Determinants of caesarean section in primigravida and of primary caesarean section in multigravida.

Amara Hayat [1,*], Shumaila[2], Rozina[3], Uzma Sattar[4], Sobia[5], Farha Naz[6], Raishem Baloch[7]

ABSTRACT:

Objective: To identify and analyze the medical, obstetrical, and sociocultural determinants contributing to the increasing rates of caesarean section (CS) among primigravida women and primary CS in multigravida women at a tertiary care hospital in Pakistan.

Methodology: This descriptive cross-sectional study was conducted over six months at the Department of Obstetrics and Gynecology, Peoples University of Medical & Health Sciences (PUMHS). A total of 100 pregnant women aged 18-40 years, with parity ranging from 1-5, were recruited through non-probability consecutive sampling. Statistical analysis was performed using SPSS version 20, applying descriptive and inferential statistics to evaluate associations among variables.

Results: Showed that 65% of participants underwent caesarean section, with a higher prevalence among primigravida women, primarily due to non-progression of labor (30%) and fetal distress (24%). In contrast, elective or family-requested CS (20%) were more commonly reported among multigravida women with previous vaginal deliveries. Medical conditions such as gestational diabetes (20%) and pregnancy-induced hypertension (20%) were significantly associated with primary CS. Non-clinical influences, including family pressure and personal preference, emerged as notable determinants, reflecting shifting cultural attitudes toward mode of delivery.

Conclusion: The data highlight the multidimensional character of rising caesarean rates, which are influenced by both clinical indications and modifiable social and behavioural factors.

Key words: caesarian section, global health, healthcare expenditures, maternal and child health.

Cite as: Hayat A, Shumaila, Rozina, Sattar U, Sobia, Naz F, Baloch R. Determinants of caesarean section in primigravida and of primary. J Muhammad Med Coll. 2025;16 (1) pp-9-13

Introduction:

The rising rates of caesarean section (CS), particularly the primary CS in first pregnancies and among women with prior normal vaginal deliveries, have become a global concern. While advancements in obstetric care have aimed to reduce maternal and neonatal risks, the increasing frequency of CS in healthy pregnancies is an unexpected phenomenon. This trend contradicts the expectation that safer obstetrical practices would lead to fewer surgical interventions, particularly for primigravida and multiparous women who have previously had a vaginal birth.

1. PG Trainee; Peoples University of Medical and Health sciences for Women, Shaheed Benazirabad.
2. Senior Registrar; Peoples University of Medical and Health sciences for Women, Shaheed Benazirabad.
3. Associate Professor. Peoples University of Medical and Health sciences for Women, Shaheed Benazirabad.
4. WMO. Peoples University of Medical and Health sciences for Women, Shaheed Benazirabad.
5. Registered Medical practitioner, Shaheed Benazirabad. Sindh
6. Registered Medical Practitioner. Shaheed Benazirabad. Sindh
7. Associate Professor; Peoples University of Medical and Health sciences for Women, Shaheed Benazirabad.

**=corresponding author :*
Email: drkhankhanzada@gmail.com.

Received: 4.8.2025, Revised 18.8.25.
Accepted 23.09.2025 Published online 20.10.2025

In particular, the primary caesarean section is becoming increasingly common, even though vaginal delivery is often a medically safe and viable option for these women.[1,2]

Locally, the escalation of caesarean rates has been noted in several studies, with a significant increase observed in both public and private sector hospitals in Pakistan. Previous research highlights various factors contributing to this rise, ranging from obstetric and medical considerations to societal and cultural influences.[3] Obstetrical factors such as abnormal fetal presentations, labor dystocia, and maternal conditions like hypertension, diabetes, or previous caesarean section play a crucial role in decision-making.[2,4] However, non-medical factors such as patient preferences, family pressures, and the growing influence of cultural perceptions surrounding childbirth also play a significant role.[5,6]

Despite the medical advancements aimed at promoting normal vaginal delivery, the rate of primary caesarean sections continues to climb.[7] Studies suggest that while CS may be warranted in cases of obstetric complications, the decision is often influenced by subjective factors like the obstetrician's comfort with surgical interventions and the patient's or family's desire for perceived convenience or safety.[3,8] Furthermore, the increasing tendency to schedule elective caesarean births is another contributing factor.[9] In some cases, CS is viewed as a safer and more predictable alternative to vaginal delivery, leading to a preference for surgical intervention, especially among first-time mothers.[10]

Several local studies in Pakistan have reflected similar trends. Research conducted in various tertiary hospitals in urban areas of Pakistan reports a rising number of caesarean deliveries, with primary caesarean sections being increasingly performed even among low-risk pregnancies4. Factors such as urbanization, the preference for elective

caesarean sections, and the availability of advanced obstetric care in private hospitals are likely to contribute to this trend.[4,9] However, there is still a notable gap in understanding the broader determinants of this phenomenon, particularly regarding patient-specific factors, healthcare provider preferences, and familial involvement in the decision-making process.

Rationale for the Study: Despite the increasing number of caesarean sections performed, the underlying factors driving this trend remain underexplored in the context of Pakistan. This research is therefore critical in providing local evidence on the determinants of primary caesarean sections in both primigravida and multiparous women. By exploring the medical, obstetrical, and human factors influencing the decision to perform a caesarean section, this study seeks to highlight the need for balanced decision-making that aligns with the best possible maternal and neonatal outcomes.

The study's findings could assist in formulating guidelines that address the rising rates of unnecessary primary caesarean sections. Such guidelines would aim to reduce the reliance on surgical births, particularly among women who could safely undergo vaginal delivery, thus improving both maternal and neonatal health outcomes. Additionally, understanding the determinants of caesarean section will help healthcare providers, policymakers, and communities address this growing concern through targeted health interventions.

Objectives:

1. Evaluate the impact of medical and obstetrical factors on the decision for primary cesarean section.
2. Investigate how patients and families, as well as societal and cultural expectations, impact the choice to have a caesarean section.
3. Analyze obstetricians' opinions about primary caesarean sections, especially for low-risk pregnancies.
4. Developing evidence-based guidelines for safer, culturally applicable obstetric practice.

Methodology:

This descriptive cross-sectional study was conducted at the Department of Obstetrics and Gynecology at Peoples University of Medical & Health Sciences (PUMHS), Benazirabad. After receiving approval from the PUMHS Ethical Review Committee, the study was conducted over a six-month period, from July 7, 2023, to January 6, 2024. Non-probability sequential sampling was used to choose the participants. The study comprised women who gave their informed consent, were between the ages of 18 and 40, and had parity scores between 1 and 5. Women with known cases of Type 1 or Type 2 diabetes, chronic hypertension, chronic renal illness, and multiple pregnancies were excluded based on stringent criteria designed to eliminate confounding variables. The emergency room and labor room were the sources of eligible participants. A standardized proforma was used to capture clinical data and conduct interviews with each lady. Age, booking status, gestational age, and other detailed demographic and obstetrical data were gathered by this tool. Maternal conditions (e.g., anemia, pregnancy-induced hypertension, pre-eclampsia, and premature labor), the manner of birth, intraoperative blood loss, and any surgical interventions were among the comprehensive clinical indicators that were also recorded.

Particular factors linked to cesarean sections were closely investigated. Among these were obstetrical variables such antepartum hemorrhage, obstructed labor, fetal distress, and non-progression of labor. Maternal health issues such as gestational diabetes and pregnancy-induced hypertension were also observed. In order to comprehend the psychosocial and cultural forces that may influence delivery choices, patient interviews were also used to examine factors that were driven by the patient and their family and that influenced the decision to have a caesarean section.

To guarantee uniformity in patient selection, consent-taking protocols, and precise data documentation, clinical staff and data collectors received training and briefing prior to data collection. The authenticity and dependability of the data gathered were preserved in part by this standardization.

SPSS version 20 was utilized for data entry and analysis. Frequencies and percentages were used to represent categorical variables like gravida, delivery method, and maternal or perinatal outcomes. Means and standard deviations were used to summarize continuous data, such as age and gestational age. Significant predictors were found in both primigravida and multigravida cohorts by using statistical comparisons to investigate relationships between the identified determinants and the chance of cesarean birth. After first cleaning and preparing the data in Excel, the analysis was carried out using SPSS version 20. For the obstetric and demographic factors, descriptive statistics were computed. For continuous variables, means and standard deviations were calculated; for categorical data, frequencies and percentages were employed. To more clearly depict trends in caesarean section indications and delivery methods, visual aids like bar and pie charts were used. To find characteristics that were highly linked to primary caesarean sections, bivariate comparisons were investigated.

Results:

One hundred ladies in all took part in the study. Participants' mean gravida was 2.3 (± 1.2) and their mean age was 28.5 (± 6.1). The average gestational age was 37.8 weeks (± 1.4), with a range of 34 to 41 weeks. Parity Distribution: The study's goal of evaluating both groups was closely reflected in the 46% primigravida and 54% multigravida participants. Compared to vaginal delivery (35%), cesarean section was the most often observed delivery method (65%).

Determinants of Caesarean Section

Obstetrical Factors.

The most frequent indication for caesarean section was non-progression of labor (30%), followed by elective or family-requested CS (20%), which notably surpassed traditional medical indications such as fetal distress (24%) and obstructed labor (15%). Antepartum hemorrhage (10%) was less commonly observed. This shift indicates a significant rise in non-clinical, preference-driven caesarean deliveries, particularly among multigravida women.

Medical Conditions.

About 40% of participants had coexisting medical conditions:

Gestational diabetes mellitus (GDM): 20%

Pregnancy-induced hypertension (PIH): 20%

No significant medical condition: 60%

These conditions were more prevalent in primigravida women and were associated with a higher rate of caesarean section, reflecting provider caution in managing at-risk pregnancies.

Patient and Family-Related Factors:

Approximately 30% of women reported family influence or personal preference as contributing factors in the decision

for caesarean delivery. This was particularly evident among multigravida women who had previously delivered vaginally but chose CS in the current pregnancy, often citing perceived safety, convenience, or cultural pressures.

Statistical Significance and Observed Trends

The analysis revealed that primigravida women were more likely to undergo CS due to fetal distress and non progression of labor. Multigravida women, in contrast, had a higher frequency of non-medically indicated CS, often influenced by family or physician preference. Women with GDM and PIH had significantly higher CS rates ($p < 0.05$), emphasizing the role of medical risk in clinical decision-making.

A noteworthy and unexpected trend was the increasing incidence of elective CS requests among healthy women, indicating a growing normalization of CS in tertiary care settings, even in the absence of obstetric complications.

Implications for Health Promotion

These findings underscore the multifactorial nature of rising caesarean section rates in both primigravida and multigravida populations. While clinical indications remain valid, the influence of cultural norms, misinformation, provider bias, and patient/family preference is increasingly driving delivery decisions. To address this trend, the following strategies are recommended:

- Structured antenatal counseling to educate women and families on the risks and benefits of vaginal delivery;
- Training for obstetricians to encourage shared, evidence-based decision-making;
- Community engagement programs to confront myths and sociocultural pressures favoring unnecessary caesarean sections.

By targeting these modifiable factors, particularly in low-risk pregnancies, health systems can strive to reduce the caesarean section rate and improve maternal and neonatal outcomes through more informed, patient-centered care.

Discussion:

This study explored the determinants of caesarean section (CS) in primigravida and multigravida women. The findings revealed a predominance of caesarean deliveries (65%), with primigravida women more likely to undergo CS due to obstetrical causes such as non-progression of labor (30%) and fetal distress (24%). Among multigravida, elective caesarean or family-requested deliveries were frequent even in the absence of clinical complications. Furthermore, medical conditions like gestational diabetes (20%) and pregnancy-induced hypertension (20%) were closely linked to caesarean delivery, especially among primigravida. A striking pattern was the increasing role of non-medical factors, such as perceived convenience and family pressure, in the decision-making process. The increasing caesarean rate identified in this study is consistent with national figures reported in the Pakistan Demographic and Health Survey 2017-18, which found CS rates of over 30% in urban areas and tertiary institutions.[11] Similar trends have been documented by Rasool MF et al., where non-progress of labor and fetal distress were the most common medical indications for CS.[12] Khan et al. also reported a significant rise in CS rates due to changing clinical thresholds and institutional policies.[13]

In agreement with our findings, a study by Amjad et al. highlighted the sociocultural role of family influence in opting for CS, particularly in multigravida women with a prior vaginal birth.[14] The prevalence of elective CS without medical justification, especially in the private sector, has been a growing concern in Pakistan.[15] International studies, such as Betran et al.'s global analysis, also acknowledge that patient and provider convenience play a role, but suggest that strong regulatory frameworks can mitigate these influences.[16] This may explain the higher elective CS trend in our context, where such frameworks are inconsistently applied.

Our findings diverge slightly from those in lower-resourced rural setups, such as the study by Ahmed et al., which reported true obstetric emergencies as the primary drivers for CS, with minimal patient preference involvement.[17] This difference may reflect the urban tertiary care setting of our study, where both patients and physicians may have greater autonomy and access to surgical delivery.

The association between medical conditions like GDM and PIH with increased CS risk aligns with existing literature.[18] However, the lack of proper antenatal counseling and insufficient patient education likely exacerbates elective CS rates among women with manageable risk profiles.[19,20] Furthermore, the presence of non-evidence-based decision-making among providers may contribute to the rising CS trend, as noted in a recent audit conducted by Ehtisham S et al.[21]

Public Health Implications

- These findings have significant implications for maternal health policy and education. There is an urgent need for:
- Targeted antenatal counseling programs that emphasize the safety of vaginal delivery in low-risk pregnancies.
- Family-inclusive education sessions to address cultural myths and empower women in decision-making.
- Implementation of clinical auditing and second-opinion protocols before performing a primary caesarean section.
- Developing context-sensitive national guidelines that balance clinical necessity with patient autonomy can help reverse the normalization of elective caesarean deliveries.

Conclusion:

This study adds important information to the corpus of knowledge on the rising patterns of cesarean sections in developing nations like Pakistan by combining clinical, patient-driven, and societal aspects. It draws attention to the intricate interactions that define delivery outcomes between non-clinical factors including patient and family preferences and medical indications. These findings have significant ramifications. To guarantee that the decision to have a caesarean section is still based on evidence-based clinical indications and not convenience or misunderstanding, they emphasize the critical need for standardized prenatal counseling protocols, institutional policy reforms, and family-inclusive health education. These findings are an important reminder to policymakers, maternal health educators, and healthcare professionals to work together to implement patient-centered, well-informed interventions to address the rising rates of CS.

Practical measures for stakeholders, such as hospital administrators, obstetricians, and public health officials, should include:

• Enforcing audit mechanisms to monitor and justify primary caesarean indications;

• Promoting training for healthcare workers to balance clinical judgment with patient autonomy;

• Introducing mandatory counseling sessions for expectant mothers and families regarding the risks and benefits of various delivery modes.

To better understand the underlying motivations and beliefs impacting delivery decisions, future study should use a multi-center strategy with bigger sample sizes, analyze rural-urban contrasts, and include qualitative assessments. The long-term maternal and neonatal outcomes linked to primary cesarean sections that are not required should also be assessed in studies.

In summary, this study confirms that clinical signs and changeable human factors both play a role in the decision to undergo a caesarean section.

References:

1. Chalmers B. WHO appropriate technology for birth revisited. Br J Obstet Gynaecol. 1992 Sep;99(9):709-10. doi: 10.1111/j.1471-0528.1992.tb13867.x. PMID: 1420006.
2. National Institute of Population Studies (NIPS) [Pakistan] and ICF. 2019. Pakistan Demographic and Health Survey 2017-18. Islamabad, Pakistan, and Rockville, Maryland, USA: NIPS and ICF. Available from https://dhsprogram.com/pubs/pdf/FR354/FR354.pdf
3. Betrán AP, Ye J, Moller AB, Zhang J, Gülmezoglu AM, Torloni MR. The Increasing Trend in Caesarean Section Rates: Global, Regional and National Estimates: 1990-2014. PLoS One. 2016 Feb 5;11(2):e0148343. doi: 10.1371/journal.pone.0148343. PMID: 26849801; PMCID: PMC4743929.
4. Boerma T, Ronsmans C, Melesse DY, Barros AJD, Barros FC, Juan L, Moller AB, Say L, Hosseinpoor AR, Yi M, de Lyra Rabello Neto D, Temmerman M. Global epidemiology of use of and disparities in caesarean sections. Lancet. 2018 Oct 13;392(10155):1341-1348. doi: 10.1016/S0140-6736(18)31928-7. PMID: 30322584.
5. Sandall J, Tribe RM, Avery L, Mola G, Visser GH, Homer CS, Gibbons D, Kelly NM, Kennedy HP, Kidanto H, Taylor P, Temmerman M. Short-term and long-term effects of caesarean section on the health of women and children. Lancet. 2018 Oct 13;392(10155):1349-1357. doi: 10.1016/S0140-6736(18)31930-5. PMID: 30322585.
6. Belizán JM, Minckas N, McClure EM, Saleem S, Moore JL et al. An approach to identify a minimum and rational proportion of caesarean sections in resource-poor settings: a global network study. Lancet Glob Health. 2018 Aug;6(8):e894-e901. doi: 10.1016/S2214-109X(18)30241-9. PMID: 30012270; PMCID: PMC6357956.
7. Ye J, Zhang J, Mikolajczyk R, Torloni MR, Gülmezoglu AM, Betran AP. Association between rates of caesarean section and maternal and neonatal mortality in the 21st century: a worldwide population-based ecological study with longitudinal data. BJOG. 2016 Apr;123(5):745-53. doi: 10.1111/1471-0528.13592. Epub 2015 Aug 24. PMID: 26331389; PMCID: PMC5014131.
8. Molina G, Weiser TG, Lipsitz SR, Esquivel MM, Uribe-Leitz T, Azad T, Shah N, Semrau K, Berry WR, Gawande AA, Haynes AB. Relationship Between Cesarean Delivery Rate and Maternal and Neonatal Mortality. JAMA. 2015 Dec 1;314(21):2263-70. doi: 10.1001/jama.2015.15553. PMID: 26624825.
9. Nantume S, Baluku EM, Kwesiga D, Waiswa P. Factors Associated with High Rates of Caesarean Deliveries: A Cross Sectional Study Classifying Deliveries According to Robson in Mengo Hospital Kampala. Risk Manag Healthc Policy. 2023 Nov 8;16:2339-2356. doi: 10.2147/RMHP.S422705. PMID: 37965117; PMCID: PMC10641024.
10. Torloni MR, Betran AP, Souza JP, Widmer M, Allen T, Gulmezoglu M, Merialdi M. Classifications for cesarean section: a systematic review. PLoS One. 2011 Jan 20;6(1):e14566. doi: 10.1371/journal.pone.0014566. PMID: 21283801; PMCID: PMC3024323.
11. Amjad A, Imran A, Shahram N, Zakar R, Usman A, Zakar MZ, Fischer F. Trends of caesarean section deliveries in Pakistan: secondary data analysis from Demographic and Health Surveys, 1990-2018. BMC Pregnancy Childbirth. 2020 Dec 2;20(1):753. doi: 10.1186/s12884-020-03457-y. PMID: 33267787; PMCID: PMC7709280.
12. Rasool MF, Akhtar S, Hussain I, Majeed A, Imran I, Saeed H, Akbar M, Chaudhry MO, Rehman AU, Ashraf W, Alqahtani F, Alqhtani H. A Cross-Sectional Study to Assess the Frequency and Risk Factors Associated with Cesarean Section in Southern Punjab, Pakistan. Int J Environ Res Public Health. 2021 Aug 21;18(16):8812. doi: 10.3390/ijerph18168812. PMID: 34444565; PMCID: PMC8391541.
13. Mumtaz S, Bahk J, Khang YH. Rising trends and inequalities in cesarean section rates in Pakistan: Evidence from Pakistan Demographic and Health Surveys, 1990-2013. PLoS One. 2017 Oct 17;12(10):e0186563. doi: 10.1371/journal.pone.0186563. PMID: 29040316; PMCID: PMC5645133.
14. Amjad A, Amjad U, Zakar R, Usman A, Zakar MZ, Fischer F. Factors associated with caesarean deliveries among child-bearing women in Pakistan: secondary analysis of data from the Demographic and Health Survey, 2012-13. BMC Pregnancy Childbirth. 2018 Apr 23;18(1):113. doi: 10.1186/s12884-018-1743-z. PMID: 29685129; PMCID: PMC5914047.
15. Parveen R, Khakwani M, Naz A, Bhatti R. Analysis of Cesarean Sections using Robson's Ten Group Classification System. Pak J Med Sci. 2021;37(2). doi: 10.12669/pjms.37.2.3823
16. Betran AP, Ye J, Moller AB, Souza JP, Zhang J. Trends and projections of caesarean section rates: global and regional estimates. BMJ Glob Health. 2021 Jun;6(6):e005671. doi: 10.1136/bmjgh-2021-005671. PMID: 34130991; PMCID: PMC8208001.
17. Ahmed I, Shahwar D, Akhtar M, Amerjee A. Caesarean Section rate amongst Obstetricians at a tertiary-care hospital of Karachi. Pak J Med Sci. 2018 May-Jun;34(3):553-557. doi: 10.12669/pjms.343.14722. PMID: 30034414; PMCID: PMC6041546.
18. Jadoon I, Khattak M, Mughal KS, Mughal US, Khan M, Abdulsamad SA, Naeem AA. Rising Cesarean Section Rates in Pakistan: Analyzing Frequency and Key Risk Factors in a Tertiary-Care Hospital. Cureus. 2024 Oct 24;16(10):e72333. doi: 10.7759/cureus.72333. PMID: 39583372; PMCID: PMC11585390.
19. Bishop D, Dyer RA, Maswime S, Rodseth RN, van Dyk D et al. Maternal and neonatal outcomes after caesarean delivery in the African Surgical Outcomes Study: a 7-day prospective observational cohort study. Lancet Glob Health. 2019 Apr;7(4):e513-e522. doi: 10.1016/S2214-109X(19)30036-1. Erratum in: Lancet Glob Health. 2019 Aug;7(8):e1019. doi: 10.1016/S2214-109X(19)30218-9. PMID: 30879511.
20. Betran AP, Torloni MR, Zhang JJ, Gülmezoglu AM; WHO Working Group on Caesarean Section. WHO Statement on Caesarean Section Rates. BJOG. 2016

Apr;123(5):667-70. doi: 10.1111/1471-0528.13526. Epub 2015 Jul 22. PMID: 26681211; PMCID: PMC5034743.
21. Ehtisham S, Akhtar Hashmi H. Determinants of caesarean section in a tertiary hospital. J Pak Med Assoc. 2014 Oct;64(10):1175-8. PMID: 25823160.

Author's contribution

Amara Hayat	Conceived idea, literature Review.
Anum Mumtaz Ali	Developed Proforma
Rabail Malik	Writing introduction
Saima Soomro	Data Collection
Sania Siyal	Manuscript draft writing
Farah Naz	Data collection/ grammatical review
Raishem Baloch	Proof read manuscript