THDD 2026, 7 (1), 1-15
Araştırma/Research
Doi: 10.70479/thdd.1823460

Kadınların Doğurganlığa Yönelik Tutum Ölçeğini Geliştirme Çalışması

Development and Psychometric Evaluation of the Women Fertility Attitude Questionnaire

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Öz

Amaç: Doğurganlık oranları dünya genelinde düşüş göstermektedir. Bu bağlamda, kadınların doğurganlığa yönelik tutumlarını ölçecek bir araç geliştirmek oldukça önemlidir. Çalışmanın amacı, Türkiye'de kadınların doğurganlığa yönelik tutumlarını ölçebilecek anlaşılır bir araç geliştirmektir.

Gereç ve Yöntem: Bu çalışma metodolojik bir araştırmadır. Çalışma örneklemi 438 kadından oluşmuştur. Ölçeğin yapı geçerliliği, açımlayıcı analizi faktör analizi (AFA) ve doğrulayıcı faktör analizi (DFA) ile test edilmiştir. Çalışma iki aşamada gerçekleştirilmiştir. Ölçeğin güvenilirliği Cronbach alfa iç tutarlılık katsayısı, madde-toplam puan korelasyonları ve test-tekrar test analizi kullanılarak ölçülmüştür.

Bulgular: AFA sonucunda, dört faktörlü 21 maddeden oluşan bir yapı elde edilmiştir. Bu faktörler toplam varyansın %59,3'ünü oluşturmuştur. Ölçeğin Cronbach alfa değeri 0,89'dur. Aracın madde test korelasyonları 0,32 ile 0,67 arasındadır. DFA sonucunda 21 maddelik üç faktörlü bir model ortaya çıkmıştır. Model uyum indeksleri kabul edilebilir düzeydedir (RMSEA= 0,082, X2/df:= 2,47, CFI=0,92, NNFI=0,91).

Sonuç: Ölçeğin, Türkiye'deki kadınların doğurganlık tutumlarını ölçmek için kullanılabilecek geçerli ve güvenilir bir değerlendirme aracı olduğu belirlenmiştir.

Anahtar Kelimeler: Doğum, Doğurganlık, Geçerlilik, Güvenilirlik, Tutum

Abstract

Aim: Fertility rates declines worldwide. In this context, it is important to measure women's attitudes toward fertility. The study aim was to develop an intelligible tool which measure women attitudes toward fertility in Turkey.

Material and Method: This methodological study was conducted with 438 women. The construct validity of the scale was tested by exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). The study conducted in two phases. The reliability of the scale measured using Cronbach's alpha internal consistency coefficient, item-total score correlations, and test-retest analysis.

Results: The results of the EFA showed a construct consisting of 21 items collected under four- factors. These factors accounted for 59.3% of total variance. Cronbach alpha value was 0.89. Item test correlations were between 0.32-0.67. The CFA yielded 21-item three-factor model.

Conclusion: The instrument was a valid and reliable assessment tool that can be used to measure fertility attitudes of women in Turkey.

Keywords: Attitude, Childbirth, Fertility, Reliability, Validity

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Received Date: November 14, 2025, Accepted Date: April 20, 2026, Published: April 27, 2026

Summary Statement

1. **What is known about this topic?**
   - The childbearing age increases gradually and fertility rates have declined globally.
   - There are many factors that could lead to reduced fertility and increased childbearing ages of women in the World.
   - In the national and international literature, there are only a few instruments that measure women's attitudes toward fertility.
2. **Conclusions of this article**
   - The instruments that assess attitudes toward fertility among women without children are lacking in Turkey.
   - The Cronbach alpha value of the questionnaire was found to be high (0.89) which is considered quite sufficient.
   - The instrument had a reliability and validity within an acceptable range.
3. **Contributions of this article**
   - The instrument can be used in many different areas and can contribute to the development of future-oriented policies related to fertility.

Introductıon

Today, while the childbearing age increases gradually all over the World, it seems that the fertility reduces.[1] According to United Nations, World Fertiliy Data 2024, global fertility rates have declined from 4.8 births per woman in 1970 to 2.2 in 2024.[1] According to data from the Turkish Statistical Institute, the total fertility rate in Turkey has been determined to be 1.48.[2] There are many factors that could lead to reduced fertility and increased childbearing ages of women in the World. [3-6]

There are strong indirect links between fertility and various socioeconomic development indicators such as income and education levels.[7] Women are delaying having children because they want to get an education, find a job, advance in their careers, and find a suitable partner. Other factors include supporting themselves financially, the costs of marriage and raising a child, and the lack of supportive family policies. In high-resource societies, it has become the norm to have children later in life, and there are negative connotations associated with being a young mother. Even though various policies are made to increase the birth rates in many developed countries, the birth rates are still low.[3-6]

Postponed childbearing brings about variety of risks and may also result in childlessness. Advanced maternal age has risks for maternal and fetal health. The most common increased risks are multiple pregnancy, down syndrome which is the most common chromosomal birth defect, miscarriage, breech presentation, cesarean section for delivery method, operative vaginal delivery, preterm labor, stillbirth, postpartum haemorrhage, placental problems, macrosomia, heart defects, cleft lip and palate and chronic diseases such as gestational diabetes, hypertension.[8-11]

There has been a significant increase in women's childbearing ages and decrease in the total fertility rate in Turkey.[12] While the highest age-specific fertility rates belonged to the 20-24 age group in previous researches in Turkey, 25-29 age group had the highest age-specific fertility rates according to Population and Health Research of Turkey (PHRT) 2008 and 2018 reports. Besides, the total fertility rate has decreased to approximately half in the last thirty-five years (1978-2013) and median maternal age at first birth for women aged 25-49 was 23.3 in Turkey. PHRT 2018 report showed that the total fertility rate has stagnated since PHRT 2013.[12]

In conclusion, women delay the age of first birth and tend to have fewer children in a globalized World. However, when the literature is scanned there are a limited number of scales to determine women's attitudes towards fertility in the World.[13,14] There is no scale about this subject in Turkey. There is a adaptation study about attitudes towards fertility and childbearing scale to Turkish.[15] Therefore, this study is aimed to develop a scale in order to evaluate women's attitudes towards fertility in Turkey.

Research questions:

1. Is this questionnaire valid in Turkish society?
2. Is this questionnaire reliable in Turkish society?

Purpose of Study

The aim of the current study was to develop a questionnaire to determine the fertility attitudes of women who were between 20-35 years of age and not mothers.

Materıal and Methods

Phase I: The Development of Women Fertility and Attitude Questionnaire (WFAQ) and Psychometric Evaluation for the first study group

Developing the attitude items

When the developing the items of WFAQ was used the deductive method. A literature review about attitudes and attitude measurement was conducted while writing the items related to the attitude questionnaire. The theoretical structure of attitudes (e.g. cognitive, affective and behavioural aspects, and the severity and intensity of attitudes) and issues appropriate to this

structure were also taken into account.[11,13,14] Research team produced a pool for items of fertility attitude based upon the literature, and their professional experience. Totaly 33 items written by research team. A five-item Likert-type scale was used to evaluate the ideas of the women concerning their attitude expressions (1=I do not agree at all, 2=I do not agree, 3=I am not certain, 4=I agree, and 5=I agree completely). The questionnaire consisted of 33 items and thirteen of items were negative (2, 4, 6, 8, 12, 13, 15, 17, 19, 21, 23, 25, 27).

Psychometric properties of WFAQ were assessed in the following three steps:

Step I: Content Validity Assessment

Qualitative content validity assessment

Four experts reviewed content validity and face validity of the questionnaire. Three of the experts were nursing professors working at a nursing college with their studies into women health and public health in nursing; one of them was an expert in statistics studying developing questionnaires. The item pool was mailed to ten experts who are experts to assess the items in terms of their capacity to measure the intended variable, content validity, and comprehensibility. Then, in accordance with the experts' opinions and recommendations, the WFAQ was revised and reexamined by the same experts. Two items that the experts did not regard as suitable were excluded from the item pool, and three others were reworded. Consequently, the questionnaire contained 31 items.

Quantitative content validity assessment

To assess the quantitative content validity, eleven experts were asked to provide their opinions on the necessity of the questions, categorising them as either 'necessary' or 'helpful but not necessary'. The content validity ratio (CVR) was then calculated for all questions.

For determining content validity index (CVI), the terms “not related (1 point),” “somehow related (point 2),” “related (point 3),” and “strongly related (point 4)” were used. The CVR scores of more than 0.70 were retained in the final version of the WFAQ. Also, the CVI was calculated for the whole instrument, with a value of >0.80 being considered acceptable.[16] Questions with a score below 0.80 were also omitted. In the qualitative content validity assessment of the WFAQ, eight questions were deleted. Following the qualitative and quantitative validity assessments, the primary version of the WFAQ included 31 items.

Step II: Construct Validity Assessment

The scale items were arranged and re-applied on the first study group (n:218) and exploratory factor analysis was performed in phase I. The construct validity of the WFAQ was examined by exploratory factor analysis using principal component with varimax rotation. Before factor analyses, to determine whether the data were suitable for factor analysis, the Kaiser-Meyer-

Olkin (KMO) Test and Bartlett's Test of Sphericity were performed. Factor analysis was performed with designating factors, rotating factors, and naming factors.

Participants

The study was carried out as a methodological study in two phases. For the first phase of study, trial form conducted on 228 women who were between 20-35 years of age, married or single, childless, without the problem of infertility and able to read and speak Turkish. However, ten data collection forms were excluded from evaluation, as they were not completed. Thus, evaluation was made with 218 women. Study group included nursing students, academicians/staff, nurses and teachers as the study criteria provided by them. In the second phase of study, second study group consisted of new 220 women who met the same criteria with first study group. Descriptive statistics for these groups were presented in Table 1.

Since the study included childless individuals aged 20-35, data was collected from people working/studying in the health and education sciences faculties of the university in order to reach this population. This aimed to more easily reach different groups of childless individuals within this age range.

Table 1. Sociodemographic Characteristics of Women

Sociodemographic Characteristics	Phase I		Phase II	
	n (n=218)	% (n=218)	n (n=220)	% (n=220)
Age				
20-24	98	45.0	154	70.0
25-29	96	44.0	54	24.5
30-35	24	11.0	12	5.5
Marital Status				
Single	184	84.4	191	86.8
Married	34	15.6	29	13.2
Educational Status				
High school	72	33.0	146	66.4
University	68	31.2	24	10.9
Post graduate	78	35.8	50	22.7
Working Status				
Working	134	61.5	143	65
Not working	3	1.4	77	35
Student	81	37.2	-	-
Current Location				
Province	189	86.7	171	77.7
District	22	10.1	38	17.3
Rural	7	3.2	11	5.0
Income Status				
Inadequate	7	3.2	4	1.8
Middle	101	46.3	122	55.5
Good	104	47.7	91	41.4
Very good	6	2.8	3	1.3
Chronic Disease Status				
Yes	31	14.2	28	12.7
No	187	85.8	192	87.3

Data Collection

Women were informed about the nature of the study and it was explained that the questionnaire would be filled out voluntarily. Respondents' willingness to complete the questionnaire was an indication of consent. The study's data was collected through face-to-face interviews by the researchers. Data was collected between June-August 2016.

Investigation

Data was collected using an information form and a WFAQ. The information form was developed based on related literature. It consisted of eight items that asked about: socio-demographic characteristics and the age at which women would like to have their first child.[8-11] Participants were asked to fill in the information form and the WFAQ by themselves. Ten minutes were given for this all participants.

Step III: Reliability Analyses

To obtain the test–retest reliability of the WFAQ in terms of stability, the WFAQ was repeated for two weeks. To calculate the stability of the scores obtained, the WFAQ was repeated over a period of two weeks. Both the overall tool and the subgroups were considered. The test was re-administered to 30 participants under the same conditions after an interval of 15 days. The aim was to establish whether Whether each sub-group of the overall instrument could produce similar results irrespective of differing times and conditions. The test–retest reliability coefficient was taken as 0.70 or over.[17] The test-retest reliability of the questionnaire was analysed using Pearson's Product-Moment Correlation Coefficient. Cronbach’s alpha reliability coefficient was used for the internal consistency analysis. To determine the items of the scale, the instrument's internal consistency was measured using Cronbach's alpha (the reliability coefficient was set at 0.70 or above) and item-total correlation (the correlation coefficient of over 0.30 was adopted) were examined.[18,19]

All statistical analyses were performed using Statistical Package for the Social Sciences version 20.0. and LISREL 8.80. Level of significance was defined as $p < 0.05$ in this study.

Phase II: Psychometric evaluation for the second study group

Step I: Construct Validity Assessment

The scale which developed on the first group applied on the second group (n:220). Confirmatory factor analysis (CFA) was conducted to determine the relationships between the variables and factors and to test whether the relationship between the factors identified by exploratory factor analysis were adequate and to determine whether the model was sufficient to define the factors. According to the CFA results, the proposed modification indices in the four-factor model were then examined.

Confirmatory factor analysis (CFA) was conducted in order to determine the relationship between the variables and the factors, to test whether the relationship between the factors identified by the exploratory factor analysis was adequate, and determine whether the model was sufficient to define the factors. According to the results of CFA, the proposed modification indices in the 4-factor model were examined.

Results

Results of Construct Validity Assessment

Exploratory Factor Analysis

Before factor analyses, to determine whether the data were suitable for factor analysis, the Kaiser-Meyer-Olkin (KMO) Test and Bartlett's Test of Sphericity were performed. For a dataset to be suitable for factor analysis, its KMO value must be greater than 0.60, and the result of Bartlett's test of sphericity must be significant ($p<0.05$). When the KMO coefficient approaches 1, it indicates that the data is suitable for analysis. When the coefficient is 1, there is a perfect fit. The KMO value was calculated as 0.875 for the data obtained. As a result of the analysis conducted during the study, the chi-square statistics obtained from the Bartlett sphericity test were found to be significant ($\chi^2 = 2{,}120.330$; $p < 0.05$). Factor analysis was applied to achieve a meaningful structure regarding attitudes towards women's fertility and to measure the scale items, as well as to uncover the underlying structure. [17,18,20]

Factor analysis study of the questionnaire involved a principal components analysis technique. Exploratory principal components analysis of factor analysis was used to determine the factorial structure of the questionnaire. The criteria of factor loadings of at least 0.30 and variance explanation ratio of at least 0.40 used in factor analysis. A factor analysis was then conducted on the trial questionnaire, which contained 21 items. The factor analysis procedure adopted the Kaiser criterion, including values with an eigenvalue of over 1.00.[17,18,20]

Table 2. WFAQ item-factor load values by factors (n=218)

Question		Items	Factor 1	Factor 2	Factor 3	Factor 4
The negative impacts of having children on life	Q2	An unplanned pregnancy would hinder my life	**0.669**	0.152	0.088	0.060
	Q4	Having children would limit my social life	**0.777**	0.079	0.236	0.061
	Q6	I think having children affects my business life adversely	**0.744**	0.060	0.270	0.001
	Q8	I think being a mother takes most of my time	**0.715**	-0.076	-0.015	0.087
	Q17	I think being a mother would limit my career	**0.676**	0.131	0.397	0.031

	Q23	I think being a mother would restrict too much of my own time	**0.833**	0.027	0.078	0.166
	Q27	I think having children affects my physical appearance adversely	**0.636**	0.007	0.203	-0.073
The positive impacts of having children on life	Q9	Being fertile is important to my feeling of femininity	0.033	**0.710**	0.270	0.262
	Q10	I think having children would increase the loyalty between me and my husband	0.105	**0.573**	0.159	0.279
	Q16	I think having children improves my communication with other women.	0.026	**0.736**	0.007	0.090
	Q20	I think having children affects my personality positively	0.070	**0.681**	0.122	-0.032
	Q22	Being a mother is essential for my identity as a woman	0.041	**0.763**	0.199	0.328
	Q26	I want to have a child to add new changes in my life	0.010	**0.620**	0.127	0.229
	Q1	I think to become a mother in the future	0.228	0.305	**0.656**	0.212
Complicated thoughts about being mother	Q3	Becoming a mother is important to me	0.227	0.295	**0.618**	0.369
	Q12	I do not want to take responsibility as a mother	0.248	0.204	**0.740**	-0.150
	Q13	Being a pregnant in the future would make me unhappy	0.226	0.138	**0.719**	0.165
	Q21	I think childbearing does not fit into my life in the future.	0.166	0.056	**0.743**	0.212
The importance of fertility	Q28	I talk to my friends about having children	0.054	0.245	0.242	**0.574**
	Q30	I think having children is required to be able to becoming family	0.044	0.229	0.036	**0.830**
	Q31	I can not imagine a life without children	0.112	0.380	0.199	**0.670**
		Eigen values:	6.86	3.20	1.34	1.04
		Percent of the variances:	32.71	15.23	6.39	4.99
		Total variance:		59.33		
		Arithmetic mean:		73.81		
		Standart deviation:		12.29		
		Variance:		151.093		
		Number of individuals(n):		218		

The Varimax rotation technique was applied to determine the questionnaire's independent dimensions, and the factor load values were examined. Items loading on more than one factor, with a difference of less than 0.10 between the respective factor load values, were excluded from the analysis, after which the EFA was repeated. As a result, ten items were excluded from the questionnaire. It was determined that the remaining 21 items in the questionnaire were grouped under four factors. Factor analysis revealed a four-factor solution, with eigenvalues greater than one explaining 59.33% of the total variance. The factor loads of the items that formed the questionnaire ranged from 0.57 to 0.83. Factor 1 included 7 items related to “the negative impacts of having children on life”, factor 2 included 6 items related to the “the positive impacts of having children on life”, factor 3 included 5 items related to “complicated thoughts about being mother”, factor 4 included 3 items related to “the importance of fertility” (Table 2). The Cronbach's alpha for 4 sub-scales ranged from 0.71 to 0.87 (Table 3).

Table 3. Cronbach's alpha coefficients of WFAQ and Factors (n=218)

Factors	Crα
FACTOR 1	0.87
FACTOR 2	0.83
FACTOR 3	0.83
FACTOR 4	0.71
WFAQ:	0.89

Confirmatory Factor Analysis

Confirmatory factor analysis (CFA) was performed in Lisrel 8.80 program on the second study data in order to verify the scale structure consisting of 4 factors and 21 questions that were obtained as a result of exploratory factor analysis of first study data. According to the CFA analysis $\chi 2$=557.31, df=189, $\chi 2$/df =2.94, p=0.000 was found. It was determined as Root Mean Square Error of Approximation (RMSEA)=0.094, Comparative Fit Index (CFI)=0.90, Non-normed Fit Index (NNFI)=0.89 (Table 4). In this study, ratio of χ^2/df was greater than 2.5 and RMSEA value was higher than 0.05. This values showed that the model did not conform. Therefore, the proposed modification indexes for the 4-factor model were investigated. In accordance with these suggestions, second and fourth factors were related (Figure 1). According to the result of the modification, it was determined that χ^2=465.06, df=188, χ^2/df=2.47, p=0.000. Compliance indexes were found as RMSEA=0.082, CFI=0.92 ve NNFI=0.91.

Table 4. Fit indices used in the WFAQ models (n:220)

Model	$\chi 2$	df	$\chi 2$/df	CFI	NNFI	RMSEA
Four factor model	557.31	189	2.94	0.90	0.89	0.094
Three factor model	465,06	188	2.47	0.92	0.91	0.082

Note: CFI: Comparative Fit Index; NNFI: Non-Normed Fit Index; RMSEA: Root-Square Error of Approximation.

After second and fourth factors were related, the questionnaire consists of a 21-item and 3-factor structure in the second study group. First factor consists of 7 items (2, 4, 5, 6, 12, 16, 18) on “the negative impacts of having children on life”, second factor consists of 9 items (7, 8, 11, 13, 15, 17, 19, 20, 21) on “positive impacts of having a child on life and third factor consists of 5 items (1, 3, 9, 10, 14) on “complicated thoughts about being mother”. 2, 4, 5, 6, 9,10, 12, 14, 16, 18 questions in the scale are the opposite items. The low scores taken from the scale show negative attitudes of women towards fertility and high scores show positive attitudes.

Results of Reliability Analyses

Following an item analysis, ten questions with coefficients of 0.30 were deleted because they correlated weakly with the other items in the questionnaire. The final questionnaire consisted of 21 items (Table 2).

The reliability of questionnaire was analyzed based on Cronbach's alpha internal consistency coefficient (α), and item test correlations (Table 5, Table 6). Table 6 gives the reliability of the data for the final 21-item questionnaire. Corrected item-total correlations ranged from 0.322 to 0.678, that above the 0.30 considered good. Cronbach's alpha was 0.89 (Table 3).

Table 5. Correlations between WFAQ and factors* (n=218)

	WFAQ	FACTOR 1	FACTOR 2	FAKTOR 3
FACTOR 1	0.714	-	0.205	0.454
FACTOR 2	0.753	0.205	-	0.491
FACTOR 3	0.751	0.454	0.491	-
FACTOR 4	0.669	0.212	0.598	0.448

*Pearson correlation test statistics were used.

Table 6. Descriptive statistics and reliability analysis of the twenty-one-item of WFAQ (n=218)

Questions	Mean	Std. Deviation	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q1	4.4817	0.72616	0.635	0.880
Q2	2.6422	1.17597	0.453	0.883
Q3	4.3440	0.74734	0.678	0.879
Q4	3.1606	1.13872	0.552	0.880
Q6	3.2706	1.07984	0.522	0.881
Q8	2.5505	1.12767	0.322	0.887
Q9	3.3761	1.14633	0.569	0.880
Q10	3.6835	1.05856	0.493	0.882
Q12	4.3807	0.86775	0.503	0.882
Q13	4.4312	0.76643	0.565	0.881
Q16	3.1284	1.00323	0.392	0.885
Q17	3.4817	1.02599	0.603	0.879
Q20	3.6697	1.08237	0.394	0.885
Q21	4.2339	0.96259	0.513	0.881
Q22	3.3807	1.24323	0.593	0.879
Q23	3.0505	1.09974	0.526	0.881
Q26	3.2477	1.16916	0.427	0.884
Q27	3.2202	1.11841	0.373	0.886
Q28	3.6147	1.05959	0.438	0.884
Q30	3.3440	1.15043	0.416	0.884
Q31	3.1193	1.22361	0.559	0.880

Crα for the first factor; 0.87, Crα for the second factor; 0.83, Crα for the third factor; 0.83, and Crα for the four factor; 0.71 (Table 3). All of these findings were used as an evidence that the instrument had reliability in satisfactory level. As shown in Table 5 correlations between scores obtained from the attitude questionnaire and factor score changed from 0.21 to 0.75. This correlation was significant at 0.05 level. The high and significant correlations showed that these four factors were components of attitudes towards women's fertility.

Test–retest reliability for the questionnaire stability was conducted two weeks following the original testing on 30 of the women participants. The overall test re-test reliability was found to be 0.94, and between sub-components (test– retest reliability), it was found to be between 0.76 and 0.88 which showed a statistically significant agreement.

Dıscussıon

Discussion of Validity Analyses

The questionnaire comprised of 21 items and had a structure of four factors. It included 7 items on "the negative impacts of having children on life (eigen value: 6.86; percent of total variance explained: 32.71 Cronbach's α= 0.87)", 6 items on "the positive impacts of having children on life (eigen value: 3.20; percent of total variance explained: 15.23 Cronbach's α= 0.83)", 5 items on "complicated thoughts about being mother (eigen value: 1.34; percent of total variance explained: 6.39 Cronbach's α= 0.84)", and 3 items on "the importance of fertility (eigen value: 1.04; percent of total variance explained: 4.99 Cronbach's α= 0.71)" and it consists of 4 sub-factors with dominant factor. Factor analysis revealed a 4-factor solution, with eigen values greater than 1, explaining 59.33% of the total variance. In addition, the internal consistency coefficient of the instrument was found to be 0.89 (Table 3). The internal consistency of the questionnaire concerning the factor structure was found to be quite high, which serves as proof that the items making up the scale measure the same dominant factors, namely 'fertility'.

Factor loads of tool's items ranged from 0.57 to 0.83. All this findings has been used as an evidence that the instrument had construct validity in satisfactory level. As regards the item validity and uniformity of the instrument, item test correlations were calculated. Item test correlations calculated for the validity and the homogeneity of the tool's items were between 0.32 and 0.67. (Table 2). All of these findings are used as an evidence that the validity of the scale items and measure the same structure.

The findings of the factor analysis demonstrated that the instrument had a factor structure with multiple components. This structure showed that the instrument comprised groups of different, separable qualities that could not be regarded as falling under one title. Similarly, "attitudes toward fertility and childbearing scale" by Söderberg et al. (2013) and used to assess and compare attitudes towars fertility and childbearing of women who are not yet mothers had three sub-factors.[14] The headings of the factor groups in this instrument were as follows: 1) importance of fertiliy for the future, 2) childbearing as a hindrance at present, 3) social identity. The similarity between our instrument and Söderberg's instrument was importance of fertility. However, this factor was assessed for present in our instrument while

Söderberg's instrument assessed it for future. All of the sub-factors in this questionnaire were considered to be the criteria of fertility in women.

In order to determine the extent to which the models proposed in the confirmatory factor analysis are consistent with the data, various conformity or conformity indices are used. Adaptation indices are important for testing the compliance of the data with the hypothetical model.[19] According to Garver and Mentzer (1999), it is recommended to report the RMSEA, CFI and NNFI (TLI) values of the fit indices in the studies. In this study, compliance indices which used commonly χ2 (chi-square), χ2/df, RMSEA, CFI, NNFI were used.[20] According to the literature, in the studies performed in small samples, ratio of χ^2/df should be less than 2.5 and RMSEA value should be less than 0.05 in order to have a perfect fit of the model.[21] The RMSEA values are between 0.08-0.1 and the ratio of χ^2/df is below 5 indicates acceptable compliance.[22,24] The CFI and NNFI values in the range of 0.90 to 0.95 indicate that the model shows an acceptable fit.[20] When the RMSEA, χ^2/df, CFI and NNFI which are compliance indices of our scale are taken into consideration, the values found showed that the model did not fit the data in the second study group (n:220). Therefore, the proposed modification indices for the 4-factor model were examined. In line with these suggestions, firstly, the 2nd and 4th factors were associated. According to the modification result, it was determined that the model became more compatible in this way and the fit indices were in the acceptable range (χ2=465,06, N=220, df=188, χ2 /df=2,47, *p*=0,000, RMSEA=0,082, CFI=0,92, NNFI=0,91). Based on these results, it can be said that the questionnaire is valid and reliable.

Discussion of Reliability Analyses

Cronbach's alpha coefficient is a measure of the internal consistency and homogeneity of the items in the questionnaire. The Cronbach's alpha value of a Likert-type questionnaire is expected to be as close to 1 as possible. A high Cronbach's alpha is considered to be a sign of the high correlation between items.[19,25] Coefficients expected to be over 0.30. If overall Cronbach alpha levels are over 0.80, it shows that the questionnaire has a high reliability, and if it is over 0.70, it indicates that the questionnaire is sufficient.[25] The Cronbach alpha value of the questionnaire was found to be high (0.89).

Item-total correlation explains the relationship between scores obtained from individual items and the total test score. Corrected item-total correlations between the WFAQ scores and the factors ranged from 0.322 to 0.678, and the correlation coefficients were found to be significant. These significant correlations indicated that the WFAQ comprised four factors.

Test-retest technique is the most commonly used and recommended reliability indicator. In terms of test–retest correlations, the questionnaire produced constantly consistent results

irrespective of changing conditions. According to the Pearson Product Moment Correlation Coefficient, the test-retest correlation coefficient of WFAQ was found to be 0.94. This indicates consistency and invariance of the WFAQ over time.

Conclusıon

WFAQ was determined to be a valid and reliable measurement instrument that could be used in further studies. It was thought that the investigations conducted using this questionnaire would contribute to the subject in various respects. Firstly, the questionnaire would encourage the expansion of limited information on the formation of attitudes towards fertility and the development of similar assessment tools. Instrument was carried out with women who were between 20-35 years and not infertile. In this sense, when the instrument is carried out in similar samples in different regions, it is expected to reach similar findings regarding the validity and reliability.

The fact that the data is from 2016 can be considered a temporal limitation. However, scale development studies primarily aim to reveal the theoretical integrity of the measured construct and the psychometric robustness of the factor structure. Accordingly, the 2016 data allowed for testing the core structure of the scale through a large and heterogeneous sample. The fact that the scale is structured not directly focusing on economic determinants, but rather on value and role perception, suggests that the core structure is relatively less susceptible to short-term contextual fluctuations. Considering that fertility attitudes are constructs sensitive to social and demographic changes, it is recommended that the instrument be retested with confirmatory factor analysis in current samples and that measurement invariance be examined among different sociodemographic groups. Such studies will further strengthen the temporal and contextual generalizability of the measurement instrument. Furthermore, to ensure diversity in future studies, participants may be selected from individuals with different educational backgrounds and professional backgrounds.

Ethics Committee Approval

This study was approved by ethics committee of Gazi University in the meeting numbered 07, dated 01.06.2016 with ethics committee numbered 77082166-604.01.02-. All procedures performed in studies involving human participants were in accordance with the ethical standarts of the instutional and/or national research committee and with the Helsinki Declaration and its later amendments or comparable ethicals standarts.

Informed Consent

Written informed consent was obtained from women who participated in this study.

Author contributions

Concept – EAG., MUA., SPA., AK.; Design - EAG., MUA., SPA., AK.; Data Collection and/or Processing - EAG., MUA., SPA.; Analysis and/or Interpretation - EAG., MUA., SPA., AK.; Literature Research - EAG., MUA., SPA.; Writing - EAG., MUA., SPA.

Acknowledgement

We would like to thank all participants.

Conflict of Interest

The authors declare that they have no conflict of interest.

Financial Disclosure

This study was not funded by any institutions.

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