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To cite this article: Pelin Calpbınici, Pınar Uzunkaya Öztoprak, Fusun Terzioğlu & Yaprak Üstün (2023): The Fathers' Fear of Childbirth Scale: a Turkish validity and reliability study, Journal of Reproductive and Infant Psychology, DOI: [10.1080/02646838.2023.2225084](https://doi.org/10.1080/02646838.2023.2225084)

To link to this article: <https://doi.org/10.1080/02646838.2023.2225084>



Published online: 13 Jun 2023.



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The Fathers' Fear of Childbirth Scale: a Turkish validity and reliability study

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ABSTRACT

Purpose: Fathers' Fear of Childbirth Scale (FFCS) was developed specifically to measure fathers' fear of childbirth. The aim of this study was to investigate the Turkish validity and reliability of the FFCS.

Design: This study used a cross-sectional and methodological design.

Methods: The population of the study consists of 315 pregnant spouses who were registered at a hospital in Ankara, Turkey, between August 11 and 5 November 2021. The mean age of expectant fathers are 31.57 (5.88). After translating the FFCS to Turkish, a confirmatory factor analysis was conducted to examine its construct validity. Concurrent validity was established by examining the correlation between the FFCS-Turkish with the Fear of Birth Scale (FOBS) and the male version of the Childbirth Fear-Prior to Pregnancy scale (M-CFPP). Both internal consistency and test-retest reliability were examined for the FFCS-Turkish. Results: The scope validity index of the scale was found to be 0.96. Based on the results of confirmatory factor analysis, a two-factor structure with 17 items was verified. The fit indices were found to be $\chi^2 = 309.610$, $\chi^2/df = 2.76$, root mean square error = 0.075, goodness of fit index = 0.89, comparative fit index = 0.93, and adjusted goodness of fit index = 0.86. All fit indices were at good levels. A strong correlation was found between the FFCS and the FOBS and M-CFPP scales within the scope of concurrent validity. Cronbach's alpha reliability coefficient for the entire scale was 0.93. The test-retest reliability was also high.

Conclusions: The FFCS is a valid and reliable scale and measurement tool that can be used on Turkish expectant fathers.

ARTICLE HISTORY

Received 6 December 2022
Accepted 9 June 2023

KEYWORDS

Father; expectant father; fear of childbirth; validity; reliability

Introduction

Childbirth is a physiological event that has a social impact on the lives of women and their families. The act of childbirth can be perceived as a painful event in which unforeseen

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complications can develop and may even have a high risk of death. This negative perception can increase the level of stress, anxiety, and fear in women and their families about childbirth (Demšar et al., 2018; Hofberg & Brockington, 2000; Serçekuş et al., 2020; Stoll & Hall, 2013). Although it is considered a physiological process, one of the most important factors that results in childbirth being perceived as a stressful and uncontrollable event is fear of childbirth (Körükçü et al., 2017; Žigić Antić et al., 2019).

Fear of childbirth is cognitively, affectively, and psychologically defined as a negative evaluation of the act of childbirth or regarding the act of childbirth with anxiety and fear (Hofberg & Brockington, 2000; Stoll & Hall, 2013). Fear of childbirth can be mild or severe (Çiçek & Mete, 2015; Demšar et al., 2018; Körükçü et al., 2017; Lukasse et al., 2014; Žigić Antić et al., 2019). The prevalence of childbirth fear in pregnant women has been reported to range of 2–50% in studies (Fenwick et al., 2009; Nieminen et al., 2009; Rouhe et al., 2009). Just like mothers, fathers may also experience fear of childbirth (Hildingsson et al., 2014; Serçekuş et al., 2020). A limited number of studies reported that the prevalence of fear of childbirth in fathers ranged from 11% to 13.6% (Eriksson et al., 2006; Hildingsson et al., 2014).

Fathers may experience fears related to the health of their spouses and baby, including pain experienced by their spouses during labour, the course of childbirth, inadequate medical care, insecurity about their spouses' ability to cope with childbirth, and their spouses' ability to cope with interventions applied during childbirth (Eriksson et al., 2006; Hanson et al., 2009; Hildingsson et al., 2014). (Eriksson et al., 2006) showed that fathers have childbirth-related fears such as the birth of a sick or disabled baby, the death of the spouse or baby, injury to the spouse during childbirth, the spouse suffering considerably during childbirth, erroneous interventions during childbirth, negative treatment by the medical staff towards the spouse, and not being able to provide adequate support to the spouse. (Greer et al., 2014) stated that childbirth was fraught with uncertainty for fathers, which created a lack of confidence and increased levels of fear.

Mothers can also be directly affected by fathers' fear of childbirth. Given that a couple may be affected by each other when deciding the mode of delivery (Torloni et al., 2013), fear of childbirth experienced by fathers can influence women to opt for caesarean delivery (Nilsson et al., 2018; Pang et al., 2007). Fathers play a key role in supporting their spouses during pregnancy, childbirth, and after birth. The needs of fathers in the perinatal period are equally important as those of the mother (Eriksson et al., 2006). Fear of childbirth experienced by fathers negatively affects their mental health and causes stress, anxiety, and depression as well as inadequate physical support for their spouses (Hildingsson et al., 2014). Even when wanted and planned, fatherhood can be a difficult transition period for some men, negatively affecting their mental health and causing stress, anxiety, and depression. A father's experience with perinatal mental health conditions can impact his physical health, personal relationships, and parenting ability. Therefore, fathers' fears of childbirth are in need of greater exploration and understanding (Eriksson et al., 2006; Hildingsson et al., 2014; Nilsson et al., 2018). It is important that healthcare professionals accurately identify fear of childbirth and manage it with preventive or mitigation initiatives. In this respect, it is very important to define fathers' fear of childbirth. In the literature, the Wijma Delivery Expectancy/Experience Questionnaire (W-DEQ) and the Fear of Birth Scale (FOBS) have been used to measure fathers' fear of childbirth. The W-DEQ was developed to measure the fear of childbirth in pregnant women (Wijma et al., 1998). (Bergström et al., 2013) adapted W-DEQ for men. FOBS is

also used to measure the fear of pregnant women and their partners about childbirth. It is a visual analog scale consisting of a single two-item question (Haines et al., 2011). Although the scale can be useful in determining a general level of fear about childbirth, it has been reported that it does not provide a comprehensive assessment of the expectations associated with childbirth. (Ghaffari et al., 2021) developed the 'Fathers' Fear of Childbirth Scale' (FFCS) specifically to measure fathers' fear of childbirth. It is considered to be more convenient since the scale is short and developed specifically for men. Therefore, assessing the validity and reliability of FFCS in Turkey and planning appropriate interventions by evaluating fathers' fear of childbirth is important.

Purpose of research

This study aimed to conduct a validity and reliability study of the Fathers' Fear of Childbirth Scale (FFCS) in Turkish culture.

Methods

Study design and sample

The study population consisted of the spouses of pregnant women registered in a hospital in Ankara between August 11 and 5 November 2021. The study sample included 315 people who had at least an elementary school degree and were 18 years of age or older, who had no communication problems, whose spouses were 20 to 40 weeks pregnant, and who volunteered to participate in the study. There are different methods in the literature on sample selection in scale adaptation studies (Carpenter, 2018; Osborne & Costello, 2004; Tavşancıl, 2002). Studies recommend that the sample size be at least five or ten times the number of items on the scale (Tavşancıl, 2002) or at least 300 (Carpenter, 2018; Osborne & Costello, 2004). The sample size required for factor analysis is categorised as follows: 50 very bad, 100 bad, 200 suitable, 300 good, 500 very good, and 1000 excellent (Osborne & Costello, 2004). In the present study, 315 expectant fathers were included in the sample by taking into account different methods to increase the reliability of the data and considering that there may be dropouts.

Data collection tools

Data were collected using the Introductory Information Form, FFCS, Pre-Pregnancy FOBS (PPFOBS), and FOBS.

Introductory information form

Researchers developed the scale by reviewing the literature (Bergström et al., 2013; Haines et al., 2011; Hanson et al., 2009; Nilsson et al., 2018). There are a total of 38 questions that include socio-demographic characteristics of expectant fathers (age, education level, working status, and socioeconomic status, among others) and obstetric features of their spouses (gestational week, number of pregnancies, previous mode of delivery, and previous birth experience).

Fathers' Fear of Childbirth Scale (FFCS)

The scale was developed by (Ghaffari et al., 2021) to determine expectant fathers' levels of fear associated with childbirth. The scale includes two sub-dimensions: the fear of the childbirth process (12 items) and the fear of the hospital (5 items) that affect fathers' fear of childbirth. FFCS is a 5-point Likert-type scale, and items are answered as follows: Strongly disagree (1), Disagree (2), Uncertain (3), Agree (4), and Strongly agree (5). The score that can be obtained from the scale ranges between 17 and 85. Scores of 17–35, 36–54, and > 55 indicate low, moderate, and high fear of childbirth, respectively. Higher scores indicate a higher level of fear associated with childbirth (Ghaffari et al., 2021). (Ghaffari et al., 2021) calculated the scale's Cronbach's alpha coefficient at 0.84. In the present study, the Cronbach's alpha value of the scale was found to be 0.92.

Childbirth Fear – Prior to Pregnancy (CFPP)

The scale was developed by (Stoll et al., 2016) to measure the pre-pregnancy fear of birth in young men and women. The Turkish validity and reliability study was carried out by (Uçar & Taşhan, 2018). The Turkish version of the scale was separated for women and men as Women CFPP (W-CFPP) and Male CFPP (M-CFPP). M-CFPP was used in the present study. M-CFPP is a 6-point Likert-type scale and consists of 10 items. Each item is scored between 1 and 6. The score that can be obtained from the scale ranges between 10 and 60. Higher scores indicate a higher level of fear associated with birth. The Cronbach's alpha coefficient for the scale was reported as 0.86 (Stoll et al., 2016). In the Turkish validity and reliability study, Cronbach's alpha values were calculated at 0.84 (Uçar & Taşhan, 2018). In the present study, the Cronbach's alpha value of the scale was found to be 0.86.

Fear of Birth Scale (FOBS)

The scale was developed by (Haines et al., 2011) to measure the fear of childbirth. Serçekuş et al. conducted a Turkish validity and reliability study on the scale (Serçekuş et al., 2020). Participants are asked to answer the question 'How do you feel about the impending birth right now?' and rate their feelings by marking them as (a) 'calm and anxious' and (b) 'no fear and severe fear' on two–100 mm lines. The cut-off value of the scale is determined at 50 points. Participants who score ≥ 50 are defined as those who have a fear of childbirth (Haines et al., 2011). The Cronbach's alpha coefficient of the original scale was reported as 0.91 (Haines et al., 2011). In the Turkish validity and reliability study, Cronbach's alpha coefficient was 0.92 (Serçekuş et al., 2020). In the present study, the Cronbach's alpha coefficient was calculated as 0.81.

Data collection

Expectant fathers who came to the obstetrics outpatient clinic with their spouse for a prenatal check-up were interviewed while sitting in the waiting area before the examination. Face-to-face interviews were held on weekdays, with expectant fathers included in the study. The questions in the data collection form were read to the expectant fathers, and the answers were filled out by the researcher. It took an average of 3–6 minutes for each expectant father to complete the FFCS, whereas the average time to fill out the entire data collection form was 7–10 minutes. Phone numbers of 50 father to be were

obtained for the test-retest analysis of the scale. After 3 weeks, the scale link was sent via WhatsApp via Google Forum. 43 fathers out of 50 need to be added to the scale again.

Cultural adaptation process

Cultural adaptation was made first in order to adapt the FFCS to Turkish. The cultural adaptation process consisted of language validation, scope validity, and a pilot scheme.

Language validation

The translation of the scale into Turkish was made by three experts in the field of English language and literature. These translations were then evaluated by the researchers, and the final translation was obtained after deciding on appropriate expressions (Alpar, 2020). The spelling and clarity of expressions on the scale were reviewed by an expert in the field of Turkish language and literature. The Turkish translation of the FFCS was then translated back into English by two independent bilingual experts who had never seen the original scale before. The similarities or inconsistencies between the original scale and the back-translated Turkish scale were evaluated by the researchers, and the Turkish version of the scale was finalised. Validity and reliability studies were then performed on the Turkish form.

Scope validity

Expert opinions were obtained from five faculty members who are experts in the field to evaluate the scope validity of the scale. The scale was sent to the experts by email. The (Davis, 1992) technique was used to evaluate expert opinions. Experts were asked to rate each scale item between 1 and 4 points to assess the suitability of scale items. According to this scoring, the items were rated as '1 - not suitable', '2 - somewhat suitable, the item needs to be rearranged', '3 - quite suitable but with minor changes required', and "'4 - highly suitable' (Davis, 1992). Expert opinions were then evaluated. The items rated by the experts as highly suitable were accepted without any changes, whereas the other items were revised. Based on the responses obtained from the experts, it was found that the scope validity index (SVI) of the scale items ranged from 0.80 to 1.00, and the total SVI of the scale was 0.96. In addition, the concordance of expert opinions was examined by Kendall's W analysis (Bowling & Ebrahim, 2005). No significant difference was found between the scores given by the experts (Kendall W. = 0.282; $p > .05$), and expert opinions were concordant.

Pilot scheme

After receiving feedback from the experts, a pilot study was conducted with 10 expectant fathers who were outside the population of the study to determine whether the scale items were clear, understandable, and applicable. These expectant fathers were not included in the sample. All items on the scale were clear and understandable; thus, no changes were made to the scale.

Psychometric analysis of the scale

Validity analysis

Confirmatory Factor Analysis (CFA) was used to evaluate the construct validity of the scale. The minimum values for fit indices are reported as follows: To conclude that the model is acceptable, the χ^2/df rate should be ≤ 5 , RMSEA (Root Mean Square Error of Approximation) should be ≤ 0.08 , the GFI (Goodness of Fit Index), CFI (Comparative Fit Index), AGFI (Adjusted Goodness of Fit Index), and the Incremental Fit Index should be above 0.80 (Kline, 2011).

In order to evaluate the criterion validity of the scale, concurrent validity was used. Concurrent Validity addresses the relationship between the results of a reliable and valid scale that is known to evaluate the situation to be tested and the results of the newly developed scale (Souza et al., 2017). In this context, the FOBS and M-CFPP scales, which were previously validated and reliable in Turkish, were used to measure the fear of childbirth.

Reliability analysis

Cronbach's α internal coefficient of consistency is the accepted measure for assessing the reliability of Likert type scales. The reliability coefficient should be close to 1 to conclude that the measurement tool is reliable (Kılıç, 2016; Polit & Beck, 2012). For this purpose, Cronbach's α coefficient was evaluated for the FFCS. Item total correlation coefficients were calculated to examine the relationship between the scores of items and the total scale score. The coefficient should be > 0.30 for each item to be acceptable (Polit & Beck, 2012). In addition, the test-retest method was used to evaluate the invariance of the scale over time. Previous studies emphasise that the scale should be applied again within a period of 2 to 6 weeks (Akgül, 2005; Polit & Beck, 2012). In this context, the scale was reapplied to 43 participants after 3 weeks. The time interval between the two measurements was appropriate, and the responses were consistent, which demonstrated the invariance of the scale over time.

Ethical considerations

Before data collection, ethical approval was obtained from the non-interventional ethics committee of the relevant university, and institutional permission was obtained from the hospital where the study was conducted. All participants in the study were informed about the study, and informed consent was obtained. The study was conducted in accordance with the principles of the Helsinki Declaration (2015).

Statistical analysis

Data were analysed using IBM SPSS 25.0 (IBM Corp., Armonk, NY) and AMOS 23.0 (Analysis of Moment Structures) programs. Descriptive statistics were presented as number, percentage, mean, and standard deviation. Q-Q plots and Skewness and Kurtosis tests were used to check whether the data conformed to a normal distribution. According to (Shao, 2002), data are considered to show normal distribution when skewness and kurtosis

values are between ± 3 . Accordingly, the data in the present study were normally distributed. CFA was performed for the construct validity of the scales, and concurrent validity was used to test the criterion validity. Cronbach's alpha coefficient, item total score correlation, and test-retest method were performed for reliability analysis. $p < .05$ indicated statistical significance.

Results

The descriptive characteristics of the expectant fathers are given in Table 1. A total of 64.1% of expectant fathers who participated in the study were aged 25–34 years (mean age, 31.57 ± 5.88 years). Furthermore, 36.8% of the participants were high school graduates, 84.1% had a nuclear family, 63.5% had an income equal to their expenses, 34.3% had only one living child, and 80.3% preferred vaginal delivery as the mode of delivery. When

Table 1. Descriptive characteristics of the expectant fathers ($n = 315$).

Characteristics	n (%)
Age, y	
<25	26 (8.3)
25–34	202 (64.1)
>35	87(27.6)
Age, Mean (SD)	31.57 (5.88)
Education level	
Primary school	104 (33.0)
High school	116 (36.8)
University and above	95 (30.2)
Occupation	
Employed	293 (93.0)
Unemployed	22 (7.0)
Place of residence	
Province	253 (80.3)
District	47 (14.9)
Town/Village	15 (4.8)
Perceived income status	
Income lower than expenses	76 (24.1)
Income equal to expenses	200 (63.5)
Income higher than expenses	39 (12.4)
Family type	
Nuclear family (mother, father and child/children)	265 (84.1)
Extended family (mother, father, child/children, a grandmother and/or grandfather)	50 (15.9)
Number of children living	
No	129 (41.0)
1	108 (34.3)
2 and ↑	78 (24.8)
Planned pregnancy	
Yes	265 (84.1)
No	50 (15.9)
Preferred mode of delivery	
Vaginal	253 (80.3)
Cesarean section	62 (19.7)
Perspective on birth^a	
Scary	53 (16.8)
Natural process	184 (58.4)
Painful process	103 (32.7)
Risky condition	96 (30.5)

^aMultiple options were marked.

the expectant fathers' views on the act of childbirth were examined, it was found that 58.4% considered childbirth as a natural process, 32.7% saw childbirth as a painful process, and 30.5% saw childbirth a risky condition.

Socioeconomic and obstetric characteristics of the expectant mothers are given in Table 2. A total of 60.0% of the expectant mothers were aged 25–34 (mean age, 28.99 ± 6.74 years). Furthermore, 53.0% of expectant mothers were in the third trimester, 47.0% were in the second trimester, and the mean gestational week was 27.95 ± 4.73 . In addition, 55.6% of the expectant mothers were multiparous, 56.6% of those who had given birth before had vaginal deliveries, and 57.5% were afraid of childbirth.

Validity

CFA was performed using the AMOS (Analysis of Moment Structures) 23.0 program to evaluate the construct validity of the Turkish scale. The original version of the scale contained two sub-dimensions. Since a construct with known factors was tested in this study, the maximum likelihood technique was used in CFA. Structural equation modelling results according to CFA were significant at $P < .001$, and a construct with 17 items and 2 sub-dimensions was confirmed. The model fit indices were $\chi^2 = 309.610$, $\chi^2/df = 2.76$, RMSE = 0.075, GFI = 0.89, CFI = 0.93, and AGFI = 0.86 (Table 3). The path

Table 2. Some socio-economic and obstetric characteristics of expectant Mothers^a ($n = 315$).

Characteristics	n (%)
Age, y	
<25	87 (27.6)
25–34	189 (60.0)
>35	39 (12.4)
Age, Mean (SD)	28.99 (6.74)
Education level	
Primary school	120 (38.1)
High school	103 (32.7)
University and above	92 (29.2)
Occupation	
Employed	58 (18.4)
Unemployed	257 (81.6)
Weeks' gestation, Mean (SD)	27.95 (4.73)
Weeks' gestation	
20–27 hf (2nd trimester)	148 (47.0)
28 ve ↑ (3rd trimester)	167 (53.0)
Parity	
Primiparous	1140 (44.4)
Multiparous	184 (55.6)
Last mode of delivery ($n = 184$)^b	
Vaginal	99 (56.6)
Cesarean section	76 (43.4)
Previous delivery experience ($n = 184$)^b	
Difficult/Negative	59 (33.9)
Neither hard nor easy	70 (39.7)
Easy/Positive	46 (26.4)
Fear of childbirth condition	
Yes	181 (57.5)
No	134 (42.5)

^aData were collected from the expectant fathers.

^bWoman who have given birth before.

Table 3. Confirmatory factor analysis results of fit index for FFCS.

	Research finding	Acceptable fit criteria
χ^2/df	2.764	≤ 5
RMSEA	0.075	≤ 0.08
GFI	0.897	≥ 0.80
AGFI	0.860	≥ 0.80
CFI	0.936	≥ 0.80
IFI	0.937	≥ 0.80
TLI	0.922	≥ 0.80
NFI	0.904	≥ 0.80
SRMR	0.057	≤ 0.10

$\chi^2 = 309.610$, $df = 112$, $P < .001$

Abbreviations: χ^2 : Chi-Square; df : Degrees of Freedom; RMSEA: Root Mean Square Error of Approximation; GFI: Goodness of Fit index; AGFI: Adjusted Goodness of Fit Index; CFI: Comparative Fit Index; IFI: Incremental Fit Index; TLI: Tucker Lewis index; NFI: Normal Fit Index; SRMR: Standardized Root Mean Square Residual.

diagram created as a result of CFA is presented in Figure 1. As seen in the path diagram, the factor loads of scale items range from 0.35 to 0.79. As a result, it was determined that the scale with 17 items and 2 sub-dimensions was a valid tool for the Turkish population.

M-CFPP and FOBS were used for the concurrent validity of the scale. A statistically significant, positive, and strong correlation was found between the FFCS and M-CFPP ($r = 0.667$; $p < .001$) and FOBS ($r = 0.549$; $p < .001$) total scores (Table 4).

Reliability

Cronbach's alpha coefficient, item total score correlation, and test-retest method were performed for reliability analysis. Cronbach's alpha coefficient for the scale was found to be 0.93. Cronbach's alpha coefficients for the sub-dimensions were 0.91 (fear of the childbirth process) and 0.87 (fear of the hospital) (Table 5).

When the item total score correlation coefficients of the scale were examined, it was found that the correlation coefficients ranged from 0.319 to 0.787 and were acceptable (Table 5). The correlation between each item score and the total score was statistically significant ($p < .05$).

FFCS was reapplied to 43 participants after 3 weeks to assess invariance over time. The candidates for the retest analysis were selected by a simple random sampling method. Pearson Correlation analysis was used to examine the correlation between the pre-test and the retest. Accordingly, the correlation coefficient between the pre-test and retest results was $r = 0.994$ ($p < .05$). No significant relationship was found between the test-retest results in dependent groups ($t = 1.253$, $p > .05$). Statistically significant results obtained from the test-retest correlation analysis indicate that the scores of expectant fathers were subject to similar changes during both measurements, whereas the lack of a significant result between the dependent groups indicates that similar mean scores were obtained in both measurements (Table 6).

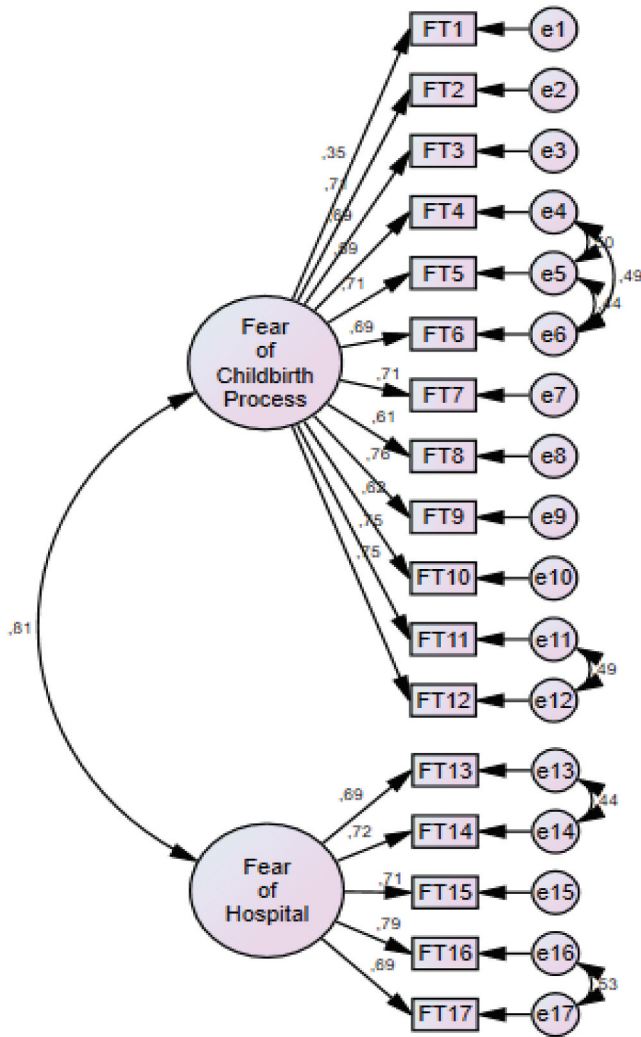


Figure 1. Path diagram belonging to the model.

Table 4. Correlation between FFCS with M-CFPP and FOBS scale mean scores.

	Fear of Childbirth Process Subscale		Fear of Hospital Subscale		Total Scale	
	r	P	r	P	r	P
M-CFPP	0.666	0.001 ^a	0.516	0.001 ^a	0.667	0.001 ^a
FOBS	0.576	0.001 ^a	0.370	0.001 ^a	0.549	0.001 ^a

Abbreviations: M-CFPP: Male-Childbirth Fear – Prior to Pregnancy; FOBS: Fear of Birth Scale.

^aP < .05.

The lowest score that can be obtained from the FFCS is 17, and the highest score is 85. A score of 17–35 indicates a low level of fear; a score of 36–54 points indicates a moderate level of fear; and a score of 55 and above indicates a high level of fear. In the present study, the lowest score obtained from the scale was 17 and the highest score was 83, and the mean score of the participants was 50.96 ± 14.34.

Table 5. Distribution of item mean scores and total item correlations of the FFCS.

Items	Mean (SD)	Factor Load	Total Item Correlation ^a	Cronbach Alfa
Fear of Childbirth Process				0.909
FT1	2.18 (1.05)	0.347	0.319	
FT2	3.24 (1.18)	0.705	0.665	
FT3	3.12 (1.14)	0.686	0.629	
FT4	2.98 (1.27)	0.588	0.633	
FT5	3.19 (1.19)	0.715	0.745	
FT6	3.11 (1.23)	0.693	0.726	
FT7	2.94 (1.26)	0.713	0.685	
FT8	2.96 (1.26)	0.607	0.582	
FT9	3.11 (1.29)	0.762	0.705	
FT10	3.02 (1.19)	0.621	0.595	
FT11	3.21 (1.23)	0.750	0.699	
FT12	3.22 (1.28)	0.746	0.690	
Fear of Hospital				0.869
FT13	3.14 (1.32)	0.693	0.719	
FT14	2.97 (1.32)	0.717	0.721	
FT15	3.29 (1.21)	0.711	0.547	
FT16	2.76 (1.30)	0.786	0.787	
FT17	2.52 (1.23)	0.689	0.697	
Total	50.96 (14.34)			0.928

^a*P* < 0.05.**Table 6.** Correlation analysis of test-retest scores of FFCS.

	Mean (SD)	t test/ <i>P</i>	r/ <i>P</i>
First Implementation	50.13 (14.12)	1.253/0.217	0.994/0.001
Second Implementation	49.83 (13.91)		

Abbreviations: t Test= Paired Sample t Test, r=Correlation between two measurements.

Discussion

This study was conducted to adapt the FFCS developed by (Ghaffari et al., 2021) to Turkish. Psychometric characteristics were evaluated on a sample of Turkish expectant fathers, and it was determined that the FFCS was a valid and reliable tool for Turkish expectant fathers.

Factor loads and scale fit indices were examined in CFA to test the construct validity of the Turkish version. It is stated in the literature that the factor loads of scale items should be at least 0.30, and items with a factor load below this value should be removed from the scale (Jak & Cheung, 2020; Xia & Yang, 2019). According to the results of the CFA, the factor loads of the items in the FFCS Turkish version were between 0.35 and 0.79. Therefore, no items were removed from the scale. The fit indices of the model were $\chi^2 = 309.610$, $\chi^2/df = 2.76$, RMSE = 0.075, GFI = 0.89, CFI = 0.93, and AGFI = 0.86. In line with these results, it was concluded that the model showed acceptable fit. The CFA fit indices for the original scale were reported to be $\chi^2 = 287.670$, $df = 110$, RMSE = 0.083, CFI = 0.918, and AGFI = 0.824. The CFA results showed that the FFCS Turkish version with 17 items and two sub-dimensions is a valid measuring tool compatible with the original scale.

In order to evaluate the concurrent validity of the FFCS, FOBS and M-CFPP, which were previously validated and reliable in Turkey, were used. The purpose of a concurrent validity analysis is to evaluate the degree of correlation between the measured and expected results. The higher the degree of similarity of function (high correlation)

between the two scales, the more concurrent validity is ensured. A strong correlation between tests is expected when investigating concurrent validity. A correlation coefficient less than 0.3 indicates weak correlation, a coefficient of 0.3–0.5 indicates moderate correlation, and a coefficient greater than 0.5 indicates strong correlation (Heale & Twycross, 2015). In the present study, a strong correlation was found between the FFCS and the FOBS and M-CFPP scales. It was concluded that the FFCS Turkish version had high concurrent validity.

Cronbach's alpha coefficient, item total score correlation, and test-retest analysis were used to evaluate the reliability of the scale. The Cronbach's alpha coefficient of the Turkish version was found to be 0.93. The Cronbach's alpha coefficient of the original scale was reported as 0.84. Cronbach's alpha coefficient varies between 0.0 and 1.0. The scale is considered reliable if the coefficient is between 0.60 and 0.80 and highly reliable if it is > 0.80 (Büyüköztürk, 2018). Accordingly, the Cronbach's alpha coefficient calculated in the present study was above 0.80, and the scale was concluded to be highly reliable.

The item total score correlation coefficients calculated in the present study were between 0.319 and 0.787. Although there is no consensus in the literature on item total score correlation coefficients, an acceptable value is generally considered to be above 0.30. Items with a correlation coefficient between 0.30 and 0.40 are considered as 'good', and those with a correlation coefficient > 0.40 are considered 'very good' (Polit & Beck, 2012; Yasir Arafat et al., 2016; Zijlmans et al., 2019). Accordingly, the item total score correlation coefficients obtained for the Turkish version were within the desired range, and each item on the scale has a good distinctive power.

Another method for reliability analysis is the test-retest method (Büyüköztürk, 2018; Yasir Arafat et al., 2016). The correlation coefficient calculated between two measurements made on the same group is examined, and the invariance, or consistency, of the scale is determined. High correlation coefficients indicate that the test scores are consistent over time and that there is not much change between the two measurements (Büyüköztürk, 2018). The test-retest correlation coefficient for the FFCS Turkish version was found to be very high (0.994). These findings demonstrate that the reliability of the scale over time is quite high, and reliable results can be obtained in multiple applications of the scale.

Strengths and limitations

There are certain strengths and limitations of this study. The FFCS assesses the fear of the childbirth process and the hospital that affects expectant fathers' fear of childbirth. This allows the scale to further assess the fear of childbirth in expectant fathers. However, there are certain limitations to the study. Study data was collected from a single hospital, and the results were based on the self-reports of the participants.

Conclusion

FFCS is a valid and reliable measurement tool that can be used on Turkish expectant fathers. This measuring tool can be conveniently used to assess expectant fathers' fear of childbirth and to determine the factors affecting their fears.

Acknowledgments

The authors wish to thank all the participants to participate in this study.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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