



## Research Article

# Correlation between Pregnant Women's Anxiety Level and Their Decision toward COVID-19 Vaccine Acceptance

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### Abstract

**Introduction:** High number of COVID-19 cases cause various effects, namely increased anxiety and depression in pregnant women, who are susceptible to transmission. To prevent further transmission, a vaccination policy was implemented which then elicited various responses. Low percentage of pregnant women's willingness to be vaccinated was found. This happened because of anxiety and hesitancy towards COVID-19 vaccine among them. **Objective:** Knowing the correlation between the level of anxiety in pregnant women towards COVID-19 vaccine and the decision to accept COVID-19 vaccine at Abadijaya Public Health Center, Depok. **Methods:** Analytic with cross sectional method is used. Population and sample of this study were 96 pregnant women who visited Abadijaya Public Health Center, Depok. **Results:** Analysis conducted using chi squared and fisher's exact test shows majority of pregnant women do not experience symptoms of anxiety (50%), no correlation between age, gestational age, gravidity, occupation and education level on the decision to accept COVID-19 vaccine, and correlation between pregnant women's anxiety levels and the decision to accept COVID-19 vaccine was found (p value = 0.000). **Conclusion:** There is a correlation between anxiety levels in pregnant women towards COVID-19 vaccine and the decision to accept COVID-19 vaccine at Abadijaya Public Health Center, Depok.

**Keywords:** acceptance, anxiety, COVID-19 vaccine, decision, pregnant

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## 1. Introduction

Coronavirus disease 2019 (COVID-19) was discovered in early 2020 in Wuhan, China. The high number of COVID-19 active cases have had some impact on the world, such as increasing death rates, economic downturn and psychological effects arising due to increased anxiety and depression in the initial phase of the spread of the disease [1]. Anxiety appears in various circles of society, including special groups such as pregnant women. Research conducted by Viandika and Septiasari (2021) on 53 pregnant women showed that almost all pregnant women at the study site had experienced anxiety during the COVID-19 pandemic with 2% of pregnant women experiencing severe anxiety, 32% moderate to severe anxiety, 23% mild anxiety and 2% no anxiety [2].

Pregnant women are vulnerable to transmission of COVID-19 and have an increased risk if infected compared to non-pregnant women of the same age. COVID-19 infection in pregnancy is associated with an increased likelihood of low birth weight babies, premature birth, complications after delivery and stunted fetal growth [3]. Pregnant women experience anxiety in maintaining their health condition and also in taking care of the fetus, worry about not getting an adequate antenatal care, and worsen by lack of knowledge of

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COVID-19 and its prevention during pregnancy [4, 5].

Massive spread of COVID-19 requires countries in the world to implement strict policies to prevent the spread of COVID-19, including Indonesia. The Indonesian government then issued regulations regarding the implementation of health protocols, large-scale social restrictions and implementation of the COVID-19 vaccine plan to break the chain of disease transmission (Republic of Indonesia's Presidential Regulation No. 99, 2020) [6, 7]. The purpose of this vaccination is to reduce the possibility of COVID-19 transmission, achieve herd immunity in the community, and reduce morbidity, prognosis and death, so as to protect the economy and society.

However, this vaccination plan reaped various public responses. An online survey conducted by the Indonesian Ministry of Health, ITAGI, UNICEF and WHO in September 2020 involving more than 115,000 respondents from 34 provinces in Indonesia stated that 65% of respondents were willing to accept the vaccine, 8% refused and 27% of respondents doubted the vaccine distribution plan [8]. The reasons for respondents who refused and doubted the vaccination plan were doubts about vaccine effectiveness and distrust of vaccines and related to vaccine safety.

Research conducted by Putri et al. (2021) stated that 48.10% of 399 respondents experienced anxiety towards COVID-19 vaccine, whereas Schaal et al. (2021) found that out of 2,339 pregnant women interviewed, 57.40% were unwilling to be vaccinated due to a lack of information regarding the safety of the COVID-19 vaccine in pregnant women [9, 10]. Doubt and anxiety about receiving the COVID-19 vaccine are found in 26.90% of pregnant women in America due to the low economy and concerns about the risks of vaccination, even though receiving the COVID-19 vaccine for pregnant women can reduce the risk of infection and serious illness caused by the coronavirus, and can build antibodies that can protect the baby [11, 12].

Based on the description above, it was found that anxiety in pregnant women can affect the health condition of the fetus, and can be worsened by the wrong perception of the COVID-19 vaccine so that pregnant women are unwilling to accept it, even though the condition of pregnancy itself is a condition of immunosuppression, which means pregnant women need external assistance such as vaccinations to support the body's immune system in fighting infection. Therefore, it is important to know the correlation between the anxiety level of pregnant women towards COVID-19 vaccine and the decision to accept the COVID-19 vaccine [13].

## 2. Methods

This research is a quantitative analytic study with a cross-sectional approach and conducted on pregnant women as samples taken by consecutive sampling method. The inclusion criteria for the respondents were pregnant women who visited Abadijaya Public Health Center, willing to participate and signed an informed consent, and had not received a complete COVID-19 vaccine (3 doses). The number of samples was determined using the Lemeshow formula and a total of 96 respondents were obtained.

This research was approved by the Ethics Committee for Health Research at the Universitas Sumatera Utara No: 645/KEPK/USU/2022. Data was collected online using Google Form and distributed via WhatsApp personal chat to pregnant women, from July to October 2022. The variables measured were the characteristics of the respondents (age, gestational age, gravida, education level and occupation), level of anxiety and decision to accept COVID-19 vaccine. This study uses univariate and bivariate analysis, through chi squared test and fisher's exact test analysis. Data collected then analyzed using statistical computer program.

Perinatal Anxiety Screening Scale questionnaire by Somerville et al. (2014) was modified and used to measure anxiety levels, which has carried out a validity test with an  $r$  count value for each question  $> r$  table (0.361) and reliability with Cronbach's Alpha value of 0,968.

## 3. Results

Based on the study on 96 pregnant women who met the inclusion criteria as respondents, data were obtained as shown in table 1.

**Table 1.** Characteristics of Respondents

Characteristics	Total (N=96)	Percentage (%)
<b>Age</b>		
≤ 16	3	3.10
17 – 25	35	36.50
26 – 35	46	47.90
≥ 36	12	12.50
<b>Gestational Age</b>		
1 <sup>st</sup> Trimester	17	17.70
2 <sup>nd</sup> Trimester	42	43.80
3 <sup>rd</sup> Trimester	37	38.50
<b>Gravida (Number of Pregnancies)</b>		
Primigravida	35	36.50
Multigravida	61	63.50
<b>Education Level</b>		
Elementary	5	5.20
Junior High	21	21.90
Senior High	60	62.50
University/equivalent	10	10.40
<b>Profession</b>		
Housewife	85	88.50
Self-employed	4	4.20
Others	7	7.30
<b>COVID-19 Vaccination History</b>		
Have received	86	89.60
Not yet received	10	10.40
<b>Total COVID-19 vaccines received</b>		
1 dose (before pregnancy)	17	17.70
1 dose (during pregnancy)	4	4.20
2 doses (before pregnancy)	60	62.50
2 doses (one/both doses during pregnancy)	5	5.20
Not at all	10	10.40

Table 1 shows that the majority of respondents in this study were 26-35 years old (46 people, 47.90%), 42 respondents were in the second trimester of pregnancy (43.80%), 61 people experienced pregnancies more than once / multigravida (63.50%), 60 people (62.50%) have graduated from high school, 85 people work as housewives (88.50%), 86 people have received the COVID-19 vaccine (89.60%) and 60 people (62.50%) had received 2 doses of the COVID-19 vaccine before pregnancy.

**Table 2.** Overview of the Decision to Accept COVID-19 Vaccine in Pregnant Women

	Willing		Unwilling	
	N	%	N	%
<b>Decision on Acceptance of Dose 1 Vaccine</b>				
Total number of 0 dose COVID-19 vaccines received	4	40	6	60
Total	4	40	6	60
<b>Decision on Acceptance of Dose 2 Vaccine</b>				
Total number of 1 dose before COVID-9 pregnancy	6	35.30	11	64.70
Vaccines received 1 dose during pregnancy	3	75	1	25
Total	9	42.90	12	57.10
<b>Decision on Acceptance of Dose 3 Vaccine</b>				
Total number of 2 doses before COVID-19 pregnancy	30	50	30	50
Vaccines received 2 doses of one/both doses during pregnancy	3	60	2	40
Total	33	50.80	32	49.20

Based on Table 2, 60% of pregnant women who had not received COVID-19 vaccine were unwilling to be vaccinated during pregnancy, and only 40% of pregnant women were willing. As many as 57.10% of pregnant women who had received first dose of the COVID-19 vaccine were unwilling to receive the second dose of vaccine and only 42.90% of pregnant women were willing. As many as 50.80% of pregnant women who have received 2 doses of the COVID-19 vaccine were willing to receive the third dose (booster) vaccine.

**Table 3.** Correlation Between Pregnant Women's Anxiety Level Towards COVID-19 Vaccine and Their Decision Towards COVID-19 Vaccine Acceptance

	Willing		Not willing		<i>p</i> -value
	N	%	N	%	
Anxiety level asymptomatic	33	68.80	15	31.30	0.00 <sup>a</sup>
Mild – Moderate	8	29.60	19	70.40	
Severe	5	23.80	16	76.20	
Total	46	47.90	50	52.00	

<sup>a</sup>= Chi squared test

Based on Table 3, the data analysis obtained a *p*-value of 0.000, therefore a correlation was found between the anxiety level of pregnant women towards COVID-19 vaccine and the decision to accept the COVID-19 vaccine at the Abadijaya Public Health Center Depok.

**Table 4.** Correlation Between Characteristics of Respondents and Their Decision Towards COVID-19 Vaccine Acceptance

Characteristics of Respondents		Willing		Not willing		p-value
		N	%	N	%	
Age	≤ 16	0	0	3	100	0.451 <sup>b</sup>
	17-25	17	48.60	18	51.40	
	26-35	24	52.20	22	47.80	
	≥ 36	5	41.70	7	58.33	
Gestational Age	1 <sup>st</sup> Trimester	8	47.10	9	52.90	0.993 <sup>a</sup>
	2 <sup>nd</sup> Trimester	20	47.60	22	8.44	
	3 <sup>rd</sup> Trimester	18	48.60	19	51.40	
Gravida	Primigravida	17	48.60	18	51.40	0.923 <sup>a</sup>
	Multigravida	29	47.50	32	52.50	
Last education	Elementary	2	40	3	60	1.000 <sup>b</sup>
	Junior High	10	47.26	11	52.40	
	Senior High	29	48.30	31	51.70	
	University	5	50	5	50	
Profession	Housewife	41	48.20	44	51.80	1.000 <sup>b</sup>
	Self-employed	2	50	2	50	
	Others	3	42.90	4	57.10	

<sup>a</sup>= Chi squared test<sup>b</sup>= Fisher's exact test

Based on Table 4 above, it was found that the correlation between each characteristic of pregnant women and their decision towards COVID-19 vaccine acceptance had a  $p$ -value  $> 0.05$ . Hence, it can be concluded that there was no correlation between the characteristics of the respondents and the decision to accept COVID-19 vaccine in pregnant women in Abadijaya Public Health Center Depok.

#### 4. Discussion

In this study, a correlation was found between pregnant women's anxiety levels towards the COVID-19 vaccine and their decision to accept the COVID-19 vaccine at Abadijaya Public Health Center, Depok. Based on the data obtained, it can be concluded that the higher the anxiety level, pregnant women tend to be unwilling to be vaccinated against COVID-19, but the milder the anxiety level, they tend to be willing to be vaccinated. The results of this analysis are in line with the research conducted by Schaal et al. [10].

This study found that the willingness to be vaccinated was significantly related to the anxiety level of pregnant women about being infected and experiencing more severe illness. The main reasons for doubts about vaccination in mothers with high levels of anxiety are limited specific information about vaccination, limited scientific evidence about the safety of vaccination, and fear of harm to the fetus or baby.

Putri et al. [9] found a significant relationship between anxiety and willingness to be vaccinated against COVID-19. According to this research, people who are willing to be vaccinated revealed that they are quite sure that the COVID-19 vaccine can protect themselves and those around them. Whereas for those who refused to receive the vaccine, they revealed that they had doubts due to misinformation. The existence of negative information and hoaxes causes a response of anxiety and panic, which can then hinder individual responses in taking appropriate action [14].

In this study, no correlation was found between age and the decision to accept the COVID-19 vaccine. It was found that the decision to accept the COVID-19 vaccine in each age group varied, where both younger and older people had almost the same tendency to be unwilling to be vaccinated. The results of this study are in line with research conducted by Skjefte et al. [15], where no relationship was found between demographic factors such as age, income, and insurance participation with the decision to accept the COVID-19 vaccine.

The highest predictors that can affect acceptance of the COVID-19 vaccine are information regarding vaccine safety and efficacy, belief in the importance of vaccines, fear of COVID-19, trust in health workers, and compliance with the use of masks. Thus, no correlation was found between age and the decision to accept the COVID-19 vaccine because each age group experienced the same anxiety for the reasons above.

There was no correlation found between gestational age and the decision to receive the COVID-19 vaccine, and the majority of pregnant women in each trimester were unwilling to be vaccinated. Research conducted by Carbone et al. and Goncu et al. support this result with the same finding [16, 17]. This study

revealed that pregnant women at various gestational ages are worried about the consequences for the health of the fetus if they receive the COVID-19 vaccine. The main reasons for pregnant women being unwilling to be vaccinated are concerns that vaccines can endanger their health, the possibility that vaccines don't work, and doubt from other family members regarding vaccine effectiveness.

As stated, no correlation was found between gravida and the decision to receive the COVID-19 vaccine, as also shown in research conducted by Tao et al. and Azami et al., where no significant relationship between gravida and vaccine acceptance in pregnant women was found [18, 19]. Factors that could explain this difference are difficult to identify, but most likely due to differences in access to health services and differences in awareness of the severity of COVID-19.

There was no correlation found between education level and COVID-19 vaccine acceptance. This study shows that lower education levels tend to be less willing to receive the COVID-19 vaccine compared to those with higher education. Research conducted by Carbone et al. and Bakri et al. support this result with the same finding [16, 20]. Although no relationship was found, these studies showed that the higher the level of education, the higher the willingness to receive the COVID-19 vaccine. This is because the decision-making process is based on good cognitive abilities that can be achieved through higher education, enabling individuals to seek fact-based information.

In this study, no correlation was found between occupation and COVID-19 vaccine acceptance. It was found that those who work as housewives, are self-employed, or have other non-formal occupations tend to be unwilling to receive the COVID-19 vaccine during pregnancy. Research conducted by Bakri et al. in the community supports this result with the same finding [20, 22]. Although no correlation was found, previous research found that respondents who do not work and work as housewives had a lower rate of receiving the COVID-19 vaccine than the working group.

The main reason for people who have not been vaccinated and are not willing to be vaccinated is because they do not have a job or obligation that requires them to be vaccinated, apart from other reasons such as age and comorbid illnesses. Meanwhile, the working group considers vaccination a necessity due to government requirements for workplace entry. Hence, findings in this study could occur because the respondents did not feel the need to receive the COVID-19 vaccine, especially since the majority of respondents were housewives [20, 22].

## **5. Conclusion**

There is no correlation between age, gestational age, gravida, education level, and occupation with the decision towards COVID-19 vaccine acceptance. There is a correlation between anxiety levels in pregnant women towards COVID-19 vaccine and the decision to accept COVID-19 vaccine at Abadijaya Public Health Center, Depok.

## **6. Data Availability Statement**

The datasets generated and analyzed during the current study are not publicly available due to privacy and ethical considerations but are available from the corresponding author upon reasonable request.

## **7. Ethical Statement**

This research was approved by the Ethics Committee for Health Research at Universitas Sumatera Utara under approval number: 645/KEPK/USU/2022.

## **8. Author Contributions**

All authors contributed to the design and implementation of the research, data analysis, and finalizing the manuscript.

## **9. Funding**

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## **10. Conflict of Interest**

Authors declares no conflict of interest.

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