



# The Correlation Of Covid Vaccine Types Administration To Menstrual Disturbances

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## KEYWORDS

COVID-19 vaccine, menstrual disturbances.

## ABSTRACT:

Background: As a form of prevention of COVID-19, there are various types of vaccines developed and which have been disseminated in Indonesia and approved by BPOM, there are 5, namely Sinovac, AstraZeneca, Sinopharm, Pfizer and Moderna. However, there have been some reports that COVID-19 vaccines cause a number of menstrual disturbances, including irregular cycles, cramps and bleeding. The menstrual cycle is regulated by the hypothalamic-pituitary-ovarian axis which can be affected by life, environmental, and health stressors. COVID-19 vaccines can create a strong immune response or stressor, temporarily affecting the hypothalamic-pituitary-ovarian axis, and causing menstrual disturbances.

Research Objectives: To find out whether there is a relationship between the administration of the COVID-19 vaccine and menstrual disturbances in female students of the Faculty of Medicine, University of Pelita Harapan.

Research Methods: The study was conducted based on an unpaired comparative analytical observation study with a cross-sectional study and was carried out in January-April 2023 at the Faculty of Medicine, University of Pelita Harapan, with a statistical testing method using the chi-square method.

Result: From the 123 respondents to the inclusion criteria, 114 (92.7%) female students did not experience menstrual disturbances after COVID-19 vaccination, while 9 (7.3%) other female students experienced menstrual disturbances. From the total 9 (7.3%) female students who experienced menstrual disturbances, the disturbances that occurred were menstrual duration disturbances, menstrual volume disturbances, and menstrual regularization disturbances. Based on the Chi-Square test, a p-value of 0.618 was obtained so that the P-Value > 0.05 and showed no relationship between the administration of the COVID-19 Vaccine type against menstrual disturbances.

Conclusion: There is no significant relationship between the administration of the COVID-19 Vaccine type against menstrual disturbances in female students of the Faculty of Medicine, University of Pelita Harapan.

## Introduction

There are 5 types of vaccines that have been disseminated in Indonesia and approved by BPOM, namely Sinovac, AstraZeneca, Sinopharm, Pfizer, and Moderna.<sup>7</sup> Nine billion doses have already been administered worldwide by mid-2022.<sup>8</sup> Some people do not immediately believe in newly developed vaccines

and cause anxiety about getting vaccinated, so the Centers for Disease Control and Prevention (CDC) decided to implement a Vaccine Adverse Event Reporting System called V-Safe to monitor potential vaccine side effects.<sup>9</sup> Correspondingly, other studies noted a range of mild side effects to vaccinations such as fever, chills, headache, arm pain, and fatigue to serious ones such as thrombosis and anaphylaxis.



Since the COVID-19 vaccination was implemented, there have been several reports that the COVID-19 vaccine causes a number of menstrual disorders, including irregular cycles, cramps and bleeding.<sup>13,14</sup> (10,11) Research conducted by Alison Edelman, Emily R. Boniface, Eleona Benhar, Leo Han, Kristen A. Matteson et al (2022) titled "Association Between Menstrual Cycle Length and Corona virus Disease 2019 (COVID-19) Vaccination" with data collection from the United States population found that of the 3,959 people vaccinated with the average group receiving the Pfizer-BioNTech vaccine 50%, Moderna 35% and Janssen (J&J) 7% (vaccinated 2,403 and unvaccinated 1,556). The vaccinated group showed an increase in menstrual cycle length along with the administration of the first, second and third vaccine doses.<sup>11</sup>

Research with the same results was also found by Nadia Mumenstruasiat, Mohammad A. Alshorouf, Muayad I Azzam, Abdulrahman M Karam, Majed W Al-Nazer, Abdallah Al-Ani et al (2022) entitled "Menstrual Symptoms After COVID-19 Vaccine: A Cross-Sectional Investigation in the MENA Region" with subjects totaling 2269 women and the average age was  $34.3 \pm 8.5$  years. Menstrual disturbances were shown by 66.3% of subjects, 46.7% of whom experienced it immediately after receiving the first dose. While in 93.6% of subjects, menstrual disturbances disappeared in less than two months. This type of vaccine did not have a significant impact on menstrual disturbances ( $p > 0.05$ ).<sup>15</sup>

The study titled "BNT162b2 and ChadOx1 SARS-CoV-2 Post-vaccination Side-Effects Among Saudi Vaccinees" found that the Pfizer-BioNTech (BNT162b2) and AstraZeneca (ChAdOx1) vaccines had side effects such as delayed or increased menstrual cycles, excessive bleeding and pain.<sup>16</sup> A similar thing was also found by Lusía Rodríguez Qejada, María Fernanda Toro Wills et al (2022) entitled "Menstrual cycle disturbances after COVID-19 Vaccination" which distributed questionnaires on social media covering women aged 18-41 years with normal cycles according to the Federation of Gynecology Obstetrics And those who had been vaccinated (complete schedule for two doses), out of 408 people who met the criteria reported that 184 people had menstrual disturbances such as

frequency irregularities, regularization, duration, and volume.<sup>17</sup> If a person has chronic menstrual disturbances it can cause infertility, anemia, and endometrial cancer.<sup>18</sup> The problem of menstrual disturbances is a leading indicator of women's health and fertility. If a person has menstrual disturbances in addition to causing adverse effects such as a decrease or addition to the menstrual cycle, excessive bleeding, and pain, chronic menstrual disturbances can also cause anemia, infertility, and endometrial cancer.

There have been several studies related to the effect of the COVID-19 vaccine on menstrual disturbances. However, in Indonesia, there is still a lack of research that reviews this, especially in medical students who have received vaccines with first, second, and booster doses. Thus, further research is needed on the relationship between COVID-19 vaccine administration and menstrual disturbances.

### Research Methodology

The study was conducted based on an unpaired comparative analytical observation study with a cross-sectional study and was carried out in January-April 2023 at the Faculty of Medicine, University of Pelita Harapan. This study was conducted by filling out the Adnex-1 Questionnaires questionnaire and by purposive sampling method as a sampling technique. The results of the study were processed using the Statistical Package for the Social Sciences (SPSS) 25 program and statistical testing was carried out using the chi-square method.

### Results of Analysis and Discussion

#### Sample Characteristics

The sample characteristics are determined based on the research findings shown in Table 5.1. The samples analyzed came from the Faculty of Medicine class of 2020 to 2022. The class of 2020 is the largest research sample 58 (26.9%), the class of 2021 is 36 (16.7%), and the class of 2022 is 29 (13.4%). The age of respondents varied from 17 to 26 years and respondents with the age of 20 years were the most respondents totaling 49 (39.8%). Body Mass Index (BMI) data was also explained in this study with respondents amounting to 35 (28.5%) people being overweight or overweight.

**Table 1 Characteristics of the sample under study**

No	Characteristic	N(%)	Total
1	Force		
	2020	58 (26.9%)	123
	2021	36 (16.7%)	
	2022	29 (13.4%)	
Usia			
2	17 years	1 (0.8%)	123
	18 years	14 (11.4%)	
	19 years	35 (28.5%)	
	20 years	49 (39.8%)	
	21 years	16 (13%)	
	22 years	4 (3.3%)	
	23 years	3 (2.4%)	
	26 years	1 (0.8%)	
3	Body Mass Index (BMI)		123
	Underweight (<18.5)	0	
	Normal (18.5 - 22.9)	88 (71.5%)	
	Overweight (23 - 24.9)	35 (28.5%)	
	Obese (>25)	0	

### The Relationship Between COVID-19 Vaccine and Menstrual Disturbances

Table 2 illustrates the findings of data analysis using chi-square on the Relationship between COVID-19 Vaccine Type and Menstrual Disturbances in Students of the Faculty of Medicine, University of Pelita Harapan, from a total of 123 respondents divided into 2 groups, namely 54 people vaccinated with the Viral Vector type and 69 people vaccinated with the Inactivated type. A total of 114 (92.7%) people did not experience post-vaccination menstrual disturbances and

9 (7.3%) people experienced post-vaccination menstrual disturbances. The results of the chi-square test show that  $p$ -value = 0.618, with an odds ratio of 0.977, the chance for vaccinated respondents using inactivated and viral vector types to experience menstrual disturbances after COVID-19 vaccination is 0.977 times. Then for the 95% confidence interval obtained a range of 0.903 – 3.827. So it can be concluded that there is no significant relationship between the administration of the type of COVID-19 vaccine against menstrual disturbances.

**Table 2. The Relationship Between COVID-19 Vaccine and Menstrual Disturbances**

Types of COVID-19 vaccines	Menstrual disturbances		Total	P Value	Odds Ratio	95% Confidence Interval
	No	Yes				
Viral Vector	50 (92.6%)	4 (7.4%)	54 (100%)	0.618	0.977	0.903 – 3.827
Inactivated	64 (92.8%)	5 (7.2%)	69 (100%)			



Total	114 (92.7%)	9 (7.3%)	123 (100%)
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This research has similar results to the journal "Effect of COVID-19 vaccination on menstrual periods in a prospectively recruited cohort" published by Ee Von Woon and Victoria Male on March 30, 2022. In this journal, out of a total of 79 respondents who used mRNA and viral vector vaccines, only 10% experienced post-vaccination menstrual disturbances. Of the 10% of respondents who experience menstrual disturbances, the type of disturbances experienced is a cycle disturbances, which is a delay to the next

### The Relationship Between COVID-19 Vaccine and Menstrual Cycle Disturbances

Table 3 shows the results of the relationship between COVID-19 vaccine types and menstrual cycle disturbances using chi-square. The results of the analysis of 123 respondents showed that of the 54 respondents vaccinated using the viral vector type, 50 (92.6%) of them did not experience interference, while 4 (7.4%) respondents experienced lengthening of the menstrual cycle. Furthermore, of the 69 respondents vaccinated using the inactivated type, 64 (92.8%) of

menstrual period, but this is only temporary. The average age of the sample who became respondents in the journal was 27-35 years old. This menstrual disturbances is caused by sudden weight loss, excessive exercise, stress during the COVID-19 pandemic and conditions related to daily life.<sup>38</sup> The results from the journal have something in common with the researchers, namely that there is no significant relationship between cycle disruption and administration of COVID-19 vaccine types.

them did not experience interference, while 5 (7.2%) experienced lengthening of the menstrual cycle. The results of the chi-square test show a p-value with a value of 0.618 or p-value > 0.05. The Odds Ratio is 1.024 so if respondents receive the COVID-19 vaccine with viral vector and inactivated types, the possibility of them experiencing menstrual cycle disruption is 1.024. Then for 95% Confidence Interval was obtained at 0.261 – 4.013. So it can be concluded that the relationship between the administration of the type of COVID-19 vaccine against menstrual cycle disturbances is not significant.

**Table 3. The Relationship between COVID-19 Vaccine Types and Menstrual Cycle Disturbances**

Types of COVID-19 vaccines	Menstrual Cycle Disturbances		Total	P Value	Odds Ratio	95% Confidence Interval
	No	Yes				
Viral Vector	50 (92.6%)	4 (7.4%)	54 (100%)	0.618	1.024	0.261 – 4.013
Inactivated	64 (92.8%)	5 (7.2%)	69 (100%)			
Total	114 (92.7%)	9 (7.3%)	123 (100%)			

### The Relationship Between COVID-19 Vaccine Type and Menstrual Duration Disturbances

Table 4 shows the results of the relationship between COVID-19 vaccine types and menstrual duration disturbances using chi-square. The results of the analysis of 123 respondents showed that of the 54

respondents vaccinated using the viral vector type, 50 (92.6%) of them did not experience interference, while 4 (7.4%) respondents experienced lengthening of menstrual duration. Furthermore, of the 69 respondents vaccinated using the inactivated type, 64 (92.8%) of them did not experience interference, while 5 (7.2%)



experienced lengthening of menstrual duration. The results of the chi-square test show a p-value with a value of 0.618 or a p-value > 0.05. The Odds Ratio is 1.024 so if respondents receive the COVID-19 vaccine with viral vector and inactivated types, the possibility of them experiencing menstrual duration disturbances is

1.024. Then for 95% Confidence Interval was obtained at 0.261 – 4.013. So it can be concluded that the relationship between the administration of the type of COVID-19 vaccine against menstrual duration disturbances is not significant.

**Table 4. The Relationship Between COVID-19 Vaccine Type and Menstrual Duration Disturbances**

Types of COVID-19 vaccines	Duration Disturbances		Total	P Value	Odds Ratio	95% Confidence Interval
	No	Yes				
Viral Vector	50 (92.6%)	4 (7.4%)	54 (100%)	0.618	1.024	0.261 – 4.013
Inactivated	64 (92.8%)	5 (7.2%)	69 (100%)			
Total	114 (92.7%)	9 (7.3%)	123 (100%)			

#### The Relationship Between COVID-19 Vaccine Type and Menstrual Volume Disturbances

Table 5 shows the results of the relationship between COVID-19 vaccine types and menstrual volume disturbances using chi-square. The results of the analysis of 123 respondents showed that of the 54 respondents vaccinated using the viral vector type, 50 (92.6%) of them did not experience disturbances, while 4 (7.4%) respondents experienced menstrual volume disturbances. Furthermore, of the 69 respondents vaccinated using the inactivated type, 64 (92.8%) of

them did not experience interference, while 5 (7.2%) experienced menstrual disturbances. The results of the chi-square test show a p-value with a value of 0.618 or p-value > 0.05. The Odds Ratio is 1.024 so if respondents receive the COVID-19 vaccine with viral vector and inactivated types, the possibility of them experiencing menstrual duration disturbances is 1.024. Then for 95% Confidence Interval was obtained at 0.261 – 4.013. So it can be concluded that the relationship between the administration of the type of COVID-19 vaccine against menstrual volume disturbances is not significant.

**Table 5 Relationship between COVID-19 Vaccine Type and Menstrual Volume Disturbances**

Types of COVID-19 vaccines	Volume Disturbances		Total	P Value	Odds Ratio	95% Confidence Interval
	No	Yes				
Viral Vector	50 (92.6%)	4 (7.4%)	54 (100%)	0.618	1.024	0.261 – 4.013
Inactivated	64 (92.8%)	5 (7.2%)	69 (100%)			
Total	114 (92.7%)	9 (7.3%)	123 (100%)			



Based on the journal "COVID-19 vaccination and changes in the menstrual cycle among vaccinated persons" published by Leslie V. Farland, Sc., Sana M. Khan, M.P.H, Alexandra Shilen, M.P.H in March 2023. The study stated that from a total of 525 respondents only 135 people experienced menstrual disturbances. Of those who experienced post-vaccination menstrual disturbances, 72% experienced stress as measured using the perceived stress scale (PSS-10). In this study, from 135 respondents, the type of disturbances experienced was in the form of disturbances in volume, duration, and pain. The journal states that the administration of the COVID-19 vaccine type is not the cause of menstrual disturbances, especially in disruptions in menstrual volume and duration but is caused by high stress levels ( $p < 0.05$ )<sup>39</sup>. The results of the journal have something in common with researchers, namely that there is no significant relationship between frequency and cycle disruption to the administration of COVID-19 vaccine types.

According to the two studies, it can be explained that the main cause of menstrual disturbances where the disruption can be in the form of volume, cycle, duration, and pain is sudden weight loss and high levels of stress due to daily life during the pandemic. In this study, the stress level and Body Mass Index of the sample were included in the confounding factors so that it did not allow researchers to check this when taking data from respondents. This is because researchers have a limited time within a predetermined time frame to reach the minimum number of samples if these two variables are exclusion factors in this study.

This research has advantages because the topic taken was carried out during the pandemic and where this problem is still a topic that is widely questioned throughout the country, research on this topic is still minimal, especially in Indonesia and to determine the relationship between these problems requires many other supporting research.

Because this research topic has just been discovered and is still an ongoing issue today, there is still minimal research that has been done. As a result, this study has limitations including the lack of reference sources used. Confounding factors such as stress levels and Body Mass Index that were not studied in this study are also other causes that can cause biased. The possibility of

inaccuracies and the truth of the information obtained can also be biased information because the average sample in this study had been vaccinated for approximately one year before this study was conducted.

## CONCLUSION

1. Based on the results of the study, it can be concluded that there is no relationship between the administration of the type of COVID-19 vaccine and menstrual disturbances.
2. Menstrual disturbances experienced by female students of the Faculty of Medicine, University of Pelita Harapan after COVID-19 vaccination are cyclical, duration and volume disturbances.

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