Journal of Clinical and Investigative Surgery

https://doi.org/10.25083/2559-5555
https://proscholar.org/jcis/
ISSN: 2559-5555

Multifactorial study of the relationship between fear of childbirth and mode of delivery

Naime Meric Konar[1*], Selda Songur Dagli[2]

[1]PhD, Assistant Professor, Kirsehir Ahi Evran University, Faculty of Medicine, Department of Biostatistics and Medical Informatics, Kirsehir, Turkey
[2]MD, Associate Professor, Kirsehir Ahi Evran University, Faculty of Medicine, Department of Obstetrics and Gynecology, Kirsehir, Turkey

ABSTRACT

Objective. This study investigated the relationship between fear of childbirth (FOC) and mode of delivery and proposed a cut-off value of FOC for an unselected Turkish pregnant population. *Materials and Methods*. This cross-sectional study was conducted between March 2019 and February 2020 at Kirsehir Ahi Evran University Obstetrics and Gynecology Polyclinic. The Wijma Delivery Expectancy (WDEQ-A) Scale and General Information Form were used for data collection. *Results*. Social-media effect, concern for disorder in baby, education level, and fear of vaginal bleeding were significant risk factors for the study groups. A new cut-off value of FOC was proposed based on the distribution of FOC scores as 69 (fourth quartile) for an unselected Turkish pregnant population. *Conclusions*. Training programs regarding delivery and pregnancy processes were recommended to be organized to reduce FOC. Moreover, the newly proposed cut-off value of FOC was recommended to be utilized in clinics.

Category: Original Research Paper

Received: May 05, 2022
Accepted: June 27, 2022
Published: November 20, 2022

Keywords:

fear, risk factors, pregnancy, parturition, multifactorial study

***Corresponding author:**

Naime Meric Konar,

Kirsehir Ahi Evran University, Faculty of Medicine, Department of Biostatistics and Medical Informatics, 40100, Kirsehir, Turkey

E-mail: naime.konar@ahievran.edu.tr , nmerickonar1@gmail.com

Introduction

Childbirth can be defined as a very important event in the life of every woman. This remarkable event has significant psychological and emotional impacts [1,2]. However, fears arise during pregnancy regarding delivery and pregnancy processes for various reasons, such as: young age of mother, the concern of genetic disorder in the baby, anxiety about the physical conditions of the hospital, negative impact on the pregnancy through posts about the pregnancy process on social networks (social media effect), fear of being alone during childbirth, unplanned pregnancy and not receiving support from spouse or family, among others.

Studies have demonstrated that Fear of Childbirth (FOC) prevalence changes across countries, its worldwide prevalence reported being 14% via a meta-analysis [3]. The prevalence of FOC changes post-partum depression and stress disorders and can even prolong labor [1].

FOC can affect the mode of delivery. This fear has led to an increasing number of cesarean deliveries worldwide [4]. Consequently, it is a major cause of a cesarean delivery preference [5]. These preferences were prevalent in women who had a history of psychological and obstetrical situations [6]. This preference is also considered a right to self-decision-making in developed countries [7]. However, nulliparous women had a higher level of FOC [7], while low-risk pregnant women who preferred vaginal deliveries had the highest level of FOC compared to alternative delivery processes [8].

Several studies have so far focused on suggesting a new cut-off value for determining FOC levels for different populations. However, no consensus could be achieved regarding the common threshold value for FOC. Currently, Wijma Delivery Expectancy/Experience Questionnaire (WDEQ-A) [9] is the most common tool for assessing FOC, and its score of 85 has been commonly used to classify the fear. Despite its common use, this cut-off value may not be useful either to detect the fearful sample or discriminate between fearless and fearful groups in different samples. Therefore, it can be considered essential to propose a cut-off value to identify the levels of FOC and to specify factors associated with FOC based on the newly suggested cut-off value that can reflect the characteristics of the population in question.

To cite this article: Konar NM, Dagli SS. Multifactorial study of the relationship between fear of childbirth and mode of delivery. *J Clin Investig Surg*. 2022;7(2):124-131. doi: 10.25083/2559.5555/7.2.2

This study proposed a new cut-off value for FOC based on WDEQ-A scores of the participants and investigated the relationship between FOC and mode of delivery based on the newly suggested cut-off value for FOC.

Materials and Methods

This paper-based cross-sectional study was conducted between March 2019 to February 2020 at Gynecology and Obstetrics Policlinics of the Kirsehir Ahi Evran University Training and Research Hospital. This study was approved by Kirsehir Ahi Evran University non-interventional clinical studies ethical committee (Approval Time: 26/03/2019 - Approval Number: 2019-06/68).

The inclusion criterion was defined as 18 years or older pregnant women, while pregnant under the age of 18 years were excluded. The sample size was determined by the G*Power (3.1.9.6) program, and 330 participants were calculated with 80% power and 5% error rate to detect a small effect size, namely, Cohen's d = 0.2. Also, the Cronbach alpha internal consistency coefficient was calculated as 0.866 in this study. Data was collected via a validated Turkish version of the 33-item WDEQ-A Scale and General Information Form that was created by the researchers by reviewing the existing literature. The form included questions regarding sociodemographic (age, educational level, and occupation), obstetric (unplanned pregnancy, fear of bleeding during delivery, and concern for disorder in the baby after delivery), and social-related (social-media effect and fear of not being able to return to former social life after delivery) determinants. This study was conducted with the participants who provided written informed consent. The original W-DEQ is a 33-item questionnaire aiming to measure the FOC during pregnancy. The items are in the form of a six-point Likert scale yielding a minimum 0 and a maximum of 165 points [9]. The reliability and validity of the Turkish version of the scale have been studied previously [10]. Some items (2, 3, 6, 7, 8, 11, 12, 15, 19, 20, 24, 25, 27, and 31) were reverse-scored for the concordance.

Statistical Analysis

Participants were divided into four categories based on the percentiles of their W-DEQ scores. Categories were defined as 'Severe level of FOC' (W-DEQ score ≥ 69, scores above the fourth quartile), 'High level of FOC' (scores in the second and third quartile; 49 ≤ WDEQ score ≤ 68), 'Moderate level of FOC' (scores in the first and second quartile; 34 ≤ WDEQ score ≤ 48), and 'Low level of FOC' (scores in below the first quartile; W-DEQ score ≤ 33). The mean ± standard deviation, median, minimum, and maximum values were calculated for quantitative variables; and frequencies and percentages were calculated for categorical variables. Kolmogorov-Smirnov test was used for normality assumption. Independent samples t-test, Mann–Whitney U tests Kruskal-Wallis test, and One-Way Analysis of Variance (ANOVA) was used for group comparisons depending on the normality of the quantitative data. Multiple binary logistic regression analysis was used to identify the factors related to FOC. The newly proposed cut-off value for FOC was used while forming the logistic regression model. Independent Samples t-test, Mann–Whitney U tests, and Chi-Square test were performed before the multiple logistic regression analysis to identify the variables for the final model. Variables with a p-value < 0.20 in the univariate analysis were included in the final multiple logistic regression model. The backward-Wald method was used for variable selection. Adjusted odds ratios (AOR) and their 95% confidence intervals (CIs) were reported. Moreover, the area under the curve (AUC) values were calculated for regression models to determine their discrimination powers. Sensitivity and specificity values were calculated for the newly proposed cut-off value of FOC. Furthermore, Cohen's Kappa was calculated to measure the agreement between the previously proposed cut-off values and newly-proposed cut-off value. The R programming language (R Core Team, 2020) was used for the analysis. The significance level was taken as 0.05.

Results

A total of 330 pregnant women were included in the current study. The overall mean and median ages were 27.55 and 27 years, respectively (range: 18–45 years; standard deviation: 5.743 years). The mean WDEQ-A score was 52.52 ± 25.034, (range: 4–122; median: 48.5). The baseline characteristics of the participants are presented in Table 1.

The proposed cut-off value was based on the distribution of the FOC scores, the fourth quartile of the scores as 69 was proposed for determining FOC in unselected Turkish population. A statistically significant difference between the prevalence of low, moderate, high, and severe FOC in terms of quantile classification and the prevalence of FOC in terms of widely accepted FOC cut-off value of 85 as proposed by Wijma et al [9] (χ^2: 13.785, p-value < 0.001). However, the prevalence of FOC was observed to be similar across the delivery mode (χ^2:1.281, p-value: 0.865), and maternal age groups (χ^2:2.036, p-value: 0.361).

The mean FOC levels were 54.04 ± 24.957, 52.227 ± 25.724, and 51.227 ± 24.18 for the previously cesarean, nulliparous, and previously vaginal delivery groups, respectively (p=0.668). Furthermore, the highest FOC levels were observed in self-employment workers (62.722 ± 31.301), while the lowest levels were observed in women without any concern for disorder in the baby (44.77 ± 22.898). The group comparison results are presented in Table 2.

Table 1. Baseline characteristics and group comparison results (all the samples)

Variable		n (%)	FOC Score		p-value
			Mean ± SD	Median [Min - Max]	
Educational Level	Primary School	6 (1.8)	53.75 ± 25.114	51 [14 - 104]	0.525
	Secondary School	40 (12.1)	49.818 ± 23.045	46 [4 - 108]	
	High School	66 (20)	50.749 ± 24.513	46 [6 - 122]	
	University - College	115 (34.8)	55.796 ± 26.336	52 [10 - 118]	
	None	103 (31.2)	51.5 ± 34.057	41 [17 - 113]	
Occupation	Housewife	244 (73.9)	51.328 ± 24.025	48 [4 - 121]	0.263
	Worker	11 (3.3)	51.091 ± 29.477	45 [7 - 97]	
	Officer	57 (17.3)	54.649 ± 26.077	53 [10 - 116]	
	Self-Employed	18 (5.5)	62.722 ± 31.301	49 [22 - 122]	
Planned Pregnancy	Yes	215 (65.2)	50.921 ± 24.636	47 [6 - 118]	0.124
	No	115 (34.8)	55.496 ± 25.603	52 [4 - 122]	
Parity	1	141 (42.7)	52.227 ± 25.724	48 [10 - 122]	0.229
	2	94 (28.5)	54.947 ± 23.271	54 [7 - 113]	
	3	55 (16.7)	46.855 ± 25.127	43 [6 - 121]	
	4+	40 (12.1)	56.6 ± 26.005	51 [4 - 103]	
Number of Alive Children	0		.	.	0.549
	1	111 (33.6)	53.586 ± 24.902	51 [7 - 113]	
	2	53 (16.1)	49.717 ± 23.988	46 [6 - 121]	
	3+	25 (7.6)	55.32 ± 24.711	51 [4 - 103]	
Mode of Delivery	Formerly Cesarean	111 (30.6)	54.04 ± 24.957	51 [6 - 121]	0.668
	Nulliparous	53 (42.7)	52.227 ± 25.724	48 [10 - 122]	
	Formerly Vaginal	25 (26.7)	51.227 ± 24.18	47 [4 - 104]	
Problems in Previous Pregnancies	Yes	49 (25.9)	49.51 ± 26.661	42 [12 - 121]	0.133
	No	140 (74.1)	53.857 ± 23.797	52 [4 - 113]	
Problems in Current Pregnancy	Yes	63 (19.1)	54.73 ± 26.359	50 [15 - 121]	0.61
	No	267 (80.9)	51.993 ± 24.733	48 [4 - 122]	
Taking Training during Pregnancy	Yes, I did have	29 (8.8)	53.586 ± 27.982	57 [12 - 98]	0.947
	Yes, I'm taking currently	7 (2.1)	50.286 ± 23.464	45 [21 - 82]	
	No	294 (89.1)	52.463 ± 24.847	48 [4 - 122]	
Social Media Effect	Yes	117 (35.5)	59.735 ± 25.217	56 [10 - 121]	<0.001
	No	213 (64.5)	48.549 ± 24.084	45 [4 - 122]	
Unqualified Health Personnel	Yes	191 (57.9)	55.288 ± 24.702	52 [6 - 122]	0.009
	No	139 (42.1)	48.705 ± 25.704	44 [4 - 118]	
Concern for not being able to return former socail life after delivery	Yes	98 (29.7)	60.663 ± 24.961	61 [15 - 121]	<0.001
	No	227 (70.3)	49.163 ± 24.406	45 [4 - 122]	
Concern for not being able to provide good life standard to the baby	Yes	114 (35.2)	55.535 ± 26.756	53 [7 - 122]	0.13
	No	210 (64.8)	51.11 ± 24.123	46 [4 - 121]	
Fear of bleeding during delivery	Yes	161 (49.8)	59.36 ± 25.168	56 [15 - 122]	<0.001
	No	162 (50.2)	46.296 ± 23.286	44 [4 - 121]	
Concern for Disorder in Baby after Delivery	Yes	190 (58.5)	58.216 ± 25.153	56 [6 - 122]	<0.001
	No	135 (41.5)	44.77 ± 22.898	38 [4 - 122]	
Fear of the effect of chemicals (drug, cigarette, alcohol etc.) taken during pregnancy on baby	Yes	128 (40)	56.828 ± 27.021	54 [6 - 122]	0.013
	No	192 (60)	49.526 ± 23.47	45 [4 - 118]	

*Social Medica Effect stands for the negatively affection from the news or posts about pregnancy process on social media. SD: Standard deviation

Table 2. Results of multiple logistic regression analysis

Mode of Delivery	Predictor	β	SE (β)	Odds Ratio (OR)	95% Confidence Interval for Odds Ratio (OR)	p-value
Formerly Cesarean	Social Media Effect	-1.097	0.495	0.334	0.127 - 0.881	0.027
	Concern for Disorder in Baby after Delivery	-1.525	0.675	0.218	0.058 - 0.817	0.024
	Constant	-0.085	0.405	1.089		0.834
Formerly Vaginal	Educational Level / Primary School	Ref.	Ref.	Ref.	Ref.	Ref.
	Educational Level / Secondary School	-2.008	0.876	0.134	0.024 - 0.747	0.022
	Educational Level / High School	-3.406	1.184	0.033	0.003 - 0.338	0.004
	Educational Level / University - College	-0.953	0.719	0.386	0.094 - 1.578	0.185
	Fear of Bleeding during Delivery	-1.592	0.668	0.203	0.055 - 0.754	0.017
	Constant	0.757	0.646	2.132		0.242
Nulliparous	Unplanned pregnancy	1.300	0.579	3.669	1.180 - 11.405	0.025
	Social Media Effect	-1.049	0.505	0.35	0.130 - 0.942	0.038
	Concern for Disorder in Baby after Delivery	-1.068	0.533	0.344	0.121 - 0.977	0.045
	Concern for not being able to return former socail life arter delivery	-1.435	0.494	0.238	0.09 - 0.627	0.004
	Fear of Bleeding during Delivery	-1.678	0.583	0.187	0.060 - 0.585	0.004
	Constant	2.497	0.936	12.147		0.008
All-sample	Concern for Disorder in Baby after Delivery	-1.083	0.402	0.339	0.154 - 0.744	0.007
	Constant	-0.273	0.314	0.761		0.351

SE: Standard Error

The results of four different binary logistic regression models (all sample, pregnant women with previously caesarean birth experience group, nulliparous group, and vaginal delivery groups) revealed that the concern for any disorder in the baby after the delivery was a significant risk factor for all sample groups (AOR = 0.339, 95% CI = 0.154–0.744; p = 0.007).

The social-media effect (AOR = 0.334, 95% CI = 0.127–0.881; p = 0.027) and concern for any disorder in baby after the delivery (AOR = 0.218, 95% CI = 0.058–0.817) were significant risk factors for caesarean delivery group; education level (AOR = 0.134, 95% CI = 0.024–0.747; p = 0.022 for secondary school and AOR = 0.033, 95% CI =0.003–0.338; p = 0.004 for high school) and fear of bleeding during delivery (AOR = 0.203, 95% CI = 0.055–0.754; p = 0.017) were significant risk factors in the vaginal delivery group; while unplanned pregnancy (AOR = 3.669, 95% CI = 1.180–11.405; p=0.025), social-media effect (AOR = 0.350, 95% CI = 0.130–0.942; p=0.038), fear of bleeding during delivery (AOR = 0.187, 95% CI = 0.060–0.585; p = 0.004), concern for any disorder in the baby after the delivery (AOR = 0.344, 95% CI = 0.12–0.977; p = 0.045), and fear of not being in formal social life after delivery (AOR = 0.238, 95% CI = 0.090–0.627; p = 0.004) were significant determinants for the nulliparous group.

The discriminative powers of these regression models were 0.683 (95% CI: 0.614–0.752), 0.691 (95% CI: 0.574–0.808), 0.783 (95% CI: 0.659–0.906), and 0.833 (95% CI: 0.759–0.907) for all samples, pregnant women with the former cesarean experience group, vaginal delivery group, and nulliparous group, respectively.

In this study, the sensitivity, specificity, and Cohen's Kappa measures were calculated based on the consideration of other cut-off values that were defined in literature as gold-standard for the WDEQ-A score of FOC. The sensitivity, specificity, and Cohen's Kappa statistics of other cut-off values in the literature were calculated as follows: (a) 50, sensitivity: 56.6%, specificity: 100%, and Cohen's Kappa: 0.502; (b) 60, sensitivity: 70.9%, specificity: 100%, and Cohen's Kappa: 0.752; (c) 66, sensitivity: 89.2%, specificity: 100%, and Cohen's Kappa: 0.922; (d) 71, sensitivity: 100%, specificity: 98.8%, and Cohen's Kappa: 0.975; (e) 81, sensitivity: 100%, specificity: 89.2%, and Cohen's Kappa: 0.723; (f) 85, sensitivity: 100%, specificity: 85.2%, and Cohen's Kappa: 0.577; and (g) 100, sensitivity: 100%, specificity: 78.7%, and Cohen's Kappa: 0.252.

These results demonstrated that the newly proposed threshold value has good agreement with the previously proposed cut-off values.

Discussion

In this study, we aimed to analyze the relationship between FOC and mode of delivery and to propose a new cut-off value of FOC for unselected Turkish pregnant population.

The prevalence of FOC was 28.7, 24.1, and 21.6% in pregnant women with previous cesarean experience, nulliparous, and vaginal delivery groups, respectively. Moreover, the previously cesarean-experienced group had slightly higher FOC scores compared to the other two groups. Our findings showed either similarities [11,12] or conflicts [8,13] in this regard. In this study, we proposed a new cut-off value of FOC for the pregnant population based on the quartiles of the WDEQ-A scores of the participants. To the best of our knowledge, this is the first study to propose a threshold value of FOC for unselected Turkish-pregnant population. Previous studies have proposed cut-off values of FOC based on either the distribution of WDEQ-A scores [14-19] or their clinical representation [20]. Moreover, we calculated the sensitivity, specificity, and Cohen's Kappa statistics of the newly proposed cut-off value as calculated by Calderani et al. [20] to determine its concordance with the other threshold values described in the literature.

Several other research proposed different cut-off values to categorize FOC previously. Threshold values as 66 and 71 were proposed by Zar et al [21] and Fenwick et al [18] for Swedish and Australian populations respectively, using the same method as our study i.e. fourth quartile of the distribution of WDEQ-A Scores. Moreover, Rouhe et al [22] took the highest fifth percentile and proposed 100 as a new threshold value for the Finnish population. Ryding et al. [23] proposed 85 as a cut-off value for the Swedish population, by taking the highest 10th percentile of scores of participants. Even though there are various threshold values defined in the literature, the optimal cut-off value was proposed as 85 for different populations in various studies [14,16-17].

The proposed cut-off value as 69 FOC score in the current study was found lower compared to other cut-off values defined in the literature. This result also shows that the threshold of fear of the Turkish pregnant population was lower, suggesting they are less fearful about childbirth. The reason for this lower threshold and less fearfulness might be the results of having previous birth experiences, participating in psychotherapy programs for the preparation of delivery, etc.

In the current study, no association was observed between FOC levels and sociodemographic characteristics of the pregnant population, such as maternal age, educational level, occupation, and gestational age. Similar results have been published previously [12,15,24,25]. In contrast, it was found that women who have a low education level and those who are unemployed are likely to have high levels of FOC, while maternal age was not associated with FOC [26]. The high levels of FOC were reported to be associated with educational levels and unemployment in several studies [27,28]. Unemployment was defined as a sociodemographic risk factor related to FOC by Saisto et al. [29]. Employed women were reported to be likely to have a higher level of FOC by Toohill et al. 2014 [25]. It was revealed that higher maternal age was associated with higher levels of FOC [30]. However, educational level and occupation were not reported to be significant risk factors for maternal cesarean preference, while age was a significant factor in this regard [31]. In the present study, effects of economic or socioeconomic status on FOC were not investigated directly, occupation and educational levels and their relationship with FOC were analyzed instead. Previous studies identified their relationship with delivery mode preferences. Buyukbayrak et al. reported that higher monthly income was observed to be related to a cesarean delivery preference [31], while high or unspecified socioeconomic status was reported to be associated with first-time mothers (the nulliparous group) by Räisänen et al. [32].

In the current study, FOC levels were found to be associated with social (social-media effect) and obstetric-related (concern for disorder in the baby) risk factors for the formerly cesarean group; sociodemographic (educational level) and obstetric-related (fear of bleeding during delivery) risk factors for the vaginal delivery group; while social (social-media effect and fear of not able to return to the former social life) and obstetric-related (unplanned pregnancy, concern for disorder in baby after the delivery, and fear of bleeding during delivery) risk factors were the determinants of the FOC levels for the nulliparous group. In contrast, cesarean delivery preference was found to be associated with FOC and educational level between 10 and 13 years in the primiparous and multiparous groups; age over 35 years and depressive symptoms in the primiparous group; and previous cesarean delivery and negative birth experience in the multiparous group by Løvåsmoen et al. [33]. Similarly, regardless of mode of delivery groups, Konar et al. have found parity and a concern of disorder in the baby after delivery as the significant factors for FOC for unselected Turkish pregnant sample [34]. In addition, medical risk factors and previous negative birth experiences were previously recorded to be associated with elective cesarean delivery [1]. Furthermore, increasing parity was reported to be related to cesarean delivery preference in an earlier study [31]. On the other hand, having depression was found to be related to first-time mothers (the nulliparous group) by Räisänen et al. [32]. Undergoing training programs regarding pregnancy and delivery processes were not found to affect FOC levels in our study. Contrary to our results, women who did not receive training regarding pregnancy and delivery processes had two times higher FOC

scores than the women who received this training [24]. In a previous study, nulliparous women were reported to be likely to have a higher level of FOC compared to multiparous women [25]; however, in contrast, we did not find any such association for the entire study population in our study.

Numerous studies have investigated the relationship between FOC and delivery mode preferences [2,5]. Moreover, several studies have contributed to the literature by analyzing the effects of FOC on cesarean delivery [1,15,17]. This study differs from the previous studies by constructing study groups with actual mode of delivery rather than the preferred one. Thus, this study is unique since risk factors were determined based on the actual mode of delivery for each study group.

This study has some limitations. Firstly, part of this study was questionnaire-based; therefore, bias arising from this kind of study design cannot be ignored. Secondly, it was a single-center study; hence, these results cannot be generalized to the entire pregnant population of Turkey. Moreover, a limited discussion could be made for this current research since the risk factors studied are different compared to the existing literature. Therefore, the most similar risk factors were reviewed, matched with the current risk factors, and attempted to be discussed.

In the current study, the focus was on the statistical evaluation of newly-proposed cut-off value rather than its clinical relevance. Therefore, other tools for measuring FOC, such as the Fear of Birth Scale (FOBS), Tilburg Pregnancy Distress Scale, etc. were not utilized for comparison and determination of clinic usefulness. A new threshold value was proposed via the most common tool for FOC, W-DEQ, and its statistical concordance was assessed primarily. Hence, this present study should be considered as having a mainly statistics-based approach.

Conclusions

In conclusion, a comprehensive study, including the research of a wide range of multi-level factors of FOC, was conducted for evaluating the relationship between FOC and mode of delivery. Both sociodemographic and obstetric-related risk factors were observed to be associated with each study group. Furthermore, having the information regarding the highest prevalence of severe FOC in the previously cesarean groups training programs regarding delivery and pregnancy process are recommended to be organized to lower the FOC and increase the knowledge regarding these processes for the entire pregnant population, especially for pregnant who prefer cesarean delivery. It’s also planned to apply this scale for each unselected pregnant woman who was admitted to polyclinic right before the medical examination and specify the most fearful group via the newly proposed cut-off value for the Turkish population. Other than training programs, the most fearful group is being aimed directed to some therapy programs which are planned to be provided in the collaboration with the Psychiatry Department and psychological counselor of the hospital to help reduce the fear. Even online therapy programs and telephone-based counseling are considered to be conducted under pandemic conditions. Furthermore, couple-based therapy programs could also be organized in an attempt to reduce fear with the father's support. Moreover, we recommend the proposed cut-off value to be utilized for the Turkish population as it yielded effective diagnostic and concordance values with the previously proposed thresholds. Additionally, multi-center studies must determine the relationship between mode of delivery and FOC more precisely. Moreover, only Turkish pregnant women were included in this study. The inclusion of pregnant women of other nationalities would enable us to analyze the differences in various populations. Therefore, it can be seen as a future research option to investigate such a comparison of different populations.

Abbreviations

FOC: Fear of Childbirth
WDEQ-A: Wijma Delivery Expectancy Questionnaire
AOR: Adjusted Odds Ratio
FOBS: Fear of Birth Scale

Conflict of interest disclosure

There are no known conflicts of interest in the publication of this article. The manuscript was read and approved by all authors.

Compliance with ethical standards

Any aspect of the work covered in this manuscript has been conducted with the ethical approval of all relevant bodies and that such approvals are acknowledged within the manuscript.

References

1. Størksen HT, Garthus-Niegel S, Adams SS, Vangen S, Eberhard-Gran M. Fear of childbirth and elective caesarean section: a population-based study. *BMC Pregnancy Childbirth*. 2015 Sep 17;15:221. doi: 10.1186/s12884-015-0655-4
2. Preis H, Benyamini Y, Eberhard-Gran M, Garthus-Niegel S. Childbirth preferences and related fears - comparison between Norway and Israel. *BMC Pregnancy Childbirth*. 2018 Sep 5;18(1):362. doi: 10.1186/s12884-018-1997-5
3. 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 Obstet Gynecol Scand*. 2017 Aug;96(8): 907-920. doi: 10.1111/aogs.13138

4. Masoumi SZ, Kazemi F, Oshvandi K, Jalali M, Esmaeili-Vardanjani A, Rafiei H. Effect of Training Preparation for Childbirth on Fear of Normal Vaginal Delivery and Choosing the Type of Delivery Among Pregnant Women in Hamadan, Iran: A Randomized Controlled Trial. *J Family Reprod Health*. 2016 Sep; 10(3):115-121.
5. Takegata M, Haruna M, Morikawa M, Yonezawa K, Komada M, Severinsson E. Qualitative exploration of fear of childbirth and preferences for mode of birth among Japanese primiparas. *Nurs Health Sci*. 2018 Sep;20(3):338-345. doi: 10.1111/nhs.12571
6. Hildingsson I. Swedish couples' attitudes towards birth, childbirth fear and birth preferences and relation to mode of birth - a longitudinal cohort study. *Sex Reprod Healthc*. 2014 Jun;5(2):75-80. doi: 10.1016/j.srhc.2014.02.002
7. Dogra P, Sharma R. Preferences of pregnant women regarding mode of delivery: a questionnaire based study. *Int J Sci Reports*. 2017;3(11):292-295. doi: 10.18203/issn.2454-2156.IntJSciRep20174870
8. Phunyammalee M, Buayaem T, Boriboonhirunsarn D. Fear of childbirth and associated factors among low-risk pregnant women. *J Obstet Gynaecol*. 2019 Aug; 39(6):763-767. doi: 10.1080/01443615.2019.1584885
9. Wijma K, Wijma B, Zar M. Psychometric aspects of the W-DEQ; a new questionnaire for the measurement of fear of childbirth. *J Psychosom Obstet Gynaecol*. 1998 Jun;19(2):84-97. doi: 10.3109/01674829809048501
10. Korukcu O, Kukulu K, Firat MZ. The reliability and validity of the Turkish version of the Wijma Delivery Expectancy/Experience Questionnaire (W-DEQ) with pregnant women. *J Psychiatr Ment Health Nurs*. 2012; 19(3): 193-202. doi: 10.1111/j.1365-2850.2011.01694.x
11. Rouhe H, Salmela-Aro K, Halmesmäki E, Saisto T. Fear of childbirth according to parity, gestational age, and obstetric history. *BJOG*. 2009 Jan;116(1):67-73. doi: 10.1111/j.1471-0528.2008.02002.x
12. Mortazavi F, Agah J. Childbirth Fear and Associated Factors in a Sample of Pregnant Iranian Women. *Oman Med J*. 2018;33(6):497-505. doi: 10.5001/omj.2018.91
13. Okumus F, Sahin N. Fear of childbirth in urban and rural regions of Turkey: Comparison of two resident populations. *North Clin Istanb*. 2017 Oct 20;4(3):247-256. doi: 10.14744/nci.2017.46693
14. Lukasse M, Schei B, Ryding EL; Bidens Study Group. Prevalence and associated factors of fear of childbirth in six European countries. *Sex Reprod Healthc*. 2014 Oct;5(3):99-106. doi: 10.1016/j.srhc.2014.06.007
15. Nieminen K, Stephansson O, Ryding EL. Women's fear of childbirth and preference for cesarean section--a cross-sectional study at various stages of pregnancy in Sweden. *Acta Obstet Gynecol Scand*. 2009;88(7):807-13. doi: 10.1080/00016340902998436
16. Adams SS, Eberhard-Gran M, Eskild A. Fear of childbirth and duration of labour: a study of 2206 women with intended vaginal delivery. *BJOG*. 2012; 119(10): 1238-46. doi: 10.1111/j.1471-0528.2012.03433.x
17. Jespersen C, Hegaard HK, Schroll AM, Rosthøj S, Kjærgaard H. Fear of childbirth and emergency caesarean section in low-risk nulliparous women: a prospective cohort study. *J Psychosom Obstet Gynaecol*. 2014;35(4): 109-15. doi: 10.3109/0167482X.2014.952277
18. Fenwick J, Gamble J, Nathan E, Bayes S, Hauck Y. Pre- and postpartum levels of childbirth fear and the relationship to birth outcomes in a cohort of Australian women. *J Clin Nurs*. 2009 Mar;18(5):667-77. doi: 10.1111/j.1365-2702.2008.02568.x
19. Heimstad R, Dahloe R, Laache I, Skogvoll E, Schei B. Fear of childbirth and history of abuse: implications for pregnancy and delivery. *Acta Obstet Gynecol Scand*. 2006;85(4):435-40. doi: 10.1080/00016340500432507
20. Calderani E, Giardinelli L, Scannerini S, Arcabasso S, Compagno E, Petraglia F, Ricca V. Tocophobia in the DSM-5 era: Outcomes of a new cut-off analysis of the Wijma delivery expectancy/experience questionnaire based on clinical presentation. *J Psychosom Res*. 2019 Jan;116:37-43. doi: 10.1016/j.jpsychores.2018.11.012
21. Zar M, Wijma K and Wijma B. Pre- and postpartum fear of childbirth in nulliparous and parous women. *Scand J Behav Ther*. 2001;30(2);75-84.
22. Rouhe H, Salmela-Aro K, Toivanen R, Tokola M, Halmesmäki E, Saisto T. Obstetric outcome after intervention for severe fear of childbirth in nulliparous women - randomised trial. *BJOG*. 2013 Jan;120(1):75-84. doi: 10.1111/1471-0528.12011
23. Ryding EL, Wijma B, Wijma K, Rydhström H. Fear of childbirth during pregnancy may increase the risk of emergency cesarean section. *Acta Obstet Gynecol Scand*. 1998 May;77(5):542-7.
24. Beiranvand SP, Moghadam ZB, Salsali M, Majd HA, Birjandi M, Khalesi ZB. Prevalence of fear of childbirth and its associated factors in primigravid women: A cross-sectional study. *Shiraz E Med J*. 2017; 18(11):e61896. doi: 10.5812/semj.61896
25. Toohill J, Fenwick J, Gamble J, Creedy DK. Prevalence of childbirth fear in an Australian sample of pregnant women. *BMC Pregnancy Childbirth*. 2014 Aug 14;14: 275. doi: 10.1186/1471-2393-14-275.
26. Khwepeya M, Lee GT, Chen SR, Kuo SY. Childbirth fear and related factors among pregnant and postpartum women in Malawi. *BMC Pregnancy Childbirth*. 2018 Oct 3;18(1):391. doi: 10.1186/s12884-018-2023-7
27. Laursen M, Hedegaard M, Johansen C; Danish National Birth Cohort. Fear of childbirth: predictors and temporal changes among nulliparous women in the Danish National Birth Cohort. *BJOG*. 2008 Feb;115(3): 354-60. doi: 10.1111/j.1471-0528.2007.01583.x

28. Salomonsson B, Gullberg MT, Alehagen S, Wijma K. Self-efficacy beliefs and fear of childbirth in nulliparous women. *J Psychosom Obstet Gynaecol*. 2013 Sep; 34(3):116-21. doi: 10.3109/0167482X.2013.824418
29. Saisto T, Salmela-Aro K, Nurmi JE, Halmesmäki E. Psychosocial characteristics of women and their partners fearing vaginal childbirth. *BJOG*. 2001 May; 108(5):492-8. doi: 10.1111/j.1471-0528.2001.00122.x
30. Mazúchová L, Škodová Z, Kelčíková S, Rabárová A. Factors associated with childbirth-related fear among slovak women. *Cent Eur J Nurs Midwifery*. 2017;8(4): 742-748. doi: 10.15452/CEJNM.2017.08.0027
31. Buyukbayrak EE, Kaymaz O, Kars B, Karsidag AY, Bektas E, Unal O, Turan C. Caesarean delivery or vaginal birth: preference of Turkish pregnant women and influencing factors. *J Obstet Gynaecol*. 2010 Feb; 30(2):155-8. doi: 10.3109/01443610903461436
32. Räisänen S, Lehto SM, Nielsen HS, Gissler M, Kramer MR, Heinonen S. Fear of childbirth in nulliparous and multiparous women: a population-based analysis of all singleton births in Finland in 1997-2010. *BJOG*. 2014 Jul;121(8):965-70. doi: 10.1111/1471-0528.12599
33. Lindstad Løvåsmoen EM, Nyland Bjørgo M, Lukasse M, Schei B, Henriksen L. Women's preference for caesarean section and the actual mode of delivery - Comparing five sites in Norway. *Sex Reprod Healthc*. 2018 Jun;16:206-212. doi: 10.1016/j.srhc.2018.04.009
34. Konar NM, Özcan B, Taş A, Yağrıncalı E, Kaplan E, Erduran A, Kuzu BB, Akbari T, Songur Dagli S. Prevalence and Predictors of Fear of Childbirth in Unselected Pregnant Women: A Cross-Sectional Study. *J DEU Med*. 2021;35(1): 13-22. https://dergipark.org.tr/tr/download/article-file/1691148