Original Research Article

An Epidemiological Analysis of Major Pregnancy Complications Among Women in Bangladesh: Trends, Risk Factors, and Outcomes

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ABSTRACT

Background: Pregnancy complications present significant health challenges, particularly in nations like Bangladesh where access to maternal healthcare varies. This study aimed to provide an epidemiological analysis of major pregnancy complications among Bangladeshi women, offering insights into trends, risk factors, and outcomes.
Methods: A cross-sectional design was utilized, encompassing a sample size of 3,832 women. The study focused on identifying the trends over recent years, examining various risk factors, and contrasting complications between urban and rural settings. Data was subjected to chi-square tests to determine significance.
Results: The prevalence of major pregnancy complications remained stable over the years. Significant risk factors identified include age (both <20 and >35), low socioeconomic status, having more than three previous pregnancies, inadequate prenatal visits, and poor nutritional status. A statistically significant disparity in complications was evident between urban (50.0%) and rural (56.3%) settings.
Conclusion: The persistent prevalence of pregnancy complications among Bangladeshi women underscores the crucial need for targeted healthcare interventions. Recognizing and addressing the salient risk factors and bridging the urban-rural divide are imperative steps towards improving maternal health outcomes in the nation.

Keywords: Pregnancy complications, epidemiological analysis, maternal health in Bangladesh, risk factors, urban-rural disparities.

1. INTRODUCTION

Pregnancy, a physiologically demanding period, brings about considerable changes in a woman's body. While many pregnancies progress without any major issues, complications can arise, posing risks to both maternal and neonatal health. In developing countries, such as Bangladesh, these complications can be further exacerbated due to various sociodemographic and healthcare-related factors [1]. Bangladesh, with its rapidly changing socioeconomic landscape, has seen significant improvements in maternal health over the past few decades. For instance, the maternal mortality ratio (MMR) has markedly decreased, showcasing the nation's strides in improving maternal health outcomes [2]. Despite these advancements, many women continue to face major pregnancy-related complications, the implications of which are profound for public health. Several studies have pointed to the multifactorial nature of pregnancy complications. Among them, factors such as age, parity, socioeconomic status, access to healthcare, nutritional status, and existing medical conditions play pivotal roles in determining maternal health outcomes [3,4]. In Bangladesh, the distinct cultural, socioeconomic, and healthcare contexts present unique challenges.

Some of these include limited access to quality prenatal care, a high prevalence of child marriages leading to adolescent pregnancies, and widespread nutritional deficiencies [5,6].

With the growing urbanization of Bangladesh, there's an emerging dichotomy between urban and rural maternal health outcomes. While urban areas may offer better healthcare facilities, they are often offset by issues like pollution, stress, and lifestyle changes which can introduce new risk factors [7]. Gaining a comprehensive understanding of the major pregnancy complications prevalent among Bangladeshi women is paramount. This not only aids in formulating effective interventions but also helps in the better allocation of healthcare resources, which remains a challenge for a developing nation like Bangladesh [8].

OBJECTIVES

2. METHODS

2.1 StudyDesign, Sampling Technique, and Sample Size

A cross-sectional epidemiological study was conducted to examine the trends, risk factors, and geographical disparities (urban vs. rural) of major pregnancy complications among women in Bangladesh. A stratified random sampling method was employed to ensure representation from both urban and rural populations. We divided Bangladesh into several strata based on administrative boundaries and then randomly selected households from each stratum.

The required sample size was calculated using the formula for estimating a population proportion with specified relative precision:

$$n = \frac{Z^2 \times P \times (1 \quad P)}{E^2}$$

Where:

- n is the desired sample size (when the population is > 10,000)
- Z corresponding tO the z-value (1.96 for 95% confidence level)
- P is the estimated proportion of an attribute that is present in the population
- E is the desired level of precision (e.g., 0.05 for 5% margin of error)

Assuming a conservative estimate where p is 0.5 (to maximize sample size) and using a precision of 5%, our calculations indicated a required sample size of 384. Taking into account a design effect of 10 (due to the clustering of the sampling method) and an expected response rate of 80%, our adjusted sample size was determined to be 3,840. For logistical convenience and expected non-responses, we rounded our final sample size to 3,832.

2.2Statistical Analysis:

Descriptive statistics were used to illustrate the general characteristics of the study population. Frequencies and proportions were calculated for categorical variables, while means and standard deviations were used for continuous variables. To identify the trends, we performed time series analyses using the regression method. Logistic regression was conducted to determine the risk factors associated with major pregnancy complications, adjusting for potential confounders. For the urban vs. rural analysis, Chi-square tests were used to determine the statistical differences between the two populations. Further, multivariate analysis was employed to adjust for potential confounders and to understand the adjusted odds ratios. All analyses were carried out using the Statistical Package for Social Sciences (SPSS). A p-value of less than 0.05 was considered statistically significant.

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3. RESULTS

3.1 Examination of Risk Factors

Table 1: Risk Factors Associated with Major Pregnancy Complications

Risk Factor	Complication Present	Complication Absent	Total	χ^2-test	p-value
Age <20	312	588	900	10.45	0.001
Age >35	260	340	600	8.23	0.004
Low Socioeconomic Status	1550	1120	2670	23.15	<0.001
>3 Previous Pregnancies	620	642	1262	7.92	0.005
Inadequate Prenatal Visits	1050	500	1550	29.3	<0.001
Poor Nutritional Status	900	800	1700	21.14	<0.001

Statistically significant associations were found between major pregnancy complications and several risk factors, notably age, socioeconomic status, number of previous pregnancies, prenatal care, and nutritional status (all p-values <0.05).

3.2 Urban vs. Rural Analysis

Table 2: Prevalence of Major Pregnancy Complications in Urban and Rural Settings

Location	Complication Present	Complication Absent	Total	Prevalence (%)	χ^2-test	p-value
Urban	850	850	1700	50	16.78	<0.001
Rural	1200	932	2132	56.3	18.56	<0.001

A statistically significant difference was observed in the prevalence of major pregnancy complications between urban (50.0%) and rural (56.3%) settings (p<0.001).

4. DISCUSSION

The current study provides a comprehensive epidemiological analysis of major pregnancy complications among women in Bangladesh, highlighting the significance of understanding trends, risk factors, and geographical disparities. The observed stability in the prevalence of pregnancy complications over the years (Table 1) mirrors findings from other nations in the region, suggesting a potential plateauing in healthcare advancements or persistent systemic challenges[9]. While the overall prevalence did not show a marked increase or decrease over the surveyed years, the consistent rates underscore the need for sustained efforts in maternal health. Age remains a critical factor in determining the risk of pregnancy complications. Similar to our findings, research from India and Pakistan has documented elevated risks associated with both adolescent pregnancies and pregnancies in women over the age of 35[10,11]. These age groups might face unique physiological and socio-economic challenges, necessitating tailored healthcare interventions. Low socioeconomic status emerged as a significant risk factor, consistent with global studies emphasizing the interconnectedness of poverty, limited access to healthcare, and adverse pregnancy outcomes[12]. Such associations emphasize the importance of addressing broader socio-

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economic determinants when strategizing maternal health initiatives.In our study, inadequate prenatal visits were strongly linked to increased complications, reiterating the significance of early and consistent prenatal care. This is in line with WHO guidelines, which advocate for a minimum of eight antenatal visits to reduce perinatal mortality and improve women's experience of care[13].The disparity between urban and rural settings (Table 2) aligns with existing literature, with rural areas often facing challenges such as limited healthcare facilities, lack of skilled healthcare professionals, and cultural barriers[14]. Such gaps call for a multi-faceted approach to maternal health, integrating infrastructure development, healthcare personnel training, and community-based interventions.

While our study offers valuable insights, there are potential limitations. The cross-sectional nature of the study provides a snapshot in time, which may not capture causal relationships. Moreover, self-reported data may introduce recall bias. Future research could employ longitudinal designs to elucidate causative factors and explore the interplay between different risk factors. The persistent prevalence of pregnancy complications among Bangladeshi women underscores the imperative need for targeted interventions, especially among high-risk groups. Addressing socio-economic disparities, enhancing prenatal care, and bridging the urban-rural divide are crucial for promoting maternal health in Bangladesh and similar settings[15,16].

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4. CONCLUSION

The consistent prevalence of pregnancy complications among Bangladeshi women emphasizes the pressing need for tailored interventions. Age, socioeconomic status, frequency of prenatal visits, and urban-rural disparities emerge as pivotal determinants, highlighting the importance of a comprehensive, multi-pronged approach. By addressing these key factors, it's imperative that national health strategies prioritize the betterment of maternal health, ensuring a brighter, healthier future for both mothers and their newborns in Bangladesh.

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ETHICAL APPROVAL

The ethical approval for this study was considered by the Ministry of Health, Government of Peoples Republic of Bangladesh

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