVID-19 information ($p < 0.05$)

were related. Detailed information is presented in Table S1 and S2.

Disease Background Information

In the study, 99% (n = 767) of the respondents chose virus as a cause of COVID-19, and only 1% (n = 8) chose bacteria. Meanwhile, for the mechanism of transmission, 94.7% (n = 734) respondents thought that COVID-19 can be transmitted through droplets, 77.5% (n = 601) thought that it can be transmitted through contaminated surfaces, 19.4% (n = 150) thought that it can be transmitted through food, 18.3% (n = 142) thought that it can be transmitted through water, and 4.1% (n = 32) thought that it can be transmitted through animal bite. Most of our respondents agreed that COVID-19 is an emerging disease (74.6%, n = 578). In addition, 97.7% (n = 757) of our respondents agreed that mask use can reduce the risk of infection. More than one answer could be selected for each question in the questionnaires about the mechanism of transmission and ways to decrease the risk of infection.

Table 1. Sociodemographic Characteristics of the Respondents

Characteristics	Participants	
	n	%
Sex		
Male	300	38.7
Female	475	61.3
Marital Status		
Married	368	47.5
Unmarried	407	52.5
Religion		
Muslim	626	80.8
Catholic	15	1.9
Protestants	47	6.1
Buddhist	2	0.3
Hindu	80	10.3
Kong Hu Cu	0	0.0
Refuse to reveal	5	0.6
Occupation		
Civil Servants	154	19.9
Private Company	250	32.3
Students	219	28.3
Housewives	44	5.7
Not Working	36	4.6
Others	72	9.3
Educational Background		
Senior High School	264	34.1
Bachelor's Degree	376	38.5
Post Graduate Degree	135	17.4
Residencies		
Banten	42	5.4
West Java	160	20.6
DKI Jakarta	149	19.2
Central Java	72	9.3
Bali	96	12.4
East Kalimantan	11	1.4
South Sulawesi	122	15.7
Others	123	15.9

Advanced Table 1. Sociodemographic Characteristics of the Respondents

Characteristics	Participants	
	n	%
Physical Contact with COVID-19		
Yes	53	6.8
No	707	91.2
Not Knowing	15	1.9
Location of Physical Contact		
Hospital	7	14.6
Workplaces	23	47.9
School/University	6	12.5
Home Environment	3	6.3
Inside the house	6	12.5
Not Knowing	3	6.3
Others	0	0.0
Frequency of getting infected with COVID-19		
Never	360	47.4
Once	281	37.0
More Than Once	52	6.8
Not Knowing	67	8.8

Perception of COVID-19

The respondents' levels of anxiety toward COVID-19 were closely distributed among slightly anxious (30.2%, n = 234), quite anxious (42.3%, n = 328), and very anxious (19.7%, n = 153) (Figure 1).

The combination of fear and anxiety, which is related to respondent risk perception and risk tolerance, was assessed to describe these findings. Perceptions of newness, severity, infectiousness, contagiousness, seriousness, and total cases of the

diseases were assessed to obtain the respondents' risk perception of COVID-19 (Figure 2).

According to the results, most respondents considered COVID-19 to be an emerging disease (74.6%, n = 578). They agreed that COVID-19 is severe, with the severity perception mainly falling into the categories of quite severe (42.1%, n = 326) and very severe (39.9%, n = 309). The majority of respondents also believed that COVID-19 is a very serious (48.6%, n = 377) and very infectious disease (63.2%, n = 490), which spreads very fast (64.8%, n = 502). Most of them also agreed that the total number of COVID-19 cases up until the time of data collection remained relatively high (64.1%, n = 497).

In this study, risk perception was associated with several individual factors, of which sex, marital status, occupation, residency, and frequency of being infected with COVID-19 were the most influential (Tables S5 and S6).

The level of risk tolerance was moderate to high (Figures 3 and 4), where over half of the respondents (51.7%, n = 401) were convinced that they were quite prepared to face the spread of COVID-19. They were also sure that their ability to control the risk was "quite able" (56.6%, n = 439) to "very able" (25.0%, n = 194). Almost half (47.4%) of the respondents perceived that they were quite prepared to face COVID-19. Almost all of them (more than 90%) were willing to take preventive actions to control the spread of the virus, such as hand washing (99.1%, n = 768), physical distancing (93.5%, n = 721), and wearing face masks (99.5% n = 771).

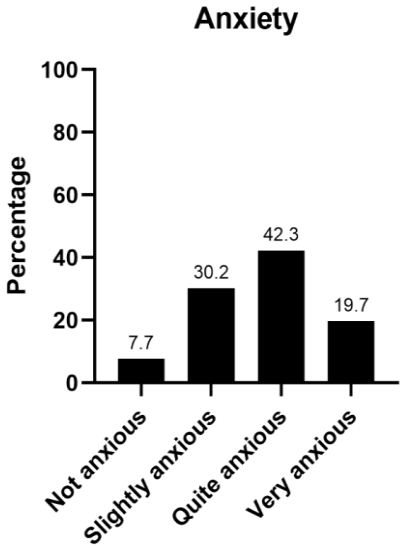

Figure 1. Level of Anxiety toward COVID-19 in Indonesia (n = 775)

Interestingly, even though 89.5% (n = 694) of the respondents agreed that staying at home brings efficacy, only 72% (n = 558) were willing to take this action.

The data collection for this study was conducted during, if not after, the school semester holidays in Indonesia. Even though the Indonesian government has adjusted the travel regulations, such as using the Peduli Lindungi App to monitor the virus spread and allowing citizens to travel as long as they have been vaccinated with the 3rd dose, approximately 72% (n = 558) respondents were still willing to stay at home and 89.5% (n = 694) still believed that it helps prevent the spread of COVID-19 (Figure 4).

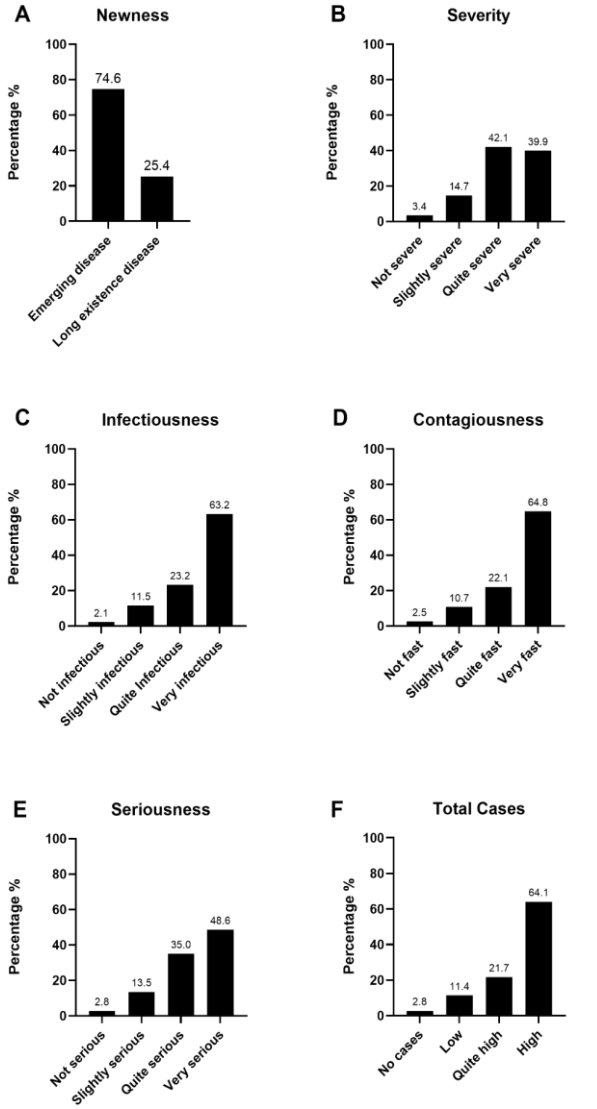

Figure 2. Perception: (A) Newness, (B) Severity, (C) Infectiousness, (D) Contagiousness, (E) Seriousness, and (F) Total Cases of COVID-19 in Indonesia (n = 775)

As in the case of risk perception, risk tolerance was also associated with sociodemographic variables (Table S7 and S8).

Motivation and Hindering Factors in Carrying Out Control Measures

Motivation plays an important role in ensuring that the control measures are effectively implemented. In general, we found that the most common motivating factors for following health protocols were responsibility toward their own health, intention to prevent the spread of COVID-19 to people around them, and trust in the benefits of implementing these measures (Table 2 and Table 3). In particular, specific answers were also found as main motivation such as "My job enables me to work from home" as motivation to work for home; and "none of their immediate family lived in their hometown" that motivates them to not visiting home town during festive holiday (Table 3).

On the other hand, less than 10% of participant will not perform health protocols. The most dominant factors that hinder the respondents from carrying out the control measures, especially for physical distancing and staying at home, were not belief that these measures would help in preventing the spreading of COVID-19 and believed that others would not carry out the measures. "Job requirement" was also another dominant hindering factors for staying at home (Table 4 and 5).

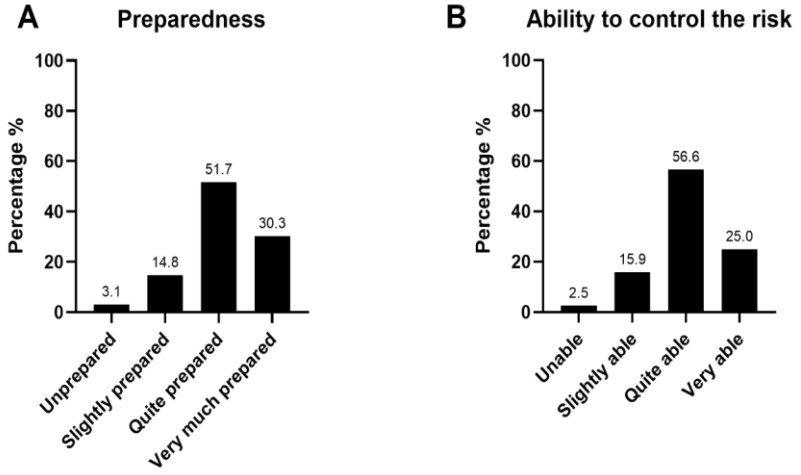

Figure 3. Perception: (A) Preparedness and (B) Ability to Control the Risk (n = 775)

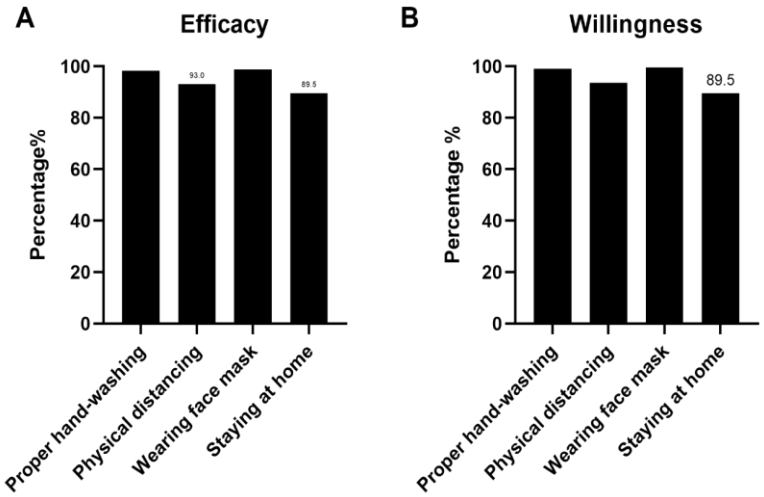

Figure 4. Perception: (A) Efficacy of Control Measures and (B) Willingness to Carry Out Control Measures (n = 775)

Table 2. Motivation to Carry Out Control Measures (Hand Sanitizing, Physical Distancing, and Face Mask)

Perception	Hand Sanitizing		Physical Distancing		Wearing a Face Mask	
	n	%	n	%	n	%
Easy to find handwashing facilities with soap	482	63.3	N/A	N/A	N/A	N/A
I have face mask	N/A	N/A	N/A	N/A	470	60.9
My job enables me to work from home	N/A	N/A	N/A	N/A	N/A	N/A
My supervisor suggested me to work from home	N/A	N/A	N/A	N/A	N/A	N/A
None of my immediate family lives in my hometown	N/A	N/A	N/A	N/A	N/A	N/A
None of my extended family lives in my hometown	N/A	N/A	N/A	N/A	N/A	N/A
I am often ill	22	2.9	25	3.4	36	4.7
COVID-19 is a very serious disease	453	59.5	450	61.2	488	63.2
I am responsible for my own health	676	88.8	626	85.2	690	89.4
I am at risk of contracting COVID-19	403	53.0	457	62.2	498	64.5
I want to prevent spreading COVID-19 to people around me	653	85.8	608	82.7	652	84.5
I trust that control measures help	568	74.6	570	77.6	593	76.8
I am following government recommendations	171	22.5	209	28.4	232	30.1
If I do not take these measures, I may regret it later	200	26.3	182	24.8	223	28.9
Others in my environment will also carry out the control measures	159	20.9	140	19.0	190	24.6
Others	0	0.0	0	0.0	0	0.0

Table 3. Motivation to Carry Out Control Measures (Staying at Home and Not Visiting Hometown)

Perception	Staying at Home		Not Visiting Hometown	
	n	%	n	%
Motivation to Carry Out Control Measures (Staying at Home and Not Visiting Hometown)	482	63.3	N/A	N/A
I have face mask	N/A	N/A	N/A	N/A
My job enables me to work from home	N/A	N/A	N/A	N/A
My supervisor suggested me to work from home	N/A	N/A	N/A	N/A
None of my immediate family lives in my hometown	N/A	N/A	N/A	N/A
None of my extended family lives in my hometown	N/A	N/A	N/A	N/A
I am often ill	22	2.9	25	3.4
COVID-19 is a very serious disease	319	51.7	2	0.4
I am responsible for my own health	439	71.2	118	25.5
I am at risk of COVID-19	312	50.6	168	36.3
I want to prevent spreading COVID-19 to people around me	390	63.2	123	26.6
I trust that control measures help	364	59.0	202	43.6
I am following government recommendations	156	25.3	160	34.6
If I do not take these measures, I may regret it later	137	22.2	87	18.8
Others in my environment will also carry out the control measures	100	16.2	42	9.1
Others	0	0.0	0	0.0

DISCUSSION

Disease Background Information and Level of Knowledge about COVID-19

According to the results of this study, most of the respondents (>85%) believed that they had descent knowledge about COVID-19. Female was shown to be more confident with their knowledge on COVID-19. Almost 100% of respondents understood that COVID-19 was caused by virus and transmitted

through droplets (94.7%) and contaminated surfaces (77.5%). However, female respondents also believed that COVID-19 was transmitted via water/ waterborne (P<0.01). This finding emphasized the discrepancy of COVID-19 knowledge over sex.

Not only knowledge on COVID-19 transmission mode, perception on control measures (proper hand washing, physical distancing, wearing a face mask, staying at home and eating nutricional food) was associated with sex (P<0.05). We found that more female believe in those measures. This finding was in accordance with a research conducted in Kalimantan, a province in Indonesia, on the significant relationship between sex and knowledge on COVID-19 prevention also found that women showed better perception over health protocols (Anggun *et al*., 2021). Sultana *et al* (2020) found that in Bangladesh females had higher levels of correct knowledge about staying at home during the pandemic to minimize transmission. In contrast, a study from India found that women were less likely to know the main symptoms of COVID-19 and less likely to practice key preventive behaviors compared to men (Pinchoff *et al*., 2020).

Since sex can be linked with health knowledge and behavior, effective health promotion and

Table 4. Hindering Factors to Carry Out Control Measures (Hand Sanitizing, Physical Distancing, and Face Mask)

Perception	Hand Sanitizing		Physical Distancing		Wearing a Face Mask	
	n	%	n	%	n	%
Difficult to find handwashing facilities with soap	2	16.7	N/A	N/A	N/A	N/A
Absence of face mask	N/A	N/A	N/A	N/A	1	33.3
Job requirement	N/A	N/A	N/A	N/A	N/A	N/A
Financial cause	N/A	N/A	N/A	N/A	N/A	N/A
My immediate family lives in my hometown	N/A	N/A	N/A	N/A	N/A	N/A
My extended family lives in my hometown	N/A	N/A	N/A	N/A	N/A	N/A
I am never ill	3	25.0	1	2.2	1	33.3
COVID-19 is not a serious disease	0	-	5	11.1	1	33.3
I am not worried about my health	0	-	0	-	0	0
I do not think I am at risk of contracting COVID-19	1	8.3	3	6.7	0	0
I do not think that I would spread COVID-19 to others	3	16.7	3	6.7	0	0
I doubt that the control measures will help	5	41.7	13	28.9	1	33.3
Takes too much effort	1	8.3	13	28.9	1	33.3
I feel that too little information is provided about the control measures	1	8.3	3	6.7	0	0
People in my environment will also not carry out the measures	0	-	16	35.6	1	33.3
Others	0	0.0	0	0.0	0	0.0

Table 5. Hindering Factors to Carry Out Control Measures (Staying at Home and Not Visiting Hometown)

Perception	Staying at Home		Not Visiting Hometown	
	n	%	n	%
Difficult to find handwashing facilities with soap	N/A	N/A	N/A	N/A
Absence of face mask	N/A	N/A	N/A	N/A
Job requirement	188	87.0	N/A	N/A
Financial cause	79	36.6	N/A	N/A
My immediate family lives in my hometown	N/A	N/A	124	29.1
My extended family lives in my hometown	N/A	N/A	269	63.1
I am never ill	3	1.4	0	-
Covid-19 is not a serious disease	7	3.2	11	2.6
I am not worried about my health	4	1.9	12	2.8
I do not think I am at risk of contracting Covid-19	5	2.3	9	2.1
I do not think that I would spread Covid-19 to others	3	1.4	24	5.6
I doubt that the control measures will help	43	19.9	37	8.7
Takes too much effort	13	6.0	28	6.6
I feel that too little information is provided about the control measures	8	3.7	12	2.8
People in my environment will also not carry out the measures	41	19.0	15	3.5
Others	0	0.0	0	0.0

communication need to be more specialized toward the target demographic, which the World Health Organization (2018) calls the sex approach.

In addition to sex, occupation and history of being infected with COVID-19 were also related with the level of knowledge about COVID-19 ($P < 0.01$) (Table S1) Working and having history of COVID-19 increased their perception on COVID-19 knowledge.

Consistent with our findings, In Alreshidi (2021) found that occupation was associated with knowledge on COVID-19. Workers in private sector were more knowledgeable in COVID-19 compare to other occupation. This might be related with access to health information.

Source of Information about COVID-19

Many of our respondents used social media (87.2%) to obtain information about COVID-19. Previous studies have shown that social media became a highly accessible source for finding information about COVID-19 (Farhana, 2020; Sultana *et al*., 2020; Zhong *et al*., 2020; Tejamaya *et al*., 2021). This is followed by online media, television, word of mouth, newspapers, and radio. Living in this era is advantageous because it is easy to access and get information related to the issues or problems that are being discussed.

However, Sultana *et al*. (2022) proved that social media can also spread misleading and false information, which results in people being poorly educated about the disease. For example, some of the respondents in their research did not know that diarrhea, fatigue, muscle pain, and vomiting are COVID-19 symptoms. Since knowledge and behavior are found to be related, poor knowledge can lead to poor behavior and reduce the effectiveness of controlling the disease. Thus, the Indonesian government and risk communicators should be aware of potential hoax news and clarify the misinformation spread through online platforms, since social media and online news are the most accessed sources of information about COVID-19.

Risk Perception and Risk Tolerance

Almost all our respondents perceived COVID-19 as an emerging disease that is serious, infectious, and contagious, with a high number of cases. In addition, most of them believed that they are moderately prepared and able to control the risk. A recent survey on society behavior during COVID-19 conducted by the Indonesian Central Bureau of Statistics, widely known as BPS, in 2022 found results similar to this study's findings. The majority of their respondents implemented control measures, such as wearing face masks, hand washing, physical distancing, and reduced mobility (Badan Pusat Statistik, 2022). Their respondents believed in the efficacy of the control measures and were willing to follow them, which is in line with our previous study (Tejamaya *et al*., 2021) and the result of the survey conducted by the Indonesian Central Bureau of Statistics during 2020–2022, which showed that nationally, most Indonesian citizens have complied with the government regulations on COVID-19, such as wearing masks, hand washing, and physical distancing (Badan Pusat Statistik, 2021; Badan Pusat Statistik RI, 2020). This result is also supported by the theory that a high perception of efficacy will influence perceptions of threat, hence affecting adaptive behavior in an attempt to control the threat (Chen and Yang, 2019). Sociodemographic factors, such as sex, occupation and infection history, had statistically significant associations with most of the risk perception and risk tolerance variables.

Perception of efficacy and willingness to carry out the control measures in this study are comparable with the observations in several previous studies, such as those conducted in Saudi Arabia and Hong Kong (Kwok *et al*., 2020; Alkhaldi *et al*., 2021). An equivalent level of risk perception and risk tolerance was found in this study as has also been found in previous studies (Tejamaya, 2021). It indicates that the respondents were aware of the spread of COVID-19 in general but also believe in their ability to control the risk. Therefore, most of respondents had moderate anxiety toward COVID-19. In managing risk and emotions, there should be a balance between the levels of risk perception and risk tolerance.

In this study, similar level of risk perception and risk tolerance were found which indicates that the respondents feared the spread of COVID-19 in general. Most respondents had moderate to high anxiety toward COVID-19, which ranged from slightly anxious, quite anxious, to very anxious. In managing risk and emotions, there should be a balance between the levels of risk perception and risk tolerance.

CONCLUSION

Most of our respondents gained information about COVID-19 from social media and perceived

that their level of knowledge was sufficient. Moderate level of anxiety due to COVID-19 in Indonesia society was contributed by positive risk perception and positive risk tolerance. Main factors associated with perception on knowledge, risk perception and risk tolerance that need to be considered for a more effective health promotion were sex, occupation, and infection history. More extensive health promotion on COVID-19 must be available for not working and never been infected by COVID-19 population.

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