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The Prevalence of Cesarean Section and some Related Factors: A Cross Sectional Study in Iran

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ABSTRACT

Introduction: Unfortunately, the prevalence of cesarean section has increased in recent years and since awareness of the prevalence and its causes for effective planning and interventions is inevitable, this research was conducted with the aim of investigating the prevalence of cesarean section and some related factors in Pasteur Hospital in Bam in the first half of 1393 (2020).

Materials and Methods: In this descriptive-analytical cross-sectional study, all pregnant mothers admitted to Pasteur Hospital in the first half of 2020 and gave birth to singleton babies were investigated. Finally, the records of 222 pregnant women (according to the statistical formula) were selected and information on the mother's job and education, mother's age, place of residence, cause of cesarean section, birth order, weight and head circumference and gender of the baby, gestational age of the fetus, history of miscarriage or stillbirth was extracted and analyzed.

Findings: Our results indicated that the prevalence of cesarean section in the study population was 44.5%. There was a statistically significant relationship between the frequency of cesarean section and higher education, employment, residing in city and older age ($P < 0.05$). The most common causes of cesarean section were history of previous cesarean section (54%), fetal problems (23.4%) and maternal diseases (22.6%), respectively.

Conclusion: Although cesarean section is common and frequent in today's society and accounts for about 45% of deliveries, it can be greatly decreased with preventive, advisory and control measures.

KEYWORDS

Delivery, Cesarean Section, Causes, Iran, Prevalence.

Introduction

The mechanism of delivery is a spontaneous process that is performed naturally and by cesarean section [1] . It has been shown that about 85-90% of deliveries can be performed naturally without any therapeutic intervention [2]. Since the ultimate goal of the delivery guidance team is to perform a safe delivery and give birth to a healthy baby while maintaining the health of the mother, the science of midwifery has been able to achieve this goal to a large extent with recent advances and dramatically reduce maternal and neonatal mortality and morbidity using prenatal and postnatal care [3-6]. According to research, vaginal delivery is known as the best type of delivery, but unfortunately, due to cesarean section, the prevalence of vaginal delivery has decreased in recent years [7, 8]. Conditions such as maternal pelvic stenosis or fetal overgrowth (for example, in mothers with diabetes), abnormal position of the fetus in the uterus, decreased or altered fetal heart rate, prolonged labor time, severe bleeding, severe pregnancy poisoning, amniotic sac rupture and not having labor pains and any disturbance in the normal progress of labor prevent natural delivery and in these cases cesarean section must be performed. All of these can be the cause of 10 to 15% of cesarean sections [2].

However, according to recent studies, the rate of cesarean section in the world is increasing, so that this rate is

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reported to be about 22%, 25%, and 27% in the United States, Brazil, and Chile, respectively [9, 10]. According to the World Health Organization (WHO), the incidence of cesarean section should not exceed 15% of all deliveries [11]. Unfortunately, according to the results of various studies, the rate of cesarean section in Iran is very high and according to statistics, this rate is reported to be 26 to 60% [12, 13]. For example, the prevalence of cesarean section in Iran from June 2017 to April 2019 was very high, with the highest in Tehran (62.1 to 72.1%) and the lowest in Sistan and Baluchestan (12%) [13]. This is due to the interaction of several factors that have created an increasing effect over more than four decades and has caused a public desire, both among the public and among service providers, to perform cesarean section compared to natural delivery. In addition, lack of knowledge about cesarean section and incorrect information about natural childbirth are important factors in performing cesarean section [14, 15][13 ,12][14 ,13][15 ,14] . On the other hand, the mother's satisfaction with the previous experience of childbirth has a significant effect on the type of delivery. Also, the results of studies have shown that fear, anxiety, and pain play an important role in choosing the type of delivery [16, 17].

Cesarean section has several complications for mother and baby. The most important maternal complications include bleeding, suture infection, endometritis, prolonged hospital stay, increased mortality rate compared to vaginal delivery, and psychological problems such as depression, anxiety, and fatigue [18]. On the other hand, the fetus may be at risk for respiratory problems and low Apgar scores [19].

Therefore, according to the above and due to the importance of cesarean delivery, its increasing trend and its complications for mother and fetus, in the present study, we decided to investigate the prevalence of cesarean section and its related factors in Pasteur Hospital in Bam, Kerman province, one of the southern cities of Iran.

Methodology

In this descriptive-analytical cross-sectional study, all pregnant mothers admitted to Pasteur Hospital in Bam (Kerman Province, Iran) during the first half of 1399 (2020) were studied. Inclusion criteria were living in Bam, giving birth in the first half of 1399 (2020) and giving birth to singleton babies. Exclusion criteria were incompleteness of information in the mothers' records. Finally, using the formula for calculating the sample size and after coordination with the management of the hospital, 222 pregnant women admitted to this hospital were selected in a completely random manner.

$$n = \frac{Nz^2pq}{Nd^2 + z^2pq}$$

Then, after selecting the records, information was extracted from patients' files in order to complete the compiled checklist. The checklist included information about the mother's occupation and education, mother's age, place of residence, cause of cesarean section, birth order, weight and head circumference and gender of the baby, gestational age of the fetus, history of miscarriage or stillbirth. It should be noted that the checklists were anonymous and also the confidentiality, protection of information and prevention of disclosure of participants' secrets were observed and the present study was registered with the code of ethics IR. MUBAM.REC.1399.55.

Statistical Analysis

Data were analyzed by SPSS software version 25 (version 25, SPSS Inc., Chicago, IL). Prevalence distribution and percentage indicators were used to describe qualitative variable and quantitative variables were described using mean and standard deviation. Kolmogorov-Smirnov test was used to determine the normality of quantitative variables. If the data distribution was normal (based on Smirnov test), parametric tests such as (ANOVA, independent t-test, regression and chi-square) were used; otherwise, non-parametric tests such as (Mann-Whitney and Kruskal-Wallis) were used. Finally, P less than 0.05 was considered statistically significant.

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Results

The results of the present study showed that 98 participants (44.5%) underwent cesarean section and 122 (55.5%) underwent natural delivery (NVD).

According to the results of the study, 39.8% of the cesarean section group and 45.9% of the natural delivery group were illiterate. The results also showed that there was a statistically significant relationship between education and the frequency of cesarean delivery so that people in the cesarean section group had a higher degree of education than those in the NVD group (P=0.04). Also, most of the subjects (76.5%) in the cesarean section group lived in the city and there was a statistically significant relationship between the place of residence and the frequency of cesarean section so that subjects in the cesarean section group were more resident in the city than the NVD group (P=0.01). The results also showed that there was a statistically significant relationship between participants' occupation and the frequency of cesarean delivery and most of the employed subjects were in the cesarean section group (P=0.03). While, there was no statistically significant relationship between participants' gender (P=0.51) and stillbirth history (P=0.19) and the type of delivery (Table 1).

Table 1. Frequency of delivery results in terms of qualitative variables

Variable	Subgroup	Type of delivery		Total	P. Value
		C-section	Natural		
Gender	Male	(44/9) 44	(44/3) 54	(44/5) 98	0/51
	Female	(55/1) 54	(55/7) 68	(55/5) 122	
	Total	(100) 98	(100) 122	(100) 220	
Education	Illiterate	(39/8) 39	(54/9) 67	(48/2) 106	0/04
	Diploma and associate degree	(32/7)32	(35/2)43	(34/1)75	
	Bachelor	(18/4) 18	(7/4) 9	(12/3)27	
	MA	(9/1)9	(2/5)3	(5/5)12	
	Total	(100) 98	(100) 122	(100) 220	
Place of residence	City	(76/5) 75	(50) 61	(61/8) 136	0/01
	Village	(23/5) 23	(50) 61	(38/2) 84	
	Total	(100) 98	(100) 122	(100) 220	
Employed	Yes	(62/2) 61	(27/9) 34	(43/2) 95	0/03
	No	(37/8) 37	(72/1) 88	(56/8) 125	
	Total	(100) 98	(100) 122	(100) 220	
Stillbirth	Yes	(3/1) 3	(6/6) 8	(5) 11	0/19
	No	(96/6) 95	(93/4) 114	(95) 209	
	Total	(100) 98	(100) 122	(100) 220	

According to Table 2, there was a statistically significant relationship between maternal age and type of delivery. The mean age of mothers in the cesarean section group was significantly higher than that in the natural delivery group (P=0.03). However, there was no statistically significant relationship between the mean gestational age of participants (P=0.13), parity (P=0.20), birth weight (P = 0.10) and head circumference (P=0.06) and the type of delivery.

Table 2. Frequency of delivery results in terms of quantitative variables

Feature/ Group	Cesarean delivery (N=98)		Natural delivery (N=122)		P.V
	Mean	Std. deviation	Mean	Std. deviation	
Gestational age (weeks)	36/8	3/3	37	5/4	0/13
Maternal age (years)	29/4	6/9	27/1	4/3	0/03
Parity	0/83	0/79	1/95	1/44	0/20

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Birth weight (grams)	3241/86	486/75	3226/43	489/01	0/10
Head circumference (centimeters)	34/4	4/1	35/6	4/3	0/06

According to our results, the most common causes of cesarean section were previous history of cesarean section (54%), fetal problems (23.4%) and maternal diseases (22.6%), respectively. (Table 3)

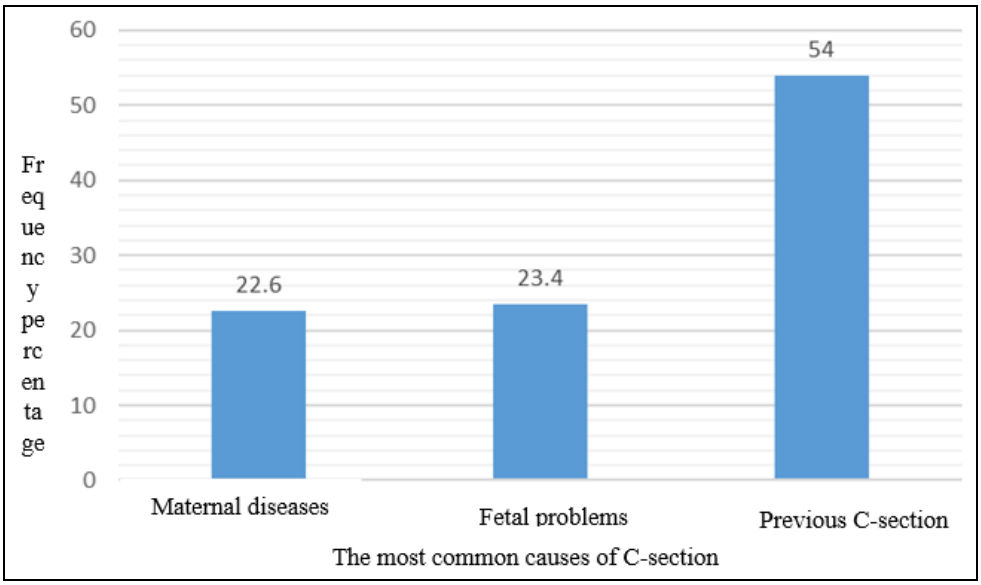

Figure 1. Percentage of the most common causes of cesarean section

Discussion

Cesarean section is the removal of placenta, fetus and membranes by cutting the wall of the abdomen and uterus. This method is recommended for use in emergencies where the lives of the mother and fetus are endangered. Although natural childbirth is recommended as the best method of childbirth in most cases, due to the increase in cesarean section, its percentage has decreased in recent years [20, 21]. The aim of this study was to determine the prevalence of cesarean section and identify some related factors in Pasteur Hospital in Bam.

The results of the present study showed that the prevalence of cesarean section in the study population is 44.5%. There was a statistically significant relationship between the frequency of cesarean delivery and higher education, employment, living in city and older age. Also, the most common causes of cesarean section were history of previous cesarean section (54%), fetal problems (23.4%) and maternal diseases (22.6%), respectively.

Today, cesarean section is one of the most common surgical procedures performed to prevent potential risks to the health of mother and fetus. The increasing number of cesarean sections has attracted the serious attention of experts, and the need for cesarean section has become one of the topics in the medical community. In other words, cesarean section is only a method of giving birth to a baby in an emergency and should not be considered as a substitute for natural childbirth [22]. Numerous factors such as relief from labor pain, trend-orientation in women, misconceptions about natural childbirth and lack of facilities and inconsistencies in natural childbirth are involved in increasing women's desire to choose cesarean delivery [15].

According to studies, the prevalence of cesarean section in the present study is approximately consistent with other studies. In two separate systematic review studies by AZAMI-AGHDASH et al and Rafiei et al [23] in Iran, the prevalence of cesarean section was 48%. In the study of Taha et al., the prevalence of cesarean section in the United Arab Emirates was 30.2% [24] . Betran et al. also studied the prevalence of cesarean section in four continents of Africa, Europe, America and Asia and reported the global average of cesarean section as 18.6% [11]. According to research, the prevalence of cesarean section in some private centers in Iran is 26 to 60% and even 90% [12]. Since

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the prevalence of cesarean section is estimated based on time period and province, the analysis during the period showed that during the years 2005 to 2009, the highest rate of cesarean section (53%) was reported in Iran. The lowest prevalence of cesarean delivery was 19% between 2015 and 2017, which is mainly due to the small number of studies conducted during this period [23].

Unfortunately, the rate of cesarean section in Iranian society is much higher than the world standard. It seems that the reasons for the higher frequency of cesarean section in domestic studies compared to international statistics are due to factors such as economic issues, previous cesarean section and the misconception that natural childbirth is not possible in these women, fetal and birth canal mismatch, misdiagnosis of lack of labor progress due to usual care during delivery, failure to apply the correct diagnostic criteria for fetal distress [25, 26].

The results of our research showed that the mean age of individuals in the cesarean section group was significantly higher than the natural delivery group, which is consistent with the results of the research of Eva Rydahl et al. [27] and Kowalcek et al. [28] Although most older mothers experience normal pregnancies and births, old age can increase the risk of persistent health problems, and some of these problems only appear when a woman becomes pregnant. The older a pregnant woman is, the more likely she is to experience disorders such as diabetes and high blood pressure. At older ages, labor will probably be performed using medical interventions such as labor induction. If the mother is 40 years old or older, labor may be induced between 39 and 40 weeks of gestation because it reduces the risk of intrauterine fetal death, especially if there are other complications at the same time [29, 30]. Cesarean section is recommended for a large number of pregnant mothers, which increases the rate of cesarean section [31], which is probably due to the fact that subjects in the cesarean section group are older than those in the natural delivery group in the present research and other consistent research.

Furthermore, most of subjects in the cesarean section group were employed and had higher education, which seems that more stress of employed women, asking a doctor and interest in using some privileges are its effective factors. There was a significant relationship between the place of residence and the choice of cesarean section, so that cesarean section was more among the residents of the city than the villagers. Perhaps one of the reasons could be that city dwellers are more in search of modern ways of living. On the other hand, the role of doctors today is one of the most important factors determining the method of delivery. Also, economic and social issues are of special importance in the doctor's decision regarding cesarean section. Since the cost of a cesarean section is much higher than a natural delivery, the doctor may be more willing to perform a cesarean section. Another advantage of a cesarean section for a doctor is that it is predictable and takes less time to perform a delivery [7, 32]. Considering these issues, it can be said that the antenatal care facility, the doctor has a greater and more direct effect on the pregnant woman and has more involvement in choosing the method of delivery, which additional research (especially qualitative type) on this issue is recommended.

In addition, according to our results, there was no statistically significant relationship between baby's gender, stillbirth, and birth weight and the frequency of type of delivery. It should be noted that cesarean section can put women at risk for ectopic pregnancy or stillbirth in subsequent deliveries. It has also been shown that one of the most common pregnancy problems leading to cesarean section is a large fetus. Sometimes, for some reason, the fetus becomes very large and weighs four kilograms or more at the time of delivery [33, 34], which the inconsistency of the results of the present research in this regard can be justified with factors such as small sample size and limited time interval.

Given that this research was conducted for the first time at Bam University of Medical Sciences, there was need for a more accurate comparison of the results of this research with other local research and evaluating the relationship between variables such as fetal Apgar score, gestational diabetes, multiple births, delivery problems, preterm delivery history, preeclampsia, and etc. Restrictions on the Covid-19 pandemic also limited the data collection in this research. It is suggested that future complementary studies be conducted in other centers with a larger sample size over a longer period of time. Also, since this research evaluated only the known factors in this field and other factors may also play a role in the occurrence of this issue, it is necessary to address other factors in future research.

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Conclusion

The results of this research showed that the prevalence of cesarean section in the present research is equal to 44.5% and factors such as age, level of education, place of residence are related to it. Although cesarean section is common in today's society and accounts for approximately 45% of deliveries, it can be greatly decreased with preventive, advisory and control measures.

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