

Influencing factors of caesarean section among married women in Bangladesh

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Abstract

Background: The worldwide increase in cesarean sections (CS) has a significant impact on maternal and newborn health, particularly in a developing nation like Bangladesh. In Bangladesh, the CS rate, which comprises institutional and community-based births, increased from approximately 3% in 2000 to 33% in 2018.

Objective: To assess the influencing factors of cesarean section in Bangladesh among married women.

Methods: This research was conducted to identify potential socioeconomic, demographic, Institutional, and social network factors influencing the provision of CS in Bangladesh. Data from the Bangladesh Demographic and Health Survey (BDHS) 2017-18 were utilized for this study.

Result: This study used data from 4,929 mothers who gave birth in healthcare institutions three years before the survey. The prevalence of CS delivery among Bangladeshi mothers was 33.37% (43.65% in urban areas and 28% in rural areas). Logistic regression showed that mothers aged 30-49 years (AOR = 1.19, 95% CI = 0.94 to 1.50), wealth index average (AOR = 1.79, 95% CI = 1.37 to 2.55), and richest (AOR = 3.13, 95% CI = 2.32 to 4.21), antenatal visit >3 (AOR = 2.03, 95% CI = 1.76 to 2.33) were significantly more prone to CS delivery. Also, the education and occupation of mothers and husbands, as well as mobile phone use, were potentially associated with CS delivery.

Conclusion: Bangladesh has a far higher rate of C-sections than the WHO recommends. As a result, Bangladesh's high CS delivery rates may not be associated with better birth outcomes. It is essential to decrease such a phenomenon, making the mothers aware of the risks of cesarean delivery and establishing counseling sessions.

Keywords: Cesarean Sections, Married women, Bangladesh.

Introduction:

A surgical procedure performed during childbirth is called Cesarean Section (CS). This process occurs through the abdominal and uterine incisions during a CS. It is a potentially dangerous procedure that can result in hemorrhage, Infection after CS, pre-eclampsia, repeated CS, other organ injuries, and other maternal-fetal factors.^{1,2} CS should only be performed when medically required. Otherwise, life-threatening complications can occur for the mother and newborn.^{3,4} Furthermore, CS-delivery infants have a higher risk of respiratory problems such as transient

tachypnea, low APGAR score, surgical injury, allergic rhinitis, childhood asthma, and type 1 diabetes onset in childhood than VB-delivery infants (Vaginal Birth).⁵ Over the last three decades, CS rates have increased, and the World Health Organization (WHO) says that up to 15% rates are acceptable. However, it climbed above the expected rate of all births in 2015 in numerous middle- and high-income countries.⁶ In Bangladesh, between 2014 and 2017-18 BDHS, the proportion increased from 23% to 33%. According to Save the Children, among the CS rates in Bangladesh, the number of medically unnecessary CS has climbed by 51% in recent decades. This rate is nearly four times higher than the World Health Organization (WHO) recommends.⁷ An earlier study of data from 26 South Asian and sub-Saharan nations found that rates were highest among the "urban rich" in every nation and lowest among the "rural poor" across every region.⁸

CS is now carried out for financial, commercial, or self-desirable motives. A few adequately specified maternal reasons, such as severe antepartum hemorrhage, significant cephalo-pelvic disproportion, failed progress of labor, repeated CS, etc., justify the use of CS.⁹ Despite being a reasonably safe delivery procedure, CS has complications.¹⁰ The government of Bangladesh has established and put into practice various maternal health-related measures throughout the last few decades.¹¹

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We are all familiar with the medical rationale for cesarean sections. So many studies have demonstrated how factors associated with pregnant mothers and the healthcare system raise the demand for CS services.¹² Numerous studies have shown that women desire CS in addition to the on-demand CS because they fear labor pain, interference with future sexual performance, and discomfort during labor.¹³ Many doctors believe this is a significant role in the rise of non-medical cesarean sections.¹⁴ Many studies have found that socio-demographic, socioeconomic, cultural, family, and facility characteristics are linked to a high rate of CS.¹⁵ This study aimed to identify the recent determinants of CS in Bangladesh. This will help us to take the necessary action by emphasizing responsible factors for reducing unnecessary CS.

Materials & Methods:

A descriptive cross-sectional study was conducted among married women in Bangladesh. This study used data from the BDHS for 2017–2018 to assess the variables affecting cesarean section. A two-stage stratified cluster sampling methodology based on enumeration areas (EAs) and households were used for the BDHS 2017–18. This study's sample size was 4,929, and 1645 were delivered through CS. The factors connected with CS delivery are divided into six major categories: Socio-demographic factors, socioeconomic factors, Institutional factors, Social-network factors, medical causes for CS-related factors, and non-medical causes for CS-related factors. The statistical analysis used the software program Stata (version 14). A descriptive analysis was used to view the characteristics of the participants. A Bivariate (Chi-square test) and multivariate analyses (Logistic regression) were done to understand the association of outcome variables and determinants of CS.

Results:

In this study among 4,929 mothers who delivered in health facilities, 1,645 (33.37%) delivered through CS.

Table 1 shows that most of the mothers were 20-24 (34.52%) and 25-29 (33.33%) years old. Two-fifths (43.65%; p<0.0001) of the urban mothers underwent CS. CS delivery was higher among the higher-educated mothers (61.59%), statistically significant, and CS was statistically prevalent among unemployed mothers (38.38%). Women who own a mobile phone went through CS more, which is statistically significant (40.85%; p<0.0001). Mothers from the richest wealth quintile also experienced CS more (63.37%; p<0.0001). CS was more prevalent among higher-educated husbands (61.74%). In contrast, CS was conducted more for mothers whose husbands were professionals (64.11%; p<0.0001), and the CS risk is equally higher when the mother or both of them choose. Those with more than four visits had a chance of a higher rate of CS (50.81%; p<0.0001). Most mothers with CS went to the private sector (65.22%), which is statistically significant.

Table 1: Socio-demographic Characteristics of participants (N=4929)

Variable	Delivered by CS n ₁ (%)	Normal delivery n ₂ (%)	P-value (Difference in proportions)
Total	1645(33.37)	3,284(66.63)	
Mother's age in year			
15-19	247(29.16)	600(70.84)	0.030
20-24	603(34.52)	1144(65.48)	
25-29	429(33.33)	858 (66.67)	
30-49	366(34.92)	682(65.08)	
Residence			
Urban	739(43.65)	954(56.35)	<0.0001
Rural	906(28.00)	2,330(72.00)	
Mother educational level			
No education	47(15.46)	257(84.54)	<0.0001
Primary	244(17.85)	1,123(82.15)	
Secondary	804(34.00)	1,561(66.00)	
Higher	550(61.59)	343(38.41)	
Mother currently working			
No	1144(38.38)	1,837(61.62)	<0.0001
Yes	501(25.72)	1,447(74.28)	
Owns a mobile telephone			
No	408(21.46)	1,493(78.54)	<0.0001
Yes	1237(40.85)	1,791(59.15)	
Economical background			
Poorest	136(12.76)	930(87.24)	<0.0001
Poorer	221(22.19)	775(77.81)	
Middle	281(31.68)	606 (68.32)	
Richer	372(38.04)	606 (61.96)	
Richest	635(63.37)	367(36.63)	
Husband education level			
No Education	110(16.22)	568(83.78)	<0.0001
Primary	365(22.07)	1,289(77.93)	
Secondary	578(35.44)	1,053(64.56)	
Higher	589(61.74)	365(38.26)	
Don't know	3(25.00)	9(75.00)	
Husband occupation			
Professional	293(64.11)	164(35.89)	<0.0001
Business	64(18.99)	273(81.01)	
Services	706(32.67)	1,455(67.33)	
Others	565(29.26)	1,366(70.74)	
Unemployed	17(39.53)	26(60.47)	
Decision maker for respondent's health issues			
Respondent alone	131(35.12)	242(64.88)	0.005
Respondent and husband	1115(34.62)	2,106(65.38)	
Husband/partner alone	298(29.30)	719(70.70)	
Someone else	94(33.81)	184(66.19)	
Other	7(17.50)	33(82.50)38	
Number of antenatal visits during pregnancy			
No antenatal visit	19(4.76)	0(95.24)	<0.0001
1-4 visits	721(26.23)	2028(73.77)	
More than 4 visits	905(50.81)	876(49.19)	

Table 2: Reasons for choosing cesarean section delivery

*Multiple response observed

Reason	Mother side (n)%	Doctor side (n)%
Convenience	109(67.70)	52(32.30)
Water broke/dried up	12(21.82)	43(78.18)
Didn't want labor pains	80(76.19)	25(23.81)
Mal presentation	90(22.50)	310(77.50)
Premature baby	01(6.67)	14(93.33)
Cord prolapsed	04(26.67)	11(26.67)
Multiple births	07(36.84)	12(63.16)
Progress in labor	129(32.74)	265(67.26)
Pre-eclampsia	08(23.53)	26(76.47)
Diabetes	01(7.69)	12(92.31)
Previous C-section	195(48.99)	203(51.01)
Complications during delivery	150(27.57)	394(72.43)

Table 2 shows that in most cases, doctors made the ultimate decision regarding CS. Therefore, convenience (67.70%), avoiding labor discomfort (76.19%), and previous CS (48.99%) were the most frequently cited reasons for having a cesarean section from the mother's side. Diabetes and premature babies were the leading reasons for conducting CS on the doctor's side.

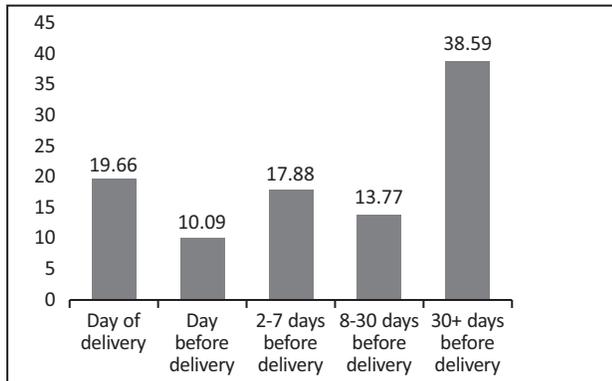


Figure 1: Timing of decision-making on cesarean section

In Fig 1 most of the cases (38.59%), the decision for CS was made 30 days before the delivery, which is called elective cesarean section. The decision was made the day before the delivery date in about one-fifth of the cases (10.09%). The decision for CS was made on the day before delivery (19.66%) and 2 to 7 days before delivery (17.88%), which are almost equal.

Table 3: Association between cesarean delivery and selected socio-economic, demographic, biological, and institutional factors and social network factors based on logistic regression.

Characteristic	Adjusted Odds Ratio	P value	95% CI of AOR
Mother Age			
20-24	0.94	0.581	0.75-1.16
25-29	1.04	0.683	0.85-1.27
30-49	1.19	0.142	0.94-1.50
Residence			
Rural	0.98	0.826	0.83-1.15
Mother Education			
Primary	0.82	0.294	0.55-1.19
Secondary	1.19	0.373	0.81-1.72
Higher	1.70	0.013	1.11-2.59
Mobile			
Yes	1.29	0.001	1.10-1.50
Economical background			
Poorer	1.36	0.018	1.05-1.75
Middle	1.68	0.000	1.28-2.17
Richer	1.79	0.000	1.37-2.34
Richest	3.13	0.000	2.32-4.21
Husband Education			
Primary	1.13	0.374	0.86-1.46
Secondary	1.28	0.076	0.97-1.67
Higher	1.86	0.000	1.35-2.55
Don't know	0.99	0.989	0.24-3.97
Mother Occupation			
Yes	0.70	0.000	0.60-0.81
Husband Occupation			
Business	1.16	0.480	0.77-1.73
Services	0.92	0.528	0.70-1.20
Others	0.79	0.090	0.60-1.03
None	0.93	0.845	0.44-1.94
Person who usually decides on respondent's health			
Respondent and husband	0.99	0.921	0.76-1.27
Husband alone	0.79	0.114	0.59-1.05
Someone else	0.87	0.459	0.59-1.26
other	0.69	0.410	0.27-1.68
Number of antenatal visits during pregnancy			
more than 4 visits	2.03	0.000	1.76-2.33

Table 3 shows that older mothers aged 25-29 years and 30-49 years had higher odds of delivery by CS [OR=1.04; CI=0.85-1.28 and OR=1.19; CI=0.94-1.50], respectively, than adolescent mothers aged 15-19 years. Mothers who lived in rural areas had lower odds of CS delivery [OR=0.98; CI=0.83-1.15] than mothers who lived in urban areas. The chance of CS increased with the mother's level of education. Similarly, those husbands with higher education had more chance of having their wives CS [OR=1.86; CI=1.35-2.55]. Mothers with mobile phones had more odds

of conducting CS [OR= 1.29; CI= 1.10-1.50]. Mothers who belonged to higher wealth quintiles had more chance of getting CS, e.g., richest [OR = 3.13; CI = 2.32-4.21]. Mothers who were employed had fewer odds of CS done [OR = 0.70; CI= 0.60-0.81] than those who were not employed. Mothers who received more antenatal care visits had a higher chance of CS delivery than those with less than three visits [OR=2.03; CI=1.76-2.33].

Discussion:

Bangladesh's rising population-based CS rates may be attributable to the various maternal health programs currently in place.¹⁶ In 2014, the all-cause CS rate in Bangladesh was 9% higher than the WHO recommendation range of 10%-15% (34).¹⁷ The message that CS is convenient, less painful, and comparatively simple was conveyed to mothers, which increases the demand for elective cesarean sections.¹⁸ In our study, we can see that more than 60% of mothers chose CS for convenience and to avoid labor pain, and when the patients are the principal decision-makers, these two reasons dominate. On the other hand, in most cases, physicians went for CS when the pregnancies were complicated, e.g., malpresentation of the fetus (22.0%), other complications (72.43%), and failure to progress in labor (67.26%). Physicians' incentives for performing CS include both saving time from prolonged normal vaginal deliveries and making more money at the same time.¹⁹

The timing of the decision on CS also shows that the decision on 38.59% of CS was taken 30 or more days before the delivery date. This signifies that a big proportion of CS was decided way before the indication for CS, e.g., complications, arose. Educated, affluent, and urban mothers have shown a significant increase in the prevalence of CS.

During the past few decades, important social determinants of health in Bangladesh, particularly female education, have improved significantly.²⁰ The findings of this study indicate that mothers gained more education than their spouses. In this study, the education and occupation of the husband have a significant effect on the CS rate, as they are the main influence on respondents' health. With increasing urbanization, rising average income, and greater coverage of private facilities, the CS rate will continue to rise in Bangladesh.^{21,22} A greater proportion of mothers have received multiple prenatal visits, indicating an increase in ANC service utilization. The outcomes of this study reveal that having a CS is less likely if you have your ANC visits and births done in a public hospital. The age of the mother also plays an important influence in CS performance.²³

In this study, older mothers have a greater likelihood of undergoing a cesarean section than younger mothers. Awareness developed due to increased exposure mobile phone, and due to increasing socialization, mothers nowadays embark on pregnancy at a later age. Therefore,

the chances of CS are high for their delivery. In this study, we found that the majority of reasons to have CS are due to complications during pregnancy or suggested by doctors.

One of the limitations of the study is the recall period. The three-year BDHS recall period was insufficient to describe all birth-related events. Therefore, the probability of recall bias should be quite low. Except for a few questions, almost all of the information collected in BDHS surveys was susceptible to reporting biases. Another limitation is that data was obtained solely from the responses of mothers. The accumulation of data from physicians would allow us to conduct a more thorough analysis. However, the strength of this paper is that it utilizes very recent data to demonstrate the cesarean section indicators.

Conclusion:

The study found that mothers from urban areas, affluent families, and private facilities were more likely to have a cesarean section. Higher maternal age, mother education, and occupation, number of ANC visits, spouse education, and occupation were all significant predictors of cesarean section delivery.

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