

## Intention of nurses to accept covid-19 vaccination



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### ABSTRACT

**Introduction:** The coronavirus disease 2019 (COVID-19) pandemic caused by Severe Acute Respiratory Syndrome-Coronavirus 2 (SARS-CoV-2) had spread worldwide. Nurses as health care workers (HCWs) are at great risk of contracting the virus, so they are prioritized for accepting the Covid-19 vaccination. This study aimed to determine the intention of nurses to accept the covid-19 vaccination.

**Method:** This online survey was given to all nurses in East Java who are scheduled to get the Covid-19 vaccine and had not been confirmed of Covid-19. This survey was conducted during 20<sup>th</sup>-27<sup>th</sup> February 2021 and distributed through social media. Data analysis used using an ordinal logistic regression.

**Result:** A total of 150 nurses in East Java responded to this survey. Most of the participants were female (68.67%), aged 30-39 years (59.33%), married (67,33%), worked less than 10 years (58.33%), graduated from Ners (60%), worked in non-covid rooms (70%), had good knowledge about vaccines (85,33%), and had no anxiety about receiving the covid-19 vaccine (66%). There were 69.33% of nurses intend to accept vaccination, 14% had no intention to accept vaccination, and 16.67% were still unsure. Intention to accept vaccination was influenced by marital status ( $p=0.043$ ) and anxiety level ( $p=0.041$ ).

**Conclusion:** The intention to accept the COVID-19 vaccination reached 69,33% among nurses. The intention to refuse and hesitate to accept vaccines was caused by doubts about the effectiveness and safety of the vaccine.

**Keywords:** COVID-19, nurses, vaccination, vaccine acceptance, vaccine hesitancy.

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### INTRODUCTION

The Coronavirus disease-19 (COVID-19) pandemic is caused by Severe Acute Respiratory Syndrome-Coronavirus 2 (SARS-CoV-2), which has spread throughout the world.<sup>1</sup> On 11 March 2020, the World Health Organization (WHO) declared COVID-19 a worldwide pandemic. At the end of May, the COVID-19 had infected over 5 million people across 215 countries or territories and caused more than 300,000 fatalities worldwide.<sup>2</sup> Health care workers (HCWs) are a group that is at great risk of contracting the virus. Until the end of December 2020, the number of health workers who died due to Covid-19 was 504 health workers consisting of 237 doctors and 15 dentists, 171 nurses, 64 midwives, 7 pharmacists, 10 medical laboratory personnel. In East Java, there were 588 cases with details of 98 patients who were declared cured, while 56 patients were declared dead. The most cases were in Surabaya with 299 cases with a total of 45 patients recovered and 31 people died (<http://infocovid19.jatimprov.go.id/> date April 20th, 2020). The high mortality

rate of health care workers has made WHO designate health workers as a priority group for Covid-19 vaccine recipients.<sup>1</sup>

The increasing number of Covid-19 cases globally made countries start developing the Covid-19 vaccine. At least 40 pharmaceutical companies and academic institutions around the world are developing the Covid-19 vaccine.<sup>3</sup> Vaccination is a government program to prevent the spike in Covid-19 cases by establishing herd immunity.<sup>4</sup> The government also must overcome public hesitancy challenges during vaccines' distribution and introduction to the public.<sup>1</sup> The World Health Organization (WHO) stated that vaccine hesitancy is one of the biggest threats to global health.<sup>5</sup> Hesitancy usually arises to the public about its effectiveness and potential safety, side effects, complications of vaccine administration,<sup>3,6</sup> and lack of clear information about vaccines, including conspiracy theories.<sup>5,7,8</sup>

Most of health workers intend to accept vaccination.<sup>9-11</sup> However, refusal to vaccination among HCWs especially nurses could be a particular concern. A study showed that out of

a total of 856 nurses, 138 nurses had no intention to accept vaccination because of anxiety and fear of the negative impact after the vaccination. In addition, anxiety and fear have the opposite association with vaccine acceptance.<sup>8,12</sup> Nurses' decision is critically important considering they are role models who are expected to influence and motivate people to accept vaccination.<sup>4,13</sup> The previous studies identified vaccination acceptance based on demographic factors and work-related factors,<sup>10,11,14</sup> and the sample population was Indonesia HCWs in general.<sup>15,16</sup> Meanwhile, in this study, we added anxiety factor to be analyzed and the subject of this study focused on nurses. This study was conducted to determine the intention to accept Covid-19 vaccination among nurses in East Java and analyzed the factors that influence the intention to accept Covid-19 vaccination.

## METHODS

### Study Design

An analytical cross-sectional study was conducted among nurses in East Java Indonesia during February 20-27<sup>th</sup>, 2021. All respondents were informed of the purpose of this survey and they voluntarily and without coercion filled out this survey. They independently fill in their initials, email addresses, and contact persons. Their data is kept confidential and used only for research purposes. If they agree, the questionnaire will be distributed via WhatsApp messages.

### Sample selection

The snowball sampling technique was used through a WhatsApp group invitation and 170 nurses responded to this survey, but only 150 met inclusion criteria. The nurses working in either public or private service provision and in any of inpatient, outpatient or outreach service in community setting were eligible for this study. Nurses who worked in administration, educational institutions, had no direct contact with patients, and did not complete the questionnaires were excluded from the study sample.

### Assessment

The questionnaire was given online via google form. It was carried out using a

self-administered, anonymous, which consisted of 3 sections: (1) demographic information, (2) Hamilton Anxiety Rating Scale, (3) Preferences for vaccination decision. The demographic data questionnaire contains age, gender, marital status, working experience, education, working room. Knowledge was measured using a questionnaire given via google form consisting of 10 questions, score of 10-50 indicated poor knowledge, score of 60-100 indicated good knowledge. The Indonesian version of Hamilton Anxiety Rating Scale (HAM-A) consisted of 14 items, each defined by a series of symptoms, and measured both psychic anxiety (mental agitation and psychological distress) and somatic anxiety (physical complaints related to anxiety). Each item was scored on a scale of 0 (not present) to 4 (severe), with a total score range of 0-56, where <17 indicated mild severity, 18-24 mild to moderate, and 25-30.<sup>17</sup> Validation and reliability tests on the anxiety questionnaire used the Pearson Correlation test. All items on the questionnaire were valid and the reliability results showed Cronbach's Alpha 0.970 which was more than 0.080 so it was stated that the reliability was good. The questionnaire was limited to only one response to prevent duplication. Any difficulties during the questionnaire filling, respondents contacted the researcher via WhatsApp chat or phone.

### Statistical Analysis

Data were analyzed using IBM Statistic SPSS 25 software. The data on all variables are complete and missing data have been excluded from the analysis. Categorical data related to demographic variables were presented as frequencies and proportions. The factors that influence nurses' intention to accept the Covid-19 vaccination were analyzed using an ordinal logistic regression model.

## RESULTS

This study was followed by 150 nurses who met the criteria from 170 nurses who responded to the survey (table 1), and all respondents are eligible for statistical analysis. A total of 20 nurses were not eligible in this study for a variety of reasons, including nurses from outside

East Java, nurses who work as lecturers, and respondents who did not fill out the questionnaire completely, so the data were not included in the statistical analysis. The respondents were female (68.67%), aged 18-29 years old (22%), 30-39 years old (59.33%), 40-49 years old (17.33%), and over 50 years old (1,33%). In terms of marital status, as many as 67.33% were married. Regarding work-related characteristics, most nurses graduated from Ners (60%), had more than ten years of working experience (60.67%), worked in a non-covid 19 room (70%). There were more than three-quarters of respondents who had good knowledge about the covid-19 vaccine. The results of the anxiety measurement showed that over half of them (66%) did not experience anxiety, while 14.67% experienced mild anxiety, 8.67% experienced moderate anxiety, also severe and very severe anxiety each 5.33%.

Table 2 shows that factors which affected the intention to receive the vaccine in nurses were age, gender, marital status, education, working experience, working room, knowledge, and anxiety. All of these factors influenced 74.8% (Nagelkerke R<sup>2</sup>: 0,748) of intentions to receive the Covid-19 vaccine, while the rest were influenced by other factors not studied. Of the factors studied, only two factors significantly influenced the intention to receive the vaccine, namely marital status (p= 0,043, 95%CI: 0,050-3,328) and anxiety (p= 0,041, 95%CI: 0,201-4,289).

Table 1 shows that 69.33% of nurses intended to receive the vaccine, 14% of nurses had no intention to receive the vaccine, and the rest still could not decide whether to receive the vaccine or not. Some of the reasons of vaccination hesitation or refusal n (figure 1) were because of doubts about vaccine safety (93,48%), distrust of vaccine effectiveness (89,13%), inaccuracy of vaccine schedule (34,78%), inconsistency of government policies (47,83%).

## DISCUSSION

This study was conducted on 20<sup>th</sup>-27<sup>th</sup> January 2021, when the first batch of vaccine recipients had been determined. Covid-19 cases in Indonesia reached 12,658 cases when this online survey was conducted.<sup>18</sup> Although wearing a mask,

washing hands, and keeping a distance are effective enough to reduce the transmission of COVID-19, the Covid-19 vaccination is still needed for long-term prevention. The Covid-19 vaccine has gone through several stages and the vaccine candidates used must fulfill standards in quality, safety and effectiveness.<sup>19,20</sup> This study has identified the intention to accept vaccination among nurses before they were vaccinated and then analyzed the factors that influence it.

More than half of the nurses participated in the study intend to receive the Covid-19 vaccination according to the schedule set by the Government. This was in line with an online survey conducted on respondents aged 18-70 years which showed that almost all respondents (94.3%) intended to receive vaccinations because they believe that vaccination can reduce the possibility of Covid-19 infection, not worrying about side effects of vaccination, perceptions of susceptibility to contracting

COVID-19 if not vaccinated.<sup>9,14</sup> A study also showed that HCWs were more supportive of vaccination than non-HCWs because they want to protect themselves, their families, patients, and colleagues.<sup>21,22</sup> Nurses as HCWs have a higher level of awareness of the transmission of Covid-19 because of their good knowledge of Covid-19. Therefore, nurses' acceptance of vaccination was higher than non-HCWs.

The government decided that health workers were the priority group to get vaccinated, but in reality some of them did not intend to receive vaccinations. The results of this study showed that 14% of nurses did not intend to receive vaccination, while 16.67% were still unsure whether to accept or refuse. Prior study showed that as many as 2,047 workers who filled out an online survey, as many as 138 health workers intended to refuse the Covid-19 vaccination.<sup>10</sup> Refusal of vaccination can reduce vaccine

coverage so that herd immunity will not be achieved.<sup>23,24</sup>

The major reasons for vaccination refusal were doubts about vaccine safety (93.48%) and distrust of vaccine effectiveness (89.13%). The first vaccine distributed by the Government was the China CoronaVac COVID-19 Vaccine developed by Sinovac. This vaccine has been proven to be harmless and protective after its third phase of trials in various countries around the world.<sup>25</sup> According to scientific results, the Sinovac vaccine was 50.4% effective in the last recent trial in Brazil.<sup>26</sup> Vaccines were provided free of charge by the government, but in reality people believe more in conspiracies and news in the media.<sup>24</sup>

This study found that marital status and anxiety were two dominant factors that influence the intention to receive the vaccine. Another study that examined ophthalmology residents who were

**Table 1.** Intentions of acceptance of COVID-19 vaccination by different characteristics of participants.

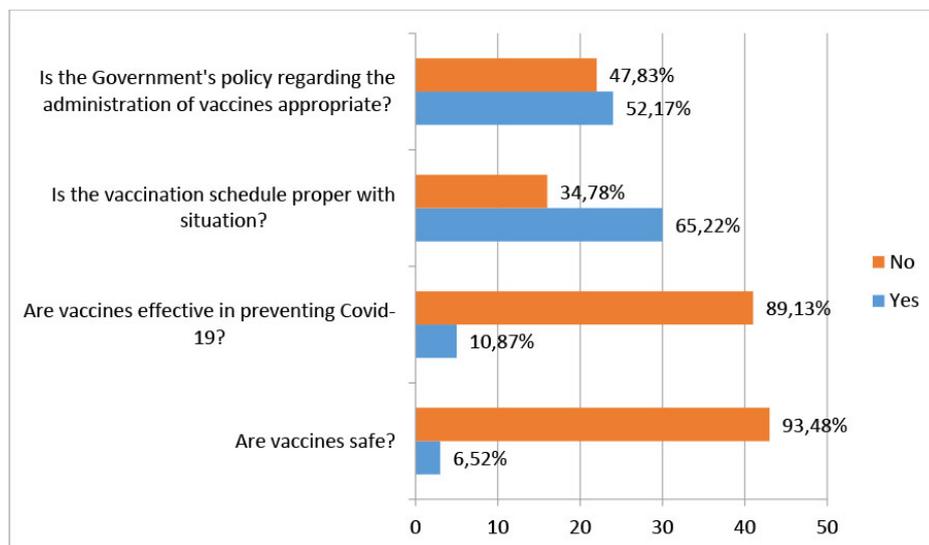
Characteristics	Intention to accept Covid-19 vaccination			Total N (%)
	Intended to accept N (%)	Not intended to accept N (%)	Undecided N (100%)	
<b>Age:</b>				
18-29 years	22 (14,67)	4 (2,78)	7 (4,67)	33 (22)
30-39 years	63 (42)	13 (8,67)	13 (8,67)	89 (59,33)
40-49 years	18 (12)	3 (2)	5 (3,33)	26 (17,33)
>50 years	1 (0,67)	1 (0,67)	0 (0)	2 (1,33)
<b>Sex:</b>				
Male	31 (20,67)	8 (5,33)	8 (5,33)	47 (31,33)
Female	73 (48,67)	13 (8,67)	17 (11,33)	103 (68,67)
<b>Marital status:</b>				
Married	74 (49,33)	11 (7,33)	16 (10,67)	101 (67,33)
Single	30 (20)	10 (6,67)	9 (6)	41 (27,33)
<b>Working experience:</b>				
< 10 years	64 (42,67)	12 (8)	15 (10)	91 (60,67)
≥ 10 years	40 (26,67)	9 (6)	10 (6,67)	59 (39,33)
<b>Education:</b>				
Diploma	37 (24,67)	5 (3,33)	12 (8)	54 (36)
Ners	64 (42,67)	14 (9,33)	11 (7,33)	90 (60)
Postgraduate	2 (1,33)	2 (1,33)	2 (1,33)	6 (4)
<b>Working room:</b>				
Covid-19 room	36 (24)	3 (2)	6 (4)	45 (30)
Non-covid 19 room	68 (45,33)	18 (12)	19 (12,67)	105 (70)
<b>Knowledge:</b>				
Good	94 (62,67)	18 (12)	16 (10,67)	128 (85,33)
Poor	10 (6,67)	3 (2)	9 (6)	22 (14,67)
<b>Anxiety</b>				
No anxiety	97 (64,67)	0 (0)	2 (1,33)	99 (66)
Mild	7 (4,67)	1 (0,67)	14 (9,33)	22 (14,67)
Moderate	0 (0)	4 (2,67)	9 (6)	13 (8,67)
Severe	0 (0)	8 (5,33)	0 (0)	8 (5,33)
Very severe	0 (0)	8 (5,33)	0 (0)	8 (5,33)

**Table 2.** Factors associated intention among nurses to accept Covid-19 vaccination.

	E.S	Wald	p-value	95% CI
<b>Age:</b>				
18-29 years	2,568	1,966	0,161	(-1,432 to 8,635)
30-39 years	2,472	1,306	0,253	(-2,020 to 7,670)
40-49 years	2,611	1,542	0,214	(-1,875 to 8,361)
>50 years	Reff	reff		
<b>Sex:</b>				
Male	0,633	0,000	0,994	(-1,246 to 1,235)
Female	Reff	reff		
<b>Marital status:</b>				
Married	0,836	4,081	<b>0,043*</b>	(0,050 to 3,328)
Single	Reff	reff		
<b>Working experience:</b>				
< 10 years	0,872	0,618	0,432	(-1,024 to 2,395)
≥ 10 years	Reff	reff		
<b>Education:</b>				
Diploma	1,432	0,082	0,775	(-3,216 to 2,398)
Ners	1,415	0,450	0,502	(-3,724 to 1,825)
Postgraduate	Reff	reff		
<b>Working room:</b>				
Covid-19 room	0,726	1,477	0,224	(-0,540 to 2,304)
Non-covid 19 room	Reff	reff		
<b>Knowledge:</b>				
Good	0,773	2,894	0,089	(-2,381 to 0,200)
Poor	Reff	reff		
<b>Anxiety</b>				
No anxiety	1,146	24,968	<b>0,000*</b>	(-7,970 to 3,479))
Mild	0,836	1,001	0,317	(-0,802 to 2,474)
Moderate	1,043	4,633	<b>0,031*</b>	(0,201 to 4,289)
Severe	1,034	0,000	0,988	(-2,011 to 2,042)
Very severe	Reff	reff		

\*variables with significant p-value <0.05

Nagelkerke R<sup>2</sup>: 0,748



**Figure 1.** Reasons for no intention or no decision of accepting Covid-19 vaccination.

married and had children preferred to be vaccinated because they believed that vaccines were effective and able to protect

their families.<sup>14</sup> Anxiety and fear also affect vaccination acceptance which was caused by misleading information in the

media.<sup>8,24</sup> The limitation in this study is that there is a bias in the intention of nurses to accept the covid-19 vaccination because whether or not nurses intend to do it, they still have to be vaccinated following the policies of the nurse organization. The high workload since the pandemic has resulted in the low literacy of nurses regarding information about the covid-19 vaccination. The government should be more aggressive in promoting vaccination to health workers and the public along with scientific evidence to prevent doubt about vaccination. The government's policy to prioritize health workers is quite good and according to a predetermined schedule. Increasing the coverage of Covid-19 vaccination is important in efforts to achieve herd immunity, reducing morbidity and mortality. Vaccination is considered quite effective in preventing the transmission of Covid-19 without ignoring health protocols.

## CONCLUSION

Vaccine acceptance among nurses in East Java was quite high, seen from the intention to accept vaccination. The marital status and anxiety were the dominant factors affecting vaccination acceptance. On the other hand, there were still nurses who do not intend to receive and were hesitant about vaccination because of vaccine safety and effectiveness issues. Vaccine hesitancy is an obstacle challenge to achieving herd immunity, as well as the increasing number of deaths due to Covid-19. The government requires to design an evidence-based strategy to promote vaccination for HCWs, so that the vaccination coverage rate for HCWs reach 100% considering that nurses are at the front-line of treating patients. Nurses have a role in motivating and influencing people to accept vaccinations, so that all nurses are expected to accept vaccination. Further research is expected to be able to analyze the nurses' perception and behavior in receiving the Covid-19 vaccination, and also nurses' responses after vaccination.

## CONFLICT OF INTEREST

There was no conflict of interest in this study.

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## ETHICAL APPROVAL

The research passed the ethical approval as evidenced by the issuance of an ethics approval certificate by the Health Research Ethics Commission of Universitas Pesantren Tinggi Darul Ulum Jombang with the number 015-KEP-Unipdu/2/2021.

## AUTHOR CONTRIBUTION

YS, EM, MIA, and FA conceptualization and designed methodology; YS, DPN, and INR designed study protocol and data interpretation, YS and NMH software and data analysis, YS and INR drafted original manuscript, All authors reviewed and approved the final manuscript.

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