

# Development of the Childbirth Fear Scale

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## ABSTRACT

**Objective:** This study was conducted to develop a scale for determining the childbirth fear of women of childbearing age.

**Methods:** The sample consisted of 680 women of childbearing age admitted to the outpatient clinics of the hospital between February and May 2019. Validity and reliability analyses such as the content validity, the construct validity, the internal consistency analysis, and the test–retest analysis were made for these items.

**Results:** The Content Validity Index value of the scale was found to be 0.84 for 34 items. The fact that the Content Validity Index value obtained was higher than the content validity ratio value indicated that the content validity of the draft scale was statistically significant. As a result of the exploratory factor analysis, it was determined that the scale consisted of 20 items and 3 factors. These factors were named “Fear of Pregnancy, Childbirth, and Maternal Role” (factor 1), “Fear of Inability to Meet Physical and Social Needs” (factor 2), and “Fear of Pregnancy and Childbirth problems” (factor 3). Cronbach’s alpha coefficient of the draft Childbirth Fear Scale was found to be 0.86 for the overall scale, 0.88 for factor 1, 0.76 for factor 2, and 0.75 for factor 3.

**Conclusion:** It was determined that the Childbirth Fear Scale was a valid and reliable measurement tool for determining women’s fears related to childbearing.

**Keywords:** Midwifery, reproducibility of results, scale development, fear, fear of childbirth, childbearing fear


## Introduction

Childbirth is an important phenomenon for a woman of childbearing age and has biological, psychological, social, and cultural effects on women.<sup>1-4</sup> Although women know and accept that childbirth is a physiological process, they are moving away from normal childbirth. One of the most important reasons for this is fear. Childbirth-related fear is called tokophobia, derived from Greek (tokos-childbirth, phobos-fear).<sup>5</sup>

While childbirth is a positive experience for some women, it is defined as a terrible action for other women. In this context, labor is a set of unknowns for many women and is a completely uncontrollable process. Therefore, every woman may experience the fear of childbirth.<sup>6</sup> The fear of childbirth may also occur before pregnancy. Of women, 13% state that they avoid becoming pregnant or postpone their pregnancy due to the fear of childbirth.<sup>7</sup> If this fear is experienced at a normal level, it is thought to be beneficial in terms of preparing a woman for childbirth, accepting the childbirth, and obtaining a satisfactory result. However, the level of fear of childbirth requiring medical intervention is considered to be a pathological condition.<sup>8</sup> Therefore, the level of fear of women of childbearing age should be determined. In order to diagnose fear, measurement tools with high validity and reliability should be developed, and strategies and care plans should be created to eliminate fear by making use of the data obtained from these measurement tools.

Different measurement tools are used to determine the fear of childbirth in the literature.<sup>9-15</sup> The most commonly used scales to determine fear in pregnancy and the postpartum period are versions A and B of Wijma’s Birth Experience/Expectation Scale,<sup>10,11</sup> Prenatal Self Evaluation Questionnaire,<sup>9</sup> and Delivery Fear Scale.<sup>14</sup> Women’s fear of childbirth during pregnancy is measured with Wijma Birth Scale version A, and in the early postpartum period, fear of childbirth with version B.<sup>10,11</sup>

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Other scales are planned for the postpartum period. When the literature is analyzed, we can find measurement tools to determine the fear of birth of women in pregnancy and the early postpartum period; however, without any pregnancy, the scale developed by Stoll et al<sup>13</sup> with Turkish validity and reliability done by Uçar and Tashan<sup>15</sup> seems to be a single scale to determine the fear of childbirth. It consists of 10 items and focuses on the pain to be conceived. Considering that this scale is insufficient to measure the biological, psychological, social, and cultural effects of having a child, the multidimensional “Fear of Childbirth Scale for Women in Fertility Age” was developed to determine the fear of childbirth in women of childbearing age.

## Methods

### Objective and Design of The Study

This research was conducted as a methodological study to develop the Childbirth Fear Scale (CFS).

### Study Population and Sampling Method

The population of the study consisted of women of childbearing age who applied to the Internal medicine outpatient clinic, Oral and Dental Health, Ear-Nose-and-Throat, Gynecology and Obstetrics, Dermatology, Orthopedics and Traumatology, Eye Health and Diseases, and Microbiology and Radiology Departments of a private hospital between February 2019 and May 2019. In scale development studies, the size of the sample consisting of 500-1000 cases is considered to be very good/excellent.<sup>16-18</sup> Accordingly, the construct validity and internal consistency analyses of the draft CFS were conducted using the data obtained from 500 women. The criterion-referenced validity stage of the CFS was performed with 150 women, and the scale was applied to 30 women at a 15-day interval to test its time invariance. The gender of the individuals included in the study should be female, they should be aged between 18 and 49 years, thus, be of childbearing age, they should not have communication problems, and be in the 36th week and below of gestation. Individuals were excluded from the study if they had a chronic disease, had problems with fertility, applied for an abortion, and were over 36 weeks of gestation.

### Data Collection Tools

The “Women Information Form” and the draft “CFS” were used for the socio-demographic characteristics of midwives developed by the researcher as a data collection tool.

**Women Information Form:** Data such as the age, marital status, income status, educational status, the presence of children, and childbirth information of women of childbearing age were obtained using this form developed by using the literature.<sup>12-15</sup>

**Childbirth Fear Scale Draft:** The scale is a 5-point Likert-type scale that is evaluated between strongly agree and strongly disagree. The development stages of the scale are included in the procedure section:

### Procedure

**Item Pool Creation Stage:** An item pool consisting of 50 statements was prepared by using the literature and the most frequently used scales to determine fear during the pregnancy-postpartum period.<sup>13-15</sup>

**Expert Opinion Stage:** Expert opinions were obtained to examine whether the statements in the measurement tool were suitable for measurement purposes. The content validity of the CFS was calculated using the Lawshe technique. The 10 experts whose opinions were received while determining the content validity of the scale consisted of 2 faculty members who had scale adaptation and development

studies in the field of health sciences, an obstetrician and gynecologist, 4 faculty members who had studied in the field of midwifery, a faculty member who had studied in the field of psychiatric nursing, a midwife, and a nurse. The draft scale was finalized according to expert opinions. The pre-application of the scale was performed after this stage.

**Pre-Application Stage:** The draft scale was applied to 30 women of childbearing age to determine the comprehensibility of the scale items. The validity and reliability analyses of the draft CFS without problems in terms of the features, such as the comprehensibility of the items, etc. were conducted. These data from 30 women were not used in the later stages of the study.

**Criterion-Referenced Validity of The Scale:** The scale is “The Childbirth Fear – Prior To Pregnancy Scale” developed by Stoll et al<sup>13</sup> with Turkish validity and reliability done by Uçar and Tashan.<sup>15</sup> After the scale was translated into Turkish, it was presented to the expert opinion, with the suggestions of the experts, the female and male forms of the scale were separated and the scale was prepared as the Female Pre-Pregnancy Fear of Birth Scale (WCF-PPS) and the Male Pre-Pregnancy Fear of Birth Scale (MCF-PPS) and was applied to 1100 students (543 women and 557 men) studying at a state university. The scale consists of 10 items and is in a 6-point Likert type. The items of the scale are “I am worried that the labor pain will be very severe,” “I think I cannot cope with the labor pain,” “I am afraid of panicking and not knowing what to do during labor pains and delivery,” “I am very afraid of the birth,” “I am worried about harming the baby during delivery,” “I am afraid of birth pain and losing my control during childbirth,” “I am afraid that a problem will occur during labor and delivery,” “Birth is unpredictable and risky,” “I am afraid of labor pains and the effects of childbirth on my body,” and “I am afraid that my body will never be the same after birth.”

Since it is the only scale that can measure the fear of childbirth in women without pregnancy, it was decided to use the WCF-PPS as the scale to be used in the concurrent validity of the draft scale during the criterion-dependent validity phase of the study.

### Statistical Analysis

The Statistical Package for the Social Sciences 20.0 (IBM SPSS Corp., Armonk, NY, USA) package program was used in the data analysis for the validity and reliability studies of the draft scale.

## Results

In this section, the results obtained from the methodological study performed to develop the CFS were addressed.

### Characteristics of Participants

The mean age of the women in the study was 27.71 (standard deviation (SD)=6.34), 57.4% of them (n=287) were married, 54.4% (n=272) were university graduates, 40% (n=204) had children, 51.8% (n=259) had previously experienced pregnancy and the childbirth process, and 17.6% (n=88) were pregnant.

### Results of Content Validity

#### Content Validity of the Scale

In the first stage of content validity, the content validity ratios and content validity index were used to evaluate expert opinions. The experts were asked to evaluate the comprehensibility of each item in the 50-item draft scale and the suitability of the thoughts of women of childbearing age about childbirth fear in terms of the content at varying degrees between 1 and (3: the item measures the targeted structure

[appropriate], 2: the item is related to the structure, but unnecessary [appropriate but should be corrected], 1: the item does not measure the targeted structure [not appropriate]). In the study, the analysis was started by accepting that the content validity ratio (CVR) value was 0.80 for 10 experts at a significance level of  $\alpha=0.05$ . The content validity ratios of each item were calculated based on the opinions of a total of 10 experts about the items. The CVR value of 34 items in the study was found to be 0.80 and above. Sixteen items (1, 3, 7, 8, 10, 11, 12, 15, 16, 19, 21, 24, 27, 29, 30, and 37) were removed from the draft measurement tool since their CVR value was below 0.80. After 16 items were removed from the scale, the content validity index value was obtained to be 0.84. Upon comparing the Content Validity Index (CVI) and CVR values, the fact that the obtained CVI (0.84) value was higher than the CVR (0.80) value ( $CVI > CVR$ ) demonstrated that the content validity of the measurement tool was statistically significant. Thus, the analysis was continued with the 34 items remaining after the content validity analysis of the measurement tool.

### Construct Validity of the Scale

The construct validity of the CFS draft, for the content validity of which expert opinions were received, was investigated by factor analysis. The principal component analysis and varimax rotation method were used to examine the factor structure. Accordingly, the fact that the Kaiser–Meyer–Olkin (KMO) value in the study was 0.88,  $\chi^2=3673.824$  in Bartlett's test of sphericity, the  $df$  was 190 ( $P < .001$ ), and the anti-image  $r$ -values were between 0.71 and 0.94 demonstrated that the scale was suitable for factor analysis. As is reflected in Figure 1, the number of points before the eigenvalue of the factor load decreases below 1 indicating the factor number of the measurement tool. The number of factors was determined to be 3 sub-dimensions. Since the eigenvalue of the other 4 factors was observed to be below 1, the factor load values of the draft CFS were accepted as 0.45, and a structure consisting of 3 sub-dimensions and 20 items which explain 51.93% of the total variance was reached. In the factor analysis, the eigenvalues of the first 3 factors were determined

to be between 1.61 and 5.91. The variance of the same 3 factors varied between 8.02% and 29.54%, and they explained 51.93% of the total variance. The factor analysis results of the 3-factor structure are presented in Table 1. At the final stage, the variables loading the factors were examined. The common points between the variables were determined and named with the names that expressed the meaning they wanted to emphasize in the best way. When factor 1 was examined in terms of the content, it was observed that items 15, 18, 21, 22, 23, 25, 30, 32, and 33 were items expressing women's fear of pregnancy, childbirth, and maternal role, and, therefore, this sub-dimension of the scale was called "Fear of Pregnancy, Childbirth, and Maternal Role." Upon examining items 16, 17, 24, 26, 31, and 34 in factor 2, they were observed to indicate women's fears of inability to meet physical and social needs during pregnancy, childbirth, and the postpartum period. Therefore, this sub-dimension of the scale was named "Fear of Inability to Meet Physical and Social Needs." When items 5, 7, 10, 20, and 27 in factor 3 were examined, the items were observed to express women's fears of problems that may occur during pregnancy, childbirth, and the postpartum period, and this sub-dimension was called "Fear of Pregnancy and Childbirth Problems." Furthermore, the mean score obtained from the 20-item scale was observed to be 3.6 ( $SD=0.62$ ). The total score average of the sub-dimension named the Fear of Pregnancy, Childbirth, and Maternal Role was found to be 3.9 ( $SD=0.80$ ), the total score average of the sub-dimension of the Fear of Inability to Meet Physical and Social Needs was found to be 3.6 ( $SD=0.85$ ), and the total score average of the sub-dimension of the Fear of Pregnancy and Childbirth Problems was found to be 3.0 ( $SD=0.85$ ).

### Criterion-Referenced Validity of the Scale

In the study, the scores of the WCF-PPS and the draft CFS applied simultaneously to 150 women were compared. Moreover, the average score of the WCF-PPS was determined to be 3.05 ( $SD=0.44$ ), and the average score of the CFS was determined to be 3.46 ( $SD=1.21$ ). A positive linear and statistically significant relationship was found between both

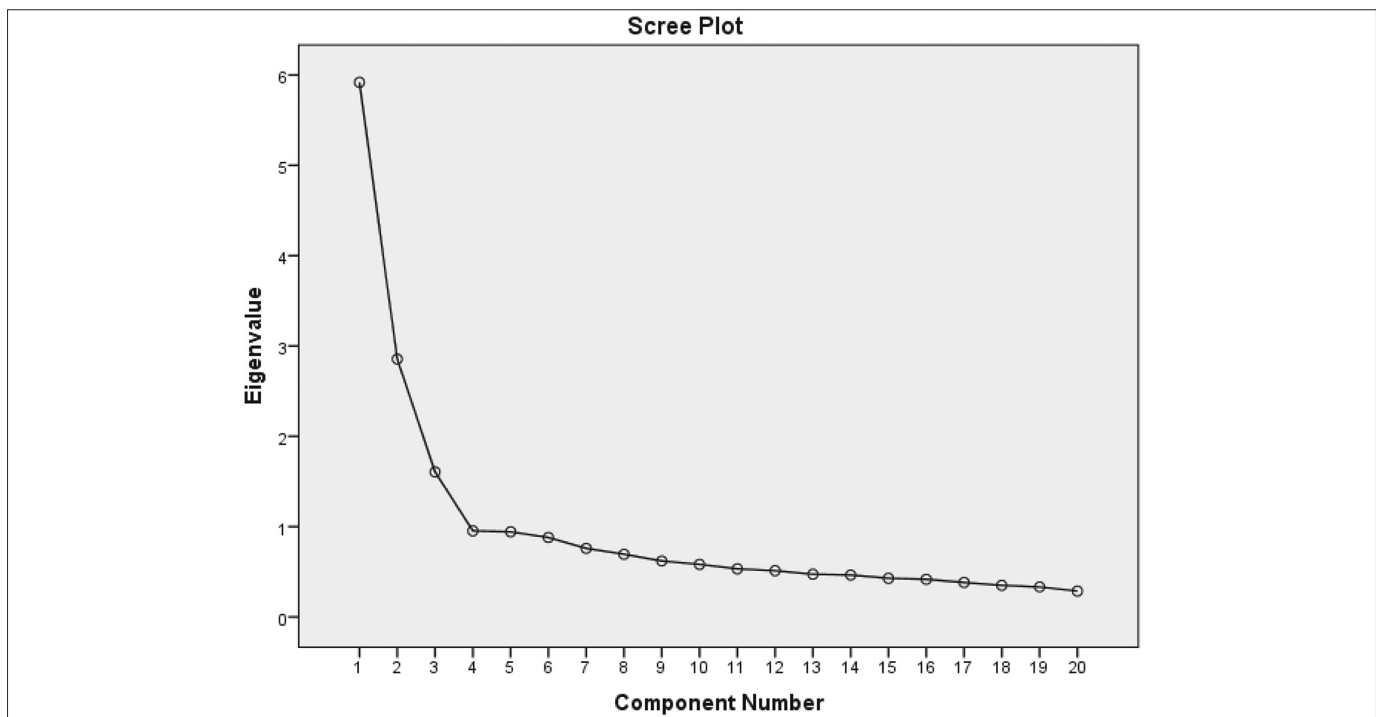


Figure 1. The scree plot shows the number of factors.

**Table 1.** Factor Loadings of the Childbirth Fear Scale (n= 500)

Items	Factor Loadings		
	1*	2*	3*
25. I think that growing a child inside me is a reward	0.79		
18. I think I will be happy to become pregnant.	0.79		
33. I like watching parents when they are with their children.	0.76		
23. I believe that pregnancy will be satisfying for me.	0.72		
32. I believe that I will be a good mother.	0.72		
21. I can overcome disorders that may occur during my pregnancy.	0.68		
15. I can talk about our baby, who will be born, with my husband/partner.	0.59		
30. I think that my relatives (mother, aunts, neighbors.....) will take care of my baby who will be born.	0.55		
22. I believe that pregnancy will be a disappointment for me.	0.51		
31. I am afraid of not being able to care enough of the baby.		0.67	
24. I believe that I cannot talk to my husband/partner about sexual needs during pregnancy.		0.66	
17. I am afraid that my husband/partner will not help with housework after the baby is born.		0.63	
16. I believe that my husband/partner will criticize me during my pregnancy.		0.63	
26. I am afraid of being perceived as a bad mother.		0.62	
34. I am afraid that I will not be able to return to my work after birth.		0.53	
7. I think that childbirth stress will be much more than I can cope with.			0.78
5. I think I cannot cope with labor pain.			0.77
20. I believe that I will have difficulties with getting used to changes that will occur due to my pregnancy.			0.63
10. I am concerned about problems that may occur at childbirth.			0.61
27. I often think of problems that may be in the baby.			0.57
Variance (%)	29.59	14.28	8.02
Cumulative variance (%)		51.9	

\*Numbers 1, 2, and 3 indicate factors.

**Table 2.** Comparison of the Childbirth Fear Scale (CFS) and Women Childbirth Fear–Prior to Pregnancy Scale (WCF-PPS) Scores (n= 150)

Measurement Tool	Mean	±SD	Correlation Between the 2 Measurement Tool			
			r	R <sup>2</sup>	t	P
WCF-PPS	3.05	0.44	0.53**	0.28	4.87	< .001
CFS	3.46	1.21				

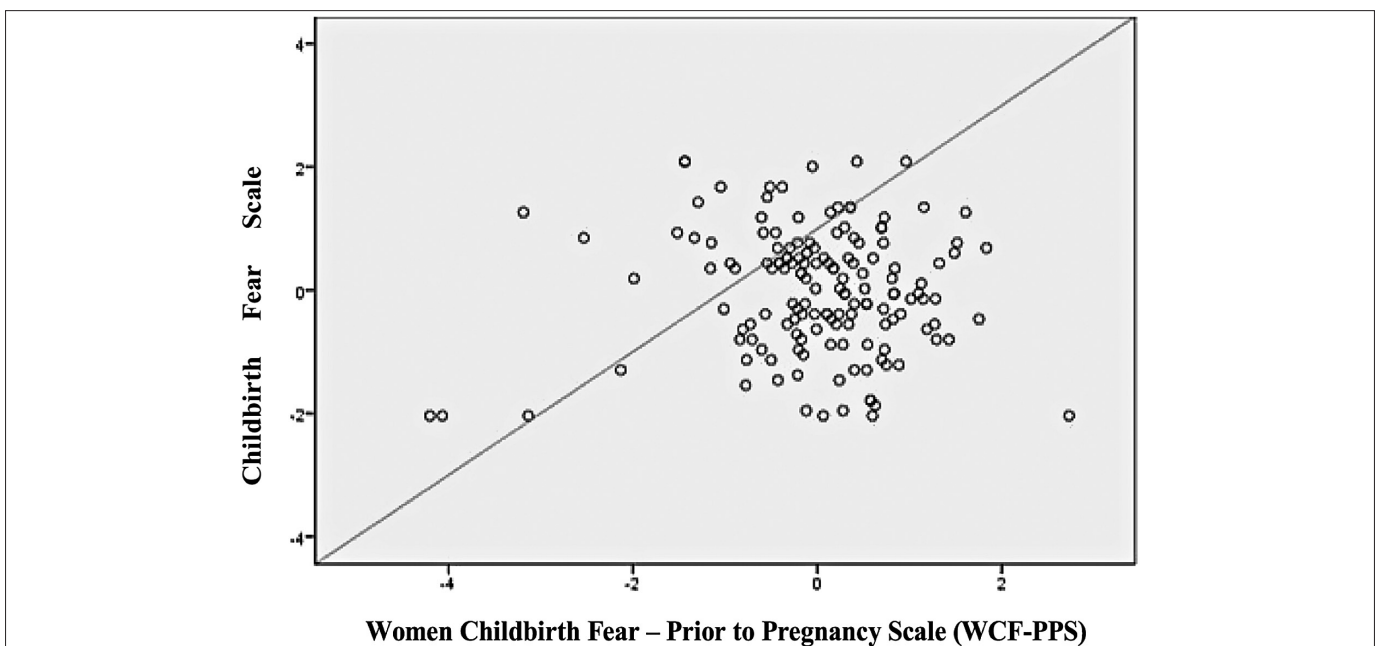
\*\*Significant at the .01 level.  
WCF-PPS, Women Childbirth Fear–Prior to Pregnancy Scale; CFS, Childbirth Fear Scale.

scales ( $r=0.53$ ;  $R^2 = 0.28$ ;  $t=4.87$ ;  $P=.000$ ) (Table 2), and the scatter plot of the positive linear relationship between the scales is presented in Figure 2.

**Results of Content Reliability**

**Internal Consistency Reliability**

The internal consistency coefficient of the scale was found to be 0.86. Cronbach's alpha reliability coefficients of the sub-dimensions of the measurement tool were found to be between 0.75 and 0.88. The CFS



**Figure 2.** Spreading Graph and Regression Line of Children Fear Scale (CFS) Scores and Women Children Fear–Prior to Pregnancy Scale (WCF-PPS) Scores.

**Table 3.** Item-Total Correlations and Cronbach's Alpha Coefficients of the Childbirth Fear Scale

Scale Sub-Dimensions	Items	Item-Total Score Correlation According to the Total of the Scale	Cronbach's Alpha Coefficient According to the Total of the Scale	Item-Total Score Correlation According to the Sub-Dimensions	Cronbach's Alpha Coefficient According to the Sub-Dimensions
Fear of Pregnancy, Childbirth, and Maternal Role	15. I can talk about our baby, who will be born, with my husband/partner.	0.45	0.85	0.57	0.87
	18. I think I will be happy to become pregnant.	0.56	0.85	0.72	0.86
	21. I can overcome disorders that may occur during my pregnancy.	0.57	0.85	0.62	0.87
	22. I believe that pregnancy will be a disappointment for me.	0.49	0.85	0.52	0.87
	23. I believe that pregnancy will be satisfying for me.	0.53	0.85	0.62	0.87
	25. I think that growing a child inside me is a reward.	0.39	0.86	0.70	0.86
	30. I think that my relatives (mother, aunts, neighbors.....) will take care of my baby who will be born.	0.58	0.85	0.49	0.88
	32. I believe that I will be a good mother.	0.50	0.85	0.69	0.86
	33. I like watching parents when they are with their children.	0.59	0.85	0.67	0.86
<b>Total of the Fear of Pregnancy, Childbirth, and Maternal Role Sub-Dimension</b>					<b>0.88</b>
Fear of Inability to Meet Physical and Social Needs	16. I believe that my husband/partner will criticize me during my pregnancy.	0.41	0.86	0.44	0.74
	17. I am afraid that my husband/partner will not help with housework after the baby is born.	0.34	0.86	0.41	0.75
	24. I believe that I cannot talk to my husband/partner about sexual needs during pregnancy.	0.47	0.85	0.53	0.72
	26. I am afraid of being perceived as a bad mother.	0.50	0.85	0.53	0.72
	31. I am afraid of not being able to care enough of the baby.	0.57	0.85	0.59	0.70
	34. I am afraid that I will not be able to return to my work after birth.	0.51	0.85	0.49	0.73
	<b>Total of the Fear of Inability to Meet Physical and Social Needs Sub-Dimension</b>				
Fear of Pregnancy and Childbirth Problems	5. I think I cannot cope with labor pain.	0.24	0.86	0.51	0.70
	7. I think that childbirth stress will be much more than I can cope with.	0.32	0.86	0.56	0.68
	10. I am concerned about problems that may occur at childbirth.	0.15	0.86	0.44	0.73
	20. I believe that I will have difficulties with getting used to changes that will occur due to my pregnancy.	0.51	0.85	0.52	0.70
	27. I often think of problems that may be in the baby.	0.33	0.86	0.51	0.70
<b>Total of the Fear of Pregnancy and Childbirth Problems Sub-Dimension</b>					<b>0.75</b>
<b>Total of the Scale</b>			<b>0.86</b>		

was observed to be highly reliable, and its sub-dimensions to be quite reliable (Table 3).

#### Item-Total Score Correlations

The correlation coefficient between the total of the scale and each item was between 0.32 and 0.59 and positive, except for items 5 and 10. For the overall scale, items 5 and 10 with the item-total score correlation value below 0.30 were not excluded from the scale since Cronbach's alpha values were at the desired level and the item-total score correlations were above 0.30 according to the sub-dimension (fifth item [ $r=0.51$ ] and tenth item [ $r=0.44$ ]) (Table 3).

#### Test-Retest Reliability

The time invariance of the scale was determined by the Pearson moment product correlation technique. A statistically significant positive correlation was determined between the 2 measurement results of the draft scale applied at a 15-day interval ( $r=0.88$ ;  $P=.000$ ) (Table 4).

#### Discussion

In the literature, few different measurement tools are observed to be used to determine the fear of childbirth.<sup>9-14,19</sup> Women's fear of childbirth during pregnancy is measured by the Wijma Delivery Experience

**Table 4.** Test–Retest Correlation Coefficients of the Childbirth Fear Scale (n=30)

Scale Sub-Dimensions	Items	r	P
Fear of Pregnancy, Childbirth, and Maternal Role	15. I can talk about our baby, who will be born, with my husband/partner.	0.59	< .001
	18. I think I will be happy to become pregnant.	0.99	< .001
	21. I can overcome disorders that may occur during my pregnancy.	0.90	< .001
	22. I believe that pregnancy will be a disappointment for me.	1.00	< .001
	23. I believe that pregnancy will be satisfying for me.	0.83	< .001
	25. I think that growing a child inside me is a reward.	0.72	< .001
	30. I think that my relatives (mother, aunts, neighbors.....) will take care of my baby who will be born.	0.76	< .001
	32. I believe that I will be a good mother.	0.97	< .001
	33. I like watching parents when they are with their children.	0.90	< .001
<b>Total of the fear of pregnancy, childbirth, and maternal role sub-dimension</b>		<b>0.91</b>	<b>&lt; .001</b>
Fear of Inability to Meet Physical and Social Needs	16. I believe that my husband/partner will criticize me during my pregnancy.	0.81	< .001
	17. I am afraid that my husband/partner will not help with housework after the baby is born.	0.78	< .001
	24. I believe that I cannot talk to my husband/partner about sexual needs during pregnancy.	0.72	< .001
	26. I am afraid of being perceived as a bad mother.	0.63	< .001
	31. I am afraid of not being able to care enough of the baby.	0.76	< .001
	34. I am afraid that I will not be able to return to my work after birth.	0.85	< .001
<b>Total of the fear of inability to meet physical and social needs sub-dimension</b>		<b>0.79</b>	<b>&lt; .001</b>
Fear of Pregnancy and Childbirth Problems	5. I think I cannot cope with labor pain.	0.69	< .001
	7. I think that childbirth stress will be much more than I can cope with.	0.85	< .001
	10. I am concerned about problems that may occur at childbirth.	0.94	< .001
	20. I believe that I will have difficulties with getting used to changes that will occur due to my pregnancy.	0.88	< .001
	27. I often think of problems that may be in the baby.	0.92	< .001
<b>Total of the fear of pregnancy and childbirth problems sub-dimension</b>		<b>0.89</b>	<b>&lt; .001</b>
<b>Total</b>		<b>0.88</b>	<b>&lt; .001</b>

Questionnaire-version A, while the fear of childbirth in the early postpartum period is measured by version B.<sup>10</sup> The other scales are scales developed to measure women's fears of childbirth during pregnancy and the postpartum period. When the literature is reviewed, it is observed that there are measurement tools to determine women's fear of childbirth during pregnancy and in the early postpartum period, but there is only 1 scale developed by Stoll et al<sup>13</sup> and of which validity and reliability studies in Turkish were conducted by Uçar and Taşhan<sup>15</sup> to determine childbirth fear, without any pregnancy. It is accepted to be the only scale to determine the fear of childbirth without pregnancy.<sup>13,15</sup> This scale consists of 10 items. With these items, only the situations related to the pain and losses experienced during birth and birth are measured. Considering that it is insufficient to measure the biological, psychological, social, and cultural effects of having a child, the multidimensional "Fear of Childbirth Scale for Women in Fertility Age" was developed to determine the fear of childbirth in women of childbearing age, and the obtained findings were discussed under the following headings.

#### Discussion of the Results Related to Content Validity

In the study, in order to investigate whether the statements in the measurement tool were suitable for the purpose of measurement, the qualitative data obtained in line with the expert opinions were converted into quantitative data by calculating the CVR and CVI for the determination of the content validity of the items in the scale. In this conversion process, first, the CVR and then the CVI were calculated. The content validity of the CFS was determined using the Lawshe technique. The Lawshe technique consists of 6 stages. These stages are as follows: (1) creation of a group of domain experts, (2) preparation of candidate scale forms, (3) obtaining expert opinions, (4) finding the content validity ratios of items, (5) finding the content validity indices

of the scale, and (6) creation of the final form according to the content validity index.<sup>20-22</sup>

In the Lawshe technique, minimum 3 and maximum 20 expert opinions are needed.<sup>22,23</sup> Each item is rated as appropriate, useful, but not sufficient (the item should be corrected), or as inappropriate. Content validity ratios are calculated according to the data obtained from experts. If the CVR values contain values of 0 and below, such items are the items eliminated at the first stage. The minimum values regarding the number of experts also give the statistical significance of the item.<sup>24</sup>

In this study, the content validity ratios of each item were calculated based on the opinions of a total of 10 experts about the items. The CVR of the 34 items in the study was found to be 0.80 and above. Sixteen items were excluded from the draft scale since their CVR value was 0.80 and below. Since more than half of the experts gave the response of "Necessary" to the relevant item, the CVR was determined to be CVR > 0. After the items that are found to be statistically insignificant with the determination of the CVR are removed, the CVI index is calculated for the entire measurement tool upon the remaining items. In this case, the average of the CVR values of the items decided to be included in the scale is calculated, and the CVI value is obtained.<sup>24,25</sup>

The content validity index value of this study was obtained to be 0.84 after 16 items were removed from the scale. The fact that the obtained CVI value was higher than the CVR value (CVI=0.84 > CVR=0.80) demonstrated that the content validity of the draft scale was statistically significant. In line with the expert opinions and statistical calculations, 16 items, among the draft items of the CFS, were excluded from the sample scale under development. With a total of 34 items, it was decided to apply the sampling planned for validity and reliability studies.



### Discussion of the Results Related to Construct Validity

In order to examine construct validity, internal consistency analysis, cluster analysis, factor analysis, and hypothesis test techniques can be used.<sup>26</sup> The construct validity of the scale was measured by applying factor analysis. Factor analysis is a statistical analysis method that aims to find few unrelated but conceptually significant new variables by bringing together *P* interrelated variables. In the exploratory factor analysis performed for the construct validity of a measurement tool, four basic stages are applied.<sup>26,27</sup> These stages can be listed as follows: (1) evaluation of the suitability of the sample for factor analysis, (2) rotation of the factors, (3) obtaining the factors, and (4) naming the factors.<sup>27</sup> In the study, the exploratory factor analysis was performed in the construct validity of the draft scale, and the KMO, Bartlett's test, anti-image correlation, principal component analysis, and varimax rotation method were used.

Kaiser–Meyer–Olkin is an analysis method used to test whether the sample is sufficient. Bartlett's test is applied to determine whether there is a sufficient correlation between variables.<sup>26,28–30</sup> Kaiser–Meyer–Olkin varies between 0 and 1. A quality scale is expected to have a KMO value higher than 0.80. Büyükoztürk<sup>31</sup> reported that a KMO value higher than 0.60 was sufficient.

In Bartlett's test (Bartlett's test of sphericity), if the *P*-value is lower than the significance level of .05, it shows that there is a sufficient relationship between variables for factor analysis.<sup>29</sup>

The anti-image correlation measures the suitability of items for factor analysis, and the fact that this value is lower than 0.50 indicates that the item should be removed at this stage.<sup>28</sup>

In this study, the fact that the KMO value was 0.88,  $\chi^2 = 3673.824$  in Bartlett's test of sphericity, the *df* was 190 ( $P < .001$ ), and the anti-image *r*-values found to be between 0.71 and 0.94 demonstrated that the scale was suitable for factor analysis.

In the study, the principal component analysis and varimax factor rotation methods were used for the factor analysis of the draft scale. The fact that the items can measure a factor together is explained by the high load values in the factor in which they are present. The factor load value of 0.45 or higher is stated to be a good criterion in the literature. The factor loads between 0.32 and 0.44 are considered as weak, between 0.45 and 0.54 as normal, between 0.55 and 0.62 as good, between 0.63 and 0.70 as very good, and above 0.71 as excellent.<sup>30</sup>

By accepting the factor load values of the draft scale as 0.45, 14 items with the factor load values below 0.45 in the factor analysis were removed, and a 3-dimensional structure with 20 items explaining 51.93% of the total variance was obtained.

At the final stage, the factors were named by giving them names that expressed the meaning that the variables wanted to emphasize in the best way. Accordingly, the sub-dimensions were obtained as follows: the first sub-dimension was the Fear of Pregnancy, Childbirth, and Maternal Role, the second sub-dimension was the Fear of Inability to Meet Physical and Social Needs, and the third sub-dimension was the Fear of Pregnancy and Childbirth Problems.

### Discussion of the Results Related to Criterion-Referenced Validity

The validity of the concept that will be measured in concurrent validity is ensured by comparing the correlation with previously tested measurement tools.<sup>30,31</sup> In this study, the scores obtained from the Women WCF-PPS and the draft CFS applied to women simultaneously were compared, and a significant positive relationship was found between the scores of both scales ( $r = 0.53$ ;  $P < .001$ ). The correlation coefficient

below 0.50 shows that the correlation is weak, between 0.50 and 0.70 that the correlation is medium, and above 0.70 that the correlation is strong. Accordingly, it can be said that the criterion-referenced validity of the draft scale is medium.

### Discussion of the Results Related to Internal Consistency

A high Cronbach's alpha reliability coefficient indicates that the items of the measurement tool are consistent with each other. The reliability coefficient varies between 0 and 1. The fact that the reliability coefficient is 0.80 and higher indicates that the measurement tool is highly reliable. The range being between 0.80 and 0.60 reports that the scale is quite reliable, between 0.60 and 0.40 that it is reliable at a low level, and range being 0.40 and below indicates that the scale is not reliable.<sup>16,28,32,33</sup> The internal consistency reliability coefficient of the draft scale was found to be 0.86. This value shows that the scale is highly reliable.

### Discussion of the Results Related to the Item-Total Score Correlations

The item-total score correlation explains the relationship between the scores obtained from the items of the measurement tool and the total score of the scale. The fact that the item-total score correlation value is high and positive means that the items of the measurement tool measure similar behaviors with high internal consistency. Büyükoztürk<sup>31</sup> reported that the item-total correlation of 0.30 and higher indicates that the items reflect the status of individuals at a high degree. It is recommended that items between 0.20 and 0.30 should be corrected or not included in the study unless it is mandatory. Items lower than 0.20 should be excluded from the scope.<sup>31</sup>

In this study, the correlation of the items with the total was calculated by the Pearson correlation coefficient. The correlation coefficient between the total of the scale and each item varies between 0.32 and 0.59, except for items 5 and 10. Accordingly, items 5 and 10 with the item-total score correlation value below 0.30 in the total of the scale were not removed from the draft measurement tools since Cronbach's alpha values were at the desired level (0.86) and the item-total score correlations according to the sub-dimension were above 0.30 (fifth item [ $r = 0.51$ ] and tenth item [ $r = 0.44$ ]).

### Discussion of the Results Related to Test–Retest Reliability

The correlation between the results obtained as a result of applying a measurement tool to the same group twice at different times explains test–retest reliability.<sup>26</sup> In this study, the relationship between both measurement scores was determined by the Pearson correlation technique. The Pearson coefficient takes values between +1 and –1. The value between 0.90 and 1.00 indicates that the relationship is very high, between 0.70 and 0.89 that the relationship is high, between 0.50 and 0.69 that the relationship is medium, between 0.49 and 0.26 that the relationship is weak, and between 0.25 and 0.00 that the relationship is very weak.<sup>9</sup> For the total of the draft scale, a statistically significant positive relationship was determined between the 2 measurement scores applied at a 15-day interval ( $r = 0.88$ ;  $P = .000$ ). The test–retest correlation values obtained to be above 0.50 indicated that the scale was time-invariant, in other words, the scale could measure the same situation at different times.

### Conclusion

As a result, the CFS that would measure the childbirth fear of women of childbearing age was developed. The CFS consists of 20 items and 3 sub-dimensions. The scale is a Likert-type scale evaluated between 1 strongly agree and 5 strongly disagree. The responses of the positive sentences determined in the scale were coded as: 1, agree; 2,

undecided; 3, disagree; 4, strongly disagree; 5, while the responses of the negative sentences were coded between strongly agree: 5 and strongly disagree: 1. In a Likert-type scale, the scale score of each respondent consists of the sum of their response points to the items. To this end, the response given by each respondent to each item should be scored. The scoring of the responses given to the items primarily varies depending on whether the item is positive or negative. Negative items are scored reversely to positive items, and thus, high scale scores always show a positive attitude.<sup>31-33</sup> The numbers of the positive items of the created measurement tools are 4, 7, 9, 11, 13, 16, 18, and 19. The negative items coded reversely are 1, 2, 3, 5, 6, 8, 10, 12, 14, 15, 17, and 20. The lowest score that can be obtained from the total of the scale is 20, and the highest score is 100, and a low score indicates that the fear of childbirth is high. The lowest score that can be obtained from the Fear of Pregnancy, Childbirth, and Maternal Role sub-dimension is 9, and the highest score is 45. The low score indicates the fear of pregnancy, childbirth, and maternal role. The lowest score that can be obtained from the Fear of Inability to Meet Physical and Social Needs sub-dimension is 6, the highest score is 30, and the low score shows that the fear of inability to meet physical and social needs is high. The lowest score to be obtained from the Fear of Pregnancy and Childbirth problems sub-dimension is 5, the highest score is 25, and low scores obtained from this sub-dimension show that individuals experience fear of problems that may occur during pregnancy and childbirth. Therefore, it was stated that as the score obtained from the CFS decreases, the childbirth fear of women of childbearing age increases. Furthermore, the scores obtained from the scale can be divided by the number of items, and a value between 1 and 5 can be obtained, and this method can also be used in the scale calculation.

It can be suggested to use and test the scale in different sample groups and to evaluate its psychometric suitability by translating it into different languages. Because the number of pregnant women participating in the study was low, this situation was accepted as the limitation of the research.

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**Informed Consent:** Written informed consent was obtained from all participants who participated in this study.

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