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Specific childbirth fears before and after a prenatal childbirth preparation intervention

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ABSTRACT

Introduction: Fear of childbirth (FOC) is a common concern during pregnancy that can negatively affect women's well-being and childbirth experiences. Understanding how different dimensions of FOC relate to one another before and after prenatal interventions may help optimize supportive care. The aim of this study was to examine correlations among specific domains of childbirth fear before and after participation in a prenatal childbirth preparation program.

Methods: This prospective longitudinal study included 97 pregnant women with uncomplicated pregnancies who participated in a one-month prenatal childbirth preparation program between November 2024 and February 2025. The intervention consisted of theoretical education and physical exercise sessions, held twice a week. FOC was assessed before and 7 days after the intervention using the Childbirth Fear Questionnaire (CFQ). Spearman correlation coefficients were used to examine relationships among CFQ subscales.

Results: Participants had a mean age of 30.5 ± 3.8 years and a mean gestational age of 32.5 ± 3.0 weeks at the time of study entry. Before the intervention, the total CFQ score was most strongly correlated with fear of medical interventions (p = 0.823). After the intervention, the strongest association shifted to fear of pain during vaginal birth (p = 0.859).

Conclusion: Following participation in the prenatal childbirth preparation program, the pattern of associations among childbirth fears changed, with fear of medical interventions becoming less dominant and fear of pain during vaginal delivery emerging as a central concern. These findings suggest that prenatal interventions may influence not only the intensity but also the structure of childbirth-related fears, highlighting the importance of addressing multiple fear dimensions simultaneously.

Keywords: Fear of childbirth; pregnant women; prenatal intervention; prenatal anxiety

INTRODUCTION

Fear of childbirth (FOC) has become an increasingly common obstetric issue that negatively affects women's health and their childbirth experience (1). The French psychiatrist Louis-Victor Marcé first described the FOC back in 1858, while the term FOC was later defined in Sweden in 1981 and described as intense anxiety that can impair a pregnant woman's daily functioning. During the 1990s, Finnish researchers further broadened the concept of FOC, describing it as a health problem associated with anxious or phobic reactions accompanied by physical symptoms, nightmares, concentration difficulties, and more frequent requests for cesarean delivery (2,3). The prevalence of FOC varies across studies, ranging globally from 3.7% to 43% (4,5). This wide range can primarily be attributed to the use of different methodological approaches and the lack of standardized instruments for measuring this phenomenon (2). Research has shown that the prevalence of FOC is higher in underdeveloped and less developed countries compared to developed countries (5). FOC is classified as primary fear, which occurs in first-time mothers, and secondary fear, which develops in multiparous women (6). The causes of fear differ between these two groups: Previous negative childbirth experience is the strongest predictor of FOC among multiparous women, while in primiparous women, the strongest predictors include the unpredictability of childbirth, fear of harming the baby, fear of not being able to cope with the pain, and fear of a fatal outcome (7). According to available studies,

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the prevalence of FOC among first-time mothers ranges from 6.7% to 74.6%, while among multiparous women, it ranges from 4.3% to 33.6% (8,9). The consequences of both primary and secondary fear include avoidance of pregnancy, higher rates of legal abortion, increased risk of maternal request for cesarean section, emergency cesarean section, numerous interventions during labor, pregnancy complications, and greater use of pain medications (3,6). In light of the changes described and the potential risk factors, it is essential to provide high-quality prenatal care to prevent trauma, adverse health outcomes for the mother and newborn, and to restore trust in the healthcare system. The primary goal of prenatal childbirth preparation should be overcoming the FOC, whose etiology is multifactorial and whose incidence is increasing (10). Identifying pregnant women with FOC enables healthcare professionals to offer appropriate interventions based on support, respect, and protection of their mental health, thereby reducing the risk of future negative outcomes (11). The aim of this study is to examine the correlation between different categories of FOC in pregnant women before and after the implementation of prenatal childbirth preparation intervention.

METHODS

This prospective, longitudinal, pilot intervention study included pregnant women with uncomplicated pregnancies who attended a prenatal childbirth preparation program conducted between November 2024 and February 2025 at the Institute for Women's and Maternity Health Care of the Sarajevo Canton. Ethical approval was obtained before the study began. The sample consisted of pregnant women who received routine prenatal care at the Institute during the study period and were recruited using a random sampling method. Inclusion criteria were: Age ≥18 years, singleton uncomplicated pregnancy confirmed by a licensed gynecologist, gestational age of at least 20 weeks, and provision of written informed consent. Women were eligible regardless of parity or physical fitness level. The intervention program lasted one month and consisted of combined theoretical education and supervised physical exercise. Sessions were held twice weekly and lasted 90 min, with 45 min dedicated to theoretical education and 45 min to physical activity. Exercise intensity and duration were tailored to individual fitness levels and conducted in accordance with the recommendations of the American College of Obstetricians and Gynecologists (12). The educational sessions covered pregnancy, childbirth, and the postpartum period and were delivered by a multidisciplinary team, including a midwife, gynecologist, physiotherapist, nutritionist, and nurse. FOC was assessed using the Childbirth Fear Questionnaire (CFQ), which was administered before the start of the intervention and seven days after completion of the program. The CFQ consists of nine subscales that assess fear of loss of sexual pleasure/attractiveness, fear of pain from a vaginal birth, fear of medical interventions, fear of embarrassment, fear of harm to baby, fear of cesarean birth, fear of insufficient pain medication, fear of mom or baby dying, and fear of bodily damage from the vaginal birth (13,14). Permission to use the instrument was obtained from the original author.

Approval for conducting this research was obtained from the Ethics Committee of the Public Institution Institute for Women's and Maternity Health Care of Sarajevo Canton.

After collecting data using a standardized questionnaire, a database was created in Microsoft Excel, which served as the basis for the statistical analysis performed in the Statistical Package for the Social Sciences 28.0 statistical software. The results are presented using descriptive statistical parameters and Spearman correlation coefficients due to the ordinal nature of the scales. The correlation coefficient factors were categorized according to the following ranges: 0.0 to ±0.10 – no practically significant relationship; ±0.10 to ±0.19 – very weak relationship; ±0.20 to ±0.35 – weak relationship; ±0.351 to ±0.59 – moderate relationship; ±0.60 to ±0.79 – strong relationship; and ±0.80 to 1.0 – very strong relationship. The results are presented in tables, and the accepted significance level for differences was set at $p < 0.05$.

RESULTS

A total of 97 pregnant women participated in the study. The mean age of the participants was 30.5 ± 3.8 years, with ages ranging from 21 to 39 years (Table 1). The mean gestational age at study entry was 32.5 ± 3.0 weeks, with a range of 22–36 weeks of pregnancy (Table 2). With regard to obstetric characteristics, most participants were primiparous (n = 76; 78.3%). Eighteen women (18.6%) were in their second pregnancy, two (2.1%) in their third, and one participant (1.0%) in her fourth pregnancy. Among participants whose current pregnancy was not their first (n = 21), 15 (71.4%) reported one previous live birth, one participant (4.8%) reported two live births, and five participants (23.8%) reported no live births due to previous spontaneous miscarriages (Table 3). This distribution indicates a predominance of 1st-time mothers within the study sample. Before the intervention, the total CFQ score demonstrated very strong correlations with most individual fear domains. The strongest association was observed between the total score and fear of medical interventions

TABLE 1. Age structure of the respondents

Variable	Mean±SD	Minimum	Maximum
Age	30.5±3.8	21	39

SD: Standard deviation

TABLE 2. Gestational age of the respondents

Variable	Mean±SD	Minimum	Maximum
Gestational age (weeks)	32.5±3.0	22	36

SD: Standard deviation

TABLE 3. Obstetric characteristics of the respondents

Variable	Category	n	%
Number of pregnancies (including current pregnancy; n=97)	First pregnancy	76	78.30
	Second pregnancy	18	18.60
	Third pregnancy	2	2.10
	Fourth pregnancy	1	1.00
Number of previous live births (excluding current pregnancy; n=21)	No children	5	23.80
	One child	15	71.40
	Two children	1	4.80

n: Number, %: Percentage

(p = 0.823; p < 0.001), followed by fear of embarrassment (p = 0.785; p < 0.001) and fear of pain from a vaginal birth (p = 0.781; p < 0.001). Strong correlations were also found for fear of loss of sexual pleasure or attractiveness (p = 0.770; p < 0.001), fear of body damage from a vaginal birth (p = 0.740; p < 0.001), and fear of cesarean birth (p = 0.723; p < 0.001). These findings indicate that, before the intervention, overall FOC was closely linked to concerns related to medical procedures, physical vulnerability, and personal dignity. Several strong interrelationships were also observed among individual fear domains before the intervention. Fear of harm to the baby showed a strong association with fear of mom or baby dying (p = 0.706; p < 0.001), highlighting the close connection between concerns for fetal safety and life-threatening outcomes. In addition, fear of pain from a vaginal birth was strongly associated with fear of insufficient pain medication (p = 0.612; p < 0.001) and fear of medical interventions (p = 0.616; p < 0.001), suggesting that pain-related fears were embedded within broader concerns about medical management during labor. Following completion of the intervention program, strong correlations between the total CFQ score and individual fear domains persisted (Table 4). The strongest post-intervention association with the total score was observed for fear of pain from a vaginal birth (p = 0.859; p < 0.001), while the association with fear of medical interventions, although still strong, was reduced compared with the pre-intervention assessment (p = 0.730; p < 0.001). This shift indicates a change in the prominence of specific fear domains within the overall fear structure. Post-intervention analyses also showed that fear of pain from a vaginal birth remained strongly associated with fear of body damage from a vaginal birth (p = 0.694; p < 0.001), whereas associations between emotional and social fears, such as fear of shame and fear of loss of sexual attractiveness, were generally weaker than those observed before the intervention. Fear of harm to baby continued to show a strong relationship with fear of mom or baby dying (p = 0.590; p < 0.001), although this

TABLE 4. Correlation matrix of the total fear of childbirth scale and its subscales before a prenatal childbirth preparation intervention

Fear domains	Fear of loss of sexual pleasure/ attractiveness	Fear of pain from a vaginal birth	Fear of medical interventions	Fear of embarrassment	Fear of harm to baby	Fear of cesarean birth	Fear of mom or baby dying	Fear of insufficient pain medication	Fear of body damage from a vaginal birth
Total score									
Rho	0.770	0.781	0.823	0.785	0.601	0.723	0.689	0.687	0.740
p	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fear of loss of sexual pleasure/attractiveness									
Rho	1	0.560	0.612	0.663	0.215	0.588	0.390	0.467	0.547
p		<0.001	<0.001	<0.001	0.035	<0.001	<0.001	<0.001	<0.001
Fear of pain from a vaginal birth									
Rho	0.560	1	0.616	0.564	0.414	0.498	0.438	0.612	0.536
p	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fear of medical interventions									
Rho	0.612	0.616	1	0.544	0.452	0.581	0.515	0.617	0.506
p	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fear of embarrassment									
Rho	0.663	0.564	0.544	1	0.332	0.556	0.459	0.511	0.533
p	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001
Fear of harm to baby									
Rho	0.215	0.414	0.452	0.332	1	0.277	0.706	0.277	0.435
p	0.035	<0.001	<0.001	<0.001		0.006	<0.001	0.006	<0.001
Fear of cesarean birth									
Rho	0.588	0.498	0.581	0.556	0.277	1	0.411	0.471	0.460
p	<0.001	<0.001	<0.001	<0.001	0.006		<0.001	<0.001	<0.001
Fear of mom or baby dying									
Rho	0.390	0.438	0.515	0.459	0.706	0.411	1	0.383	0.437
p	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001
Fear of insufficient pain medication									
Rho	0.467	0.612	0.617	0.511	0.277	0.471	0.383	1	0.436
p	<0.001	<0.001	<0.001	<0.001	0.006	<0.001	<0.001		<0.001
Fear of body damage from a vaginal birth									
Rho	0.547	0.536	0.506	0.533	0.435	0.460	0.437	0.436	1
p	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	

Rho: Spearman's rank correlation coefficient, P<0.05

TABLE 5. Correlation matrix of the total fear of childbirth scale and its subscales after a prenatal childbirth preparation intervention

Fear domains	Fear of loss of sexual pleasure/ attractiveness	Fear of pain from a vaginal birth	Fear of medical interventions	Fear of embarrassment	Fear of harm to baby	Fear of cesarean birth	Fear of mom or baby dying	Fear of insufficient pain medication	Fear of body damage from a vaginal birth
Total score									
Rho	0.501	0.859	0.730	0.673	0.639	0.604	0.690	0.555	0.786
p	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fear of loss of sexual pleasure/attractiveness									
Rho	1	0.326	0.255	0.390	0.195	0.247	0.384	0.345	0.349
p		0.001	0.0012	<0.001	0.056	0.0015	<0.001	0.001	<0.001
Fear of pain from a vaginal birth									
Rho	0.326	1	0.566	0.593	0.481	0.463	0.483	0.429	0.694
p	0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fear of medical interventions									
Rho	0.255	0.566	1	0.515	0.391	0.599	0.417	0.438	0.507
p	0.012	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fear of embarrassment									
Rho	0.390	0.593	0.515	1	0.263	0.366	0.360	0.362	0.425
p	<0.001	<0.001	<0.001		0.009	<0.001	<0.001	<0.001	<0.001
Fear of harm to baby									
Rho	0.195	0.481	0.391	0.263	1	0.220	0.590	0.210	0.489
p	0.056	<0.001	<0.001	0.009		0.03	<0.001	0.039	<0.001
Fear of cesarean birth									
Rho	0.247	0.463	0.599	0.366	0.220	1	0.344	0.254	0.334
p	0.015	<0.001	<0.001	<0.001	0.03		0.001	0.012	0.001
Fear of mom or baby dying									
Rho	0.384	0.483	0.417	0.360	0.590	0.344	1	0.396	0.484
p	<0.001	<0.001	<0.001	<0.001	<0.001	0.001		<0.001	<0.001
Fear of insufficient pain medication									
Rho	0.345	0.429	0.438	0.362	0.210	0.254	0.396	1	0.404
p	0.001	<0.001	<0.001	<0.001	0.039	0.012	<0.001		<0.001
Fear of body damage from a vaginal birth									
Rho	0.349	0.694	0.507	0.425	0.489	0.334	0.484	0.404	1
p	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	

Rho: Spearman's rank correlation coefficient, $P<0.05$

association was less pronounced than at baseline (Table 5). Overall, the post-intervention correlation matrix reflects a more differentiated pattern of childbirth-related fears, with physical aspects remaining central and emotional or social dimensions showing reduced interdependence.

DISCUSSION

This study examined the interrelationships among specific domains of FOC before and after participation in a prenatal childbirth preparation intervention, using a correlational framework based on the CFQ. By focusing on how different fear dimensions cluster and change in relation to one another, rather than solely on fear intensity, the findings contribute to a more nuanced understanding of the multidimensional nature of FOC and its potential modulation following prenatal intervention. The sociodemographic and obstetric characteristics of the study sample are broadly consistent with previous research in this field. The mean age of participants was comparable to that reported in studies conducted in both high-income and middle-income settings. For example, Alhemedi et al. reported a mean maternal age of 31.6 years among pregnant women assessed for childbirth fear in Jordan, which closely aligns with the age profile observed in the present study (15). Such similarities suggest that the findings are not limited to an atypical age group and may reflect common patterns across diverse healthcare contexts. The predominance of primiparous women in the present sample is also consistent with existing literature, indicating that FOC is more frequently reported and more intense among 1st-time mothers. Garces et al., in a large multicenter cohort study conducted across low and middle-income countries, found that primiparous women constituted the largest subgroup of participants reporting childbirth-related fear (16). Before the intervention, overall FOC was strongly correlated with multiple CFQ subscales, indicating a highly interconnected fear structure. Fears related to medical interventions, pain from a vaginal birth, body damage from a vaginal birth, loss of sexual pleasure or attraction, and experiences of embarrassment

constituted the dominant dimensions of overall fear. These results are broadly consistent with the results of the original CFQ validation study by Fairbrother et al., who reported strong correlations between the total CFQ score and fear of physical injury, pain during vaginal birth, fear of medical interventions, and fear of loss of sexual pleasure or attraction (13). The consistency between the correlational structures observed in these two studies suggests that the underlying dimensions of FOC may be relatively stable across populations and cultural settings. Concerns related to fetal and maternal safety also emerged as a prominent component of fear in the present study. The strong association between fear of harm to the baby and fear of mom or baby dying reflects the central role of perceived safety outcomes in childbirth-related anxiety. Similar findings have been reported by Nasr et al., who identified fear of complications affecting the baby or mother as one of the most frequently expressed fears among pregnant women (17). The persistence of this association underscores the importance of addressing safety-related concerns within prenatal education and counseling. Finally, our results before intervention demonstrated strong associations between fear of pain from a vaginal birth and fear of insufficient pain medication, as well as fear of medical interventions. This pattern suggests that fears related to pain are not experienced in isolation but are embedded within a broader framework of concerns related to medical treatment and perceived control during childbirth. Similar associations were reported by Koelewijn et al., who found that higher levels of fear of labor pain were associated with an increased likelihood of labor induction and the use of pharmacological analgesia (18). Although their study did not include an intervention, these findings reinforce the conceptual link between fear of pain, expectations of medical care, and perceived need for assistance during childbirth.

After a prenatal childbirth preparation intervention, the correlational structure of FOC showed a discernible change in the relative prominence of specific fear domains. Although strong interrelationships among CFQ subscales remained, the total fear score was most strongly associated with fear of pain from a vaginal birth, while fear of medical interventions was no longer the dominant correlate observed before the intervention. This shift indicates a reorganization within the fear network, with pain-related concerns emerging as the central component of overall fear following program participation. At the same time, correlations involving fears related to medical procedures, shame, and loss of sexual attractiveness appeared less prominent within the overall structure, suggesting a relative attenuation of these domains. Importantly, the persistence of strong correlations across multiple subscales after the intervention underscores the multidimensional nature of FOC, indicating that different fear components remain closely interconnected even after structured prenatal preparation. These findings suggest that while the pattern of fear interrelationships may change following participation in a prenatal program, FOC continues to function as a complex and integrated psychological construct.

To our knowledge, no prior study has examined the correlation structure of childbirth fears following prenatal education, highlighting the novelty of these findings.

CONCLUSION

The present study provides insight into the interrelationships among specific domains of FOC before and after participation in a prenatal childbirth preparation intervention. The results showed that the implementation of a multidisciplinary intervention program, which integrates psychophysical, educational, and medical components of support, can significantly contribute to reducing the intensity of FOC and improving the emotional well-being of pregnant women. The strong correlations observed among CFQ subscales indicate that different dimensions of fear frequently co-occur and should be addressed in an integrated manner. These findings suggest that interventions targeting one aspect of fear may be associated with broader changes across multiple fear domains. Future studies with larger and more diverse samples are needed to further explore these patterns.

Limitations

Several limitations should be considered when interpreting the findings of this study. First, the use of a correlation matrix to examine fears related to childbirth after prenatal intervention limits direct comparability with previous research, as similar analytical approaches have rarely been applied in this area. Although this limits the extent to which the results can be contextualized within the existing literature, it also reflects the novel contribution of this study. Second, the relatively wide gestational age range at inclusion (22–36 weeks) may have influenced baseline fear levels and the observed correlational patterns, as FOC is known to vary across pregnancy. Because gestational age was not controlled for analytically, it should be regarded as a potential confounding factor. Finally, the predominance of primiparous women in the sample limits the generalizability of the findings to multiparous populations, whose childbirth fears may be shaped by prior birth experiences. Accordingly, caution is warranted when extrapolating these results to the broader obstetric population, and future studies should include more diverse samples and conduct stratified analyses.

DECLATARION OF INTERESTS

Authors declare no conflict of interests.

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