

# The Effect of Health System Development Plan on Reduction of First Cesarean in Kohgiluyeh and Boyer Ahmad in 2016

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## Abstract

Preserving health and promoting it is one of the transcendental goals of health systems of countries which is being scrutinized every day by utilizing financial, human, and modern methods. Cesarean delivery in all countries is one of the indicators for evaluating the performance of health programs (Nematzadeh, 2015). Considering the known complications of cesarean delivery and the growing trend of this practice in Iran, for the purpose of preserving and promoting the health of mothers and babies and improving the conditions of delivery, promoting normal delivery is one of the guidelines for the development of the health system (Farzighi et al., 2015). The aim of this study was to measure the success of this project in decreasing first cesarean delivery in Kohgiluyeh and Boyerahmad province in 2016.

**Materials and Methods:** In this study, the database of hospitals was used to collect data. Separate data related to the causes of cesarean section were introduced from the hospitals' delivery offices to the Excel form and then statistical methods were used to analyze the data. In the first step, using descriptive statistics methods including mean, standard deviation, the minimum and maximum values and plotting the tables and the percentages as graphs and charts. We describe the information gathered. Then, using inferential statistical methods

including independent t-test and one way and two-way analysis of variance analysis, we analyze the information. It should be noted that the SPSS software version 24 and Excel 2010 were used to analyze the data of this research.

**Findings:** The findings indicate that the percentage of cesarean section decreased after the implementation of the health system reform plan. Regarding the equality of variances ( $F = 0.39$ ,  $p = 0.53 < 0.05$ ), the value of the T 2.3 was statistically significant ( $p < 0.05$ ). Therefore, the hypothesis of equality of meanings before and after implementation of the plan is rejected at a significant level of 5%. In other words, the percentage of cesarean section had a significant change at the 5% level after the implementation of the health system reform plan.

**Conclusion:** In summary, according to the findings of this research and the analysis of the other studies, one can conclude the implementation of the health system reform plan is effective in reducing cesarean section in the province and can be hoped that by continuation of this plan and implementation of all its related items to the global standard and the ultimate goal of the Ministry of Health and in principle to reduce mortality and increase the health of mothers and babies has increased in this area.

**Key words:** Caesarean, Natural delivery, Health system development plan, Painless delivery

## Introduction

Reforming the health system in other countries is done in different ways, but at the same time, with common goals. In Iran, one of these reforms is the implementation of the Health System Development Plan (Nematbakhsh, 2015). Considering the announcement of general health policies, the plan for the development of the health system from 2014, the approach to protecting people from the financial system, creating equity in access to health services and improving the quality of services, the health service package was officially implemented in all medical universities affiliated with the Ministry of Health and Medical Education in order to provide, maintain and promote the health of mothers and babies and improve the conditions of delivery; the promotion of normal delivery was included in the guidelines for the development plan. In the health system's development plan, the program for the promotion of normal labor has four distinct goals: first, cesarean section cessation, second, increased satisfaction of pregnant mothers, third, the reduction in payout from the people's pocket and fourthly increase in incentives for service providers (Farzgi et al., 2015). The process of delivery due to the importance of maternal and fetus health, the involvement of different levels of service delivery, high rates of cesarean delivery are among the most important considerations in medical science studies in the world (Lamee et al., 2014). The increasing rate of cesarean delivery is one of the problems of the health system of all societies, and Iran is no exception (Amiri Farahani and Abbasi, 2012). Certainly caesarean section is essential as a way of protecting the mother and baby's life during difficult labor (Ghasemi, 2009). But according to the World Health Organization, a maximum of 15 percent can be acceptable (John Babaie et al., 2015). While the incidence of cesarean delivery in many countries is more than this, as cesarean section has grown from 5% to 25% in the last 20 years, in our country, in recent years, cesarean rates have increased significantly in public and private centers, so that after three countries, Brazil, Cyprus, Colombia, Iran was the fourth largest in terms of cesarean section rate, and was 46 percent in 2014 (Zahedi et al., 2015). Normal delivery is a physiological phenomenon without need for intervention (Abbaspour et al, 2014). It is a natural condition in humans as well as animals; caesarian is a medical intervention (Sorani et al., 2016). Compared with cesarean delivery, natural birth has many benefits, including reducing maternal and infant mortality, it is cost effective, lactation of these mothers is faster and better, the emotional relationship between the mother and the baby will be faster in natural delivery, which makes these babies less susceptible to respiratory problems. Resuming sexual activity is faster in these mothers and most importantly, research has shown that mothers with normal living have a better quality of life (Shams et al., 2016).

Instead, cesarean section has many problems and complications for the mother and the baby. Some of these complications include post-operative infections, bleeding, thromboembolism, re-admission within 60 days after cesarean section (Hajian et al., 2010). Pelvic damage is

due to surgery, blood transfusion, pathogenicity may be exacerbated by rupture of the uterus, hysterectomy and adhesions (Yarandi et al., 2002). Post-caesum adhesions cause abdominal pain, pain in the vicinity of the stomach and pelvic pain (Sekhava et al., 2007), and an important complication that leads to intestinal obstruction, infertility and clinical problems in subsequent surgical procedures (Dehghani Firoozabadi et al., 2015). The risk of maternal death in cesarean delivery is eight times that of normal delivery (Schuitemake et al, 1997). And the complications of the wound are up to 2.5-5% higher (Basha et al, 2010). In women with a history of cesarean section, the incidence of placentaemia is 10 times higher than that of women whose previous delivery was normal, causing uncontrollable bleeding in 40-40% of these women (Jurkovic et al, 2003). Research has also shown that elective cesarean section has a negative effect on the physiological response of the infant such as increased lung volume, pulmonary arterial resistance; biochemical responses and acute respiratory syndrome increase the risk of regeneration in newborns (Pouragal et al., 2009). However, midwifery interventions from administration of sedative medicines to the creation and intensification of contractions during labor and delivery can have significant effects on the perinatal outcomes and in some cases lead the mother to the cesarean section. Therefore, physiological delivery and reduction of midwifery interventions can reduce cesarean delivery (Bolandhemat et al., 2011). Maternal stress and anxiety can be reduced by promoting natural delivery and delivery of painless medication, drug analgesics such as epidural, spinal, and gazentonox, and topical analgesics such as massage, hot water bags, and air fresheners, and music therapy (Abbasi et al., 2005). Several researchers have shown that a significant reduction in the number of cesarean sections can be made without increasing the number of pathogens. The plans presented to reduce unnecessary cesarean section generally focused on educational efforts and careful examination, normal delivery after one cesarean section, limiting cesarean section due to dystocia (Ranaei, 2004). Normal delivery in mothers who once had a cesarean section is safe and acceptable (Michael et al, 1996). Participating in childbirth classes is evident in reducing the fear of giving birth and increasing normal delivery in nursing women attending these classes (Abuzari Gozafroudi et al., 2015). Lack of knowledge and mothers anxiety increase medical interventions, especially cesarean section (Firozbakht et al., 2013).

The purpose of this study was to investigate the effect of health system reform on reducing cesarean section in Kohgiluyeh and Boyer Ahmad provinces. The probable results of this study can affect the current process of affairs and planning to reduce the total cesarean section in the province.

## Methodology

In this study, the database of hospitals was used to collect data. Separate data related to the causes of cesarean section were introduced from the hospitals' delivery offices to the Excel form and then statistical methods were used

to analyze the data. In the first step, we describe the information using descriptive statistics methods, which includes average, standard deviation, minimum and maximum amounts, and plotting the charts and graphs. Then, using inferential statistics including independent t test and one way and two-way analysis of variance analysis, we analyze the information. SPSS software version 24 and Excel 2010 was used to analyze the data of this research. The current research is descriptive analytical and in terms of applied purpose. This study was conducted longitudinally in the year 2016 on the information collected about the deliveries before and after the development of the health system in hospitals affiliated with Yasouj University of Medical Sciences. In this regard, comparing the statistics of year 1992 as the base year, one year before implementation of the health care reform plan with the data of 1993, 1994 and 1995, was performed three years after the implementation of the health system reform plan. Also, training was completed for the completion of the form to the delivery staff. The statistical population includes all pregnant women who were referred to hospitals with delivery blocks in Kohgiluyeh and Boyerahmad provinces (university hospitals including Imam Sajjad (AS), Shahid Rajai, Imam Khomeini (RA) and non-university hospitals including Besat, Gomnam Shohada and Zagros) and were first cesarean deliveries. These statistics were compared. The sample is the same as the statistical population. Also, the moral rights of the university were reserved.

## Research findings

In Table 1, the descriptive information related to the percentage of cesareans is reported for the first time in the entire province. On average, the percentage of cesarean deliveries was 37.44 before the implementation of the health promotion plan and after running it, it was 28.75. The dispersion of data is based on standard deviations and the lowest and maximum values are approximately the same.

In Table 2, descriptive information regarding the percentage of cesarean sections among the university centers is reported.

On average, the percentage of cesarean delivery is 29.59 before the implementation of the Health Promotion Plan, and after the implementation of it are 29.20. The dispersion of data is based on standard deviations and the lowest and the most different values and dispersion of information for the percentage of cesareans is more common among university centers before implementing a health promotion plan and this should be taken into consideration when using the test.

In Table 3, descriptive information about the percentage of cesarean sections among non-university centers is reported. On average, the percentage of cesarean delivery is 43.93 before the implementation of the Health Promotion Plan, and after it is 37.20. The dispersion of data is based on standard deviations and the lowest and maximum values are approximately the same.

According to Table 4, independent T-test data for the first cesarean were reported after the implementation of the Health Promotion Plan. Considering the equality of variances ( $F = 0.39$ ,  $p = 0.53 < 0.05$ ), the value of the T 2.3 was statistically significant, which was significant based on p-value of 0.00 ( $> 0.05$ ). Therefore, the hypothesis of equality of means before and after. On the other hand, the percentage of cesarean sections had a significant change in the level of 5% after the implementation of the health system reform plan. As shown in the table; an average of 8% was counted for the first cesarean.

According to Table 5, independent t-test data for the percentage of cesarean section at university centers before and after implementation of the health promotion plan are presented. Due to the lack of equality of variances ( $F = 44.73$ ,  $p = 0.00$ ), the t-test was found to be 29.5, which is significant based on the p-value of 0.00. Therefore, the hypothesis of equality of meanings after project implementation is rejected at a significant level of 5%. In other words, the percentage of cesarean section in the university centers has changed significantly at 5% level. As shown in the table, an average of 9.26% of the cesarean sections has been reduced for the first time.

According to Table 6, independent T-test data for the percentage of first cesarean in non-university centers before and after implementation of the health promotion plan have been presented. Considering the equality of variances ( $F = 1.40$ ,  $p = 0.24$ ), the value of T 45.1 was obtained, which is not significant at the p-value of 0.15, and so the hypothesis of equality of meanings after the implementation of the plan is not rejected at a significant level of 5%; In other words, the percentage of first cesarean has not changed in the non-university centers since the implementation of the health promotion plan. As shown in the table, an average of 6.72% of the first cesarean was decreased, but this decline is not statistically significant.

## Discussion and Conclusions

In order to provide, maintain and promote the health of mothers and infants and to improve the conditions of delivery, promotion of normal delivery was included in the guidelines for the development plan and implementation of this plan has provided satisfaction to all segments of society (Farzighi et al., 2015). Childbirth can be considered one of the most beautiful events in women's lives (the acquisition of motherhood) and at the same time a tense reality. Sometimes it is difficult to prevent the risk of a mother or newborn baby and so delivery of cesarean section can be done as a lifesaver (Zahedi et al., 2015). But in many cases, cesarean is not due to medical necessity, but the unwillingness of women to give birth in a natural way (Aghayee et al., 2015). Attitudes, behaviors and misconceptions (Badie Aval et al., 2011) and social and economic factors determine the type of delivery (Delaram and Vardis, 1997). Fear of the inability of normal delivery and associated pain (Yvonne et al, 2016) and reducing pelvic floor injury are factors (Alderdic et al, 2003). And choosing cesarean as a way for physicians and family to set their work and life plans is another reason for more women

**Table 1: Descriptive statistics of percentage of first cesarean in the province**

After implementing the health promotion plan	Before implementing health promotion plan	Percentage of first cesarean in the country
28.75	36.74	Average
20.02	17.48	Standard deviation
0.00	13.78	minimum amount
92.59	74.80	maximum amount

**Table 2: Descriptive statistics of percentage of cesarean section among academic centers**

After implementing the health promotion plan	Before implementing health promotion plan	Percentage of first cesarean in the country
20.29	29.56	Average
4.99	10.11	Standard deviation
11.03	13.78	minimum amount
34.20	47.10	maximum amount

**Table 3: Descriptive statistics of percentage of cesarean sections among non-academic centers**

After implementing the health promotion plan	Before implementing health promotion plan	percentage of first cesarean in the country
37.20	43.93	Average
25.23	20.29	Standard deviation
0.00	14.82	minimum amount
92.59	74.80	maximum amount

**Table 4: Independent T test for the first cesarean in the province**

T test for equality of averages				Lions test for equality variance	
Difference of averages	P-value	Degrees of freedom	t	P-value	F
7.99	0.00	286	3.24	0.53	0.39

**Table 5: Independent T-test for the first cesarean percentage in university centers before and after the implementation of the health promotion plan**

T test for equality of averages				Lions test for equality variance	
Difference of averages	P-value	Degrees of freedom	t	P-value	F
9.26	0.00	40.84	5.29	0.00	44.73

**Table 6: Independent T-test for the first cesarean percentage in non-university centers before and after implementation of health promotion plan**

T test for equality of averages				Lions test for equality variance	
Difference of averages	P-value	Degrees of freedom	t	P-value	F
6.72	0.15	142	1.45	0.24	1.40

choosing cesarean section (Khani and Shabankani, 2004). To reduce non-emergency cesareans, it is necessary to delay early admission of primipara women in latent phase and the most common cause of their cesarean section is fetal distress, until the patient has entered the active phase of the delivery, unless there is indication for admission (Rahnama, 2005).

Different non-pharmaceutical methods may also be used to induce labor (Aghamohamadi et al., 2014). Instead of using oxytocin, it is possible to use other methods such as catheter to prepare the cervix and terminate the pregnancy in pregnant women, which is effective and safe and has a more favorable delivery outcome and it somewhat reduces surgical interventions (Malekzadegan et al., 2008). There are other ways to reduce cesarean delivery, including the continuous presence of midwife at the mother's bedside and providing effective emotional and physical support during delivery (Muslim Abadi Farahani et al., 2006). Participating in childbirth classes is evident in reducing the fear of giving birth and increasing normal delivery in nursing women attending these classes (Abuzari Gozafroudi et al., 2015). Delivery in water due to reduced labor length and reduced pain and decreased need for medical interventions can be a suitable substitute for selective cesarean section (Akbari et al., 2008) and the use of pain relief methods, especially non-prescription pain relief methods that are less costly and have less side effects, can promote normal delivery and make the beautiful birth process a memorable one for the mother (Rahmanian, 191).

Seidali and Namazi, in a descriptive study in the Shoosh hospital of Khuzestan, in 1993, concluded that implementation of health system development plan was effective in reducing cesarean section and cesarean section indications. The results of this study are consistent with the present study. Aghaei et al., in a descriptive analytic study in Shiraz in 2015, concluded that the implementation of the health system development plan has led to an increase in the normal delivery rate and reduction of cesarean section in hospitals affiliated to Shiraz University, which is consistent with the findings of this study.

Surani et al (2016) in his cross-sectional descriptive study in Shahrekord concluded that implementation of health system development plan was effective in decreasing cesarean section in the first year of the project. The results of this research are also consistent with our research results.

Piroozi et al (2015) in his retrospective descriptive, longitudinal, and retrospective study, in Kurdistan Province concluded that the plan for the development of the health system to its predetermined goal, namely, a 10% decrease in the rate of cesarean section within a year after the implementation of the development plan relative to the amount was founded.

According to Table 4, there is a significant relationship between reductions of cesarean section after implementation of the development plan at a 5% level. That

is, the development plan of the health system has reduced caesarean section in the province. In Table 4, there is a significant relationship between reducing the percentage of cesarean section after the implementation of the health system development plan in the provincial universities. The implementation of the health system reform plan in this province has been able to reduce cesarean section at university centers. And in Table 5, there is no significant relationship between decreasing the percentage of cesarean section after the implementation of the health system development plan in the non-university centers of this province. Despite the fact that implementation of the health system reform plan in this province has been able to reduce first cesarean at non-university centers but because the average three years after the implementation of the plan was taken into account, the total number of hospitals in the first and second year did not drop significantly and declined more in the third year than the independent T-test. This decline is not statistically significant. Educational planning can be useful for empowering physicians and midwives, performing painless and pain-free deliveries, and holding maternity-benefit classes at these centers. Taken together, according to the findings of this research, it can be concluded that the implementation of the health system reform plan (freeing from normal delivery, starting without pain, starting classes for childbirth, empowering and increasing motivation in service providers, protecting privacy and giving credit to pregnant women, and using incentive and hinting methods) is effective in reducing the caesarean rate of this province and it can be hoped that with the continuation of this plan and the full implementation of all related issues, the global standard has essentially reduced mortality and increased maternal and neonatal health.

### Practical suggestions

According to the results of this study, although the first cesarean section in this province after the implementation of the health system development plan has decreased significantly at 5% with the implementation of the following suggestions, it is possible to expect a decrease in the cesarean section in the province.

- The prevalence of physiological delivery, including maternal limitations in the mother's bed and positions, uncontrolled attachment of serum, the use of birth balls, techniques and exercises that the mother saw when attending childbirth classes.
- Reducing childbirth interventions, including induction and strengthening of labor, episiotomy will reduce the fetal distress and related cesarean section.
- Training personnel in the beliefs of the physiological delivery and their empowerment. Certainly, the implementation of all items related to the guidelines for the promotion of normal delivery will lessen cesarean delivery in this province. In this regard, our proposal is as follows:
  - Timely payment of staff remuneration to motivate employees.
  - The development of maternity unit blocks with single-room rooms for the mother, which will satisfy the mothers.

- A companion to the mother who encourages and reduces stress for the mother.
- Permission of delivery by the mother or a privately appointed obstetrician or midwife. Not only the development of painless labor pain but also the use of non-prescription pain relief methods such as aromatherapy, music therapies, massage, hot water bin, etc.
- Respect for the mother.
- Provide retraining courses for midwives responsible for holding childbirth classes.

It seems that lack of awareness of families is the reason for the high incidence of cesarean section therefore, it is suggested that the localization of codes and culture-building be more influential according to the native beliefs of each region, including the holding of festivals for the promotion of normal delivery, lectures, meetings with women and their families, film and media production in accordance with beliefs.

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