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Vaginal Birth after Cesarean Section in Iran: A Narrative Review

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ABSTRACT

Background & aim: Vaginal birth after cesarean (VBAC) is a global solution to reduce the number and complications of repeat cesarean section (C-section); however, fear of consequences is an obstacle preventing its performance. Knowledge of research available in each country provides the support needed for making decisions regarding evidence-based actions for healthcare service providers in the country. This study aimed to review the studies performed to investigate VBAC in Iran.

Methods: Search was carried out on Engliah and Persian databases including PubMed, Scopus, Google Scholar, Magiran, and SID. Retrieved articles up to October 2020 were included in the review and the search process was performed using the keywords of "Vaginal birth after cesarean", "Repeat C-section", "Trial of labor after C-section", "VBAC", and "TOLAC". All related studies without time restriction were entered into the study, resulting in a total of 12 studies.

Results: The success rate of VBAC varied from 27%-91.2% in different parts of Iran between 1981 and 2020. Moreover, maternal and neonatal adverse outcomes and cost and length of hospitalization were lower in the VBAC group. No related maternal death was reported in all reviewed studies.

Conclusion: The findings of the present review indicated the lack of access to sufficient study resources on this field of research in Iran. Nevertheless, it is required to employ strategies as building an organizational culture, clinical contextualization at the level of healthcare services, and improving service environments, including VBAC supportive centers to promote this practice in the country.

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Introduction

One of the medical concerns is related to the complications of cesarean delivery (1). Although the advances in specialist knowledge and improvement in facilities have reduced the fatal and debilitating side effects of this method since its inception, the mortality rate of cesarean section (C-section) is still more than 7 times higher than that of normal delivery. Moreover, the unreasonable and unjustifiable growth of the C-section has increased the financial burden on the healthcare system of communities and has significantly increased the share of healthcare per capita in national production (2). One way to reduce the rate of C-sections is to decrease its recurrence, which accounts for about one-third of all C-sections, and its suitable alternative is a vaginal birth after cesarean (VBAC).

The selection of VBAC may seem a wise and rational decision for many women, and if these women are chosen correctly, the risk of such morbidities as postpartum hemorrhage,

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infection, surgical injuries, thromboembolism, hysterectomy, and even death will decrease. This matter should be taken into consideration by those who decide to have larger families and are, therefore, at risk of possible consequences of repeat C-sections, such as hysterectomy, bladder and intestines damage, blood transfusion, infection, abnormal placental implantation, placenta pervia, and placenta accreta. Moreover, in females who undergo a trial of labor after cesarean and, consequently, experience a successful vaginal delivery, the recovery period is faster and the total cost of delivery is lower than in those who choose a second cesarean (3, 4).

The rate of C-section in Iran has increased from 35% in 2000 to 56% in 2013, while slightly decreased to 50.77% in 2018 (5). Despite the high rate of C-sections in Iran, the rate of VBAC in 2018 was reported less than 1% (i.e., 0.8%) (6), while it was estimated at 13.3% in the United States in the same year. This rate was obtained at 14% and 29-36% in Australia (7, 8) and in Ireland, Germany, and Italy, respectively. In the Netherlands, Sweden, and Finland the same rate was calculated at 44-55% in 2008 (9).

The results of studies have shown that among the factors that could affect the patient's decision about performing VBAC included physician encouragement, ultimate benefits of the type of delivery, physical and psychological factors and the woman's sense of control over the decision-making process, lack of awareness of the possibility of VBAC (10), unawareness of delivery results, fear of unpleasant experiences, lack of access to positive physicians, pressure from others for the type of delivery (abstract norms), lack of self-confidence, lack of self-efficacy in the decision-making process, and maternal negative attitude (11).

Since the fear of legal issues due to the poor results of VBAC is one of its significant obstacles, knowing the results of research conducted in the field of VBAC and comparing them with those reported regarding repetitive C-section can provide the basis for evidence-based performance among healthcare providers and informed choice among healthcare recipients. In addition, access to the research background of a topic in any country provides a good research horizon for users of that topic. Despite the existence of many international studies carried out on research and international and national guidelines for the safety of VBAC, the statistics of Iran indicate that this matter is not dealt with clinically. Therefore, the present study was conducted to review the studies investigating VBAC in Iran.

Materials and Methods

This narrative review research was carried out in 2020 on the studies limited to Internet search. Detailed research was performed on studies conducted in Iran, in both Persian and English, without a time limit on the Irandoc, SID, Google Scholar, Scopus, PubMed, Web of Science Magiran, and Iran Medex databases. All Iranian articles up to October 2020 were included and the research process was conducted using Persian and English keywords of "Vaginal birth after cesarean", "Repeated C-section", "VBAC", "Trial of labor after cesarean", "TOLAC", and Iran.

The initial search was performed by both authors separately and to access all studies conducted in Iran, the type of study and time restriction were not considered. The screening of studies was performed in three stages based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses process. The required data were extracted using a checklist, including the type, time, and results of the study. To improve the research methodology and review the quality of the articles, another researcher reviewed the articles separately in terms of title, abstract, introduction, methodology, and results.

First, irrelevant studies to the subject were excluded by reviewing their title and abstract and repeated research was excluded. The inclusion criteria were English or Persian studies investigating VBAC, conducted in Iran, and full-text available, according to which the required studies were gradually entered to be reviewed. As a result, a total of 142 articles were retrieved; however, finally, according to the inclusion criteria and after removing duplicate articles, 12 full-text articles were carefully reviewed by researchers (Figure 1).

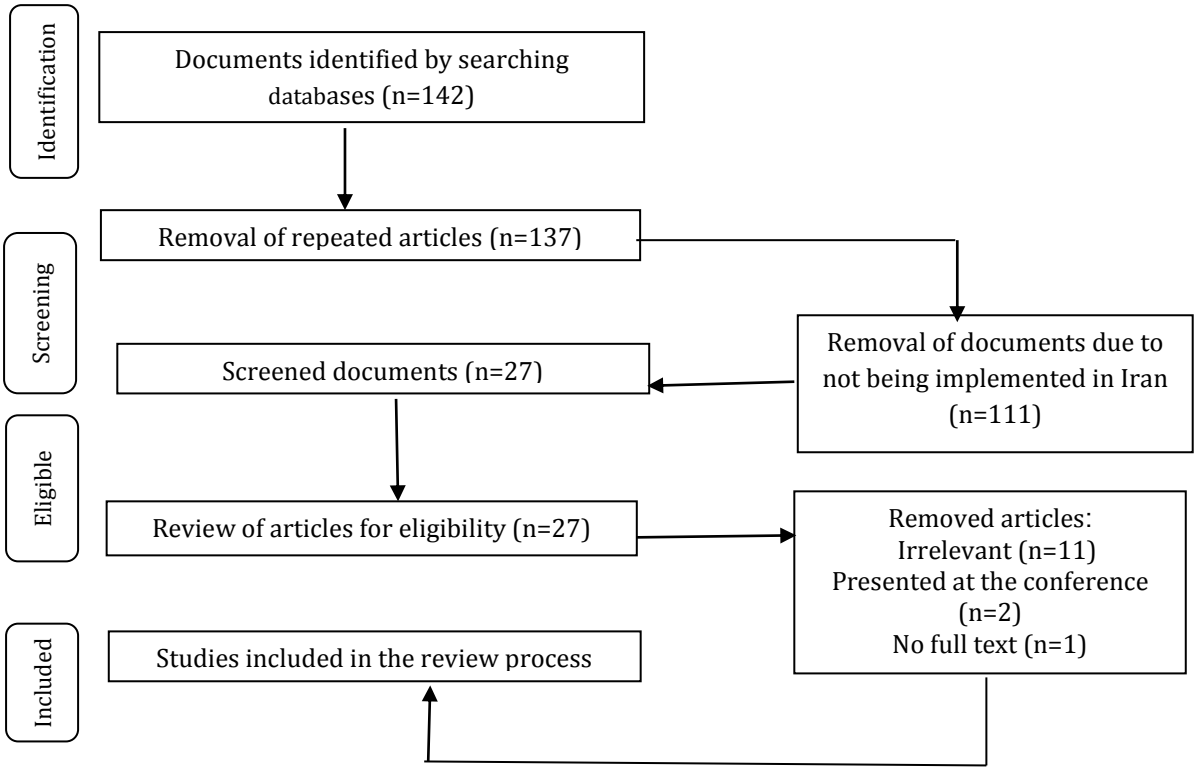

Figure 1. Flowchart of steps for the selection and inclusion of articles into the study in accordance with the PRISMA protocol

Results

The total number of reported studies on VBAC in Iran was 12 articles (8 Persian and 4 English) with a sample size of 2,969 cases, all of which were reviewed. The results of reviewed studies are summarized in Table 1. It was revealed that in all cesarean deliveries, compared to vaginal delivery, there was an increase in maternal mortality and main and important maternal complications, such as infection, bleeding, thromboembolism, and anesthesia complications. Although cesarean delivery is associated with a lower risk of fetal trauma, the rate of initial respiratory distress is higher in C-section than in VBAC (21). The examined outcomes in the present review studies include:

A- Maternal consequences

Fever: Based on the results of a study performed by Arab (2001), fever was the most common complication in both normal delivery and repeat C-section groups, although it was reported to be more common in the C-section group (7%). Bagheri (2016) reported that there was no significant difference between the two groups (P=0.529) in this regard; however, according to Yousefzadeh (2006), a higher prevalence of postpartum fever (17.88%) was observed in the repeat C-section group. Ghorashi (2004) reported fever in 0.23% of mothers in the repeat C-section group, while, no cases were reported in the VBAC.

Maternal death: The results of studies performed by Arab (2001), Yousefzadeh (2006), and Mirtimouri (2015) were indicative of no cases of maternal death followed by VBAC.

Bleeding: Based on the findings of a study performed by Bagheri (2016), bleeding was not

significant in the two groups (P=0.629). The postpartum hemorrhage incidence in the VBAC group was estimated at 5.88%, 2.7%, and 2% of cases respectively in the studies carried out by Yousefzadeh (2004), Mirtimori (2015), Asgarian (2018), which were higher than in the repeat C-section. Ghorashi (2004) reported bleeding in 0.23% of mothers in the repeat C-section group, while no cases were observed in the VBAC group regarding this.

Uterine rupture: One of the most important complications in VBAC is uterine rupture, which is reported to be 1 out of 200 cases and is accompanied by such factors as the unripe cervix and the use of prostaglandins for induction of labor. The incidence probability of this complication in repeat C-sections was found to be 1 out of 4,000 cases (22). Bagheri (2016) and Yousefzadeh (2006) reported that uterine rupture occurred in 2.15% and 0.49% of women with a repeat C-section, respectively. However, Pahlavani-Sheikhi (2015) and Vatanchi (2016), respectively, reported two cases of uterine rupture associated with the trial of labor and one case of vaginal omentum prolapse following uterine rupture associated with VBAC. According to the results of a study performed by Asgarian (2018), the uterine rupture was observed in 0.7% of females who underwent trial labor.

Hysterectomy: The rate of a hysterectomy varies from 0.4 to 2.5 cases per 1,000 deliveries, and hysterectomy is performed during C-section with the most common reasons of preventing or stopping bleeding due to uterine atony or abnormal placental implantation (21). The rate of hysterectomy in the repeat C-section group was estimated at 1.05%, 0.49%, 0.9%, in the studies carried out by Bagheri (2013), Yousefzadeh (2006), Ghorashi (2004).

Constipation: Bagheri (2016) reported that constipation was significant in the normal delivery and in the repeat C-section group (16.67% and 34.73%, respectively; P=0.005). Based on the results of a study conducted by Yousefzadeh (2004), a higher prevalence of constipation was observed in the repeat C-section group (1.48%).

Flatulence: Yousefzadeh (2006) reported flatulence incidence in 6.43% of the cases in the repeat C-section group.

Cervical rupture: According to Ghorashi (2004), the cervical rupture was observed in 0.6% of cases following a VBAC.

Curettage: Ghorashi (2004) reported the 1.2% frequency of postpartum curettage for placental abruption in the normal delivery group.

Nausea and vomiting: In a study performed by Ghorashi (2004), ileus, including nausea and vomiting, were the complications that were reported only in the repeat C-section group (0.7%).

Bladder rupture: Ghorashi (2004) reported that intraoperative bladder rupture was a complication observed only in the repeat C-section group (0.46%).

B- Neonatal outcomes: Apgar score: In the studies conducted by Bagheri (2016) and Ghorashi (2004), no difference was observed in neonatal outcomes (Apgar score) in the two groups. Yousefzadeh (2006) reported that Apgar scores of less than 7 were revealed only in 1.98% of repeated C-sections.

Admission to the neonatal intensive care unit: Based on the results of a study performed by Mirtimori (2015), admission to the neonatal intensive care unit and the need for resuscitation were more common (57.1%) in the repeat C-section group (P=0.002). According to the findings of a study carried out by Asgarian (2018), 2.67% of neonates born by normal delivery needed resuscitation.

Breastfeeding: Mirtimori (2015) reported that the rate of successful breastfeeding was higher in the VBAC group (95.8%) than in the repeat C-section group (42.9%), which was significantly different (0.002).

C- Costs and length of hospitalization

It was found that the mean length of hospital stay was longer in the repeat C-section group than in the normal delivery, estimated at 2.7, 3.1, and 4.7 days in the studies performed by Arab (2001), Yousefzadeh (2004), and Ghorashi (2004), respectively. Mirtimori (2015) reported

this index for 2 days, which was significantly higher than that in the VBAC group (P=0.007).

Cost of C-section: In a study conducted by Arab (1996), the cost of repeated C-section was calculated as twice the cost of VBAC.

D- Success rate and failure cause

The success chances of VBAC in cephalic pregnancy and one previous C-section were estimated at 37 weeks and more and 80-60%, respectively. Vaginal birth after cesarean is recognized as an appropriate option among 83% of cases with a history of one C-section and one natural childbirth, and 94% of individuals with a history of VBAC (23, 24). The success rates of VBAC was obtained at 91.2%, 74.3%, 47.8%, 62.9%, 85.33%, and 27.4% in the studies carried out by Mirtimori (2015), Arab (2001), Bagheri (2016), Yousefzadeh (2004), Asgarian (2018), and Ghorashi (2004), respectively. Based on the results of a study performed by Asgarian (2018), the most important causes of VBAC failure were found to be prolonged and stopped labor and fetal heart failure.

E- Obstacles and effective factors in the selection of the delivery type

In the studies carried out by Firoozi (2007, 2020), the attitude of the medical staff towards performing VBAC was reported positively and from the point of view of gynecologists and specialized students, lack of legal protection was recognized as the most important obstacle for VBAC.

Table 1. Studies on vaginal birth after cesarean in Iran

Row	Author-Year	Place of study	Type of study	Objectives of the study	Sample size	Results
1	Malihe Arab 2001 (12)	Hamedan	Cohort	Comparison of delivery results, delivery complications, and costs of VBAC and repeat C-section	Case group (n=109) and control group (n=371)	The frequency values of complications in the repeat C-section and VBAC groups were estimated at 7% and 3.7%, respectively. In both groups, the most common complication was fever. Maternal length of stay (2.8 vs. 1.1 days) and hospital costs were also double in the repeat C-section.
2	Sedigheh Yousefzadeh 2005 (13)	Sabzevar	Case-control	Comparison of VBAC complications and repeat C-section	Case group (n=81) and control group (n=172)	In the VBAC group, one and three cases of postpartum fever and hemorrhage were observed and the prevalence of episiotomy was obtained at 70%. In repeat C-section (control) group, 36, 13, 3, and 1 of cases revealed fever, flatulence, constipation, and hysterectomy, respectively. The length of hospital stay was 3.1 days vs. 1.2 days (P<0.05)
3	Zahra Ghorashi 2004 (14)	Rafsanjan	Case-control	Comparison of complications of natural childbirth and C-section in women with a history of a previous C-section	n=592	In 154 (26.7%) cases of vaginal delivery, no uterine rupture was observed, except for 1 case that was due to in-home delivery. Maternal complications and Apgar score were not significant in the two groups. A significant difference was observed in the length of stay (P=0.001). In the C-section group, 4 cases of hysterectomy were performed (3 cases due to severe decolonization and 1 case for intraoperative bleeding).
4	Mahboubeh Firoozi 2007 (15)	Mashhad	Descriptive	The attitude of gynecologists and midwives towards VBAC	n=124	It was revealed that 80%, 61.1%, 81.4%, 60.5% of gynecologists, specialized students, midwives of maternity hospitals, and midwives of health centers had a positive attitude towards VBAC, respectively. There was a significant difference between the attitudes of research units in terms of job and year of graduation (P=0.027 and P=0.049, respectively). From the point of view of gynecologists and specialized students, lack of legal protection was the most important obstacle in relation to VBAC.

5	Maryam Bagheri 2016 (16)	Bojnord	Cross-sectional	Comparison of maternal and neonatal outcomes in VBAC and repeat C-section	n=180	Maternal outcomes, including hysterectomy, uterine rupture, and constipation, were less common in the natural childbirth group than in the repeat C-section group, which was not significantly different, except for constipation (P=0.005). The frequency of fever was higher in the vaginal delivery group; however, it was not significantly different. Neonatal outcomes in the two groups were not significant.
6	Zahra Pahlavani Sheikhi 2015 (17)	Zahedan	Case report	Rupture of the uterus following delivery of a dead fetus	n=2	The first case was a 25-year-old G5P4 woman with a history of two C-sections referring to the center due to severe abdominal pain and vaginal bleeding. The fetus's heartbeat was not detectable; therefore, the patient underwent laparotomy due to suspected uterine rupture. Rupture of the previous incision and removal of the fetus from the uterus were observed. The stillborn fetus was born and the ruptured uterus was repaired. The second case was a 19-year-old G3P2 woman with a history of C-section and a subsequent vaginal delivery referring to the center for labor pain and brief bloody vaginal discharge. Uterine rupture was suspected due to the sharp drop in the fetal heart rate to 60 beats/min and an increase in the position of the fetal head in the birth canal. Rupture of the uterus was observed at the site of the previous scar. The boy neonate was removed with an Apgar score of 4 at 1 min and the uterine rupture was repaired.
7	Atieh Mohammadzadeh Watanchi 2016 (8)	Mashhad	Case report	Omentum prolapses of vaginal following VBAC	n=1	Due to the lack of fetal heartbeat in the dead fetus and the use of oxytocin to strengthen contractions, vacuum delivery was performed due to lack of fetal descent and maternal satisfaction with cesarean section. Laparotomy and uterus repair were performed at the site of the previous scar by detecting the omentum out of the vagina.
8	Mahboubeh Firoozi 2019 (18)	Mashhad	Clinical trial	The effect of motivational interview on the selection of VBAC	60 cases in both groups	Motivational interview was effective in encouraging females with a history of one C-section to choose VBAC.
9	Azadeh Asgarian 2018 (19)	Qom	Cross-sectional 2015-2017	Success rate, effective factors, causes of VBAC failure	n=150	The failure rate of trial of labor after C-section was 14.6%. The interval between delivery and previous C-section was the successful VBAC and failed labor groups were significant (P=0.002). The most important causes of VBAC failure were prolonged and stopped labor and fetal heart failure.
10	Masoumeh Mirtimori 2015 (5)	Mashhad	Cross-sectional 2013-2014	Evaluation of maternal and neonatal outcomes	n=80	The success rate of VBAC was 91%. Postpartum hemorrhage occurred in 2.7% of women with successful VBAC and 1.3% of C-section cases. Maternal and neonatal death, uterine rupture, dystocia, and neonatal tachypnea were not observed during the study. Neonatal complications, including admission to the NICU and the frequency of neonatal resuscitation in VBAC and repeat C-section were 6.8% and 57.1%, respectively (P=0.002). The differences in neonatal birth weight were significant in successful and unsuccessful VBAC groups (P=0.007). The difference in successful breastfeeding rate in VBAC patients was significant, compared to the repeat C-section group (P=0.002).

11	Mahboubeh Firoozi 2020 (20)	Mashhad	Qualitative content analysis	Barriers to the healthcare system for VBAC	n=28	Barriers to the healthcare system in VBAC include imposed policies, deficiencies in access to specialized services, inefficiency in incentive system, modeling in C-section, central physician in VBAC, fear of legal responsibilities, marginalization of midwives, and lack of staff support from VBAC.
12	Zahra Hosseini Haji 2020 (6)	Mashhad	Review	A review of shared decision-making about knowledge, decision-making conflict, and choice of the type of delivery after C-section	n=1.180	The use of shared decision-making methods increased the awareness of females with a previous C-section about choosing the type of delivery and reduced decision-making conflict.

It was revealed that there were also some barriers related to the healthcare system regarding the performance of VBAC, including imposed policies, deficiencies in access to specialized services, inefficiency in incentive system, modeling in C-section, central physician in VBAC, fear of legal responsibilities, marginalization of midwives, and lack of staff support from VBAC.

In the studies conducted by Hosseini (2020) and Firoozi (2018), it was reported to be effective to counseling with the approach of motivational interviewing and the employment of shared decision-making methods in raising awareness of women with previous C-section about VBAC selection and reducing decision-making conflict.

Discussion

The increasing trend of performing C-sections in recent years and the complications related to repeat C-sections have directed growing attention to the trial of VBAC. Vaginal birth after caesarian is considered a safe delivery method worldwide, provided that the ideal conditions for the mother are considered, such as a history of one or two previous C-sections, lack of high maternal body mass index (BMI), lack of a classic uterine incision, proper interval with previous C-section, and lack of suspicion of fetal macrosomia (25, 26).

The present study aimed to review studies related to VBAC in Iran. Among the 12 reviewed studies, no prospective cohort studies were dedicated to investigate the controlling of maternal, fetal, and labor conditions. These retrospective cohort studies mainly compared maternal and neonatal complications, costs, length of hospital stay, and success rates in the two groups of VBAC and repeat C-section. Accordingly, in 3 studies, it was revealed that fever was more prevalent in the repeat C-section group. The results of research conducted by Kugler (2007) study indicated that fever was more common in the repeat C-section group (27).

In three studies, hysterectomy was reported only in the group of repeat C-section, which in a study performed by Fitzpatrick (2019), this complication was more common in the group of repeat C-section (1, 28). In three studies, postpartum hemorrhage was more prevalent in the VBAC group than in the repeat C-section. It was reported that the reason for postpartum hemorrhage may be attributed to the high maternal BMI, high birth weight, or placental hemorrhage, whereas according to the findings of the studies carried out by Takeya (2020) and Uno (2020), this complication was more common in the repeat C-section group, which is inconsistent with the results of the present research (29, 30).

In the current study, which is a case report, the uterine rupture was more reported in the VBAC group, which is in line with the findings of a study performed by Patrick (2019) and Takeya (2020). In none of the reviewed studies, maternal death was reported in the vaginal delivery group; this result is consistent with that of research conducted by Takeya (2020). Given the highly rare occurrence of maternal death, such a finding is not unexpected considering the limited number of samples in these studies.

The success rate of trial of labor after C-section in the present study was estimated at 85.4% and 91% in the pieces of research carried out by Asgarian and Mirtimori, respectively. This finding was in agreement with that reported by Takeya (2020), Familiari (2020), Grilka and Bachelin (2019), Uno (2020) with the rates of 88.6%, 74.7%, 74.6 %, and 91.3%, respectively (29-32). Furthermore, the length of hospitalization in the present study was longer in the repeat C-section group, which is consistent with the results reported by Patrick (2019).

In a study, the neonatal outcome of Apgar score was reported less than 7 in the repeat C-section group, which was obtained higher in the VBAC group in a study conducted by Patrick (2019). Based on the results of research carried out by Uno (2020), there was no difference in the Apgar score of the two groups. In another study, successful breastfeeding was more reported in the natural childbirth group, which is consistent with that reported by Patrick (2019). It was found that admission to the neonatal intensive care unit was more prevalent in the repeat C-section group, while Soni (2015) reported that no statistically significant difference was observed between the two groups (33).

One of the strengths of the present study was related to the attention paid to the high number of repeat C-sections in Iran, highlighting the importance of considering a suitable alternative solution, namely VBAC. Since this study reviewed the entirety of research conducted in Iran and reported the results based on their evidence, it can provide reliable scientific support for clinicians to be confident in promoting VBAC. Moreover, it encourages researchers to fill the existing research gap.

The limitation of the present study was the lack of access to studies with the same methodology, and therefore, the impossibility of meta-analysis of clinical results. In addition, due to the obtained small number of studies and considering the aim of reporting the entirety of existing studies, the authors did not qualitatively evaluate the articles and reported all available studies through avoiding the removal of the studies.

Conclusion

Limited studies have been conducted in Iran to investigate VBAC, and the type of studies performed in this regard are mostly observational and retrospective. However, maternal and neonatal results indicate the acceptable safety of trial labor after C-section in Iranian society. The high number of repeat C-sections in the current society, on the one hand, and population policies based on childbearing, on the other hand, highlight the need to promote VBAC with appropriate strategies. Among such strategies can be holding orientation courses for maternal healthcare providers and providing evidence-based documents on VBAC safety, building the culture of VBAC, introducing and expanding hospitals supportive of VBAC in the community, and providing legal support to providers of this effective service.

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Conflicts of interest

Authors declared no conflicts of interest.

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