

ANALYSIS OF CAESAREAN SECTION ACCORDING TO ROBSON CRITERIA OF C-SECTION

Mehwish Mehmood^{*1}, Ghulam Mujtaba Shah², Altaf Hussain Memon³, Nida Khaskheli⁴,
Muhammad Siddique Rajput⁵, Rukhsana Malik⁶

^{*1}FCPS Trainee, Department of Gynaecology & Obstetrics, PUMHS, Nawabshah

^{2,4}Assistant Professor, Department of Physiology, PUMHS, Nawabshah

³Associate Professor, Department of Physiology, PUMHS, Nawabshah

⁵Associate Professor, Department of Community Medicine, PUMHS, Nawabshah

⁶Assistant Professor, Department of Pharmacology, PUMHS, Nawabshah

^{*1}drmishe.khan@yahoo.com

Corresponding Author: *

Mehwish Mehmood

DOI: <https://doi.org/10.5281/zenodo.18440894>

Received
01 May 2025

Accepted
17 June 2025

Published
30 June 2025

ABSTRACT

Background: The World Health Organization endorses the Robson Ten-Group Classification System as an international standard for assessing, monitoring, and comparing C-section rates. This system categorizes women into ten groups based on specific obstetric characteristics, enabling meaningful analysis of C-section trends. The current study aimed to analyse the C-section based on the Robson classification caesarean section.

Methods: A descriptive cross-sectional study was conducted at the Obstetrics and Gynaecology department of Maternal and child health department. The sample size was 357. A well-designed preformed proforma was used. The proforma consisting of two parts, the first part included maternal age, gestational age, parity, previous history of delivery, number of fetus, fetal presentation and pregnancy related symptoms while the second part consisted of fetal outcome like birth weight, APGAR score and complaint of any serious issue needing NICU admission. Data was analysed using the Statistical Package for Social Science (SPSS) version 23.

Results: The mean maternal age of the study participants was 28.9 ± 5.5 years, majority of them were having gestational age between 37 weeks to 40 weeks (86.8%). About 245 (68.6%) participants were multipara (1-4 live births) while 87 (24.3%) were nulliparous and only 25 (7.1%) were grand multiparas (more than 5 live births). Cephalic fetal presentation was the most common (86.3%). Frequency of caesarean deliveries according to Robson criteria, which showed G5 group of Robson criteria was highly frequent (35.9%) followed by G2 (19.7%), G1 (13.2%) and G4 (11.4%). The mean birth weight and mean APGAR score were 3.34 ± 0.52 kg and 8.21 ± 0.38 respectively. Only 69 (19.3%) neonates need NICU admission

Conclusion: Analysis using Robson's Ten-Group Classification indicated that Groups 5, 2, 1 and 4 were the leading contributors to the caesarean deliveries observed. These findings highlight the need to focus particularly on the management of women in Groups 1, 2, 4 and 5 to reduce C-section rates.

Keywords: Robson's Ten-Group Classification, Caesarean section, Deliveries

INTRODUCTION

The global rate of caesarean sections (C-sections) has risen sharply in recent decades, nearly doubling over the past 15 years. Previously, experts estimated that only 10–15% of deliveries genuinely required this surgical intervention [1, 2]. While C-sections remain essential in circumstances where vaginal birth is unsafe or unfeasible, the proportion performed today often exceeds medical necessity [3]. In some regions, the rate now approaches 30% globally [4]. In life-threatening scenarios such as when spontaneous vaginal delivery (SVD) is impossible, avoiding a C-section can endanger both mother and child. However, these procedures are also sometimes undertaken in cases with uncertain or poorly defined indications, such as obstructed labor with intact membranes [5, 6]. Although C-sections can be life-saving, they carry risks for both current and future pregnancies, including increased maternal morbidity and mortality in the short and long term. The primary challenge is safeguarding the health of both mother and newborn while keeping C-section rates within appropriate limits, which calls for regular monitoring and evaluation of their use [7].

Despite recommendations suggesting that the optimal C-section rate is around 15%, global figures show little change. To address this, Robson's classification system, introduced in 2001, offers a practical framework [8]. Among classification methods, Robson's and Denk's systems score highly for clarity, exclusivity, inclusivity, reproducibility, and the ability to identify cases prospectively. The World Health Organization endorses the Robson Ten-Group Classification System as an international standard for assessing, monitoring, and comparing C-section rates. This system categorizes women into ten groups based on specific obstetric characteristics, enabling meaningful analysis of C-section trends [9].

Studies using the Robson criteria show considerable variation in rates among groups. The highest rates are typically observed in women with a history of C-section (Groups 5, 2, and 1), whereas the lowest are found among multiparous women without a prior C-section who experience spontaneous labor (Groups 3, 9, and 8) [4].

Overall, the Robson system serves as a valuable tool for evaluating C-section indications, identifying high-use categories, and guiding interventions aimed at reducing unnecessary procedures. The current study aimed to analyze the C-section based on the Robson classification caesarean section.

Material and Methods

A descriptive cross-sectional study was conducted at the Obstetrics and Gynaecology department of Peoples University of Medical and Health Sciences during September 2024 to February 2025. The study got ethical approval from the Ethical Review Committee of concerned institute. The sample size was calculated by using OpenEpi calculator and was 357. All the pregnant ladies who went under C-section were enrolled in the study while those were excluded who delivered baby by spontaneous vaginal delivery (SVD) or through assisted delivery technique. The informed written consent was taken prior to the study.

A well-designed preformed proforma was used. The proforma consisting of two parts, the first part included maternal age, gestational age, parity, previous history of delivery, number of fetus, fetal presentation and pregnancy related symptoms while the second part consisted of fetal outcome like birth weight, APGAR score and complaint of any serious issue needing NICU admission. All the C-section cases were classified into ten groups according to Robson Criteria of C-section as given below:

Group 1 → Nullipara, single, cephalic, term pregnancy, spontaneous labor

Group 2 → Nullipara, single, cephalic, term, induced labor or planned C-Section

Group 3 → Multipara without uterine scar, single, cephalic, term, spontaneous labor

Group 4 → Multipara without uterine scar, single, cephalic, term, induced labor or planned C-Section

Group 5 → Multipara with uterine scar, single, cephalic, term

Group 6 → Nullipara, single, Breech presentation

Group 7 → Multipara, single, breech, including previous C-Section

Group 8 → Multiple Pregnancy

Group 9 → Single, abnormal lie, including previous scar

Group 10 → Single, Cephalic, Preterm including previous scar

Data was analyzed using the Statistical Package for Social Science (SPSS) version 23. The numerical variables were presented as mean with standard deviation while categorical variables were presented as frequency and percentage.

Results

The mean maternal age of the study participants was 28.9 ± 5.5 years, majority of them were having gestational age between 37 weeks to 40 weeks

(86.8%). About 245 (68.6%) participants were multipara (1-4 live births) while 87 (24.3%) were nulliparous and only 25 (7.1%) were grand multiparas (more than 5 live births). Cephalic fetal presentation was the most common (86.3%) followed by breech and transverse/oblique presentation (12.0% and 1.7% respectively). About 212 (59.4%) participants were having positive history of previous C-section. The characteristics of study participants are presented in Table 1.

Table 1 Characteristics of study participants	
Variables	n= 357
Maternal age (years)	28.9 ± 5.5
Gestational age	37.7 ± 1.4
≤37 weeks	33 (9.3%)
37-40 weeks	310 (86.8%)
≥40 weeks	14 (3.9%)
Parity	
Nulliparous	87 (24.3%)
Multipara (1-4)	245 (68.6%)
Grand multiparas (≥5)	25 (7.1%)
Fetal presentation	
Cephalic	308 (86.3%)
Breech	43 (12.0%)
Transverse/Oblique	6 (1.7%)
Positive history of previous C-section	212 (59.4%)
Number of fetuses	
Single	349 (97.8%)
Multiple	8 (2.2%)

Frequency of caesarean deliveries according to Robson criteria are presented in Figure 1, which showed G5 group of Robson criteria was highly frequent (35.9%) followed by G2 (19.7%), G1 (13.2%) and G4 (11.4%). Looking over the different maternal and fetal variables of Robson criteria, the most common mode of delivery was

C-section (99.7%) and in majority of the cases there was no onset of labor (72.8%). Among the fetal variables the mean birth weight and mean APGAR score were $3.34 \pm 0.52\text{kg}$ and 8.21 ± 0.38 respectively. Only 69 (19.3%) neonates need NICU admission as presented in Table 2.

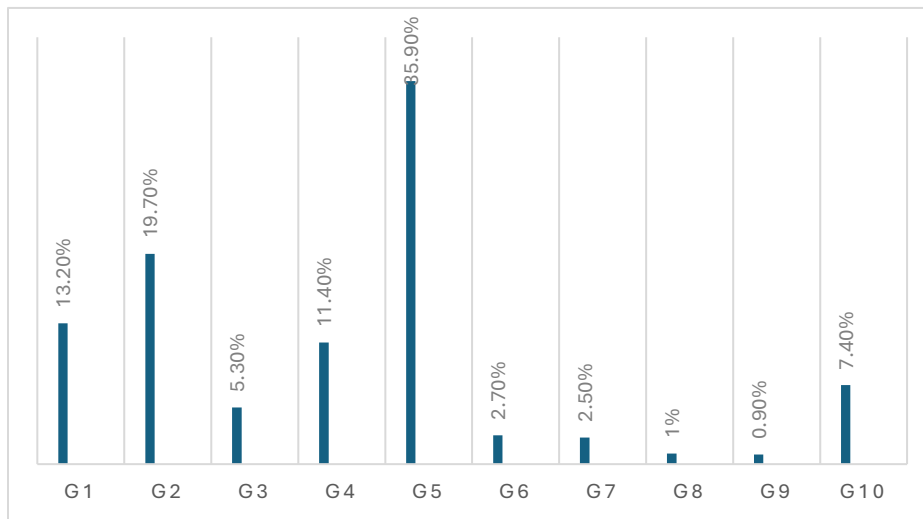


Figure 1 Frequency of C-section according to the Robson criteria of C-section

Maternal variables	
Mode of delivery	
SVD	1 (0.3%)
C-section	356 (99.7%)
Onset of labor	
Spontaneous	35 (9.8%)
Induced	62 (17.4%)
No labor	260 (72.8%)
Fetal variables	
Birth weight (kg)	3.34 ± 0.52
APGAR score at 5 minutes	8.21 ± 0.38
NICU admission	69 (19.3%)

Discussion

Global surveys indicate that caesarean section (C-section) deliveries constitute nearly half of all births in countries such as Brazil, Mexico, Turkey, and Egypt, and approximately one-third in the United States and Australia. In Pakistan, the C-section rate has shown a steady upward trend, rising from 3.2% to 20% over the past thirty years [10]. Although C-sections can be life-saving for both mother and child, unnecessary procedures are linked to higher maternal and perinatal morbidity and mortality. To address this increase, Robson developed a classification system—endorsed by the World Health Organization—that categorizes women into ten groups based on parity, fetal presentation, onset of labor, prior C-section, and gestational age [11,

12]. This framework enables healthcare providers to objectively compare C-section rates across different facilities and track changes over time, ultimately identifying areas where clinical practices can be improved [13].

In the current study, G5 group of Robson criteria was highly frequent (35.9%) followed by G2 (19.7%), G1 (13.2%) and G4 (11.4%). Together, these four groups accounted for 80.2% of all caesarean deliveries, contributing substantially to the overall C-section rate. Similar findings have been reported in other developing countries. For example, an Ethiopian study found a C-section rate of 25.7%, with Groups 3, 5, and 1 being the major contributors [14], while research from Nepal also identified Groups 1, 5, and 3 as the main sources of C-section deliveries [15].

Vaginal Birth After Caesarean (VBAC) has been shown to lower overall C-section rates, reduce maternal complications, and decrease risks in future pregnancies. The Royal College of Obstetricians and Gynecologists recommends using VBAC checklists during antenatal counselling to ensure informed consent and shared decision-making [16]. Women should be made aware of VBAC's benefits, as Elective Repeat Caesarean Delivery (ERCD) is associated with a slightly increased risk of placenta previa or accreta in subsequent pregnancies, as well as pelvic adhesions that can complicate future abdominal or pelvic surgeries [17].

Factors contributing to rising C-section rates include maternal fear of labor pain, scheduling convenience for families or medical staff, perceptions that the procedure is less stressful for newborns, cultural preferences for certain birth dates, professional pressures for optimal outcomes, and beliefs regarding pelvic floor protection [6]. Addressing this public health concern in Pakistan requires evidence-based strategies. The WHO advocates for Robson's classification as a global standard to assess and compare C-section rates within and across facilities. However, its use remains limited in most Pakistani healthcare institutions [18]. Implementing systematic reviews and audits, particularly targeting primary C-section rates, alongside further analytical studies based on the Robson classification, could help guide policy and reduce unnecessary procedures.

Conclusion

Analysis using Robson's Ten-Group Classification indicated that Groups 5, 2, 1 and 4 were the leading contributors to the caesarean deliveries observed. The most common indications for the procedure were a history of previous C-section and fetal distress. These findings highlight the need to focus particularly on the management of women in Groups 1, 2, 4 and 5 to reduce C-section rates. Overall, Robson's Ten-Group Classification proves to be a simple, effective, and adaptable tool that can be applied successfully in various clinical settings.

Reference

1. Betran AP, Temmerman M, Kingdon C, Mohiddin A, Opiyo N, Torloni MR, et al. Interventions to reduce unnecessary caesarean sections in healthy women and babies. *The Lancet*. 2018;392(10155):1358-68.
2. Boerma T, Ronsmans C, Melesse DY, Barros AJ, Barros FC, Juan L, et al. Global epidemiology of use of and disparities in caesarean sections. *The Lancet*. 2018;392(10155):1341-8.
3. Shalash A, Wahdan Y, Alsalman HM, Shehab AaJK, Afifi T, Nabaa HA, et al. Variation of caesarean section rates in Palestinian governmental hospitals. *BMC Pregnancy and Childbirth*. 2022;22(1):943.
4. Yadav RG, Maitra N. Examining caesarean delivery rates using the Robson's ten-group classification. *The Journal of Obstetrics and Gynecology of India*. 2016;66(Suppl 1):1-6.
5. Mumtaz S, Bahk J, Khang Y-H. Rising trends and inequalities in caesarean section rates in Pakistan: Evidence from Pakistan Demographic and Health Surveys, 1990-2013. *PloS one*. 2017;12(10):e0186563.
6. Khowaja B, Mughal FB, Valliani K. The factors influencing caesarean-section rates-a narrative review from Pakistan. *Pakistan Journal of Medical Research*. 2021;60(3):143-7.
7. Parveen R, Khakwani M, Naz A, Bhatti R. Analysis of caesarean sections using Robson's ten group classification system. *Pakistan journal of medical sciences*. 2021;37(2):567.
8. Jamshed S, Chien S-C, Tanweer A, Asdary R-N, Hardhantyo M, Greenfield D, et al. Correlation between previous caesarean section and adverse maternal outcomes accordingly with Robson classification: systematic review and Meta-analysis. *Frontiers in medicine*. 2022;8:740000.

9. Abubeker FA, Gashawbeza B, Gebre TM, Wondafrash M, Teklu AM, Degu D, et al. Analysis of caesarean section rates using Robson ten group classification system in a tertiary teaching hospital, Addis Ababa, Ethiopia: a cross-sectional study. *BMC pregnancy and childbirth*. 2020;20(1):767.
10. Afridi F, Akhtar Z, Afridi A, Qazi Q, Naib JM. Determining the indications of C-Section based on WHO Robson Classification-An experience in a tertiary care hospital I Peshawer, *Journal of Medical Sciences*. 2022;30(02).
11. Betrán AP, Ye J, Moller A-B, Zhang J, Gülmezoglu AM, Torloni MR. The increasing trend in caesarean section rates: global, regional and national estimates: 1990-2014. *PloS one*. 2016;11(2):e0148343.
12. Sindiani A, Obeidat N, Abu-Azzam O, Hijazi H. The impact of previous caesarean section on the outcome of patients with non-adherent placenta previa, *Gynecological Surgery*. 2021;18(1):5.
13. Vila-Candel R, Martín A, Escuriet R, Castro-Sánchez E, Soriano-Vidal FJ. Analysis of caesarean section rates using the robson classification system at a university hospital in Spain. *International Journal of Environmental Research and Public Health*. 2020;17(5):1575.
14. Tura AK, Pijpers O, De Man M, Cleveringa M, Koopmans I, Gure T, et al. Analysis of caesarean sections using Robson 10-group classification system in a university hospital in eastern Ethiopia: a cross-sectional study. *BMJ open*. 2018;8(4):e020520.
15. Malla RV, Hamal C, Neupane B, Khatri R. Analysis of caesarean section using Robson's 10-group classification at a tertiary level hospital in Nepal. *Medical Journal of Shree Birendra Hospital*. 2018;17(2):4-11.
16. Pravina P, Ranjana R, Goel N, RANJANA R. Caesarean audit using Robson classification at a tertiary care center in Bihar: a retrospective study. *Cureus*. 2022;14(3).
17. Janani L, Christina S, Akoijam BS, Nameirakpam D, Laiphrakpam RS. Analysis of caesarean section rates and its indications using robson's classification at a tertiary care hospital, Manipur. *Indian Journal of Public Health*. 2022;66(4):434-8.
18. Yagi T, Kinose Y, Bun M, Horai M, Matsuda C, Miyake T, et al. Obstetrical outcomes of labor with and without analgesia in Robson classification groups 1 and 2a: a single-center retrospective study. *Journal of Anesthesia*. 2023;37(1):39-48.