

Original Article

A Study to Assess the Factor Leading to Increase Rate of Cesarean Section among Pregnant Women at Selected Hospital in Haridwar Uttarakhand

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Abstract - A descriptive study was conducted to assess the factor leading to an increased cesarean section rate among pregnant women at selected hospitals in Haridwar Uttarakhand. A non-experimental research design was used to assess the knowledge regarding factors leading to an increased rate of cesarean sections among pregnant women. The sample size was 109 pregnant women or reproductive women at a selected hospitals in Haridwar. A purposive sampling technique was used for the selection of samples. The data was collected using a self-structured questionnaire. The result depicts that the factors associated with the increased number of cesarean sections among pregnant women in terms of mean \pm SD score were 5.9 ± 4.9 . The result of the study also indicates that there is no influence of factors leading to an increased rate of cesarean section among pregnant women with their level of knowledge.

Keywords - Cesarean section, Knowledge, Pregnant women.

1. Introduction

Cesarean section delivery or lower segment cesarean section is a surgical procedure used to deliver a baby through an incision in the abdomen and uterus⁹. Cesarean section delivery is known to be a major life-saving obstetric surgical intervention for mothers and babies from pregnancy and childbirth-related complications, as these reduce the chances of IMR (infant mortality rate) and MMR (maternal mortality rate)¹.

This vital clinical procedure is performed to avoid obstetric complications and thereby avert the incidence of maternal and neonatal deaths¹. According to several studies, the first cesarean section documented occurred in 1020 AD, and since then, the procedure has evolved tremendously. Cesarean section is now the most common surgery performed in the United States, with over 1 million women delivered by cesarean section every year²⁰.

The cesarean delivery rate rose from 5% in 1970 to 31.9% in 2016²⁰. Today cesarean birth accounts for 15%-25% of all the deliveries in developed countries with a maternal mortality of less than 1:10,000. Though there are continuing efforts to reduce the rate of cesarean sections, experts do not anticipate a significant drop for at least a

decade or two²⁰. While it confers the risk of both immediate and long-term complications for some women, cesarean section delivery can be the safest or even the only way to deliver a healthy newborn²⁰. Many people prefer cesarean section because they think it will be the safest procedure for delivering a healthy baby and safe for the mother's life².

According to new research from the world health organization (WHO), there will be an increase in the cesarean section rate continuously globally, now accounting for more than 1 in 5 (21%) of all childbirths. This number is set to continue increasing over the coming decades, with nearly a third (29%) of all births likely to take place by cesarean section mode of delivery by 2030¹⁰.

While cesarean section can be life-saving surgery, it can put women and babies at unnecessary risk of long and short-term health problems if performed when there is no medical need²¹. Cesarean sections are absolutely critical to save lives in situations when normal vaginal deliveries would cause more risk to the mother's and baby's health. So all health systems must ensure timely access for all women when needed, said Dr. Ian Askew, director of WHO's department of sexual and reproductive health and research and the UN joint program, HRP¹⁰. But not all cesarean section carried out



at the moment is needed for medical reasons. Unnecessary surgical procedures can be harmful to both woman and her baby¹⁰. Cesarean section is done because the cesarean section is safer for both mother and her baby than vaginal delivery⁹. Doctors might recommend for cesarean section mode of delivery if the women have some medical conditions like her labor is not progressing, the baby is in distress, the baby or babies are in an abnormal position, there is a problem in the location of the placenta, prolapsed umbilical cord, health-related problems, mechanical obstruction, previously having a history of cesarean section⁹.

Identifying factors associated with a cesarean section is important to minimize the unnecessary practice of such life-saving intervention and increase its access to those needing it the most¹⁶. The factor contributing to this increased rate of cesarean section includes delayed childbearing, policies promoting repeat cesarean section, refusal to offer vaginal birth after, cesarean section wide use of continuous electronic fetal monitoring, use of epidural analgesics, fear of malpractice liability, dystocia, professional practice style, the professional expectation for work-life balance, reimbursement system, financial incentives, maternal request or lack of regulation⁴. Studies done to explore the prevalence and factors associated with cesarean section in the current study area are limited¹⁶.

Unnecessary cesarean section has an adverse impact on maternal, neonatal and infant morbidity and mortality. The more cesarean section, the higher the risks of other medical conditions like abnormal placental location and uterus tearing. The high cost of cesarean section may result in catastrophic health expenditure for families and additional pressure upon health systems, especially in low and middle-income countries¹⁸.

The reasons for such drastic increases rate of cesarean section are multifactorial, including medical as well as non-medical reasons. It has been suggested that non-medical factors such as social, cultural, or unequal accessibility to health services, as well as clinical practice pattern styles, might have been a major contribution to wide variation in cesarean section rate across different countries¹⁹.

2. Objectives

- To assess factors associated with the increment of cesarean rate like mother's age, cesarean indicator, educational level, and socioeconomic status.
- To find out the association factor leading to the increase in the number of cesarean sections among pregnant women with their selected demographic variable.

3. Hypothesis

All hypotheses were tested with a $p < 0.05$ level of significance.

H₀- There is no statistical significance exists in a set of given observations and is used to assess the credibility of a hypothesis by using sample data at $p < 0.05$ level of significance.

4. Review of Literature

Avjit Roy, Pintu Paul, Pradip Chouhan, Margubur Rahaman and Nanigopal Kapasia. 2021 India, Geographical variability and factors associated with cesarean section delivery in India: a comparative assessment of Bihar and Tamilnadu. The result of the study shows that about 19% of women had undergone C-Section delivery. The study conclusion reveals that the women who experience pregnancy loss and have pregnancy complications were more likely to undergo cesarean section delivery. The study conclusion reveals that the women who experience pregnancy loss and have pregnancy complications were more likely to undergo cesarean section delivery.

Aisha Amjad, Uzair Amjad, Rubeena Zakar, et al. 2012 Pakistan "Factor associated with cesarean section deliveries among childbearing women in Pakistan". The result of the study shows that cesarean delivery is associated with women whose age is more than 24 years. Therefore the women in Pakistan who had undergone cesarean section delivery were about 13.6%. The study's conclusion reveals that women should have adequate awareness about reducing pregnancy complications that help n reducing malpractice and detailed medical justification by doctors for performing the cesarean delivery.

Chitkasaem Suwanrath, sopen chunuan, et al 2020 South Thailand. A study to assess why pregnant women prefer cesarean section birth. The result of the study was that women who have negative experiences of vaginal delivery, positive attitudes towards cesarean section birth, and belief in auspicious birth dates. The study's conclusion reveals that obstetricians should provide effective counseling to women who have preferred cesarean delivery, which could reduce the cesarean section delivery rate.

Sulochana Dhakal, Edwin van Teijlingen, Pramod R. Regmil 2021 South Asian countries. Factors contributing to increasing cesarean section rates in South Asian countries: a systemic review. A total of 1543 studies, of which 524 duplicates were removed using Endnotes. Of 1019 studies, 925 studies were excluded after initial screening and a further 23 were removed after assessing the full text, leaving 71 which were assessed for quality. The result of the study was that cesarean delivery of women is associated with medical and non-medical conditions. The conclusion of the study includes greater precision in the diagnosis of fetal distress keeping primary CS to a minimum and educating the family and women about the risk and benefits of CS, and avoiding CS for non-medical reasons.

Roshni R. Patel, Tim j Petres, Deirdre J Murphy, 2004 England. Prenatal risk factor for caesarean section analysis of the ALSPAC cohort. The result of this study was that 1153 had Caesarean section (685 emergencies, 468 electives. This study concluded that the careful exploration of risk factors might allow us to identify reasons for CS.

Honglei Ji, Hong Jiang, Limin Yang Xu Qian, Shenglan Tang 2015 Shanghai. Factors contributing to the rapid rise of caesarean section: a prospective study of primiparous Chinese women in Shanghai. The result of this study was that 13.2% preferred CS in the second trimester, and 34.9% of women undergoing CS did not have indications listed in the clinical guidelines nor based on maternal request. The conclusion of the study reveals that concerted action targeting service providers as well as users needs to be taken in the near future in order to control the rapid rise of CS effectively.

Batieha AM, Al-Daradkah SA, et al 2017. Caesarean Section: Incidence, Causes, Associated Factors and Outcomes: A National Prospective Study from Jordan. The result of this study was that the overall rate of CS was 29.1% (13.2% as emergency CS and 15.9% as planned CS or EMR CS. The conclusion of this study was that the CS was more currently based on the physician's judgments; it may be extremely useful to develop and strictly implement national guidelines for CS.

Dr. Nazia Mussarat, Dr. Saima Qurashi, Prof. Dr. Mahnaz Roohi 2013 Faisalabad. LOWER SEGMENT CESAREAN SECTION (LSCS); Indications and Complications at Teaching Hospital. The result of the study was that Out of 100 patients, 58(58%) had emergency and 42(42%) had elective caesarean section. The study concluded that the most effective means to control previous CS is the prevention of the first CS, which could be achieved by adopting the policy of trial of vaginal delivery after previous CS.

Eghbal Zandkarimi, Abbas Moghimbeigi, Hossein Mahjub. 2020 Hamadan, Iran. Assessing the Factors Affecting Caesarean Section Selection in Iranian Women. The result of this study was that out of the 17284 Iranian women with a mean age of 34.86 ± 9.98 years, 11588 (67%) of VD and 5696 (33%) used CD. This study concluded that the findings highlighted the importance of supplemental insurance and socioeconomic status in choosing a CD by women.

5. Research Methodology

5.1. Research Approach

The study attempt to find the knowledge of pregnant or reproductive women about the factor leading to an increased

rate of cesarean section among pregnant women. The investigator has employed quantitative and non-experimental research approaches. This may do by asking questions. The investigator employed non-experimental research approaches in this study to assess the factor leading to an increased rate of Cesarean Sections among Pregnant women²³.

5.2. Research Design

The investigator has applied the non-experimental research design. The design used in this study was descriptive research design, where the aim of this research is to generate new facts that are largely non-experimental. It is especially suited to such studies since description implies natural observation of the characteristics of the research subject without deliberate manipulation of the variables or control over the research setting²³.

The study has analyzed the factor leading to an increased rate of Cesarean Sections among Pregnant women.

5.3. Instruments

The study tools were a self-structured questionnaire to assess the knowledge of pregnant women to assess the factor leading to an increased rate of Cesarean Sections among Pregnant women. The self-structured questionnaire is used to assess the level of knowledge of the women regarding the causes of increased cesarean section rate among women. The other section consists of socio-demographic variables. In this way, there were two tools used.

- Socio-demographic variables
- Closed-ended question

6. Data Collection

The written permission was obtained from the authority. Prior informed consent was obtained from the participant for the purpose of data collection. Data were collected from 109 pregnant women or reproductive women from the selected hospital of Haridwar, who were available at the time of the study. The purposive sampling technique was used for the selection of samples for the purpose of data collection. The data was collected through the self-structured questionnaire.

The data shown in table no.1 depict the percentage and frequency of characteristics, which shows that the majority, 70(64.22%) of the reproductive women were in the age group of 19-29 years, and 39 (35.77%) participants were in the age of 30-43 years.

The majority of reproductive women who participated in the study had primary education; 42 (38.53%) and 67 (61%) were in secondary education. The majority of reproductive women, 65 (59.63%), have a family income between 8,000 to 55,000 and 44 (40.36%) have 56,000 to 2.5 lakh.

Table 1. Frequency and percentage distribution of demographic variables

N=109			
S.No.	Demographic Variable	Frequency Distribution	Percentage
1	Age In year		
	19-29	70	64.22%
	30-43	39	35.77%
2	Education		
	Primary education	42	38.53%
	Secondary education	67	61%
3	Income		
	8,000-55,000	65	59.63%
	56,000-2.5lakh	44	40.36%
4	Gravida		
	Primi gravida	51	46.78%
	Multi gravida	58	53.21%
5	Antenatal visits		
	1-7	47	43.11%
	8-15	62	56.88%
6	Hospital		
	Private hospital	75	68.80%
	Government hospital	34	31.19%
7	Mode of delivery preferred		
	Normal vaginal delivery	67	61.46%
	Cesarean section	42	38.53%
8	Cesarean section mode of delivery indication		
	Yes	90	82.56%
	No	19	17.43%

The majority of the reproductive women, 58 (53.21%), were multigravida mothers, and 51 (46.78%) were primigravida. The majority of the reproductive women, 62 (56.88%), have 8-15 antenatal visits and 47 (43.11%) had 1-7 antenatal visits. The majority of the reproductive women, 75 (68.80%), have preferred private institutional delivery, whereas 34 (31.19%) have preferred a government hospital for the delivery.

The majority of the reproductive women, 67 (61.46%), preferred normal vaginal delivery mode, whereas 42 (38.53%) preferred the cesarean section mode of delivery. The majority of the women, 90 (82.56%), said they had medical indications related to the cesarean mode of delivery and 19 (17.43%) women said they had complications related to delivery, so their doctor suggested the cesarean section mode of delivery.

Table 2. Distribution of the sample according to their knowledge score

Knowledge score	Poor	Average	Excellent
	1-5	6-10	11-15
	58	39	12

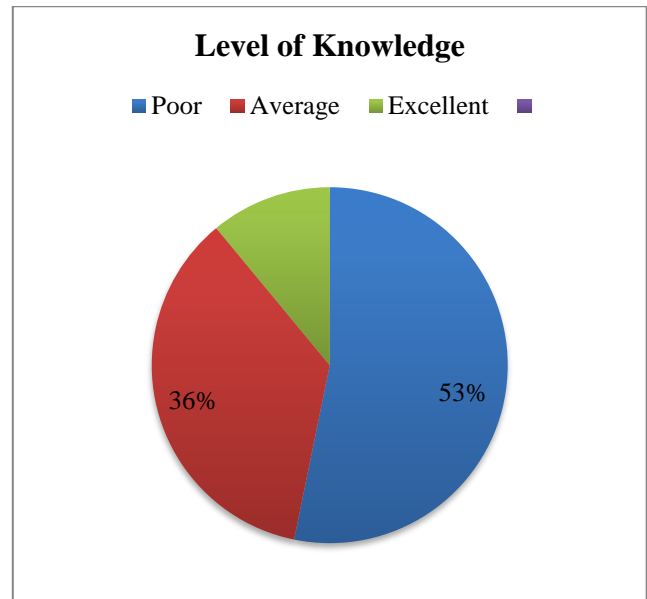


Fig. 1 inferred that 53% of pregnant women had poor knowledge, 36% of pregnant women had average knowledge, and only 11% of pregnant women had excellent knowledge regarding the cesarean section mode of delivery

Table 3. Knowledge score of the study participants regarding increased cesarean section rate

Knowledge score	Mean ± SD	Median	Range score	Mean Percentage
	5.9 ±4.9	5	1-15	24.58%

Table no. 3 reveals that the overall mean score ± SD for the increased cesarean section rate was 5.9 ±4.9, the median knowledge score was 5, the minimum knowledge score was 1, and the maximum knowledge score was 15. The mean percentage of the knowledge score was 24.58%.

7. Result

The factors associated with the increased number of cesarean sections among pregnant women in terms of mean \pm SD score was 5.9 ± 4.9 and median is 5, the standard deviation is 4.9, the mean percentage is 24.58%; therefore, the result of the study based on, ages factor of the women 64.22% women have age between 19-29 years old and 35.77% women have age between 30-43, 38.53% women only have primary education whereas 61% women have secondary or higher education. Indication of cesarean section among women means 82.56% of women have cesarean section indication, whereas only 17.43% of women said that they do not have any indication of cesarean delivery. 46.78% of women were primigravida, whereas 53.21% of women were multigravida. There is no significant association between the demographic variables and the factor leading to an increased cesarean section rate.

8. Conclusion

The study concluded that the majority of 82.56% reproductive women have indications related to cesarean section medical conditions like placenta previa, meconium aspiration, twin pregnancy, hypertension and non-medical indication like prolonged labor, malpractice during the time

of first delivery, anxiety related to labor pain whereas 61.46% women have a first preference toward normal vaginal delivery. The doctors play an important role in using the decision on cesarean section mode of delivery; the women should have adequate awareness about the reduction of pregnancy complications that helps reduce malpractice and detailed justification by doctors for performing the cesarean delivery.

Recommendation

A similar study can be conducted and undertaken on a large scale to make more valid generalizations.

- The study was conducted in college expectant parents, student nurses and obstetrics.
- The study can be replicated by other research designs, such as pre-experimental design.
- A similar study can be done to provide an education program to enhance the knowledge of pregnant women.
- A similar study can be done on the knowledge, attitude of the pregnant women and doctors.
- A comparative study can be done to compare the knowledge of pregnant women regarding cesarean sections in public and private hospitals.

References

- [1] Avijit Roy et al., "Geographical Variability and Factors Associated with Caesarean Section Delivery in India: A Comparative Assessment of Bihar and Tamil Nadu," *BMC Public Health*, vol. 21, no. 1715, 2021. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [2] Sulochana Dhakal-Rai et al., "Factors Contributing to Rising Cesarean Section Rates in South Asian Countries: A Systematic Review," *Asian Journal of Medical Science*, vol. 13, no. 2, pp. 143–174, 2022. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [3] Aaisha Amjad et al., "Factors Associated with Caesarean Deliveries Among Child-Bearing Women in Pakistan: Secondary Analysis of Data from the Demographic and Health Survey, 2012–13," *BMC Pregnancy and Childbirth*, vol. 18, no. 113, 2018. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [4] Chitkasaem Suwanrath et al., "Why Do Pregnant Women Prefer Cesarean Birth? A Qualitative Study in a Tertiary Care Center in Southern Thailand," *BMC Pregnancy and Childbirth*, vol. 21, no. 23, 2021. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [5] Patel R. Roshni et al., "Prenatal Risk Factor for Caesarean Section Analysis of the ALSPAC Cohort of 12 944 women in England," *International Journal of Epidemiology*, vol. 34, no. 2, pp. 353-367, 2005. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [6] Honglei Ji et al., "Factors Contributing to the Rapid Rise of Caesarean Section: A Prospective Study of Primiparous Chinese Women in Shanghai," *BMJ Open*, vol. 5, no. 11, 2015. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [7] AM Batiha, "Cesarean Section: Incidence, Causes, Associated Factors, and Outcomes: A National Prospective Study from Jordan," *iMedPub Journals*, vol. 3, no. 3:55, pp. 1-11, 2017. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [8] Zandkarimi Eghbal, Moghimbeigi Abbas, and Hossein Mahjub, "Assessing the Factors Affecting Cesarean Section Selection in Iranian Women," *Iranian Journal of Public Health*, vol. 50, no. 4, pp. 816-824, 2021. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [9] C-Section, Mayo Clinic, 2022. [Online]. Available: <https://www.mayoclinic.org/tests-procedures/c-section/about/pac-20393655>
- [10] WHO Statement on Cesarean Section Rate. [Online]. Available: <https://www.who.int/publication/i/item/WHO-RHR-15.02>
- [11] Centre for Health Protection Department of Health, Infant Mortality Rate (IMR) and Maternal Mortality Ratio (MMR), 1981 – 2021. [Online]. Available: <https://www.chp.gov.hk/en/statistics/data/10/27/113.html>
- [12] Ana Pilar Betran et al., "Trends and Projections of Caesarean Section Rates: Global and Regional Estimates," *BMJ Global Health*, vol. 6, no. 6, 2021. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [13] Limbs and Things, Increasing Rate of Cesarean Section Implication for Training, 2022. [Online]. Available: <https://limbsandthings.com/uk/news/36013/increasing-caesarean-section-rates-and-the-implications-for-training>
- [14] Byamugisha Josaphat, and Moses Adroma, *Caesarean Section in Low-, Middle-and High-Income Countries, Recent Advances in Cesarean Delivery*, Intech Open, 2020. [[Google Scholar](#)]

- [15] Nenad Miseljic, Ejub Basic, and Sanja Miseljic, "Causes of an Increased Rate of Caesarean Section," *Mater Sociomed*, vol. 30, no. 4, pp. 287-289, 2018. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [16] Moges Gelaw Taye et al., "Prevalence and Factors Associated with Caesarean Section in a Comprehensive Specialized Hospital of Ethiopia: A Cross-Sectional Study; 2020," *Annals of Medicine and Surgery*, vol. 67, 2021. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [17] Alaa Marouf, Firas Hussein, and Louai Hasan, "Analytical Study of Thrombocytopenia in Pregnant Women in Tishreen University Hospital (Causes, Complications, Management)," *SSRG International Journal of Medical Science*, vol. 9, no. 1, pp. 9-13, 2022. [[CrossRef](#)] [[Publisher Link](#)]
- [18] Neetu Singh, Yasodhara Pradeep, and Sugandha Jauhari, "Indications and Determinants of Cesarean Section: A Cross-Sectional Study," *International Journal of Applied and Basic Medical Research*, vol. 10, no. 4, pp. 280-285, 2020. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [19] Ye J et al., "Association between Rates of Caesarean Section and Maternal and Neonatal Mortality in the 21st Century: A Worldwide Population-Based Ecological Study with Longitudinal Data," *BJOG: An International Journal of Obstetrics & Gynaecology*, vol. 123, no. 5, pp. 745-753, 2015. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [20] Nivedita Roy et al., "Changing Scenario of C-section Delivery in India: Understanding the Maternal Health Concern and Its Associated Predictors," *Journal of Family Medicine and Primary Care*, vol. 10, no. 11, pp. 4182-4188, 2021. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [21] Sharon Sung, and Heba Mahdy, *Cesarean Section*, StatPearls [Internet], 2022. [[Publisher Link](#)]
- [22] Keenan Laura, Cesarean Section Rates Continue to Rise, Amid Growing Inequalities in Access -16 Jan 2021, WHO articles, 2021. [Online]. Available: <https://www.who.int/news/items/16-06-2021>
- [23] Sharma K Suresh, *Nursing Research and Statistics, Research Methodology*, 3rd edition, Elsevier India publication. 2018. [[Google Scholar](#)]