

Analysis of Caesarean Sections using the Robson 10-Group Classification System in Dow University Hospital, Karachi

Analysis of CS
using the Robson
10-Group
Classification

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ABSTRACT

Objective: To examine the cesarean section rates of the Robson 10-Group Classification System and the significant obstetric groups contributing to cesarean section at Dow Ojha Hospital, Karachi.

Study Design: Retrospective study.

Place and Duration of Study: This study was conducted at the Department of Obstetrics and Gynecology, Dow Ojha Hospital, Karachi, during the period of 15th March 2026 to 15th May 2026.

Methods: The data were obtained by non-probability consecutive sampling of 4527 delivery records of the period from January 2023 to December 2025. Data was analyzed within eight weeks in month of April 2026 after IRB approval on 10/3/2026.

Results: The total cesarean delivery rate was 38.6%. Group 5 had the highest percentage of cesarean deliveries (45.8%), followed by Group 10 (17.7%) and Group 1 (9.1%). The highest cesarean section rate (100%) was observed in Group 9, and Groups 5 and 6 had a CS rate of 98.6%.

Conclusion: The study revealed that previous cesarean section, preterm pregnancy, and nulliparous women with a primary cesarean section were the biggest factors associated with the increasing rate of cesarean section.

Key Words: Cesarean section, Robson, delivery, reproductive health, maternal health.

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INTRODUCTION

Cesarean section (CS) is a surgical procedure used to deliver a baby through incision in the mother's abdomen and uterus¹. It is the most frequently performed procedure within obstetrics to reduce fetomaternal morbidity and mortality. CS may be life-saving, but unnecessary procedures may lead to unnecessary short- and long-term complications¹. World Health Organization (WHO) reported ideal CS rate of between 10-15%. However, the cesarean delivery rate has increased enormously from the recommended rate in the past few decades¹. The prevalence of CS in Latin America and Caribbean is 40%². The increasing prevalence of CS has become an

important public health issue in both developed and developing countries. Hospitals and health care providers are now being asked to pinpoint the causes of the increased incidence of CS and to take steps to ensure that cesarean delivery is used appropriately².

WHO recommends Robson Ten group Classification System. This system divided women into ten mutually exclusive groups by parity, gestation, presenting part, induction, prior cesarean delivery and the number of fetuses. The system allows health care professionals to determine which groups are the significant contributors to the field of computing rate and to target interventions for those groups². The Robson classification is widely accepted around the world due to its simplicity, repeatability, and applicability to various healthcare systems. The classification system is effective in the study of trends in cesarean deliveries and understanding obstetric practices in low-resource and conflict-affected areas².

Another study conducted in Nigeria showed the value of the Robson classification in the identification of preventable causes of cesarean section in tertiary health care facilities³. The authors also noted that the continuous auditing using Robson system might be able to contribute to the formulation of policies and institutional quality improvement programs. This study confirms the use of Robson classification as a useful audit tool to monitor interventions for CS reduction³. Several actions have been taken in Brazil to reduce

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unnecessary cesarean sections, including the "Project Appropriate Birth", which aimed to promote vaginal delivery if possible and to optimize the practice of obstetricians⁴.

The study found that the multidisciplinary approach, patient education, and standardized labor management procedures adopted in the institutions could have a significant effect on the obstetric outcomes⁴.

The findings of the retrospective analysis in the northern Uganda also showed the value of Robson classification in assessing the obstetric trends in tertiary teaching hospitals⁵. The study also showed significant regional and institutional differences in cesarean rates, indicating that socioeconomic factors, institutional policies, and physician preferences could play a role in the decision to have a cesarean section⁵. Regular auditing using the Robson classification was found to be a potential way to identify unnecessary cesarean sections and help implement interventions to improve the quality of maternal and neonatal care^{6,7}.

The same trend of rising cesarean section rates has also been reported in tertiary care hospitals of Pakistan. Local research showed that Robson Group 5 continues to be one of the highest contributing groups to the overall CS rate. The factors that were shown as important determinants were an increase in repeat cesarean sections, maternal request, delayed referrals, and changes in obstetric practices⁸. The study also highlighted the fact that the Robson classification helps health care workers identify high-priority groups to target interventions. The authors recommended that regular institutional audits can enhance decision-making and safe maternal health services^{8,9}. The local data regarding the cesarean deliveries according to Robson Classification System is limited therefore the aim of this study to analyze trends in CS deliveries using Robson 10 Group Classification System in tertiary care hospital, Karachi and to determine the predominant groups which are responsible for the increasing rate of cesarean section.

METHODS

SAMPLE TECHNIQUE: Non-probability consecutive sampling technique.

Inclusion Criteria: All women who delivered at DOW Ojha Hospital, Karachi during the study period were included. The Robson classification criteria were used to select all vaginal and cesarean deliveries with complete obstetric records for analysis.

Exclusion Criteria: Incomplete medical records, women with termination of pregnancy, women with uterine rupture and laparotomy and women without key obstetric data were excluded.

Data was collected from the electronic medical records of the hospital, delivery registers and patient files of the Department of Obstetrics and Gynecology, Dow Ojha

Hospital, Karachi in a retrospective manner. The information regarding the maternal age, parity, fetal presentation, onset of labour, previous caesarean section, mode of delivery and number of fetuses was collected using a structured proforma. All women eligible were classified according to Robson 10-Group Classification System. The overall cesarean section rate was determined as the proportion of cesarean sections performed to all births. The size of each Robson group, the CS rate and the contribution of each group to the overall CS rate was examined. Data entry and statistical analysis were done with SPSS version 22, within four weeks in Month of (April 2026) after ethical approval was obtained from the Institutional Review Board of Dow University of Health Sciences, Karachi (Reference No. IRB-4467/DUHS/Approval/2026/161, dated 10th March 2026).

RESULTS

During the study period, a total of 4527 deliveries were recorded at DOW Ojha Hospital, Karachi. Of these deliveries, 1747 women had cesarean section, giving an overall cesarean section rate of 38.6% as shown in Table 1.

Table No. 1: Overall Delivery and Cesarean Section Rate

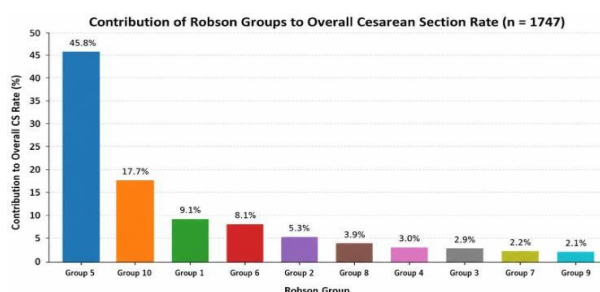
Variable	Frequency	Percentage
Total Deliveries	4527	100%
Total Cesarean Sections	1747	38.6%
Vaginal Deliveries	2780	61.4%

The Robson classification further identified the major obstetric groups contributing to this increasing trend of cesarean deliveries.

In comparison, Group 10 (26.4%) had the highest proportion of women, closely followed by Group 5 (25.2%) of all Robson groups. Groups 1, 7, 8, and 9 had the smallest proportions of the study population. The high percentage of women in Groups 5 and 10 showed significant numbers of previous cesarean sections and preterm pregnancies in the institution. The highest cesarean section rate was seen in Group 9, where all women were delivered by cesarean section. Likewise, Groups 5 and 6 had very high CS rates of 98.6%. The rate of 94.4% was also significantly higher for Group 8. Groups 2, 3, and 4 showed lower cesarean section rates. These data suggest that cesarean-scarred women, abnormal fetal presentation, and high-risk pregnancies were key factors in surgical deliveries. Group 5 was determined to be the most significant group in the overall cesarean section rate, responsible for 45.8% of all cesarean deliveries. Group 10 was the second largest with 17.7%, followed by Group 1 with 9.1% as shown in table 2 and figure 1.

Table No. 2: Distribution of Cesarean Sections According to Robson Ten-Group Classification

Robson Group	Obstetric Characteristics	Number of CS (n)	Total women in the group	Group C/S rate (%)	Contribution to Overall CS (%)
Group 1	Nulliparous, singleton, cephalic, ≥ 37 weeks, spontaneous labor	160	450	35.5%	9.1%
Group 2	Nulliparous, singleton, cephalic, ≥ 37 weeks, induced/pre-labor CS	92	352	26.1%	5.3%
Group 3	Multiparous (no previous CS), singleton, cephalic, ≥ 37 weeks, spontaneous labor	51	211	24.1%	2.9%
Group 4	Multiparous (no previous CS), singleton, cephalic, ≥ 37 weeks, induced/pre-labor CS	52	210	24.8%	3.0%
Group 5	Previous CS, singleton, cephalic, ≥ 37 weeks	800	811	98.6%	45.8%
Group 6	Nulliparous breech	142	144	98.6%	8.1%
Group 7	Multiparous breech	39	45	86.7%	2.2%
Group 8	Multiple pregnancies	68	72	94.4%	3.9%
Group 9	Transverse/oblique lie	36	36	100%	2.1%
Group 10	Singleton, cephalic, < 37 weeks	310	850	36.5%	17.7%

**Figure No.1: Contribution of Robson Groups to Overall Cesarean section Rate (n=1747)**

DISCUSSION

The present study was designed to find the trend of cesarean section in DOW Ojha Hospital, Karachi according to Robson 10-Group classification. The overall CS rate in this study was 38.6% which is significantly higher than the recommended rate by the WHO of 10-15%. The study conducted by Rizwana et al found the same trend of an increasing cesarean rate in tertiary healthcare facilities¹⁰. The reason behind high rate of CS in our study is that our hospital is a tertiary care hospital where intensive care and neonatal intensive care facilities are available. Hospital also receive referrals from Primary and secondary care settings. Based on the present finding, it can be concluded that repeated cesarean section is one of the major contributors to the increased rate of surgical delivery in tertiary hospitals. The study conducted by Guner et al and Gilani et al also reported that the highest rate of cesarean section deliveries was in Group 5. The authors emphasized that the rising trend of repeat cesarean section was due to limited implementation of VBAC protocols and growing preference of clinicians for repeat cesarean section^{2,11}. The second largest group was Group 10 (preterm). The high cesarean rate among Group 10 pregnancies could

be associated with maternal and fetal complications that require urgent obstetric intervention. These results are consistent with other studies^{12,13}. The higher number of surgical deliveries in Groups 5 and 10 may be explained by the fact that these groups were attended by tertiary centres, which are more likely to have complicated cases. The findings of the current study also demonstrated that the contribution of the Group 1 to the total CS burden was significantly higher with a cesarean rate of 35.5% in nulliparous women who were in spontaneous labor. This is clinically important as nulliparous women who have undergone a primary cesarean section are at higher risk of having another cesarean section on their next pregnancy. The key indicator of good obstetric practice is the intrapartum care of women with low risk pregnancies. The study in the private hospitals showed that Group 5 continued to be the predominant group, followed by nulliparous women with induced labor or pre-labor cesarean section¹⁴. Induction of labor without counselling, lower threshold of labor pains and less expertise in instrumental deliveries are responsible for rising trends of CS in nulliparous women.

The extremely high cesarean section rate in the present study was another important observation in groups 6, 7, 8, and 9. Surgical delivery is more commonly performed in breech presentation, multiparity, and abnormal fetal lie due to the risks involved for the mother and fetus in a vaginal delivery. Geze et al. found similar results in Ethiopia, with cesarean section rates significantly higher in women with abnormal presentations and previous cesarean scars. The study found that the Robson classification was able to identify high-risk groups for targeted clinical attention and intervention¹⁴.

The major contributions of CS in our study was Group 5, 10 and 1. Another study conducted in Pakistan observed that the Group 10(50.9%), 5(14.4%) and

1(11.4%) were the major contributors to the CS¹⁵, while a study from India reported Group 1(33.3%), 5(19.7%) and 2(14.6%) were the commonest group¹⁶. Group 2, 5 and 10 was found to be the frequently encountered groups¹⁷.

Strengths and limitations: The present study has a number of strengths as it was conducted with a large number of deliveries in a tertiary care setting, with a standardized WHO recommended classification system. The retrospective design limited the information available on detailed clinical data of indication for cesarean section and maternal and perinatal outcomes. It was a single center study. Despite these limitations our study demonstrated that Robson Classification system is a useful tool to find out the reason of high rates of CS. It should be used on a regular basis to analyze the overall trends of CS. It should be implemented in all primary and secondary care facilities. The results of our study provide some clues to the obstetric groups that are responsible for the trend of cesarean section in Karachi, Pakistan.

CONCLUSION

The rate of CS in our study is 38.6%, which is much higher than the WHO recommended rate of CS. Group 5 had the highest contribution to the overall cesarean section rate followed by Group 10 and Group 1. The findings indicate that repeat cesarean section and preterm deliveries are major factors leading to the increased surgical birth rate, while primary cesarean section among nulliparous women is a minor factor.

Author's Contribution:

Concept & Design or acquisition of analysis or interpretation of data:	Nazia Hakeem, Rabia Jamil
Drafting or Revising Critically:	Kanwal Jan Memon, Wajiha Karim, Tehreem Farooqui
Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

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