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Development and Validation of an Infertility Distress Scale for Turkish Women

[Türk Kadınları için İnfertilite Etkilenme Ölçeği Geliştirilmesi ve Geçerliliğin Belirlenmesi]

SUMMARY
AIM: The aim of this study was to develop a specific scale to determine distress level among women caused by the infertility and its treatment process.
METHODS: This scale was developed in three main phases which were described as item generation, refining items and pre-testing and, Reliability and Construct Validity. Study sample included a total of 338 women with 198 infertile and 140 fertile women who accepted to participate from December 2005 to July 2006. Infertile group was reached at Invitro Fertilization Unit of Gulhane military Medical Academy and fertile group was recruited by asking patients who presented to gynecology and obstetrics outpatient service of the same Academy. Data obtained from the study was analyzed with SPSS package version 15.0.
RESULTS: Cronbach's alpha value for the scores of items in the measurement tool used in the study has been found as 0.933. Corrected Item-total correlation of items varied 0.27 to 0.78. These results suggest that the 21-item scale is a reliable and valid measure tapping a single underlying component.
CONCLUSION: We advocate further research to find out the validity of the scale among women from different socioeconomic settings and thus a scale for men should be developed and tested for its validity.

ÖZET
AMAÇ: Bu çalışmanın amacı kadınlar arasında infertilite ve tedavi sürecinin neden olduğu etkilenme düzeyini belirlemek için özel bir ölçek geliştirmektir.
YÖNTEM: Bu ölçek madde oluşturulması, maddelerin geliştirilmesi ve ön testinin yapılması ile güvenirlilik ve yapı geçerliliğinin saptanması olarak tanımlanan üç ana aşamada geliştirilmiştir. Çalışma örneği 198 infertil ve 140 fertil olmak üzere çalışmaya katılmayı kabul eden 338 kadından oluşmaktadır. İnfertil grup Gülhane askeri Tıp Akademisi İn vitro fertilizasyon ünitesine başvuranlar, Fertil grup ise aynı hastanenin kadın-doğum kliniğine başvuranlar arasından Aralık 2005 Temmuz 2006 döneminde seçilmiştir. Elde edilen veriler SPSS 15.0 paket programı ile analiz edilmiştir.
BULGULAR: Ölçeğin madde puanlarının Cronbach Alpha değeri 0.933 olarak saptanmıştır. Maddelerin düzeltilmiş madde-toplam korelasyonu 0.27 ile0.78 arsında değişim göstermiştir. Bu sonuçlar 21 maddelik ölçeğin bir grup Türk kadını için bir faktöre dayanan geçerli ve güvenilir bir ölçek olduğunu göstermektedir.
SONUÇ: Bu ölçeğin daha geniş gruplarda geçerliliğini araştırmak amacıyla farklı sosyo-ekonomik düzeydeki kadınlar arasında çalışma yapılması ve ayrıca ölçeğin erkeklere yönelik olarak da geliştirilip geçerliğinin denenmesi önerilmektedir.

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Key words: infertility, Scale development, psycohology, distress

Anahtar Kelimeler: infertilite, Ölçek geliştirme, Psikoloji, sıkıntı

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INTRODUCTION

Infertility is an essential crisis threats psychosocial well being of couples (1-4). Couples diagnosed as infertile mostly apply for infertility treatment in order to reach their dreams of having a real family and to rescue themselves from the effect of this crisis (5). However, the process of infertility treatment which has been perceived a powerful flicker of hope for couples to have their own babies is physically tiring and emotionally very difficult. (5-7). Therefore infertile couples are trying to cope with psychosocial problems emerged due to treatment process addition to the stress caused by not having their own child biologically during the many parts of their lives (6-8).

Each of couples may response differently to infertility and its treatment process. However, the most common responses in both of any couple are anger, decrease in self-respect, difficulty in relation with others, decrease in life satisfaction, anxiety,

depression (1,2,4,7). Infertility also influences negatively the relation between wife and husband and their sexual life (1,9,10). Some previous studies determined the stress, anxiety, and depression scores among infertile couples were higher than corresponding scores among fertile population (3,5,6,10).

Although psychological effects of infertility could be observed on both women and men, women have suffered more intensively (3,7-9,11). Akyuz, et al. have stated the main goal of infertile women was to have a baby and they felt unhealthy, unhappy and guilty and guilty when they failed to reach this goal (12). Pasch et al. have revealed different emotional distresses between women and men have been sourced from their different consideration of the value of having a baby (9). Because of infertility the self respect of women has been affected deeper than men and women have suffered more serious feeling of anxiety, depression, anger, disappointment, weakness and loss of control (3,6-8,11). The higher tendency of women to depression in general population, the higher number of tests and other invasive procedures targeted women for infertility, the women's roles of child bearing and giving births all cause women to be affected heavier from the result of infertility (5-7,9,13).

During treatment process, couples attempting to have a baby and health workers served to support them to reach their goals work with sacrificing. However, when health workers try to manage all procedures properly for reaching goal, sometimes emotional needs of couples could be neglected (14,15). The most important goal in infertility treatment is to support couples to have a baby. But whatever the outcome, it should not be ignored by nurses to give care couples for their full healthiness (6, 16). For this reason, it is important to determine the psychosocial status of couples during diagnosis of infertility and its treatment process. Although, today, infertility is regarded as a common problem of couples, not merely a woman or man (17), due the reasons above women are still in a more prior place in the evaluation of infertility. It is considered that the psychosocial evaluation of women at IVF treatment would be a base for planning of health care not only for women but for couples.

It has been observed in the previous studies different anxiety and depression scales have been used more frequently to determine the psychosocial effects of infertility on women (2,6,8,13). However, the number of special scales targeted to determine the level of distresses experienced by individuals to the infertility problem and included all aspects of psychosocial effects caused by infertility on the life are very scarce (8). No scale is available for Turkish people. This has been considered to be a cause for nurses serving at infertility services to be failed in proper psychosocial evaluation of infertile individuals. This study has aimed to develop a scale for specifically measuring distress level experienced by women during the infertility and its treatment process.

MATERIAL AND METHOD

Development of Infertility Distress Scale (IDS) The scale was developed in three main phases, each of which is described as below:

First phase; Item Generation: The goal of this phase was to establish item relevance, by generating as many unique items about the experience of infertility, its treatment and its psychosocial effects as possible. To accomplish this task, we first conducted an extensive literature review of the psychological aspects of infertility. We combined these data with our experience obtained by our previous studies (5,12,16) and results of interviews with patients at treatment process. After the first evaluation, it has been determined infertility has caused women to be affected on their own feelings, their relations with husbands and other family members, and their social life (1,6,11). Considering these, items have been generated begin with an item stem, such as "I feel. . . " to be followed by a series of statements relevant to infertility issues and to which a respondent rates each item, based on a Likert scale (e.g., "never" to "always"). The research team members (three) generated an initial list of more than 30 potential items.

Second Phase; refining items and pre-testing:

A. Refining items; the goal of this phase was to improve and select the items. This draft of 30-item scale was further refined with a final check in determining item relevance and content validity by five health professionals. These professionals were recruited from major fertility centers or group practices across Turkey and asked to rate the initial 30-items of the scale. They were asked to participate based on recommendations by our project consultants and because they represent thought leaders in their respective disciplines. They rated every item between 1 to 5 points. They used 5 if they believed the item had to be absolutely included in the scale and they scored 1 when they believed the item were not necessary. The five experts included a health psychologist, a psychiatry nurse, a specialist in

gynecology and obstetrics, two faculties in gynecology and obstetrics nursing, After this expert study, the items were reevaluated by researchers, the items scored lowly were dropped and the 21-item Likert type scale was developed.

B. Pre-testing; although the health experts rated the importance of each proposed item to new scale, 20 participants (10 infertile and 10 fertile women) were recruited for the pre-testing. These women have approved the clarity of the scale and no change was needed after pre-testing.

Third phase: Reliability and Construct Validity: The goals of Phase III were to test the performance of the items in a participant sample, identify the underlying components comprising the scale for construct validity, to determine the scale's reliability. The original Turkish version of scale was applied to a total of 338 participants and all necessary analyses and evaluation were performed by using Turkish version. The English version was obtained by the combination of translations by 3 Turkish faculties experienced many years in English.

Participants:

Study sample included a total of 338 women with 198 infertile and 140 fertile women who accepted to participate from December 2005 to July 2006. Infertile group was reached at Invitro fertilization unit of Gulhane military Medical Academy and fertile group was recruited by asking patients who presented to Gynecology and obstetrics outpatient service of the same Academy. Fertile women have been included in the study in order to compare the scores of scale between fertile and infertile women. For matching reason fertile group was selected among women with no child and without having diagnosed as infertile. All women in both groups were briefed about the aim and scope of study and after their verbal consent they were requested to fill the new scale.

The new instrument; IDS

The new scale involves 21 items with 16 positive (straight) statements and 5 negative (inverse) statements. The negative statements were number 3, 10, 13, 14, and 21 ones. Positive items were scored on a four point scale anchored by 1: never feel and 4: always feel, but negative items were scored adversely. Total possible scores would be ranged between 21 and 84 points. The scale based on one component with no subscales. The higher total scores represented the severity of effect caused by infertility.

Data analyses

Data obtained from the study was analyzed with SPSS package version 15.0. Statistical methods were chosen as recommend in literature (18). Descriptive analyses have been done to demonstrate the distribution of participants according to certain variables. The Cronbach's alpha value was estimated to evaluate internal consistency of measurement tool. The mean scores of entire scale were estimated. T-test was used to compare the mean scores of groups based on fertility status. Correlation analyses were conducted to find out any association between scale scores and continuous variables like age, marriage, duration. Factor analysis was done for construct validity. The results of interim analyses for Factor analyses like Kaiser- Meyer-Olkin (KMO) test, Bartlett's Test of Sphericity, Principal Component Analysis as Extraction Method and Promax with Kaiser Normalization as Rotation Method were also estimated.

RESULTS

Descriptive characteristics of women participated in the study have been presented in table 1.

According to study all participants were in the age group of '20-49'. The average age of all participants was 27.74±4.70, it was estimated as 26.32±4.10 for infertile group and 28.74±4.85 for fertile group (table 1). While the percentage of women with lower education level was the highest with a rate of 46.0 % in infertile group, the proportion of women with higher education was the highest with 69.3 % in fertile group. Cronbach's alpha value for the scores of items in the measurement tool used in the study has been found as (0.933) that was higher than the recommended value (0.70).

Corrected Item-total correlation of items varied 0.27 to 0.78. Deletion of any item did not increase Cronbach's alpha Value. This indicates the scale with 21 items has a sufficient level of reliability (Table 2).

We performed the same analysis regarding only infertile group as seen in Table 3. Cronbach's alpha Value has been found as (0.899) (95% confidence interval= 0.878-0.919) that was again higher than the recommended value (0.70). Corrected Item-total correlation of items varied 0.24 to 0.71. In practice any item with a value under 0.20 looses its reliability (19). Deletion of two items increased Cronbach's alpha Value as 0.01.

In order to accept any item as weak it is required to increase Alpha value at least 0.1 (8) . Therefore no item was deleted.

Table 1. The distribution of socio-demographic characteristics of study population

Age	**Infertile**		**Fertile**		**Total**	
	26.32±4.10		**28.74±4.85**		**27.74±4.70**	
Education	**n**	**%**	**n**	**%**	**n**	**%**
Primary School	91	46.0	4	2.9	95	28.1
Secondary School	18	9.0	5	3.5	23	6.8
High School	57	28.8	34	24.3	91	26.9
College University	32	16.2	97	69.3	120	35.5
Total	198	100.0	140	100.0	338	100.0

Table 2. Item analysis and internal consistency of Infertility response scale (for the total study population)

	Mean	**SD**	**Item-total correlation**	**If item deleted**
I feel as if I were alone in the World	1.91	1.0	.75	.93
I feel myself excluded out of my family and friends	1.46	.80	.67	.93
There are people around me to whom I can admit when I am bored	1.69	.87	.42	.93
I have no more power to resist and struggle	1.86	.99	.78	.93
I feel myself useless	1.55	.85	.72	.93
I feel myself unhealthy	1.83	.95	.72	.93
I feel myself anxious and nervous continuously	2.33	1.06	.78	.93
I have no pleasure from any of my works	1.85	.87	.66	.93
I feel myself continuously tired recently	2.36	1.07	.72	.93
I much more take care of myself when compared to previous time	2.93	1.00	.35	.93
I avoid to talk about not being able to have a child	2.19	1.23	.72	.93
I would’t like being asked questions about not being able to have a child	2.35	1.25	.70	.93
My husband and I easily talk about not being able to have a child	1.5	.79	.27	.93
I easily have friendship with families who have children	1.63	.94	.46	.93
I think people around me accuse me of not being able to have a child	1.56	.86	.70	.93
I think my husband accuse me	1.33	.67	.64	.93
That I cannot have a child affects sexual partnership with my husband	1.37	.62	.63	.93
I feel anger to my husband	1.24	.52	.58	.93
I think my husband does not currently love me as mush as previously	1.30	.58	.64	.93
Relationship between me and my husband has been affected negatively	1.31	.60	.69	.93
My husband is interested in me much more than before	2.89	1.02	.38	.93

Table 3. Item analysis and internal consistency of Infertility response scale (for the infertile group)

	Mean	SD	Item-total correlation	If item deleted
I feel as if I were alone in the World	2.47	.93	.58	.89
I feel myself excluded out of my family and friends	1.74	.93	.65	.89
There are people around me to whom I can admit when I am bored	1.88	.96	.38	.89
I have no more power to resist and struggle	2.40	.96	.65	.89
I feel myself useless	1.89	.95	.65	.89
I feel myself unhealthy	2.28	.98	.59	.89
I feel myself anxious and nervous continuously	2.96	.84	.57	.89
I have no pleasure from any of my works	2.23	.88	.49	.89
I feel myself continuously tired recently	2.94	.87	.51	.89
I much more take care of myself when compared to previous time	3.18	.88	.29	.90
I avoid to talk about not being able to have a child	2.90	1.11	.50	.89
I would not like being asked questions about not being able to have a child	3.04	1.11	.46	.89
My husband and I easily talk about not being able to have a child	1.57	.83	.47	.89
I easily have friendship with families who have children	1.96	1.03	.24	.90
I think people around me accuse me of not being able to have a child	1.89	.95	.65	.89
I think my husband accuse me	1.53	.79	.64	.89
That I cannot have a child affects sexual partnership with my husband	1.61	.71	.54	.89
I feel anger to my husband	1.40	.63	.55	.89
I think my husband does not currently love me as mush as previously	1.49	.68	.61	.89
Relationship between me and my husband has been affected negatively	1.50	.71	.71	.89
My husband is interested in me much more than before	3.05	.94	.41	.89

Table 4. The correlation analysis of IDS regarding certain variables. (for infertile group)

Variable	r	Comment
Age	0.123	No correlation
Marriage duration	0.370	Strong correlation
Desiring time for a baby	0.410	Strong correlation
Education level	-0.268	Strong correlation
Number of intra uterin insemination (IUI) treatment	0.134	No correlation
Number of IVF treatment	-0.228	No correlation

Table 4 presents correlation coefficients between IDS and certain variables. The increase in marriage duration and desiring time for a baby significantly correlates with IRS score in a positive direction.

T test analysis has revealed a significant difference between the IDS scores of infertile group and fertile group (Table 5).

Table 5. The distribution of IDS scores according to groups based on fertile status.

	n	mean	Ss	
Fertile	140	28.20	4.8	t=-18.0
Infertile	196	45.94	10.9	P=0.000

Table 6. The results of factor analysis in total study population (Structure Matrix)

	Component			
	1	2	3	4
I feel myself anxious and nervous continuously	.871			
I have no more power to resist and struggle	.848			
I feel as if I were alone in the World	.821			
I avoid to talk about not being able to have a child	.821			
I feel myself continuously tired recently	.818			
I feel myself unhealthy	.798			
I would not like being asked questions about not being able to have a child	.797			
I have no pleasure from any of my works	.767			
I feel myself useless	.728			
I feel myself excluded out of my family and friend	.645			
Relationship between me and my husband has been affected negatively		.881		
I think my husband does not currently love me as mush as previously		.847		
I feel anger to my husband		.794		
I think my husband accuse me		.788		
I think people around me accuse me of not being able to have a child		.709		
That I cannot have a child affects sexual partnership with my husband		.685		
My husband and I easily talk about not being able to have a child			.589	
I think people around me accuse me of not being able to have a child			.533	
There are people around me to whom I can admit when I am bored			.460	
I much more take care of myself when compared to previous time				.754
My husband is interested in me much more than before				.551

Extraction Method: Principal Component Analysis. Rotation Method: Promax with Kaiser Normalization.

Table 7. Total Variance Explained according to factor analysis.

Component	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total
1	9.719	46.281	46.281	8.609
2	1.749	8.331	54.612	7.165
3	1.163	5.539	60.151	2.885
4	1.022	4.865	65.016	1.910

Extraction Method: Principal Component Analysis.
[a] When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

A factor analysis was done for validity of the scale. Kaiser- Meyer-Olkin (KMO) test result has been 0.921, it was "marvelous" according to Kaiser Criteria (20). The significance level of Bartlett's Test of Sphericity has been highly significant ($p<0.000$). This has indicated 21 item correlation matrix was not identity matrices. The Measures of Sampling Adequacy (MSA)s ranged from 0.839 for item (My husband and I easily talk about not being able to have a child) to 0.959 for item (I have no more power to resist and struggle). According to Kaiser Criteria the individual MSAs have been. (20) By using Principal Component Analysis as Extraction Method and Promax with Kaiser Normalization as Rotation Method 4 factors have been determined (Tables 6). But these 4 factors could explain cumulatively only 65,016% of variance. This implies that nearly 35 % of information would be lost if these factors were used. Thus the first component could explain more than 46% of variance solely (Table 7), all items should be regarded as based on one underlying component and should be included in measurement tool.

DISCUSSION

The purpose of the study was to develop a new scale that could assess all psychosocial responses of infertile women to the all aspects infertility and its treatment process and to determine its validity and reliability. Through an iterative, rigorous process the instrument was developed and it was tested on highly acceptable number of study population. The scale demonstrated a clear and easily interpretable single-component structure and a high estimated internal consistency. These results suggest that the 21-item scale is a reliable and valid measure tapping a single underlying component.

Another important point, it could be claim that the validity of the scale was confirmed since the study was carried on both infertile and fertile women, and study results demonstrated that infertile women had significantly higher scores than fertile women. Moreover, the significant positive correlation determined between total score and both marriage duration and the duration after the decision of having a baby suggested the increase in the intense of responses due to the increase in the time passed after the diagnosis of infertility. It was demonstrated in the literature as the duration of infertility had been increased the problems due the infertility, especially depression levels had been increased (4).

On the other hand study showed a strong but inverse correlation between IDS scores and educational levels of infertile women. This suggests education helps to increase the capability of coping of women against infertility.

It is considered Infertility response scale developed through this study might be an important tool for the psychological evaluation of women being suffered with infertility and having infertility treatment. So during medical treatment those who need psychological support and care could be identified and covering their needs might be possible.

However, there was a limitation regarding the selection of study groups. For the purpose of matching, fertile group was selected among women with no child and without having diagnosed as infertile. These women preferred to delay her pregnancies and most of them had a higher education background. Therefore fertile women in this study had higher education level than infertile women and also they were older than infertile group.

In other limitation of the study was lack of data regarding social environment, family structure, belief and tradition which women have come from and might possibly affect women's the response to the infertility.

Another important point regarding this scale, it was developed by Turkish researchers based on the needs of Turkish women. This point demonstrates both weak and strength aspect of the study. On the strength aspect of the study this scale could be reliably apply to Turkish women. On the weak aspect what if it would be apply the women from the different cultural background? We advocate further research to find out the validity of the scale among women from different settings and also among men who share the infertility problems with their wives.

CONCLUSION

Although the Infertility Distress scale developed through this study needs additional studies in order to prove its reliability and validity among different settings, this study has demonstrated significant evidence that the scale can be used to determine the psychological status of infertile women. On the other hand education seems an important tool to increase the coping capability of women against infertility.

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