

**A comparison of fear of childbirth and labor pain intensity among primiparous and multiparous women: A cross-sectional study**

**Abstract**

**Background & Aims:** Fear of Childbirth (FOC) can be seen as an anxiety disorder or as a phobia that women experience in relation to pregnancy and childbirth. This study was conducted with the aim of comparing the FOC and the intensity of labor pain in multiparous and primiparous women.

**Methods:** This cross-sectional study was conducted on 432 pregnant women with gestation age of 38–42 weeks in from January 2018 to April 2019 in Babol, Iran.. Convenience sampling was used by adhering to the inclusion criteria. All pregnant women completed the Demographic and FOC questionnaire. Labor pain intensity was measured four times using visual analog scale (VAS).

**Results:** The mean of FOC was  $37.14 \pm 9.00$ . The FOC in primiparous women was significantly higher than multiparous mothers (MD: 12.08 < 0.001, P). The results of the multivariate linear regression analysis indicated that there was no statistically significant difference in primiparous and multiparous women concerning the intensity of pain during the active phase of labor (MD: 0.07; CI 95% -0.32, 0.47; P=0.71) and the expulsion of the fetus (MD: 0.02; CI 95% -0.38, 0.44; P=0.89). However, a statistically significant difference was found in placental discharge (MD: 0.52; CI 95% 0.01, 1.02; P=0.043).

**Conclusion:** FOC in primiparous women was significantly higher than that of multiparous women. No statistically significant difference was found between the two study groups in the intensity of pain during childbirth. The study's findings emphasize the need for policymakers to prioritize efforts in reducing childbirth fear, especially among primiparous women.

**Keywords:** Childbirth, Labor pain, Women , Pregnancy, Parity

## **Introduction**

Pregnancy and childbirth are important and emotionally powerful life events. For many pregnant women, pregnancy follows a complex emotional path that is accompanied by positive and negative emotions (1). Giving birth is a vital experience in the life of most women and is considered as a transition stage to motherhood at the physical, psychological and social levels (2). Although pregnant women experience pleasant and positive feelings during pregnancy, for some of them, negative feelings prevail, including fear related to childbirth (3).

In general, FOC can be seen as an anxiety disorder or as a phobia that women experience in relation to pregnancy and childbirth which manifests as physical complaints, nightmares, and difficulty concentrating on work and family activities (2). FOC affects about 20% of pregnant women (1). In a systematic review and meta-analysis, the combined and global prevalence of FOC in pregnant women was estimated at 14% (4).

Despite the relative safety of childbirth in high-income settings and societies, pregnant women may be afraid of not being able to prepare for and cope with unpredictable conditions. These include the pain they will experience during labor and delivery, possible medical procedures that may be needed (e.g., caesarean section), as well as concerns about the health and well-being of themselves and their baby (5). The prevalence of FOC varies across countries, even when measured by the same method. The reasons for this variance are unknown. However, different methods of measuring FOC as well as cultural differences are possible explanations for the various prevalence rates. Furthermore, researchers reported conflicting levels of FOC in primiparous and multiparous women (6).

The level of FOC is usually higher among primiparous women compared to multiparous women (7). Primiparous women who have not yet experienced childbirth are likely to feel lower self-efficacy and have more concerns about childbirth, which may be exacerbated by the uncertainty of the current situation due to Covid-19 and the restrictions placed on hospital visitors in general and maternity wards (8). In a systematic review, the results of studies regarding the association between FOC during pregnancy in multiparous and primiparous women were different. Of the 10 studies reviewed, four studies showed a reduction in fear for multiparous women, and six studies showed no significant difference between primiparous and multiparous women (6).

Sometimes fears related to childbirth (such as fear of pain, medical interventions, possible harm to the baby), which are common among primiparous and multiparous pregnant women, can be intense (6, 9). This can have consequences for the health of women, delivery, birth and the postpartum period (6). FOC is associated with a range of negative outcomes, including pregnancy avoidance, pregnancy termination, higher levels of perceived pain during labor, longer labor, postpartum depression and post-traumatic stress, increased parenting stress, and poor mother-infant bonding (5). In addition, FOC is often the reason for the pregnant woman's request for emergency and elective caesarean section. For example, a Finnish cohort study of more than 700,000 pregnant women found that caesarean section rate for women with FOC was 4.4 times higher than for women without FOC (10). Over the past decade, there has been an increase in the rate of elective caesarean section in third world and industrialized countries. The rate of caesarean section in Iran has been estimated to be around 15-55%, which is 3–4 times the rate recommended by the World Health Organization (WHO) (11).

Cesarean section preferences are often associated with factors such as anxiety and FOC. Previous caesarean section, previous negative experiences of childbirth, mother's age and socio-economic

factors are other determining factors. The impact of increase in parity on cesarean preference has also been researched; some studies have shown that multiparous women prefer cesarean section more than primiparous women (12, 13). However, Fuglenes et al. (2011) found that the probability of preferring or choosing caesarean section among primiparous women with high FOC is higher than multiparous women (14). There are ways to reduce the negative effects of FOC. Previous research has shown that psychotherapy and educational interventions, such as counseling provided by birth care providers and birth preparation/antenatal classes, can reduce pregnant women's FOC (15).

Perceived labor pain intensity may also be different in primiparous and multiparous women. Some researchers have shown that primiparous women feel more pain during labor than multiparous women (16, 17). The cause of this pain is probably the fear and anxiety caused by the mother's cognitive distortions. On the other hand, Deng et al. (2021) found that labor pain was higher in multiparous women than in primiparous women (18). The perception of greater pain intensity in multiparous women is probably due to the previous experience of childbirth pain and the fear of experiencing this pain again (10). Especially in women who have given birth less than five years ago (10).

As there are contradictory studies in the field of FOC and intensity of childbirth pain in multiparous and primiparous women, more studies are needed to better understand these concepts to enable designing strategies that reduce FOC and intensity of childbirth pain. Therefore, the present study was conducted with the aim of comparing the FOC and the intensity of labor pain in multiparous and primiparous women.

## **Methods**

This cross-sectional study was conducted on pregnant women admitted to the maternity hospital of Shahid Yahiinejad Hospital in Babol, Iran during the years 2018-2019. Yahiinejad Hospital is one of the hospitals covered by Babol University of Medical Sciences, Iran, where low-risk pregnant women are admitted for delivery. The study was approved by the Research Ethical Committee of Babol University of Medical Sciences (MUBABOL.HRI.REC.1396.178). Written informed consent was taken from all the participants. All methods were carried out in accordance with relevant guidelines and regulations.

Inclusion criteria were pregnant women with gestation age of 38–42 weeks hospitalized in the maternity ward, without pregnancy complications (i.e., gestational diabetes, high blood pressure, preeclampsia) and women who did not have a known mental illness. Mothers with less than 38 and more than 42 weeks of pregnancy and those with known pregnancy problems and mental illness were not included in the study because these problems might have an effect on their fear of childbirth. The exclusion criterion was pregnant women' unwillingness to take part in the study and emergency cesarean section.

Convenience sampling was used by adhering to the inclusion criteria and obtaining informed consent. The required sample size, estimated at 394, was determined based on a previous study comparing labor pain intensity between primiparous and multiparous women. This estimation was conducted using G Power software and the assumption of bilaterality, with an effect size (mean difference) of 0.2,  $\alpha$  of 0.05, and  $\beta$  of 0.20. (18). Taking into account a dropout rate of 20%, the final estimated sample size was 430. . Hence, all pregnant women who were admitted to the maternity hospital to give birth, if they agreed to participate in the study, were asked for demographic information including age, occupation, education, place of residence, affordability of living expenses and obstetric information such as number of births, number of abortions,

number of children, pregnancy, and training classes to prepare for childbirth. Furthermore, all pregnant women completed the FOC questionnaire developed by Pirdil et al (2015)(19). This questionnaire contains 15 questions with a 5-point Likert scale. The scoring of the questionnaire works as follow: a score less than 35: severe fear, between 35 and 55: moderate fear and above 55 indicates low fear. The content validity method was employed to assess the validity of this questionnaire.. Accordingly, Pirdil et al (2015) developed the questionnaire by studying valid scientific books and distributed the questionnaire to 15 academic members of the Faculty of Nursing and Midwifery of Tabriz University of Medical Sciences, and after collecting their opinions and feedback, the necessary amendments were made. To assess the reliability of the questionnaire, the re-testing method was employed with a group of 20 individuals exhibiting characteristics similar to the research subjects, conducted at a 15-day interval. The reliability coefficient for the FOC questionnaire was 0.76.

Labor pain intensity was measured four times including three stages of labor process and once in postpartum stage. In the active phase of labor (dilation 5-8 cm), and during the phase of the fetus and placenta expulsion, the women were asked how much pain they feel according to a visual pain scale. In addition, one day after giving birth, the women were asked how much pain they were in the active phase of labor. Pain intensity was measured with a visual analog scale (VAS). In this scale, a score of zero indicates minimal pain, and a score of ten indicates the most severe pain (20). The questionnaire completion method employed in this research was self-reporting.

In Yahiinejad hospital, if needed and conditions are present, epidural analgesia is performed for pregnant women in labor. These conditions include availability of an anesthesiologist, woman's request, and cervical dilatation of 5 cm or more. In this study, we also investigated the amount of epidural analgesia consumed. Moreover, further information during childbirth such as the use of

pain reduction methods in childbirth including accompanying midwife, use of balls and heat therapy, and use of oxytocin were also investigated

Data were analyzed using SPSS version 16 software and descriptive and analytical indices. Paired t-test was used to compare the feeling of pain intensity during the active phase of labor, fetus and placenta expulsion phases and after labor. The t-test was used to compare pain intensity and FOC between primiparous and multiparous women (In case of normal distribution). The normality of the variables was determined by the Kolmogorov–Smirnov test. A multivariate linear test was used to adjust the effect of demographic and obstetrics intervening variables between the two study groups. To assess the crude effect of demographic variables (age, education level, place of residence, income level, employment status) and obstetric intervening factors (wanted pregnancy, education classes, pain relief methods, use of oxytocin, infertility) on both pain intensity and fear of childbirth, univariate regression models were initially employed to analyze each variable separately. Subsequently, all these variables were collectively entered into a multivariate regression model for adjustment. The models were adjusted for both demographic and obstetric intervening variables. The results are presented as adjusted mean differences (aMD) along with 95% CIs. A significance level of less than 0.05 was considered.

## **Results**

Out of 436 pregnant women who entered the study, four were excluded due to non-cooperation (the participation rate was estimated at 99%). Therefore, statistical analysis was performed on 432 participants; 260 of whom were multiparous and 170 were primiparous.

Demographic and obstetric results

The average age of women were  $27.56 \pm 5.20$  years. The majority of women (64%) had diploma and bachlers education, and there was no statistically significant difference in terms of age ( $P=0.18$ ) and education ( $P=0.389$ ) in primiparous and multiparous women. 58.6% of the pregnant women in the study were housewives and more than half of them lived in the city (52.3%). No statistically significant difference was found between the two groups in terms of place of residence ( $p=0.81$ ) and occupation ( $p=0.32$ ). But there was a statistically significant difference between the two groups in terms of income level ( $P=<0.001$ ). With regard to obstetrics characteristics, almost one third of pregnant women participated in educational and training classes during pregnancy. 10.3% of women had unwanted pregnancies (Table 1).

The mean and standard deviation of the FOC of the participating women was  $37.14 \pm 9.00$  and a statistically significant difference was found between primiparous women ( $31.28 \pm 5.49$ ) and multiparous women ( $43.37 \pm 6.46$ ) ( $P<0.001$ ). This indicates that primiparous women experienced significantly more fear than multiparous women (Table 2). After adjusting for demographic and obstetric variables, the FOC in primiparous women was significantly higher than multiparous women (MD:  $12.08 < 0.001$ , P). (Table 3). Based on the classification of FOC, the results of the study showed that a total of 76.9% of the women in the study experienced severe fear and none of them had low fear.

The results of this study showed that the intensity of labor pain in the active phase of labor, the expulsion of the fetus and the expulsion of the placenta were  $1.66 \pm 8.40$ ,  $2.12 \pm 8.04$ ,  $2.61 \pm 3.58$ , respectively. There was no statistically significant difference between the two study groups in the active phase of labor ( $P=0.59$ ) and fetal expulsion ( $P=0.64$ ). However, there was a significant statistical difference between the two groups during the placental expulsion phase ( $P=0.04$ ). (Table 2). One day after giving birth, the women described their feeling of pain intensity during



the active phase of labor ( $7.53 \pm 2.25$ ); there was a significant difference between the feeling of pain intensity during the active phase of labor, fetus and placenta expulsion phases and after delivery ( $P < 0/001$ ). This difference in the perception of severity of labor pain was significant in both multiparous and primiparous women.

The results of the multivariate linear regression test showed that after adjusting the intervening and obstetrics variables, the intensity of pain in the active phase of labor (MD: 0.07; CI 95% -0.32, 0.47;  $P=0.71$ ) and the expulsion of the fetus phase (MD: 0.02; CI 95% -0.38, 0.44;  $P=0.89$ ) was not statistically significant different in primiparous and multiparous women. However, a statistically significant difference was found in placental expulsion phase (MD: 0.52; CI 95% 0.01, 1.02;  $P=0.043$ ).

## **Discussion**

This study was conducted with the aim of comparing the FOC and the severity of labor pain in primiparous and multiparous women. The results of the study showed that the women experienced a high FOC and the FOC in primiparous women was significantly higher than that of multiparous women after adjusting the intervening variables. No statistically significant difference was found between the two study groups in the intensity of pain during the active phase of labor and fetal expulsion after adjusting for intervening variables. In addition, the results of the study showed that the perception of pain by women one day after delivery was significantly lower than the active phase of delivery.

The results of the present study showed that the FOC was significantly higher in primiparous women than in multiparous women after adjusting for intervening variables. The results of studies by Deng and colleagues from China (18), O'Connell and colleagues from Ireland (21),

Fenwick from Australia (22), Rouhe from Finland (23), Hoshmandi and colleagues from Iran (24) are also in line with the present study. Multiparous mothers, having experienced childbirth before, may be better prepared for subsequent childbirths. Thus, multiparas may have a lower risk of FOC than primiparous mothers (18). However, in contrast with the present study, researchers such as Nasreen et al. (25) and Khwepeya (26), report that multiparous women experience higher FOC compared to primiparous women. The higher FOC in multiparous women is probably the result of a previous traumatic birth and indicates that these mothers suffer from PTSD (Post-traumatic stress disorder) in the postpartum period (27). FOC is one of the most important factors that shape women's negative experiences and perception of birth (19). Therefore, women at risk of high FOC should be identified and consulted in pregnancy care clinics.

In the present study, no difference was found between pain intensity in different stages of labor in primiparous and multiparous women. This result is consistent with the studies of Abushaikha et al. (28), Hoshmandi et al. (24) and Pirdil et al (19). Although multiparous mothers would be expected to have less pain compared to primiparous mothers, this was not the case in the current study. Some researchers such as Deng et al and Ranta et al. report that multiparous women experience higher labor pain compared to primiparous mothers, or the demand for analgesia was higher in multiparous women (18, 29). In relation to parity and labor pain, it is obvious that women' previous experiences of childbirth play an important role in perceiving and the severity of their pain in the next delivery. The results of a study on 420 pregnant Chinese women show that 50% of women experienced the same intensity of pain as their first delivery and 13% experienced a higher intensity of pain during the birth of their second child (30).

It is argued that the "memory of labor pain" may affect the woman's labor pain in subsequent deliveries within 5 years after delivery (31, 32). In the present study, the gap between the previous birth experiences in women was less than 5 years, which likely influenced the similarity in the severity of pain experienced during their subsequent deliveries.. In contrast with the current study, Yadollah et al. (33). find that multiparous women experience less pain compared to primiparous women and the request for analgesic consumption is significantly lower in them.

The authors justify these results by suggesting that multiparous mothers tend to experience less anxiety and perceive less pain during subsequent deliveries.

The results of the present study showed that on one day after giving birth, the participating women's perception of labor pain is significantly lower than the active phase of labor. Of course, one day after giving birth, women still reported high levels of labor pain intensity, although it was less than their perception of pain during labor. . Karampoorian et al. also report that the perception of pain in patients before and after coronary bypass surgery was significantly different and that patients reported less pain after surgery (34). One of the possible reasons for this is the release of oxytocin from the pituitary gland during and after childbirth (35, 36). Oxytocin is a neuropeptide that is synthesized in the nuclei of paraventricular, super-optics and lateral nuclei of the hypothalamus of mammals. Animal studies have shown that there is a relationship between oxytocin and the perception of pain (37). Oxytocin induces analgesia for both acute and chronic pain in humans.. Oxytocin has also been shown to modulate neural activity in the limbic and cortical areas of brain, which play a major role in the cognitive and emotional processing of pain (38). Of course, human studies that examine the effect of oxytocin on pain perception are few and more studies are needed in this field. One of the limitations of the present study was the inaccuracy of mothers in expressing the intensity of pain in the active

phase of labor due to high level of pain. However, one of the strengths of this study was the inclusion of fear of childbirth alongside the intensity of childbirth pain..It is recommended that future studies investigate the intensity of pain and fear of childbirth in mothers from their first to second child. The study's findings emphasize the need for policymakers to prioritize efforts in reducing childbirth fear, especially among primiparous women. Another clinical implication of the study's findings is that, considering the lack of difference in pain intensity between multiparous and primiparous groups, both pharmacological and non-pharmacological methods for pain reduction should be also considered for multiparous mothers to ensure a positive childbirth experience.

### **Conclusion**

The women experienced a high FOC, and the FOC in primiparous women was significantly higher than that of multiparous women after adjusting the intervening variables. No statistically significant difference was found between the two study groups in the intensity of pain during childbirth. The study emphasizes the importance of interventions to alleviate labor pain and provide support for both primiparous and multiparous women. Multiparous women experience labor pain similarly to primiparous women. Therefore, they require support and should have access to pain reduction methods similar to those used for primiparous women during childbirth.

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### **Abbreviations**

FOC: Fear Of Childbirth; MD: Mean Difference; WHO: World Health Organization.

## **Declarations**

### **Ethics approval and consent to participate**

### **Consent for publication**

Not applicable

### **Availability of data and materials**

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

### **Competing interests**

The authors declare that they have no competing interests.

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**Table 1. Participants' demographic characteristics**

Characteristics		Total		Group		P value
				Nullipara	Multipara	
Age (year) Mean $\pm$ SD		27.56 $\pm$ 5.20		27.33 $\pm$ 5.26	27.69 $\pm$ 5.14	0.186 <sup>a</sup>
Characteristics		N	%	N %	N%	
Education Level	Primary and Secondary	149	34.6	89 (35.30)	60 (33.50)	0.389
	Diploma and Bachelor's	282	65.4	163 (64.70)	119 (66.50)	
Place of residence	Urban areas	223	52.3	127 (%51.6)	94 (%52.8)	0.812 <sup>b</sup>
	Rural areas	203	47.7	119 (%48.4)	84 (%47.2)	
Income level	Sufficient	20	4.6	19 (%95.0)	1 (%5.0)	<0.001 <sup>b</sup>
	Moderately sufficient	178	40.9	116 (%65.2)	62 (%34.8)	
	Insufficient	218	50.1	108 (%49.5)	110 (%50.5)	
Employment status	Housewife	397	93.4	230 (%92.4)	167 (%94.9)	0.320 <sup>b</sup>
	Employed	28	6.6	19 (%7.6)	9 (%5.1)	
Wanted Pregnancy	Yes	382	89.7	221 (%89.5)	159 (%89.8)	0.901 <sup>b</sup>
	No	44	10.3	26 (%10.5)	18 (%10.2)	
Number of abortions	0	154	65.8	74 (%59.2)	80 (%73.4)	0.027 <sup>b</sup>
	$\geq$ 1	80	34.2	51 (%40.8)	29 (%26.6)	

Infertility	Yes	26	6.2	13 (%5.3)	13 (%7.3)	0.396 <sup>b</sup>
	No	396	93.8	232 (%94.7)	164 (%92.7)	
Educations classes	Yes	145	34.4	85 (%34.5)	60 (%34.3)	0.953 <sup>b</sup>
	No	276	65.6	161 (%65.4)	115 (%65.7)	
Relive Pain	Yes	109	24.8	69 (%27.5)	37 (%20.8)	0.105 <sup>b</sup>
	No	322	75.2	181 (%72.4)	141 (%79.2)	
Use of Oxytocin	Yes	185	46.2	101 (%45.9)	84 (%53.8)	0.120 <sup>b</sup>
	No	191	50.8	119 (%54.1)	72 (%46.2)	

a: The student t-test

b: The Chi-Square test

**Table2: Mean and standard deviation of intensity pain and fear and anxiety of delivery between Nulipara and Multipara.**

Characteristics	Group		MD (CI)*	P value
	Nullipara	Multipara		
	Mean $\pm$ SD**	Mean $\pm$ SD		
Fear, Anxiety of delivery	31.28 $\pm$ 5.49	43.37 $\pm$ 6.46	-12.0 (-13.22, -10.94)	<0.001 <sup>a</sup>
Intensity Pain (5-8 cm)	8.36 $\pm$ 1.69	8.46 $\pm$ 1.62	-0.10 (-0.50,0.29)	0.471 <sup>a</sup>
Intensity Pain (Fetus expulsion)	8.03 $\pm$ 2.10	8.06 $\pm$ 2.16	0.27(0.70, 0.14)	0.900 <sup>a</sup>
Intensity Pain (Placenta expulsion)	3.37 $\pm$ 2.51	3.88 $\pm$ 2.72	-0.035 (-0.45, 0.37)	0.040 <sup>a</sup>

\*: Mean Difference (Coefficient Interval); MD (CI)

\*\* : Mean  $\pm$  Standard Deviation; (Mean  $\pm$ SD)

a: The student t-test

**Table 3: Crude and adjusted mean difference of intensity Pain and fear and anxiety of delivery between Nullipara and Multipara**

Characteristics	B (SE)	Crude MD (95% CI)	P-Value	B (SE)*	Adjusted MD (95% CI) *	P-Value
Fear and anxiety of delivery	0.7 (0.57)	12.08(10.31, 13.85)	<0.001 <sup>a</sup>	0.712(0.89)	12 .08 (10.94, 13.22)	<0.001 <sup>b</sup>
Intensity Pain (5-8 cm)	0.022(0.20)	0.18 (-0.49, 0.85)	0.590 <sup>a</sup>	0.60(0.34)	0.07 (-0.32, 0.47)	0.712 <sup>b</sup>
Intensity Pain (Fetus expulsion)	0.007(0.21)	-0.16 (-0.86, 0.53)	0.64 <sup>a</sup>	-0.037 (0.35)	0.02 (-0.38, 0.44)	0.890 <sup>b</sup>
Intensity Pain (Placenta expulsion)	0.098(0.25)	-0.002 (-0.79, 0.79)	0.99 <sup>a</sup>	0.000(0.40)	0.52 (0.01, 1.02)	0.043 <sup>b</sup>

a: Univariate linear test

b: Multivariate linear test

\*: Standard Error; (SE)

Mean difference estimated directly from linear mixed-effects model. The final multivariable models were adjusted for the following risk factors: Age, education level, Place of residence, Income level, Employment status, Wanted Pregnancy, Educations classes, Relieve Pain, Use of Oxytocin and Infertility