

Comparing Fear of Childbirth and Labor Pain Intensity among Primiparous and Multiparous Women: A Cross-Sectional Study

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ARTICLE INFO	ABSTRACT
Article type: Original article	Background & aim: Fear of Childbirth (FOC) can range from a general anxiety disorder to a specific, intense phobia related to pregnancy and childbirth. Labor pain, as an inevitable and multidimensional experience, is closely related to women's perception of childbirth and may interact with FOC. We conducted this study to compare the FOC and labor pain intensity in multiparous and primiparous women. Methods: This cross-sectional study was conducted on 432 pregnant women using convenience sampling in Babol, Iran, between January 2018 and June 2019. All pregnant women completed the demographic and fear of childbirth (FOC) questionnaires. Then, labor pain intensity was measured four times in labor and postpartum using a visual analog scale (VAS). Data were analyzed with student t-test, paired t-test and linear regression model using SPSS version 16. Results: FOC in primiparous women was significantly higher than in multiparous mothers (MD: 12.08, $P < 0.001$). The multivariate linear regression showed that after adjusting the confounding variables, in terms of intensity of pain in the active phase of labor (MD: 0.07; CI 95% -0.32, 0.47; $P = 0.71$) and the phase of fetus expulsion (MD: 0.02; CI 95% -0.38, 0.44; $P = 0.89$), there was no statistically significant difference between primiparous and multiparous women. However, multiparous women significantly experienced higher levels of pain compared with primiparous women during placental expulsion (MD: 0.52; CI 95% 0.01; $P = 0.043$). Conclusion: This study provides basic information for policy makers to pay more attention to reducing the fear and pain of childbirth in both primiparous and multiparous women.
Article History: Received: 09-Oct-2023 Accepted: 18-Mar-2024	
Key words: Childbirth Labor Pain Women Pregnancy Parity	

► Please cite this paper as:

Nikpour M, Alijanpour M, Behmanesh F, Omrani A, Yahyavi-Koochaksaraei F, Karimnezhad-Sorkhi F, Haghighi-Kenari T, Hajian-Tilaki K, Mohsenzadeh-Ledari F, Faramarzi M. Comparing Fear of Childbirth and Labor Pain Intensity among Primiparous and Multiparous Women: A Cross-Sectional Study. Journal of Midwifery and Reproductive Health. 2025; 13(4): 5085-5093. DOI: 10.22038/jmrh.2024.75434.2219

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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 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 about 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, and 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 an 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 issues to enable designing strategies that reduce FOC and intensity of childbirth pain. Therefore, the present study was conducted to compare the FOC and the intensity of labor pain in multiparous and primiparous women.

Materials and Methods

This cross-sectional study was conducted on pregnant women admitted to one maternity hospital affiliated to Babol University of Medical Sciences, Babol, Iran, where low-risk pregnant women are admitted for delivery, between January 2018 and June 2019. Inclusion criteria were pregnant women with gestational 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. The exclusion criteria were mothers with less than 38 weeks and more than 42 weeks of pregnancy, those with known pregnancy problems and mental illness, were not included in the study because these problems might affect their fear of childbirth. Other exclusion criteria included pregnant women's 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 was

estimated 394 according to the previous study difference in labor pain intensity between primiparous and multiparous women using G Power software and the assumption of bilaterality and the effect size (Mean difference) of 0.2, with an α of 0.05, a β of 0.20 (18). But considering the drop out of 20%, the final sample size was estimated to be 430.

To collect data, at first, all pregnant women who were admitted to the maternity hospital to give birth, in case of agreement to participate in the study, asked for demographic characteristics including age, occupation, education, place of residence, affordability of living expenses as well as obstetric data such as number of births, number of abortions, number of children, pregnancy, and participation in educational classes to be prepared for childbirth. Furthermore, all pregnant women completed the Fear of Childbirth (FOC) questionnaire developed by Pirdel et al. (2015), in the latent phase of labor. This questionnaire contained 15 questions with a 5-point likert scale. The scoring of the questionnaire worked as follows: a score less than 35: severe fear, between 35 and 55: moderate fear, and above 55 indicates low fear. Content and construct validity were used to validate the questionnaires. Test-retest was used to assess questionnaire reliability, yielding a reliability coefficient of 0.76 (19).

Labor pain intensity was measured four times, including dilation 5-8 cm, during the phase of the fetus and placenta expulsion and in the postpartum stage (one day after giving birth). The women were asked how much pain they felt according to a visual analog scale (VAS) in three stages before delivery. In addition, one day after giving birth, the women were asked how much pain they were during the active phase of labor. Pain intensity was measured with a VAS. In this scale, a score of zero indicates minimal pain, and a score of ten indicates the most severe pain (20). Participants completed face to face questionnaires at various stages of labor and postpartum, with an estimated completion time of 15 minutes.

Also, further information during childbirth, such as using pain reduction methods in childbirth, including use of epidural analgesia, use of balls and heat therapy, use of oxytocin, as

well as the presence of an accompanying midwife, was also recorded..

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 for the effect of demographic and obstetric intervening variables between the two study groups. To evaluate the crude effect of the demographic (age, education level, place of residence, income level, employment status) and obstetrics intervening variables (wanted pregnancy, ducational classes, Relive Pain, Use of Oxytocin, and infertility), with the intensity of pain and fear of childbirth, first these variables were separately entered into the univariate regression model and analyzed. In the following, all these variables were entered into the multivariate regression model for adjustment. The models were adjusted for the demographic and obstetric intervening variables. The results are shown by adjusted mean difference (aMD)

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 was 27.56 ± 5.20 years. Most women (64%) had a diploma and bachelor's 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 ($P \leq 0.001$). With regard to obstetric characteristics, almost one third of pregnant women participated in educational classes during pregnancy. 10.3% of women had unwanted pregnancies (Table 1).

Table 1. Frequency distribution of participants' demographic characteristics

Characteristic	Total	Group		P-Value
		Nulliparous	Multiparous	
Age (year) Mean $\pm$ SD	27.56 $\pm$ 5.20	27.33 $\pm$ 5.26	27.69 $\pm$ 5.14	0.186 ^a
Characteristics	N (%)	N (%)	N (%)	
Educational 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 ^b
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 ^b
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 ^b
Employed	28 (6.6)	19 (%7.6)	9 (%5.1)	
Wanted Pregnancy				
Yes	382 (89.7)	221 (%89.5)	159 (%89.8)	0.901 ^b
No	44 (10.3)	26 (%10.5)	18 (%10.2)	
Number of abortions				

Characteristic	Total	Group		P-Value
		Nulliparous	Multiparous	
0	154 (65.8)	74 (%59.2)	80 (%73.4)	0.027 ^b
≥ 1	80 (34.2)	51 (%40.8)	29 (%26.6)	
Infertility				
Yes	26 (6.2)	13 (%5.3)	13 (%7.3)	0.396 ^b
No	396 (93.8)	232 (%94.7)	164 (%92.7)	
Educational classes				
Yes	145 (34.4)	85 (%34.5)	60 (%34.3)	0.953 ^b
No	276 (65.6)	161 (%65.4)	115 (%65.7)	
Relive Pain				
Yes	109 (24.8)	69 (%27.5)	37 (%20.8)	0.105 ^b
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 ^b
No	191 (50.8)	119 (%54.1)	72 (%46.2)	

a: The student t-test, b: The Chi-Square test

The mean and standard deviation of the FOC of the participating women were 37.14±9.00 and a statistically significant difference was found between primiparous women (31.28±5.49) and multiparous women (43.37±6.46) ($P<0.001$). This indicates that primiparous women experienced significantly more fear than multiparous women (Table 2).

Table 2. Mean and standard deviation of pain intensity and fear and anxiety of delivery among nulliparous and multiparous women

Characteristic	Group		MD (CI)*	P-Value
	Nulliparous	Multiparous		
	Mean ± SD**	Mean±SD		
Fear, Anxiety of delivery	31.28±5.49	43.37±6.46	-12.0 (-13.22, -10.94)	<0.001 ^a
Pain intensity (5-8 cm)	8.36±1.69	8.46±1.62	-0.10 (-0.50, 0.29)	0.471 ^a
Pain intensity (Fetus expulsion)	8.03±2.10	8.06±2.16	0.27(0.70, 0.14)	0.900 ^a
Pain intensity (Placenta expulsion)	3.37±2.51	3.88±2.72	-0.035 (-0.45, 0.37)	0.040 ^a

*: Mean Difference (Coefficient Interval); MD (CI), **: Mean ± Standard Deviation; (Mean ±SD), a: The student t-test

After adjusting for demographic and obstetric variables, the FOC in primiparous women was significantly higher than in 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.

Table 3. Crude and adjusted mean difference of pain intensity and fear and anxiety of delivery among nulliparous and multiparous women

Characteristic	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 ^a	0.712(0.89)	12.08 (10.94, 13.22)	<0.001 ^b
Intensity Pain (5-8 cm)	0.022(0.20)	0.18 (-0.49, 0.85)	0.590 ^a	0.60(0.34)	0.07 (-0.32, 0.47)	0.712 ^b
Intensity Pain (Fetus expulsion)	0.007(0.21)	-0.16 (-0.86, 0.53)	0.64 ^a	-0.037 (0.35)	0.02 (-0.38, 0.44)	0.890 ^b
Intensity Pain (Placenta expulsion)	0.098(0.25)	-0.002 (-0.79, 0.79)	0.99 ^a	0.000(0.40)	0.52 (0.01, 1.02)	0.043 ^b

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, educational classes, relief pain, use of oxytocin, and infertility.

The results of this study showed that the intensity of labor pain in the active phase of labor, the phase of expulsion of the fetus, and the expulsion of the placenta were 1.66 ± 8.40 , 2.12 ± 8.04 , and 2.61 ± 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 ($P=0.64$). But in the placental expulsion phase ($P=0.004$), the statistical difference between the two groups was significant (Table 2). On one day after giving birth, the women described their feeling of pain intensity during the active phase of labor (7.53 ± 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 the placental expulsion phase (MD: 0.52; CI 95% 0.01, 1.02; $P=0.043$).

Discussion

This study was conducted to compare the FOC and the severity of labor pain in primiparous and multiparous women. The results of the study showed that women experienced a high FOC, and the FOC in primiparous women was significantly higher than that of multiparous women after adjusting for the confounding 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 confounding variables. In addition, the results of the study showed that the perception of pain by women one day after delivery was significantly lower than during 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 et al. (2021) from China (18), O'Connell et al. (2012) from Ireland (21), Fenwick from Australia (22), Rouhe from Finland (23), Hoshmandi et al. (2012) from Iran (24) are also in line with the present study. Multiparous mothers experienced childbirth can be better prepared for their next childbirths. Thus, multiparas may have less risk of FOC than primiparous mothers (18). However, in contrast with the present study, researchers such as Nasreen et al. (2011) (25) and Khwepeya et al. (2018) (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 Abushaikh et al. (28), Hoshmandi et al. (2012) (24), and Pirdel and Pirdel (2015) (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. (2021) report that multiparous women experience higher labor pain compared to primiparous mothers, or the demand for analgesia was higher in multiparous women (18, 29). About parity and labor pain, it is obvious that women's 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 experience in women was less than 5 years, which probably affected the experience of the same severity of pain in their next delivery. 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. In justification of these results, they state that multiparous mothers are less worried and experience less painful feelings in their next delivery.

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 described the intensity of labor pain, but it was less than the perception of pain that they reported at the time. Karamporian and Imani (2003) 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, supraoptic 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 causes anesthesia to acute or chronic pain in humans. Oxytocin has also been shown to modulate neural activity in the limbic and cortical areas of the 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 strengths of the this study was assessing labor pain intensity at multiple stages. However, limitations include

potential inaccuracy in mothers' pain reporting during the active phase due to high pain levels, and the focus on low-risk mothers. Future research should consider including high-risk pregnancies.

Conclusion

The women experienced a high FOC, and the 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. Multiparous women experienced labor pain similar to primiparous women. Therefore, they need support, and it is better to use pain reduction methods for them, like primiparous women during childbirth. This study suggests increased attention and psychological support for all pregnant women to reduce their fear of childbirth and labor pain intensity.

Declarations

Acknowledgments

The authors would like to thank Vice Dran for Research and Technology of Babol University of Medical Sciences as well as Infertility and Reproductive Health Research Center, Babol, Iran. Also, all women who participated in the present study are warmly appreciated.

Conflicts of interest

The authors declared no conflicts of interest.

Ethical considerations

The study was approved by the Research Ethical Committee of Babol University of Medical Sciences, Babol, Iran. Written informed consent was taken from all the participants. All methods were carried out in accordance with relevant guidelines and regulations.

Code of Ethics

MUBABOL.HRI.REC.1396.178.

Use of Artificial Intelligence (AI)

This article was written without the use of artificial intelligence.

Funding

The author(s) received grant from Babol University of Medical Sciences (Grant Code: 9604617).

Authors' contribution

FB & MN: Conceptualization, planning methodology and writing initial draft. FKS, THK, MA, FML & FY: Data curation. MN & FB: Visualization and investigation. M.N. Software validation and data analysis. All authors approved the final manuscript and agreed to be accountable for all aspects of the work in terms of accuracy and integrity.

References

1. Fawcett EJ, Fairbrother N, Cox ML, White IR, Fawcett JM. The prevalence of anxiety disorders during pregnancy and the postpartum period: a multivariate Bayesian meta-analysis. *The Journal of Clinical Psychiatry*. 2019; 80(4): 1181.
2. Qiu L, Sun N, Shi X, Zhao Y, Feng L, Gong Y, et al. Fear of childbirth in nulliparous women: A cross-sectional multicentre study in China. *Women and Birth*. 2020; 33(2): e136-e141.
3. Howard L, editor What does excellence in Perinatal Mental Health look like. Meeting the NICE Guideline for Postnatal Mental Health King's Health Partners; 2016.
4. Räisänen S, Lehto SM, Nielsen HS, Gissler M, Kramer MR, Heinonen S. Risk factors for and perinatal outcomes of major depression during pregnancy: a population-based analysis during 2002–2010 in Finland. *BMJ Open*. 2014; 4(11): e004883.
5. Stoll K, Swift EM, Fairbrother N, Nethery E, Janssen P. A systematic review of nonpharmacological prenatal interventions for pregnancy-specific anxiety and fear of childbirth. *Birth*. 2018; 45(1): 7-18.
6. Dencker A, Nilsson C, Begley C, Jangsten E, Mollberg M, Patel H, et al. Causes and outcomes in studies of fear of childbirth: A systematic review. *Women and Birth*. 2019; 32(2): 99-111.
7. Calderani E, Giardinelli L, Scannerini S, Arcabasso S, Compagno E, Petraglia F, et al. Tocophobia in the DSM-5 era: Outcomes of a new cut-off analysis of the Wijma delivery expectancy/experience questionnaire based on clinical presentation. *Journal of Psychosomatic Research*. 2019; 116: 37-43.
8. Taubman-Ben-Ari O, Chasson M, Abu-Sharkia S. Childbirth anxieties in the shadow of COVID-19: Self-compassion and social support among Jewish and Arab pregnant women in Israel. *Health & Social Care in the Community*. 2021; 29(5): 1409-1419.
9. O'Connell MA, Leahy-Warren P, Khashan AS, Kenny LC, O'Neill SM. Worldwide prevalence of tocophobia in pregnant women: systematic review and meta-analysis. *Acta obstetrica et Gynecologica Scandinavica*. 2017; 96(8): 907-920.
10. O'Connell MA, Khashan AS, Leahy-Warren P, Stewart F, O'Neill SM. Interventions for fear of childbirth including tocophobia. *Cochrane Database of Systematic Reviews*. 2021; 7: 1-64.
11. Ghazaie M, Davoodi I, Neysi A, Mehrabizadeh Honarmand M, Bassak Nejad S. The effectiveness of cognitive-behavioral therapy on fear of childbirth, fear of pain, self-efficacy of childbirth and tendency to caesarean in nulliparous women. *The Iranian Journal of Obstetrics, Gynecology and Infertility*. 2016; 19(31): 1-2.
12. Kringeland T, Daltveit AK, Møller A. What characterizes women in Norway who wish to have a caesarean section. *Scandinavian Journal of Public Health*. 2009; 37(4): 364-371.
13. Bracken JN, Dryfhout VL, Goldenhar LM, Pauls RN. Preferences and concerns for delivery: an antepartum survey. *International Urogynecology Journal*. 2008; 19: 1527-1531.
14. Fuglenes D, Aas E, Botten G, Øian P, Kristiansen I. Why Do Some Pregnant Women Prefer Cesarean? The Influence of Parity, Delivery Experiences, and Fear. *Obstetric Anesthesia Digest*. 2012; 32(2): 93-94.
15. Fairbrother N, Collardeau F, Albert A, Stoll K. Screening for perinatal anxiety using the childbirth fear questionnaire: A new measure of fear of childbirth. *International Journal of Environmental Research and Public Health*. 2022; 19(4): 2223.
16. Nisa SM, Murti B, Qadrijati I. Path analysis on the psychosocial factors affecting anxiety and delivery pain. In *The International Conference on Public Health Proceeding*. 2018; 3(1): 173.
17. Zanardo V, Parotto M, Manghina V, Giliberti L, Volpe F, Severino L, et al. Pain and stress after vaginal delivery: characteristics at hospital discharge and associations with parity. *Journal of Obstetrics and Gynaecology*. 2020; 40(6): 808-812.
18. Deng Y, Lin Y, Yang L, Liang Q, Fu B, Li H, et al. A comparison of maternal fear of childbirth, labor pain intensity and intrapartum analgesic consumption between primiparas and multiparas: a cross-sectional study. *International Journal of Nursing Sciences*. 2021; 8(4): 380-387.
19. Pirdil M, Pirdel L. A comparison of women's expectations of labour and birth with the experiences in primiparas and multiparas with normal vaginal delivery. *Journal of Kathmandu Medical College*. 2015; 4(1): 16-25.

20. Huskisson EC. Measurement of pain. *The lancet*. 1974; 304(7889): 1127-1131.
21. O'Connell MA, Leahy-Warren P, Kenny LC, O'Neill SM, Khashan AS. The prevalence and risk factors of fear of childbirth among pregnant women: A cross-sectional study in Ireland. *Acta obstetrica et gynecologica Scandinavica*. 2019; 98(8): 1014-1023.
22. Fenwick J, Toohill J, Creedy DK, Smith J, Gamble J. Sources, responses and moderators of childbirth fear in Australian women: a qualitative investigation. *Midwifery*. 2015; 31(1): 239-246.
23. Rouhe H, Salmela-Aro K, Halmesmäki E, Saisto T. Fear of childbirth according to parity, gestational age, and obstetric history. *BJOG: An International Journal of Obstetrics & Gynaecology*. 2009; 116(1): 67-73.
24. Hoshmandi S, Dolatian M, Kamalifard M, Gojazadeh M. Comparison of labor pain and factors affecting the pain perception among primiparous and multiparous women referring to women's private and state hospitals in Tabriz in 2010. *Medical Journal of Tabriz University of Medical Sciences*. 2012; 34(3): 117-121.
25. Nasreen HE, Kabir ZN, Forsell Y, Edhborg M. Prevalence and associated factors of depressive and anxiety symptoms during pregnancy: a population based study in rural Bangladesh. *BMC Women's Health*. 2011; 11(1): 1-9.
26. Khwepeya M, Lee GT, Chen S-R, Kuo S-Y. Childbirth fear and related factors among pregnant and postpartum women in Malawi. *BMC Pregnancy and Childbirth*. 2018; 18: 1-10.
27. Jokić-Begić N, Žigić L, Nakić Radoš S. Anxiety and anxiety sensitivity as predictors of fear of childbirth: different patterns for nulliparous and parous women. *Journal of Psychosomatic Obstetrics & Gynecology*. 2014; 35(1): 22-28.
28. Abushaikha L, Oweis A. Labour pain experience and intensity: a Jordanian perspective. *International Journal of Nursing Practice*. 2005; 11(1): 33-38.
29. Ranta P, Jouppila P, Jouppila R. The intensity of labor pain in grand multiparas. *Acta Obstetrica et Gynecologica Scandinavica*. 1996; 75(3): 250-254.
30. Deng Y, Li H, Dai Y, Yang H, Morse AN, Liang H, et al. Are there differences in pain intensity between two consecutive vaginal childbirths? A retrospective cohort study. *International Journal of Nursing Studies*. 2020; 105: 103549.
31. Waldenström U, Schytt E. A longitudinal study of women's memory of labour pain—from 2 months to 5 years after the birth. *BJOG: An International Journal of Obstetrics & Gynaecology*. 2009; 116(4): 577-583.
32. Chajut E, Caspi A, Chen R, Hod M, Ariely D. In pain thou shalt bring forth children: the peak-and-end rule in recall of labor pain. *Psychological science*. 2014; 25(12): 2266-2271.
33. Yadollahi P, Khormaie F, Makvandi S, Soofi A, Ariashekouh A, Hashemifard T. The relationship between personality traits and labor pain intensity. *International Journal of Community Based Nursing & Midwifery*. 2013; 1(4): 224-229.
34. Karamporian A, Imani B. Comparison Relation to Analgesics between Nurses and Patients Perception in Pain in Patients who had Undergone Coronary Bypass Graft. *Avicenna Journal of Clinical Medicine*. 2003; 10(1): 57-62.
35. Herpertz SC, Schmitgen MM, Fuchs C, Roth C, Wolf RC, Bertsch K, et al. Oxytocin effects on pain perception and pain anticipation. *The Journal of Pain*. 2019; 20(10): 1187-1198.
36. Pfeifer A-C, Ditzen B, Neubauer E, Schiltenswolf M. Effect of oxytocin on human pain perception. *Der Schmerz*. 2016; 30: 457-469.
37. Boll S, De Minas AA, Raftogianni A, Herpertz S, Grinevich V. Oxytocin and pain perception: from animal models to human research. *Neuroscience*. 2018; 387: 149-161.
38. Lopes S, de Lima Osório F. Effects of intranasal oxytocin on pain perception among human subjects: A systematic literature review and meta-analysis. *Hormones and Behavior*. 2023; 147: 105282.