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Determinants of Acceptance of the COVID-19 Vaccine in Pregnant Women, Indonesia: A Literature Review

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Abstract: Pregnant woman are a vulnerable group for COVID-19. Efforts to control and prevent COVID-19 are being made with the implementation of vaccination, but the fact is that still many pregnant woman refuse to be vaccinated because of many factors, such as fear, feeling insecure about their health and their babies, so there is a doubt about receiving the COVID-19 vaccine. This research aims to find out determinants of acceptance of the COVID-19 vaccine among pregnant women in Indonesia. This study used a literature review (PRISMA) model for guide. Literacy is limited to articles published in January 2021 until September 2023. The extracted data is synthesized with a narrative approach. The article search obtained 17 selected articles. There are 19 determinants that influence the acceptance of the COVID-19 vaccine among pregnant women in Indonesia, including: knowledge, perception, vaccination history, vaccine information, participation, education, anxiety, employment status, behavior, attitude, history of comorbid diseases, family support, role of health workers, social media information, age, community culture, pregnancy status, ANC frequency, and vaccine safety. The underlying factors behind receiving the COVID-19 vaccine in pregnant woman are very complex and context-specific, varying all the time. Socio-demographic variables play a major role in it.

Keywords: Acceptance; COVID-19; Determinants; Pregnant Women; Vaccine

Introduction

Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV-2) is the cause of the infectious disease COVID-19, which attacks the respiratory tract, including the lungs (Kemenkes, 2020). The symptoms are almost similar to those of pneumonia, but COVID-19 is more dangerous because it can cause acute shortness of breath and even death (Kemenkes, 2020).

Physiological changes during pregnancy increase the possibility of transmitting COVID-19 to pregnant women (Dolang, 2022). Pregnant women with COVID-19 are at risk of preeclampsia, stillbirth or premature labor (Wei et al., 2021). Everyone is at risk of infected the virus, but pregnant women are a group that is more vulnerable to contracting the virus (Hernández-Padilla et al., 2020). During the COVID-19 pandemic, pregnant women had greater opportunities to interact with health workers compared to non-pregnant women (Zhang et al., 2020). Vaccination is one way to control and prevent COVID-19 (Kemenkes, 2021). The goal of vaccination is to increase population immunity globally to protect people from disease, protect public health systems, and reduce the risk of new variants. WHO target is to vaccinate 70% of the world's population against COVID-19 (WHO, 2021). The size of the herd immunity target is based on the basic reproduction number (R0), namely the average number of people who can be infected by someone infected with COVID-19 in a population and is calculated using the formula 1-1/R0 (Kartikasari et al., 2022).

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According to data from Our World in Data, 70% of people worldwide have received at least one dose of the COVID-19 vaccine. 13.39 billion doses have been worldwide, with 66.122 doses administered daily (Our world in data, 2023). In Indonesia, the COVID-19 vaccination program has reached 234.666.020 targets, including health workers, the elderly, public sector officers, vulnerable and general community members, children aged 12 to 17 years, and children aged 6 to 11 years (Kemenkes, 2023). Data from COVID-19 vaccination shows that 86% per 100 target population have received one dose of COVID-19 vaccine or around 234.666.020 residents. Then, data as of October 13 2023 shows that the vulnerable and general population has been vaccinated with dose 1, which reached 82.79% (116.914.521), dose 2, namely 70.51% (99.565.230), dose 3, namely 34.99% (49.409.458), and vaccination dose 4, namely 0.93% (1.308.756) (Kemenkes, 2023).

The Centers for Disease Control and Prevention (CDC) have released information about the safety of COVID-19 vaccination for pregnant women. The CDC also encourages all pregnant women or mothers who are planning a pregnancy or who are breastfeeding to get vaccinated to protect themselves from the virus (CDC, 2023). In addition, the Indonesian government, through the Directorate General of Disease Prevention and Control, Ministry of Health, has issued a circular regarding vaccination policies for pregnant women. This policy is stated in SE Number HK.02.01/I/2007/2021 concerning COVID-19 Vaccination for Pregnant Women and Screening Adjustments in the Implementation of COVID-19 Vaccination, this effort is also recommended to provide COVID-19 vaccination for pregnant women which is also recommended by National Immunization Expert Advisory Committee (Kemenkes, 2021).

Community self-protection is the key to suppressing the spread of infectious diseases such as COVID-19. Primary prevention such as vaccination is needed as the best strategy to defeat the pandemic (Akbar, 2021). A study showed that 35% of people in the Republic of Ireland and 48.9% of people in Northern Ireland were hesitant to receive vaccination, including pregnant women (Breslin et al., 2021). In a study conducted on 150 prenatal women, 86% of pregnant women and 35% of postpartum women said they were hesitant about administering COVID-19 vaccination (Gencer et al., 2022). Their concerns and doubts are related to myths, certain religious beliefs, social factors, lack of information, interest or need to receive the vaccine, concerns about the overall safety of the vaccine and for the fetus, and fear of viral transmission (Tao et al., 2021). The fear of possible side effects, doubts and concerns regarding the safety and efficacy of the vaccine cause someone to hesitate in receiving the COVID-19 vaccination (Ichsan et al., 2021). Based on the description in the background, pregnant women have an interest in getting encouragement to receive the COVID-19 vaccine. This research aims to find out determinants of acceptance of the COVID-19 vaccine among pregnant women in Indonesia.

Method

This literature review design method will be conducted using the five stages developed by the researcher (Djasri et al., 2019). Firstly, identifying the research question to meet the objective of the study, the researchers developed the following research question: 'What are determinants of acceptance of the COVID-19 vaccine among pregnant women in Indonesia?'. Secondly, identifying relavant studies, this research uses databases such as: Google Scholar, Science Direct and Pubmed. Key words and terms used in this research consist of Indonesian and English. In English they are: determinants, acceptance, vaccines, COVID-19, pregnant women. in indonesian they are: determinan, penerimaan, vaksinasi, COVID-19, wanita hamil. Thirdly, study selection this study has the following inclusion criteria: scientific journals published most recently from January 2021 to September 2023, open access and full text studies, the languages used are English and Indonesian, articles using cross-sectional or survey study designs, case control, cohort, mix- method or longitudinal survey.

Exclusion criteria: literature review journal, systematic review or univariate analysis, manuscript not available full text. PRISMA model used http://www.prisma-statement.org/. Fourthly, data extraction will include several variables as follows: author, year of publication, research location, research design, research objectives, published (Table 1). And the last is collating, summarising and reporting the results the research results are presented a narrative of the topic studied. Article selection process is presented (Figure 1).

Result and Discussion

Research found 17 studies on the determinants that influence the receipt of the COVID-19 vaccine among pregnant women in Indonesia which can be seen in Table 1. There are 19 determinants that influence the acceptance of the COVID-19 vaccine among pregnant women in Indonesia. Health behavior is all types of experiences and interactions of individuals, environments, especially in terms of knowledge and attitudes about health and health-related resources.

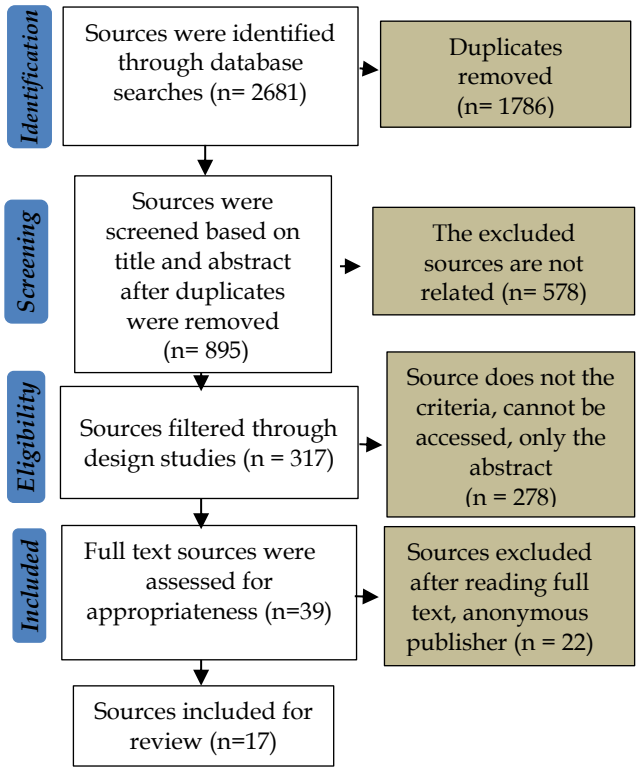

Figure 1. Modified from PRISMA flow diagram for article selection process

Pregnant women are more worried about their own condition and that of their fetuses due to the COVID-19 (Marbán-Castro et al., 2022). They are also concerned about the safety of pregnancy tests during the pandemic and whether they are healthy and free from COVID-19 infection (Nowacka et al., 2022). Lawrence Green's theory that there are two factors that play a role in influencing human health, behavioral factors and non-behavioral factors (Hilliard et al., 2018). Behavioral factors are influenced by three things: predisposing factors (knowledge, trust, social norms, cultural values and socio demographics), enabling factors (distance, cost and social, availability of health services and regulations). Reinforcing factors (support from family, friends, partner, and feedback from health workers (Hayden, 2022).

Researchers used Lawrence Green's theoretical approach there are: predisposing factors: knowledge, education, pregnancy status, age, vaccine history, history of comorbid diseases, community culture, frequency of ANC, attitudes, behavior, perceptions and participation. Enabling factors are: employment status, social media information, vaccine safety, vaccine side effects. Then, the reinforcing factors are the role of health workers, support from partners, family, friends. Predisposing factors are defined as factors that underlie an individual in carrying an action (Hayden, 2022).

Table 1. Characteristics of the studies

Knowledge correlates with a person's education, if a person has a high level of education, has broad knowledge (Erawan et al., 2021). Table 1 shows that 13 articles found a relationship between knowledge and acceptance of the COVID-19 vaccine in pregnant women. Acceptance of COVID-19 vaccination becomes more difficult for uninformed people because they may not know much about vaccination and may doubt it as a means of prevention (Hastuti et al., 2022; Mose & Yeshaneh, 2022). Research 4 articles found a relationship between education and acceptance of the COVID-19 vaccine in pregnant women (Jaelani & Syahniar, 2023; Karnita et al., 2022; Simanjuntak, 2023; Yolanda, 2022). Education is a predictor factor that influences acceptance of the COVID-19 vaccine, especially in women who have higher education (Ghamri et al., 2022). Poor education correlates with awareness about health and the prevalence of diseases in society is difficult to discern. People with higher education usually find it easier to obtain information (Hasnidar et al., 2020).

Furthermore, 1 article found a relationship between pregnancy status and receipt of the COVID-19 vaccine in pregnant women (Aisyah et al., 2022). Also related to vaccine history, namely 3 articles found a relationship between vaccine history and receipt of the COVID-19 vaccine in pregnant women (Anjelika & Indarjo, 2022; Azizah, 2023; Lellyawaty et al., 2022). Vaccine among pregnant women in the US, they are willing to receive the COVID-19 vaccine, they think that with their pregnancy status they think it is necessary to protect her and the baby she is carrying (Wilder-Smith & Osman, 2020). Then, another predisposing factor is age, 2 articles found a relationship between age and receipt of the COVID-19 vaccine in pregnant women (Jaelani & Syahniar, 2023; Karnita et al., 2022). In univariate regression analysis, older women were more likely to receive the vaccine compared with younger women. These findings are consistent with previous research conducted in the UK and Turkey (Ghamri et al., 2022). Meanwhile, 1 article found a relationship between a history of comorbid diseases and receipt of the COVID-19 vaccine in pregnant women (Azizah, 2023). The results of a study in Saudi Arabia of women with high-risk pregnancies due to gestational diabetes mellitus were almost twice as likely to be vaccinated compared with women with low-risk pregnancies (Ghamri et al., 2022). Furthermore, 1 article found a relationship between community culture and acceptance of the COVID-19 vaccine in pregnant women (Karnita et al., 2022). Other predisposing factors are attitudes, behavior, perceptions and participation which correlate with receipt of the COVID-19 vaccine in pregnant women.

Author	Study Design	Results
Maluku (Makayaino et al., 2022)	Cross-sectional; knowledge, perception	41 respondents, there was a relationship between knowledge, perception with the willingness of pregnant women to vaccinate against COVID-19.
Banjarmasin (Lellyawaty et al., 2022)	Cross-sectional; vaccine history, vaccine information.	46 respondents, there is a relationship between vaccine history and interest in COVID-19 vaccines in pregnant women with a p-value of 0.02 and information and interest in the COVID-19 vaccine with a.
Mojokerto (Lestari., 2022)	Cross sectional, knowledge, participation	30 respondents, there was a relationship between knowledge and participation in the COVID-19 vaccine.
Padang panjang, (Yolanda, 2022)	Cross-sectional; education, knowledge, anxiety	143 respondents, there were 78.3% had high knowledge related to COVID-19 vaccination, 48.3% of respondents had a moderate level of anxiety. The analysis found the knowledge variable was the most dominant variable.
Medan (Simanjuntak., 2023)	Cross-sectional; education, employment status	361 respondents, Pregnant women with higher education or those who worked were also less anxious about the COVID-19 pandemic.
Surabaya (Budiarti et al., 2021)	Cross-sectional; knowledge, behavior, attitudes	74 respondents, there is a relationship between knowledge and behavior of pregnant women in preventing COVID-19 with and attitudes, behavior of pregnant women in preventing COVID-19 with a.
Grobogan (Untari., 2022)	Cross-sectional; knowledge	44 respondents, there is a relationship between COVID-19 vaccination with the level of knowledge and participation of pregnant women.
Semarang (Anjelika et al., 2022)	Cross-sectional; knowledge, attitudes, motivation	80 respondents, there was a relationship between knowledge, attitude, and motivation of pregnant women with the participation of COVID-19 vaccination in Patemon Village.
Makassar (Azizah, 2023)	Cross-sectional; knowledge, history of comorbid diseases, history of COVID-19	78 respondents, there is a relationship the use of COVID-19 vaccination in pregnant women, history of comorbid disease, and a history of COVID-19.
Lampung, (Yulianingsih et al., 2022)	Cross-sectional; knowledge, family support, role of health workers	87 respondents, there was a relationship knowledge, attitude, family support, the role of health workers, with COVID-19 vaccination in pregnant women in Metro City in 2022.
Depok (Zada, 2022)	Cross-sectional; knowledge, attitude	60 respondents, the level of knowledge of pregnant women about the COVID-19 vaccine, namely as 4 people (6.6%) had poor knowledge. Attitude of the respondents, namely 38 people (63.3%) had a good attitude, as many as 22 (36.6%) people had a bad attitude.
Pekanbaru (W. Lestari et al., 2023)	Cross-sectional; role of health workers, family support, social media information	80 respondents, information extrinsic factors from health workers. For family support and information from social media COVID-19 vaccination.
Bangka Belitung (Karnita et al., 2022)	Cross-sectional; age, education, knowledge, support family, and community culture	100 respondents, there is a relationship between age, education, knowledge, family support, and community culture with the participation of pregnant women in the COVID-19 vaccination program in the East Belitung Regency Region.
Pekalongan (Risqi Dewi et al, 2022)	Cross-sectional; behavior, knowledge	155 respondents, the results showed that the factors related to the mother's attitude towards the COVID-19 vaccine, namely knowledge.

Author	Study Design	Results
Central Java (Aisyah et al., 2022)	Cross-sectional; age, pregnancy status, ANC frequency, knowledge	255 respondents, the factors related to willingness of pregnant women in the COVID-19 vaccination were age, gravida status, ANC frequency and knowledge about COVID-19 vac.
Banten (Jaelani et al., 2023)	Cross-sectional; education, frequency of ANC, husband's support	102 respondents, 63% pregnant women receive COVID-19 vaccination. There are relationships between education frequency of antenatal care, husband's support and willingness to receive vaccination.
Manggarai (Halu et al., 2022)	Cross-sectional; knowledge, vaccine safety	65 respondents, vaccination willingness was strongly influenced by mother's knowledge about COVID-19 in pregnancy, belief in the COVID-19, vaccine, and vaccination safety.

Diverse cultures lead to the exchange of customs, understandings, and shared values between racial groups. Racial differences also influence acceptance of the COVID-19 vaccine (Karnita et al., 2022). Then, 2 articles found a relationship between ANC frequency and receipt of the COVID-19 vaccine in pregnant women (Aisyah et al., 2022; Jaelani et al., 2023; Risqi Dewi et al., 2022). Not only pregnant women in the third trimester are vaccinated, but also pregnant women in the first and second trimesters. The aim of vaccination for pregnant women is to protect the mother and fetus to reduce the level of COVID-19 infection. A previous study in Turkey found that pregnant women in the second and third trimesters received the vaccine more often than pregnant women in the first trimester (Goncu Ayhan et al., 2021). As a result of the study, there were 3 articles that found a relationship between attitudes and acceptance of the COVID-19 vaccine in pregnant women (Anjelika et al., 2022; Budiarti et al., 2021; Hartuti et al., 2021; Zada, 2022).

Furthermore, 3 articles found a relationship between behavior and acceptance of the COVID-19 vaccine in pregnant women (Anjelika et al., 2022; Budiarti et al., 2021; Risqi Dewi et al., 2022), then there was 1 article that found a relationship between perception and acceptance of the COVID-19 vaccine in pregnant women (Makayaino et al., 2022)and 1 article found a relationship between participation and receipt of the COVID-19 vaccine in pregnant women (Lestari et al., 2022). Information, attitudes and actions resulting from human interactions with their environment shape human behavior. The formation of behavior, especially in adults, begins in the cognitive realm, where the subject knows about the stimulus, which is material or objects outside it, before getting new information. This then produces an internal perception of the object known as object position. Furthermore, a stimulus, namely an object that is known and realized, causes participation in the form of action (activity) towards or related to the previous stimulus or object (Hayden, 2022).

Enabling factors are defined as factors that enable an individual to motivate behavior. In this research, the enabling factors include employment status, social media information, vaccine information, anxiety and vaccine safety. 1 article found a relationship between employment status and receipt of the COVID-19 vaccine in pregnant women (Simanjuntak et al., 2023). People who work for the government or public servants have high COVID-19 vaccination rates because they have access to valid vaccination information, so they understand vaccines better (Perez et al., 2022). Then, 1 article found a relationship between social media information and receipt of the COVID-19 vaccine in pregnant women (Lestari et al., 2022) and 1 article found a relationship between vaccine information and acceptance of the COVID-19 vaccine in pregnant women (Lellyawaty et al., 2022). Among the reasons for refusing COVID-19 vaccination are belief in rumors about COVID-19 circulating on social media, not believing in the existence of SARS-CoV-2 and not believing that COVID-19 can reduce mortality and morbidity in pregnant women. Furthermore, 1 article found a relationship between anxiety and receipt of the COVID-19 vaccine in pregnant women (Yolanda, 2022). 1 article found a relationship between vaccine safety and acceptance of the COVID-19 vaccine in pregnant women (Halu, 2022). Fears about the safety of vaccines, both real and fake, spread by informants, will affect the number of COVID-19 vaccinations given and hinder the formation of herd immunity (Pairat et al., 2022).

Reinforcing factors are defined as factors that strengthen the occurrence of behavior in an individual. Motivating factors are the consequences of actions that determine whether the individual receives positive feedback and receives social support. In this research, the reinforcing factors included are the role of health workers and support from the family. There are 2 articles that found a relationship between the role of health workers and receipt of the COVID-19 vaccine in pregnant women (Lestari et al., 2022; Yulianingsih et al., 2022). Health care providers are trusted sources for

accurate vaccine information, and health care provider recommendations or offers of vaccination are strong predictors of vaccination (Dubé et al., 2022). In Thailand, to build confidence in COVID-19 vaccination the government used a vaccine priority policy and a campaign to promote COVID-19 vaccination in pregnant people (Pairat et al., 2022). Meanwhile, 4 articles found a relationship between family support and acceptance of the COVID-19 vaccine in pregnant women (Jaelani et al., 2023; Karnita et al., 2022; Lestari et al., 2022; Yulianingsih et al., 2022). Some reinforcing factors that provide social reinforcement can become supporting factors when they become support social, for example from those closest to you (Hilliard et al., 2018). Research conducted in Thailand, husbands encouraging their wives to vaccinate against COVID-19 is a significant factor in the acceptance of the COVID-19 vaccine among pregnant women (Pairat et al., 2022).

COVID-19 has caused not only a health and social crisis, but has also caused global economic turmoil (Blakeway et al., 2022). The World Economic Forum (WEF) in Switzerland, Global Risk Report 2020 shows that the COVID-19 Pandemic is among the ten worst threats that could cause a global economic crisis (WEF, 2020). No country can control a pandemic without the government providing appropriate infrastructure for emergency management, transparent media, and information transparency (Kemenkes, 2020). World Health Organization (WHO) stated that one of the best ways to stop the COVID-19 pandemic is to vaccinate everyone, especially those who are vulnerable to the virus (WHO, 2023). According to the Center of Disease, COVID-19 vaccination is recommended for everyone aged six months and over, including those who are pregnant, breastfeeding, planning to become pregnant, or have the potential to become pregnant in the future. Because, if you are pregnant or have recently become pregnant, you are more likely to experience serious and severe consequences of COVID-19 compared to people who are not pregnant. Additionally, receiving COVID-19 vaccination can protect pregnant women and babies from complications that can affect pregnancy and baby development (CDC, 2022). Many factors influence the decision to implement COVID-19 vaccination. To achieve the level of acceptance and coverage of COVID-19 vaccination, vaccination campaigns for women, breastfeeding mothers and mothers should be carried out on a massive scale in every country (Kemenkes, 2021).

Conclusion

There are 19 determinants that influence the acceptance of the COVID-19 vaccine among pregnant women in Indonesia, including: knowledge, perception, vaccination history, vaccine information, participation, education, anxiety, employment status, behavior, attitude, history of comorbid diseases, family support, role of health workers, social media information, age, community culture, pregnancy status, ANC frequency, and vaccine safety. Receiving vaccines repeatedly for each person, such as for pregnant women, changes from time to time, after knowing and observing the benefits and side effects, so the findings of this study may not be valid after a certain period of time.

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The authors provide equal contribution to this study.

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Conflicts of Interest
All of authors declare no conflict of interest.

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