Predictors of Fear of Childbirth and Normal Delivery Among Iranian Postpartum Women: A Cross-Sectional Study

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Abstract

Background: Fear of childbirth (FOC) may contribute to postpartum depression, impaired maternal-infant relation, and preference for cesarean in future pregnancies. The mode of delivery may have a role in postpartum FOC. We aimed to investigate predictors of FOC and normal vaginal delivery (NVD) among postpartum women who had planned for NVD.

Methods: This cross-sectional study was conducted in 2019 on postpartum women during the first 24 hours after the delivery. A sample of 662 women, selected using convenient sampling method, filled out the questionnaire composed of socio-demographic and obstetric questions and the Wijma Delivery-Expectancy Questionnaire (W-DEQ). We used univariate and multivariate logistic regression analyses to determine predictors of FOC and NVD.

Results: The percentage of women with mild (scores ≤ 37), moderate (38-65), high (66-84), severe (scores 85-99) and intense (scores ≥ 100) FOC were 7.9%, 19.5%, 40.9%, 21.1%, and 10.6% respectively. Predictors of severe FOC were a low level of satisfaction with husband's support and a low level of satisfaction with pregnancy. Predictors of intense FOC were age < 30, primiparity, low maternal satisfaction with pregnancy, and a low level of perceived marital satisfaction. Overall, 21.8% of women gave birth by cesarean. Predictors of NVD were birth weight < 4kg, spontaneous labor pain, mother's age < 30, term pregnancy, having a doula, multiparity, satisfaction with husband's support, and satisfaction with pregnancy. FOC was not a predictor of NVD.

Conclusions: The rate of severe and intense FOC among this group of postpartum women is high. Our findings highlight modifiable factors for reducing FOC and increasing NVD. In designing programs to increase the rate of NVD, the following factors should be considered: limiting induced labor, encouraging women to recruit a doula to help them at labor, facilitate husband's attendance throughout antenatal/intrapartum and postnatal care to support his wife, consultation with couples to increase husband's support, and other steps to make pregnancy pleasant and memorable. According to our findings, factors that can contribute to the reduction of the rate of FOC were consultation with couples to increase husband support and marital satisfaction and also finding ways to make pregnancy a pleasant experience.

Background

Most pregnant women regard childbirth as an important and challenging event which may be accompanied by fears and worries. Fear of childbirth (FOC) is common among pregnant women in Western countries with a prevalence rate of eight to 27% [1]. The prevalence of severe FOC in Iran was reported at 19.6% [2]. Several adverse consequences were reported in women with a high level of FOC including postpartum depression, impaired maternal-infant relation [3], preference for cesarean delivery [4, 5], dystocia, and emergency caesarean delivery [6].

Several studies have found that a number of factors might increase FOC including advanced maternal age, high socio-economic status [7], insufficient antenatal education [8], obstetric complications, increased analgesic use in labor [9], postdate pregnancy [10], low self-esteem [11], and low level of acceptance of pregnancy and identification with the motherhood role [5]. Earlier studies have shown that nulliparous women experience higher levels of fear than multiparous women before birth. However, recent studies indicate that there is no difference in levels of postpartum fear between these two groups [2, 6]. Lack of social support is also associated with FOC [12]. Pregnant women may receive support from family, spouse, and health care providers. Having a doula during pregnancy, birth, and postpartum may have a positive impact on maternal emotional well-being. It has been observed to reduce anxiety and stress and increase self-esteem and self-efficacy [13] and also reduce the cesarean rate [14].

Iran is among the countries which have a high rate of cesarean delivery. Between 1976 and 2010, the overall incidence of caesarean increased from 19.5–48% in Iran, which led to the adoption of policies in 2014 to decrease the rate of caesarean delivery [15]. These new policies involved a number of financial, infrastructural, and educational interventions including providing free hospital birth services and financial incentives for normal delivery providers, improving the infrastructures of maternity facilities, and free childbirth preparatory classes. Pregnant women were also allowed to have their own midwife or a lay companion as a doula to accompany them during labor and delivery [15, 16]. This was well received by pregnant women who planned to have a normal vaginal delivery (NVD) [17]. These findings from earlier studies suggest that it would be informative to investigate FOC among women who had planned for NVD and who delivered via cesarean or NVD after going into labor. Several questions are worth considering with regard to these women such as 1. Does FOC differ between primiparous and multiparas? 2. Does FOC differ between women who had a doula at birth and those who had not? 3. Is there a relationship between FOC and mode of delivery? 4. What are predictors of FOC and NVD in this group of women?

In designing policies to reduce FOC and cesarean rate, it is important to identify predictors of FOC and NVD among postpartum women. Most of the previous studies about FOC have focused on evaluating antenatal FOC by investigate women’s expectations towards childbirth. In contrast, we aimed to investigate FOC in early postpartum to explore women’s actual experience of childbirth among those who had planned for NVD.

Methods

This study was conducted using data previously collected for a descriptive cross-sectional study on the validity of the Persian Birth Satisfaction Scale-Revised (the Persian BSS-R) [18]. The Ethics Committee of Sabzevar University of Medical Sciences has approved this study (Number: IR.MEDSAB.REC.1399.119). All methods were performed in accordance with guidelines of the Sabzevar University which is in accordance with the Declaration of Helsinki. study population was postpartum women. Mothers hospitalized in the postpartum wards of Mobini Hospital, affiliated with Sabzevar University of Medical Sciences, Sabzevar, Iran were recruited during the first 24 hours after delivery using a convenient

sampling method. Recruitment for this study began in July and ended in September 2019. Before the COVID-19 pandemic, there were on average 6,000 births in this hospital annually.

The inclusion criteria for the validity study of the questionnaire were having a pregnancy with a healthy single baby, ability to read and write, being physically able to fill out the questionnaires and giving consent to participate in the study. Exclusion criteria included mental illness requiring medication and having postpartum complications that may compromise the accuracy of the questionnaire. For the present analysis, we excluded women who planned elective cesarean as well as those with vaginal birth after cesarean (VBAC) and instrumental delivery.

We instructed two graduate midwives on data collection. After obtaining verbal consent from participants in the study, the midwives distributed the written consent forms and the questionnaires among postpartum women and instructed them on how to fill out the socio-demographic and obstetric questionnaire and the Wijma Delivery-Expectancy Questionnaire (W-DEQ) version B. We instructed the women to rate their level of satisfaction with pregnancy, husband's support, and marital relationship on a five-point Likert scale ranging from zero (not satisfied) to five (very satisfied). The questionnaires were anonymous and the midwives instructed the participants to put the completed forms in an envelope which was then delivered to the midwives.

Instruments

Interview form

The women were interviewed at the postpartum and an interview form was completed. It consisted of three sections containing questions on socio-demographic characteristics (such as age, level of education, employment status, monthly family income), obstetrical information (such as parity, mode of delivery, labor pain, pain relief method during labor, having a doula at birth), and psychosocial factors (i.e., the level of satisfaction with pregnancy, husband's support, and marital relationship).

Wijma Delivery Experience Questionnaire (W-DEQ) version B

The Wijma Delivery Experience Questionnaires (W-DEQ) was developed to investigate postpartum FOC [19]. The W-DEQ is unidimentional and contains 33 items that are rated on a six-point Likert scale ranging from zero (strongly disagree) to five (strongly agree). The minimum and maximum total scores of the scale are 0 and 165, respectively, with higher scores indicating higher fear. In addition, Wijma's study proposed two cut-off points of 85 and 100 for screening women with clinical and severe childbirth fear, respectively. In their next study, Wijma et al. proposed scores ≤ 37 as mild fear, 38–65 as moderate fear, 66–84 as high fear, and ≥ 85 as severe fear [20]. The reliability of the scale was excellent (Cronbach's alpha = 0.93). The validity of the W-DEQ was confirmed by the moderate correlations between the scale and several psychological scales [19]. The W-DEQ was translated into Persian. The Persian W-DEQ which consists of six factors showed moderate correlation with the Childbirth Attitude Questionnaire (CHQ) and

the State-Trait Anxiety Inventory (STAI). The Cronbach's alpha coefficients of the scale and its factors were in the acceptable range (between 0.633 and 0.919) [21].

Data analysis

SPSS version 18 was used to analyze the data. Descriptive statistics were used to define the sample characteristics. The women were classified into two groups according to parity and the mean scores of W-DEQ for the two groups were compared using t-test. We used the chi-square test of independence to investigate the relationships between categorical variables. Multivariate logistic regression analyses by backward-LR method was used to determine independent variables predicting the mode of delivery and FOC. All variables with a p-value < 0.25 in univariate logistic regression analyses were entered into the multivariate logistic regression analyses.

Results

Of the 784 participants who were recruited for the validity study, we removed cases who had chosen elective cesarean (101), VBAC, and NVD with vacuum extraction (21); so, the sample size for the present study is 662. The mean W-DEQ score was 74.7 ± 23.1. Fear scores ranged from 0 to 157 (out of 165). The percentage of women with mild (score ≤ 37), moderate (38–65), high (66–84), severe (score ≥ 85) and intense (score ≥ 100) FOC were 7.9%, 19.5%, 40.9%, 31.7%, and 10.6% respectively. The mode of delivery for 21.8% of women was emergency cesarean; the corresponding percentages among primiparous and multiparous were 24% and 20.1%, respectively. The percentage of primiparous and multiparous who had a doula at birth were 31.1% and 25.6%, respectively. Participants' demographic and obstetric characteristics is presented in Table1. The mean duration of admission to delivery was 8.1 ± 14.6 hours. The mean duration of admission to delivery was different in women who gave birth by cesarean (12.13 ± 29.20) and those who gave birth by NVD (6.91 ± 5.45) ($p < 0.001$).

The means of the W-DEQ total scores and the mean scores of all its six factors for primiparous and multiparous women are presented in Table 2. The means of the loneliness, fear, and loss of control factors and the mean of the W-DEQ total score are higher in primiparous than multiparas ($p < 0.05$). There was no significant relationship between parity and levels of FOC. There was a significant relationship between severe FOC (W-DEQ > 85) and having a doula at childbirth ($p = 0.047$). We found no significant relationship between severe FOC (W-DEQ > 85) and mode of delivery ($p = 0.092$); however, we found significant difference in W-DEQ mean scores between women in NVD group (72.9 ± 24.1) and the cesarean group (80.9 ± 18.0) ($p < 0.001$). The mean duration of admission to delivery was not different in women with Wijma scores < 85 and those with scores ≥ 85 ($p = 0.337$) (Table 3).

Table 1
Participants' demographic and obstetric characteristics (N = 662).

Demographic/obstetric Variables	Mean ± SD
Age (years) Mean ± SD	28.1 ± 6.2
Educational level (years) Mean ± SD	11.0 ± 3.6
Gestational age at birth (week) Mean ± SD	39.32 ± 1.15
Birth weight (gr) Mean ± SD	3163.7 ± 487.4
	N (%)
Job	
Housewife	603 (91.9)
Employed	59 (8.9)
Household income	
Low income	239 (36.1)
Middle or high income	423 (63.9)
Parity	
Primipara	283 (42.7)
Multipara	379 (57.3)
Mode of delivery	
Cesarean	144 (21.8)
Vaginal delivery	518 (78.2)

Table 2
Fear of childbirth according to parity (N = 662).

	All	Primiparous (N = 283)	Multiparas (N = 379)	t	P
Factors of the W-DEQ	Mean ± SD	Mean ± SD	Mean ± SD		
Lack of self-efficacy	23.7 ± 11.7	24.2 ± 12.6	23.3 ± 10.9	0.908	0.374
Lack of positive anticipation	5.4 ± 4.1	5.7 ± 4.1	5.2 ± 4.0	1.432	0.153
Concerns for fetus health	3.1 ± 3.5	3.2 ± 3.4	3.1 ± 3.5	0.356	0.722
Loss of control	5.3 ± 3.2	5.6 ± 3.2	5.1 ± 3.1	2.129	0.034*
Loneliness	18.9 ± 9.4	19.9 ± 9.0	18.2 ± 9.6	2.336	0.020*
Fear	15.4 ± 5.2	16.1 ± 5.1	14.9 ± 5.2	2.973	0.003**
Total score	74.7 ± 23.1	77.5 ± 24.3	72.5 ± 21.9	2.766	0.006**
	N (%)	N (%)	N (%)		
Fear of childbirth				4.96	0.174
Mild	52 (7.9)	23 (8.1)	29 (7.7)		
Moderate	129 (19.5)	45 (15.9)	84 (22.2)		
High	271 (40.9)	116 (41.0)	155 (40.9)		
Severe	140 (21.1)	56 (19.8)	84 (22.2)		
Intense	70 (10.6)	43 (15.2)	27 (7.1)		
*p < 0.05, **p < 0.01					

Correlates of severe FOC include low household income, not having a doula at birth, low level of satisfaction with pregnancy, low level of marital satisfaction, and low level of satisfaction with husband's support. Correlates of intense FOC include age, primiparity, low level of satisfaction with pregnancy, low level of perceived husband's support, and low perceived quality of marital relationship (Table 3).

Table 3
Distribution of severe (Wijma score ≥ 85) and intense (Wijma score ≥ 100) fear of childbirth according to participants' demographic and obstetric characteristics.

	Severe fear of childbirth		**Intense fear of childbirth**	
Variables	score < 85	score ≥ 85	score < 100	score ≥ 100
Age (years)				
< 20	31(6.9)	17(8.1)	40 (6.8)	8 (11.4)
20–30	222(49.1)	115(54.8)	293 (49.5)	44 (62.9)
> 30	199(44.0)	78(37.1)	259 (43.8)	18 (25.7)
χ^2	2.82		8.95	
p	0.244[a]		0.011[a]	
Educational level (years)				
< 12	341(75.4)	171(81.4)	457 (77.2)	55 (78.6)
> 12	111(24.6)	39(18.6)	135 (22.8)	15 (21.4)
χ^2	2.93		0.07	
p	0.087[a]		0.795	
Household income				
Low income	147(32.5)	92 (43.8)	208 (35.1)	31 (44.3)
Middle or high income	305(67.5)	118(56.2)	384 (64.9)	39 (55.7)
χ^2	7.92		2.27	
p	0.005[a]		0.132[a]	
Gestational age (week) (Mean ± SD)				
< 38	64(14.2)	26(12.4)	83 (14.0)	7 (10.0)
38–40	322(71.2)	159(75.7)	427 (72.1)	54 (77.1)
> 40	66(14.6)	25(11.9)	82 (13.9)	9 (12.9)
χ^2	1.49		1.00	
p	0.475		0.605	
Parity				
Primipara	184(49.7)	99(47.1)	240 (40.5)	43 (61.4)

	Severe fear of childbirth		Intense fear of childbirth	
Multipara	268(59.3)	111(52.9)	352 (59.5)	27 (38.6)
χ^2	2.26		11.16	
p	0.119[a]		0.001[a]	
Delivery mode				
Cesarean	90(19.9)	54(25.7)	127 (21.5)	17 (24.3)
NVD	362(80.1)	156(74.3)	465 (78.5)	53 (75.5)
χ^2	2.84		0.29	
p	0.092[a]		0.587	
Having a doula				
No	315(69.7)	162(77.1)	423 (71.5)	54 (77.1)
Yes	139(30.3)	65(22.9)	169 (28.5)	16 (22.9)
χ^2	3.96		1.00	
p	0.047[a]		0.316	
Labor pain				
Spontaneous	313(69.2)	145(69.0)	410 (69.3)	48 (68.6)
Induced	139 (30.8)	65 (31.0)	182 (30.7)	22 (31.4)
χ^2	0.003		0.014	
p	0.959		0.907	
Pain relief method[£]				
Entonox	226(50)	93(44.3)	281 (48.1)	38 (54.3)
Spinal anesthesia	85 (19.7)	50 (25.7)	120 (20.5)	15 (21.4)
Hot water showers or massage	18 (4.0)	6 (2.9)	21 (3.6)	3 (4.3)
Nothing	119 (26.3)	57 (27.1)	162 (27.7)	14 (20.0)
χ^2	3.26		1.98	
p	0.352		0.576	
Satisfaction with pregnancy				

	Severe fear of childbirth		Intense fear of childbirth	
Not satisfied	13(2.9)	24(11.4)	21 (3.5)	16 (22.9)
Low satisfied	33(7.3)	33(15.7)	53 (9.0)	13 (18.6)
Moderately satisfied	166(36.7)	76(36.2)	218 (36.8)	24 (34.3)
Satisfied	186(41.2)	71(33.8)	241 (40.7)	16 (22.9)
Very satisfied	54(11.9)	6(2.9)	59 (10.0)	1 (1.4)
χ^2	44.02		56.78†	
p	< 0.001[a]		< 0.001†[a]	
Perceived marital satisfaction				
Not satisfied to moderately satisfied	39(8.6)	29(13.8)	54 (9.1)	14 (20.0)
Satisfied	218(48.2)	125(59.5)	309 (52.2)	34 (48.6)
Very satisfied	195(43.1)	56(26.7)	229 (38.7)	22 (31.4)
χ^2	17.54		8.24	
p	< 0.001[a]		0.016[a]	
Satisfaction with husband support				
Not satisfied to low satisfied	10(2.2)	11(5.2)	17 (2.9)	4 (5.7)
Moderately satisfied	71(15.7)	51(24.3)	104 (17.6)	18 (25.7)
Satisfied	212(46.9)	89(42.4)	275 (46.5)	26 (37.1)
Very satisfied	159(35.2)	59(28.1)	196 (33.1)	22 (31.4)
χ^2	12.69		4.75‡	
p	0.005[a]		0.093‡[a]	

[†] chi-square test was conducted for an eight-cell table, [‡] chi-square test was conducted for a six-cell table., [a] univariate logistic regression: $p < 0.25$

We conducted two multivariate logistic regression analyses on Wijma scores to determine socio-demographic/obstetric and psychological predictors of severe (score ≥ 85) and intense FOC (score ≥ 100). In the first regression, primiparity, low level of satisfaction with husband's support, and low level of satisfaction with pregnancy predicted severe FOC. Compared with the category of women who were very satisfied with pregnancy, other categories of women with lower levels of satisfaction had a higher chance of severe FOC. In the second regression, age < 30, primiparity, low level of satisfaction with pregnancy,

and low level of perceived marital satisfaction predicted intense FOC. Women who were not satisfied or moderately satisfied with their marital relationship were more likely to have intense FOC compared to those who were satisfied. Women who were not satisfied or moderately satisfied with pregnancy had a higher chance of experiencing intense FOC compared to those who were satisfied with pregnancy (Table 4).

Table 4
Logistic regression analyses of associations between independent significant socio-demographic and psychological variables and fear of childbirth.

W-DEQ (B) **Less fear (< 85) vs. Severe fear (≥ 85)**								
Variables							95% CI† for OR	
	B	S.E.	Wald	df	P	OR	Lower	Upper
Parity								
Multiparity						1		
Primiparity	.330	.179	3.392	1	.066	1.391	.979	1.976
Satisfaction with pregnancy								
Very satisfied						1		
Not satisfied	2.673	.556	23.074	1	< .001	14.483	4.866	43.105
Low satisfied	2.110	.504	17.530	1	< .001	8.246	3.071	22.140
Moderately satisfied	1.269	.462	7.543	1	.006	3.556	1.438	8.795
Satisfied	1.161	.459	6.402	1	.011	3.192	1.299	7.845
Satisfaction with husband support								
Very satisfied						1		
Not satisfied to low satisfied	1.194	.487	6.019	1	.014	3.300	1.271	8.567
Moderately satisfied	.521	.254	4.226	1	.040	1.684	1.025	2.768
Satisfied	.090	.210	.185	1	.667	1.094	.726	1.651
Variables entered on step 1: age, education, income, parity, mode of delivery, having a doula, maternal satisfaction with pregnancy,perceived marital satisfaction, and satisfaction with husband support. method: backward LR, Cox & Snell R Square = 0.081, Nagelkerke R Square = 0.11								
W-DEQ (B) Less fear (< 100) vs. Intense fear (≥ 100)								
Variables							95% CI† for OR	
	B	S.E.	Wald	df	P	OR	Lower	Upper
Parity								
Primiparity	.658	.315	4.374	1	.036	1.931	1.042	3.578

W-DEQ (B) Less fear (< 85) vs. Severe fear (≥ 85)								
Multiparity						1		
Age								
< 20	.952	.538	3.137	1	.077	2.591	.903	7.429
20–30	.696	.336	4.287	1	.038	2.005	1.038	3.873
> 30						1		
Perceived marital satisfaction								
Satisfied/very satisfied						1		
Not satisfied to moderately satisfied	.889	.370	5.777	1	.016	2.432	1.178	5.020
Satisfaction with pregnancy								
Satisfied / very satisfied						1		
Not satisfied	2.498	.435	32.955	1	< .001	12.154	5.181	28.515
Low satisfied	1.618	.411	15.477	1	< .001	5.044	2.252	11.297
moderately satisfied	.627	.339	3.417	1	.065	1.873	.963	3.643

Variables entered on step 1: age, income, parity, maternal satisfaction with pregnancy, perceived marital satisfaction, and satisfaction with husband support. method: backward LR, Cox & Snell R Square = 0.089, Nagelkerke R Square = 0.181

To investigate whether the relationship between having a doula and FOC is influenced by mode of delivery, we conducted two chi-square test, one in the NVD group and the other in the cesarean group. In the NVD group, women who had a doula for childbirth experienced a lower level of fear than those who did not have a doula ($p < 0.001$). In the cesarean group, we found no significant difference between the mean scores of W-DEQ in women who had a doula at birth and those who had not ($p = 0.117$) (Table 5).

Table 5
Distribution of Wijma scores according to the mode of delivery and having a Doula at birth.

	Cesarean		**Vaginal birth**	
Having a doula at birth	N	Mean ± SD	N	Mean ± SD
No	129	80.2 ± 18.1	348	75.6 ± 23.2
Yes	15	86.9 ± 16.4	170	67.4 ± 25.0
t	1.36		3.69	
P	0.117		< 0.001	

Our results indicate that in the case of women who planned for NVD, seven factors influenced the final mode of delivery. Cesarean was more prevalent among women with the following characteristics: age > 30, having induced labor, not having a doula at birth, gestational age < 38 week, and birth weight > 4 kg or < 2.5 kg. Women who were satisfied with their husband's support and those who were satisfied with pregnancy were more likely to give birth by NVD (Table 6). We entered 10 variables with p-value < 0.25 into a multivariate logistic regression analysis. Eight factors remained in the model (Table 7).

Table 6
Distribution of mode of delivery (cesarean and normal vaginal delivery) according to participants' demographic and obstetric characteristics (N = 662).

Variables	NVD (N = 478)	Emergency Cesarean (N = 144)	χ^2	p
Age (years)	27.78 ± 6.04	29.22 ± 6.53	9.93	0.007**[a]
< 20	37(7.1)	11(7.6)		
20–30	280(54.1)	57(39.6)		
> 30	201(38.8)	76(52.8)		
Educational level (years)	11.08 ± 3.46	10.81 ± 3.89		
< 12	109(75.7)	403(77.8)	0.285	0.594
> 12	35(24.3)	115(22.2)		
Job			0.003	0.956
Housewife	472 (91.1)	131 (91.0)		
Employed	46(8.9)	13(9.0)		
Household income			1.89	0.169 [a]
Low income	180(34.7)	59 (41.0)		
Middle or high income	338(65.3)	85(59.3)		
Gestational age (week) (Mean ± SD)	39.23 ± 1.20	38.64 ± 1.37		
< 38	51(9.8)	39(27.1)	28.73	< 0.001***[a]
38–40	391(75.5)	90(62,5)		
> 40	76(14.7)	15(10.4)		
Birth weight (gr)	3182.33 ± 469.32	3096.81 ± 543.91		
< 2500 gr	42(8.1)	18(12.5)	7.29	0.026*
2500–3999	462(89.2)	117(81.3)		
> 4000	14(2.7)	9(6.3)		
Having a doula			28.10	< 0.001***[a]

Variables	NVD (N = 478)	Emergency Cesarean (N = 144)	χ^2	p
No	348 (67.2)	129 (89.6)		
Yes	170 (32.8)	15 (10.4)		
Parity				
Primipara	215(41.5)	68(47.2)	1.50	0.220 [a]
Multipara	303(58.5)	76(52.8)		
Infant gender			0.66	0.417
Female	268(51.7)	80(55.6)		
Male	250(48.3)	64(44.4)		
Labor pain			11.51	0.001** [a]
Spontaneous	375(72.4)	83(57.6)		
Induced	143(27.6)	61(43.4)		
Fear of childbirth			2.84	0.092 [a]
Wijma score < 85	362 (69.9)	90 (62.5)		
Wijma score ≥ 85	156 (30.1)	54 (37.5)		
Satisfaction with husband support			8.71	0.013‡* [a]
Not satisfied to low satisfied	17 (3.3)	4 (2.8)		
Moderately satisfied	82 (15.8)	40 (27.8)		
Satisfied	243 (46.9)	58 (40.3)		
Very satisfied	176 (34.0)	42 (29.2)		
Perceived marital satisfaction			2.62	0.271
Not satisfied to moderately satisfied	56 (10.8)	12 (8.3)		
Satisfied	260 (50.2)	83 (57.6)		
Very satisfied	202 (39.0)	49 (34.0)		
Satisfaction with pregnancy			21.70	< 0.001*** [a]
Not satisfied	22 (4.2)	15 (10.4)		

Variables	NVD (N = 478)	Emergency Cesarean (N = 144)	χ^2	p
Low satisfied	45 (8.7)	21 (14.6)		
Moderately satisfied	190 (36.7)	52 (36.1)		
Satisfied	204 (39.4)	53 (36.8)		
Very satisfied	57 (11)	3 (2.1)		

*p < .05, ** p < .01, ***p < .001, ‡chi−square test was conducted for a six−cell table· [a] univariate logistic regression: p < 0.25

Table 7
Factors predicting normal vaginal delivery in women who planned for NVD (N = 662).

							95% C.I for OR	
	B	S.E.	Wald	df	P	OR	Lower	Upper
Age								
> 30						1		
< 20	.784	.445	3.105	1	.078	2.190	.916	5.238
20–30	.892	.249	12.866	1	< .001	2.439	1.498	3.970
Gestational age								
< 38						1		
38–40	1.110	.293	14.374	1	< .001	3.035	1.710	5.389
> 40	1.339	.412	10.538	1	.001	3.814	1.700	8.559
Birth weight								
> 4000						1		
< 2500	1.588	.597	7.081	1	.008	4.894	1.520	15.765
2500 = 3999	1.190	.488	5.946	1	.015	3.286	1.263	8.550
Having a doula								
No						1		
yes	1.447	.306	22.290	1	< .001	4.250	2.331	7.749
Parity								
Pimiparity						1		
Multiparity	.702	.254	7.667	1	.006	2.019	1.228	3.319
Labor pain								
Induced						1		
Spontaneous	.594	.221	7.196	1	.007	1.811	1.173	2.795
Satisfaction with husband support								
Not satisfied/ moderately satisfied						1		
Satisfied/very Satisfied	.616	.238	6.673	1	.010	1.851	1.160	2.953

							95% C.I for OR	
Satisfaction with pregnancy								
Not satisfied						1		
Low satisfied	.334	.459	.530	1	.466	1.397	.568	3.437
Moderately satisfied	.710	.404	3.090	1	.079	2.033	.922	4.486
Satisfied	.670	.400	2.806	1	.094	1.954	.892	4.280
Very satisfied	2.139	.707	9.142	1	.002	8.490	2.122	33.969

Variables entered on step 1: having a doula, income, parity, birth weight, gestational age, mother's age, labor pain, fear of childbirth (W−DEQ≥85 vs. W−DEQ <85), maternal satisfaction with pregnancy, satisfaction with husband support. method: backward, LR Cox & Snell R Square = 0.149, Nagelkerke R Square = 0.230

Discussion

We investigated the predictors of FOC and NVD. Our results show that overall, primiparous women had a higher level of FOC than multiparas but the percentages of women experiencing severe and intense FOC were not different between the two groups. In our previous study on pregnant women, levels of FOC were not different between nulliparous and multiparous women [2]. In Toohil's study in Australia, 31.5% of nulliparous and 18% of multiparous women reported high levels of fear [1]. Further investigation revealed that scores for the two factors of feeling lonely and being concerned about loss of control were higher among primiparous than multiparas but the two groups did not differ with regard to perceived lack of self-efficacy, lack of positive anticipation, and concerns for fetus health. The preceding points about the different domains of FOC should be taken into account in designing educational programs for reducing FOC in primiparous women.

For the whole sample, the prevalence of mild (scores ≤ 37), moderate (38–65), and high (66–84) FOC were 7.9%, 19.5%, and 40.9%, respectively. The prevalence of severe (scores ≥ 85) and intense FOC (scores ≥ 100) were 31.7% and 10.6%, respectively. The above percentages are higher compared to those obtained in our previous study on pregnant women. In that study, the prevalence of severe and intense antepartum FOC were 19.6% and 6.1%, respectively [2]. These results are not in agreement with the results of a study in Malawi which had found that the prevalence high FOC in pregnant women was twice the corresponding rate in postpartum women [22]. The prevalence of severe FOC in Indian women in the postpartum period was 13.1% [23].

The rates of prevalence of high and severe FOC in our study are generally higher than those reported in western countries [1]. In a study in Ireland, the prevalence of high and severe FOC were 36.7% and 5.3%, respectively [24]. In Storksen's study in Norway, eight percent of the women had severe FOC [25]. In Toohil's study in Australia, the prevalence of high FOC was 24% [1]. In another study in Australia, the

prevalence of low, moderate, and high antenatal FOC were 26%, 48%, and 26%, respectively [6]. These differences may be due to the fact that we conducted our study in a maternity hospital with a small delivery ward where deliveries are carried out by traditional method of childbirth. In such delivery wards, women undergoing labor share the same space with other parturient women though they may have a doula at labor. In western countries, maternity hospitals usually have labor delivery recovery (LDR) rooms where a parturient women stays is in a separate room with her family during her stay in the hospital. Another factor which might explain the difference between our results and those of other studies is that we measured FOC during the 24 hours after birth while other studies were conducted during pregnancy or with a period after giving birth.

Predictors of severe FOC were primiparity, low level of satisfaction with husband's support, and low level of satisfaction with pregnancy. In our study, predictors of intense FOC were mothers' age > 30, primiparity, low level of satisfaction with pregnancy, and low level of perceived marital satisfaction. Primiparity has been found to be associated with antenatal FOC in several studies [1, 6, 26, 27]; however, such an association was not observed in a study conducted on postpartum women [6].

Some studies investigated the association of different sources of support and FOC. Women's satisfaction with husband's support [28], family support [11], intrapartum support [26], informational support [24], and couple adjustment [27] have been found to be predictors of FOC in previous studies. In a study conducted in Istanbul, there were significant but weak correlations between FOC scores and the two factors of being pleased with pregnancy and accepting the motherhood role [5]. Bryanton and colleagues also showed that partner support was a strong predictor of women's childbirth perceptions [29].

Several other variables have been associated with different levels of FOC. Being illiterate and unemployed [22], antenatal anxiety and depression [25, 27, 28, 30], low financial status and lack of knowledge and understanding of the delivery process [11, 28, 30], previous birth mode [1], and having postnatal depressive symptoms [23] were associated with high to severe FOC. Although one study indicated that satisfaction with marital life was not associated with FOC [30], another study found that marital relationship could predict pregnancy anxiety [31] which is in turn strongly correlated with FOC according to several studies [25, 27, 28, 30].

Our results show that having a doula at birth could reduce FOC in women who gave birth by NVD. This result is in agreement with a previous study which found that doula support reduced anxiety and tension and had a positive impact on maternal emotional wellbeing [13]. In contrast, women who had a doula at birth but finally gave birth by cesarean, experienced the same level of fear as those who did not have a doula and gave birth by cesarean. This implies that having a doula at birth did not have a positive impact in reducing FOC among those who finally gave birth by cesarean. In recent years, childbirth preparatory classes have become increasingly popular among pregnant women. Participants in such free classes may opt to have a doula during labor. It seems that women who choose to have a doula to give birth by NVD but fail to deliver normally, experience frustration as a consequence. The results of a study revealed that a mismatch between a woman's preferred mode of delivery and actual mode increases the risk of

developing post-traumatic stress symptoms [32]. Such cases should be taken into account in designing educational programs for reducing FOC.

Overall, 78.2% of women in our study gave birth by NVD. According to our results, demographic and obstetric predictors of NVD were birth weight < 4kg, spontaneous labor pain, mother's age < 30, term pregnancy, having a doula, and multiparity. There were also two psychological predictors of NVD namely satisfaction with husband's support and satisfaction with pregnancy. Among the predictors of NVD, four variables can be manipulated; so, they should be considered in programs to increase the rate of NVD. According to a study on 284 Nigerian nulliparous women in which 74.8% of the parturient gave birth by vaginal delivery, normal birth weight was a factor associated with vaginal delivery [33]. In Prosser's study in which 28.7% of women had a normal delivery, predictors of NVD were multiparity, younger age, spontaneous labor, lower gestational age, knowing the midwives before labor and childbirth, and receiving continuity of care during labor and birth [34].

Our results indicate that the percentage of women experiencing severe fear is not different between NVD and cesarean groups. In contrast to this, the results of a previous study on pregnant women showed that the mean score of FOC was significantly higher in multiparas who preferred cesarean in comparison to those who preferred vaginal delivery [2]. Another study found that cesarean increased levels of postpartum fear [6]. In another study, the only statistically significant psychosocial predictor of emergency cesarean was FOC [35].

We used the W-DEQ version B to measure the severity of postpartum FOC. The W-DEQ also provides information on different domains of the fear. We did not use validated scales to measure perceived marital satisfaction, the level of husband's support, and mothers' satisfaction with pregnancy. Considering there are significant association between these latter factors and FOC, we recommend further research be conducted on postpartum FOC using valid scales to measure these variables. Also, interventional studies are needed to investigate the effects of consultation with couples about husband's support on FOC. Qualitative studies are also needed to investigate women's perspective on what makes pregnancy pleasant.

Conclusions

The rates of prevalence of high, severe, and intense FOC in our study are higher in comparison with those reported in western countries. Intense FOC is more prevalent among primiparous than multiparas. Inspection of factors likely to influence FOC showed that the mode of delivery did not have a significant effect on FOC. In contrast, psychological variables such as mother's satisfaction with pregnancy or her satisfaction with the husband's support and marital relationship could predict FOC. So, in designing programs for reducing FOC, researchers and policy makers in Iran should pay more attention to psychological factors. Also according to our results, two psychological variables could predict NVD namely satisfaction with husband's support and women's satisfaction with pregnancy. This means that these variables could be manipulated to reduce cesarean.

Our findings highlight factors which could be modified to increase normal delivery. Limiting induced labor, encouraging women to have a doula to help them at labor, facilitating husbands' attendance throughout antenatal/intrapartum and postnatal care to support their wives, consultation with couples to increase husband's support, and attempts to make pregnancy pleasant and memorable should be considered in programs to increase the rate of NVD.

List Of Abbreviations

FOC
fear of childbirth
NVD
normal vaginal delivery

Declarations

Ethics approval and consent to participate

The Ethics Committee of Sabzevar University of Medical Sciences has approved this study (Number: IR.MEDSAB.REC.1399.119). All methods were performed in accordance with guidelines of the Sabzevar University which is in accordance with the Declaration of Helsinki**.** Women who consented to participate in the study signed an informed consent form.

Consent for publication

Not applicable**.**

Availability of data and materials

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Competing interests

We declare that there is no conflict of interest in publishing this manuscript.

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Authors' contributions

All authors contributed to the study. MM collected the data and wrote the first draft of the manuscript. FM analyzed the data and wrote the final draft of the manuscript. The authors have read and approved the manuscript.

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