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Evaluating the Effectiveness of the Health Reform Plan on the Mode of Delivery in Khorram Abad Hospitals in 2020

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ABSTRACT

The cesarean section rate is widely recognized as a critical indicator for evaluating the effectiveness of maternal health programs across different countries. An upward trend in elective or emergency cesarean sections indicates inefficiencies within the healthcare system's performance. Since 2014, Iran has implemented a health reform plan aimed at reducing the cesarean section rate to 25–30%. This study aimed to assess the prevalence of cesarean sections and vaginal deliveries before and after the implementation of the health reform plan in Lorestan province. Conducted in 2020, this descriptive-analytical study focused on all women who gave birth between 2011 and 2016 in a public hospital in Khorramabad, where the health reform plan was implemented. Data were collected through a census sampling method using statistics provided by the Vice Deputy of Treatment of the Lorestan University of Medical Sciences and analyzed using descriptive and analytical statistics, including the chi-square test. The findings revealed a statistically significant increase in the cesarean section rate in public hospitals in Khorramabad following the implementation of the health reform plan, compared to the pre-implementation period, with a corresponding decrease in the percentage of vaginal deliveries. The discrepancy between the study's results and the objectives of the health reform plan cannot be solely attributed to the plan itself. Various factors, such as the rising age of marriage in recent years, which has led to an increase in the age of pregnant women and the likelihood of cesarean sections, are influential in this context. Additionally, the increasing age of primiparous mothers, along with the rise in the number of ultrasounds, has enhanced the detection of maternal and fetal complications, thereby contributing to an increased rate of cesarean sections.

Keywords: Vaginal delivery; Cesarean section; Health reform plan; Effectiveness

Introduction

Childbirth refers to the expulsion of the fetus and the birth process. In vaginal delivery, the fetus is born through the birth canal, and in cesarean section (CS), the fetus is delivered through an incision made in the abdominal wall and uterine wall [1]. The prevalence of CS has risen significantly in the 20th century [2]. Although CS is necessary in some cases to save the life of the mother and fetus, it is associated with more complications than vaginal delivery, e.g., thromboembolism and anesthesia issues are twice as common [3]. The ratio of CS to total births is one of the important indicators of pregnancy care, with an acceptable range of 10–15% [4]. According to the data obtained from the maternal mortality surveillance system, the CS rate has increased significantly over the past few decades [5]. The main cause of maternal mortality in hospitals and delivery centers has been reported postpartum hemorrhage, and the mortality rate in CS is more than twice that of vaginal delivery [7]. Based on the Demographic and Health Surveys (DHS) results 1999, educated individuals

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performed 85% of deliveries in hospitals and delivery centers. Additionally, the CS rate in the United Kingdom exceeds the acceptable limit set by the WHO (15%) [6]. Based on the WHO statement, CS is one of the world's most common types of surgery at an increasing rate, especially in developed and developing countries. Although CS is life-saving in necessary cases, it is often performed without medical urgency, exposing pregnant women and newborns to both short term and long term medical complications [8].

Cesarean section can cause various complications and risks, so it should be avoided in non-essential cases. Serious CS-related complications can lead to disability, impairment, and even death, especially in the absence of adequate facilities for safe surgeries or the treatment of potential complications arising from the procedure, increasing the risk [9]. Recent studies indicated that a reduction in maternal and neonatal mortality during childbirth is observed when the CS rate in a community reaches 10%. Although CS rate enhancement does not necessarily correlate with further reductions in mortality, it could lead to additional complications [10]. In other words, a CS rate exceeding 10% fails to indicate a further decrease in mortality rate. Therefore, a 10% CS rate should be considered an optimal standard, emphasizing the importance of avoiding unnecessary surgical interventions [11]. However, WHO experts stress that hospitals should not focus solely on CS statistics, and each pregnant woman should be carefully examined to ensure the need for surgery is medically justified [12].

The primary objectives of all healthcare systems are to improve public health, ensure equitable participation in resource allocation, and achieve patient satisfaction. To this end, healthcare systems continually strive to achieve intermediary goals such as improving access, quality, and efficiency, aiming to enhance indicators aligned with their objectives. Ultimately, these efforts are expected to lead to better community health, fair resource distribution, and patient satisfaction through an adequate response to both medical and non-medical needs [13].

Healthcare systems worldwide are constantly seeking reform driven by four key forces with relative impact varying from country to country, including rising healthcare costs and citizen expectations, financial constraints of governments in covering healthcare expenditures, and doubts about the effectiveness of the existing system in achieving healthcare goals [14]. Therefore, healthcare reforms in many countries with diverse socio-economic conditions have recently focused on organizing and financing healthcare systems while improving effectiveness, efficiency, and equity [15]. The CS rate is increasing rapidly in developing countries, and Iran is no exception [16]. According to official reports, the CS rate in Iran reached 58% in 2022 [17].

According to the Maternal Health Department of the Ministry of Health, maternal and physician-related factors contribute to the CS rate rising in Iran. Among the maternal factors, fear of the intense and exhausting pain of vaginal delivery is a significant reason. Additionally, maternal motivations for opting for CS include the specialists' recommendation to perform CS, misconceptions about maternal and fetal health, adherence to social trends, disrespect or mistreatment by maternity staff of hospitals during the labor process, and concerns about potential anatomical changes in the vaginal area influencing the future sexual relationships [18].

The patient's personal preference and request from the physician is identified as one of the medical-related factors [19].

The health reform plan was launched in May 2014 to enhance healthcare access and equity in health service delivery. Its implementation

instructions were issued to medical universities across the country. In addition to providing financial protection against healthcare costs, the plan sought to improve the quality of inpatient services in public hospitals [20].

Enhancing maternal health and reducing maternal mortality is the fifth of the eight Millennium Development Goals (MDGs), and addressing the prevalent causes of maternal mortality and morbidity throughout pregnancy and the postpartum phase is crucial for achieving the objective [21].

Given the aforementioned reasons, aiming to improve maternal and neonatal health indicators, one of the objectives and instructions of the health reform plan, which commenced in mid-May 2014, is to reduce CS and promote vaginal delivery. The optimal CS rate is determined to be between 25% - 30%, and healthcare centers are mandated to maintain CS rates within this range. If the rate exceeds this threshold, they must reduce it by 2.5% every three months, resulting in a 10% reduction from the baseline by the end of the year [22].

Given the lack of sufficient studies on the success or failure of the plan, especially at the provincial level in Lorestan, the present study was conducted to compare CS and vaginal delivery rates over three years before and after the implementation of the health reform plan to evaluate the success of the plan in reducing CS rates and promoting vaginal delivery. The findings of this study should be considered in future health-related policymaking, and implementing the health reform plan could assist policymakers and implementers in advancing healthcare in the country.

Materials and Methods

This descriptive-analytical study was conducted in 2020 on all women giving birth between 2011-2016 in one of the public hospitals in Khorramabad city, Iran, participating in the health reform plan. The data were collected through a census sampling method using annual statistics provided by the Vice President of Treatment of the Lorestan University of Medical Sciences over six years (2011–2016). If needed, patient records were reviewed, and hospital archives were utilized. After obtaining permission from the Deputy for Research and Technology, the researcher attended the vice president of treatment of Lorestan University of Medical Sciences to complete legal procedures. The total number of CS and vaginal deliveries in public hospitals implementing the health reform plan in Khorramabad from 2011–2016 was obtained and analyzed. Inclusion criteria included having the type of delivery recorded in the patient's file, completeness of the file, and accessibility to the records. The data were analyzed using version 21 SPSS software and statistical methods, including the Chi-square test and descriptive statistics (e.g., mean). The frequency of CS and vaginal deliveries before and after the implementation of the health reform plan was compared using the Chi-square test.

The data were analyzed using SPSS version 21, employing descriptive statistics (e.g., means) and the Chi-square test.

One of the limitations of this study was the lack of cooperation of the Deputy of Treatment. To overcome this issue, all necessary legal procedures were followed, including submitting official letters through relevant authorities. The researcher was committed to adhering to ethical considerations throughout the publication of results, ensuring the confidentiality of sensitive data. Furthermore, prior to initiating the study, all required permissions were obtained from the Deputy for Research and Technology of the university, and confidentiality was strictly observed in practice.

(Ethics Code: IR.LUMS.REC.1398.180).

Results

The study results indicated a significant difference in the frequency of vaginal delivery

and CS before and after implementing the health reform plan. In hospitals implementing the plan in Khorramabad, the mean score of the CS rate increased from 48.54% prior to the implementation of the plan to 54.63% afterward, which is statistically significant ($p < 0.001$) (Table 1).

In a Specialized Obstetrics and Gynecology Hospital (hospital1), the CS rate was 45.8% before implementing the health reform plan and 50.4% afterward. Similarly, the rate of vaginal delivery decreased from 54.2% before the plan to 49.6% after its implementation. Based on the chi-square test, the difference was statistically significant ($p < 0.001$) (Table 2).

In a Social Security Hospital (hospital 2), the vaginal delivery and CS rate before implementing the plan was 59% and 41%, respectively. After implementing the plan, the rate changed to 52.5% for vaginal delivery and 47.5% for CS and the difference was statistically significant based on the chi-square test ($p < 0.001$) (Table 2).

In a private Hospital (hospital 3), the prevalence of vaginal delivery and CS prior to the implementation of the health reform plan was 10.6% and 89.4%, respectively. Following the implementation of the plan, these rates were reported as 11.5% for vaginal delivery and 88.5% for CS. The chi-square test analysis indicated that the difference was not statistically significant ($p = 0.181$) (Table 2).

Table 1. Comparing the distribution of vaginal delivery and cesarean section in the health reform plan in Khorramabad city before and after the plan

Time	Mode of delivery			P – value
	Cesarean section No. (%)	Total No. (%)	Vaginal delivery No. (%)	
Before implementing the health reform plan	16337 (48.54)	33650 (100)	17313 (51.45)	<0.001
After implementing the health reform plan	17784 (54.63)	32558 (100)	14774 (45.37)	

Table 2. Comparing the before and after frequency distribution of vaginal delivery and cesarean section in the health reform plan

Hospital/ City	Time	Mode of delivery			P – value
		Vaginal delivery No. (%)	Cesarean section No. (%)	Total No. (%)	
Hospital1	Before implementing plan	7783 (54.2)	6533 (45.8)	14271 (100)	<0.001
	After implementing the plan	8664 (49.6)	8817 (50.4)	17481 (100)	
Hospital2	Before implementing the plan	9119 (59.0)	6326 (41.0)	15445 (100)	<0.001
	After implementing the plan	5604 (52.5)	5070 (47.5)	10674 (100)	
Hospital3	Before implementing the plan	411 (10.6)	3478 (89.4)	3899 (100)	0.181
	After implementing the plan	506 (11.5)	3897 (88.5)	4403 (100)	

Table 3. Comparing the before and after frequency distribution (categorized by Year) of vaginal delivery and cesarean section in the health reform plan

Year	Mode of delivery			P – value
	Vaginal No. (%)	**Cesarean section No. (%)**	**Total No. (%)**	
Before implementing the plan (2011)	32189 (100)	14452 (44.9)	17738 (55.1)	<0.001
Before implementing the plan (2012)	34046 (100)	14811 (43.5)	19235 (56.5)	
Before implementing the plan (2013)	34158 (100)	14879 (43.6)	19279 (56.4)	
After implementing the plan (2014)	35751 (100)	15216 (42.6)	20535 (57.4)	
After implementing the plan (2015	35244 (100)	19787 (56.1)	15457 (43.9)	
After implementing the plan (2016)	33355 (100)	18482(55.4)	14873 (44.6)	

Discussion

The results of the present study revealed that the CS rate in most hospitals increased after the implementation of the health reform plan compared to the pre-implementation period, contradicting the plan's objectives. Seidali and Namazi in 2015 reported that the vaginal delivery and CS rates before the health reform plan were 50.44% and 49.56%, respectively. After implementing the plan, these rates shifted to 67.90% for vaginal delivery and 32.10% for CS, which is not consistent with the results of the present study [23]. The discrepancy cannot necessarily be attributed to the plan itself. Various factors might be involved, such as the rising age of marriage in recent years and, consequently, the increasing age of pregnant women, necessitating CS.

Today, fetal and maternal problems are better diagnosed due to the rising age of primiparous mothers and the increase in the number of ultrasounds. Consequently, mothers are forced to undergo a CS. Another contributing factor is the shift in women's preference toward having only one child, unlike previous generations, leading to a growing inclination for quicker and more reliable delivery methods. On the other hand, some mothers mistakenly perceive CS to be healthier for both the mother and the newborn compared to vaginal delivery. Consequently, they insist on undergoing a CS and, in various ways, exert pressure on physicians to comply. This issue is also evident in Khorram-Abad, Iran, and might have influenced the study's results somewhat.

One of the strengths of this study is its comprehensiveness and the long-term (six-year) survey of CS and vaginal delivery rate. However, the lack of complete or reliable information regarding the actual reasons for CS is regarded as the limitation of this study, which was beyond the researcher’s control, leading to the failure to determine the proportion of elective CS. Further prospective studies are suggested to investigate the reasons for CS. Based on the results of the present study, practical strategies could be proposed to reduce CS rate and promote vaginal delivery.

Conclusion

Considering the higher-than-standard CS rate in Khorramabad city and the ineffectiveness of the health reform plan, more extensive efforts are needed to raise awareness and promote cultural change in the community to reduce the CS rate and achieve the standard level of CS in Lorestan province.

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Conflict of interests

The authors have no financial interest related to this article

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