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ORIGINAL ARTICLE

Further evidence of psychological factors underlying choice of elective cesarean delivery by primigravidae

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Objective: Requests for elective cesarean delivery (ECD) have increased in Iran. While some sociodemographic and fear-related factors have been linked with this choice, psychological factors such as self-esteem, stress, and health beliefs are under-researched.
Methods: A total of 342 primigravidae (mean age = 25 years) completed questionnaires covering psychological dimensions such as self-esteem, perceived stress, marital relationship quality, perceived social support, and relevant health-related beliefs.
Results: Of the sample, 214 (62.6%) chose to undergo ECD rather than vaginal delivery (VD). This choice was associated with lower self-esteem, greater perceived stress, belief in higher susceptibility to problematic birth and barriers to an easy birth, along with lower perceived severity of ECD, fewer perceived benefits from VD, lower self-efficacy and a lower feeling of preparedness. No differences were found for marital relationship quality or perceived social support.
Conclusions: The pattern suggests that various psychological factors such as self-esteem, self-efficacy, and perceived stress underpin the decision by primigravidae to have an ECD.

Keywords: Elective cesarean delivery; vaginal delivery; psychological predictors; Health Belief Model; fear; stress

Introduction

The obstetric dilemma[1] refers to the trade-off between a woman's relatively small pelvis and birth canal compared to fetal head and shoulder size. While a smaller pelvis and pelvic birth canal evolved as a result of bipedalism during the last four to five million years, the newborn's head dimensions have increased over the last 500,000 years due to rapid brain expansion.[2] This cephalopelvic disproportion is responsible for obstructed labor, which ranges from 3% to 6% worldwide.[3] Cesarean delivery (CD) has thus become a common option for dealing with cephalopelvic disproportion. Very recent evidence indicates that CDs are increasing worldwide[4] and, according to Mitteroecker et al.,[3,5] there is reason to believe that while increased rates of CD are a response to a cephalopelvic disproportion, they will also lead to further increases in this disproportion.

The grounds for performing a CD can be categorized as absolute, relative, or elective. Whereas in absolute and relative indications for CDs, the health of both mother and fetus are primary considerations (e.g., placenta previa, HIV infection, contracted pelvis, obesity and diabetes mellitus, breech presentation or previous cesarean section), for elective cesarean delivery (ECD; also called cesarean delivery on maternal request, or CDMR) the mother's desire, rather than a medical indication, is the chief factor.[6-9]

Worldwide, the CD rate is approximately 30-40% in public hospitals and 50-60% in private hospitals, with the highest rates (90%) found in private practice in Brazil.[10] The rate of ECDs in both developed and developing countries, such as Iran,[11,12] is increasing. In Iranian province of Hamadan, the CD rate is 47.5% in public hospitals and 79.1% in private hospitals.[13] These rates are much higher than the 10-15% rate recommended by the World Health Organization (WHO).[11]

While it is clear that CD is increasing worldwide, there is no uniform agreement regarding the reasons for, or consequences of, ECDs.[14]

In a review of the literature, Mylonas & Friese[15] identified three reasons for choosing ECD: a) the physical health profiles of the mother and fetus; b) legal aspects, and c) psychological factors. The physical health category involves factors such as advanced maternal age, fertility treatment, obesity, diabetes mellitus, previous pregnancies, and previous CDs.[16,17] Legal aspects include issues of responsibility (and financial consequences) in the event of injury to the mother or child. Both risk-oriented and

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risk-averse attitudes can be found among obstetricians. As for psychological factors, fear seems to be the most powerful influence underlying ECD.[18-20] More specifically, fear of complications, tokophobia,[17,21] dysfunctional beliefs about childbirth,[22,23] previous traumatic births, depression.[24] and other psychiatric and psychosomatic issues can lie behind a decision to undergo ECD. In a previous study,[25] we found that fear for the health and life of the fetus, fear of the process of labor and childbirth, and doubts about the competence and behavior of the maternity staff, along with fear of parenthood and family life were the strongest factors associated with seeking ECD. In short, both expectant mothers and perinatal health experts can list a number of reasons for choosing ECDs.

Evidence for the benefits of ECDs is mixed. On the one hand, several studies have reported that, compared to vaginal delivery (VD), hospitals stays are longer following ECDs, and the risk of hysterectomy due to post-partum bleeding and cardiac arrest is higher.[15] A large cohort study in Scotland indicated that children born by CD had a higher risk of asthma by age 5 (however, Black et al.[26] emphasized that this study counted both planned and unplanned CDs). Likewise, other studies[27] have reported higher rates of severe maternal health outcomes after E/CD and higher rates of postpartum depression for CD than for VD.[28]

On the other hand, there is evidence that, compared to VD, there is less abdominal and perineal pain during and three days after ECD, as well as fewer vaginal injuries and anesthesia-related emergencies (e.g. shock and bleeding).[15] More recently, Molina et al.[29] investigated the association between CDs and maternal and neonatal mortality across all 194 WHO member states and found that a CD rate of up to approximately 19% was associated with lower levels of maternal and neonatal mortality, which calls the 1985 WHO recommendation to restrict CD rates to a maximum of 10-15% into question[11] (for further discussion, see D'Alton & Hehir[30]). Likewise, Betran et al.[31] also observed that ECD rates above 9-16% were not associated with higher mortality outcomes. More importantly, two studies published in 2007 (Gamble et al.[32] and McCourt et al.[33]) pointed out that the psychosocial context of obstetric care had until then involved a power imbalance in favor of the physician and that the following factors had not been taken into account in the historical context of maternal decision-making: the influence of care offered, the interaction between the expecting mother and health care providers, the context of care, tokophobia, and the perceived inequality and inadequacy of care. The WHO's most recent statement (2015)[34] acknowledged that CD decisions should reflect women's individual care requirements rather than conform to predetermined limits. We also note that large cohort studies[4,29,31,35] have not taken into account emotional factors in decisions for ECD.

To address this imbalance, the present study focused on psychological reasons for ECDs. Specifically, we considered women's self-esteem, stress, and health-related beliefs based on the Health Belief Model (HBM). Briefly put, the HBM[36] seeks to explain the cognitive-emotional processes that underlie health-related behavior. Thus, we used HBM constructs applied to VD childbirth, such as the perceived susceptibility to poor/difficult VD, and the benefits of and barriers to VD. Due to limited previous research in this area, the following research question was formulated: Are there differences in self-esteem, perceived stress, marital relationship quality, and HBM scores between primigravidae opting for ECD and those opting for VD? That is, do women who choose ECD have lower self-esteem, higher perceived stress, lower marital relationship quality, and more negative health-related beliefs?

To answer these questions, a sample of primigravidae referred to public health care centers for routine prenatal care was assessed. We believe this study has the potential to shed more light on the psychological processes underlying the choice of ECD and might facilitate effective educational interventions and health care programs aimed at improving women's capacity to make informed decisions regarding ECDs and VDs.

The present data are part of larger study investigating Iranian women's attitudes to CD and VD. In a previous study,[25] we found that ECD was associated with advanced age, higher education level, higher family income, and unplanned pregnancy, as well as that women opting for ECD had higher fear scores in the following dimensions: labor and childbirth, life and well-being for themselves and for the fetus, becoming a parent and family life after delivery, their own competencies, and the competencies of the maternity ward staff. In this paper, we focus on previously unpublished evidence concerning the psychological factors underpinning decisions for ECD.

Methods

Procedure

This cross-sectional study was carried out among primigravidae referred to public health care centers for routine prenatal care in Hamadan, Iran. The health care centers of three of the four municipal areas of Hamadan were randomly selected. To select potential participants, stratified random sampling was used. Eligible participants were informed about the aims of the study and the voluntary basis of participation. Participants were informed that the data would be handled anonymously and provided written informed consent. Of the 470 individuals approached, 342 met the inclusion criteria (see below) and agreed to participate.

Sample

As mentioned above, a total of 342 women (mean age = 25 years; standard deviation [SD] = 3.5) took part in the study.[25] The inclusion criteria were: 1) being at the end of the first trimester (gestational age between 13-15 weeks); 2) having no legal or medical indication for CD; 3) being willing and able to complete questionnaires covering sociodemographic, psychological, and pregnancy-related questions (see below); and 4) aged between 18 and 35 years. The exclusion criteria were: 1) not meeting any point of the inclusion criteria; 2) a history of or existing medical, psychiatric, or obstetric problems, including

congenital fetal anomaly; 3) a history of inherited disease in the mother's or father's family.

Instruments

Participants completed a set of questionnaires covering sociodemographic, psychological and pregnancy-related information.[25] The data used in the present study are from the psychological instruments, which are described below. Before these evaluations began, however, the participants reported whether they were opting for ECD or VD.

Self-esteem

Participants completed the Farsi version of the Rosenberg Self-Esteem Scale (RSES), translated and validated by Shapurian et al.[37] The RSES consists of 10 items and is used as a one-dimensional measure of global self-esteem (cognitive and affective components), general self-worth, and positive self-esteem. Answers are given on four-point Likert scales ranging from 0 (= strongly disagree) to 3 (= strongly agree), with higher total scores reflecting higher self-esteem. Scores between 15 and 25 points are within the normal range; scores below 15 points are associated with lower self-esteem.

Perceived stress

To assess perceived stress, the Farsi version of the Perceived Stress Scale (PSS[38]), translated and validated by Maroufizadeh et al.,[39] was used. The PSS is a measure of the degree to which situations in one's life are appraised as stressful. The 10 items are intended to measure how unpredictable, uncontrollable, and overloaded respondents find their lives. Answers are given on 5-point Likert scales ranging from 'never' to 'very often' (reverse scoring was used for some items). Higher total scores reflect greater subjectively perceived stress.

Marital relationship quality

The Farsi version of the Revised Dyadic Adjustment Scale (RDAS[40]), translated and validated by Isanezhad et al.,[41] was used to assess marital satisfaction. The RDAS consists of 14 items, with answers given on a 6-point Likert scale ranging from 0 (= not at all) to 5 (= completely true). Higher total scores reflect greater satisfaction.

Perceived social support

To assess perceived social support, we used the Farsi version of the Multidimensional Scale of Perceived Social Support (MDSPSS[42]), translated and validated by Bagehrian-Sararoudi et al.[43] It consists of twelve questions that assess perceived support from family, friends, and significant others. Answers are given on a 7-point Likert scale ranging from 1 (= strongly disagree) to 7 (= very strongly agree). Higher total scores reflect stronger perceptions of social support.

Health Belief Model (HBM)

To assess the participants' health beliefs, the Farsi version of the HBM questionnaire,[36] translated and validated by Assari,[44] was administered. The questionnaire includes 43 questions on the following topics: perceived susceptibility to poor or difficult VD (5 items), perceived severity of complications associated with VD (7 items), perceived benefits of VD (spontaneous VD; 7 items), perceived barriers to successful VD (8 items), self-efficacy for VD (10 items), and feelings of preparedness for VD (6 items). The answers are given on a 5-point Likert scale, end-anchored by 1 (= strongly disagree) and 5 (= strongly agree).

Statistical analysis

Preliminary calculations: to determine whether planned or unplanned pregnancies had an influence on the pattern of results, a series of *t*-tests were performed. It was observed that planned or unplanned pregnancy had no systematic effect on the results (all t values < 1.2 and p values > 0.25).

The participants were divided into two groups according to delivery type. The psychological and HBM-related data were compared between groups using chi-square and *t*-tests. To predict which psychological and HBM-related dimensions best predicted ECD, a binary logistic regression analysis was performed with the psychological factors (self-esteem, perceived stress, quality of marital relationship, perceived social support) and health-related belief dimensions as independent factors, and the choice of delivery method (ECD vs. VD) as the dependent variable. The significance level was set at 0.05 for all tests. All statistical analyses were performed with SPSS version 23.0.

Results

General characteristics of the primigravidae

The mean participant age was 25 years (range 18-34 years); 224 (65.5%) had planned pregnancies, and 214 (62.6%) requested ECD on non-medical grounds in the course of a normal pregnancy. Participants opting for ECD were 1.86 years older than participants opting for VD (ECD: n=214; mean = 25.88 years, SD = 3.62; range: 18-34 years; VD: n=128; mean = 24.02 years, SD = 2.87; range: 18-32 years; $t_{340} = 4.96$, p = 0.01, $d = 0.47$).

Psychological factors

Table 1 shows all statistical indices (descriptive and inferential statistics). Compared to VD, participants opting for ECD had lower self-esteem scores and higher perceived stress scores, whereas no significant mean differences were found for marital relationship quality or perceived social support.

Health Belief Model (HBM)

Table 1 also reports all statistical indices related to the HBM constructs. Compared to VD, participants opting for

ECD had higher scores for susceptibility to poor or difficult VD and barriers to a successful VD (i.e., lower confidence in VD) and lower scores for severity of complications of ECD, the benefits associated with VD, preparedness for VD, and self-efficacy in coping with VD.

Predicting elective cesarean delivery (ECD)

To predict the choice of ECD, a binary logistic regression analysis was performed. All statistical indices are shown in Table 2. ECD was predicted by higher perceived susceptibility to a poor or difficult VD, greater barriers to a successful VD, and lower self-efficacy, while severity of complications, benefits and preparedness were excluded from the equation.

Discussion

A total of 214 (62.3%) of the 342 primigravidae opted for ECD in the absence of medical indications. The key finding of the present study was that those opting for ECD reported higher levels of perceived stress and had lower self-esteem.

The research question involved differences in self-esteem, perceived stress, marital relationship quality and HBM dimensions between primigravidae opting for either ECD or VD, i.e., do women opting for ECD also have lower self-esteem, higher perceived stress, a poorer marital relationship quality, and lower HBM scores than women opting for VD? The answer was not clear-cut. Whereas those opting for ECD also had lower self-esteem and higher perceived stress, no differences were found regarding marital relationship quality or social support.

Regarding marital relationship quality and social support, the present findings are at odds with previously published evidence. For example, one study found that women reporting greater tokophobia also showed a greater response when midwives were very supportive.[45] Leone et al.[46] reported that the odds of ECD were inversely related to the frequency with which women exchanged reproductive health information with friends and family. Saisto et al.[47] reported that lower marital satisfaction was associated with increased fear of VD. In contrast, we found that perceived social support and marital relationship quality were unrelated to the decision for or against ECD by primigravidae. The data available to us in this study shed no further light on why marital relationship quality was unrelated to ECD,

Table 1 Relationship between psychological characteristics and mean scores on Health Belief Model constructs vs. choice of mode of delivery

	Elective cesarean delivery (n=214)	Vaginal delivery (n=128)	*t*-test	*d*
Psychological characteristics				
Age (years)	25.88 (3.62)	24.02 (2.87)		
Self-esteem	25.88 (1.78)	26.30 (1.75)	$t_{340} = 2.09$*	0.24
Perceived stress	25.60 (5.73)	20.88 (3.23)	$t_{340} = 9.78$†	1.05
Quality of marital relationship	47.40 (3.89)	47.70 (3.79)	$t_{340} = 0.63$	0.08
Social support	53.96 (9.60)	53.50 (9.06)	$t_{340} = 0.44$	0.05
Beliefs				
Susceptibility	16.25 (2.66)	14.99 (2.44)	4.47†	0.50
Severity	24.85 (3.89)	26.13 (3.66)	3.00*	0.34
Benefits	27.24 (3.60)	28.56 (3.55)	3.29‡	0.37
Barrier	28.37 (3.95)	25.50 (4.62)	6.17†	0.67
Self-efficacy	20.28 (3.45)	21.73 (3.50)	3.75*	0.42
Cue to action	35.12 (3.73)	36.27 (3.51)	2.82*	0.32
Total beliefs	152.10 (9.83)	153.10 (9.92)	0.91	0.10

Data presented as mean (standard deviation).
* $p < 0.05$; † $p < 0.001$; ‡ $p < 0.01$.

Table 2 Logistic regression analysis of psychological dimensions and Health Belief Model constructs for choice of elective cesarean delivery

Variables	B	SE	Wald	OR	95%CI
Perceived stress	-0.01	0.06	0.05	0.99	0.88-1.11
Self-esteem	0.002	0.11	0.000	1.00	0.81-1.24
Beliefs					
Susceptibility	0.13	0.05	5.57*	1.13	1.02-1.26
Seriousness	-0.02	0.04	0.26	0.98	0.91-1.06
Benefits	-0.03	0.04	0.56	0.97	0.89-1.10
Barrier	0.14	0.03	17.11†	1.15	1.08-1.23
Self-efficacy	-0.08	0.04	5.23*	1.11	0.99-1.19
Cue to action	0.02	0.05	0.18	1.02	0.93-1.12
Constant	-15.56	4.808	10.48†	0.000	

95%CI = 95% confidence interval; B = coefficient; OR = odds ratio; SE = standard error.
* $p < 0.01$; † $p < 0.001$.

unlike the findings of Saisto et al.[47] We found that self-esteem, stress and health beliefs were unrelated to marital relationship quality. In this context, it is worth noting that in a qualitative study in Argentina,[48] where the CD rate is approximately 30%, it was observed that most expectant mothers at both public and private hospitals preferred VD due to cultural, personal, and social factors. VD was viewed as normal, healthy, and a natural rite of passage from womanhood to motherhood. The pain associated with VD was viewed positively. In contrast, women viewed CD as a medical decision and often deferred to medical staff to make this decision on medical grounds. In the present study, and for Iranian primigravidae in general, we have no estimate of the extent to which VD would be seen as a normal, healthy, and a natural rite of passage from womanhood to motherhood; to the best of our knowledge nothing has yet been published on this question.

A further finding of the present study was that lower self-esteem was associated with a greater likelihood of ECD. Research on this topic is limited and has mainly focused on self-esteem levels after discharge following CD. Salomonsson et al.[49] reported that higher self-esteem and higher self-efficacy scores were associated with choosing VD over ECD. Loto et al.[50] reported lower self-esteem scores both prior to and after discharge in women who had CDs than in women who had VDs. We cannot say on the basis of the present study why there was an association between low self-esteem and ECD, although we may speculate that primigravidae opting for ECD at the end of the first trimester, that is, 25 to 27 weeks before their due date, might have low confidence in their ability to cope with the difficulties of childbirth.

To the best of our knowledge, this is the first study showing an association between ECD and higher perceived stress scores. Generally speaking, higher stress scores reflect a subjective appraisal of being less able or unable to cope with a situation; in other words, higher stress scores generally reflect the belief that the situations an individual faces exceed their skills and competencies. The reasons for the higher stress scores in primigravidae opting for an ECD in the present dataset remain unclear. One might plausibly speculate that these higher stress scores were related to lower self-esteem in a sort of reciprocal influence. Given our current lack of understanding of the mechanisms underlying the association between stress and ECD, future studies should more closely examine this issue.

Regarding the HBM scores, the overall pattern showed that dysfunctional beliefs about VD tended to result in a decision for ECD, as shown in Tables 1 and 2. In our view, the overall pattern of HBM scores reflects higher stress, lower self-esteem, more dysfunctional beliefs about childbirth[22,23] and fear of pregnancy and birth-related issues, as has been reported extensively in prior studies.[13,15,17,21] Our conclusion is that psychological issues rather than convenience/scheduling issues[51] or legal/medical indications[15] were the main factors for ECD. Accordingly, we propose that pre-birth information and counselling could help primigravidae weigh the risks and benefits of both ECD and VD.

Despite the novelty of the findings, several limitations warn against overgeneralization of the results. First, although the centers and the participants were randomly selected to limit possible sampling biases, the data were gathered in a single city, which could limit the generalizability of the findings. Second, the pattern of results could reflect the influence of further latent, but unassessed, variables that might have biased two or more dimensions in the same or opposite directions. This could be especially important with respect to physical activity, since Poyatos-Leon et al.[52] observed that regular physical activity during pregnancy reduced the odds of CD. Third, while we assessed the choice of delivery and psychological status at the end of the first trimester, we do not know whether or to what extent psychological status or choice of delivery method changed over time. In this respect, it would have been interesting to know whether further counselling, for example, during the second and third trimesters could have influenced the choice by impacting fear, stress, and self-esteem.

In conclusion, the pattern of results suggests that psychological factors related to low self-esteem, higher stress levels, tokophobia issues and dysfunctional beliefs about ECD and VD were associated with choosing ECD, while social support and marital relationship quality were not associated with a delivery method. Taking into account the sociodemographic and fear-related characteristics of primigravidae opting for ECD,[13,25] we suggest that the psychosocial context of pregnant women should be taken into consideration in programs for reducing ECDs.[32,33] As our findings show, primigravidae did not opt for ECD out of convenience or scheduling, as has been suggested in the US media,[51] but in response to more fundamental psychological needs.

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Disclosure

The authors report no conflicts of interest.

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