TRENDS AND OUTCOMES OF CESAREAN DELIVERIES IN MANAS, JALAL-ABAD, KYRGYZSTAN: A CROSS-SECTIONAL STUDY ON PREVALENCE AND CONTRIBUTING FACTORS

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ABSTRACT

Background: Cesarean section (CS) rates have risen dramatically worldwide, exceeding the World Health Organization (WHO) recommended threshold of 10–15%. In Kyrgyzstan, national CS rates have more than doubled over the past decade, reaching 13–14% nationally and up to 20–38% in individual institutions. Despite this trend, region-specific data from smaller districts such as Manas, Jalal-Abad, remain sparse, limiting the ability to monitor and optimize local obstetric practice.

Objectives: This study aimed to (i) determine the CS rate in Manas over the study period, (ii) identify the most common indications for CS, and (iii) evaluate associated maternal and neonatal outcomes, including postoperative complications.

Methods: A cross-sectional study was conducted from December 1, 2025, to March 7, 2026, in Manas, Jalal-Abad, Kyrgyzstan. A structured questionnaire was administered via Google Forms to 65 eligible women (women who had experienced pregnancy or delivered more than one child). Descriptive statistics were computed using Microsoft Excel and SPSS.

Results: The overall CS rate was 41.5% (n=27/65), substantially higher than the WHO-recommended range. The most frequently identified indication was premature rupture of membranes (PROM), with preeclampsia representing the predominant maternal complication. Neonatal outcomes were largely favorable; however, a minority of neonates required NICU admission. A total of 43.1% of participants reported a prior CS history, and 72.3% delivered in private facilities.

Conclusion: The CS rate in Manas substantially exceeds WHO recommendations and mirrors rising operative delivery trends observed across Kyrgyzstan and globally. While favorable maternal and neonatal outcomes affirm the clinical utility of CS in high-risk presentations, the elevated rate underscores the need for evidence-based guidelines, standardized indications, and systematic monitoring to curtail medically unwarranted procedures.

Keywords: cesarean section, obstetric outcomes, PROM, preeclampsia

ТЕНДЕНЦИИ И РЕЗУЛЬТАТЫ КЕСАРЕВА СЕЧЕНИЯ В МАНАСЕ, ДЖАЛАЛ-АБАД, КЫРГЫЗСТАН: ПОПЕРЕЧНОЕ ИССЛЕДОВАНИЕ РАСПРОСТРАНЕННОСТИ И ФАКТОРОВ, СПОСОБСТВУЮЩИХ ЭТОМУ

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АННОТАЦИЯ

Введение: Показатели кесарева сечения (КС) резко возросли во всем мире, превысив рекомендуемый Всемирной организацией здравоохранения (ВОЗ) порог в 10–15%. В Кыргызстане национальные показатели КС за последнее десятилетие увеличились более чем вдвое, достигнув 13–14% в масштабах страны и до 20–38% в отдельных учреждениях. Несмотря на эту тенденцию, региональные данные по небольшим районам, таким как Манас, Джалал-Абад, остаются скудными, что ограничивает возможности мониторинга и оптимизации местной акушерской практики.

Цели: Целью данного исследования было (i) определить частоту кесарева сечения в Манасе за исследуемый период, (ii) выявить наиболее распространенные показания к кесареву сечению и (iii) оценить связанные с этим исходы для матери и новорожденного, включая послеоперационные осложнения.

Методы: Было проведено поперечное исследование с 1 декабря 2025 года по 7 марта 2026 года в Манасе, Джалал-Абад, Кыргызстан. Структурированная анкета была распространена через Google Forms среди 65 женщин, отвечающих критериям отбора (женщины, имевшие беременность или родившие более одного ребенка). Описательная статистика была рассчитана с использованием Microsoft Excel и SPSS.

Результаты: Общая частота кесарева сечения составила 41,5% (n=27/65), что значительно выше рекомендованного ВОЗ диапазона. Наиболее часто выявляемым показанием было преждевременное излитие околоплодных вод (ПРОВ), при этом преобладающим материнским осложнением являлась преэклампсия. Неонатальные исходы в основном были благоприятными; однако меньшинству новорожденных потребовалась госпитализация в отделение интенсивной терапии новорожденных (ОИТН). В общей сложности 43,1% участниц исследования сообщили о наличии в анамнезе кесарева сечения, а 72,3% родов проходили в частных клиниках.

Заключение: Показатель кесарева сечения в Манасе значительно превышает рекомендации ВОЗ и отражает растущую тенденцию к оперативным родам, наблюдаемую в Кыргызстане и во всем мире. Хотя благоприятные материнские и неонатальные исходы подтверждают клиническую целесообразность кесарева сечения при высоком риске, повышенный показатель подчеркивает необходимость научно обоснованных рекомендаций, стандартизированных показаний и систематического мониторинга для сокращения числа медицински необоснованных процедур.

Ключевые слова: кесарево сечение, акушерские исходы, ПРОВ, преэклампсия

1. INTRODUCTION

Cesarean section (CS) has evolved from an emergency lifesaving procedure into one of the most frequently performed surgical operations in contemporary obstetrics. Its dual role as a critical intervention in complicated deliveries and as an increasingly utilized elective procedure has fueled a global rise in operative delivery rates. The World Health Organization (WHO) recommends that CS rates should not exceed 10–15% of total deliveries [1]; however, current global figures consistently surpass this threshold, raising concerns about the clinical

necessity of non-medically indicated procedures and their consequences for maternal and neonatal health.

While CS, when appropriately indicated, is associated with reduced perinatal morbidity and mortality, it carries significant short- and long-term risks. Immediate postoperative complications include hemorrhage, wound infection, and prolonged hospitalization, whereas long-term reproductive risks encompass abnormal placentation, placenta accreta spectrum, and uterine rupture in subsequent pregnancies [2].

The relationship between CS indications and postoperative morbidity is well established. Rehu and colleagues [3] demonstrated that among patients undergoing primary CS, the incidence of postoperative endometritis was 9.8% and wound infection was 6.8%, with longer labor duration and a greater number of vaginal examinations correlating strongly with febrile morbidity. Similarly, a systematic review and meta-analysis by Mascarello et al. [4] reported that CS performed without medical indication was associated with approximately three-fold higher odds of maternal death (OR = 3.10; 95% CI: 1.92–5.00) and postpartum infection (OR = 2.83) compared with vaginal delivery.

Multi-country evidence has further demonstrated that both the underuse and overuse of CS negatively affect maternal and neonatal outcomes, reinforcing the imperative of balanced, evidence-based utilization [5]. To facilitate standardized monitoring, the WHO endorses the Robson Ten-Group Classification System (TGCS) as an internationally applicable framework for assessing, auditing, and comparing CS rates within and between healthcare facilities. The Robson system classifies all women into one of ten mutually exclusive and comprehensively inclusive groups based on five fundamental obstetric characteristics routinely collected at delivery: parity, number of fetuses, previous CS, onset of labor, gestational age, and fetal presentation [6].

Cesarean section rates in Kyrgyzstan have more than doubled over the past decade, rising from approximately 6.3% to 13–14% nationally. In certain institutions, rates range from 20% to 38%, and more than 20,000 cesarean operations are now performed annually across the country. Despite growing global attention to CS trends, published data from Central Asian regions, and particularly from smaller districts such as Manas, Jalal-Abad, remain limited. Understanding local trends and their associated maternal-neonatal outcomes is essential for evaluating the appropriateness of CS utilization and for informing targeted improvements in obstetric care. Accordingly, this study aims to evaluate the trends and outcomes of cesarean deliveries in Manas, Kyrgyzstan, and to generate region-specific evidence that may contribute to the optimization of maternal and neonatal health services.

1.1 Objectives

(i) To determine the cesarean section rate in Manas over the study period.

(ii) To identify the most common indications for cesarean section among women delivering in Manas.

(iii) To evaluate maternal and neonatal outcomes following cesarean section, including postoperative complications and selected neonatal outcomes.

1.2 Rationale

Cesarean section remains an indispensable, life-preserving mode of delivery. However, the global and national upward trend in CS rates raises concerns about unnecessary operative procedures and their associated complications. This study was undertaken to analyze local

CS trends and outcomes, identify areas requiring improvement in obstetric care, and support evidence-based clinical decision-making to enhance maternal and neonatal safety in Manas, Kyrgyzstan.

2. METHODOLOGY

2.1 Study Design and Setting

A cross-sectional observational study was conducted at Manas, Jalal-Abad, Kyrgyzstan. The study period extended from December 1, 2025, to March 7, 2026.

2.2 Study Population and Sampling

A total of 65 women participated. The inclusion criteria comprised women who had experienced at least one pregnancy or had delivered more than one child. Women who had never been pregnant were excluded. Convenience sampling was employed given the scope and duration of the study.

2.3 Data Collection Instrument

A structured questionnaire was developed and administered via Google Forms. The questionnaire collected information on sociodemographic characteristics (age, education, marital status, employment, and residence), obstetric history (number of prior pregnancies and deliveries, previous CS), prenatal care practices, comorbidities, mode of delivery, and maternal and neonatal outcomes. Data were compiled in Microsoft Excel and analyzed using SPSS.

2.4 Ethical Considerations

Approval was obtained from the institutional academic leadership and the relevant hospital authority prior to data collection. Participant anonymity and confidentiality of all personal health information were strictly maintained throughout the study. Participation was voluntary, and informed consent was obtained from all respondents.

3. RESULTS

3.1 Sociodemographic Characteristics

A total of 65 women participated in the study. The majority belonged to older reproductive age groups: 38.5% (n=25) were above 32 years of age, followed by 32.3% (n=21) aged 17–22 years, 21.5% (n=14) aged 23–28 years, and 7.7% (n=5) aged 29–32 years. Regarding educational attainment, 84.6% (n=55) were college graduates, 13.8% (n=9) had completed secondary schooling, and 1.5% (n=1) reported homeschooling. Marital status indicated that 67.7% (n=44) were married and 32.3% (n=21) were unmarried. In terms of employment, 69.2% (n=45) were employed outside the home, while 30.8% (n=20) were housewives. The majority of participants resided in urban areas (87.7%, n=57), with 12.3% (n=8) from rural settings. With respect to prior children, 36.9% (n=24) had none, 26.2% (n=17) had one child, 26.2% (n=17) had two children, and 10.8% (n=7) had more than two children.

Table 1. Sociodemographic characteristics of study participants (n=65)

Variable	Frequency (n=65)	Percentage (%)
Age Group		
17–22 years	21	32.3%

Variable	Frequency (n=65)	Percentage (%)
23–28 years	14	21.5%
29–32 years	5	7.7%
Above 32 years	25	38.5%
Education Level		
College graduate	55	84.6%
Secondary school	9	13.8%
Homeschooled	1	1.5%
Marital Status		
Married	44	67.7%
Unmarried	21	32.3%
Employment Status		
Employed	45	69.2%
Housewife	20	30.8%
Residence		
Urban (City)	57	87.7%
Rural (Village)	8	12.3%
Number of Children		
None	24	36.9%
One	17	26.2%
Two	17	26.2%
More than two	7	10.8%

3.2 Prenatal Care Utilization

Regarding antenatal care practices, 46.2% (n=30) of participants attended prenatal checkups at their own convenience, 27.7% (n=18) followed the American College of Obstetricians and Gynecologists (ACOG) schedule of 6–10 visits, 20.0% (n=13) adhered to the WHO-recommended schedule of 10–15 visits, and 6.2% (n=4) relied exclusively on homeopathic methods without formal medical consultation.

Table 2. Prenatal care attendance practices among participants

Prenatal Care Practice	Frequency	Percentage (%)
At own convenience	30	46.2%
Per ACOG schedule (6–10 visits)	18	27.7%
Per WHO schedule (10–15 visits)	13	20.0%
Solely relying on homeopathy	4	6.2%

3.3 Cesarean Section History and Delivery Setting

Among all respondents, 43.1% (n=28) reported a previous history of CS, while 56.9% (n=37) had no prior CS. The majority of participants delivered in private hospitals (72.3%, n=47), while 27.7% (n=18) delivered in public facilities.

Table 3. Prior CS history and delivery setting

Variable	*Frequency*	*Percentage (%)*
Previous History of CS — Yes	28	43.1%
Previous History of CS — No	37	56.9%
Delivered in Private Hospital	47	72.3%
Delivered in Public Hospital	18	27.3%

3.4 Maternal Complications and Neonatal Outcomes

Among the obstetric complications documented, anemia was the most prevalent condition, identified in more than 40 participants during the current pregnancy. Gynecological infections were reported by a minority, with candidiasis being the most common. Sexually transmitted infections (STIs) were uncommon in this cohort, with genital herpes representing the most frequently noted STI. A small proportion of participants were affected by Botkin's disease (hepatitis A) and ovarian or uterine disorders, including adenomyosis and uterine fibroids. The majority of women did not report significant antepartum complications; however, a notable subset experienced multiple complications requiring close monitoring.

Regarding mode of delivery and its outcomes, the overall CS rate was 41.5% (27 of 65 deliveries). Premature rupture of membranes (PROM) was the most commonly identified indication for CS, with a close correspondence between PROM occurrence and operative delivery. Postoperative complications, including infection, hemorrhage, and need for intensive care, were observed in a subset of women following CS. Neonatal outcomes were predominantly favorable, with more than 40 neonates born healthy. A small proportion of neonates required NICU admission. Postpartum depression was reported in a minority of mothers. Intrauterine fetal death (IUFD) was documented in a small number of participants, though survivors confirmed the event did not adversely affect their current pregnancy.

4. DISCUSSION

The present cross-sectional study, conducted in Manas, Kyrgyzstan, from December 1, 2025, to March 7, 2026, evaluated trends, indications, and outcomes of cesarean deliveries among 65 women. The overall CS rate of 41.5% substantially exceeds the WHO-recommended range of 10–15% [1], reflecting the broader global trend of rising operative deliveries observed over recent decades. The predominant indication was PROM followed by inadequate labor progression, while preeclampsia emerged as the leading maternal complication. Neonatal outcomes were generally favorable, with most infants healthy at birth, though a minority required NICU admission. These findings underscore the clinical importance of timely CS intervention in high-risk obstetric presentations while simultaneously highlighting the growing reliance on operative delivery in this region.

At a global level, the CS trends observed in Manas are consistent with rising rates documented in middle- and low-income countries, where factors such as improved access to institutional

delivery, increasing maternal health awareness, and evolving provider practices collectively contribute to higher operative delivery rates [7]. Evidence indicates that CS, when medically warranted, substantially reduces perinatal morbidity and mortality; however, excessive utilization beyond clinical necessity introduces long-term maternal reproductive risks, including placenta accreta spectrum and repeat surgical morbidity [8].

A regional comparison within Kyrgyzstan and Central Asia further contextualizes these findings. A retrospective analysis of national CS data across the Kyrgyz Republic over an 11-year period demonstrated a nearly three-fold increase in CS rates, accompanied by improvements in maternal and perinatal survival [9]. The Manas data thus reflect a broader, systematic shift in obstetric practice within Kyrgyzstan, emphasizing the importance of standardizing CS indications and implementing outcome monitoring frameworks to optimize both maternal and neonatal health.

International comparisons provide additional perspective. During China's One Child Policy era, CS rates escalated dramatically, with urban facilities reporting rates of 46–50%, driven primarily by parental preference to minimize perceived risk to their only child, prevailing sociocultural norms, and medicolegal considerations [10, 11]. Although Kyrgyzstan does not operate under equivalent population-control policies, the elevated local CS rate may similarly reflect increasing maternal preference for operative delivery, enhanced access to institutional care, and physician tendencies toward risk-averse clinical decisions. This parallel highlights how sociocultural context and health policy frameworks influence CS utilization patterns and underscores the necessity of context-sensitive clinical guidelines.

Comparative trends in India further illustrate these patterns. Rising CS rates in urban and private hospital settings in India have been attributed to socioeconomic status, maternal age, and prior CS history [12], mirroring the demographic profile observed in our cohort—where 72.3% of participants delivered in private facilities and 43.1% had a prior CS. These findings reinforce the multifactorial nature of CS utilization, encompassing medical, demographic, and sociocultural determinants [1].

From a clinical outcome perspective, the generally favorable maternal and neonatal results observed in Manas, despite elevated CS prevalence, affirm the utility of operative delivery in appropriately selected cases such as PROM and preeclampsia. Nevertheless, global evidence cautions that rising CS rates, particularly in resource-limited settings, may engender long-term complications, including placenta accreta, uterine rupture, and cumulative surgical morbidity [1]. Systematic monitoring, adherence to evidence-based indications, and comprehensive patient counseling are therefore essential to ensure that the benefits of CS continue to outweigh its risks in this setting.

5. CONCLUSION

This cross-sectional study documented a CS rate of 41.5% in Manas, Jalal-Abad, Kyrgyzstan—nearly three times the upper limit of the WHO-recommended range. The findings align with rising CS trends observed nationally and globally. PROM was the most common operative indication, and while maternal and neonatal outcomes were largely favorable, the elevated CS rate signals a need for renewed attention to evidence-based practice. Adoption of the Robson Ten-Group Classification System for ongoing CS auditing, investment in provider education, and strengthening of antenatal counseling services are recommended as priority interventions. Future prospective and multi-center studies with larger sample sizes are warranted to generate more robust epidemiological data for Kyrgyzstan and the Central Asian region.

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