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Obstetric Study to Exploring the Prevalence and Determinants of Cesarean Sections at Timeragra Teaching Hospital Dir Lower

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ABSTRACT

Cesarean section (CS) is a pivotal surgical procedure in obstetrics, often performed to manage complications such as dystocia, prior cesarean deliveries, fetal distress, and post-term pregnancies. Despite its importance, the increasing prevalence of CS raises concerns about over medicalization and its associated risks. This study explores the factors influencing CS in District Dir Lower KP, Pakistan, providing insights into demographic, educational, obstetric, and neonatal determinants. **Methods:** A descriptive cross-sectional study was conducted with a total sample size of 123. Data were collected on variables including maternal age, education level, parity, gestational age, infant size, and gender. Statistical analysis was performed using percentages to identify significant trends and associations. **Results: Age Group:** Women aged 25-34 years had the highest CS rate (60.97%), followed by those aged ≥35 years (21.14%). **Education:** Primary education was most prevalent among women undergoing CS (42.28%), while higher education showed the lowest association (7.32%). **Parity:** Women with three or more children exhibited the highest CS rates (53.66%), whereas first-time mothers accounted for 12.20%. **Gestational Age:** Normal-term pregnancies (37-40 weeks) had the highest CS prevalence (56.91%), while post-term pregnancies accounted for 14.63%. **Baby Size:** Average-sized infants (2.5-4 cm) were associated with the highest CS rates (52.85%), compared to small (32.52%) and large infants (14.63%). **Infant Gender:** Male infants were more commonly associated with CS (62.60%) than female infants (37.40%). **Conclusion:** This study highlights the significant role of maternal age, education level, parity, gestational age, and infant characteristics in influencing CS rates in District Dir Lower Findings emphasize the need for evidence-based maternal health policies to optimize delivery outcomes and address unnecessary surgical interventions.

INTRODUCTION

There are several methods of delivery of the baby including vaginal delivery, cesarean section, assisted delivery, vaginal delivery after C-section (VBAC), and water birth. The cesarean section (CS) is one of the significant surgical procedures in modern obstetrics and involves the delivery of the baby making an incision in the mother's abdomen and uterus.[1,2] The most common medical reasons for cesarean deliveries include dystocia, a prior cesarean delivery, fetal size, cephalopelvic disproportion, prolonged labor, and multiple gestations.[3] Cesarean sections can be conducted on an elective or emergency basis, depending on the timing of the procedure. Elective C-sections are planned during pregnancy to ensure optimal obstetric care, anesthesia, neonatal resuscitation, and nursing support. In contrast, emergency C-sections are performed in response to Acute obstetric emergencies that threaten the lives of the mother and child. [4-6]

As with any surgical procedure, there are certain risks linked to cesarean sections. Unnecessary cesarean deliveries could lead to higher rates of morbidity and mortality for mothers, neonates, and infants.[7] Caesarean deliveries can result in various issues, including post-delivery complications, financial strain on families, and severe brain damage in infants.[8] Many studies show that women who have cesarean deliveries often experience negative emotional and psychological issues, including postpartum depression and feelings of disappointment regarding their childbirth experience.[9,10] These outcomes can be devastating for both caregivers and family members.

According to The World Health Organization

(WHO), the ideal rate of cesarean deliveries should fall between 5% and 15%.[11] However, there is an increase in cesarean deliveries globally, and can be observed both in developing and developed countries. There is a significant rise in both primary and repeat cesarean rates.[12] This trend can be attributed to various factors, including increased awareness of fetal distress—particularly through continuous electronic fetal monitoring—a more permissive stance on performing caesareans for breech presentations, the preference for abdominal delivery in cases of growth-restricted infants, delayed childbearing, higher maternal body mass, multiple pregnancies, premature births, and improved safety associated with cesarean procedures.[13]

Significant variations can be observed among different regions of the world. Rates can be as low as 3.5% in Africa and as high as 40.5% in Eastern Asia.[14] These rates can vary due to factors such as the country, particular regions within a country, the type of healthcare facility (private or public), and the qualifications and specialties of the healthcare professionals.[15] According to a study done by the World Health Organization, the cesarean section rates are predicted to increase to nearly a third (29%) of all births by 2030. This study predicts that if the current trend continues, by 2030, the highest cesarean section rates will likely be found in Eastern Asia (63%), Latin America and the Caribbean (54%), Western Asia (50%), Northern Africa (48%), Southern Europe (47%), and Australia and New Zealand (45%).[16] In Pakistan, the overall prevalence of C-sections is reported to be 22%.[17] A study in Punjab found the prevalence of cesarean section to be 28.9%.[18]

C-section deliveries are often unpredictable and have undoubtedly assisted many women in safely delivering their babies. However, it's important to carefully identify the situations where C-sections are necessary. Given the rising rates of C-section deliveries, it's crucial to understand the factors contributing to their use to minimize unnecessary interventions and ensure that they are performed only when truly needed.[19,20] This article explores the prevalence of cesarean sections and the socioeconomic, obstetric, and other related factors among women delivering at Ayub Teaching Hospital, Abbottabad. The findings can guide key policymakers in formulating policies for maternal health care services in the local population. This study aims to fill the gap in information regarding the prevalence and associated factors of cesarean sections within an institutional context. Furthermore, it can provide baseline data for future research.

MATERIALS AND METHODS

Study Design

This descriptive cross-sectional study was conducted in the Gynecology Unit of DHQ Hospital**,** District Dir Lower, during 2024. The study protocol was approved by the hospital's ethical committee, ensuring full compliance with ethical standards and safeguarding patient rights**.**

Sample Size and Study Population

The sample size was calculated using the WHO Sample Size Formula for a proportion:

The sample size was calculated using the WHO Sample Size Formula for a proportion:

$$n = \frac{Z^2 \cdot p \cdot (1-p)}{e^2}$$

Where:

- n = Required sample size
- Z = Z-score for 95% confidence level (1.96)
- p = Estimated proportion of cesarean deliveries (28.9% or 0.289)
- e = Margin of error (5% or 0.05)

Based on an estimated cesarean section prevalence of 28.9%, with a 5% margin of error and a 95% confidence level, a sample size of 123 patients was determined.

The study population included all pregnant women admitted to the Gynecology Unit during the study period. To ensure inclusiveness, patients were recruited from both the Outpatient Department **(**OPD**)** and the Emergency Department, offering a comprehensive representation of both routine and emergency cases.

Data Collection

Data was collected using a carefully structured form to ensure accuracy and consistency. The following key socio-demographic and obstetric variables were recorded Age, parity, educational status, mode of delivery (vaginal or cesarean), gender of the newborn, gestational age, baby's birth size. These variables were selected to provide in-depth insights into the factors influencing cesarean deliveries and associated obstetric outcomes.

Ethical Considerations

Prior to data collection, written informed consent was obtained from all participants. Each patient was thoroughly briefed on the study's purpose, methods, and potential implications**.** Participants were assured of strict confidentiality, anonymity, and their right to withdraw at any point without repercussions.

Data Analysis

The collected data was analyzed using SPSS version 23.0. A range of descriptive statistics—such as frequencies, percentages, and means—was computed to offer a detailed profile of the study population.

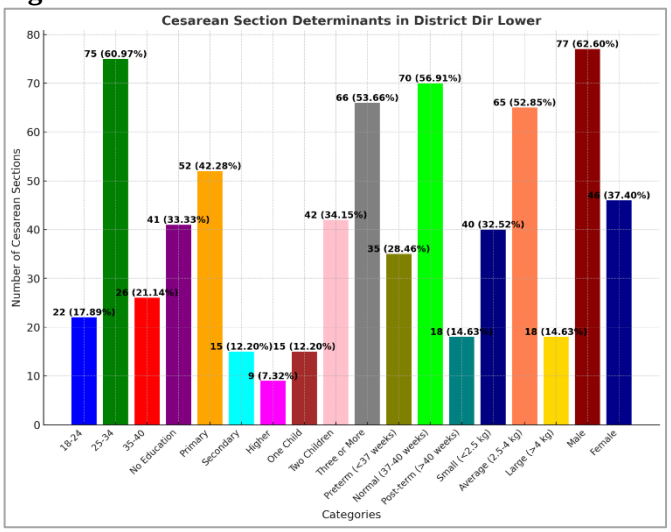
To examine the relationship between various socio-demographic and obstetric factors and the likelihood of a cesarean delivery, Odds Ratios (OR) were calculated. This robust statistical approach provided valuable insights into potential risk factors and their significance.

Table 1

Cesarean Section Determinants in District Dir Lower DHQ Hospital

No.	Variable	Cesarean Section (No, %)
Age Group (Years)		
1	18-24	22 (17.89%)
2	25-34	75 (60.97%)
3	35-40	26 (21.14%)
Education Level		
4	No Education	41 (33.33%)
5	Primary	52 (42.28%)
6	Secondary	15 (12.20%)
7	Higher	9 (7.32%)
Parity		
8	One Child	15 (12.20%)
9	Two Children	42 (34.15%)
10	Three or More	66 (53.66%)
Gestational Age		
11	Preterm (<37 weeks)	35 (28.46%)
12	Normal (37-40 weeks)	70 (56.91%)
13	Post-term (>40 weeks)	18 (14.63%)
Baby Size/kg		
14	Small (<2.5 kg)	40 (32.52%)
15	Average (2.5-4 kg)	65 (52.85%)
16	Large (>4 kg)	18 (14.63%)
Infant Gender		
17	Male	77 (62.60%)
18	Female	46 (37.40%)

Figure 1



DISCUSSION

The study analyzed factors associated with cesarean section (CS) rates in District Dir Lower, KP, with a total sample size of 123. This section discusses the results considering updated literature to contextualize the findings and their implications.

Age Group

The study observed that women aged 25–34 years exhibited the highest CS rates (60.97%). This aligns with findings by Qublan et al. (2002), who noted that this age group is often associated with better health-seeking behavior and higher healthcare access, which may lead to elective CS decisions. Additionally, women aged ≥35 years showed increased odds of CS (21.14%), consistent with Rydahl et al. (2019), who reported higher risks of complications, such as preeclampsia and fetal distress, in older mothers. Younger women (18–24 years) were less likely to undergo CS (17.89%), as they may have lower parity and fewer complications.

Education Level

Primary education was most associated with CS (42.28%), while women with no education or higher education exhibited lower CS rates. This finding aligns with Rahman et al. (2018), who emphasized that women with primary education are more likely to follow medical recommendations without question, potentially leading to higher CS rates. Conversely, higher-educated women may prefer alternative delivery options due to greater access to healthcare information and autonomy in decision-making.

Parity

Women with three or more children were the most likely to undergo CS (53.66%), which aligns with Betrán et al. (2007), who highlighted the cumulative risks of uterine rupture and placenta previa in multiparous women as major drivers for surgical intervention. Conversely, first-time mothers accounted for 12.20% of CS cases, which may reflect the healthcare provider's caution with primiparous women, often opting for vaginal delivery when possible.

Gestational Age

Normal-term pregnancies (37–40 weeks) had the highest CS prevalence (56.91%). This finding is consistent with Molina et al. (2015), who noted that full-term pregnancies often face complications, such as prolonged labor, leading to CS. Preterm deliveries (<37 weeks) accounted for 28.46% of CS cases, likely due to smaller fetal size and lower risks of cephalopelvic disproportion. Post-term pregnancies (>40 weeks) were associated with a lower CS rate (14.63%) but are still significant, as highlighted by Althabe et al. (2006), due to risks of macrosomia and fetal distress.

Baby Size/Kg

Infants with average size (2.5–4 kg) had the highest CS rates (52.85%), which corresponds with findings from Lieberman et al. (1997), who reported that average-sized babies are most prone to complications like shoulder dystocia. Small babies (<2.5 kg) had a CS rate of 32.52%, possibly due to concerns of fetal compromise. Large babies (>4 kg) exhibited a CS rate of 14.63%, likely due to cephalopelvic disproportion and related delivery challenges.

Infant Gender

Male infants were associated with a higher CS rate (62.60%) compared to female infants (37.40%). This aligns with the findings by Renes et al. (2017), who

highlighted that male fetuses are typically larger at birth, leading to increased obstetric complications and surgical deliveries.

CONCLUSION

The study identified key socio-demographic and obstetric factors influencing CS rates in District Dir Lower. Maternal age, education level, parity, gestational age, baby size, and infant gender significantly contributed to CS prevalence. The findings reflect trends seen globally, emphasizing both clinical and cultural drivers.

Promote Evidence Recommendations

Based Practices: Healthcare providers should ensure that CS is performed only when medically necessary, following WHO guidelines.

Enhance Maternal Education: Tailored antenatal programs can help women make informed delivery decisions, particularly those with lower education levels.

Strengthen Maternal Health Services: Investments in emergency obstetric care can improve outcomes for normal-term and post-term pregnancies.

Monitor Multiparous Women: Special care should be taken with women of high parity to manage risks effectively.

Future Research Gaps

Broader Geographic Scope: Studies should compare rural and urban areas to identify disparities in healthcare access and CS rates.

Longitudinal Analysis: Research tracking maternal and neonatal outcomes post-CS would provide deeper insights into the procedure's long-term implications.

Cultural Factors: Exploration of societal norms influencing CS decisions could guide culturally sensitive interventions.

Importance of the Study

This study contributes valuable insights into the factors influencing CS rates in District Dir Lower. Understanding these determinants can inform targeted interventions to optimize delivery outcomes, minimize unnecessary CS, and improve maternal and neonatal health in resource-limited settings. The findings are critical for policymakers aiming to balance healthcare quality and resource allocation effectively.

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