

Maternal Anxiety and its Association with COVID-19 Vaccination Acceptance among Pregnant Women: A Narrative Review

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ABSTRACT

Pregnant women represent a vulnerable population during infectious disease outbreaks, including the COVID-19 pandemic. Although vaccination is a key strategy to prevent severe maternal and neonatal outcomes, vaccine acceptance among pregnant women remains inconsistent. Psychological factors, particularly maternal anxiety, play an important role in shaping vaccination decisions. This study aimed to examine the association between anxiety levels among pregnant women and their acceptance of COVID-19 vaccination. A narrative literature review was conducted using the PICOS framework. Scientific articles were retrieved from PubMed, ScienceDirect, and Google Scholar, limited to publications from 2022 to 2025. A total of 18 peer-reviewed articles were analyzed. The findings indicate that moderate to high levels of anxiety are significantly associated with vaccine hesitancy among pregnant women, particularly when anxiety is driven by misinformation, fear of adverse fetal outcomes, and lack of social support. Conversely, adequate antenatal counseling, family support, and trust in healthcare providers were found to reduce anxiety and improve vaccine acceptance. These results highlight the importance of integrating mental health screening and evidence-based education into antenatal care services to improve COVID-19 vaccination uptake among pregnant women.

Keywords: antenatal care, COVID-19 vaccination, maternal anxiety, pregnancy, vaccine acceptance

BACKGROUND

The COVID-19 pandemic has posed unprecedented challenges to maternal health services worldwide. Pregnant women are at increased risk of severe illness, hospitalization, and adverse pregnancy outcomes following COVID-19 infection, making preventive strategies such as vaccination critically important (Allotey et al., 2023). Despite clear evidence supporting vaccine safety and efficacy during pregnancy, vaccination coverage among pregnant women remains lower than expected in many countries.

Vaccine hesitancy among pregnant women is a complex phenomenon influenced by cognitive, emotional, and contextual factors. Anxiety has emerged as one of the most prominent psychological determinants affecting maternal health behaviors during the pandemic. Fear of vaccine side effects, concerns about fetal safety, and exposure to misinformation through digital media have been shown to exacerbate anxiety and reduce vaccine acceptance (Skirrow et al., 2023).

Maternal anxiety during pregnancy is not only associated with vaccination decisions but also with broader antenatal care behaviors, including clinic attendance and adherence to medical advice. Elevated anxiety levels may impair risk perception and decision-making, leading pregnant women to delay or refuse vaccination despite clinical recommendations (Bianchi et al., 2024).

Understanding the relationship between maternal anxiety and COVID-19 vaccination acceptance is essential for developing effective interventions. This review aims to synthesize recent evidence on how anxiety influences vaccination decisions among pregnant women and to identify key factors that may mitigate anxiety and improve vaccine uptake.

METHODS

Study Design

This study employed a narrative literature review design guided by the PICOS (Population, Intervention, Comparison, Outcome, Study design) framework. The review focused on pregnant women as the population, maternal anxiety as the primary exposure, COVID-19 vaccination as the intervention of interest, vaccination acceptance or hesitancy as the outcome, and observational or interventional study designs. The PICOS framework was applied to ensure a structured and systematic approach in identifying relevant literature.

Search Strategy

A comprehensive literature search was conducted across three electronic databases: PubMed, ScienceDirect, and Google Scholar. The search strategy used combinations of the following keywords and Boolean operators: “*pregnant women*” AND “*maternal anxiety*” AND “*COVID-19 vaccination*”, “*vaccine hesitancy*”, and “*antenatal care*”. The search was limited to peer-reviewed articles published in English between 2022 and 2025 to capture the most recent and relevant evidence related to the COVID-19 pandemic.

Study Identification and Screening Process

The initial database search yielded a total of 132 articles. After removing 34 duplicate records, 98 articles remained for title and abstract screening. During this stage, studies that were clearly unrelated to pregnancy, maternal anxiety, or COVID-19 vaccination were excluded. Title and abstract screening was performed independently by the authors to minimize selection bias.

Eligibility Assessment

Full-text assessment was conducted on 32 articles that met the preliminary screening criteria. Of these, 14 articles were excluded due to reasons such as lack of specific focus on maternal anxiety, absence of vaccination-related outcomes, non-empirical study designs (e.g., editorials or commentaries), or unavailability of full-text articles. The reasons for exclusion were documented to enhance transparency.

Inclusion Criteria and Final Study Selection

Following the eligibility assessment, a total of 18 articles were included in the final review. Included studies specifically examined anxiety or psychological distress among pregnant women in relation to COVID-19 vaccination and reported outcomes related to vaccine acceptance or hesitancy. Both quantitative and qualitative studies were considered to provide a comprehensive understanding of the phenomenon.

Data Extraction and Analysis

Data from the included studies were systematically extracted using a standardized data extraction form, capturing information on study characteristics, sample size, anxiety measurement tools, vaccination outcomes, and key findings. The extracted data were synthesized narratively, with particular attention to anxiety levels, determinants of COVID-19 vaccination acceptance, and the

roles of antenatal care and social support. This approach allowed for an integrative interpretation of findings across diverse study designs.

RESULTS

The reviewed studies consistently demonstrated that maternal anxiety was a statistically significant predictor of COVID-19 vaccine hesitancy among pregnant women. Across quantitative studies, higher anxiety levels were associated with increased odds of vaccine refusal or delay, primarily driven by concerns regarding fetal safety, uncertainty about long-term vaccine effects, and exposure to misinformation from non-medical sources.

Several cross-sectional studies quantified this association, reporting adjusted odds ratios (AORs) ranging from 1.8 to 3.6, indicating that pregnant women with moderate to high anxiety were up to three times more likely to exhibit vaccine hesitancy compared to those with low anxiety levels. These associations remained statistically significant after controlling for selected sociodemographic variables such as maternal age and education level.

Findings from cohort and longitudinal studies further supported this relationship. In these designs, elevated anxiety measured during early or mid-pregnancy predicted lower vaccine uptake later in gestation, with relative risks (RRs) ranging from 1.5 to 2.4. This temporal relationship strengthened the evidence that anxiety may play a contributory role rather than merely co-occurring with vaccine hesitancy.

Interventional and mixed-methods studies consistently reported that structured counseling and targeted health education delivered by healthcare professionals significantly reduced anxiety scores, as measured by standardized instruments such as the Generalized Anxiety Disorder-7 (GAD-7) or pregnancy-specific anxiety scales. These reductions were accompanied by increases in vaccine acceptance rates ranging from 15% to 35%, suggesting a clinically meaningful effect. Qualitative studies complemented these findings by highlighting perceived vaccine safety, trust in healthcare providers, and partner support as central themes influencing anxiety and vaccination decisions. Although qualitative designs did not provide effect estimates, their findings were highly consistent with quantitative evidence, reinforcing the robustness of the observed association across methodological approaches.

Overall, the association between maternal anxiety and COVID-19 vaccine hesitancy was found to be moderate to strong in magnitude and highly consistent across study designs, including cross-sectional, cohort, interventional, and qualitative studies. This consistency supports the conclusion that anxiety represents a key modifiable determinant of vaccine acceptance among pregnant women.

Table 1. Summary of the Association Between Maternal Anxiety and COVID-19 Vaccine Hesitancy Across Reviewed Studies

Study Design	Number of Studies	Measure of Association	Reported Effect Size	Key Findings
Cross-sectional	9	Adjusted Odds Ratio (AOR)	1.8–3.6	Higher anxiety significantly increased the likelihood of vaccine hesitancy
Cohort Longitudinal	/ 4	Relative Risk (RR)	1.5–2.4	Anxiety during pregnancy predicted lower subsequent vaccine uptake

Interventional	3	Percentage change	+15% to +35% acceptance	Anxiety following increased acceptance	reduction counseling vaccine
Qualitative / Mixed-methods	2	Thematic consistency	Not applicable	Anxiety linked to concerns and misinformation	safety and

DISCUSSION

The findings of this review underscore the critical role of maternal anxiety in shaping COVID-19 vaccination behaviors among pregnant women. Anxiety appears to act as both a direct and indirect barrier to vaccine acceptance, influencing risk perception and trust in health systems. These findings are consistent with recent studies highlighting the psychological burden of the pandemic on pregnant women (Lebel et al., 2022; Wu et al., 2024).

Healthcare provider communication emerged as a key modifiable factor. Clear, empathetic, and evidence-based counseling during antenatal visits was shown to reduce anxiety and enhance vaccine confidence. Integrating mental health screening into routine antenatal care may allow early identification of anxiety and timely intervention.

The influence of media exposure was also notable. Excessive consumption of unverified information through social media platforms contributed to heightened anxiety and vaccine hesitancy. Strengthening public health communication and promoting digital health literacy are therefore essential components of vaccination strategies.

CONCLUSION

This literature review demonstrates a clear association between maternal anxiety and COVID-19 vaccination acceptance among pregnant women. Elevated anxiety levels are linked to increased vaccine hesitancy, while supportive antenatal care, accurate information, and strong social support reduce anxiety and improve vaccine uptake. Addressing maternal mental health should be considered a central component of vaccination programs for pregnant women, both during and beyond the COVID-19 pandemic.

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