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A STUDY TO ASSESS THE INDICATIONS OF CESAREAN SECTION AND IMMEDIATE NEONATAL COMPLICATIONS IN A TERTIARY CARE CENTRE

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ABSTRACT

Introduction: Globally, Cesarean section rates have surged, surpassing the World Health Organization's recommended 10-15%. In Chennai, India, high rates are particularly evident in private facilities, driven by demographic shifts, medical advancements, and socioeconomic factors.

Objectives: To assess the indications for cesarean section, immediate neonatal complications among neonates born via cesarean section, relationship between cesarean section indications and immediate neonatal complications, and associate indications of cesarean section with selected socio-demographic variables.

Methods: This quantitative study employed a descriptive design to examine indications for cesarean sections and immediate neonatal complications among 81 mothers at a Tertiary Care Center.

Results: The most common indication was previous cesarean section (91.4%), followed by central placental previa (63%) and the third most common indication was contracted pelvis. (54.3%). The immediate neonatal complications included feeding difficulties (35.8%), meconium aspiration syndrome (30.9%) and Hyperbilirubinemia (19.8%). Common complications also include hypothermia (22.2%) and birth injuries (8.6%). The coefficient of correlation between indications and immediate neonatal complication is 0.574. This indicates a moderately positive correlation which was statistically significant. Occupation was found to be significantly associated with indications of cesarean section.

Keywords: Indications, Cesarean section, Neonatal complications

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INTRODUCTION:

Childbirth, or parturition, is the physiological process of delivering a neonate, which can occur through various modalities such as vaginal delivery and cesarean section(C-section)¹. Vaginal delivery encompasses spontaneous, assisted, and vaginal birth after cesarean (VBAC). Cesarean section involves surgically delivering the neonate through an abdominal incision and can be classified as an elective or emergency procedure². Elective cesarean sections are scheduled for non-urgent indications, such as a breech presentation or maternal request, while emergency cesarean sections address immediate complications like fetal distress³. Although cesarean sections can be lifesaving, they should be medically justified due to associated morbidities².

Globally, cesarean section rates have surged, surpassing the World Health Organization's recommended 10-15%⁴. In Chennai, India, elevated rates are particularly evident in private healthcare facilities, driven by demographic shifts, medical advancements, and socioeconomic factors⁵. Research focusing on cesarean section trends and neonatal complications aims to inform clinical practices and policies⁶. Understanding the indications for cesarean sections and their impact on neonatal outcomes is crucial for optimizing obstetric care, minimizing unnecessary surgeries, and optimizing maternal and neonatal health⁷. By comparing regional and institutional practices, best practices can be identified, ultimately improving overall obstetric care⁸.

NEED OF THE STUDY:

Cesarean section rates have increased globally, with over 18 million performed annually. Both developed and developing countries exhibit a rate (27.2% vs 20.9%), with significant rises in Asia (6.4%) and India (21.5%). This study aims to identify the indications for cesarean section and immediate neonatal complications. The WHO recommends cesarean section only when medically necessary, advising that no region should exceed a 10%-15% rate, as higher rates do not reduce mortality. Identifying common indications and analyzing neonatal complications can improve risk management and reduce morbidity and mortality. This study seeks to optimize maternal and newborn health by providing clear insight into the reasons for cesarean sections and the resulting neonatal complications that follow.

STATEMENT OF THE PROBLEM:

A study to assess the indications of Cesarean section and immediate neonatal complications in a tertiary care center.

AIM & OBJECTIVES:

Aim: The study aims to comprehensively assess the indications of Cesarean section and immediate neonatal complications.

Objectives:

1. To assess the indications of Cesarean section in a tertiary care center.
2. To find out the immediate neonatal complications among neonates of mothers who delivered via cesarean section.
3. To find the relationship between indications of cesarean section and immediate neonatal complications.
4. To associate indications of cesarean section with selected socio-demographic variables.

METHODOLOGY:

Study design: A Quantitative approach was used for this research.

Sample:

The study was conducted in a tertiary care hospital. The sample was selected using convenience sampling technique and 81 pregnant women who delivered via Cesarean section and their Neonates who were admitted to the Postnatal ward and met the inclusion criteria were selected.

Ethical consideration:

All the study materials and procedures were reviewed & approved by The Institutional Human Ethics Committee (CARE IHEC-I) ethical approval code (Ref No: IHEC-I/2692/24).

Main instruments:

A semi-structured tool and checklist were used for the study.

Tool 1: SOCIO-DEMOGRAPHIC AND OBSTETRIC VARIABLES,

Section A: SOCIO-DEMOGRAPHIC VARIABLES include age, educational status, occupational status, residence, and income.

Section B: OBSTETRIC DATA includes parity, gravida, number of living children, type of Cesarean section, pregnancy complications, period of gestation, and previous cesarean section.

Tool 2: CHECKLIST ON INDICATIONS FOR CESAREAN SECTION contains absolute indications and relative indications. The score was given as 0-3: low risk, 4-6: moderate risk, 7-9: high risk, and 10-15: very high risk.

Tool 3: CHECKLIST ON NEONATE COMPLICATIONS. It consists of 24 types of neonatal complications. The score was given as 0-5: low risk, 6-10: moderate risk, 11-15: high risk and 16-24: very high risk.

INTERPRETATION:**1. Interpretation of indications of cesarean section**

Score	Indications
0-3	Low risk
4-6	Moderate risk
7-9	High risk
10-15	Very high risk

2. Interpretation of immediate neonatal complications

Score	Complications
0-5	Low risk
6-10	Moderate risk
11-15	High risk
16-24	Very high risk

FINDINGS OF THE STUDY**Objective 1: Indications of cesarean section in a tertiary care center**

Table 1: Frequency and percentage (%) distribution of indications of cesarean section

N=81

Characteristics	Category	Frequency	Percentage (%)
Central placenta previa	No	30	37.0
	Yes	51	63.0
Contracted pelvis or cephalopelvic	No	37	45.7
	Yes	44	54.3
Pelvic mass	No	53	65.4
	Yes	28	34.6
Advanced carcinoma cervix	No	64	79.0
	Yes	17	21.0
Vaginal obstruction	No	68	84.0
	Yes	13	16.0
Cephalopelvic disproportion	No	72	88.9
	Yes	9	11.1
Previous cesarean delivers	No	7	8.6
	Yes	74	91.4
Non-reassuring FHR	No	77	95.1
	Yes	4	4.9

Dystocia	No	77	95.1
	Yes	4	4.9
Antepartum hemorrhage	No	75	92.6
	Yes	6	7.4
Malpresentation	No	70	86.4
	Yes	11	13.6
Failed surgical induction	No	64	79.0
	Yes	17	21.0
Bad obstetric history	No	62	76.5
	Yes	19	23.5
Hypertensive disorders	No	53	65.4
	Yes	28	34.6
Medical-gynecological disorders	No	52	64.2
	Yes	29	35.8

The indications of cesarean Section identified were Previous Cesarean Section (91.4%), Central Placenta Previa (63.0%), Contracted pelvis or Cephalopelvic (54.3%), Medical Gynecological Disorder (35.8%). Pelvic mass (34.6%), Hypersensitive disorder (34.6%), Bad Obstetric History (23.5%), Advanced Carcinoma Cervix (21.0%), Fail Surgical Induction (21.0%), Vaginal Obstruction (16.0%), Malpresentation (13.6%), Cephalopelvic Disproportion (11.1%), Antepartum Hemorrhage (7.4%), Non-Reassuring FHR (4.9%), Dystocia (4.9%).

Objective 2: Immediate neonatal complications among neonates of mothers who delivered via cesarean section

Table 2: Frequency and percentage (%) distribution of immediate neonatal complications among neonates of mothers who delivered via cesarean section

N=81

Characteristics	Category	Frequency	Percentage (%)
Respiratory Distress Syndrome (RDS)	No	70	86.4
	Yes	11	13.6
Transient Tachypnea of the New-born (TTN)	No	76	93.8
	Yes	5	6.2
Meconium Aspiration Syndrome (MAS)	No	56	69.1
	Yes	25	30.9
Pneumothorax	No	76	93.8
	Yes	5	6.2
Persistent Pulmonary Hypertension of the New-born (PPHN)	No	77	95.1
	Yes	4	4.9

Hypotension	No	78	96.3
	Yes	3	3.7
Cardiac arrhythmias	No	76	93.8
	Yes	5	6.2
Intraventricular Hemorrhage (IVH)	No	80	98.8
	Yes	1	1.2
Periventricular Leukomalacia (PVL)	No	78	96.3
	Yes	3	3.7
Seizures	No	78	96.3
	Yes	3	3.7
Hypoglycemia	No	66	81.5
	Yes	15	18.5
Hyperbilirubinemia	No	65	80.2
	Yes	16	19.8
Polycythemia	No	75	92.6
	Yes	6	7.4
Coagulopathies	No	77	95.1
	Yes	4	4.9
Neonatal sepsis	No	72	88.9
	Yes	9	11.1
Group-B Streptococcus (GBS) infection	No	79	97.5
	Yes	2	2.5
Nosocomial infections	No	73	90.1
	Yes	8	9.9
Birth injuries	No	74	91.4
	Yes	7	8.6
Cephalohematoma	No	70	86.4
	Yes	11	13.6
Caput succedaneum	No	69	85.2
	Yes	12	14.8
Hypothermia	No	63	77.8
	Yes	18	22.2
Hyperthermia	No	65	80.2
	Yes	16	19.8
Feeding difficulties	No	29	35.8
	Yes	52	64.2
Necrotizing Enterocolitis (NEC)	No	65	80.2
	Yes	16	19.8

The immediate neonatal complications identified were Feeding Difficulty (64.2%), Meconium Aspiration Syndrome (30.9%), Hypothermia(22.2%), Hyperthermia(19.8%), Hyperbilirubinemia (19.8%), Necrotizing Enterocolitis (19.8%), Hypoglycemia (18.5%), Caput Succedaneum (14.8%), Cephalohematoma (13.6%), Respiratory Distress Syndrome

(13.6%), Neonatal sepsis (11.1%), Nosocomial Infections (9.9%), Birth Injuries (8.6%), Polycythemia (7.4%), Transient Tachypnea of the Newborn(6.2%), Pneumothorax (6.2%), Cardiac Arrhythmias (6.2%), Persistent Pulmonary Hypertension of the Newborn (4.9%), Coagulopathies (4.9%), Hypotension (3.7%), Periventricular Leukomalacia (3.7%), Seizures (3.7%), Group-B Streptococcus Infection (2.5%), Intraventricular Hemorrhage (1.2%),

Objective 3: Relationship between indications of cesarean section and immediate neonatal complications

Table 3: Relationship between indications of cesarean section and immediate neonatal complications

N= 81

Parameters	Mean	Std. Deviation	r- value	P - value
Indications of cesarean section	1.51	.691	.574	0.00
immediate neonatal complications	1.19	.391		

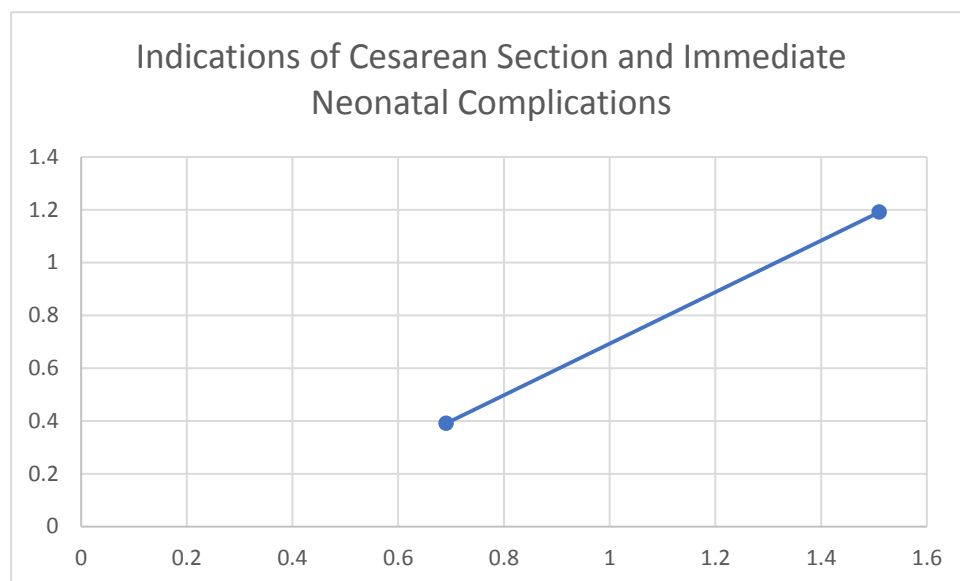


Figure 1: correlation coefficient graph

The Correlation Coefficient between the indications of cesarean section and immediate neonatal complications was 0.574. This indicates a moderate positive correlation between the indications of cesarean section and immediate neonatal complications which was statistically significant at $p < 0.00$.

Objective 4: Association between indications of cesarean section with selected socio-demographic variables.

Table 4: Association between indications of cesarean section with selected socio-demographic variables.

N= 81

S.no	Demographic Variable	Indications of Cesarean Section				Chi-square	P value
		Low Risk	Moderate Risk	High Risk	Very High Risk		
Section A- Demographic Variables							
1	Age in years					7.654	.569 (NS)
	18-21	7	3	0	0		
	22-25	14	12	4	0		
	26-29	14	7	3	0		
	>30	11	4	1	1		
2	Educational status					12.75	.174 (NS)
	No formal education	4	0	0	0		
	Primary school	20	6	2	0		
	Higher secondary school	13	12	5	0		
	Graduation and above	9	8	1	1		
3	Occupation					19.78	.019* (S)
	Housewife	28	17	5	0		
	Daily wages	10	4	2	0		
	Government employee	4	0	0	1		
	Private employee	4	5	1	0		
4	Residence					4.03	.672 (NS)
	Rural	30	18	6	0		
	Urban	12	7	2	1		
	Semi urban	4	1	0	0		
Section B- OBSTETRICS VARIABLES							
5	Parity					1.729	.631 (NS)
	Primi-parous	24	12	3	1		
	Multi-parous	22	14	5	0		
6	No. of living children					1.793	.616 (NS)
	One	23	16	4	1		
	Two	23	10	4	0		

7	Pregnancy complications						
	No	21	18	5	1	4.753	.191 (NS)
	Yes	25	8	3	0		
8	Period of gestation						
	32-37 weeks	7	3	0	0	6.08	.414 (NS)
	38-40 weeks	39	22	7	1		
	40-42 weeks	0	1	1	0		
9	Previous cesarean section						
	No	28	15	4	0	1.74	.626 (NS)
	Yes	18	11	4	1		
10	Type of cesarean section						
	Elective	23	13	6	1	2.702	.440 (NS)
	Emergency	23	13	2	0		

*S-significant, *NS-non-significant

The above table shows that occupation was significantly associated with indications of cesarean section.

Frequency and percentage distribution of women who underwent cesarean section based on demographic and obstetric variables

Table 5: Frequency and percentage distribution of women who underwent cesarean section based on demographic and obstetric variables.

N= 81

Characteristics	Category	Frequency	Percentage (%)
Section-A Demographic Variables			
Age in years	18-21	10	12.35
	22-25	30	37.0
	26-29	24	29.6
	>30	17	21.0
Educational status	No formal education	4	4.9
	Primary school	28	34.6
	Higher secondary school	30	37.0
	Graduation and above	19	23.5
Occupation	Housewife	50	61.7
	Daily wages	16	19.8

	Government employee	5	6.2
	Private employee	10	12.3
Residence	Rural	54	66.7
	Urban	22	27.2
	Semi urban	5	6.2
Section-B Obstetric Variables			
Parity	Primi parous	40	49.4
	Multi parous	41	50.6
No of living children	One	44	54.3
	Two	37	45.7
Pregnancy complications	No	45	55.6
	Yes	36	44.4
Period of gestation	32-37 weeks	10	12.3
	38-40 weeks	69	85.2
	40-42 weeks	2	2.5
Previous cesarean section	No	10	12.3
	Yes	69	85.2
Type of cesarean section	Elective	2	2.5
	Emergency	10	12.3

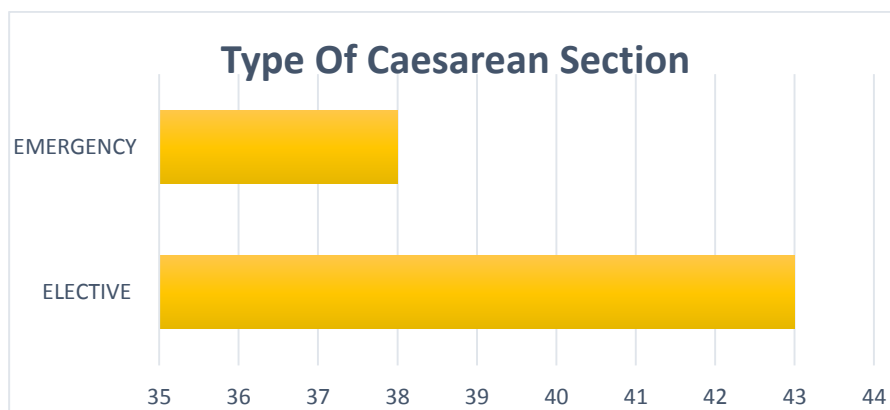


Figure 2: Frequency distribution on type of cesarean section.

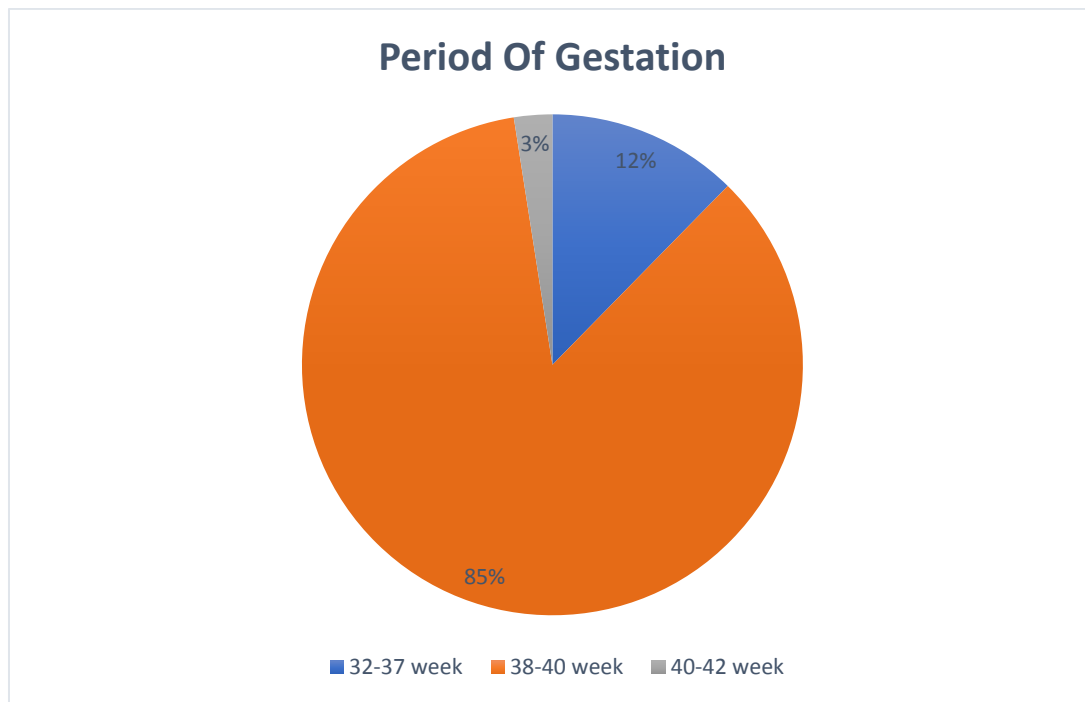


Figure 3: Frequency distribution on period of gestation

The majority (37.0%) of mothers were between the ages of 22-25 years, most of them (66.7%) were living in rural areas, and the majority (37.0%) had educational qualifications of higher secondary education. Most of the mothers (61.7%) are housewives. Almost all the mothers (50.6%) are Multi-parous. Most mothers (54.3%) have one living child, and the majority (55.6%) do not have any pregnancy complications. Most (85.2%) of the mothers have a gestation period between 38-40 weeks and most (85.25%) had a previous cesarean section. The majority (53.1%) of them underwent elective cesarean section.

RESULT:

The most common indication was previous cesarean section (91.4%), and central placental previa (63%) was the second, and third most common indication were contracted pelvic or cephalopelvic and pelvic mass (54.3%, 34.6%) respectively. And the major immediate neonatal complications were feeding difficulties (64.2%), Meconium aspiration syndrome (30.9%) second and third most complicated Hyperbilirubinemia (19.8%) Common complications also include hypothermia (22.2%) and birth injuries (8.6%). The coefficient of correlation between indications of cesarean section and immediate neonatal complication was 0.574. This indicates a moderately positive correlation which was statistically significant. Occupation was significantly associated with indications of cesarean section.

($X^2 = 19.78$, p-value= 0.019)

DISCUSSION:

The major Indication was previous cesarean section (91.4%), central placental previa (63%) were second, and third most common indications were contracted pelvic or cephalopelvic and pelvic mass (54.3%,34.6%) respectively. And the major immediate neonatal complication was feeding difficulties (64.2%), Meconium aspiration syndrome (30.9%) are

second and third most complication Hyperbilirubinemia (19.8%) Common complications also include hypothermia (22.2%), and birth injuries (8.6%). The correlation coefficient (r -value=0.574) reported in the study suggests a moderate positive relationship between indications for cesarean section and immediate neonatal complications which was statistically significant. Occupation was significantly associated with indications of cesarean section.

However, a study conducted by Sharma, Patel, and Gupta in 2021 on "Relationship Between Indication of Cesarean Section and Immediate Neonatal Complications", showed no significant correlation between cesarean indications and neonatal outcomes, Jones et al. (2018) conducted a retrospective cohort study using electronic health records from a large urban hospital to investigate the association between indications for cesarean sections and socio-demographic variables. They identified women who underwent cesarean sections and categorized them based on indications such as fetal distress, breech presentation, and maternal health conditions. Socio-demographic factors including maternal age, ethnicity, education level, and insurance status were collected from medical records and patient surveys. The study revealed significant associations between these variables and cesarean section indications. Older mothers were more likely to opt for elective cesarean sections due to concerns related to advanced maternal age, while certain ethnic groups showed higher rates of emergency cesarean sections, potentially influenced by cultural preferences or disparities in healthcare access. Moreover, women with higher education levels tended to undergo elective cesarean sections more frequently, possibly due to greater healthcare literacy. Conversely, uninsured or publicly insured women exhibited higher rates of emergency cesarean sections, highlighting disparities in access to prenatal care and medical interventions. These findings underscore the complex interplay between socio-demographic factors and medical decision-making in obstetrics, emphasizing the need for targeted healthcare policies to address disparities and improve maternal and neonatal outcomes.

CONCLUSION:

This study highlights the diverse demographic profile and complex obstetric conditions among mothers undergoing cesarean sections at a tertiary care center. The primary indication was a prior cesarean section, with central placental previa ranking second, followed by contracted pelvis or cephalopelvic disproportion and pelvic mass. And the major immediate neonatal complication was feeding difficulties (64.2%), Meconium aspiration syndrome (30.9%) are second and third most complication Hypothermia (22.2%) Common complications also include Hyperbilirubinemia (19.8%), and Birth injuries (8.6%). Therefore, there is a critical requirement for customized maternal and neonatal care strategies in tertiary care settings.

REFERENCE:

1. American College of Obstetricians and Gynecologists (2019) 'ACOG Practice Bulletin No.205: Vaginal Birth After Cesarean delivery', *Obstetrics & Gynecology*,133(2).
2. Betrán, A.P., Torloni, M.R., Zhang, J.J. and Gülmezoglu, A.M. (2016) 'WHO Statement on Cesarean Section Rates', *BJOG*, 123(5), pp. 667-670.

3. Betran, A.P., Torloni, M.R., Zhang, J.J., Gülmezoglu, A.M. and WHO Working Group on Cesarean Section (2016) 'WHO Statement on Cesarean Section Rates', *BJOG*, 123(5), pp. 667-670. doi: 10.1111/1471-0528.13526.
4. Betran, A.P., Ye, J., Moller, A.B., Souza, J.P. and Zhang, J. (2021) 'Trends and projections of cesarean section rates: global and regional estimates', *BMJ Global Health*, 6(6). doi: 10.1136/bmjgh-2021-005671.
5. Boerma, T., Ronsmans, C., Melesse, D.Y., Barros, A.J.D., Barros, F.C., Juan, L., Moller, A., Say, L., Hosseinpoor, A.R., Yi, M., de Lyra Rabello Neto, D. and Temmerman, M. (2018) 'Global epidemiology of use of and disparities in cesarean sections', *Lancet*, 392(10155), pp. 1341-1348. doi: 10.1016/S0140-6736(18)31928-7.
6. Gibbons, L., Belizán, J., Lauer, J., Betrán, A., Meriáldi, M. and Althabe, F. (2021) The Global Numbers and Costs of Additionally Needed and Unnecessary Cesarean Sections Performed per Year: Overuse as a Barrier to Universal Coverage. Background Paper, 30. Geneva: World Health Organization, 11 June [cited 2023 Jan 24].
7. Roy, A., Paul, P., Chouhan, P., Rahaman, M. and Kapasia, N. (2021) 'Geographical variability and factors associated with cesarean section delivery in India: a comparative assessment of Bihar and Tamil Nadu', *BMC Public Health*, 21(1), p. 1715. doi: 10.1186/s12889-021-11750-4.
8. Kwawukume, E. (2001) 'Cesarean section in developing countries', *Best Practice & Research Clinical Obstetrics & Gynecology*, 15(1), pp. 165-178. doi: 10.1053/beog.2000.0155.