

Women in Pregnancy Acceptance of the COVID-19 Vaccine

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Abstract. The COVID-19 epidemic has caused a large number of deaths worldwide. The World Health Organization (WHO) declared vaccination resistance to be one of the major global health dangers even before the COVID-19 pandemic. Women in pregnancy are more susceptible to illness because of the way their bodies change throughout pregnancy, particularly when neo coronavirus variations are prevalent, which might raise the likelihood of an unfavorable pregnancy result. Currently, there is still some dispute about whether pregnant women can be vaccinated. Some think that promoting early, safe, and effective vaccination of women in pregnancy with a novel coronavirus vaccine is the key to successfully building a population immune barrier. Some even advise pregnant women not to get vaccinated. For the pregnant women themselves, vaccine reception is also low, significantly lower than the general rate of vaccination against COVID-19. And vaccine doubts are common. This article specifically analyzes the current situation and causes of vaccine doubt among pregnant women during the pandemic.

Keywords: COVID-19, Vaccine Acceptance, Women in Pregnancy.

1. Introduction

According to the WHO, COVID-19 has been responsible for more than two million fatalities as of February 2021. So, it's crucial to be healthy. The only method to halt coronavirus illness (COVID-19) is via non-medical means since there is no effective treatment for it. The best way to stop a virus epidemic is to vaccinate animals against it, just like what has been done in the past [1].

Compared to women of the same age who are not pregnant, women in pregnancy are more likely to get ill, need acute care, or require invasive ventilation. Therefore, women in pregnancy are among those who have a high risk of contracting COVID-19. According to research from the Centers for Disease Control and Prevention, women in pregnancy had a 1.5 times higher risk of dying from COVID-19 and a 3 times higher risk of needing hospitalization or intubation than non-women in pregnancy [2].

The World Health Organization (WHO) listed vaccine indecision as one of the top ten global health hazards even before the COVID-19 pandemic. Vaccination uncertainty is defined as a delay in deciding whether to obtain a vaccine or not. Despite the fact that the majority of people advise being vaccinated before becoming pregnant, many women in pregnancy choose not to have the flu shot because they lack knowledge about it, dislike it, have no prior experience with it, and are concerned about its potential negative effects. Some of them believe they can stay healthy in other ways or that vaccinations aren't necessary. There isn't a lot of data yet on how uncertainty and other elements impact the new corona vaccination for expectant mothers. There is currently little evidence that the COVID-19 vaccination is safe for expectant mothers (COVID-19 vaccine). Regarding whether or not women in pregnancy should get the COVID-19 vaccination, various nations have varied laws. This makes people doubt the vaccine and makes it harder to keep women in pregnancy from getting COVID-19 and to treat it if they do.

This study aims to summarize the current situation and factors influencing vaccination hesitation in pregnant and lying women, providing a theoretical basis for the formulation of a vaccination strategy for this population.

2. Vaccination of women in pregnancy

2.1. Impact of vaccines on women in pregnancy

Pregnant women are a special group. Affected by high levels of estrogen and progesterone in the body, it is thickened, slightly congested, edematous, and prone to upper respiratory tract infections in the upper respiratory tract (nose, pharynx, trachea). The inflammatory stress response to viral respiratory system infections was significantly increased. For early-pregnant women, viral infection can lead to spontaneous abortion; for pregnant women in the second and third trimesters of pregnancy, high fever and hypoxia can cause fetal distress and premature delivery. Respiratory symptoms that are severe and life-saving for the fetus often require emergency termination of pregnancy [3].

Getting the new crown vaccine has many benefits for pregnant women. In addition, maternal vaccinations help protect babies from serious illnesses early on. Since 2014, pregnant women in China have been designated as a priority population for influenza vaccination to protect their children from influenza and prevent adverse pregnancy outcomes [4].

Some trials did not detect any harmful effects of vaccination in early pregnancy. Regarding the effect of vaccination on early pregnancy, the data that most clearly answers the question: whether the COVID-19 vaccine harms fertility comes from the clinical trials themselves. The scholars have an understanding of how the vaccine affects female pregnancies in pregnant volunteers in clinical trials [5]. There is no significant difference between interest rates.

2.2. Pregnant women's acceptance of the COVID-19 vaccine

2.2.1. The status and acceptance of the COVID-19 vaccine by women in pregnancy

Women in pregnancy receive the vaccine in various ways depending on the country. Searches were conducted manually and in four databases to locate 375 studies published between December 2020 and April 2022. Last but not least, 25–147 people from these 17 trials were examined in the quantitative analysis. The participants in this research ranged in age from 25 to 35, and it was discovered that 62% of them held employment. Finally, it revealed that only 49% of people received the COVID-19 vaccination (with a 95% confidence range of 42% to 56%, $p = 0.001$). In high-income nations where individuals had less education and more women had previously given birth, acceptance of the COVID-19 vaccination was lower. Overall, when a person's wealth increases, fewer COVID-19 admissions occur. This equates to 47% in high-income countries, 48% in middle-income countries, and 61% in low-income countries. The COVID-19 vaccination rate likewise varies significantly from region to region. Africa had the highest vaccination acceptability (61%; 95% CI: 40%-81%), followed by Asia (49%; 95% CI: 33%-65%), America (46%; 95% CI: 35%-56%), and Europe/Oceania (45%; 95% CI: 35%-56%). The COVID-19 vaccination rate likewise varies significantly from region to region.

Africa had the highest vaccination acceptability (61%; 95% CI: 40%-81%), followed by Asia (49%; 95% CI: 33%-65%), America (46%; 95% CI: 35%-56%), and Europe/Oceania (45%; 95% CI: 35%-56%). Compared to women who had never given birth, those who had previously given birth were less likely to have received the COVID-19 immunization (41%; 95% CI: 28%–55%). The COVID-19 vaccination was shown to be more readily accepted previously by women in pregnancy (62%; 95% CI 44-80%) than by first-time mothers (51%; 95% CI. 24% to 79%). Additionally, it was indicated that women in pregnancy with many health issues were more likely to have had vaccinations than those who just had one (35%; 95% CI: 16%–54%). Women who worked had a higher rate of COVID-19 vaccination (62%; 95% CI 51% to 74%) compared to women who did not work (41%; 95% CI 28% to 55%). It was indicated that women in pregnancy with at least 12 years of education had higher COVID-19 vaccination rates (50%; 95% CI, 41% to 61%) than did women in pregnancy without at least 12 years of education (38%; CI 95). % 19% to 58%). In women in pregnancy, there was a marginally favorable connection between receiving the COVID-19 vaccination and being aware of the disease ($r = 0.164$; 95% CI: 0.946 to 0.972; $p = 0.8359$), although it wasn't statistically significant.

From October 28 to November 18, 2020, the Preregistry conducted an online poll to see how women in pregnancy felt about the COVID-19 immunization. The study received 17,871 answers

from 16 different nations. Given the 90% effectiveness of the COVID-19 vaccination, 52.0% of women in pregnancy ($n = 2747/5282$) and 73.4% of non-women in pregnancy ($n = 9214/12,562$) indicated they intended to get the shot. 69.2% of the ladies ($n = 11,800/17,054$). Most people in India, the Philippines, and Latin American nations tolerate vaccinations better than individuals in Russia, the US, and Australia [7].

Carbone L. conducted 15 studies involving 25, 839 women. 61.6% of mothers were nursing, and 49.1% of mothers (CI: 42.3-56.0) were willing to be immunized while pregnant (CI: 50.0-75.0). The overall SARS-CoV-2 vaccination rate among expectant women continues to be poor. Vaccination efforts are therefore urgently needed to boost public trust in vaccinations, which will aid in halting the spread of diseases and their potential consequences on unborn children [8].

In a Chinese study, 77.4% of the 1,392 women in pregnancy receiving the COVID-19 vaccination said they were satisfied with it. Women in pregnancy received more COVID-19 doses during the first trimester than during the second and third trimesters. Studies done outside of the United States have also indicated that women in pregnancy and doctors are more likely to agree to routine flu shots if they have a bachelor's degree or higher.

The Sutton D survey started on 01/07/2021 - 29/01/2021. However, pregnant respondents had the lowest vaccine acceptance rate (44.3%; P less than 0.001). Work in health care was not found to be associated with vaccine reception [9].

2.3. Factors affecting the acceptance

Vaccines and the individuals they are designed to defend have many distinctions. Therefore, it's critical to understand why women in pregnancy resist vaccination.

Women in pregnancy in China continue to question whether they should receive vaccinations despite the fact that there is a lot of scientific evidence to the contrary. Most likely, it's as a result of the "confused" manner in which the advantages of vaccination have been conveyed. In reality, none of the COVID-19 vaccination studies included pregnant or nursing women, which is similar to practically all clinical trials. Even though the COVID-19 vaccine is well-made and accessible to many individuals worldwide, this makes it more difficult to determine if it is safe and effective. Furthermore, less is known about messenger RNA vaccines, which are a relatively novel concept. Breaking out of this innovation rut is challenging. Having a thorough understanding of immunizations, linked illnesses that can be averted in women in pregnancy, and knowledge of women in pregnancy who are at risk will help dispel misconceptions and encourage more women in pregnancy to get the vaccine. The author concentrates on the most recent data about prenatal vaccines during this COVID-19 pandemic [10].

Additionally, there was a connection between women in pregnancy receiving the COVID-19 vaccine and those who had previously received an influenza vaccination. In comparison to those who did not get the flu shot, the percentage of women in pregnancy receiving the COVID-19 vaccination was 72.48% (95% CI: 70.18-74.72) [11].

Analysis of correlation data from clinical trials revealed that there was little association between willingness to receive the COVID-19 vaccination and knowledge about the disease. According to a Chinese study, when individuals are informed about the COVID-19 vaccination, they are less inclined to receive it. Women in pregnancy could hear unfavorable things about vaccinations, which can increase their doubts about their safety [12].

In Goncu Ayhan's research, 111 participants, or 37%, provided various justifications for receiving the COVID-19 vaccination for women in pregnancy. Because they don't know whether the COVID-19 vaccination is safe for women in pregnancy, the majority of individuals don't want to have it. The number of school-age children and the licensure of a COVID-19 vaccination are not strongly correlated. According to the research, women in pregnancy are still reluctant to get the COVID-19 vaccination. Therefore, it is important to consider whether or not immunizations are safe. Making plans to disseminate the COVID-19 virus during the pandemic will be made simpler by learning how women in pregnancy feel about receiving vaccinations. A high COVID-19 knowledge score, a high

perceived vulnerability level, a low perceived barrier level, and a high perceived acceptance rate were all related to higher acceptance rates in the multivariate regression model. Other factors included being young, living in the West, having a low level of education, becoming pregnant later in life, and having a high perceived acceptance rate. advantages and several action suggestions [13].

According to research published in Am J, a person's decision to receive a vaccine is influenced by their beliefs about how safe or effective vaccines are, their concerns regarding COVID-19, how important they think various vaccines are in various countries, how well they follow instructions for using a mask, and how much they trust medical professionals. public health and attitudes toward regular immunizations. Around the globe, there are several ways that women in pregnancy absorb the COVID-19 vaccine and its predictions [8].

The main influences on acceptance of the COVID-19 vaccine during pregnancy were, along with conviction in the need and efficacy of the vaccine, clear information about the vaccine's safety for women in pregnancy, and acceptance of other vaccinations such as immunizations. Concern about COVID-19, confidence in the value of vaccines and widespread immunization in a society, worry about COVID-19, faith in public health organizations and the medical community, and wearing masks as directed. Other considerations include socioeconomic position, age, and educational attainment [14].

More studies also revealed that women without employment and those with less than 12 years of education weren't big fans of the COVID-19. According to research on views about vaccination throughout the world, unemployed women are more prone to having doubts about the efficacy and safety of vaccinations. A subgroup study revealed that the number of pregnancies a woman has had and the number of viable pregnancies she has carried to term (parity) are indicators of how few women in pregnancy get the COVID-19 vaccination. Women who have had more than one child are less likely to get COVID-19 than single mothers. Women who have more children could be more concerned since the COVID-19 vaccination regulations are still relatively new. Women who are pregnant are more self-assured than those who have just given birth, so they are less likely to receive the COVID-19 vaccination [15].

The age of women in pregnancy and their desire to get the vaccination do not vary much. The COVID-19 vaccination was agreed to by 55.93% of women in pregnancy under the age of 35 and 57.61% of women in pregnancy above the age of 35 (95% CI: 42.92–68.53). Additionally, there was a connection between age (under 35 years vs over 35 years) and women in pregnancy's willingness to get the COVID-19 vaccination (OR = 1.02 [95% CI: 0.93-1.11]).

The acceptability of vaccines is significantly influenced by geographical variables (Asia, South American nations), as well as pandemic considerations (a variety of dangers and hazards of infection). The elements that have the most effect on acceptance have to do with how much people are aware of the danger of illness, how safe vaccines are, and how well-researched information on vaccine needs and safety is disseminated. Professional and reliable patient data from trained obstetricians and medical staff will give people a lot more faith in the COVID-19 vaccination.

3. Limitation

Geographical (Asia and South America) and pandemic (various hazards and threats of infection) considerations both have a significant impact on how people take vaccinations. The most significant factors influencing adoption are how well people understand the danger of infection, the safety of vaccinations, and how trustworthy information is provided about the need and safety of vaccines. If trained obstetricians and other medical professionals collect expert and reliable patient data, people will have a lot more faith in the COVID-19 vaccine.

Clinical trials of some vaccines cover several risk groups, such as pregnant women, but the total number is small, making it difficult to reach a statistically significant number of study subjects. The incidence of adverse reactions to some vaccines in this population is higher than in other populations.

When the vaccine is sold, this population may not be eligible for vaccination and may not receive immediate protection.

Not everything is covered in this analysis. Data from scientific databases could not accurately represent the most current public opinion because of peer review and publishing procedures. Anyone with access to the PubMed database may do so. Even though the research isn't flawless, it does include many crucial surveys and other crucial elements that provide a complete picture of current developments.

You should use caution when analyzing and using the survey findings since the questions and responses don't always predict how respondents will behave in the future. Additionally, opinions might shift, particularly in light of the current epidemic. When new vaccines or treatment methods come out, new cases are reported, the results of clinical trials are released, or other things happen, vaccine sensitivity monitoring may pick up on any changes in how the public feels about immunization.

4. Conclusions

At present, the development and situation of epidemic prevention and control is still bleak and complex. Relevant experts are still studying developments and knowledge related to the epidemic. As a special group, pregnant women have lower immunity than healthy adults. Therefore, pregnant women are also vulnerable to COVID-19. Currently, there is still controversy about whether pregnant women should be vaccinated. Contrary to general COVID-19 vaccination rates, about half of women in pregnancy have received the COVID-19 vaccine. Therefore, the appropriate actions should be taken to increase acceptance of vaccines, raise awareness of their safety, and inform the public about them.

According to this review, opinions on the COVID-19 vaccine varied greatly. But descriptive analysis of the number of individuals who receive immunizations across continents may indicate some tendencies. People who live in prosperous nations dispute whether or not immunization's function and are safe. This might due to the fact that there are disparities between low-income and high-income nations in how much vaccination information is accessible, how much it costs, and how many people know about it. The findings are also in accord with those of previous research, which suggests that people in Europe don't believe the COVID-19 vaccination is safe.

There has to be open communication and strategies for dealing with vaccination skepticism in order to increase the awareness of how safe vaccines are among women in pregnancy and medical professionals. These tactics include long-term monitoring of newborns as well as follow-up following immunization to learn more about the pregnancy's progress, particularly after immunization in the first trimester. Because of this, pharmaceutical firms and the US government must consider the skepticism that exists over the COVID-19 vaccination. The country's economic and social stability may be threatened by the spike in hospitalizations and the negative impacts of COVID-19 on those who weren't immunized, which might exacerbate inequalities. Minorities in terms of race, sexual orientation, and gender are concerned about vaccination decisions. To stop a COVID-19 outbreak in vulnerable people, they urge awareness campaigns. Racial inequities in the system must be strategically corrected if people are to once again have faith in medical and vaccination experts. Plans for getting vaccines to people on time are also hard to carry out because of the new coronavirus strain, which puts healthcare systems at risk.

References

- [1] Hinman AR. The eradication of polio: have we succeeded? Vaccine. Zambrano LD, Ellington S, Strid P. Update: characteristics of symptomatic women of reproductive age with laboratory-confirmed SARS-CoV-2 infection by pregnancy status - United States, January 22-October 3, 2020. MMWR Morb Mortal Wkly Rep. 2020; 69: 1641 – 1647.

- [2] Allotey J, Stallings E, Bonet M, et al. Clinical manifestations, risk factors, and maternal and perinatal outcomes of coronavirus disease 2019 in pregnancy: living systematic review and meta-analysis. *BMJ*. 2020; 370: m3320.
- [3] Hou Xinnan. Nursing care of pregnant women with suspected new coronavirus pneumonia during home isolation [J]. *Contemporary Nurses (First Ten-Day Journal)*, 2021, 28 (2): 181 - 183.
- [4] Feng L, Yang P, Zhang T, Yang J, Fu C, Qin Y, Zhang Y, Ma C, Liu Z, Wang Q, et al. technical guidelines for the application of seasonal influenza vaccine in China (2014-2015). *Hum Vaccin Immunother*. 2015; 11 (8): 2077 – 101.
- [5] Sutton D, D'Alton M, Zhang Y, Kahe K, Cepin A, Goffman D, Staniczenko A, Yates H, Burgansky A, Coletta J, Williams Z, Gyamfi-Bannerman C. COVID-19 vaccine acceptance among pregnant, breastfeeding, and nonpregnant reproductive-aged women.
- [6] Azami M, Nasirkandy MP, Esmaeili Gouvarchin Ghaleh H, Ranjbar R. COVID-19 vaccine acceptance among pregnant women worldwide: A systematic review and meta-analysis. *PLoS One*. 2022 Sep 28; 17 (9): e0272273.
- [7] Goncu Ayhan S, Oluklu D, Atalay A, Menekse Beser D, Tanacan A, Moraloglu Tekin O, Sahin D. COVID-19 vaccine acceptance in pregnant women. *Int J Gynaecol Obstet*. 2021 Aug; 154 (2): 291 - 296.
- [8] *Am J Obstet Gynecol MFM*. 2021 Sep; 3 (5): 100403.
- [9] Tao L, Wang R, Han N, et al. Acceptance of a COVID-19 vaccine and associated factors among pregnant women in China: a multi-center cross-sectional study based on health belief model. *Hum Vaccin Immunother* 2021; 17: 2378 – 88.
- [10] Wang PH, Lee WL, Yang ST, Tsui KH, Chang CC, Lee FK. The impact of COVID-19 in pregnancy: Part II. Vaccination to pregnant women. *J Chin Med Assoc*. 2021 Oct 1; 84 (10): 903 - 910.
- [11] Azami M, Nasirkandy MP, Esmaeili Gouvarchin Ghaleh H, Ranjbar R. COVID-19 vaccine acceptance among pregnant women worldwide: A systematic review and meta-analysis. *PLoS One*. 2022 Sep 28; 17 (9): e0272273.
- [12] Tao L, Wang R, Han N, et al. Acceptance of a COVID-19 vaccine and associated factors among pregnant women in China: a multi-center cross-sectional study based on health belief model. *Hum Vaccin Immunother* 2021; 17: 2378 – 88.
- [13] Goncu Ayhan S, Oluklu D, Atalay A, Menekse Beser D, Tanacan A, Moraloglu Tekin O, Sahin D. COVID-19 vaccine acceptance in pregnant women. *Int J Gynaecol Obstet*. 2021 Aug; 154 (2): 291 - 296.
- [14] Yasmin F, Najeeb H, Moeed A, et al. COVID-19 Vaccine Hesitancy in the United States: A Systematic Review. *Front Public Health*. 2021 Nov 23; 9: 770985.
- [15] Bhattacharya O, Siddiquea BN, Shetty A, Afroz A, Billah B. COVID-19 vaccine hesitancy among pregnant women: a systematic review and meta-analysis. *BMJ Open*. 2022 Aug 18; 12 (8): e061477.