COVID-19 Vaccine Hesitancy in Pregnant Women

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Abstract

As the COVID-19 pandemic continues in our world, it is important to ensure immunity from the virus through rigorous and consistent vaccination among all populations. Pregnant women are a vulnerable population that so far have fallen behind in getting vaccinated against COVID-19. Public health agencies and government officials, as well as medical organizations, have attempted to address their vaccination hesitancy with limited success. For their safety, it is crucial to understand the underlying reasons why pregnant women are hesitant to receive the COVID-19 vaccine and strategize how to effectively communicate the vaccine’s safety and efficacy with this group.

Through a systematic literature review, I analyzed 11 research papers that studied responses from pregnant populations regarding their vaccine hesitancy, and found a multitude of underlying factors influencing their decision not to get vaccinated against COVID-19. Fear of adverse effects to the unborn child and mother due to insufficient research data, the trimester of the mother, and mistrust in information provided by the government or public health agencies were major contributing factors to not receiving the vaccine. I recommended including pregnant women in future clinical trials of the COVID-19 vaccine as a solution to boosting confidence in the vaccine in pregnant women, and to include more communication professionals in government, public health, medical organizations, and social media efforts, as they are the leading experts in communicating information based on their audience. As pregnant women are a widely varied population, especially from country to country, localized and targeted information campaigns especially with the aid of social media was encouraged.
**Introduction**

**Background**

The COVID-19 pandemic has impacted populations worldwide and claimed millions of lives since its onset in 2020. The rise of a novel infectious disease galvanized scientists and government organizations globally to create a vaccine to defend against it, and many vaccines have been distributed since. However, the vaccine’s effectiveness can only be realized if all populations are willing to repeatedly receive the shot. Vaccine hesitancy has become a rising health concern, especially with the reemergence of infectious diseases like whooping cough and measles (Januszek, et. al., 2021, p. 6). Recently, we have seen a growing mistrust of vaccines and disbelief of the science behind their efficacy; the COVID-19 pandemic has further highlighted the divide between those who will and will not vaccinate. This, in turn, hinders the public health response to the pandemic. Januszek, et. al. (2021) also write, “Nevertheless, reluctance to vaccinate for COVID-19 may be a limiting step in global efforts to control the current pandemic, with its negative health and socio-economic impact” (p. 6).

Pregnant women are among those hesitant to receive the COVID-19 vaccine. In the early days of the pandemic, it was unclear what effect COVID-19 posed to pregnant women (Skirrow, et. al., 2022, p. 2). Additionally, pregnant women were not included in initial clinical trials of the vaccine (Geoghegan, et. al., 2021). This presents a significant problem as unvaccinated pregnant women are particularly vulnerable if they contract
the virus. The World Health Organization (WHO) cautioned that pregnant women who contract COVID-19 are likely to "require hospitalization, intensive care and invasive ventilation to help with breathing. In addition, compared with pregnant women without COVID-19, pregnant women with COVID-19 have an increased risk of preterm birth and of having babies that need neonatal intensive care. They might also have an increased risk of stillbirth and maternal death" (JAMA, 2022). It has also been found that vertical transmission of the virus, as in the virus transfers from parent to offspring, could result with hydrops fetalis and death of the unborn child (Januszek, et. al., 2021, p. 2). Both the Center for Disease Control and Prevention (CDC) and the World Health Organization (WHO) have emphasized the COVID-19 vaccine does not pose any increased adverse events to pregnant recipients of the vaccine (Kiefer, et. al., 2022) (WHO, 2022). As of March 2022, 68% of pregnant women in the U.S. have been fully vaccinated in the United States (Kharbanda & Vasquez-Benitez, 2022). While this is a promising number, it has not yet reached immunity standards in the U.S.; furthermore, the global vaccination rate for pregnant women has yet to be accurately determined, but one can estimate it would be less than the current global and fully vaccinated rate, which sits at 59.3%.

Despite the knowledge that contracting the virus while unvaccinated and pregnant can have potentially harmful effects on the mother and fetus, vaccine hesitancy persists. One woman in a study by Geoghegan, et. al. (2021) said, “I wouldn’t take it as it is a new vaccine, and no one knows the effects of it yet” (p.3374). The WHO’s current guidelines stress that the benefits of the vaccine far outweigh any potential risks, going on further to say that no pregnancy-related concerns have been
found (WHO, 2022). It is important to ensure pregnant women’s safety during the pandemic, and achieving immunity would be a significant way to do so. According to Skjefte, et. al. (2020), “A community is considered to have immunity if 75% of the population is vaccinated” (p. 198). Therefore, it is imperative to identify the underlying reasons of why pregnant women are still reluctant to receive the COVID-19 vaccine, and how their perception of the vaccine could improve.

Key Questions

The purpose of this paper is to better understand the factors influencing pregnant women’s decision to hold off receiving the COVID-19 vaccine. Pregnant women are my focus since they are a key vulnerable population that are not only aware of the vaccine, but are also still hesitant to accept it. I aim to address the following questions through this systematic review:

1. What are the reasons behind pregnant women choosing to avoid the Covid-19 vaccine?
2. How can information be better communicated so more pregnant women consider receiving the vaccination?

I answer these questions by performing a systematic review of selected academic research papers that conducted studies—both in the U.S. and globally—to analyze why pregnant populations were not getting vaccinated. The methods section details my search strategy and the source selection process for the systematic review. In the results, I describe and display the qualitative information from all the studies I examined. The discussion section is where I navigate the reasons behind vaccine hesitancy in pregnant women and offer practical solutions. Finally, the conclusion summarizes
findings and recommendations that address pregnant women’s concerns about the safety and efficacy, as well as how targeted information communication on an individual basis may be key to boosting confidence in the vaccine for pregnant women’s consent.

**Methods**

**Purpose**

The WHO posits that the reluctance to get vaccinated is one of the leading threats in the world (Januszek, et. al., 2021)(p. 198). With a global pandemic ongoing, it is crucial to understand the limiting factors of COVID-19 vaccine acceptance, i.e. willingness to receive the vaccine, both in an effort to understand the setbacks and to improve communication toward vulnerable populations like pregnant women.

My goal is to analyze and understand the reasons why COVID-19 vaccine hesitancy is prevalent among pregnant populations on both a U.S. and global scale. To do this, I systematically reviewed the results, conclusions, and discussions of relevant literature on COVID-19 vaccine acceptance in pregnant populations.

**Search Strategy and Terms**

UMN Libraries was the search tool utilized for this paper. Searching “Covid-19 Vaccine Acceptance Pregnant Population” generated 351 results, sorted by relevance. Of these results, I further sorted by “Date–Newest” to collect the most recent research, but this seemed to lose articles that specifically included pregnant populations. “Covid-19 Vaccine Hesitancy Pregnant Population” generated 370 results. “Covid-19 Vaccine Pregnant Women” generated 2,922 results, but predominantly featured
research and clinical trials of the COVID-19 vaccine on pregnant women, rather than their acceptance or hesitancy. Therefore, I focused on my first two queries and used the Advanced Search function to specify “pregnant population”, “Covid-19 vaccine” and “vaccine acceptance” as filter keywords. 12 articles remained that met my criteria that studied the vaccine acceptance rates in pregnant populations. 11 of the 12 selected articles performed research studies that could be used for the systematic review in this paper. Notably, studies analyzing postpartum lactating individuals were also included, alongside nonpregnant and pregnant women.

**Review Criteria**

My primary focus when collecting information was to identify the methods, results, discussion, and possible conclusions made on the topic at hand. I reviewed each of the focus sections, selected key information and posted them in a document to compare and contrast.

**Results**

The articles selected for this systematic review focused on identifying the reasons why pregnant populations have not been vaccinated, or are hesitant to be vaccinated, against the COVID-19 virus.

**Article Characteristics**

11 articles were considered in this review. All studies utilized surveys or questionnaires, with some specifying cross-sectional methods in their research approach such as in-person interviews or in-person surveys. Four studies were
conducted in the U.S. while others collected responses from the U.K, Turkey, Ireland, Japan, and some South American countries as well as South Africa. The studies were conducted between August 2020 and December 2021, which is an understandable bracket given the onset of the pandemic in early 2020. The survey sample sizes ranged from 17,871 (Skjefte, et. al., 2021) to 89 (Kansal, et. al., 2021) valid responses from participants. Table 1 displays the full characteristics of the literature reviewed in this paper.

<table>
<thead>
<tr>
<th>Study</th>
<th>Country</th>
<th>Date of Study</th>
<th>Study Type</th>
<th>Completed Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skjefte, et. al.</td>
<td>USA, India, Brazil, Russia, Spain, Argentina, Columbia, UK, Mexico, Peru, S. Africa, Italy, Chile, the Philippines</td>
<td>Oct. – Nov. 2020</td>
<td>Online Survey</td>
<td>17,871</td>
</tr>
<tr>
<td>Kiefer, et. al.</td>
<td>USA</td>
<td>Mar. – Apr 2021</td>
<td>Cross-sectional Study</td>
<td>456</td>
</tr>
<tr>
<td>Ayhan, et. al.</td>
<td>Turkey</td>
<td>Jan. – Feb. 2021</td>
<td>Questionnaire</td>
<td>300</td>
</tr>
<tr>
<td>Hosokawa, et. al.</td>
<td>Japan</td>
<td>July – Aug. 2021</td>
<td>Cross-sectional Study</td>
<td>1,621</td>
</tr>
<tr>
<td>Kansal, et. al.</td>
<td>USA</td>
<td>Nov. 2020 – March 2021</td>
<td>Survey</td>
<td>89</td>
</tr>
<tr>
<td>Skirrow, et. al.</td>
<td>UK</td>
<td>Aug. – Oct. 2020</td>
<td>Online Survey</td>
<td>1,404</td>
</tr>
</tbody>
</table>
Table 1: Characteristics of systematic literature studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Country</th>
<th>Date Range</th>
<th>Research Design</th>
<th>Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sutton, et. al.</td>
<td>USA</td>
<td>Jan. 2021</td>
<td>Online Survey</td>
<td>1,012</td>
</tr>
</tbody>
</table>

Vaccine Hesitancy in Pregnant Women

Table 2 details the COVID-19 vaccine acceptance from pregnant women, which varied from study to study. A low of 34.2% was found in a cross-sectional study based in Romania (Citu, et. al., 2022) and a high of 82% was found in an online survey based in the U.K. (Skirrow, et. al., 2022). The average vaccine acceptance rate across the 11 studies was 47.2%. Reasons for vaccine hesitancy focused around safety concerns for the fetus or mother, potential harmful side-effects, and feeling that there was insufficient data on the COVID-19 vaccine’s efficacy. Women in Goeghegan, et. al.’s study (2021) provided direct input, with one participant saying, “this choice does not just affect me. For example, (nonsmoker) I’ve cut alcohol, pate, cheesecake, coffee, soft serve ice cream and google pretty much everything I’ve put into my mouth for the last 6 months to protect my unborn child . . . given the above are minor low risk sacrifices I feel the C19 vaccine is too high of a risk, given the nature of the ‘unknowns’” (p. 3374). Mistrust in information sources and the government, and favoring information from social media, were also astounding factors that had pregnant women hesitate or refuse to accept the COVID-19 vaccine.
Other possible contributing factors to vaccine hesitancy were age, ethnicity, education status, employment status, and prior vaccination history during pregnancy with the Tdap, Influenza, or Pertussis vaccines. Kiefer, et. al. (2022) found that non-Hispanic Black pregnant women, compounded with sociodemographic factors like younger age, lower education, substance abuse, and public insurance plans were associated with higher chances of COVID-19 vaccine hesitancy. Kansal et. al. (2022) also found that pregnant women who were more agreeable to receive the COVID-19 vaccine were White, and on Medicaid or employer-provided insurance, while Black or African American pregnant women were less likely to accept the vaccine (p. 314). Additionally, they found that mistrust in health organizations, perceived racism from healthcare providers, and education status, and salary, as well as access to healthcare were not significant factors in vaccine hesitancy (p. 314). Notably, a previous mistrust of vaccine efficacy or the necessity of them in general contributed to the hesitancy pregnant women displayed about the COVID-19 vaccine. The existing mistrust around vaccination led researchers to believe that acceptance of the COVID-19 vaccine would be an uphill struggle, and that vaccine hesitancy has been a growing public health concern in the last ten years. (Ayhan, et. al., 2021, p. 294).

Globally, Skjefte, et. al. (2021) found that “[COVID-19 vaccine] acceptance in India, the Philippines, and Latin America was above 60% among pregnant women” whereas the U.S. and Russia had lower vaccination acceptance rates, including confidence in the COVID-19 vaccine, its safety and effectiveness, and general trust in the vaccination. In Czechia, Riad, et. al. (2021) found pregnant women to view the COVID-19 vaccine favorably, with 76.6% willing to receive the vaccine, though
interestingly it found lactating women’s acceptance level of the vaccine at 48.8% and lactating pregnant women at 70.2%. They also found that the trimester was positively associated with COVID-19 acceptance, claiming it to be understandable given that several vaccines, like Tdap and Influenza (H1N1) are often recommended in the third trimester. Further, Riad et. al. (2021) suggest that the risk perception of medications in the first trimester of pregnancy causes pregnant women to avoid certain medications, through concern of disrupting what is considered a crucial stage of organogenesis. Kiefer, et. al. (2022) posit a similar sentiment, suggesting that provider recommendations influenced pregnant women’s decision-making if they had already received the Tdap and Influenza vaccinations.

<table>
<thead>
<tr>
<th>Study</th>
<th>Demographic</th>
<th>Vaccine Acceptance</th>
<th>Reason for Hesitance</th>
<th>Other Influencing Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skjefte, et. al.</td>
<td>Pregnant and non-pregnant women</td>
<td>52% pregnant women</td>
<td>Harmful side-effects to fetus; rushed vaccine via politics; more data needed</td>
<td>Belief in vaccine safety, trust in public health agencies, belief in vaccination in childhood; some demographics</td>
</tr>
<tr>
<td>Kiefer, et. al.</td>
<td>Pregnant and postpartum women</td>
<td>54%</td>
<td>Safety concerns, insufficient data, fear of adverse effects</td>
<td>Ethnicity, age, health conditions, education, substance abuse</td>
</tr>
<tr>
<td>Citu, et. al.</td>
<td>Pregnant women</td>
<td>34.2%</td>
<td>Social media, disbelief in COVID-19</td>
<td>Income, education</td>
</tr>
<tr>
<td>Ayhan, et. al.</td>
<td>Pregnant women</td>
<td>37%</td>
<td>Lack of data; potential harm to fetus</td>
<td>Number of schoolchildren at home</td>
</tr>
<tr>
<td>Study</td>
<td>Population</td>
<td>Acceptance</td>
<td>Reasons</td>
<td>Influencing Factors</td>
</tr>
<tr>
<td>------------------</td>
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</tr>
<tr>
<td>Hosokawa, et. al.</td>
<td>Pregnant women</td>
<td>13.4%</td>
<td>Effects of vaccine on fetus and lactation; adverse reaction</td>
<td>Mistrust in govt; socially acceptable answers provided</td>
</tr>
<tr>
<td>Kansal, et. al.</td>
<td>Pregnant women</td>
<td>36.2%</td>
<td>Ethnicity, mistrust</td>
<td>None</td>
</tr>
<tr>
<td>Goeghegan, et. al.</td>
<td>Pregnant women</td>
<td>38%</td>
<td>Long-term effects, lack of data, fear and anxiety</td>
<td>Gestational age</td>
</tr>
<tr>
<td>Skirrow, et. al.</td>
<td>Pregnant and postpartum women</td>
<td>82%</td>
<td>Existing vaccination hesitance</td>
<td>Household income, ethnicity, age</td>
</tr>
<tr>
<td>Sutton, et. al.</td>
<td>Pregnant and non-pregnant women</td>
<td>44.3%</td>
<td>Harmful effects; belief in low-risk of getting COVID-19; infertility</td>
<td>Acceptance of Flu vaccine; language</td>
</tr>
<tr>
<td>Levy, et. al.</td>
<td>Pregnant women</td>
<td>58.3%</td>
<td>Risk to fetus/neonate; side effects</td>
<td>Mistrust in information; lower education in White women</td>
</tr>
<tr>
<td>Riad, et. al.</td>
<td>Pregnant and lactating women</td>
<td>70.2%</td>
<td>Trimester status; safety for child and mother; previous vaccine inclinations</td>
<td>Education, employment, social mediate, trust in govt</td>
</tr>
</tbody>
</table>

Table 2: Vaccine acceptance and hesitancy characteristics in pregnant or postpartum women.
Discussion

Hesitancy Factors

The results of this systematic review found both positive and negative reception from pregnant women toward the COVID-19 vaccine, with a sizable amount hesitant to receive it. Concern over the safety and efficacy of the vaccine with respect to the unborn child was the chief concern; women often cited fear of the vaccine’s potential in harming their child. Pregnant women shared they felt uncertain toward the COVID-19 vaccine due to the initial clinical trials not including pregnant women as a key demographic, and therefore from their point of view, had insufficient data on the safety of its administration to pregnant women. Hosokawa et. al. (2021) note that “previous studies have not reported elevated pregnancy complications after vaccination, and there have been reports of neutralizing antibodies being transferred to the fetus and breastmilk following vaccination during pregnancy” (p. 3). Based on the results of the systematic review, one can conclude that reassurance is not enough for pregnant women. Despite experts having “consistently advocated for the inclusion of pregnant women in trials of therapeutics and vaccines” (Geoghegan, et. al., 2021, p. 3371), COVID-19 vaccine trials did not include pregnant women. Pregnant women’s inclusion into future clinical trials, especially with any booster shots, is a vital step in gaining trust and confidence amongst pregnant women. It is worth noting that there is a historical precedent of pregnant women being excluded from vaccine trials. Pregnancy alone comes with increased risks and is why researchers are wary of including them in
vaccine trials (Reagan, 2021). Furthermore, pregnant women are often excluded in late-stage vaccine trials as a means to fast-track licensing the vaccine (Reagan, 2021).

The second factor in vaccine hesitancy depended on the trimester the mother was in. Riad, et. al. (2021) suggest “one of the explanations for this finding is that an array of vaccines, including Influenza (H1N1) and Tdap vaccines, are particularly recommended during the third-trimester in multiple countries with various economic capacities, therefore it can be assumed that vaccination during the third trimester is normalised and widely accepted” (p. 13373). While Sutton, et. al. (2021) did not find “any varying levels of concern” (p. 6) in this matter, other studies led me to conclude the trimester of the pregnancy somewhat influenced when the mother would willingly accept the COVID-19 vaccine. Again, this would benefit from rigorous data collection in vaccine trials. While studies haven’t found any persistent danger to the mother or the unborn child in receiving the COVID-19 vaccine through any stage of the pregnancy, having that information backed by trials would likely increase pregnant women’s willingness to accept the vaccine during the 1st or 2nd trimesters.

The third factor was mistrust in the information distributed by public health agencies and government bodies. This was in part due to trusting information on social media rather than public health and government officials. In one instance, this was linked with a belief that vaccines are not needed in childhood, while others were linked with their education status and whether the women were employed or not, as well as ethnicity. Levy, et. al. (2021) found that the education level of Black or African American women did not impact the decision to get vaccinated against COVID-19, but with White women lower education status was associated with lower vaccination against
COVID-19. (p. 1). They also noted, “an alternative approach may be necessary among Black or African American women because of their lived experiences with systemic racism and mistrust in the healthcare system” (p. 1). This leads me to conclude that future work must consider community-based outreach, and specifically with targeted communication in specific locations across the U.S. and other countries. Areas where lower education and/or lower income populations reside would benefit from a change in communication tactics, starting with building trust between public health officials—and in extension government bodies—and the pregnant population. In addition, there should be efforts to rebuild trust between healthcare workers and patients, especially African American women. An approach to communication that emphasizes listening and mutual respect as a way to rebuild trust with communities that have been disproportionately harmed may help improve the COVID-19 acceptance rate.

**Communication Solutions**

The second question of this systematic review was about how information can be better communicated so that more pregnant women will consider receiving the COVID-19 vaccine. Having determined the overwhelming reasons why this demographic is unwilling or hesitant to accept the vaccine, it is important to to denote how information needs to be communicated based on the circumstance. There is no one-size-fits-all approach in this matter, especially due to the global context of the problem. As previously mentioned, I believe a big step forward would be to first include pregnant women in future clinical trials. This would provide ample data and also boost confidence in the vaccine by pregnant women who cite insufficient research and adverse effects as a key reason they will not receive the vaccine.
Next, while public health efforts on a country-level basis are helpful, the current communication methods do not seem to reach all audiences. Realistically we cannot expect to convince everybody, therefore targeting key vulnerable populations at a local level would help refine strategies to reach that community. Understanding that community, and adjusting communication methods based on that information, would broaden the reach of COVID-19 vaccine safety information. Currently, the CDC (2022) has proposed 12 strategies to reach communities about the COVID-19 vaccine, suggestions ranging from vaccine ambassadors and messages relayed by trusted messengers, to combating misinformation through social media. I believe all these strategies should and must be utilized globally, especially in targeted social media efforts. Several studies cited pregnant women trusting information on social media above anything else, which poses a potential stumbling block in encouraging them to get vaccinated. Riad, et. al., (2021) posits “...media platforms may accelerate the infodemic during public health emergencies to a degree that hinders healthy decisions from being made. Social media platforms can also be utilized to mitigate the risk of misinformation by providing high-quality information from authentic and engaging resources to [pregnant women]” (p. 13373). Therefore, I suggest a rigorous social media campaign should be implemented in combination with the public health officials and local communities, as well as in partnership with social media platforms, in order to emphasize the safety and efficacy of the COVID-19 vaccine for pregnant women. Since pregnant women tended to mistrust information provided by public health officials and the government, focusing on internet spaces with voices of local communities and peers
as well as the platforms themselves, could shift public opinion in a positive direction toward the COVID-19 vaccine.

Lastly, I believe utilizing professional communication experts would greatly benefit public health agencies, government bodies, and medical professionals. I find there is a difference between communication and only relaying facts. Technical communicators implement strategies to reach specific audiences and convey complex information in clear, understandable terms. They make sure their audience “can actually do something with a product by designing, in whatever medium using whatever tool, the most effective and ethical piece of communication for that audience and purpose” (Pringle, K. & Williams, S., 2005. p. 368). This skill set can potentially be game-changing when reaching a vulnerable population like pregnant women, as communication experts can potentially narrow the gap between the COVID-19 vaccine and the pregnant women hesitant to receive it. To my previous point, using technical communicators specifically in social media platforms would be doubly beneficial to public health efforts.

**Conclusion**

It is crucial that vulnerable populations get vaccinated against COVID-19. Pregnant women are a particularly vulnerable group, as contracting COVID-19 while unvaccinated can have harmful effects on their pregnancy and fetus. To combat their vaccine hesitancy, targeted information communication strategies should be implemented on every level to rebuild trust in the medical profession, public health agencies, and the government, as well as including technical communicators in these
efforts. In addition, COVID-19 vaccine trials should consider including pregnant women in their demographic to collect safety and efficacy data.
References


Covid-19 Vaccine Hesitancy


DOI: [https://doi.org/10.3390/medicina57090977](https://doi.org/10.3390/medicina57090977)


DOI: [https://doi.org/10.3390/ijerph182413373](https://doi.org/10.3390/ijerph182413373)


