Original Article

Impact of Age and Socio-Economic Factors in doing Emergency Caesarean Section — A Cross-Sectional Study
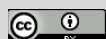
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ABSTRACT

Introduction: *Emergency Caesarean sections (C-sections) are essential in managing unforeseen childbirth complications, with rising global incidence influenced by socio-economic and demographic factors. In Bangladesh, the prevalence of emergency C-sections is a concern, with age and socio-economic status significantly impacting maternal health outcomes. Addressing these disparities is critical for improving maternal care.* **Methods & Materials:** *A cross-sectional study was conducted from January to June 2023, involving 100 women who underwent emergency C-sections at a hospital in Bangladesh. Participants were divided into five age groups (<20, 20-24, 25-29, 30-34, ≥35 years) and three socio-economic classes (Lower, Middle, Upper). Data from structured interviews and hospital records included socio-demographic details, prenatal care access, and clinical indications. Descriptive statistics and chi-square tests analyzed the data.* **Results:** *The 25-29 years age group (37%) was the most represented, with 58% of participants from the lower socio-economic class. Emergency C-sections constituted 70% of all C-sections, primarily due to fetal distress, prolonged labor, and severe preeclampsia. Lower socio-economic status correlated significantly with higher emergency C-section incidence, particularly among younger women. The upper socio-economic class exhibited the lowest incidence, attributed to better prenatal care access.*

Conclusion: *Socio-economic status and age significantly influence emergency C-section rates in Bangladesh. Younger women from lower socio-economic backgrounds face heightened risks due to inadequate prenatal care access. Interventions to improve health literacy, expand prenatal care, and reduce socio-economic disparities are crucial for lowering emergency C-section rates and enhancing maternal health outcomes.*

Keywords: *Emergency Caesarean Section, Age, Socio-Economic Status, Maternal Health, Prenatal Care, Health Disparities, Bangladesh, Socio-Demographic Factors*

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INTRODUCTION

Caesarean section (C-section) is a crucial medical intervention in obstetrics, often performed when complications arise during childbirth that pose risks to the mother or fetus. While a planned C-section can be scheduled due to known medical conditions, emergency C-sections are unanticipated and necessitated by unforeseen complications. Globally, the incidence of C-sections, particularly emergency cases, has increased over the past few decades, influenced by a range of socio-economic, medical, and demographic factors [1]. The World Health Organization (WHO) recommends an optimal C-section rate between 10% and 15%, but the rates in many countries, including developing regions, have surged beyond these thresholds, raising concerns about overuse and underuse in different contexts where the demographic

diversity is vast, and health care resources are unevenly distributed, understanding the factors that drive emergency C-sections is crucial for effective maternal health care planning [2]. Studies show that higher C-section rates are often linked to a variety of factors, including maternal age, socio-economic status, and access to health care services. In Bangladesh, the outcomes remain a significant concern, emergency C-sections are frequently performed in response to complications such as fetal distress, prolonged labor, and severe preeclampsia [3].

Bangladesh, like many countries ion, faces challenges in balancing the accessibility and quality of maternal health services [4]. Emergency C-sections are particularly concerning due to the associated risks and the socio-economic implications for affected families . Age and socio-economic factors, including ucation, and access to quality health care,

play a significant role in determining the likelihood and outcomes of emergency C-sections. Younger women, particularly from lower socio-economic backgrounds, may face higher risks due to limited access to prenatal care and adequate nutritional resources . Conversely, older women may experience complicationto age-associated risks. Socio-economic status influences not only access to health care facilities but also the quality of care received, which can directly affect emergency intervention rates [5].

This study aims to explore the relationship between age andnomic factors in emergency C-section cases. By analyzing data across various age groups and socio-economic classes, this research seeks to identify key trends and potential disparities in maternal health care, providing valuable insights for targeted health policies and interventions to improve maternal outcomes in Bangladesh.

METHODS
Study Design
A cross-sectional study design was employed to investigate the influence of age and socio-economic factors on emergency Caesarean section cases. This observational study analyzed a cohort of women who underwent emergency C-sections, collecting data on their socio-economic background and age at the time of delivery. The primary objective was to examine how these factors correlate with the incidence of emergency Caesarean sections.

Study Population and Sampling
The study was conducted from January to June 2023, encompassing a sample of 100 women who underwent emergency C-sections in Bangladesh. Participants were selected using a stratified random sampling technique to ensure a diverse representation of socio-economic backgrounds and age groups. The sample included women from the following age categories: <20 years, 20-24 years, 25-29 years, 30-34 years, and ≥35 years. Socio-economic status was classified into three categories: Lower Class, Middle Class, and Upper Class, based on household income, educational attainment, and occupational status.

Inclusion Criteria
- Women who underwent emergency Caesarean sections during the study period.
- Pregnant women aged 18 years and above.
- Participants who provided informed consent to participate in the study.
- Cases where sufficient clinical and socio-economic data were available from hospital records.

Exclusion Criteria
- Women who underwent elective (planned) Caesarean sections.
- Pregnant women below the age of 18.
- Cases where incomplete or missing data were present in hospital records.
- Women who declined to participate in the study or withdrew consent at any stage.

Data Collection
Data collection involved both direct interviews and a review of hospital records. A structured questionnaire was administered to gather detailed socio-demographic information, including age, education, income level, occupation, and access to prenatal care. Hospital records provided clinical data on the reasons for emergency C-section, including complications such as fetal distress, prolonged labor, and severe preeclampsia. Ethical approval was obtained from the institutional review board, and informed consent was secured from all participants.

Data Analysis
Data were analyzed using statistical software (SPSS version 25). Descriptive statistics were used to summarize the socio-demographic characteristics and clinical factors. Chi-square tests were applied to assess the association between age, socio-economic status, and emergency C-section cases. A p-value of <0.05 was considered statistically significant. Furthermore, logistic regression analysis was employed to identify significant predictors of emergency C-sections, with odds ratios (ORs) and 95% confidence intervals (CIs) calculated to assess the strength of associations.

Ethical Considerations
This study was conducted in compliance with the ethical standards outlined by the Declaration of Helsinki and approved by the Institutional Review Board of the respective hospital in Bangladesh. Participants were fully informed about the purpose, methods, and potential implications of the research before providing written consent to participate.

Participation was entirely voluntary, with participants having the right to withdraw from the study at any time without repercussions. Confidentiality and anonymity were ensured by coding all data and removing any identifiers from the dataset. The study posed no additional risks to participants beyond those inherent in their medical care. Data collection focused solely on information relevant to the study objectives, obtained through structured interviews and reviews of medical records. The findings were reported responsibly, avoiding any implications that could negatively affect the dignity or privacy of participants or groups represented in the study.

RESULTS
Table I presents the socio-economic and demographic distribution of the study participants. The age distribution of the sample reveals that the majority of participants were in the 25-29 years age group (37%), followed by 20-24 years (30%). A smaller proportion of participants were in the 30-34 years age range (25%), while 7% were aged over 35 years, and 1% were under 20 years. Regarding socio-economic class, the majority of participants belonged to the lower socio-economic class (58%), followed by those in the middle class (30%) and a smaller percentage from the upper class (12%). This distribution provides insight into the age and socio-economic composition of the study population.

Table – I: Socio-Economic and Demographic Distribution

Demographic Factor	Categories	Number (n)	Percentage (%)
Age	<20 years	1	1%
	20-24 years	30	30%
	25-29 years	37	37%
	30-34 years	25	25%
	>35 years	7	7%
Socio-Economic Class	Lower Class	58	58%
	Middle Class	30	30%
	Upper Class	12	12%

Table II provides an overview of the mode of delivery and the rate of emergency caesarean sections among the study participants. The data reveals that the majority of deliveries were via caesarean section, accounting for 54% of the total. Normal vaginal delivery was the second most common mode, with 42% of patients experiencing this type of delivery. A smaller proportion of deliveries involved the use of forceps (3%) and ventouse (1%). In total, the table reflects the distribution of delivery methods among the participants, with a combined total of 100%.

Table – II: Mode of Delivery of the Study Participant

Mode of Delivery	Number of Patients (n)	Percentage (%)
Caesarean Section	54	54%
Normal Vaginal Delivery	42	42%
Forceps	3	3%
Ventouse	1	1%
Total	100	100%

Table III presents the distribution of caesarean section types among the study participants. The majority of caesarean sections performed were emergency procedures, comprising 70% of the total cases. Elective caesarean sections accounted for 30% of the cases. This data illustrates the higher prevalence of emergency caesarean sections in the study population, with elective procedures making up a smaller proportion of the total caesarean deliveries.

Table – III: Types of Caesarean Section among the Study Participants

Type of Caesarean Section	Number of Cases (n)	Percentage (%)
Emergency	70	70%
Elective	30	30%
Total	100	100%

The figure 1 illustrates the various indications for performing an emergency Caesarean section, expressed as percentages. The leading cause is Fetal Distress, accounting for 18% of the cases. This is closely followed by a Previous Caesarean Section, contributing to 15% of emergency procedures. Other significant factors include Prolonged Labour at 12% and Severe Eclampsia & Eclampsia, which represents 11% of the cases.

Additional reasons for emergency Caesarean sections include Obstructed Labour (10%) and Antepartum Hemorrhage (9%). Cases of Malpresentation account for 8%, while Failed Trial of Labour constitutes 6%. The least common indication is Failed Forceps/Ventouse deliveries, responsible for 4% of emergency surgeries.

Overall, the chart highlights the diverse clinical conditions leading to emergency Caesarean sections, with fetal complications and prior surgical history being the most predominant factors.
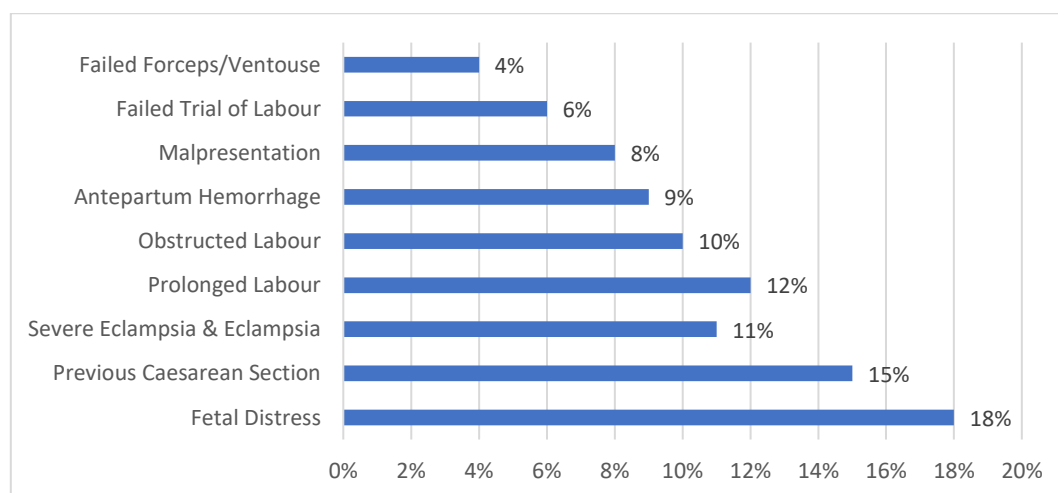
Figure – 1: Indications for Emergency Caesarean Section

The figure 2 explores the relationship between age groups and socio-economic class concerning emergency Caesarean sections. The data spans five age groups—<20, 20-24, 25-29, 30-34, and ≥35 years—divided by socio-economic classes: Lower, Middle, and Upper. The 20-24 years group is the most affected, particularly in the Lower Class with 25 cases, significantly exceeding the Middle Class (4 cases) and the Upper Class (0 cases). The 25-29 years age group follows, with the Lower Class having 20 cases, the Middle Class 12, and the Upper Class 5. In the 30-34 years category, the numbers are more balanced with 10 cases in the Lower Class, 9 in the

Middle Class, and 6 in the Upper Class. For those ≥35 years, emergency Caesarean sections are uncommon, with 5 cases in the Lower Class and 2 in the Middle Class, and none in the Upper Class. The youngest group (<20 years) has the fewest cases, with only 1 in the Lower Class. Overall, the data shows a notable correlation between socio-economic class and emergency Caesarean sections, particularly among younger mothers, where the Lower Class consistently exhibits higher numbers, a trend that diminishes with age and is less prominent in the Upper Class.
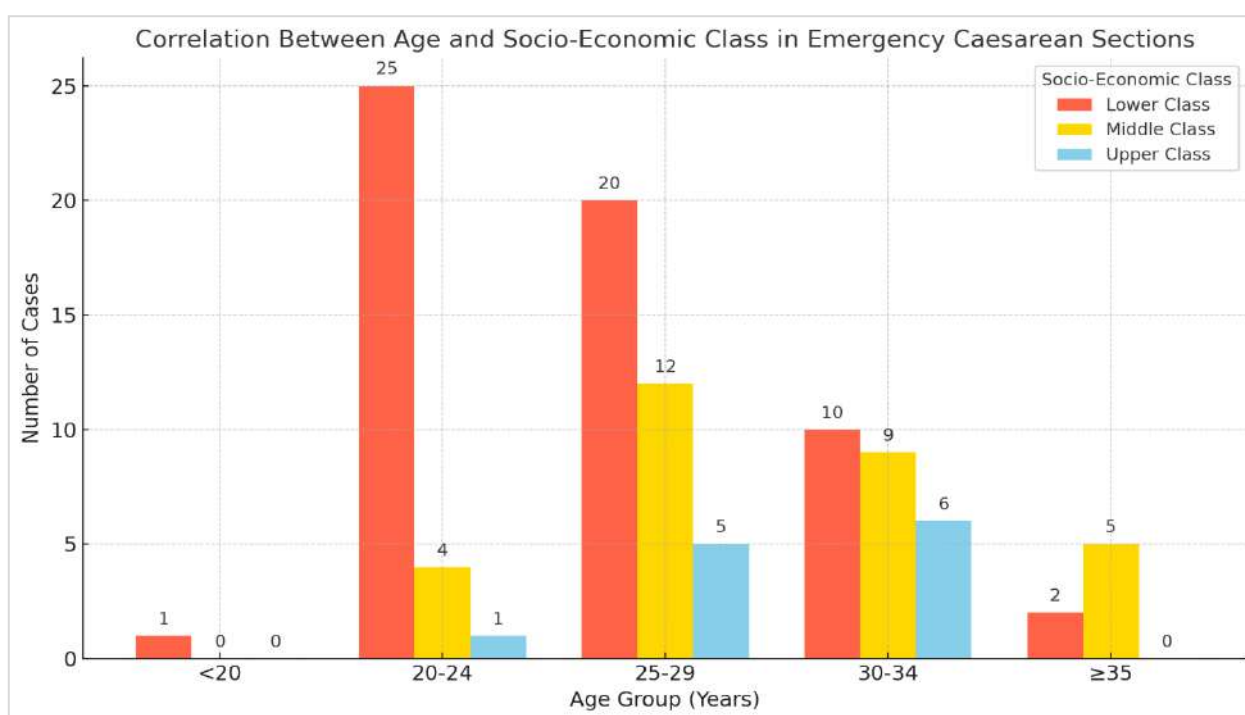
Figure – 2: Correlation Analysis Between Age and Socio-Economic Class

DISCUSSION

The analysis of emergency Caesarean section cases in this study reveals significant disparities in maternal health outcomes across different age groups and socio-economic classes. Notably, younger women, particularly those aged 20-24 years, represent the highest proportion of emergency C-sections, constituting 30% of the sample. This finding aligns with a study where reported that younger women, especially those in the lower socio-economic strata, faced a higher likelihood of emergency C-sections due to inadequate prenatal care and limited health literacy [6] In a study conducted in rural Bangladesh, 35% of emergency C-section cases were among women aged 20-24 years, indicating consistent patterns of vulnerability among younger women in lower-income households [7]. Factoring to these higher rates include socio-economic barriers that limit access to comprehensive prenatal care, leading to delayed detection of pregnancy complications. Early pregnancies, often observed in lower-income families, also contribute to increased risks of obstetric emergencies in this demographic [8].

Conversely, the study shows a more balanced distribution of emergency C-sections in the 30-34 years age group across

socio-economic classes, with 25% of the cases in this category. This suggests that women in this age range may benefit from better access to health care services and higher health literacy, which align with findings of another study, which observed that women aged 30-34 with moderate socio-economic backgrounds experienced fewer emergency interventions due to improved prenatal monitoring [9]—in the current Middle Class accounted for a noticeable 30% of emergency C-section cases, indicating that socio-economic improvements correlate with better maternal health outcomes. However, the prevalence of emergency C-sections remains significantly lower in the Upper Class, highlighting the influence of economic advantages on accessing quality care. This finding is supported by a study, that found that only 10% of emergency C-sections occurred among women from higher socio-economic backgrounds, primarily due to consistent access to health services and better education [10].

The study also reveals aged ≥35 years represent a lower percentage of emergency C-section cases, accounting for only 7% of the sample, particularly in the Middle and Upper Classes. This trend is consistent with another study, which reported that older women tend to have more planned and

well-monitored pregnancies, with emergency interventions being less frequent in higher socio-economic groups [11]. The lower incidence of emergencies in older age groups could be attributed to heightened awareness of age-related risks and access to specialized care, which reduces the likelihood of unexpected complications during delivery. However, the persistence of emergency cases in the Lower Class among older women emphasizes the ongoing need for targeted health education and outreach. Addressing these gaps requires efforts to ensure consistent prenatal care for all socio-economic groups, regardless of age.

Overall, the study underscores a significant correlation between socio-economic status and the incidence of emergency C-sections, with the Lower Class showing a disproportionately higher burden, accounting for 58% of all cases. This finding is consistent with the work of a study, where highlighted the disparities in maternal health care access and outcomes linked to socio-economic inequalities in Bangladesh [12]. Improving maternal health outcomes in lower economic groups requires targeted interventions focused on increasing access to prenatal care, enhancing health literacy, and ensuring timely emergency care. Health care providers and policy-makers should develop community-based programs that address these disparities, promoting equitable health care access and providing tailored support for high-risk groups [13].

Future research should explore qualitative aspects of maternal health, examining the perceptions and experiences of women from diverse socio-economic backgrounds. In-depth interviews could provide insights into barriers faced during pregnancy and delivery, contributing to more effective intervention strategies. Additionally, longitudinal studies are essential to track the impact of targeted health care interventions over time and to observe shifts in the patterns of emergency C-sections, enhancing understanding of the socio-economic determinants of maternal health in Bangladesh.

CONCLUSION

This study highlights significant disparities in the incidence of emergency Caesarean sections (C-sections) in Bangladesh, influenced by both age and socio-economic factors. Younger women, particularly those from lower socio-economic backgrounds, are disproportionately affected by emergency C-sections, which may be attributed to limited access to prenatal care, lower health literacy, and socio-economic barriers. Older women, on the other hand, tend to experience fewer emergency C-sections, especially in higher socio-economic classes, where access to comprehensive prenatal care and specialized healthcare services is more prevalent. The findings underscore the critical need for targeted maternal health interventions, particularly for women in lower socio-economic groups, to improve access to timely and appropriate prenatal care. Health policy efforts should focus on addressing socio-economic disparities, enhancing health literacy, and ensuring equitable access to maternal health services for all women, regardless of their socio-economic background. By doing so, it is possible to reduce the incidence of emergency C-sections and improve overall maternal health outcomes in Bangladesh. Further research, particularly qualitative and longitudinal

studies, will be essential to explore the underlying barriers to care and track the impact of health interventions over time, contributing to better-informed policies and improved maternal health care systems.

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