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Original Article

# Obstetric Factors Contributing to the Rising Trend of Cesarean Deliveries at Sheikh Khalifa Bin Zaid Hospital, Rawlakot

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## Abstract

The study aimed to assess the rate of cesarean section and to analyse the risk factors contributing to C-sections to introduce measures to check unwanted, non-medical reasons to go for a C-section. The study was retrospectively conducted at Sheikh Khalifa Bin Zaid Hospital Rawlakot Azad Kashmir on 5226 normal deliveries and 1604 C-sections. The rate was found to be 30.6%, more than the recommended rate by WHO (10-15 %). The major contributing factor was the previous scar (41.6%). The most prevalent indications were foetal distress (14%), older age more than 35 years (6 %), obstructed labour (1.9 %), failed IOL (1.6 %), failure of progress of labour (1.8 %), multiple pregnancies (1.74 %), PIH (0.99 %), meconium aspiration (1.62 %), placental problems (1.8 %), only one patient (0.06 %) requested for elective caesarean and other risk factors were also seen (18 %) in aggregate. The study concluded that at SKBZ hospital C-sections were overused. The study was conducted with a limited sample size only in one high-standard hospital in Rawalakot Azad Jammu and Kashmir, where the demographic characteristics of the patients were almost similar. Yet, it will be better to repeat the same kind of study in other hospitals of the AJK with larger sample sizes and with varying population characteristics and facilities, including populations from both the urban as well as from rural areas to get a clear understanding based on these differences to and generalize the results. The findings of this study will contribute to theory and practice and will be helpful to the government functionaries in healthcare planning.

**Keywords:** Cesarean Section Study, Placental Problems, Obstructed Labour, Failure of Progress of Labour, Multiple Pregnancies.

## Introduction

The cesarean or C-Section carries risk for the mother and to some extent for the baby as it is a major surgery that involves increased healthcare utilization, a relatively larger hospitalization period, needs time to recover, and greater expenditures as compared to the normal vaginal delivery (Downe, 2008). C-section was initially performed in 715 BC for the survival of the baby after the death of the mother (Dhakal-Rai, 2021). Later it was performed for the survival of both the mother and the baby when antiseptics and anaesthetics were introduced in the 1800s. Ferdinand Adolf Kehrer was the first gynaecologist who performed the first-ever modern C-section in Germany in 1881(West, 2021). Sometimes C-section is performed in an emergency and sometimes it is planned to alleviate the agony of the mother caused by other medical issues. There are various causes to perform C-section which involves religion, profession, affordability, and development in technology (Perkins, 2023). A study conducted in America to measure the C-section rate reported that the C-section rate in the USA was 34% in 2009 while in 2012 rate of C-sections in China was 46%, 25% and above in Asian, European, and Latin American countries (Nderitu,2 022). In 2015 Rate of C-section was 16% in Pakistan (Baluchistan 1.3%, KPK 3.2%, Sindh 23%, Punjab 28%, and Islamabad 33% (Mir *et al*., 2013). A survey was carried out by the Pakistan Demographic and Health Survey (PDHS) in 2012-13 which studied the determinants of cesarean in Pakistan on a national level. PDHS provided comprehensive information on demographic, maternal, and child health indicators.

### Aim of the Study

This research seeks to determine the most common factors leading to C-sections in Rawlakot, to inform evidence-based practices to minimize unnecessary C-sections and promote preventive measures among women, thereby curbing the increasing rate of C-sections. Hence the study will contribute to improving medical, social, and physical well-being as well and the economic loss of the target population will be reduced. The current study is going to establish a ground for descriptive and exploratory studies in AJK state about the C-section phenomenon (Ajayi, 2021). Being the first and foremost academic investigation in this area of study this work is confronting a lot of issues in finding data, establishing methodology, and analyzing facts. To set up a ground for work the study aims for this work is divided into three levels,

**Level 1**: This level is the most basic and primary. This level aims to find the rate of caesarean sections out of total deliveries in a specific period. For this purpose, 'n' will denote the total number of C-sections performed during the period under study, 'N' will be the total number of deliveries and %age will be calculated by following the formula %age of C-section=n/N (100)
**Level 2:** The secondary level aims to find common and repeated factors associated with C-sections at SKBZH, Rawalakot.
**Level 3:** A tertiary level formulated to find the most common risk factor among all prevalent factors at SKBZH, Rawalakot, and in this level all the factors will be arranged in an order according to their initiation.

## Method

To achieve the specific aims outlined previously, retrospective data from hospital records were collected for analysis. This research implies a cross-sectional study of secondary data of the obstetric patient as a unit of analysis. A retrospective study was conducted on secondary data collected from Sheikh Zaid Hospital, Rawlakot during the year 2022-23. The study population was all (5226) females who delivered at Sheikh Zaid Hospital, Rawlakot. Duration of study was one year i.e. 1st June to 31st July 2023. The total number of deliveries and C-sections performed in this period was 5226 and 1604 respectively. A coding sheet as a measure was prepared to code the variables for analysis along with demographics. Age was the only demographic that was considered for this study as other demographics like social status, education, occupation, etc., were not recorded.

**Table 1**

*Operationalization of Key Variables under Study*

| Variable | Conceptualization | Operationalization |
|---|---|---|
| Previous Scar | A mark is left on the skin after an incision is healed. | A mark left on abdominal skin after incision to deliver foetus, is healed. |
| Fetal distress | Fatal distress is an uncommon complication of labour. It typically occurs when the foetus has not been receiving enough oxygen. | Foetal distress or non-reassuring foetal status occurs when a baby`s oxygen supply is compromised in the womb. This ends up with a C-section. |
| Maternal age | The age of the mother at the time of delivery. | This study defines maternal age as 35 or more at delivery. |
| Breech presentation | A breech birth occurs when a baby is born bottom first instead of head. | The abnormal position is termed breech in this study, where the baby exits the pelvis with a part other than the head (foot, shoulder, buttocks, hand). |
| Obstruct labor | Obstructed labor is when even the uterus contracts routinely, but foetus does not exodus the pelvis due to being clogged. | This study consumes the term as a phenomenon during childbirth when a baby is physically blocked in the birth canal. |
| Failed induction of labour | The artificial initiation of labor that does not work. Not all failed IOL cases need a C-Section. | Failed IOL is the inability of the cervix to dilate above 4 centimetres after 12 +- 3 hrs of oxytocin administration. This study considers only those cases that need a C-Section. |
| Others | "Used to refer to a person or thing that is different or distinct from one already mentioned or known about" | All conditions or variables other than those defined here, that are causing C-section. |

**Inclusion Criteria**

All vaginal deliveries
All booked patients during the antenatal period for which C-section was indicated later
All non-booked patients were admitted in early labor for which C-section was indicated later.
All cases come in emergencies at any time during the study for whom a C-section was indicated later.

**Exclusion Criteria**

All non-pregnant females
Ectopic pregnancies
Cases of ruptured uterus revealed on laparotomy
Cases referred to any other institution

**Research Question**

This study is structured around three primary objectives, providing a framework for investigation

RQ1- What is the rate of C-sections in SKBZH, Rawlakot?
RQ2- What are the major factors contributing to C-sections in SKBZH, Rawlakot?
RQ3- What is the most prevalent factor contributing to C-sections in SKBZH, Rawlakot?

## Results and Findings

Level 1 was the most basic and primary, formulated to find the rate of caesarean sections out of total deliveries in a specific period. For this purpose, the following formula C-section=n/N (100) was used. Table 3.1 displays the percentage of C-sections (1604/5226 (100) as 30.6%. Hence the results show that the caesarean rate is twice the recommended rate of WHO i.e., 10-15%.

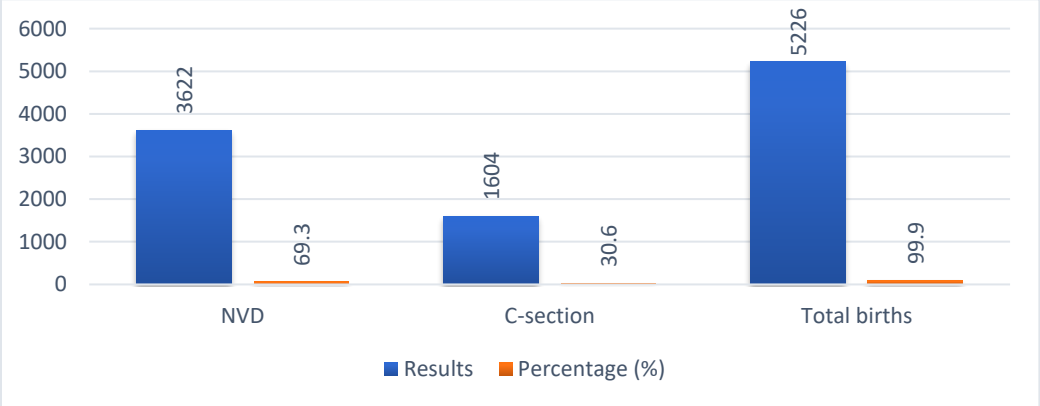
**Table 2**

*Rate of C-section at SKBZ Hospital, Rawlakot, (AJK)*

| Observed Delivery Type | Results | %age (%) |
|---|---|---|
| NVD | 3622 | 69.3 |
| C-section | 1604 | 30.6 |
| Total births | 5226 | 99.9 |

**Figure 1**

*The Rate of C-Section*




This secondary level of investigation aimed to find common and repeated factors associated with C-sections at SKBZH, Rawlakot. According to data 12, reasons including previous scar, Age, foetal distress, breech presentation, obstructed labor, failed induction, progress failure, multiple pregnancies, PIH, meconium aspiration, placental problem, and patients' requests were common and repeated reasons. There were some other factors also which were not mentioned here all those factors are kept in a separate category named 'others. Hence the result indicates that there are almost 10-12 reasons that can be categorized as common risk factors prevalent in SKBZH, Rawlakot. In a similar study conducted at Isra University Hospital Haidarabad, most prevalent factors found repeated C-section due to previous scar (19.2 %), dystocia (13.4 %), APH (11.8 %), breech (4.2 %), obstructed Labour (6.5 %), failed induction (4.7 %), malpresentation (4.4 %), cord prolapse (1.0 %), twin pregnancy (2.1 %), BOH (6.3 %), eclampsia (9.2 %) and miscellaneous (4.2 %) (Haider *et al.*,2009).

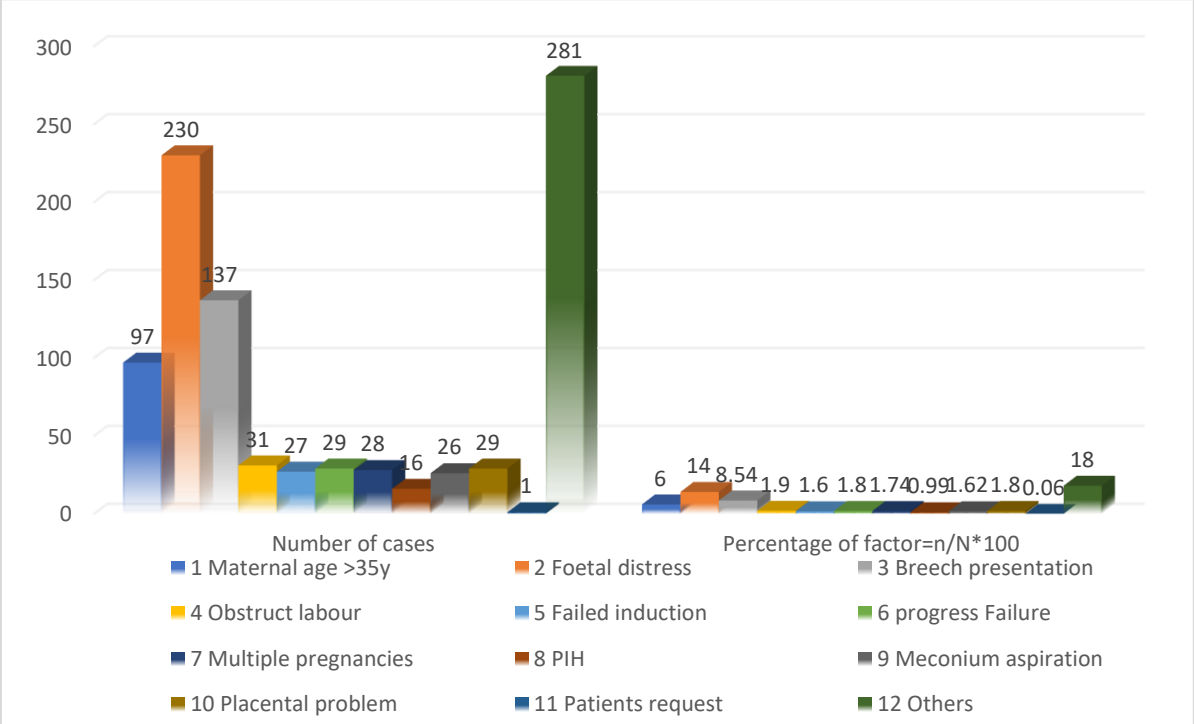
**Table 3**

*Major Contributing Factors to C-section at SKBZ Hospital, Rawlakot, (AJK)*

| Serial Number | Risk Factors | Number of Cases | %age of factor=n/N*100 |
|---|---|---|---|
| 01 | Maternal age >35y | 97 | 6 |
| 02 | Foetal distress | 230 | 14 |
| 03 | Breech presentation | 137 | 8.54 |
| 04 | Obstruct labor | 31 | 1.9 |
| 05 | Failed Induction of Labor | 27 | 1.6 |
| 06 | Progress Failure | 29 | 1.8 |
| 07 | Multiple pregnancies | 28 | 1.74 |
| 08 | Pregnancy-Induced Hypertension | 16 | 0.99 |
| 09 | Meconium aspiration | 26 | 1.62 |
| 10 | Placental problem | 29 | 1.8 |
| 11 | Patients request | 01 | 0.06 |
| 12 | Others | 281 | 18 |

**Figure 2**

*Factors Contributing to C-section*




Level 3, the tertiary level was formulated to find the most common risk factor among all prevalent factors at SKBZH, Rawlakot. Data shows in Table 3.4 that the previous C-section was the most prevalent factor among all risk factors by carrying 41.82 % of total factors.

**Table 4**

*The most prevalent risk factor for C-Section at SKBZ Hospital, Rawlakot, (AJK)*

| Risk Factors | Number of cases | Percentage of factor=n/N*100 |
|---|---|---|
| Previous scar | 672/1604 | 41.89 |

A previous scar means the female has already undergone with C-section. In this study, the previous scar was recorded most prevalent factor (41.6 %) that contributed to the total rate of C-sections at SKBZ Hospital Rawlakot. But only the previous scar is not sufficient justification for having a repeat C-section. 56 % of females having previous scars attempt vaginal delivery and 33 % succeed in the UK. The success rate of VBAC in Scotland was stated as 74 %. Repeat C-section due to previous scar was found to be the most common (19 %) indication for C-section in a similar study conducted at Isra University Hospital Hyderabad (Haider *et al.*,2009).

**Other Contributing Factors for C-Section at SKBZ Hospital, Rawlakot, (AJK)**

Other factors like Oligohydramnios, precious pregnancy, APH, cord prolapse, IUGR, CPD, PV leaking, delayed second stage, non-engaged head, IUD, and PROM were collectively seen in 281females which become 18 % of all data.

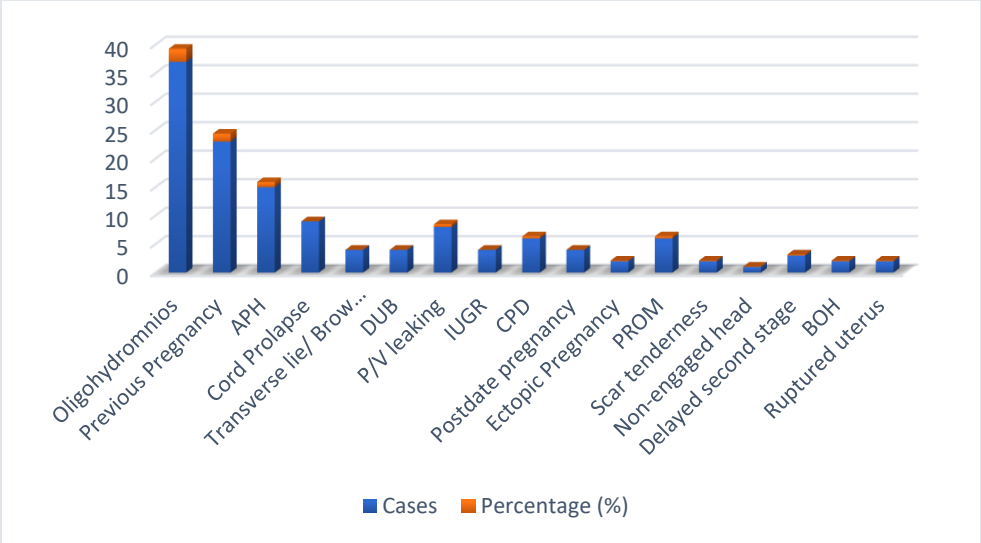
**Table 5**

*Other Contributing Factors to C-Section Rate C-Section at SKBZ Hospital, Rawlakot, (AJK)*

| Sr No. | Other contributing factors | Cases | %age (%) |
|---|---|---|---|
| 01 | Oligohydramnios | 37 | 2.3 |
| 02 | Previous Pregnancy | 23 | 1.4 |
| 03 | APH | 15 | 0.9 |
| 04 | Cord Prolapse | 09 | 0.005 |
| 05 | Transverse Lie/ Brow Presentation | 04 | 0.002 |
| 06 | DUB | 04 | 0.002 |
| 07 | P/V leaking | 08 | 0.49 |
| 08 | IUGR | 04 | 0.002 |
| 09 | CPD | 06 | 0.37 |
| 10 | Postdate pregnancy | 04 | 0.002 |
| 11 | Ectopic Pregnancy | 02 | 0.12 |
| 12 | PROM | 06 | 0.37 |
| 13 | Scar tenderness | 02 | 0.12 |
| 14 | Non-engaged head | 01 | 0.06 |
| 15 | Delayed second stage | 03 | 0.18 |
| 16 | BOH | 02 | 0.12 |
| 17 | Ruptured uterus | 02 | 0.12 |

**Figure 3**

*The Other Contributing Factors to C-Section Rate*




## Discussion and Analysis

### Foetal Distress a Major Indication of C-Section

Deficiency of oxygen during labor complications was seen in about 1 % of cases and usually, it ends with death in about 1 in 2000 cases. So, when it is suspected and proved clinically it becomes vulnerable to delivering a foetus as soon as possible, 30 minutes is adopted as an audit standard for this situation. In the current study 230 cases, out of 1604 were recorded to be incised for having this very condition and were successfully delivered. It makes up 4 % of total births at SKBZ and 14 % of total C-sections. In a similar study conducted at Isra University Hospital Hyderabad Sindh, foetal distress was found to be 13.4 % as a contributor to the rate of C-sections (Haider *et al.*,2009). In another study conducted in India, foetal distress is said to be 18.024 % of all the risk factors leading to foetal distress (Gangwar, 2016).

### Effect of Age on Rate of C-Section

Age was the only demographic found in the record, but no significant relation could be built between age and rate of C-section. Only 97 cases 6 % of total C-sections were conducted on females more than 35 years of age. Many cases were recorded where the age of the mother was between 20 to 25 years. So, in the case of SKBZ hospital, it is difficult to say that a specific age group is more prone to caesarean deliveries as it ranges from females of 20 to 45 years age group that is almost maximum age of fertility. In another study conducted in Pakistan, it was observed that 41.79 % of females more than 30 years of age underwent C-sections (Nazir, 2015).

### Breach Presentation

Breach presentation means that the foetus is not in vertex position. The presenting part is other than the head (foot, buttocks, etc.). The birth canal is so designed by nature that it is favourable for labour in head down position. Therefore, it is difficult to deliver a foetus in breach presentation. A breech presentation may be frank, complete, footling, or kneeling. In a study conducted in the Netherlands on 58000 cases from 1999 to 2007, it is stated that the chances of death were 10% in breech NVDs than those delivered via C-section (Hannah *et al.*,2000).

To reduce this death toll, it is customized to deliver breech babies through C-section. This, as a result, contributed to increased C-Section. In another study conducted in 2088 mothers with singleton breech pregnancy, it was observed that complications and deaths were very few among those born by C-section and were not associated with increased complications or death of mothers (Hannah *et al.*, 2000). In my study contribution of breach presentation as a risk factor for cesarean was 8.54 % (137 cases).

**Labour Obstruction**

Obstructed labor means that the uterus is normally contracting but the foetus is not delivered due to some physical obstruction of the birth canal. It may be due to a small pelvis, abnormal position of the baby, or a large baby. Obstruction resulted in 29000 deaths in 1990 and reduced to 19000 in 2013 (Golding, 2001). The treatment is mainly C-section and perhaps the said decline in the death toll from 1990 to 2013 due to obstructed labour is attributed to an increased rate of C-section. As C-section is said to be safer than NVD for obstructed labor, CSR is directly influenced by increased cases of labor obstruction. Of the total 1604 cases of C-section at SKBZ hospital 31 females were indicated for obstructed labour making 1.9 % of the total rate.

**Failed of Induction of Labour**

Rates of IOL failure are rising in developing countries one of every four gestations at term is induced. Usually after a failed IOL, the option is a C-section but WHO stated that it is not necessary to conduct a C-section after a failed IOL (Gofton, 2001). Induction failure in primigravida females usually follows C-section and is one of the main causes of high rates of C-section (Golding, 2001). In the current data of SKBZ hospital 27 cases of failed induction 1.6 % of the total rate were observed.

**Failure of Progress**

Increased C-Section is greatly influenced by increasing cases of failed progress in the USA (Neuhoff *et al.,*1989). This study revealed that 80 % of C-sections were done due to progress failure in the private sector. Cases of failure of progress were 29 (1.8 %) in the current study.

**Multiple Pregnancies**

Twins and multiple pregnancies, if delivered vaginally, carry a great risk of complications and death for foetuses during birth as compared to singleton pregnancy C-section is planned to avoid such morbidities and mortalities. The contribution of multiple pregnancies in this study, to the total rate was observed to be 1.74 % that is 28 cases (Haider, 2009).

**Pregnancy-Induced Hypertension**

Pregnancy-induced hypertension (PIH) is one of the contributors to increased C-sections. PIH affects about 5-8% of gestations. Due to the morbidity and mortality associated with PIH, mostly these cases are delivered through C-section. In a study conducted during 2009-2011, 19.4% prevalence was reported in Zimbabwe. In this study, PIH including preeclampsia was recorded in 16 cases (0.99 %) (Menacker, 2010).

**Meconium Aspiration**

Meconium is the first stool passed by the baby. It may be passed before, during or after labor. If it is passed before or during labor there is a great chance of inhalation of meconium by fetal lungs (Mundhra, 2013). Before birth, fetal lungs act in a fluid environment but after birth, they are already facing a challenge to breathe in a different medium that is air. In this already tough situation, if meconium is aspirated by the baby, it can complicate the situation and may lead to meconium aspiration syndrome (MAS). Cases of meconium aspiration were 26 making 1.62 % in the data

from SKBZ Hospital. In a prospective study conducted in India during 2010-11, 16.96 % of cases of meconium staining among 355 pregnant females were observed (Mundhra, 2013).

**Placental Problems**

Placenta previa is the most common placental abnormality, in which the placenta is abnormally attached to or near the cervix. It affects 1 in 200 pregnancies (Gardez *et al.*, 2024). It can cause birth injuries. Placental problems (previa, abruption, etc.) were indicated for C-section in 29 cases (1.8%) in this study.

**Patients Request**

In developed countries, many females opt for cesarean deliveries. In developing countries like Pakistan, the" on request" C-section rate is high in urban areas. It is very common for better socioeconomic groups, highly educated females, older age mothers, and very young mothers at first pregnancy due to fear of the birth process. Maternal request for C-sections was found rare, 01 patient out of 1604 requested her own for the caesarean delivery making 0.06 % of the total sample. In this study only one mother (0.06 %) requested for C. section on her choice (Hannah *et al.*, 2000).

## Conclusions

From the obtained results, it is concluded that the rate of C-sections at SKBZ hospital is very high, but it is not recorded why and at which time of gestation, cesarean was done. Moreover, it is not clear from the data what is the gap between the current and previous pregnancy. So, the high rates of C-sections could be checked, and victims of unnecessary C-sections could be saved from physical, psychological, and monitory costs on cesarean deliveries that are estimated to be double than normal deliveries. It seems that at SKBZ hospital C-sections are overused its use is beyond the range suggested by WHO, but if other confounding factors are kept in mind, we can conclude that it may not be the overuse of caesarean because SKBZ is the only hospital in Poonch (one of the 10 districts of Azad Kashmir) bearing almost 90% burden of caesarean deliveries (other 10% opt for private hospitals or are referred to other cities) of a population of 500571 persons, with 43 doctors, 282534 outdoors and 22832 indoor patients 4824 major and 4258 minor surgeries in 2016. It is concluded from the current study that at SKBZ hosp. during 2016, 59% C-sections are justified. Other 41%, if recorded properly, may or may not be justified but one important fact is that if conception is soon after C-section, VBAC is risky, and many couples do not avoid conception after caesarean. Keeping all these facts in mind, according to WHO`s recommendations SKBZ hosp. should conduct C-section for all those patients who have a clear medical reason irrespective of the rate of C-sections.

## Limitations and Future Directions

The study was conducted with a limited sample size only in the one high-standard hospital in Rawalakot Azad Jammu and Kashmir, where the demographic characteristics of the patients were almost similar. Yet, it will be better to repeat the same kind of study in other hospitals of the AJK with larger sample sizes and with varying population characteristics and facilities, including populations from both the urban as well as from rural areas to get a clear understanding based on these differences too and generalize the results. The findings of this study will contribute to theory and practice and will be helpful to the government functionaries in healthcare planning.

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## Declaration of Interest

The authors declare that there is no clash of interest.

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