



Non-obstetric Causes of Cesarean Section in Iranian Pregnant Women Referring to Medical Services Commission

Ali Kord¹, Maryam Chamangasht², Mahnaz Akbari Kamrani ³, Sedigheh Zalzar¹ and Malihe Farid^{3,*}

¹Vice-Chancellor for Treatment Affairs, Alborz University of Medical Sciences, Karaj, Iran

²Department of Midwifery, Medicine Faculty, Alborz University of Medical Sciences, Karaj, Iran

³Social Determinants of Health Research Center, Alborz University of Medical Sciences, Karaj, Iran

*Corresponding author: Social Determinants of Health Research Center, Alborz University of Medical Sciences, Karaj, Iran. Email: malihefarid@yahoo.com

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Abstract

Background: Despite the implementation of the Health Transformation Plan in recent years, the cesarean section (CS) rate has increased in private and public centers in Iran. Accordingly, Iran is the first among the four countries in the world with the highest CS rate.

Objectives: The present study aimed to investigate the non-obstetric causes of CS in mothers who were referred to the Medical Services Commission of Alborz province, Iran, to review their requests for CS.

Methods: In this cross-sectional study, 312 subjects were selected based on a census of all clients by the Midwifery Office of Alborz province, whose requests for CS for non-obstetric reasons were submitted to the Medical Services Commission in 2020. The information in this study was collected using a researcher-made questionnaire containing 26 items in two sociodemographic and medical sections.

Results: The highest frequency of sociodemographic factors was observed for the age range of 20 - 30 years (n = 163, 52.2%), the educational level of diploma and higher (n = 236, 75.6%), urban residence (n = 274, 87.8%), and no complementary insurance (n = 258, 82.7%). The frequency distribution of the non-obstetric reasons of the participants was reported as 83 (26.6%), 60 (19.2%), 25 (8%), 24 (7.7%), 20 (6.4%), 14 (4.5%), and 86 (27.6%) for lumbar disc disease, eye diseases, repeat CS, genital warts, in vitro fertilization, fear of childbirth pain, and other causes, respectively. There was a significant association between the reason for requesting CS and the age group (P < 0.001), the type of insurance (P = 0.043), and the mother's educational level (P < 0.001).

Conclusions: In the present study, most of the women in the younger age group and non-employees requested a CS for non-obstetric reasons.

Keywords: Obstetrics, Cesarean Section, Pregnant Women, Socioeconomic Factors

1. Background

Cesarean section (CS), which is one of the most common and oldest surgeries, is performed in conditions where natural childbirth endangers the life of the mother and the neonate (1). The CS rate is increasing rapidly throughout the world (2). Cesarean section is performed for one in three births in the USA. The excessive use of this method is significant as an important problem of maternal safety (3, 4). In recent years, the CS rate has increased in private and public centers in Iran. Accordingly, Iran is the first among the four countries in the world with the highest CS rate (5) and the first rank in Asia (6). The average prevalence of CS within 2019 - 2021 in Iran was reported to be about 51.6% (7).

The rate of severe complications in planned CS, compared to planned vaginal delivery, has been reported three times (8), which will also increase treatment costs (9). Given the higher rates of maternal morbidity and mortality associated with CS, it is, therefore, necessary to evaluate the indications and maternal and neonatal outcomes associated with CS (10). In addition to medical and non-medical causes, in recent studies, some factors such as high social class (11), delivery by the doctor and the desired time (12, 13), greater awareness of women about their rights to make decisions for their health issues, traumatic experiences in previous pregnancies (14) were studied. In addition, the fear of loss of sexual attractiveness due to perineal tissue damage, the risk of urinary incontinence in the future (13), and fertility with

assisted reproductive technology (ART) (15) can increase the CS rate. Other reasons for the increase in CS are the personal preference of gynecologists due to financial incentives, the reduction of training and skills to perform forceps and vacuum techniques, reduced risk, comfort, and ease in performing CS, the fear of litigation, and the use of CS as a protective strategy (16).

Several studies have shown that the elective CS rate in Iran ranges from 11.2% to 22% (17, 18). Previous studies conducted in Iran have suggested that lack of knowledge and misrepresentation about natural childbirth, fear of pain in natural childbirth, and the need to plan for the delivery date can be considered the causes of elective CS. In addition, a part of this increase might be due to the change in individuals' attitudes toward childbirth approaches. Other studies showed that emotional causes, misconceptions and wrong mental norms in Iranian mothers, sociocultural, religious, and economic customs, and poorly understood behavioral control were the most important causes in choosing the type of delivery (19). Currently, 6 - 17% of all births occurring through CS worldwide are based on the mother's request (11). Moreover, 17% of indications for CS are due to non-obstetric reasons (20). The most common non-obstetric causes of CS between 1950 - 2017 include cardiovascular and eye diseases (e.g., myopia, diabetic retinopathy, and glaucoma), blood diseases, rheumatology, psychological diseases (e.g., tokophobia), neurological diseases, orthopedic diseases (e.g., herniated disk), and infectious diseases (e.g., genital warts). Rejecting non-obstetric indications for CS provided by other specialists in the absence of evidence-based support can be a useful strategy to reduce the rate of unnecessary CS (21).

A study performed in the USA showed that prior CS was the strongest predictor of CS with medical and non-medical indications. Vaginal birth after cesarean section (VBAC) is a viable option for many women. However, since 1996, the number of VBACs has significantly decreased and might not even be available in some clinical settings (22). The VBAC rate in 2018 in Iran (0.8%) was much lower than in the USA (13.3%) because women do not have the opportunity to choose VBAC, and health service providers do not recommend it (12). The easiest attempt to reduce the CS rate is to reduce elective CS on maternal request (23). In 2014, one of the most important reforms in Iran's health system was implemented under the name of the Health Transformation Plan (HTP), one of the goals of which was to reduce the CS rate and increase the desire for vaginal delivery. In the first months of the implementation of the plan, the results indicated a decrease in the CS rate for public and private hospitals (24). In the continuation of the implementation of the plan, some results showed that

it was increasing every month in the following months, and it is a sign that this plan, despite being free, did not promote the rate of natural childbirth and socioeconomic and cultural factors are involved in the increase of the CS rate. A reduction in the rate of CS will occur in the long term before planning and performing repeated CS (25).

2. Objectives

The elective CS without medical indications has become a serious concern in Iran and many countries, and officials have expressed concern about the increase in the CS rate and its effects on the health of mothers and children. Not only should the CS rate be determined, but also CS should be provided for women with real medical indications for it, and unnecessary CS should be avoided. Furthermore, according to the implementation of the HTP, the present study aimed to investigate the non-obstetric causes of CS in mothers who were referred to the Medical Services Commission of Alborz province, Iran, to review their requests for CS.

3. Methods

This was a cross-sectional analytical study. The sample selection was based on a census of all clients by the Midwifery Office of Alborz province (one of the provinces adjacent to the capital of Iran) whose requests for CS for non-obstetric reasons were submitted to the Medical Services Commission in 2020. This study examined the information of 312 women. Since the required information of all the study participants was complete, no sample was excluded from the study. It should be noted that in Iran, with the implementation of the HTP in order to reduce the number of unnecessary CSs, pregnant mothers who request a CS for non-obstetric reasons must be submitted by the medical team, along with their medical documents, to the Medical Services Commission located in the deputy director of obstetrics department for treatment. The final review and approval will be referred, and those whose documents are approved will be allowed to undergo elective CS.

In this study, the data were collected using a researcher-made questionnaire containing 26 items in two sociodemographic and medical sections. The data were collected and recorded by the interviewers. The sociodemographic section included age, educational level, occupation, residency, and insurance status. Also, medical history, including the number of pregnancies, type of previous delivery, number of live children, abortion, stillbirth, history of infertility, number of pregnancy care,

and location, were checked. The medical section was prepared after a detailed study of the literature, books, and other sources (until 2021) in the field of cesarean causes. The face and content validity was confirmed by expert members (majors of obstetrician, gynecology, reproductive health, midwifery, and general practitioner). To evaluate the content validity in the quantitative method, the content validity ratio (CVR) and content validity index (CVI) with the support of expert members were assessed. According to eight academic members with expertise in the relevant field and considering the standard of above 0.75 in Lawshe's table, the CVR was approved. Furthermore, the CVI for each item was calculated, as previously mentioned, at 0.79. The internal consistency of the instrument with Cronbach's alpha of 0.86 was also confirmed.

The state of rejecting or approving the request for CS and what was the final type of delivery of the case were two variables that were measured after the follow-up of the subjects. The study protocol was approved by the Ethics Committee of Alborz University of Medical Sciences (ID number: ABZUMS.REC.1395/139). After obtaining written informed consent from the clients to request a CS from the midwifery department, the questionnaire was given to the participants, and they were asked to answer the items carefully. Then, the subjects' contact numbers and addresses were taken for follow-up after delivery. All statistical analyses were performed using SPSS software (version 23). Descriptive statistics, including central and dispersion indices, tables for description, and statistical tests of Fisher's exact and chi-square, were used to evaluate the association between the reason for requesting CS and sociodemographic variables.

4. Results

In this study, 312 pregnant mothers requested CS for non-obstetric reasons. In this study, 75.6% of mothers were nulliparous, and 87.8% of the participants lived in urban areas. Moreover, 2.9%, 52.2%, 30.4%, and 14.4% of the participants were in the age group under 20, 20 - 30, 31 - 35, and over 35 years, respectively. In this study, only 17.3% of the participants had complementary insurance. [Table 1](#) shows other demographic characteristics of mothers requesting CS.

The results of the study showed that the average time since the last birth of the participants was 8.45 ± 3.71 years. The average duration of suffering from non-obstetric causes among the participants was 4.97 ± 5.70 years. In this study, all mothers received prenatal care. Furthermore, 98.7% of the participants had attended childbirth preparation classes. In this study, 3.8% of the

Table 1. Frequency Distribution of Participants According to Mother's Education, Spouse's Education, Mother's Occupation, and Spouse's Occupation (N = 312)

Variables	No. (%)
Mother's education	
Illiterate	2 (0.6)
Elementary	13 (4.2)
High school	61 (19.6)
Diploma	165 (52.9)
Associate degree	11 (3.5)
Bachelor's degree	54 (17.3)
Higher than a bachelor's degree	6 (1.9)
Father's education	
Illiterate	1 (0.3)
Elementary	15 (4.8)
High school	61 (19.6)
Diploma	169 (54.2)
Associate degree	16 (5.1)
Bachelor's degree	41 (13.1)
Higher than a bachelor's degree	9 (2.9)
Mother's occupation	
Employee	19 (6.1)
Self-employed	4 (1.3)
Housewife	289 (92.6)
Father's occupation	
Employee	65 (20.8)
Self-employed	247 (79.2)

participants had a history of infertility. [Table 2](#) shows other characteristics of the obstetric history of the participants.

The frequency distribution of the non-obstetric reasons of participants was reported as 83 (26.6%), 60 (19.2%), 25 (8%), 24 (7.7%), 20 (6.4%), 14 (4.5%), and 86 (27.6%) for lumbar disc disease, eye diseases, repeat CS, genital warts, in vitro fertilization (IVF), fear of childbirth pain, and other causes, respectively. [Table 3](#) shows the frequency distribution of the non-obstetric reasons of participants based on the decision of the Medical Services Commission.

Fisher's exact test showed a significant association between the age group and the reason for requesting CS ($P < 0.001$) ([Table 4](#)). Fisher's exact test showed a significant association between the type of insurance and the reason for requesting CS ($P = 0.043$). Accordingly, a higher percentage of complementary insurance holders were referred to undergoing CS due to back problems and fear of childbirth.

In addition, the Chi-square test results showed that

Table 2. Frequency Distribution of Participants According to History of Abortion, Number of Pregnancies, Number of Births, and History of Child Death (N = 312)

Variables	No. (%)
History of abortion	
Yes	50 (16)
No	262 (84)
Number of pregnancies	
1	206 (66)
2	48 (15.4)
3	44 (14.1)
4	10 (3.2)
5	2 (0.6)
7	1 (0.3)
11	1 (0.3)
Number of births	
0	236 (75.6)
1	47 (15.1)
2	27 (8.7)
3	1 (0.3)
4	1 (0.3)
History of child death	
Yes	2 (0.6)
No	310 (99.4)

a significant association was observed between the educational level of the mothers (diploma and higher or lower than diploma) and the reason for requesting a CS ($P < 0.001$). Accordingly, a higher percentage of women with an educational level lower than a diploma were referred to performing repeat CS.

Additionally, Fisher's exact test results did not show a significant association between the reason for a woman's request for CS with her place of residence (city/village) ($P = 0.08$), mother's status of employment or unemployment ($P = 0.08$), and father's occupation (self-employed/employee) ($P = 0.9$). Furthermore, 87.8% of the total number of requests were accepted by the Medical Services Commission. In the postpartum follow-up of participants, it was shown that 26.3% of the participants requesting CS were rejected by the Medical Services Commission and ended their pregnancy with CS. Fisher's exact test results showed that there was a significant association between the outcome (vaginal delivery or CS) and the reason for requesting CS in the group whose request was not accepted ($P = 0.014$) (Table 5).

5. Discussion

The findings of this study showed a significant association between the reason for requesting CS and the age group ($P < 0.001$), the type of insurance ($P = 0.043$), and the mother's educational level ($P < 0.001$). Cesarean section without medical indication has increased in Iran in the last three decades. According to studies conducted in Iran, sociodemographic factors, such as increasing marriage age, mothers' employment, educational level, living in urban areas, access to health insurance, low economic status, ethnicity, housing status and family size, and maternal and midwifery factors, such as lower parity, history of childbirth, previous history of abortion, infertility and assisted pregnancy, and female preference for CS, were associated with the CS rate. Increasing access to health services, having health insurance, and decreasing fertility rates are reported to be the most important factors contributing to the increase in elective CS. Several factors, including the role of healthcare professionals, insurance companies, sociocultural factors, and health policies, can contribute to the significant increase in the CS rate, which is due to removing the delivery from its natural and non-medical processes. (14, 25-28).

In the present study, most of the women in the younger age group of less than 30 years (55.1%) and non-employees (92.6%) requested CS for non-obstetric reasons. Dweik et al., contrary to the common discussion about increasing the CS rate at an older age, proposed a younger maternal age due to the influence of the perceived environment on CS and the individual's belief that CS is more beneficial (28). In a study by Shehwar et al., CS was more common among women aged 26-30 years and housewives with higher educational levels due to frequent visits to prenatal care (29). It has been suggested that women with higher educational levels are more likely to seek a reason to perform a CS due to the knowledge of the association between natural childbirth and pelvic organ prolapse and urinary incontinence. Women with a history of abortion and ART choose CS due to the desire to preserve this precious pregnancy and with the idea that CS is safer for themselves and especially their child, and the traumatic experience of previous abortion affects their choice (30).

In the current study, the non-obstetric causes in the order of prevalence were lumbar disc disease ($n = 83$, 26.6%), eye diseases ($n = 60$, 19.2%), repeat CS ($n = 25$, 8%), genital warts ($n = 24$, 7.7%), IVF ($n = 20$, 6.4%), fear of childbirth pain ($n = 14$, 4.5%), and other causes ($n = 86$, 27.6%).

In the present study, 26.6% of participants undergoing CS had lumbar disc disease. It is estimated that lumbar disc herniation (LDH) affects approximately

Table 3. Frequency Distribution of Delivery Results According to Non-obstetric Reasons

Non-obstetric Causes	Natural Childbirth, No. (%)	Cesarean Section, No. (%)	P-Value
Eye diseases (e.g., LASIK)	1 (1.7)	59 (98.3)	0.011
Lumbar disc disease	14 (16.9)	69 (83.1)	
Genital warts	4 (16.7)	20 (83.3)	
In vitro fertilization	1 (5)	19 (95)	
Fear of childbirth pain	0 (0)	14 (100)	
Repeat cesarean section	0 (0)	25 (100)	
Other causes (e.g., epilepsy and hemorrhoids)	9 (10.5)	77 (89.5)	
Total	29 (9.3)	283 (90.7)	

Table 4. Association Between Age Group and Non-obstetric Reasons for Cesarean Section

Non-obstetric Causes	Under 30 Years	31-35 Years, No. (%)	Over 35 Years, No. (%)	Test	P-Value
Eye diseases (e.g., LASIK)	38 (22.1)	17 (17.9)	5 (11.1)	Fisher's exact	0.014
Lumbar disc disease	46 (26.7)	28 (29.5)	9 (20.0)		
Genital warts	20 (11.6)	4 (4.20)	0 (0)		
In vitro fertilization	2 (1.2)	12 (12.6)	6 (13.3)		
Fear of childbirth pain	10 (5.8)	2 (2.1)	2 (4.4)		
Repeat cesarean section	1 (.6)	14 (14.7)	10 (22.2)		
Other causes (e.g., epilepsy and hemorrhoids)	55 (32)	18 (18.9)	13 (28.9)		

Table 5. Frequency Distribution of Delivery Results According to Non-obstetric Reasons in the Application Rejection Group

Non-obstetric Causes	Natural Childbirth, No. (%)	Cesarean Section, No. (%)	Test	P-Value
Eye diseases (e.g., LASIK)	1 (50)	1 (50)	Fisher's exact	0.000
Lumbar disc disease	13 (86.7)	2 (13.3)		
Genital warts	4 (100)	0 (0)		
In vitro fertilization	1 (25)	3 (75)		
Fear of childbirth pain	0 (0)	2 (100)		
Repeat cesarean section	0 (0)	0 (0)		
Other causes (e.g., epilepsy and hemorrhoids)	9 (81.8)	2 (18.2)		
Total	28 (73.7)	10 (26.3)		

1 in 10,000 pregnant women. Although women with normal deliveries do not report high rates of persistent neurological symptoms, some doctors recommend that women have CS to prevent the worsening of lumbar spine symptoms. Labor induction before LDH treatment can increase nerve damage due to increased epidural venous pressure occurring during labor (31, 32).

In the current study, the frequency of eye diseases was 19.2%. The percentage of indications for CS might be due to non-obstetric reasons, 20.5% of which are related to eye diseases. It has also been said that the eye diseases

that are the most common indications of CS are myopia, retinopathy, and glaucoma. A review of the articles shows no consensus about planning the delivery method based on eye diseases (20). A recent meta-analysis showed that the vertical transmission rate of human papillomavirus (HPV) in CS is lower than in vaginal delivery. However, CS prevents vertical transmission but does not make it impossible (33). In HPV-DNA positive mothers, CS should be indicated only in the presence of large obstructing condyloma, leading to a physical obstruction in vaginal delivery. Although if there is a high load of HPV and

healthy membranes, it is appropriate for the mother to be informed about the risks and benefits of CS or vaginal delivery and decide on the delivery type (21).

In line with the results of this study, several studies reported the demand for CS after IVF (33, 34). Decisions about how to deliver pregnancies resulting from ART should only be based on evidence, and vaginal delivery should be encouraged in low-risk pregnancies. There is no specific information about CS after ART in Iran. The choice of CS following ART has become common because the management of these pregnancies is considered high-risk. The actual medical condition of these women should be considered in determining the mode of delivery. Further research is needed to investigate the rate and indications of CS after ART in Iran (15).

One of the main indications for CS is prior CS (35, 36). Women with prior CS do not want to have a VBAC due to fear, loneliness, and powerlessness. Therefore, comprehensive support, including planning a special care system for women who have had prior SC, is necessary. Designing cultural plans for natural childbirth helps modify women's beliefs and increase their knowledge in making decisions about VBAC. It is recommended to plan for these strategies and evaluate their effectiveness (37). Since the number of children of a mother undergoing CS is limited, it is essential to perform such an operation only if there are clear medical indications. Although a CS is a safe operation, when performed without a medical need, it exposes mothers and their neonates to short- and long-term health problems.

All individuals and groups should be involved in reducing the CS rates. Persuading specialists to perform vaginal delivery through modifying payment mechanisms and increasing access to delivery services and community-based education through mass media can help change the attitude of Iranian mothers toward CS (38). Iran's national health policy for natural childbirth promotion program is to reduce the CS rates for nulliparous women. Therefore, it is necessary to develop health literacy among women through counseling in birth preparation classes by midwives. Efforts to reduce CS in Iran can be achieved by empowering healthcare providers, particularly obstetricians, and gynecologists, to provide physiologic delivery and ensure continuity of care by midwives. (7).

As the strengths of this study, it can be mentioned that it was conducted for the first time in Iran and in Alborz province, which is a highly populated province with multi-ethnic residents. Documentary data were obtained from the vice-chancellor for treatment affairs, which received all the requests of the Alborz province. The authors suggest that similar studies be repeated at

certain intervals to monitor the changes in the causes of CS requests. It is also suggested to conduct this study in other parts of the country.

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Footnotes

Authors' Contribution: A. K. participated in designing and collecting the data. M. C. participated in the designing and critical revision of the manuscript. M. A. K. participated in the designing and critical revision of the manuscript. S. Z. participated in collecting the data. M. F. performed the statistical analysis and revised the manuscript.

Conflict of Interests: All the authors declare that they have no conflict of interest (financial and non-financial).

Ethical Approval: This study was approved under the ethical approval code of ABZUMS.REC.1395.139. At the time of ethical approval of the research project of this study (2016 - 2017), the Ethics Committee of Alborz University of Medical Sciences informed the researcher by providing a letter containing the ethical approval code (ABZUMS.REC.1395.139).

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Informed Consent: Written informed consent was obtained from the participants.

References

1. Jafarzadeh A, Hadavi M, Hasanshahi G, Rezaeian M, Vazirinejad R, Aminzadeh F, et al. Cesarean or cesarean epidemic? *Arch Iran Med*. 2019;22(11):663-70. [PubMed ID: 31823633].
2. Chen H, Tan D. Cesarean section or natural childbirth? cesarean birth may damage your health. *Front Psychol*. 2019;10:351. [PubMed ID: 30846956]. [PubMed Central ID: PMC6394138]. <https://doi.org/10.3389/fpsyg.2019.00351>.
3. Lagrew DC, Kane Low L, Brennan R, Corry MP, Edmonds JK, Gilpin BG, et al. National partnership for maternal safety: consensus bundle on safe reduction of primary cesarean births-supporting intended vaginal births. *J Obstet Gynecol Neonatal Nurs*. 2018;47(2):214-26. [PubMed ID: 29478788]. <https://doi.org/10.1016/j.jogn.2018.01.008>.

4. Kant A, Mendiratta S. Classification of cesarean section through Robson criteria: an emerging concept to audit the increasing cesarean section rate. *Int J Reprod Contracept Obstet Gynecol.* 2018;7(11). <https://doi.org/10.18203/2320-1770.ijrcog20184528>.
5. Zamani-Alavijeh F, Araban M, Hassanzadeh A, Makhoul K. Contributing factors of pregnant women's beliefs towards mode of delivery: a cross-sectional study from Iran. *Matern Health Neonatol Perinatol.* 2018;4:9. [PubMed ID: 29744129]. [PubMed Central ID: PMC5930689]. <https://doi.org/10.1186/s40748-018-0077-1>.
6. Safaei nezhad A, Rastegari L, Kharaghani R. Prevalence and predictors of cesarean section in zanjan-Iran during 2014-2016. *Prev Care Nurs Midwifery J.* 2017;7(3):47-55.
7. Poursheirazi M, Heidarzadeh M, Taheri M, Esmaily H, Babaei F, Talkhi N, et al. Cesarean delivery in Iran: A population-based analysis using the Robson classification system. *BMC Pregnancy Childbirth.* 2022;22(1):185. [PubMed ID: 35260106]. [PubMed Central ID: PMC8903666]. <https://doi.org/10.1186/s12884-022-04517-1>.
8. Nigar A, Ahmad A, Khan K. A study of rate, indications and maternal morbidity associated with cesarean delivery in a tertiary care hospital. *Int J Reprod Contracept Obstet Gynecol.* 2019;8(7). <https://doi.org/10.18203/2320-1770.ijrcog20193047>.
9. Hatupopi SK, Nghanukamo M, Nghitanwa EM, Tuhadeleni ON. Indications for caesarean sections in rundu state hospital in kavango East region, Namibia. *Glob J Health Sci.* 2019;11(11). <https://doi.org/10.5539/gjhs.v11n11p120>.
10. Aftab S, Ali N, Saleh F, Ghafoor SG, Mahesh A, Memon S. Indications of primary cesarean section In multipara. *J Bahria Univ Med Dent Coll.* 2019;9(2):105-8. <https://doi.org/10.51985/jbumdc2018117>.
11. Carlotto K, Marmitt LP, Cesar JA. On-demand cesarean section: Assessing trends and socioeconomic disparities. *Rev Saude Publica.* 2020;54:1. [PubMed ID: 31939575]. [PubMed Central ID: PMC9586441]. <https://doi.org/10.11606/S1518-8787.2019053001466>.
12. Majeed N, Kalsoom S, Rani H, Tariq S. Rising caesarean section rate-whether the women choice, doctor preference or clinical/non clinical indications are responsible. *J Rawalpindi Med Coll.* 2018;22(1).
13. Michalik A, Pietrzak J, Widomska M, Olszewska J. Women's opinions about potential complications of caesarean delivery. *J Public Health Nurs Med Rescure.* 2017;2:52-8.
14. Behjati Ardakani Z, Navabakhsh M, Ranjbar F, Tremayne S, Akhondi MM, Mohseni Tabrizi A. Dramatic rise in cesarean birth in Iran: A coalition of private medical practices and women's choices. *Int J Women's Health Reprod Sci.* 2020;8(3):245-58. <https://doi.org/10.15296/ijwhr.2020.41>.
15. Ranjbar F, Gharacheh M. Increased rate of elective cesarean delivery following assisted reproductive technology: A letter to the editor. *Int J Reprod Biomed.* 2020;18(2):145-6. [PubMed ID: 32259009]. [PubMed Central ID: PMC7097169]. <https://doi.org/10.18502/ijrm.v18i2.6425>.
16. Kingdon C, Downe S, Betran AP. Interventions targeted at health professionals to reduce unnecessary caesarean sections: a qualitative evidence synthesis. *BMJ Open.* 2018;8(12). e025073. [PubMed ID: 30559163]. [PubMed Central ID: PMC6303601]. <https://doi.org/10.1136/bmjopen-2018-025073>.
17. Mohammadtabar S, Rahnama P, Mohammadi K. Cesarean section on maternal request in Tehran 2010-2011: incidence and predisposing factors. *J Maz Univ Med Sci.* 2014;24(114):74-82. Persian.
18. Alimohamadian M; Shariat M; Mahmoodi M; Ramezanzadeh F. The influence of maternal request on the elective cesarean section rate in maternity hospitals in Tehran, Iran. *Payesh (Health Monitor) J.* 2003;2(2):137-42. Persian.
19. Naghibi SA, Khazae-Pool M, Moosazadeh M. The Iranian version of theory-based intention for cesarean section (IR-TBICS) scale: development and first evaluation. *BMC Pregnancy Childbirth.* 2021;21(1):5. [PubMed ID: 33402125]. [PubMed Central ID: PMC7784005]. <https://doi.org/10.1186/s12884-020-03498-3>.
20. Coşkun B, Özateş S, Coşkun B, Kinci MF, ŞİMŞİR C. Retrospective evaluation of indications and birth results of cesarean section due to ophthalmologic diseases. *Eur Res J.* 2020;6(4):287-91. <https://doi.org/10.18621/eurj.559681>.
21. Venturella R, Quaresima P, Miceli M, Rania E, Palumbo A, Visconti F, et al. Non-obstetrical indications for cesarean section: a state-of-the-art review. *Arch Gynecol Obstet.* 2018;298(1):9-16. [PubMed ID: 29560505]. <https://doi.org/10.1007/s00404-018-4742-4>.
22. Witt WP, Wisk LE, Cheng ER, Mandell K, Chatterjee D, Wakeel F, et al. Determinants of cesarean delivery in the US: a lifecourse approach. *Matern Child Health J.* 2015;19(1):84-93. [PubMed ID: 24770955]. [PubMed Central ID: PMC4209310]. <https://doi.org/10.1007/s10995-014-1498-8>.
23. Hellerstein S. Safe Prevention of Primary Cesarean Section in China. *J Anesth Perioper Med.* 2017;4. <https://doi.org/10.24015/japm.2017.0031>.
24. Behzadifar M, Behzadifar M, Saki M, Valipour M, Omidifar R, Iranshahi F, et al. The impact of the "health transformation Plan" and related policies on the prevalence rate of cesarean section in Iran: Insights from an interrupted time series analysis. *Int J Health Plann Manage.* 2020;35(1):339-45. [PubMed ID: 31637776]. <https://doi.org/10.1002/hpm.2916>.
25. Karami Matin B, Hajizadeh M, Najafi F, Homaie Rad E, Pirooz B, Rezaei S. The impact of health sector evolution plan on hospitalization and cesarean section rates in Iran: an interrupted time series analysis. *Int J Qual Health Care.* 2018;30(1):75-9. [PubMed ID: 29272503]. <https://doi.org/10.1093/intqhc/mzx169>.
26. Peydayesh M, Zamani N, Mohseni M, Dehghani Z, Nikfar S. The prevalence of cesarean section and some related factors: A cross sectional study in Iran. *Ann Rom Soc Cell Biol.* 2021;25(6):371-7.
27. Zarshenas M, Zhao Y, Binns CW, Scott JA. Incidence and determinants of caesarean section in Shiraz, Iran. *Int J Environ Res Public Health.* 2020;17(16). [PubMed ID: 32764231]. [PubMed Central ID: PMC7459978]. <https://doi.org/10.3390/ijerph17165632>.
28. Dweik D, Girasek E, Meszaros G, Toreki A, Kereszturi A, Pal A. Non-medical determinants of cesarean section in a medically dominated maternity system. *Acta Obstet Gynecol Scand.* 2014;93(10):1025-33. [PubMed ID: 25066090]. <https://doi.org/10.1111/aogs.12466>.
29. Shehwar DE, Sheikh IS, Sulehri SA, Batool F, Masooma. Socio-demographic, obstetric and non-obstetric factors influencing the incidence of cesarean section (C-section). *Pak-Euro J Med Life Sci.* 2022;5(2):395-402. <https://doi.org/10.31580/pjmls.v5i2.2502>.
30. Masciullo L, Petruzzello L, Perrone G, Pecorini F, Remiddi C, Galoppi P, et al. Cesarean section on maternal request: An Italian comparative study on patients' characteristics, pregnancy outcomes and guidelines overview. *Int J Environ Res Public Health.* 2020;17(13). [PubMed ID: 32610490]. [PubMed Central ID: PMC7369872]. <https://doi.org/10.3390/ijerph17134665>.
31. Paslaru FG, Giovani A, Iancu G, Panaitescu A, Peltecu G, Gorgan RM. Methods of delivery in pregnant women with lumbar disc herniation: A narrative review of general management and case report. *J Med Life.* 2020;13(4):517-22. [PubMed ID: 33456600]. [PubMed Central ID: PMC7803304]. <https://doi.org/10.25122/jml-2020-0166>.
32. Whiles E, Shafafy R, Valsamis EM, Horton C, Morassi GL, Stokes O, et al. The management of symptomatic lumbar disc herniation in pregnancy: A systematic review. *Global Spine J.* 2020;10(7):908-18. [PubMed ID: 32905728]. [PubMed Central ID: PMC7485082]. <https://doi.org/10.1177/2192568219886264>.
33. Kovacs JR. 606 Association between in vitro fertilization and cesarean delivery among laboring nulliparous women. *Am J Obstet Gynecol.* 2021;224(2). <https://doi.org/10.1016/j.ajog.2020.12.627>.
34. Diao J, Gao G, Zhang Y, Wang X, Zhang Y, Han Y, et al. Cesarean section defects may affect pregnancy outcomes after in vitro fertilization-embryo transfer: a retrospective study. *BMC Pregnancy Childbirth.* 2021;21(1):487. [PubMed ID: 34229640]. [PubMed Central ID: PMC8261987]. <https://doi.org/10.1186/s12884-021-03955-7>.
35. Batieha AM, Al-Daradkah SA, Khader YS, Basha A, Sabet F, Athamneh

- TZ, et al. Cesarean section: Incidence, causes, associated factors and outcomes: A national prospective study from Jordan. *Gynecol Obstet Case Rep.* 2017;**3**(3):55. <https://doi.org/10.21767/2471-8165.1000055>.
36. Verma S, Saini J, Sehra R, Nagaraj N. A clinical study of rate and indications of cesarean section, maternal and fetal outcomes at tertiary care center in north western Rajasthan. *Int J Reprod. Contracept Obstet Gynecol.* 2016:2791-4. <https://doi.org/10.18203/2320-1770.ijrcog20162667>.
37. Firoozi M, Tara F, Mazloun SR, Latifnejad Roudsari R. A qualitative inquiry to explore why women with previous cesarean-section Do not choose vaginal birth after cesarean. *J Midwifery Reprod Health.* 2021;**9**(2):2753-62. <https://doi.org/10.22038/jmrh.2021.58760.1713>.
38. Behzadifar M, Behzadifar M, Bakhtiari A, Azari S, Saki M, Golbabayi F, et al. The effect of the health transformation plan on cesarean section in Iran: a systematic review of the literature. *BMC Res Notes.* 2019;**12**(1):37. [PubMed ID: 30658686]. [PubMed Central ID: PMC6339382]. <https://doi.org/10.1186/s13104-019-4081-y>.