



COVID-19 Vaccination Status and Pregnant Women's Perceptions of Pandemic Omicron COVID-19 Wave in Indonesia

Leo Simanjuntak[✉], Benhard Christopher Simanjuntak

Department of Obstetrics and Gynecology, Faculty of Medicine, Universitas HKBP Nommensen, Medan, Indonesia

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Abstract

Pregnant women are susceptible to COVID-19 infection. COVID-19 vaccination protects pregnant women. This study aims to determine their perception of COVID-19 vaccination and its relation to the Omicron Variant wave of the COVID-19 pandemic in Indonesia. This cross-sectional study took time from February to March 2022. Subjects were asked to sign an informed consent and fill out a questionnaire. Demographic data, vaccination status, and perception of the pandemic were collected and statistically analyzed. Of the 361 study subjects, 219 (60%) are vaccinated, and 142 (40%) are unvaccinated. The vaccinated pregnant women were less anxious about the COVID-19 pandemic ($p < 0.001$, OR 2.24). Pregnant women with higher education or those who work were also less anxious about the COVID-19 pandemic ($p < 0.05$; OR 1.58 and OR 1.6). Most unvaccinated subjects were afraid of the vaccine's effects on the fetus (62%). The emergence of the Omicron variant is the most cause of anxiety (38%). The most reason for pregnant women who were not anxious is because they had received vaccination (55%). The COVID-19 vaccination can provide a sense of security for pregnant women facing the COVID-19 pandemic.

Introduction

Developments in the COVID-19 case show that there has been an increase in cases of confirmed COVID-19 pregnant women in some major cities in Indonesia who are in severe condition. Pregnant women have an increased risk of becoming severely ill if infected with COVID-19, especially pregnant women with certain medical conditions. Pregnant women with COVID-19 have a higher risk of developing preeclampsia/eclampsia, severe infections, admission to intensive care units, maternal death, preterm birth, and increased morbidity and mortality in their fetuses compared to pregnant women who are not infected with COVID-19 (Villar et al., 2021). The Working Group on Reproductive Tract Infections of the Indonesian Obstetrics and Gynecology Association (POGI) reported that from April 2020 to April 2021, there were 536 cases of

COVID-19 in pregnant women. The Royal College of Obstetrics & Gynecologists (RCOG) reports that more than two-thirds of pregnant women with COVID-19 are asymptomatic. But of those with symptoms, around 5% require intensive treatment and further breathing assistance (Royal College of Obstetricians & Gynaecologists, 2022). Thus, the morbidity and potential mortality caused by COVID-19 in pregnant women should not be underestimated. Especially during the Omicron variant wave period, where the Omicron COVID-19 variant was found to increase the risk of reinfection with COVID-19 through an immune-evasion mechanism (Pulliam et al., 2022). Preventive measures must be taken, such as administering the COVID-19 vaccine to pregnant women.

Several world health agencies have recommended COVID-19 vaccination for pregnant women. Like WHO, on June 2, 2021, it

[✉] Correspondence Address:

Department of Obstetrics and Gynecology, Faculty of Medicine, Universitas HKBP Nommensen, Medan, Indonesia
Email : leosimanjuntak@uhn.ac.id

recommended giving COVID-19 vaccination to pregnant women as long as the benefits outweigh the risks. For example, pregnant women with high exposure to COVID-19 or comorbidities (Goodman, 2021). ACOG (American College of Obstetricians and Gynecologists) also stated that no complications were found in pregnant women or the fetus in pregnant women who received the COVID-19 vaccination (Ghamri et al., 2022). On June 21, 2021, POGI (Indonesian Gynecological Obstetrics Association) issued a recommendation for advocacy on COVID-19 vaccination for pregnant women and children through Focused Group Discussions (FGD) with BKKBN, BPOM, ITAGI, POGI, and IDAI. It is hoped that this advocacy will encourage pregnant women to take part in vaccinations. Considering the increasing number of pregnant women infected with COVID-19 and the high risk for pregnant women if the infection with COVID-19 becomes severe and affects their pregnancy and their babies, efforts are needed to provide COVID-19 vaccinations for pregnant women. The Indonesian government issued a policy on August 2, 2021, to give COVID-19 vaccinations to pregnant women with priority in high-risk areas. Vaccines that can be used for pregnant women are the Pfizer and Moderna mRNA platform COVID-19 vaccines, and the Sinovac inactivated-vaccine platform vaccine, according to availability (Kementerian Kesehatan Republik Indonesia, 2021). The administration of the 1st dose of the COVID-19 vaccination begins in the second trimester of pregnancy, and the 2nd dose is administered according to the interval of the vaccine type. Vaccination will reduce the worries of pregnant women about the COVID-19 pandemic amid the recent increase in cases, especially the new Omicron variant which is believed to transmit more quickly than other variants. Thus, the formulation of the problem in this study is how pregnant women perceive the COVID-19 pandemic and its relationship with COVID-19 vaccination status.

Method

This research is analytical research with a cross-sectional design. This study was conducted on pregnant women in the obstetrics & gynecology outpatient clinic owned by

researchers in Medan, Indonesia. This research took time from February to March 2022. This study received information that it had passed an ethical review from the Health Research Ethics Committee, Faculty of Medicine, University of HKBP Nommensen. The target population of the study was pregnant women who had their prenatal check-ups at the private practice of a specialist in Obstetrics and Gynecology in the city of Medan. The reachable population is pregnant women who come to check their pregnancies at the Obstetrics & Gynecology outpatient clinic owned by researchers in Medan, Indonesia. The study inclusion criteria were: pregnant women who had antenatal checks and were willing to be interviewed and signed research consent. The study exclusion criteria were: pregnant women with complications of hyperemesis gravidarum, hypertension in pregnancy, abortion, antepartum hemorrhage, and fetal death in the womb.

Researchers provide explanations to respondents about the benefits and objectives of the study. After explaining the research to be carried out, respondents who were willing to sign an informed consent were asked to sign the informed consent. Respondents who signed informed consent were interviewed and filled out a questionnaire. Researchers collected demographic data such as age, obstetrical status, education level, and employment status. Respondents then filled out the questionnaire by answering questions. Questions on the questionnaire asked about vaccination status, vaccination frequency, and perceptions of being worried or not worried about the COVID-19 pandemic in this Omicron wave. The questionnaire also contains questions about the subject's reasons for not receiving the vaccination, as well as the reasons for choosing the perception of being worried or not worried about the COVID-19 pandemic.

Results and Discussions

A study was conducted on 361 pregnant women with characteristics including age, education, occupation, parity, and gestational age, which can be seen in Table 1. The majority of pregnant women, 317 people (88%), were at a healthy reproductive age, i.e. <35 years,

and there were as many as 44 (12%) who were above healthy reproductive age. The majority of respondents in this study had a higher education level, namely, at least a bachelor's degree or diploma (56%), were not working (52%), were multigravida (54%), and were in their third trimester of pregnancy (55%). Table 1 shows that regardless of vaccination status, education and work have relationships with perceptions of worry about the COVID-19 pandemic ($p < 0.05$). The odds-ratio results found that

pregnant women with higher education are 1.58 times more likely to not worry about the COVID-19 pandemic than pregnant women with low education. Meanwhile, the possibility of working pregnant women not worrying about the COVID-19 pandemic is 1.6 times greater than pregnant women who are not working. No relationship was found between the age of pregnant women, gravida, and gestational age on perceptions of worry about the COVID-19 pandemic ($p > 0.05$).

Table 1. Respondent's Characteristic

Characteristics	Worried N (%)	Not Worried N (%)	Total N (%)	OR*	95% CI	P-value*
Age						
< 35 years	145 (40%)	172 (48%)	317 (88%)	1.00		
35 years	25 (7%)	19 (5%)	44 (12%)	0.641	(0.339, 1.210)	0.168
Education						
Low	85 (23,5%)	74 (20,5%)	159 (44%)	1.00		
High	85 (23,5%)	117 (32,5%)	202 (56%)	1.58	(1.040, 2.403)	0.032
Work Status						
Working	71 (19,6%)	102 (28,4%)	173 (48%)	1.6		
Not working	99 (27,4%)	89 (24,6%)	188 (52%)	1.00	(1.053, 2.424)	0.027
Gravida						
Primigravida	86 (24%)	81 (22%)	167 (46%)	1.00		
Multigravida	84 (23%)	110 (31%)	194 (54%)	1.390	(0.918, 2.107)	0.120
Gestational Age						
1st Trimester	36 (10%)	40 (11%)	76 (21%)			
2nd Trimester	41 (11%)	46 (13%)	87 (24%)			0.998
3rd Trimester	93 (26%)	105 (29%)	198 (55%)			

*P-value and Odds-Ratio calculation by Chi-square Test.

Table 2 shows the frequency of the respondents' COVID-19 vaccinations in this study. A total of 219 respondents (60%) had been vaccinated against COVID-19, and 142 respondents (40%) had not received the vaccination. Of all study respondents, 40 people (11%) had received the first dose of vaccination, 167 people (46%) had received complete vaccination twice, and 12 people (3%) had received a booster.

The respondents' reasons for not being vaccinated against COVID-19 are shown in Figure 1. Most pregnant women (62%) are afraid of the dangers that the vaccine poses to the fetus they contain. As many as 31 people (22%)

of pregnant women have difficulty adjusting their schedule to be vaccinated. Meanwhile, other reasons for not being vaccinated include comorbid/other diseases in the mother (9%), no notification (5%), and fear of the dangers of vaccines in the mother (2%).

Table 2. Respondent's COVID-19 Vaccination Frequency

Vaccination Frequency	N	%
Not yet	142	40
I	40	11
II	167	46
III	12	3
Total	361	100

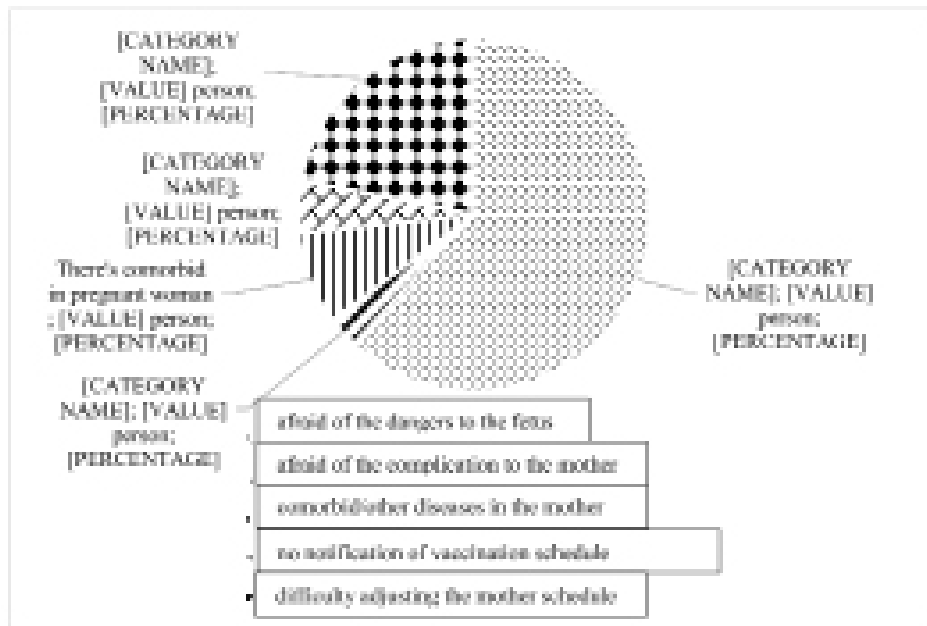


FIGURE 1. Reasons of COVID-19 Unvaccinated Respondents

Table 3 shows that 219 (60%) pregnant women have been vaccinated against COVID-19, and 142 (40%) have not been vaccinated against COVID-19. From the group that had received the COVID-19 vaccine, 133 people (36%) were not worried about facing the current pandemic, while 86 people (24%) were worried. From the group that had not been vaccinated, 58 people (17%) felt not worried, and as many as 84 people (23%) felt worried

about the current pandemic. From this data, a significant relationship was found between vaccination status and perceptions of worry about the COVID-19 pandemic ($p < 0.001$). The statistical test obtained an odds-ratio value of 2.24. It means pregnant women who have been vaccinated against COVID-19 are 2.24 times more likely than pregnant women who have not received the COVID-19 vaccination.

Table 3. Distribution of Perception to Vaccination Status

Characteristics	Worried N (%)	Not Worried N (%)	Total N (%)	OR	95% CI	P-value
Has been vaccinated	86 (24%)	133 (36%)	219 (60%)	2.24	(1.456, 3.446)	< 0.001
Has not been vaccinated	84 (23%)	58 (17%)	142 (40%)	1.00		
Total	170 (47%)	191 (53%)	361 (100%)			

As many as 170 (47%) of respondents were worried about the COVID-19 pandemic. Respondents' reasons for choosing the perception of worry are presented in Figure 2. In the group that had received the vaccine, the most common reason for worry was the presence of the Omicron variant (38%), followed by fear of exposure (37%). In the unvaccinated group, the most common reason for worry was

because they had not been vaccinated (38%), followed by fear of exposure (31%). While overall, the most reasons to feel worried were fear of exposure (34%), the presence of new variants such as Omicron (26%), the condition of respondents who were pregnant (17%) and had not received the COVID-19 vaccination (14%).

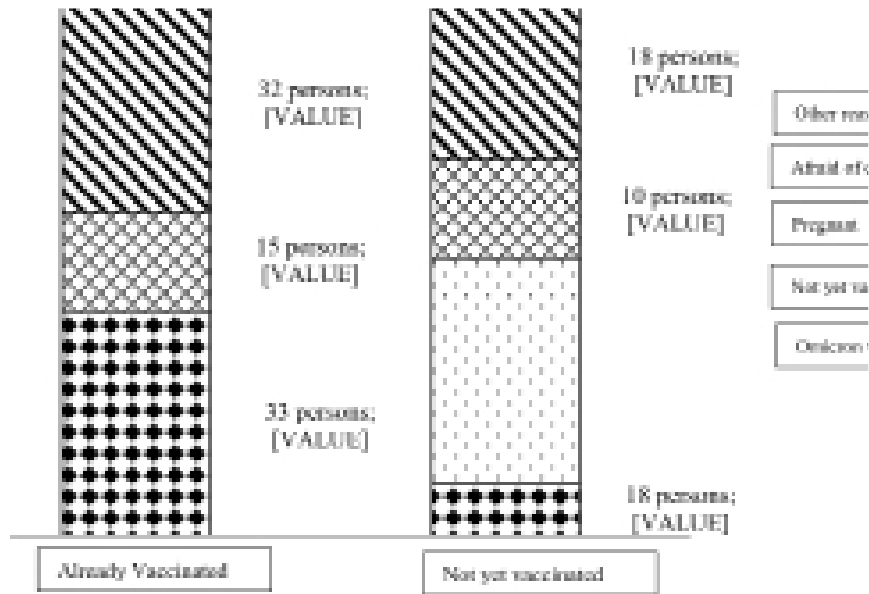


FIGURE 2. Reasons of Pregnant Woman Choose Worry Perception

As many as 191 (53%) respondents felt they were not worried about the COVID-19 pandemic. Respondents' reasons for choosing not to worry about the COVID-19 pandemic are presented in Figure 3. Of the group who had the vaccine, the most reasons for not worrying were because they had been vaccinated (38%), had implemented health protocols (9%), and surrendered to God (8. %). From the group that had not been vaccinated, the most reasons for not worrying were surrendering to God

(10%), trying to maintain health (8.5%), and following health protocols (6%). Overall, the most reason not to worry is that they have been vaccinated against COVID-19 (38%). Other reasons in order were surrendering to God (18%), implementing health protocols (15%), maintaining health (14.5%), getting used to it because they had been through the COVID-19 pandemic for a long time (11%), and had had previously been infected with COVID-19 (3.5%).

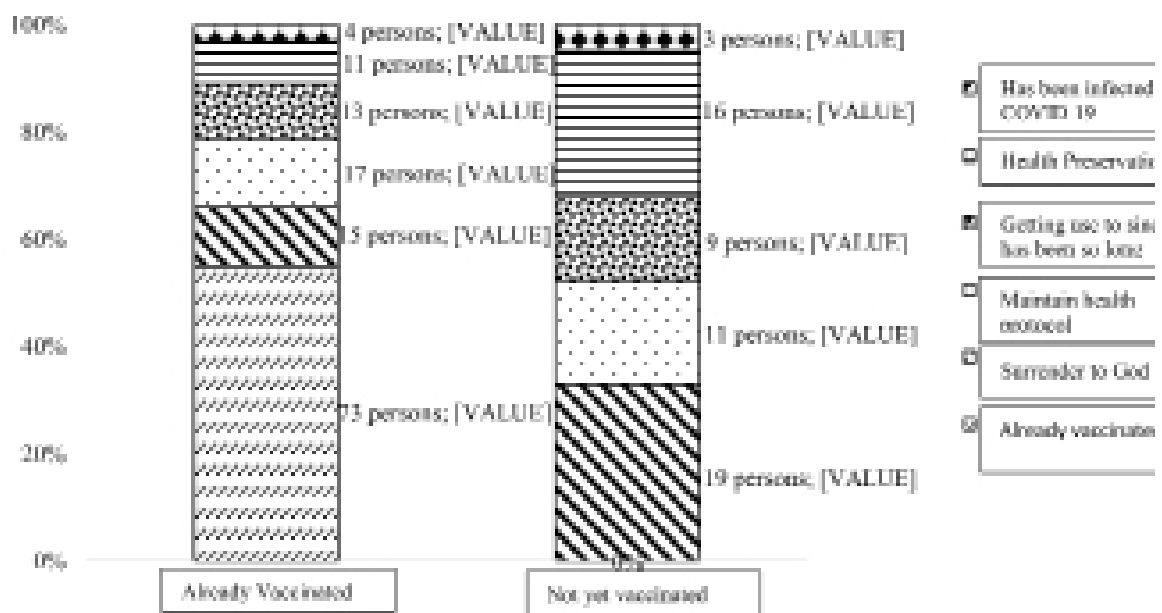


Figure 3. Reasons of Pregnant Woman Choose Not to Worry Perception

To the authors' knowledge, this study is the only one assessing the relationship between COVID-19 vaccination status and perceptions of the COVID-19 pandemic in pregnant women visiting private obstetrics & gynecology practices for antenatal check-ups when cases of the Omicron variant were infecting Indonesia and continues to experience an increase, namely in February - March 2022.

This study finds a relationship between education and perceptions of worry about the COVID-19 pandemic ($p < 0.05$), and an odds-ratio value of 1.58. In other words, it is 1.58 times more likely that pregnant women with a high level of education are not worried about the COVID-19 pandemic than pregnant women with a low level of education. The education level can be linked to a good literacy level so that respondents with a higher level of education will have a better understanding of health protocols, the benefits of vaccinations, and other ways to stay safe during the COVID-19 pandemic. It is per studies in China found that a higher level of education indicates better knowledge about COVID-19. Respondents with higher levels of education are also more aware of fake news about the COVID-19 pandemic, so they are less worried (Zhong et al., 2020). This research is also in line with research in Malaysia that the level of tertiary education, namely at the university level or equivalent, is significantly related to the mother's level of knowledge about the COVID-19 pandemic, so it is also related to positive perceptions of the COVID-19 pandemic (Syed Anwar Aly et al., 2021).

The level of knowledge about COVID-19 vaccination can be caused by a lack of information obtained by pregnant women about the importance of the COVID-19 vaccination or the many hoaxes circulating in the community that cause misinformation. Different educational backgrounds, varied environments, and receiving various messages are certainly opportunities for spreading fake news regarding the COVID-19 vaccine. Knowledge is a process that occurs after an individual sense a particular object. Most individuals' sense is obtained through the eye and ear, namely through seeing and hearing. Knowledge can also be obtained through experiences and learning processes in formal

and informal education.

One of the information sources playing a vital role in knowledge is the mass media. Information conveyed through the mass media that describes the common reactions that occur after the COVID-19 vaccination includes pain or redness around the injection site, itching, mild fever, fatigue, drowsiness, headache, and muscle aches are common reactions and only last less than a week and not a barrier to vaccination. It is necessary to encourage various socializations, both through various types of media and directly by health workers or other parties who have competence regarding the importance of providing a calm sense about the COVID-19 vaccination in pregnant women.

This study also found a significant relationship between employment status and perceptions of worry about the COVID-19 pandemic ($p < 0.05$) and obtained an odds-ratio value of 1.6. It indicates that the possibility of pregnant women who work not worrying about the COVID-19 pandemic is 1.6 times greater than pregnant women who do not work. By studies in several other populations, work status is related to the level of knowledge about COVID-19 so that they follow health protocols properly and generate positive perceptions or are not worried about the COVID-19 pandemic (Al-Hanawi et al., 2020; Zhong et al., 2020).

Of all respondents, 219 (60%) pregnant women had received the COVID-19 vaccination. As many as 40 people (11%) had received the first dose, 167 people (46%) had received complete vaccination twice, and as many as 12 people (3%) had received a booster dose. The Ministry of Health of the Republic of Indonesia previously permitted COVID-19 vaccination for pregnant and lactating women in Indonesia on August 2, 2021, due to increased morbidity and mortality due to COVID-19 in this population (Sarwal et al., 2021). The data for this study were collected in February - March 2022, about 6-7 months after the issuance of a circular letter from the Ministry of Health of the Republic of Indonesia to vaccinate COVID-19 in pregnant women. So that the subject has been exposed for quite a long time to information and outreach regarding the COVID-19 vaccination on pregnant women. Research in England showed that two months

after the recommendation was issued to give COVID-19 vaccination to pregnant women by the JVICI (Joint Committee on Vaccination and Immunization), only around 28.5% of pregnant women received at least one dose of COVID-19 vaccination. Thus, time is needed to provide information and outreach to pregnant women regarding the safety of the COVID-19 vaccine and data regarding the vaccine efficacy to increase vaccination coverage (Blakeway et al., 2022).

As many as 142 people (40%) of the respondents had not received the COVID-19 vaccination. Most respondents (62%) did not receive the COVID-19 vaccination because they were afraid of the danger the vaccine would pose to the fetus they were carrying. There were 31 people (22%) pregnant women who had difficulty getting the opportunity to be vaccinated. A study in France on 664 pregnant women in February – April 2021 also explained that the most common reason pregnant women did not want to be vaccinated was fear of side effects of the COVID-19 vaccine on their fetus (76.9%) and on themselves (33.8%) compared to the fear of the COVID-19 infection itself (Egloff et al., 2022). A meta-analysis study involving 40,978 pregnant women stated that COVID-19 vaccination in pregnant women was not associated with adverse fetal outcomes such as abortion, stillbirth, low birth weight babies, or fetal death (Ma et al., 2022). Thus, it is necessary to provide education and socialization that the COVID-19 vaccination is safe for pregnant women, thereby increasing the coverage of COVID-19 vaccination in pregnant women.

The data analysis found a relationship between vaccination status (already or not) and perceptions of the COVID-19 pandemic (worried or not worried) with ($p < 0.001$). In other words, respondents who had received COVID-19 vaccination felt significantly less worried about the pandemic compared to those who had not. A study on the American adult population from December 2020 to March 2021 showed that receiving one dose of the COVID-19 vaccine could improve the mental status of respondents, such as reducing the prevalence of depression and anxiety in respondents (Perez-Arce et al., 2021). So, with

the decreased anxiety in pregnant women, because they have received the COVID-19 vaccination, it is in line with the results of this study that the COVID-19 vaccination can create a sense of security for pregnant women in dealing with the COVID-19 pandemic.

Overall, the most common reasons for pregnant women to feel worried were fear of exposure (34%), the existence of new variants such as Omicron (26%), the condition of respondents who were pregnant (17%), and had not received the COVID-19 vaccination (14%). The perception of worry about facing the COVID-19 pandemic is found in both. Those who have received vaccination and those who have not. In the group that had received the vaccination, the most common reason for worry was the presence of the Omicron variant (38%), followed by fear of exposure (37%). It shows that the increase in cases of the new Omicron variant is very troubling for pregnant women. As reported by the Ministry of Health of the Republic of Indonesia on February 21, 2022, there were already 5,277 cases of the Omicron variant of COVID-19 in Indonesia at that time. This fact is confirmed by the understanding that the Omicron variant spreads quicker than the previous variants and affects groups of people, families, and communities.

The Omicron variant has also become a problem in several other countries from late December 2021 to early 2022. A COVID-19 study in England from December 2021 to January 2022 stated that more than 90% of subjects infected with COVID-19 were infected with COVID-19 variants of Omicron BA.1 or BA.2 (Chadeau-Hyam et al., 2022). Meanwhile, on 15 February 2022, WHO stated that of the 432,470 specimens collected from mid-January to mid-February 2022 from around the world, 98.3% of the Omicron variants of COVID-19 were obtained (World Health Organization, 2022). Apart from its faster transmission ability, it is also stated that the Omicron variant is more likely to cause reinfection than the previous COVID-19 variant. The risk of reinfection was 1.7 times higher in November 2021, when Omicron was circulating in South Africa, compared to the first wave of the pandemic in early 2020 (Pulliam et al., 2022). So this further supports the reasons pregnant women

are worried about the Omicron variant of COVID-19.

In addition, a cause of concern for pregnant women is fear of exposure. If exposed, it will be susceptible to vertical infection from mother to child (Saccone et al., 2020). A study in Pakistan also stated that vertical transmission of infection from mother to baby is the main factor for high levels of anxiety (Hossain et al., 2020). Although in-utero infection and vertical transmission of COVID-19 seem rare, infection in pregnancy can increase the risk of preeclampsia, premature birth, low birth weight, or infant death (Kotlyar et al., 2021). Overall, the most reason for pregnant women not to worry is because they have been vaccinated against COVID-19 (38%). Other reasons in order were surrendering to God (18%), implementing health protocols (15%), maintaining health (14.5%), getting used to it because they had been through the COVID-19 pandemic for a long time (11%), and had had previously been infected with COVID-19 (3.5%).

The perception of not worrying about the COVID-19 pandemic was found in the vaccinated group of 133 (70%) respondents and 58 (30%) who had not received the vaccination. Perceptions are not worried more in the group receiving the COVID-19 vaccine because they had received the vaccine (38%). It is in line with one of the results of this study that pregnant women who have received vaccination are less worried about the COVID-19 pandemic than those who have not been vaccinated ($p < 0.05$). This finding further strengthens that vaccines give pregnant women a sense of security and calm in the face of the current COVID-19 pandemic. Individuals who have been vaccinated feel secure and believe in reducing the possibility of mortality due to COVID-19 infection (Singh & Jaswal, 2020). This reduction in stress and worry levels significantly dropped even after the first dose of the COVID-19 vaccine.

In the group that had not received the vaccination, 58 people (30%) feel not worried about facing the COVID-19 pandemic, even though there was an increase in the new Omicron variant. Most mothers stated that their reasons for not worrying were surrendering to God's

will (10%) and maintaining their health (8.5%). A study in Iran found concerning perceptions of COVID-19, where research subjects believed that life and death are in God's hands, so humans do not need to worry about contracting the COVID-19 virus (SoleimanvandiAzar et al., 2021). There is a tendency for a small group of people to feel that this pandemic is an ordinary respiratory infection that is nothing to worry about and does not need a vaccine. Others believe that following health protocols, eating healthy food, exercising diligently, and taking supplements will prevent COVID-19 infection. Little knowledge about disease and health guidelines is one of the individual factors reason for the lack of preventive measures for COVID-19 infection (Liem et al., 2020). Thus, some people believe that COVID-19 is an ordinary respiratory infection and don't need to worry. There needs to be more education and outreach to the community so that they become more compliant with health protocols and are aware of the dangers of COVID-19 infection.

Conclusion

From this study, we confidently conclude that vaccination provides a sense of security for pregnant women facing the COVID-19 pandemic, especially during the Omicron variant of COVID-19 in Indonesia in February-March 2022.

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