Jurnal Riset Kesehatan, 12 (1), 2023, 41 - 49
DOI: 10.31983/jrk.v12i1.9565

Jurnal Riset Kesehatan

http://ejournal.poltekkes-smg.ac.id/ojs/index.php/jrk

MOTIVATION AND HESITANCY TOWARDS THE COVID-19 VACCINE IN EXPECTING MOTHERS

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Abstract

The practical and efficient prevention of the transmission of COVID-19 infection is through vaccination. However, there are challenges associated with refusing or postponing vaccination due to skepticism regarding the efficacy and safety of vaccines, particularly among pregnant women. The risk factors of pregnant women tend to make this vulnerable group reluctant to uptake the vaccines. Motivation influences personal hesitancy in deciding, especially regarding the COVID-19 vaccine. Therefore, this study investigated the correlation between motivation and hesitancy related to COVID-19 vaccines in expectant mothers at the Bening Nawangsari Midwife Clinic, Bekasi City. In this cross-sectional study, as many as 301 pregnant mothers were chosen using the consecutive sampling method. The Motivations of Vaccination Questionnaire and The Reasons for Hesitation Questionnaire were employed when collecting the data. After calculating the data with the Chi-Square test, a significant relationship between motivation and vaccine hesitancy was revealed (p-value= 0.001). It was concluded that there was a significant relationship between expectant mothers' motivation and hesitation to receive the COVID-19 vaccine.

Keywords: *COVID-19 vaccine; expecting mothers; hesitancy, motivation*

1. Introduction

The urgent spread of COVID-19 globally has been going on since the end of 2019 (Zhu et al., 2020). Reducing the spread of COVID-19 transmission is highly recommended by vaccination programs that are considered an effective strategy to contain the rapid spread of infection (Z.-P. Yan, Yan, & Lai, 2021). Conditions in the field reveal that vulnerable populations such as expecting mothers are at higher risk of exposure to COVID-19 infection compared to non-expecting mothers (Fakari & Simbar, 2020). Physiological changes in the antenatal period generally increase the risk of expecting mothers being exposed to infection, which can cause respiratory failure if the infection affects the cardio respiratory system (Dashraath et al., 2020). Expecting mothers confirmed positive for COVID-19 infection are also at a high potential of experiencing abortion, premature parturition, suffering from critical conditions in treatment at an intensive care unit, dependence on an artificial ventilator and the increasing risk of mortality (Adhikari et al., 2020; Zambrano et al., 2020).

Early development of a COVID-19 vaccine is a principal matter that must consider improving women's immune responses to the virus, along with hormone-modulating technology. Relevant research has been conducted in the past on women-specific

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vaccines, and these clinical trials address women's concerns, confirming that women's complications and antibody responses are robust and effective. National policies should also propose good strategies for the immunization of women. These strategies will help raise awareness, help women have a better vaccination experience, prepare them for vaccination, and protect them from COVID-19 infection (Chang, 2020).

The Government of the Republic of Indonesia, through the Ministry of Health, has made it mandatory for expecting mothers who pass screening to receive the COVID-19 vaccine as a protective measure against this risk group after proving that the vaccine is safe (Halu, Dafiq, Banul, Laput, & Trisnawati, 2022; Kemenkes RI, 2021). The goal of administering the COVID-19 vaccine is a priority in efforts to reduce the potency of COVID-19 infection and ensure a safe environment for the fetus (Z. Yan, Yang, & Lai, 2021). Nevertheless, there is still significant hesitancy about vaccination, such as the concern of expecting mothers about the possible side effects of vaccination (Vallée, Fourn, Majerholc, Touche, & Zucman, 2021). The government has socialized through prioritizing vaccination for expecting mothers, but the achievement of vaccination in this aggregate is still low. There is a gap between the efforts made by the government and the targeted results.

Studies show that low motivation to get the COVID-19 vaccine indicates a reluctance to get the COVID-19 vaccine. On the other hand, high motivation can increase vaccination acceptance (Lin, Yen, Chang, & Wang, 2021). Therefore, studies are needed to investigate further the association between motivation and hesitation to receive the COVID-19 vaccines in the population of expecting mothers. If a correlation is demonstrated, this study will recommend intervention efforts to local governments to modify the motivational factors and factors of hesitancy in expecting mothers receiving vaccine injections to avoid SARS Cov-2 infection.

Results of the pilot study were implemented on ten expecting mothers at the study site, and it is known that six expecting mothers received the first dose of the immunization, and the other four expecting mothers decided to discontinue the COVID-19 vaccine. Six expecting mothers agreed to get the COVID-19 vaccine because they did not want to catch COVID-19 infection. Meanwhile, four expecting mothers delayed receiving the COVID-19 vaccine because of suspicions about its safety and side effects on themselves and their fetuses. Therefore, we would like to investigate the description of expecting mothers' motivation and hesitancy about the COVID-19 vaccine and the association between expecting mothers' motivation and hesitation to this immunization at the Bening Nawangsari Midwife Clinic in Bekasi City.

2. Method

A cross-sectional design was applied in this study. The population in this study were 1215 expecting mothers. Based on the calculation of the Slovin formula, a total sample of 301 expecting mothers was obtained who were recruited using the consecutive sampling method. The location of this research was carried out at the Bening Nawangsari Midwife Clinic, Bekasi City. The time of research took place from April to June 2022.

This study used the Motivations of Vaccination Questionnaire and The Reasons of Hesitation Questionnaire (Tavolacci, Dechelotte, & Ladner, 2021). The Motivations of Vaccination Questionnaire consists of 8 statements that are positive (favourable) items with a Guttman scale, namely 0: no and 1: yes. This questionnaire has also been tested for validation and reliability, with valid results (with a calculated r value per item in the range of 0.379-0.746 and reliable (with a Cronbach α value of 0.660). The Reasons of Hesitation Questionnaire consists of 13 favourable and valid statements with a calculated r value per item ranging from 0.367 to 0.720 and reliable with a Cronbach α value of 0.770.

Inclusion criteria in this study included expecting mothers registered to carry out examinations at the Bening Nawangsari Midwife Clinic, Bekasi City. Exclusion criteria include expecting mothers who are confirmed positive for COVID-19 transmission and are currently undergoing isolation. After reaching the specified samples, the research data were analyzed using the Chi-Square test.

This study upholds the principles of research ethics, including respecting human dignity, respecting the privacy and confidentiality of research subjects, guaranteeing the right to protection from exploitation, and not endangering respondents. Before participating in this study, prospective expecting mothers respondents have explained the research

procedure, the benefits and potential losses that might occur in terms of time. Prospective respondents already understood the research design to be carried out and then gave their consent to participate in the research on the informed consent sheet. After participating in this study, respondents received souvenirs for participating in the research. Prior to the implementation of data collection by the research team, this research protocol had gone through an ethical review by the Health Research Ethics Committee, Faculty of Medicine, Jakarta "Veteran" National Development University. It had been declared to have passed the ethical review with a certificate of ethical approval Number 287/V/2022/KEPK. After the data were collected, a Chi-Square test was carried out to analyze the relationship between motivation and hesitancy towards the COVID-19 vaccine.

3. Result and Discussion

Table 1. Description of Mother's Age and Gestational Age (n=301)

Variable	Mean±SD	Min-Max
Mother's age	28.63±5.301	16-44
Gestational age	22.94±11.962	6-39

The results showed that the mean age of expecting mothers in this study was 28.63 years, and the majority (84.7%) were between 20 and 35 years old (See Table 1). A study conducted early in the pandemic found that younger age was associated with greater reluctance to vaccinate (Fisher et al., 2020). However, other studies reported different results, which explained that older expecting mothers are more concerned about vaccine side effects during pregnancy (Tao et al., 2021). In Table 2, it is explained that the majority (148 people, 42.9%) of expecting mothers surveyed had equivalent senior high school qualifications. On the other hand, two expecting mothers (0.7%) still do not attend school. One study reported no significant differences in motivation to be vaccinated among people with different educational qualifications (Tong, He, Wu, Dang, & Chen, 2021). Nonetheless, respondents who graduated from high school reported a much higher motivation to vaccinate.

Table 2 also explains that 177 respondents (58.8%) do not work, and 124 (41.2%) work. This figure shows that most expecting mothers at the Bening Nawangsari Midwife Clinic in Bekasi City are not workers or act as housewives in the family. One study reported that people who do not work experience less stress than those who work (Dede Yoshima Nekada, Aquino Erjinyuare Amigo, Deni Krisnanto, Respati Yogyakarta Program Studi Keperawatan, & Ilmu Kesehatan, 2020). Working professionals are usually anxious because of the workload and pressure at home. This study did not investigate whether this work status directly affected the motivation or hesitancy of respondents to receive the COVID-19 vaccine.

The study of 301 samples found that the majority (254 respondents; 84.4%) had low income. However, 47 respondents (15.6%) indicated a high-income level. This information reveals that most of the expecting mothers in this study are in the middle to lower socioeconomic class because their income is below the regional minimum wage in Bekasi City. Individual socioeconomic status influences three factors in vaccination decisions: cost, knowledge and awareness, and motivation. The cost factor means not only the price of the vaccine but also the time factor and other costs associated with arrival at the health care facility and the vaccination program. Therefore, cost estimation and a sense of urgency to get the vaccine will motivate their participation in the vaccination program (Hanifah, Herdiana, & Ardi, 2021).

Respondent characteristic data (Table 2) also provides information related to the average gestational age of the respondents, which is 22.94 weeks, with an average gestational age of 24 weeks. In addition, it is also known that the youngest gestational age is six weeks, and the oldest is 39 weeks. Most expecting mothers are in their third trimester of pregnancy, between 29 and 39 weeks, with as many as 120 respondents (39.9%). Expecting mothers in the second and third trimesters are more motivated to receive the COVID-19 vaccine than those in the first trimester (Tao et al., 2021). Based on gestational age, expecting mothers in the first trimester may experience more stress and more severe psychological effects during the COVID-19 outbreak than women in the second or third trimester (Saccone et al., 2020).

Table 2. Distribution Frequency of Characteristics of Respondent (n=301)

Variable	Frequency (n)	Percentage (%)
Education		
Uneducated	2	0.7
Elementary school	14	4.7
Junior high school	41	13.6
Senior high school	148	49.2
College	96	31.9
Working Status		
Not working	177	58.8
Working	124	41.2
Income		
Low (≤ Minimum wage in Bekasi City Rp. 4,816,921)	254	84.4
High (> Minimum wage in Bekasi City Rp. 4,816,921)	47	15.6
Gravida Status		
Primigravida	90	29.9
Multigravida	211	70.1
Parity Status		
Nullipara	111	36.9
Primipara	132	43.8
Multipara	58	19.3
History of COVID-19 infection		
Never	243	80.7
Once	58	19.3
History of the COVID-19 Vaccine		
Not yet vaccinated	20	6.6
Dose 1	6	2
Dose 2	214	71.1
Dose 3 (Booster)	61	20.3
Motivation		
Low	163	54.2
High	138	45.8
Vaccine Doubt		
Low	209	69.4
High	92	30.6

Table 2 also explains that 90 respondents (29.9%) were pregnant with their first child, and the remaining 211 (70.1%) were multigravida mothers. So, it can be concluded that most of the expecting mothers in this study had been pregnant more than once. In addition, a study reported no significant association between primigravida and multigravida groups with vaccination status (Pertiwi & Ayubi, 2022). Another study also reported no significant difference in receiving the COVID-19 vaccine between the first and more pregnant groups (Geoghegan et al., 2021).

Most of the respondents in the study were primiparas, with as many as 132 respondents (43.9%). A total of 111 (36.9%) expecting mothers in this study had never given birth, and 64 (19.3%) had given birth more than once. From this, it can be concluded that most respondents had given birth once (primipara). A previous study concluded no association between parity status and participation in immunization programs (Yulida, 2018). Parity is one of the internal factors influencing the respondent's willingness to vaccinate. However, interest in immunization is influenced by many other internal and external factors, such as knowledge, family support, information from the media and health promotion by professionals, so no single parity factor does not significantly determine participation in vaccination (Reihana & Artha Budi Susila Duarasa, 2012).

The study results of 301 samples, most of which were never confirmed positive for COVID-19, namely 243 respondents (80.7%). Meanwhile, 58 respondents (19.3%) were confirmed to be COVID-19 positive. Acceptance of the COVID-19 vaccination was significantly higher among expecting mothers with high susceptibility to COVID-19 infection and lower among mothers with high vaccine resistance (Di Mascio et al., 2020).

Most respondents in this study received up to two doses of the COVID-19 vaccines. That is 214 respondents (71.1%). Meanwhile, 61 respondents (20.3%) received three doses or a booster of the COVID-19 vaccine, six respondents (2%) received the first dose of the COVID-19 vaccine, and 20 respondents (6.6%) objected to being vaccinated. Many factors can prevent expecting mothers from vaccinating, including maternal and fetal health, being too young for gestational age, or other health problems. Therefore, expectant mothers should not be vaccinated without careful consideration. Giving the COVID-19 vaccine to expecting mothers must be done after considering the results of the previous health examination. Most of the respondents to this study had low motivation for the COVID-19 vaccine, namely 163 respondents (54.2%). New mothers tend to be less motivated and more hesitant about vaccinations. Although expecting mothers are the priority population to be vaccinated, expecting mothers often refuse or hesitate to be vaccinated due to a lack of knowledge, negative attitudes towards vaccines, lack of experience with vaccinations, and concerns about vaccine side effects and safety. Understanding the motivation behind the COVID-19 pandemic

situation and the reasons behind the reluctance to vaccines in expecting mothers is very important to make the proper preparations to overcome the doubts of expecting mothers (Tao et al., 2021).

Regarding the hesitancy factor, most respondents had doubts about receiving the COVID-19 vaccine, namely 209 respondents (69.4%). At the same time, 92 respondents (30.6%) were doubtful about receiving the COVID-19 vaccine. Perinatal women's impressions, beliefs and circumstances regarding COVID-19 vaccination may differ from those of the general public. The main concerns related to vaccination hesitation are myths and misconceptions, specific religious beliefs, social factors, diminished knowledge, interest or need for immunization, concerns about the safety of vaccination to maternal and fetal safety, and the threat of contamination at the immunization sites (Gencer, Özkan, Vardar, & Serçekuş, 2021).

Table 3. Results of the Chi-Square Test of Motivation with Hesitation of the COVID-19 Vaccine (n=301)

Motivation	Hesitation				Total		P-value	OR (95% CI)
	Low		High					
	f	%	f	%	f	%		
High	109	36.2	29	9.6	138	45.8	0.001	2.368 (1.41-3.97)
Low	100	33.3	63	20.9	163	54.2		
Total	209	69.6	92	30.5	301	100		

Table 3 shows the relationship between motivation and vaccine hesitancy obtained with *a* p-value of 0.001. The survey of 301 expecting mothers at the Bening Nawangsari Midwife Clinic, Bekasi City, revealed that 109 respondents (36.2%) were expecting mothers with high motivation and low doubts about vaccination. This result is consistent with previous research that high vaccination motivation can increase vaccination rates (Lin et al., 2021). In addition, 29 respondents (9.6%) had the high motivation and high vaccine doubts. Then there were 100 respondents (33.3%) expecting mothers with low vaccination doubts and 63 respondents (20.9%) weakly motivated expecting mothers with low vaccination doubts.

The odds ratio in this study was 2.368. Therefore, if OR > 1 (OR= 2.368), it can be concluded that expecting mothers with low motivation tend to be 2.368 times more hesitant to vaccinate against COVID-19 than expecting mothers with high motivation. In other words, expecting mothers with low motivation may have a higher chance of delaying or refusing the COVID-19 vaccination due to high doubts than expecting mothers with high motivation.

Based on the researcher's analysis, expecting mothers with high motivation and high vaccine doubts can be related to the characteristics of the respondents, namely the age of expecting mothers who have entered the recommended safe end of pregnancy, which is <35 years. This study involved 16 expecting mothers over 35 who had high motivation. At this age, they may be more worried about the side effects of vaccines on pregnancy, making them suspicious. This result is supported by previous research, which stated that older women are more worried about the side effects of vaccines during pregnancy (Tao et al., 2021).

Expecting mothers with high motivation and strong doubts about vaccination may also be related to the characteristics of the respondents, namely work. This research involved 49 working and highly motivated expecting mothers. This position can put a lot of stress and pressure on him, so it can cause fear that makes him doubt. This result is consistent with previous research, which explains that professional workers tend to be anxious because of workload and household burdens (Dede Yoshima Nekada et al., 2020).

Expecting mothers with high motivation and high doubts about vaccination may also be related to the characteristics of the respondents, namely young gestational age. This study involved 44 highly motivated expecting mothers at a young age or in the first trimester of pregnancy. Young gestational age usually worries mothers because they adapt in a way that makes them doubtful about the COVID-19 vaccine. This result is a line with previous research which explains that women in the first trimester can experience more anxiety and more severe psychological effects during the

COVID-19 outbreak than women in the second or third trimester (Saccone et al., 2020).

Another result of this study was that 63 expecting mothers who were studied (20.9%) with low motivation had high doubts about vaccination. This result is consistent with a study in Taiwan where researchers rated their motivation to receive the COVID-19 vaccine low, indicating that subjects were reluctant to receive the COVID-19 vaccine (Lin et al., 2021).

In addition, 100 respondents (33.3%) were expecting mothers with low motivation and low hesitancy about vaccination. According to the researcher's analysis, expecting mothers are weakly motivated with low hesitancy about vaccination related to the characteristics of the respondents. In this study, 113 expecting mothers with low motivation were multigravida respondents. Because of this, they already have experience with previous pregnancies, so their doubts about the COVID-19 vaccination are minimal. This result is consistent with previous research, which explains that mothers in the multigravida group have the opportunity to be vaccinated due to the influence of previous pregnancy experiences (Aisyah, Fitriyani, & Pambudi, 2021).

Expecting mothers with low motivation and low hesitancy about vaccination can also be associated with the characteristics of the respondents, namely a history of being infected with COVID-19. For example, this study involved 27 expecting mothers who were confirmed positive for COVID-19 and showed low motivation. This condition made them feel vulnerable to COVID-19, and they wanted to protect themselves, so their hesitancy about the COVID-19 vaccine was low. This result is supported by previous research, which found that the acceptance rate of the COVID-19 vaccine was significantly higher in expecting mothers with a high risk of COVID-19 infection (Di Mascio et al., 2020).

Based on interviews with expecting mothers at the research location, it is known that the motivation of expecting mothers to receive the COVID-19 vaccine is based on the education of health workers that expecting mothers can receive the COVID-19 vaccination safely. Additional motivation comes from the fact that expecting mothers do not want to catch COVID-19. The reasons for expecting mothers delaying giving the COVID-19 vaccine are doubts about the vaccine's safety and the side effects for themselves and the fetus contained in it. However, expecting mothers who delay also state that they want to be vaccinated against COVID-19 after giving birth. The interview results are consistent with previous research, which states that a sense of shared responsibility and the desire to be someone who plays a role in the fight against COVID-19 are the most critical motivational and psychological factors for receiving a vaccine. This condition can happen because individuals can have a sense of responsibility for the value of health and life together and social solidarity (Bavel et al., 2020). The results of other studies also align with this statement that the main reasons for doubt about vaccines are fear of possible adverse effects on the fetus, side effects during injection, fear of possible adverse effects on the baby and trust in vaccines (Hosokawa et al., 2022).

From Table 3, it can be seen that *the p-value* for the relationship between motivation and hesitation about vaccination is 0.001 with OR=2.368, so it means that there is a correlation between motivation and hesitancy about the COVID-19 vaccine in expecting mothers at the Bening Nawangsari Midwife Clinic, Bekasi City. From this, it can be concluded that expecting mothers with low motivation tend to have high doubts about the COVID-19 vaccine by 2.368 times compared to expecting mothers with high motivation. In other words, expecting mothers with low motivation may have a higher chance of delaying or refusing the COVID-19 vaccination due to high doubts than expecting mothers with high motivation. This study's results align with previous research, which found that low motivation to receive the COVID-19 vaccine indicates hesitancy about receiving the COVID-19 vaccine. Conversely, high vaccination motivation can increase vaccination acceptance (Lin et al., 2021).

This study obtained the results of a significant correlation between motivation and hesitancy about COVID-19 vaccination for expecting mothers at the Bening Nawangsari Midwife Clinic, Bekasi City. Therefore, researchers recommend developing strategies to increase the motivation of expecting mothers to receive vaccines and strategies to reduce their hesitancy about vaccination. Strategies to overcome vaccine hesitancy can be grouped into four categories such as community-level policies and interventions (e.g., reducing the cost of vaccines), organizational-level interventions (e.g., home visits, reminders, feedback), interpersonal-level interventions (e.g., recommendations by doctors for their patients), and individual-level interventions (e.g.

addressing individual-level problems and barriers) (Finney Rutten et al., 2021).

This research was conducted during the COVID-19 pandemic which limited the implementation of health services. Thus, it took longer time to meet with respondents to collect research data. However, this study is very good to be suggestion for local government when implementing the COVID-19 vaccines program.

4. Conclusion and Suggestion

A significant correlation or relationship exists between motivation and hesitancy about the COVID-19 vaccine in expectant mothers at the Bening Nawangsari Midwife Clinic, Bekasi City. Therefore, it is recommended that health providers develop strategies to increase the motivation to receive vaccines and overcome vaccine hesitancy. The researchers also suggest further research to conduct a quasi-experimental design to test planned intervention programs to reduce vaccination hesitancy and increase motivation to vaccinate expectant mothers with COVID-19.

5. Acknowledgments

The research team would like to thank the Head of the Bening Nawangsari Midwife Clinic, Bekasi City, for our permission and opportunity to carry out this research. The research team is also very grateful to all expecting mothers willing to participate in this research and to various parties who have provided support and assistance during the research process.

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