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FACTORS INFLUENCING RISING CAESAREAN SECTION: A NARRATIVE REVIEW OF QUANTITATIVE STUDIES

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ABSTRACT **Background:** Caesarean section (C-section) is a vital medical procedure in obstetrics for managing pregnancy and childbirth complications. Unnecessary C-sections can harm mothers and newborns. The global C-section rate has risen, with the World Health Organization recommending 10-15% for optimal outcomes. Recent WHO research shows a global increase, projecting 29% of births as CS by 2030. In India, C-section rate is 21.5%, exceeding WHO guidelines. Factors like maternal age, birth order, education, and wealth impact C-section occurrence. Escalating rates are linked to institutional births, private facilities, and patient preferences. Tertiary care centres have higher rates, while lacking healthcare regions face risks due to limited access. The financial burden and health system strain affect low-income countries. This article analyses CS trends and influencing factors. **Material And Methods:** This research article aims to expand knowledge about caesarean sections, offering fresh insights through a PubMed search from 2013 to 2022. Focusing on influencing factors and determinants, contributes to understanding and perspective on the subject. **Conclusion:** The article underscores diverse drivers of rising caesarean rates, including socioeconomic factors, education, medical history, healthcare settings, and location. While crucial when needed, a balanced approach is vital for informed choices. Considering the risks of undue caesarean births, a balance between medical necessity and patient choice is essential.

KEYWORDS : Caesarean Section, Factors, Maternal Health

INTRODUCTION

A Caesarean section, commonly known as C-section, is a significant medical procedure used in obstetrics to safeguard the lives of women and their infants when facing complications during pregnancy and childbirth. However, it is important to note that unnecessary C-sections can have negative effects on the well-being of both the mother and the newborn. (1) Over the past three decades, the rising CS rate trend has elicited growing concerns and generated alarm among experts and researchers. (2) *World Health Organization* (WHO) previously indicated that while caesarean sections are generally considered safe, it is important to maintain a caesarean rate within the range of 10-15% to ensure optimal outcomes. (3)

Recent research conducted by the WHO reveals a global increase in the utilization of caesarean sections, contributing to more than 1 in 5 (21%) of all births worldwide. This trend is projected to persist in the next ten years, with approximately 29% of all deliveries expected to be performed via caesarean section by 2030, as reported by the study. (4) In terms of regional statistics, Eastern Asia exhibits a higher rate of 35%, whereas Central America showcases a rate of 38%. Similarly, both North America and Oceania have a rate of 32%. (5) According to NFHS-5, the rate of C-sections in India is 21.5%, higher than the WHO recommendations. (6)(4)

Factors such as advanced maternal age, higher birth order, shorter gaps between pregnancies, increased household wealth, and higher educational attainment of both mothers and their partners have been identified as the most influential determinants for the occurrence of caesarean sections (CS) in relation to maternal demographic and reproductive characteristics. (5)

One of the primary factors contributing to the escalating rate of C-sections is the rise in institutional births and other factors that can be attributed to unregulated health facilities, particularly private institutions, as well as the growing trend of women choosing to undergo this procedure. (7) Tertiary care centres exhibit elevated rates of CS procedures, while regions lacking accessible healthcare facilities may experience maternal fatalities resulting from inadequate access to CS interventions. (2)

Additionally, the substantial financial burden associated with Caesarean sections can give rise to catastrophic health expenditures for families and impose additional strain on overburdened healthcare systems, particularly in low and middle-income countries from a scientific perspective. (1)

Evidence suggests that the utilization of CS contributes to the prevention of approximately 187,000 maternal deaths and 2.9 million neonatal deaths on a global scale. Despite the positive impact on reducing maternal and child mortality rates, it is important to acknowledge that unnecessary caesarean sections (CS) can lead to heightened health risks for both mothers and their children in the short and long term.

In the short term, there are potential risks associated with unnecessary caesarean sections, such as the occurrence of infections, haemorrhages, visceral injuries, placenta accreta, and placental abruption. (8)(5)(9) Over the long term, there is a possibility of increased risks, including asthma and obesity, as a result of unnecessary caesarean sections. (9)(5) However, the long-term risks and advantages of caesarean delivery for both the mother, baby, and future pregnancies are often not adequately discussed with women. (9) This article aims to examine the trends in CS delivery rates and identify the factors influencing the rise in caesarean section rates.

MATERIAL AND METHODS

Research Strategy

The rationale for this research article is to enhance understanding, provide new perspectives, and contribute to the growth of knowledge surrounding caesarean sections while offering new insights into various aspects associated with this topic. The literature was searched on Pubmed. The search was narrowed to articles between 2013 and 2022 covering around 10 years.

Study was conducted using “MeSH terms” - “Caesarean Section”, “Influencing Factors” and “Determinants”.

Studies with quantitative data regarding factors influencing Caesarean section rates were included. The study did not include case reports, case series, or qualitative studies that focused on factors influencing Caesarean section.

Findings

Following thorough research, we have identified nine distinct factors

potentially influencing the rate of caesarean sections.

Socio Economic Status

Women belonging to the wealthiest quintile households had a 2.5 times higher likelihood of delivering via C-section in comparison to women from the poorest quintile households. (1) Women categorized in the middle wealth index group had a greater probability of undergoing a CS, with women from affluent households following closely behind, in contrast to women from less privileged households. This factor is closely linked to one's livelihood and lifestyle. Overweight or obese women are frequently observed in middle-class and affluent households. (7)

Women are more susceptible to CS deliveries compared to those from lower-income households. Women from affluent family backgrounds have a higher inclination towards opting for CS compared to women from economically disadvantaged backgrounds.(10)(11) Mothers with high SES had more than double the chance of having a CS.(12) With more prenatal visits or "additional or unofficial" payments to their doctors, mothers with higher socioeconomic level may increase the possibility of having a CS. (13) Due to the significant hazards to the health and life of both mothers and newborns, women from low socioeconomic backgrounds may have minimal ability to undergo caesarean birth, even in situations where it is medically necessary. (14)

Education

Educated respondents are more likely to use CS delivery compared to respondents with no education. Higher maternal education levels were associated with an elevated likelihood of CS delivery, as educated women tend to have more autonomy in decision-making regarding their delivery method, with a general preference for CS. (11) Women with a higher level of education, specifically secondary and above, were twice as likely to undergo a CS compared to women with no educational background. (1) Mothers studied till junior high were about three times more likely than those with no education to undergo a CS and mothers studied till Senior High were eight times more likely to undergo CS than those who didn't study at all. (12) Women with higher study attainments were more likely to have a CS. This might be explained by the idea that educated women exhibit more care for their wellbeing and look for ways to cut back on labour. (15)

The level of literacy significantly influences the occurrence of CS deliveries, indicating that higher literacy levels are associated with a higher likelihood of CS delivery. However, it is important to note that reducing the incidence of unnecessary CS deliveries cannot be solely achieved through literacy alone.(7) Study that revealed a contrasting pattern to the common belief that higher education consistently leads to an elevated likelihood of CS delivery. This observation aligns with existing literature from South Korea, which demonstrates an inverse relationship between education and the rate of CS. This exception can be attributed to the fact that education not only imparts knowledge but also enhances awareness of the potential drawbacks associated with unnecessary CS.(11)(16)

Residence

The preference for CS delivery is higher among individuals residing in urban areas, while the rate is comparatively lower among those in rural settings. This difference may be influenced by factors such as limited access to alternative birthing methods, lower knowledge or understanding, and constrained economic means among women living in rural areas.(11)(17) The greater presence, ease of reaching, and affordability of CS in urban areas women are more than rural women could be the factors behind the elevate CS rate.

The increased number of private CS centres and a higher rate of women's job opportunities in urban areas may contribute to the same. (11)(18)(20) Even in urban communities, mothers residing in urban communities were 1.25 times more prone to undergo a CS compared to mothers living in rural communities.(21) The location of living revealed that women living in urban areas in contrast to rural areas, have shown a higher likelihood of undergoing CS.(3)

Moreover, previous studies suggesting that the presence and proximity of medical facilities are linked to increased rates of CS deliveries.(12) Living in rural areas is associated to a lower likelihood of having a CS because it may be more difficult to access facilities that are suitable. These institutions might not have enough staff or resources, for instance, anaesthesia, to perform caesarean births. (22)

Maternal Age

Women aged over 35 years at the time of childbirth have more than twice the probability of undergoing a CS, with this effect being more pronounced in urban areas.(23) Rate of CS deliveries is positively associated with increasing age at birth. As the maternal age rises, there is a corresponding rise in the likelihood of having a CS.(7) A notable correlation was observed between the age and their choice to accept the CS as Women of a lesser age women were significantly swayed by family members.(10) The frequency of CS gets escalated with the progression of women's age. As women surpassed the age of 35,(22) the risk of encountering complications during pregnancy and facing unfavourable consequences such as chronic hypertension, diabetes, the need for primary CS delivery, excessive haemorrhage during labour, and pregnancy-related hypertension amplified.(21)(24) Advancing age of mother is an acknowledged influential factor with the progression of age during pregnancy, specific biological changes takes place, including mal-position, elevated risk of hypertension, eclampsia, and diabetes, obesity. Further, raises the chance of miscarriage, early birth, and bleeding during the childbirth period. These risks, along with women's preference, could lead to the higher prevalence of CS.(1)(25) The link between older age of women and certain negative maternal results, including an increased risk of health issues such as high blood pressure and gestational diabetes, could clarify why the likelihood of having CS delivery rises in our study as women get older.(12) The current research demonstrates that a significant factor warranting attention in caesarean deliveries is the advanced age of the mothers.(14)

History Of Caesarean Section

Past Caesarean section (C-section) experiences were a crucial determinant in shaping the decision-making process. Participant's decision-making was influenced by their knowledge and comprehension of the likelihood of having another CS (10). According to the ICD-10 classification, the most prevalent reason (24.1%) for performing CS was a prior history of CS.(1) Following a previous LSCS, there is a 67% likelihood of undergoing a subsequent caesarean delivery, in a study by revealed a 19% occurrence of previous LSCS. This was predominantly observed among unscheduled women who presented directly in labour and displayed irregular foetal monitoring. (26) Women who have undergone a CS in the past often opt for elective CS in their subsequent pregnancies, without attempting a Birth through vagina after Caesarean. (27) Past scars, from a prior caesarean surgery, were the main considerations when deciding whether to have a repeat CS. The hesitance to go for vaginal delivery after a previous CS may have been brought on by worries about potential legal repercussions resulting from the uterine wall separation, which could be dangerous for both the mother and the foetus.(28) Many women have a higher risk of experiencing negative outcomes as a result of avoidable repeat caesarean procedures. (29) Overall CS rate was substantially affected by women who had previously undergone CS. (30)

Place Of Delivery

The rates of caesarean deliveries in private hospitals significantly surpass those in public hospitals, as indicated by the studies conducted. This increase can be attributed to a combination of social, economic, and medical factors. There was a significantly higher occurrence of caesarean deliveries in private hospitals, with a rate 11.2 times greater, and in university hospitals, with a rate 6.1 times greater, compared to public hospitals, specifically among primiparous women. (31)

The likelihood of undergoing a caesarean delivery was found to be 1.6 times higher for women who gave birth in private hospitals compared to those who delivered in public healthcare systems.(21) Even when they got delivery help from healthcare facilities connected to BNHS, expectant mothers who received prenatal care in private healthcare settings had a greater incidence of caesarean births.(14) Private/ charitable healthcare facilities had greater rates of caesarean sections than public hospitals in three out of four regions. Well-educated women, particularly in metropolitan India, had a greater risk of having caesarean births in private healthcare settings, suggesting a connection between education and facility type. (32)

Parity

When comparing women who have given birth multiple times with those who are giving birth for the first time, the odds of having a CS were 1.38 times higher for primipara women, healthcare providers play a significant role.(21) The factors include the convenience for

doctors to schedule CS deliveries based on their choices, financial incentives, shorter duration of CS, insufficient training of obstetricians in conducting vaginal deliveries is another influential factor contributing to the increased CS rate. (21) Women with lower parity had a greater rate of CS. (33) CS delivery is reduced by 60, 37, and 35% for women with parities 2, 3, and 3+, respectively. (12) A woman's likelihood of undergoing CS, increased considerably in circumstances when she had many pregnancies.(29) Multiple births (almost five times more probable than single births) exhibited a significant relation with women undergoing CS. (22) Compared to mothers who had single pregnancies, mothers who had several pregnancies were more likely to give birth via CS. (15)

Maternal Risk Factors

Failed progress during labour and unsuccessful induction of labour are also important contributing factors leading to caesarean deliveries for women. Around 12% of CS are attributed to cephalo-pelvic disproportion or shoulder dystocia. (27) Antepartum haemorrhage (APH) was a factor in of 5.9% of CS. Placental abruption made up 3.1%, while placenta previa made up 2.8%.(28) Hypertensive disorders and premature labour were shown to be more common in African American women and were significantly connected to elective primary CS. (33) A link between women with higher BMI and higher rates of CS was also observed in the study.(33) Disorders such as and antepartum haemorrhage, eclampsia/pre-eclampsia, and labour difficulties were the key determinants in the current study, for both PCS and PPCS. (25) 2% of CS were conducted due to non-progress of labour. The optimal approach for tracking labour progression is to utilise a 4-hour action-line partogram. However, effective partogram maintenance was lacking in 20% of cases where CS performed due to non-progressive labour (NPOL).(28) If a woman was obese before getting pregnant, her odds of having CS increased noticeably.(29) Maternal overweight/obesity were factors that showed a significant relationship with an increased likelihood of caesarean delivery.(22)

Complications Related To Foetus

A significant factor leading to the increased rates of CS was the presence of malpresentation, particularly breech presentations during childbirth. (27) In this study by Abebe FE et al (34), the second most common reason for performing a CS was foetal distress. Around 73%, who were diagnosed with non-reassuring foetal heart rate patterns, it is expected that over-diagnosis of foetal distress occurred as none of the foetuses were monitored using a continuous electronic foetal monitoring system. CS for breech presentation constituted 6.6% of all cases and were the most common reason for primary elective caesareans. Furthermore, patients who came in labour were not given the option of vaginal delivery and were immediately operated in cases of emergency.

Malpresentation was found to be a substantial risk factor among non-African American women.(33) Foetal growth restriction was a determinant in 5.7% of CS cases, while oligohydramnios was in 9.1% of the cases.(27) Breech presentation, placenta previa, abruption of placenta were found to be key determinants in the current study, for both PCS and PPCS(25), following foetal state without reassurance. Challenges arise as these scenarios may be subject to varying clinical interpretations and potential categorization errors. Other significant factors that contributed to PCS rather than PPCS in this study involved low levels of amniotic fluid, the newborn's weight of under 2,000 grams and pregnancies between 33 and 36 weeks.(25) Women who had larger babies were more likely to give birth by CS.(15)

Healthcare provider's effect

This highlights that approximately one-third of CS cases either lacked CS criteria outlined in the guideline or did not arise from maternal appeals. (35) The type of counselling and information given by medical experts during prenatal care may have an effect on the delivery technique. (14) When doctors are involved in choosing the process of childbirth, the rate of CS rises by a factor of 4.03 compared to situations when doctors have no impact. The study proposes two methods by which this rise in CS is caused by doctors occurs. First, doctors give women information about the benefits and drawbacks of having a CS while they are choosing the method of childbirth and the other is due to the knowledge gap between the patient and the doctor, doctors have a direct influence on the patient's decision to undergo a caesarean section. (31) 60%of the women who remembered stating a desire for a CS and eventually had CS, had prenatal care doctors' recommendations for a CS. Contrarily, the obstetricians engaged in the actual delivery process had recommended a CS to about half of the women who initially stated a preference for vaginal delivery but ultimately underwent one.(36)

CONCLUSION

This article underscores the myriad factors influencing the upward trajectory of caesarean section rates, encompassing socioeconomic status, maternal education, previous CS history, healthcare provider influence, and delivery location. While recognizing the indispensability of these procedures in various scenarios, it is imperative to prioritize informed decision-making for women. Striking the delicate balance between medical necessity and patient autonomy becomes paramount, particularly in light of potential risks associated with unnecessary caesarean deliveries, both in the short and long term.

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Ethical Approval: The authors of this article have not conducted any investigations involving human subjects or animals.

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