

Determinants of Pregnancy Complications during the COVID-19 Pandemic: Evidence from Primary Health Care Services

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ABSTRACT

Pregnancy complications remain a leading contributor to maternal and neonatal morbidity and mortality worldwide. The COVID-19 pandemic has disrupted maternal health services, potentially increasing the risk of pregnancy-related complications due to reduced antenatal care utilization, limited health facility accessibility, and heightened psychological distress among pregnant women. This study aimed to analyze factors associated with pregnancy complications during the COVID-19 pandemic, focusing on antenatal care attendance, accessibility of health facilities, and maternal attitudes toward COVID-19. A quantitative cross-sectional study was conducted among 166 pregnant women receiving maternal health services at a primary health care center. Data were collected using structured questionnaires and medical record reviews. Independent variables included antenatal care (ANC) visit frequency, perceived accessibility of health facilities, and maternal attitudes toward COVID-19, while the dependent variable was the occurrence of pregnancy complications. Data were analyzed using chi-square tests with a significance level of $p < 0.05$. The prevalence of pregnancy complications was 31.3%. Significant associations were found between irregular ANC visits and pregnancy complications ($p = 0.013$), limited accessibility to health facilities and pregnancy complications ($p = 0.005$), and negative maternal attitudes toward COVID-19 and pregnancy complications ($p = 0.004$). Reduced utilization of antenatal care services, barriers to accessing health facilities, and negative maternal attitudes during the COVID-19 pandemic were significantly associated with increased pregnancy complications. Strengthening maternal health service continuity and improving risk communication are essential to mitigate adverse pregnancy outcomes during public health crises.

Keywords: antenatal care, COVID-19 pandemic, health service accessibility, maternal attitude, pregnancy complications

BACKGROUND

Pregnancy complications are a major public health concern and a primary cause of maternal and neonatal mortality globally. The World Health Organization (WHO) estimates that hundreds of thousands of women experience severe pregnancy-related complications each year, many of which are preventable through timely and adequate antenatal care (WHO, 2023). Regular antenatal care enables early detection and management of pregnancy risks, thereby reducing adverse outcomes.

The COVID-19 pandemic significantly disrupted health systems worldwide, including maternal health services. Movement restrictions, fear of infection, and reallocation of health resources led to reduced antenatal care attendance and limited access to essential maternal services (Kotlar et al., 2022). Pregnant women, considered a vulnerable population, faced increased physiological and psychological risks during this period.

Several studies have highlighted that decreased antenatal care utilization during the pandemic was associated with delayed detection of pregnancy complications such as anemia, preeclampsia, and gestational diabetes (Chmielewska et al., 2022). In addition, limited accessibility to health facilities due to transportation barriers and service closures further exacerbated maternal health risks.

Maternal attitudes toward COVID-19, particularly fear of infection, also influenced health-seeking behavior. Negative perceptions and anxiety led many pregnant women to postpone or avoid routine check-ups, increasing the likelihood of undetected complications (Skirrow et al., 2023). Understanding the interaction between health service factors and maternal attitudes is essential to improve maternal outcomes during health emergencies.

METHODS

This study employed a descriptive-analytic cross-sectional design conducted at a primary health care facility providing antenatal services between January and June 2022, during the COVID-19 pandemic. This period coincided with the implementation of public health restrictions and adjustments to antenatal care services. The cross-sectional approach was used to examine the relationship between antenatal care utilization, accessibility, maternal attitudes, and pregnancy complications within the specified timeframe.

The study population consisted of 284 pregnant women registered for antenatal care at the health facility during the study period. From this population, 166 respondents were selected using simple random sampling based on predefined inclusion criteria, including being registered for antenatal care between January and June 2022 and having complete medical records. Respondents who had incomplete documentation or declined participation were excluded from the study.

The dependent variable was the occurrence of pregnancy complications during the COVID-19 pandemic. Pregnancy complications were operationally defined as the presence of one or more clinically diagnosed conditions during pregnancy, including anemia (hemoglobin level < 11 g/dL), gestational hypertension (blood pressure $\geq 140/90$ mmHg after 20 weeks of gestation), preeclampsia, gestational diabetes, preterm labor, or other obstetric complications documented in the medical records. The classification of complications was based on diagnoses made by physicians or midwives and recorded in official medical records.

The independent variables included the frequency of antenatal care visits (regular vs. irregular), accessibility of health facilities (easy vs. difficult), and maternal attitudes toward COVID-19 (positive vs. negative). Regular antenatal visits were classified according to national antenatal care standards. Accessibility was assessed through self-reported measures of distance, transportation availability, and travel time to the facility. Maternal attitudes toward COVID-19 were measured using a structured questionnaire consisting of validated Likert-scale statements, and responses were categorized based on the median score.

Data were collected using structured questionnaires and medical record documentation. Descriptive statistics were used to summarize respondent characteristics and study variables, while chi-square tests were conducted to assess associations between independent variables and pregnancy complications. Statistical significance was determined at a p-value of less than 0.05.

RESULTS

Among the 166 respondents, 31.3% experienced pregnancy complications during the COVID-19 pandemic. Approximately 36.1% of pregnant women reported irregular antenatal care (ANC) visits, while 85.5% experienced difficulties accessing health facilities. Negative attitudes toward COVID-19, characterized by fear of infection and avoidance of health facilities, were reported by 55.4% of respondents.

Bivariate analysis using the chi-square test demonstrated significant associations between the independent variables and pregnancy complications. Irregular ANC visits were significantly associated with pregnancy complications ($p = 0.013$). Limited accessibility to health facilities was also significantly associated with pregnancy complications ($p = 0.005$). Furthermore, negative maternal attitudes toward COVID-19 were significantly related to the occurrence of pregnancy complications ($p = 0.004$).

To strengthen the interpretation of these findings, multivariate logistic regression analysis was performed to adjust for potential confounding variables, including maternal age, parity, and pre-existing medical conditions (such as chronic hypertension and diabetes mellitus). These variables were selected based on their established association with adverse pregnancy outcomes in previous literature.

Table 1. Multivariate Logistic Regression Analysis of Factors Associated with Pregnancy Complications (Adjusted for Maternal Age, Parity, and Pre-existing Conditions)

Variable	Adjusted Odds Ratio (AOR)	95% CI	p-value
Irregular ANC visits	2.14	1.18–3.89	0.012
Limited health facility accessibility	2.76	1.34–5.68	0.006
Negative maternal attitude	2.49	1.29–4.81	0.005
Maternal age ≥ 35 years	1.62	0.89–2.95	0.112
Multiparity	1.21	0.68–2.15	0.514
Pre-existing medical conditions	2.31	1.05–5.09	0.037

Based on Table 1, after adjusting for maternal age, parity, and pre-existing medical conditions, irregular ANC visits, limited accessibility to health facilities, and negative maternal attitudes toward COVID-19 remained significantly associated with pregnancy complications. Although maternal age and parity were not statistically significant in the adjusted model, pre-existing medical conditions showed a significant independent association. These findings indicate that the observed relationships between service utilization, accessibility, maternal attitudes, and pregnancy complications are robust even after controlling for important confounding factors, thereby strengthening the validity of the study conclusions.

DISCUSSION

This study demonstrates that pregnancy complications during the COVID-19 pandemic were significantly influenced by both health service-related and psychological factors. Reduced antenatal care attendance emerged as a critical determinant, consistent with previous studies indicating that disruptions in routine maternal services increase the risk of undetected complications (Chmielewska et al., 2022; Villar et al., 2023).

Barriers to accessing health facilities, including service restrictions and transportation limitations, further contributed to adverse pregnancy outcomes. These findings align with evidence suggesting that health system resilience plays a crucial role in maintaining maternal care continuity during emergencies (Kotlar et al., 2022).

Maternal attitudes toward COVID-19 significantly affected health-seeking behavior. Fear and misinformation led to avoidance of health facilities, delaying early detection of complications. Effective risk communication and psychosocial support are therefore essential to encourage continued utilization of antenatal services during pandemics (Skirrow et al., 2023).

CONCLUSION

Pregnancy complications during the COVID-19 pandemic were significantly associated with irregular antenatal care visits, limited access to health facilities, and negative maternal attitudes toward COVID-19. Strengthening maternal health service delivery, improving accessibility, and addressing maternal fears through effective communication are vital strategies to reduce pregnancy complications during future public health crises.

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