

[bjop] Editor Decision

2022-11-11 08:39 AM

Lolita Lolita, Azis Ikhsanudin:

The editing of your submission, "Illness Risk Perceptions and Efficacy Beliefs Among Indonesian In The Course of COVID-19 Pandemic," is complete. We are now sending it to production.

Submission URL: <https://journal.umpr.ac.id/index.php/bjop/authorDashboard/submission/3287>

Mohammad Rizki Fadhil Pratama

[Borneo Journal of Pharmacy](#)

Response Letter to Editor and Reviewer

Dear editor and reviewer

Thank you so much for reviewing our manuscript and raising many valuable comments towards our paper. We have made some corrections and promoted our manuscript according to these comments, which are shown as follows:

1. Comment on abstract:

with aged 17 years and above → Must mention the upper limit

Author's reply:

Thank you for the suggestion. We have added the upper limit as suggested. Therefore, we have revised in our abstract. The change is highlighted in green within the manuscript.

Revision

An analytical cross-sectional study was conducted among 227 respondents living in Indonesia with aged 17 to 70 years old.

2. Comments on introduction:

a. These behaviours are significantly influenced by how much danger they perceive the event to be, how likely to occur, how effective their current coping behaviours are, and what they believe they can do to solve the problem (McCaffrey, 2004) → Kindly adjust the citation format

Author's reply:

Thank you for the suggestion. We have incorporated these suggestion by adjust the citation format in our article

Revision :

These behaviours are significantly influenced by how much danger they perceive the event to be, how likely it is to occur, how effective their current coping behaviours are, and what they believe they can do to solve the problem¹⁴.

The COVID-19 risk perception is considered an essential aspect of health and risk communication as its goal is to understand what risks of COVID-19 to the public are and how the public addresses them¹⁴

b. These influencing factor refer to sex, gender, region, education level, occupation, marital status, monthly personal income, income condition, direct cash assistance, health status, quarantine conditions, history of chronic illness, smoking history and supplement use → Kindly mention the reference source for each factor. If it doesn't exist, the authors have to justify it

Author's reply:

Thank you for the suggestion. The aims of our study was to explore illness risk perception and efficacy belief of COVID-19 and its related individual characteristic factors. Therefore, we have revised the statement in the manuscript.

Revision :

Therefore, our study investigated the individual characteristic factors influencing COVID-19 risk perception and efficacy belief in different outbreak stages, when the number of cases increased significantly. Those factors include sex, gender, region, education level, occupation, marital status, monthly personal income, income condition, direct cash assistance, health status, quarantine conditions, chronic illness, smoking history and supplement use.

3. Comments on method:

a. The target population was Indonesian active social media user → By social media, is that meant by a certain conversation platform (Twitter, Instagram, etc)? Or are one-way social media users like blogs also included?

Author reply:

Thank you for pointing this out. We launched an online survey through certain social networking sites such Facebook, Twitter, Whatapp, and Instagram. We do not include one-way social media platform like blogs. The revision statement is :

The target population was Indonesian active social media user who used specific platforms such as Facebook, Twitter, Whatapp and Instagram.

2. The eligibility criteria of participants were the Indonesian people aged 17 years above → This requirement is too loose, the authors should include an age limit requirement and target a certain generation, considering that several generations use social media differently.

Author reply:

We agree with your suggestion. We have revised the eligibility criteria by including the age limit requirement, and target a certain generation. The revision statement is :

The eligibility criteria of participants were Indonesian people aged 17 to 70 years old. We classified them into several age groups such adolescence (17 to 25 years old), adult (26 to 45 years old), elderly (46 to 65 years old) and geriatric (above 65 years old).

3. The online questionnaire was distributed via Google Form → Mention the link for the survey conducted

Author reply :

We accept the reviewer suggestion. The link for survey have added in the article. The revision statement is :

The online questionnaire was distributed via a link of Google Form as follows: <http://bit.ly/WHOQOLID>.

4. Why is each dimension rated on a different Likert scale? (10,5,4)

Author reply :

Thank you for raising this question.

The measurement of risk perception based on the constructs of the protection motivation theory (PMT). The perceived severity assessed the severity of COVID-19 using a 10-point Likert

scale, from 1 (not severe) to 10 (very severe). Meanwhile, the perceived vulnerability assessed the likelihood of acquiring this disease using a 5-point Likert scale, from 1 (very unlikely) to 5 (very likely). The questionnaire used in this study was adapted from a previous study, whereas each perceived dimension was rated on a different Likert scale. Furthermore, we calculated the perceived threat as the overall risk perception measure, which was determined by the formula as follows (the square root of the multiplication of severity/2 and vulnerability). In order to achieve a level of comparability between the scores, the severity score was initially divided by two. A square root transformation was performed to normalize the skewed distribution of the new variable, resulting in a scale ranging from 1 (low) to 5 (high) for measuring perceived threat.

We have also added those explanations in the method section

4. Comments on results and discussion.

a. The study sampled 232 eligible subjects filled the questionnaire with a response rate of 94.8% → Authors should also state if there are certain groups that dominate the survey (such as certain college students).

Author reply :

Thank you for pointing this out. We agree with the suggestion. Therefore, we have stated the certain groups that dominate the survey. The revision statement is :

The majority of participants which dominated the survey were female (56.8%), adult (60.4%), living in the western region (74.4%), holding higher degrees in education (63.9%) and married (67.4%).

b. In Table I, what is the age limit for each age category?

Author reply :

We have revised the Table 1 and included the age limit for each age category. The revision of Table 1 is :

Table 1. Demographic characteristic of respondents

Variables	n	%
Sex		
Male	98	43.2
Female	129	56.8
Age		
Adolescent (17 to 25 years old)	50	22.0
Adult (26 to 45 years old)	137	60.4
Elderly (46 to 65 years old)	37	16.3
Geriatric (above 65 years old)	3	1.3

Region

Western region	169	74.4
Middle region	56	24.7
Eastern region	2	0.9
Education		
Primary Education	12	5.3
Middle Education	70	30.8
Higher Education	145	63.9
Occupation		
Student	33	14.5
Private sector employee	48	21.1
Government worker	37	16.3
Entrepreneur	32	14.1
Others	77	33.9
Marital Status		
Married	153	67.4
Single	59	26.0
Widow/ Widower	15	6.6
Monthly Personal Income (IDR)		
Low income	9	4.0
Lower middle income	56	24.7
Upper middle income	92	40.5
High income	70	30.8
Income Conditions		
Decreased income	118	52.0
Increased revenue	2	0.9
No changes	101	44.5
No income	6	2.6
Direct Cash Assistance		
Yes	14	6.2
No	213	93.8
Health Status		
Healthy	205	90.3
Do not know	22	9.7
Quarantine Conditions		
Full time activities at home	32	14.1
Still leaving the house 2-3x a week is not for work	51	22.5
Work outside the home every day	82	36.1
Work outside the home 2-3x a week	46	20.3
Others	16	7.0
History of Chronic Illness		
Yes	11	4.8
No	216	95.2
Smoking History		

Yes	47	20.7
No	180	79.3
Supplements Use		
Yes	134	59.0
No	93	41.0

c. Still in Table I, are there certain provisions in the division of the region? Like based on the Indonesian time zone for example?

Author reply :

Thank you so much. We agree with your suggestion and have added this statement in the manuscript. The revision was in Table 1 :

Table 1. Demographic characteristic of respondents

Variables	n	%
Sex		
Male	98	43.2
Female	129	56.8
Age		
Adolescent (17 to 25 years old)	50	22.0
Adult (26 to 45 years old)	137	60.4
Elderly (46 to 65 years old)	37	16.3
Geriatric (above 65 years old)	3	1.3
Region (Indonesian time zone)		
Western Region	169	74.4
Middle Region	56	24.7
Eastern Region	2	0.9
Education		
Primary Education	12	5.3
Middle Education	70	30.8
Higher Education	145	63.9
Occupation		
Student	33	14.5
Private sector employee	48	21.1
Government worker	37	16.3
Entrepreneur	32	14.1
Others	77	33.9
Marital Status		
Married	153	67.4
Single	59	26.0
Widow/ Widower	15	6.6

Monthly Income (IDR)	Personal		
Low income	9	4.0	
Lower middle income	56	247	
Upper middle income	92	40.5	
High income	70	30.8	
Income Conditions			
Decreased income	118	52.0	
Increased revenue	2	0.9	
No changes	101	44.5	
No income	6	2.6	
Direct Cash Assistance			
Yes	14	6.2	
No	213	93.8	
Health Status			
Healthy	205	90.3	
Do not know	22	9.7	
Quarantine Conditions			
Full time activities at home	32	14.1	
Still leaving the house 2-3x a week is not for work	51	22.5	
Work outside the home every day	82	36.1	
Work outside the home 2-3x a week	46	20.3	
Others	16	7.0	
History of Chronic Illness			
Yes	11	4.8	
No	216	95.2	
Smoking History			
Yes	47	20.7	
No	180	79.3	
Supplements Use			
Yes	134	59.0	
No	93	41.0	

d. Regardless, a majority of respondents believed the COVID-19 pandemic was severe and fatal → Where did this conclusion come from?

Author reply :

Thank you so much for raising this question. In our study reported that a majority of respondents believed the COVID-19 pandemic was severe and fatal. This conclusion come from the Table II which reported the mean score of perceived severity of respondents was male (8.38+2.04) and female (8.59+2.06). These high score indicated that the perceived severity of COVID-19 among male and female was severe and fatal.

The revision statement is :

Table II reported that the mean score of perceived severity of respondents was male (8.38+2.04) and female (8.59+2.06). This high score indicated that the perceived severity of COVID-19 among males and females was severe and fatal.

5. Comments on conclusions.

a. Most of the respondents believed that they were susceptible to COVID-19 disease → What research data support this statement? Meanwhile in Table I, the majority of respondents are in a favorable condition (Health status, chronic illness, smoking, supplements)

Author reply :

Thank you so much for pointing out this question. In our study reported that most of the respondents believed they were susceptible to COVID-19 diseases. This conclusion come from the Table II which reported the mean score of perceived threat of respondents was male (3.30+0.91) and female (3.25+0.82). The high score indicated that the respondent believed the threat of a COVID-19 risk to be serious and susceptible.

Considering the main purpose of study, we decided to remove the sentences of “Most of the respondents believed that they were susceptible to COVID-19 disease” from the conclusions

6. Also, add Funding detail, Data availability, and Authors contributions (according to the guidelines and templates)

Funding detail

The authors received no financial support for the research, authorship, and/or publication of this article.

Data availability

None

Authors contribution

Lolita, Lolita : study design, methodology, data collection, validation, and writing -original draft. Azis Ikhsanudin : data management, data collection, visualization, statistical analysis, editing.

We sincerely hope that our revised manuscript could be suitable for publication in your journal.
Best regards!

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Illness Risk Perception and Efficacy Belief Among Indonesian In The Course of COVID-19 Pandemic

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Indonesia

Abstract

COVID-19, a worldwide pandemic, has posed a significant challenge for public health systems worldwide. Health risk perception and efficacy belief are primary constructs in influencing individuals' protective behavior due to the outbreak. Our study investigated each item of illness risk perception, efficacy belief, and its related factors concerning the COVID-19 pandemic. An analytical cross-sectional study was conducted among 227 respondents with aged 17 to 70 years old. Data collection was conducted using convenience sampling by distributing the web questionnaire between April and July 2020. Mann-Whitney or Kruskal-Wallis bivariate analysis was performed using SPSS version 21.0 to assess the relationship between individual characteristic factors among the illness risk perception and efficacy belief. The study established that respondents had a medium to a high level of illness risk perception and a reasonable efficacy belief in dealing with the COVID-19 pandemic. Region ($p=0.027$) and occupation ($p=0.036$) differences were significantly associated with the threat and severity perception, respectively. Smoking history ($p=0.037$), supplement use ($p=0.029$), and occupation ($p=0.018$) differences were significantly associated with self-efficacy. Meanwhile, gender ($p=0.045$) differences were significantly associated with response efficacy. Therefore, the public's illness risk perception and efficacy belief could be substantial in planning, modifying and implementing a coordinated response for risk communication in current and future epidemics.

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INTRODUCTION

The novel coronavirus, SARS-CoV-2, was identified as a cluster cause of atypical cases of pneumonia in Wuhan, China¹. WHO has declared this coronavirus disease (COVID-19) a global health emergency due to many confirmed cases in more than 70 countries globally². Indonesia, the world's fourth most populous country, was reported as having confirmed two cases of COVID-19 infection on March 2, 2020. To date, the number of COVID-19 case keeps increasing rapidly in this country³. Over the study period, the latest data regarding COVID-19 reported an increase significantly with an average of over 1790 confirmed cases with 113 new cases, 170 dead cases, and 112 recovered cases⁴.

The Indonesian government has issued several restrictive measures to curtail the spread of the virus across the nations. However, those policies affect an individual psychologically, which causes frustration, anxiety, and even the need to change their daily life behavior^{5 6 7}. A systematic review reported that these pandemic has led to high mental disorder rates among the general population⁸. Separate inline, another study has also stated that quarantine measures could worsen a person's psychological condition, such as depression, anxiety, stress disorder, and health risk perception⁹.

Illness risk perception and efficacy beliefs are reliable predictors of preventive health behavior^{10 11}. Illness risk perception is a subjective assessment to respond to fearful communications about a health threat. It could relate with the efficacy beliefs as individual capabilities in taking protective action behavior towards

a potential threat¹². Health behavior theories suggested that perceptions of illness risks related to perceptions of vulnerability, severity, and threat¹³. Individuals perceiving significant risks were more likely to implement protective behaviors. These behaviors are significantly influenced by how much danger they perceive the event to be, how likely it is to occur, how effective their current coping behaviors are, and what they believe they can do to solve the problem¹⁴. Therefore, monitoring risk perceptions and efficacy beliefs is an integral part of public health emergency management.

The COVID-19 risk perception is considered an essential aspect of health and risk communication as its goal is to understand what risks of COVID-19 to the public and how the public addresses them¹⁴. During the COVID-19 pandemic, the public will have different efficacy beliefs that will influence how people react to risk¹³. Our previous study found that the perceived risk of acquiring COVID-19 was low when there was no confirmed case among Indonesian¹⁵. Meanwhile, the COVID-19 perceived threat was high at the beginning of outbreaks from March 3rd to 27th, 2020¹⁶. People are more considered that COVID-19 is a life-threatening danger to them at that point. Therefore, our study investigated the individual characteristic factors influencing COVID-19 risk perception and efficacy beliefs in different outbreak stages when the number of cases increased significantly. Those factors include sex, gender, region, education level, occupation, marital status, monthly personal income, income condition, direct cash assistance, health status, quarantine

conditions, chronic illness, smoking history and supplement use. In collaborating with the private sector, the Indonesian government has pursued comprehensive policies such as large-scale social distancing, work from home, region quarantine, self-isolation, face mask use, and social distancing to prevent the transmission of COVID-19¹⁷. Hence, understanding risk perception and efficacy belief will give public health authorities a vital reference about protective behavior among Indonesian. Furthermore, these results will determine the willingness of the Indonesian's efforts and contribution to handling COVID-19.

MATERIALS AND METHODS

Study Design and Data Collection:

The study has been reviewed for ethical considerations and obtained approval from the University of Aisyiyah Research Ethics Committee (No. 1305/KEP-UNISA/IV/2020). This cross-sectional online-survey was conducted from April to July 2020. The target population was Indonesian active social media users who used specific platforms such as Facebook, Twitter, Whatapp and Instagram. According to Global Digital, reported by Hootsuite and We are Social, active social media user in Indonesia has reached 150 million people per January 2020¹⁸. The eligibility criteria of participants were Indonesian people aged 17 to 70 years old, active social media users who resided in Indonesia and could give informed consent. We classified the participants into several age groups such as adolescence (17 to 25 years old), adult (26 to 45 years old), elderly (46 to 65 years old)

and geriatric (above 65 years old). Exclusion criteria were those non-Indonesian residents who did not complete to respond to one or more online survey items. The minimum sample sizes of 220 participants were selected using the survey system sample size calculator, an online survey software package, with 95% confidence and a 5% significance level. Quantitative data was generated from a questionnaire containing closed-ended questions. This study was voluntary and anonymous. The individuals' consent was obtained before data collection.

Research Instrument and Study Variable:

The instrument was designed based on previous SARS research¹⁹, translated and modified to Indonesian¹⁶. Prior to the distribution of the questionnaires, reliability tests were carried out. The pilot test was conducted on a total of 30 study participants. The assessing instrument for risk perception and efficacy belief were reliable. The Cronbach's alpha and the validity test for risk perceptions were 0.806 and 0.782, while efficacy beliefs were 0.703 and 0.612. The online questionnaire was distributed via a link of Google Form as follows: <http://bit.ly/WHOQOLID>. The questionnaire comprised two sections: sociodemographic characteristics and risk perception with efficacy beliefs. The first section comprised questions on respondent sociodemographic characteristics, namely age, sex, region, education level, occupation, marital status, personal income, income condition, direct cash assistance, health status, quarantine conditions, history of chronic illness, smoking history and the use of supplements. The second section consisted of a question about perceived risk and efficacy beliefs.

There are three dimensions of risk perception : perceived threat, vulnerability, severity. In comparison, efficacy beliefs are associated with response efficacy and self-efficacy. The measurement of risk perception is based on the construct of the protection motivation theory (PMT). The perceived severity assessed the severity of COVID-19 using a 10-point Likert scale, from 1 (not severe) to 10 (very severe). Meanwhile, the perceived vulnerability assessed the likelihood of acquiring this disease using a 5-point Likert scale, from 1 (very unlikely) to 5 (very likely). The questionnaire used in this study was adapted from a previous study, whereas each perceived dimension was rated on a different Likert scale. Furthermore, we calculated the perceived threat as the overall risk perception measure, which was determined by the formula as follows (the square root of the multiplication of severity/2 and vulnerability). In order to achieve a level of comparability between the scores, the severity score was initially divided by two. A square root transformation was performed to normalize the skewed distribution of the new variable, resulting in a scale ranging from 1 (low) to 5 (high) for measuring perceived threat¹⁹. The perceived threat rating was on a scale from 1 to 5, with 1 being "low" and 5 being "high". The response-efficacy was assessed by asking participants to respond to how confident they believe others around them would be in taking practical actions to prevent contracting COVID-19 using a 4-point Likert scale from 1 (not at all) to 4 (very much). Additionally, self-efficacy was determined by asking how confident people felt that they could prevent contracting the disease. The respondents were asked each question on a rating scale

from 1 ("not confident") to 4 (very confident). Respondents completed a survey concerning these categories.

Data Analysis:

A descriptive statistical analysis was used to examine the frequency of data on socio-demographic characteristics, risk perception, and efficacy belief toward COVID-19. All the variables were tested for normality using the Kolmogorov-Smirnov test, and none of the variables was normally distributed. Therefore Kruskal-Wallis test and Mann-Whitney test were employed to determine significant differences in the categorical independent variable (socio-demographics) on the dependent variable of risk perception (perceived vulnerability, perceived severity, perceived severity) and efficacy beliefs (response efficacy, self-efficacy). We have analyzed the data using SPSS version 21.0. Values of p less than 0.05 were considered statistically significant.

RESULTS AND DISCUSSION

The study sampled 232 eligible subjects who filled the questionnaire with a response rate of 94.8%. After excluding 5 participants with incomplete data, a final sample of 227 subjects were required in the current study. The majority of participants who dominated the survey were female (56.8%), adult (60.4%), living in the western region (74.4%), holding higher degrees in education (63.9%) and married (67.4%). Overall, 89% of the participants had good health, 59% used supplements, and 4.8% had a prior history of chronic illness. Regarding

income conditions, they still work outside the home daily (36.1%), whereas 52.0% have decreased income during the pandemic. Only 6.2% of participants provided direct financial aid from the government. The sociodemographics of the participant are listed in Table 1.

Table 1. Demographic characteristic of respondents

Variables	n	%
Sex		
Male	98	43.2
Female	129	56.8
Age		
Adolescent (17 to 25 years old)	50	22.0
Adult (26 to 45 years old)	137	60.4
Elderly (46 to 65 years old)	37	16.3
Geriatric (above 65 years old)	3	1.3
Region (Indonesian time zone)		
Western Region	169	74.4
Middle Region	56	24.7
Eastern Region	2	0.9
Education		
Primary Education	12	5.3
Middle Education	70	30.8
Higher Education	145	63.9
Occupation		
Student	33	14.5
Private sector employee	48	21.1
Government worker	37	16.3
Entrepreneur	32	14.1
Others	77	33.9
Marital Status		
Married	153	67.4
Single	59	26.0
Widow/ Widower	15	6.6
Monthly Personal Income (IDR)		
Low income	9	4.0
Lower middle income	56	24.7
Upper middle income	92	40.5
High income	70	30.8
Income Conditions		
Decreased income	118	52.0
Increased revenue	2	0.9
No changes	101	44.5
No income	6	2.6
Direct Cash Assistance		
Yes	14	6.2
No	213	93.8
Health Status		
Healthy	205	90.3
Do not know	22	9.7
Quarantine Conditions		

Full time activities at home	32	14.1
Still leaving the house 2-3x a week is not for work	51	22.5
Work outside the home every day	82	36.1
Work outside the home 2-3x a week	46	20.3
Others	16	7.0
History of Chronic Illness		
Yes	11	4.8
No	216	95.2
Smoking History		
Yes	47	20.7
No	180	79.3
Supplements Use		
Yes	134	59.0
No	93	41.0

Table II revealed a statistically significant difference between the efficacy responses between men and women ($p=0.045$). Men participants had a significantly higher mean of response efficacy than women. Therefore, they are more confident in being able to take action in trying to prevent COVID-19. Moreover, men are physically stronger and emotionally more stable than women. Thus they are more willing to take precautions to reduce their risk of COVID-19²⁰. It is also likely because men have a lower immune system, which can be attributed to their differences in innate and adaptive immune responses. Sex-specific responses result from X chromosome inheritance which contains genes associated with high immunity²¹. Therefore, men perceived a higher efficacy response to prevent them from contracting COVID-19 during a pandemic.

This study also showed a significant difference in perceived threat between regions ($p=0.027$). Participants in western region had a significantly lower mean of a perceived threat than those in middle or eastern regions. People living in the western region perceive that they are less likely to be exposed to the COVID-19 threat. The highest number of cases in Indonesia is in the western

regions. World Health Organization estimates that as of February 3, 65.8% of Indonesia's cumulative confirmed cases have been reported on Java Island.

In contrast, Jakarta has the highest number of confirmed cases per one million, followed by East Kalimantan, North Kalimantan, Special District of Yogyakarta and Central Java ²². The low perception of threat among people in the western region could affect adherence to health protocols. These regions also have high mobility and population density, where many business industrial centers are still operating continuously. It will be a potential cause of the increasing number of confirmed cases in this area.

Occupation differences also have a statistically significant relationship with perceived severity ($p= 0.036$) and self-efficacy ($p= 0.018$). Those who work in government have a significantly higher perceived seriousness than those who work in the private sector or entrepreneurship. It means that if government workers suffer from COVID, it will severely threaten them. The potentially higher risk of severe outcomes for COVID-19 depends on the worker's characteristics in various occupations ²³. Previous research has also demonstrated that government employees have the highest risk of serious adverse outcomes due to COVID-19 ²⁴. Furthermore, our study found that those in the private sector have a greater sense of self-efficacy than others. Private companies have stringent rules in issuing their employees' policies regarding work regulations and health protection due to the COVID-19 pandemic ²⁵. Therefore, the private sector employees have more ability to defend themselves from the pandemic.

Our findings also revealed that smoking history and use of supplements were significantly correlated with self-efficacy ($p= 0.037$; $p= 0.029$, respectively). Non-smokers have a stronger belief in their capability to counteract the pandemic threat. Smoking can increase the likelihood of hand-to-mouth transmission of COVID-19. It can pose a significant threat to the COVID-19 spread since contaminated fingers and cigarette sticks will contact the smoker's lips ²⁶. A clinical study suggested that ACE2 may be the receptor being used by SARS-CoV-2 to gain entry into cells ²⁷.

Meanwhile, cigarette smoke could induce mucosa, the primary source of ACE2 in the lungs. Smoking also increases ACE2 in the lungs, thus enhancing the individual's susceptibility to COVID-19 ²⁸. This statement aligns with a study about tobacco smokers at high risk of developing severe co-infections due to impaired lung function, cross-infection, and vulnerable hygiene habits ²⁶. Furthermore, the mortality rate among smokers with COVID-19 infection is higher at 38.5% than non-smokers ²⁹.

Our study stated that people who consume nutritional supplements have significantly greater self-efficacy than those who do not. It indicates that they have a lower sense of risk associated with the pandemic threat, as they take supplements regularly. Regular diet supplementation with vitamins and micronutrients can enhance the immune system. It is a different approach to preventing the transmission of COVID-19. Sahebnaasagh et al. demonstrated that specific vitamins have a vital role in innate and adaptive immune responses. Vitamins A, D, E, C and B have antioxidant and immunomodulatory

properties which benefit the immune system²⁷. A study has shown that taking probiotics, omega-3 fatty acids, multivitamins, or vitamin D supplements can reduce the risk of positive COVID-19 test results³⁰.

According to our findings, participants' mean perceived threat and severity score was (3.28±0.86) and (8.50±2.05), respectively. Furthermore, we identified that most respondents had moderate to high levels of concern regarding the risks related to COVID-19. The majority of participants revealed that they were susceptible to

COVID-19. As COVID-19 cases increase significantly in the field, public concern in Indonesia regarding the severity of the disease and population vulnerability is also growing³¹

Table II. Illness Risk Perceptions and Efficacy Beliefs toward COVID-19

No	Independent Variables	Dependent Variables									
		Perceived Vulnerability		Perceived Severity		Perceived Threat		Response Efficacy		Self Efficacy	
		$\bar{x} \pm SD$	<i>p</i>	$\bar{x} \pm SD$	<i>p</i>	$\bar{x} \pm SD$	<i>p</i>	$\bar{x} \pm SD$	<i>p</i>	$\bar{x} \pm SD$	<i>p</i>
1	Sex										
	Male	2.76±1.09	0.370	8.38±2.04	0.245	3.30±0.91	0.675	3.49±1.03	0.045*	4.13±0.74	0.980
	Female	2.61±0.99		8.59±2.06		3.25±0.82		3.22±1.01		4.13±0.73	
2	Age										
	Adolescent	2.60±1.09	0.228	8.76±1.51	0.605	3.29±0.80	0.203	3.20±1.16	0.848	4.16±0.62	0.283
	Adult	2.74±0.98		8.42±2.27		3.30±0.87		3.36±0.95		4.08±0.79	
	Elderly	2.49±1.17		8.38±1.85		3.13±0.93		3.46±1.12		4.30±0.62	
	Geriatric	3.00±1.00		9.00±1.73		3.62±0.73		3.00±1.00		4.00±1.00	
3	Region										
	Western region	2.60±1.00	0.063	8.38±2.16	0.328	3.20±0.85	0.027*	3.26±0.02	0.092	0.41±0.72	0.697
	Middle region	2.86±1.10		8.79±1.67		3.59±1.00		3.59±1.00		0.42±0.70	
	Eastern region	4.00±0.00		10.0±0.00		4.47±0.00		3.00±1.41		0.35±2.12	
4	Education										
	Primary Education	3.00±1.21	0.504	9.00±1.35	0.121	3.60±0.92	0.411	3.33±0.99	0.855	4.00±0.74	0.09
	Middle Education	2.64±1.04		8.96±1.44		3.35±0.74		3.44±1.06		4.13±0.74	
	Higher Education	2.66±1.02		8.23±2.29		3.21±0.90		3.29±1.01		4.14±0.73	
5	Occupation										
	Student	2.58±1.00	0.771	8.85±1.66	0.036*	3.29±0.74	0.952	3.24±1.17	0.161	4.15±0.57	0.018*
	Private sector employee	2.73±1.09		8.52±2.12		3.31±0.94		3.52±1.03		4.29±0.74	
	Government worker	2.84±1.01		7.68±2.40		3.19±0.87		3.22±1.00		3.78±0.82	
	Entrepreneur	2.53±1.05		9.19±1.23		3.31±0.75		3.63±1.16		4.28±0.77	
6	Marital Status										
	Married	2.73±1.01	0.297	8.46±2.19	0.881	3.31±0.88	0.135	3.39±0.99	0.139	4.12±0.74	0.734
	Single	2.63±1.07		8.66±1.66		3.29±0.81		3.15±1.06		4.14±0.68	

	Widow/ Widower	2.27±1.10		8.66±1.66		3.29±0.81		3.53±1.12		4.27±0.80	
7	Monthly Personal Income (IDR)										
	Low income	3.00±1.41	0.547	8.56±2.24	0.215	3.48±1.08	0.690	3.11±1.36	0.691	4.33±0.71	0.539
	Lower middle income	2.70±1.04		8.52±2.05		3.31±0.90		3.50±1.03		4.09±0.64	
	Upper middle income	2.54±0.92		8.59±2.03		3.22±0.78		3.30±1.04		4.21±0.73	
	High income	2.79±1.11		8.36±2.09		3.29±0.90		3.29±0.97		4.04±0.79	
8	Income Conditions										
	Decreased income	2.67±1.01	0.319	8.62±2.01	0.490	3.30±0.84	0.064	3.31±1.04	0.622	4.16±0.74	0.415
	Increased revenue	3.50±0.71		9.00±1.41		3.96±0.71		4.00±0.00		4.00±0.00	
	No changes	2.69±1.03		8.45±1.94		3.28±0.83		3.35±1.00		4.08±0.72	
	No income	2.17±1.60		6.83±3.97		2.38±1.34		3.67±1.21		4.50±0.84	
9	Direct Cash Assistance										
	Yes	2.71±1.27	0.884	8.57±1.83	0.966	3.29±0.95	0.988	2.93±0.92	0.101	4.00±0.68	0.416
	No	2.67±1.02		8.50±2.07		3.28±0.86		3.36±1.03		4.14±0.73	
10	Health Status										
	Healthy	2.62±1.02	0.028	8.47±2.09	0.955	3.23±0.85	0.050	3.37±1.03	0.269	4.17±0.74	0.029
	Do not know	3.19±1.08		8.67±1.71		3.68±0.91		3.10±0.99		3.81±0.60	
11	Quarantine conditions										
	Full time activities at home	2.56±1.19	0.052	8.38±2.03	0.559	3.19±0.97	0.087	3.44±1.16	0.464	4.28±0.68	0.567
	Leaving the house 2-3x per week not for work	2.65±0.87		8.86±1.71		3.35±0.68		3.16±0.93		4.16±0.67	
	Work outside every day	2.94±1.13		8.44±2.14		3.43±0.95		3.39±1.03		4.12±0.79	
	Work outside 2-3x per week	2.35±0.85		8.54±1.92		3.08±0.71		3.43±1.00		4.09±0.73	
	Others	2.56±0.97		7.75±2.84		3.00±0.96		3.19±1.11		3.94±0.68	
12	History of Chronic Illness										
	Yes	2.55±0.82	0.779	9.00±1.55	0.479	3.35±0.74	0.585	2.91±0.83	0.204	4.18±0.75	0.835
	No	2.68±1.05		8.47±2.07		3.27±0.87		3.36±1.03		4.13±0.73	
13	Smoking History										
	Yes	2.89±1.05	0.114	8.45±1.82	0.403	3.43±0.87	0.173	3.47±1.04	0.358	3.94±0.73	0.037*
	No	2.62±1.03		8.51±2.11		3.23±0.85		3.31±1.02		4.18±0.72	
14	Supplement Use										
	Yes	2.69±1.07	0.800	8.50± 2.25	0.183	3.26±0.90	0.828	3.28±1.07	0.334	4.22±0.74	0.029*
	No	2.66±0.98		8.49± 1.74		3.29±0.80		3.42±0.96		4.01±0.70	

Table II reported that the mean score of perceived severity of respondents was male (8.38±2.04) and female (8.59±2.06). This high score indicated that the perceived severity of COVID-19 among males and females was severe and fatal. The general

population's severity perception in Indonesia is higher than in the Myanmar-based study³². Similar results were found in a study in Hongkong, where all participants agreed that the COVID-19 disease was very severe³³. Regarding the pandemic, the

internet and other information sources can better influence people's thinking in applying protective measures³⁴. A study reported that respondents in Indonesia had taken more protective behavior. People who often get information related to COVID will have higher self-efficacy beliefs³⁵. Mya et al. have reported that individuals would engage in more protective behavior due to the easy access to mass media and social media³².

A person perceiving the high risk of COVID-19 is likely to feel stress, panic, depression, and try to adapt to others' behavior³⁶. It is because strong negative emotions could encourage one to think about protective behavior in the face of this pandemic³⁷. Nevertheless, the higher threat perceived by vulnerable groups may increase their self-protective behavior, which is beneficial in pandemic control. However, those with a low-risk perception of COVID-19 are less likely to engage in protective behavior. Thus, public health education is targeted for this group³⁸.

Understanding risk perception is a complex phenomenon created from various psychological, social and cultural factors in different places and times³⁹. This phenomenon can be interpreted as a form of pandemic preparedness. Based on previous studies, risk perception can assess and evaluate an individual's response to a pandemic⁴⁰. Though perceived risk acts as a trigger for preventive actions, it is also determined by a person's social networks, community beliefs and the source of information about the health

behavior^{41,42}. Social networks may amplify the spread of beneficial or dangerous behavior during this COVID-19 epidemic⁴³. As a non-medical measure, personal protective practices are needed to control the COVID-19 pandemic by implementing health protocols, wearing masks, avoiding crowds and maintaining social distancing⁴⁴. The community's willingness could play a vital role in successfully implementing government policies⁴⁵.

CONCLUSION

We concluded a moderate to a high level of risk perceptions associated with COVID-19 in Indonesia's general population. Additionally, they had a relatively good efficacy response in adopting self-protection measures in the COVID-19 pandemic. The public's risk perception of a pandemic contribute to increasing public participation in preventing the COVID-19 pandemic. Furthermore, these findings will contribute to the health authorities regarding COVID-19 pandemic risk communication management.

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AUTHORS' CONTRIBUTION

Lolita,Lolita : study design, methodology, data collection, validation, and writing –

original draft. Azis Ikhsanudin: data management, data collection, visualization, statistical analysis, editing.

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DATA AVAILABILITY

None

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The authors declare no conflict of interest.

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