Research Department

Cultural Validation of the Turkish Version of the Infertility Self-Efficacy Scale–Short Form (TISE-SF)

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Abstract

Purpose: To translate and test the psychometric properties *of* the Turkish version of the Infertility Self-Efficacy Scale–Short Form (TISE-SF). **Methods:** The convenience sample consisted of 120 infertile women. A psychometric research design was used with content and construct validity and reliability. **Results:** Cronbach's alpha of .78 showed moderate reliability, whereas item–total correlations ranged from .30 to .54. Factor analysis extracted a single component, explaining 40.3% of the variance. Kendall *W* showed agreement with each expert regarding the appropriateness of the items, confirming the content validity of the translated TISE-SF. **Conclusion:** The results supported the construct validity and reliability of the TISE-SF for measuring infertility self-efficacy in a population of Turkish women. **Implications:** Evaluating infertile women's perception of self-efficacy with the TISE-SF may be useful in clinical studies in Turkey. TISE-SF can be used by professionals as a counseling tool to help guide women in managing their treatments at infertility centers.

Keywords

infertility, psychometric testing, self-efficacy, instrument validity, instrument reliability, TISE–Short Form, ISE–Short Form

Women struggling to conceive a baby or who have been diagnosed with infertility can experience significant negative emotions, distress, anxiety, and depression (Cousineau & Domar, 2007; Domar, Lockwood, Schwenk, & Barss, 2008). Also, many women who could potentially benefit from reproductive therapies may drop out of treatment primarily because of the emotional and financial costs associated with prolonged treatment (Domar, 2004). Self-efficacy is the self-confidence that a required task, or aspired goal, is achievable: the stronger the belief in one's self to be able to complete a task successfully, the greater the efforts to achieve the task (Bandura, 1994). The level of self-efficacy is measurable, and attained self-efficacy can be a strong predictor of partial, or even complete, mastery of a task: the higher the sense of self-efficacy, the greater the effort, persistence, and resilience (Bandura, 1994). In this research, we were interested in Turkish women's *perceived self-efficacy* associated with the demands of fertility treatment.

Literature Review

Infertility in Turkey

In traditional and developing countries such as Turkey, associated negative psychosocial consequences associated with infertility have been reported (Albayrak & Gunay, 2007; Inhorn, 2006; Kazandı, Gunday, Mermer, Erturk, & Ozkınay,

2011). In Turkey, motherhood is believed to be the major role for women. According to Turkish cultural beliefs, it is important to get married and, soon after, have children. In particular, Turkish women typically face some questions such as "Are you married?" and then "Do you have a child?" If the answer is no, it can cause negative social consequences such as loneliness, hopelessness, and isolation (Kazandı et al., 2011; Özdemir, Gokler, & Unsal, 2013; Yağmur & Oltuluoğlu, 2012). Güz, Özkan, Sarısoy, Yanık, and Yanık (2003) found that the negative reactions infertile Turkish women experienced included denigration, accusation, being despised, and pitied. Researchers have stated that not only did the infertile women experience poor self-esteem but they also manifested depression, grief, and psychosomatic symptoms (Albayrak & Gunay, 2007; Güz et al., 2003; Kazandı et al., 2011). Similarly, Teskereci and Oncel (2012) found that the quality of life of the infertile Turkish women was low. Van Rooij, van Balen, and Hermanns (2007) compared emotional distress experienced by infertile Turkish couples

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living in Denmark with that of Dutch couples, and they found that infertile Turkish women reported significantly higher levels of depression than infertile Dutch women. The study showed the enduring values related to having children even for those women removed from the original culture.

Turkey is primarily a Muslim country where marriage and motherhood is highly valued, as evidenced by the fact that nearly all adults are married. The Turkey Demographic and Health Survey (TDHS; 2008) showed that the majority (65%) of women at childbearing age are currently married. Turkish society has a pronatalist perspective (Kuzulugil, 2010). Thus, having a child is the most important aspect of marriage in Turkey. The TDHS (2008) found that, for women of reproductive ages, the median age at first birth was 22.3 years and fertility rate was 2.16 births per woman. Voluntary childlessness is rare; therefore, married women who do not give birth by their late 40s are predominantly childless involuntarily. For example, the TDHS (2008) showed that the level of childlessness among married women at the end of their reproductive period was only 9%. Although it may appear to be a small percentage, according to the World Health Organization (Rutstein & Shah, 2004), Turkey is among the countries with the highest percentages of infertility. A study by Turkish investigators (Güz et al., 2003) also showed that because of the social stigmatization associated with infertility, infertile women exhibited significantly higher levels of anxiety and depression than the women with children. Other researchers (Yağmur & Oltuluoğlu, 2012) corroborated the findings of Guz et al. (2003), who showed that in contemporary Turkey there were enduring beliefs regarding women and fertility and that not bearing children significantly altered the psychological and social well-being of Turkish women. This is because children who carry on the family's name are a guarantee for the future of the parents. Hence, childlessness is perceived as an uncertain future, and social pressure to have children is intensive and extensive (Guz et al., 2003; van Rooıj et al., 2007). As a result, in the Muslim world, infertile women often live in fear that their marriages will "collapse," as Islamic personal laws consider a wife's barrenness a major ground for divorce (Inhorn, 2006). For example, research (Rutstein & Shah, 2004) shows that the divorce rate among women who have never had a child is 10.7%, whereas the overall divorce rate among women of reproductive age is 3.3% (TDHS, 2008) in Turkey.

Yağmur and Oltuluoğlu (2012) report that the cost of assisted reproductive techniques (ART) is a serious burden for couples in Turkey. Furthermore, most of the couples that experience this problem do not have easy access to diagnosis and treatment of infertility because of their geographic location and/or financial constraints.

Self-Efficacy and Infertility

Cousineau et al. (2006) assert that the perception of self-efficacy has a distinct influence on infertile women's ability to cope with the issue of infertility. Furthermore, a woman's mental state may lead to feeling helpless about her fertility and inhibit motivation to seek treatment (Domar, 2004). Additionally, loss of pregnancy and failures in treatment cycles would further lower a woman's self-confidence to cope with treatment challenges and decrease perception of self-efficacy (Cousineau et al., 2008). In contrast, an infertile woman with a high level of self-efficacy would exhibit a more constructive attitude and a more positive emotional state in seeking and sustaining a fertility program (Cousineau et al., 2006). An infertile woman with high perceived self-efficacy may also have confidence in her body's healing capabilities, and hence have the necessary skills to do follow-up care, such as monitoring body temperature over a period of time and giving herself scheduled injections after treatments (Elsworthy, 2010).

Hence, positive feelings toward the state of infertility and its treatment could increase a woman's perception of self-efficacy while equally decreasing negative feelings toward the success of the treatment. Therefore, before designing any nursing intervention, it is necessary to assess women's perception of self-efficacy in relation to infertility along with assessing the psychosocial effects of infertility on a woman's well-being (Nelson, 2010).

Self-Efficacy and Nursing

Research in the nursing field (Johnston-Brooks, Lewis, & Garg, 2002; Sousa, Zauszniewski, Musil, Price, & Davis, 2005) found a relationship between the concept of self-efficacy and self-care agency (Orem, 1995), asserting that self-efficacy influences an individual's performance in self-care management activities. Orem (1995), for example, believed that an individual must have self-care agency to engage in self-care activities and achieve optimal health and well-being. Self-efficacy research on infertility is guided by the conceptualization that self-care agency and self-efficacy are interrelated concepts. For individuals to engage in infertility treatments, they must believe in their ability (self-efficacy) to manage treatment programs in tandem with the actual ability (self-care agency) to perform self-care activities. Moreover, nurses play a significant role in assessing self-efficacy and developing interventions to enhance the self-care agency of their patients (Sousa et al., 2005).

Typically, the psychological measurement tools, such as the Beck Depression Inventory and State Trait Anxiety Inventory (Albayrak & Gunay, 2007; Kazandı et al., 2011; Özkan & Baysal, 2006; Tuzer et al., 2010), used for infertility studies in Turkey tend to be distress-focused. We believe that self-efficacy is a crucial trait used to cope with infertility and should be measured both before and during the treatment of infertility. However, there is currently no scale available to measure Turkish women's perception of infertility self-efficacy. Hence, the need for standardized and well-tested instruments to measure infertile women's self-efficacy is pressing. The purpose of this study was to translate and then to test the

translated version of the Infertility Self-Efficacy Scale–Short Form (ISE-SF) scale as a relevant, valid, and reliable instrument for determining the self-efficacy of infertile women in Turkey to complete the fertility treatments. No reports on the use of a translation and validation of the ISE-SF into Turkish language have been previously published.

Methodology

Design

A psychometric research design used an analysis of Cronbach's alpha coefficients to determine reliability, the Kendall *W* statistic to examine content validity, and an exploratory factor analysis to measure construct validity.

Participants and Settings

Convenience sampling was used to recruit from a group of women receiving infertility treatments at an infertility center in a university hospital in Turkey. This center has adequate infrastructural facilities for many types of clinical investigations of infertility. In 2009, this infertility center performed a total of 705 ART procedures.

Polit and Beck (2008) suggests 10 participants for each scale item to determine sample size. The number of items in this scale is 10. Thus, a sample size of 100 was deemed sufficient. However, 20 participants were added to compensate for possible attrition. The study was carried out with a sample size of 120. The inclusion criteria were the following: (a) diagnosis of infertility, with female factor as etiology; (b) 18 to 45 years of age; (c) able to speak, read, and write in Turkish; (d) no psychiatric diagnoses; and (e) willing to take part in the research.

Instruments

Infertility Self-Efficacy Scale. The Infertility Self-Efficacy Scale (ISE) was originally developed in the United States by Cousineau et al. (2006, 2008). The original scale consisted of 16 items, measuring an infertile woman's perception about her ability to engage in a set of cognitive, emotional, and behavioral skills related to the treatment of infertility. Cronbach's alpha coefficient for the original scale was .96, with item–total correlations ranging from .59 to .86. Following factor-analytic procedures, the authors also identified the single component with an eigenvalue of 8.89, explaining 55.6% of the variance (Cousineau et al., 2006). Subsequently, Cousineau et al. (2006, 2008; T. M. Cousineau, personal communication, January 20, 2010) developed a shorter version of the scale. ISE-SF consists of 10 items with similar content validity, internal consistency (α = .94), and a single-factor structure. The items of the scale have 9-point Likert-type response choices, ranging from 1 = *not at all confident*, 5 = *moderately confident*, to 9 = *extremely confident*. The highest possible score is 90, with higher scores indicating a greater degree of infertility self-efficacy.

The ISE is a comprehensive instrument for assessment of self-efficacy to engage in the activities required for infertility treatment. The ISE has been psychometrically tested among infertile women in Portugal (Galhardo, Cunha, & Pinto-Gouveia, 2013) and has been applied in a variety of studies, including in a study of the effectiveness of acupuncture for improving infertility self-efficacy in Australia (Kovárová, 2008; Kovárová, Smith, & Turnbull, 2010; Smith, Ussher, Perz, Carmady, & de Lacey, 2011) and a test of the effectiveness of a brief online education and support program for infertile women in the United States (Cousineau et al., 2008). Gouveia, Galhardo, Cunha, and Matos (2012) explored how emotional regulation processes such as psychological flexibility/acceptance, self-compassion, and coping styles are related to depression and to the sense of self-efficacy to deal with infertility in infertile patients. Elsworthy (2010) examined the influences of self-efficacy on coping with the challenges of diagnosed infertility. The results indicated a significant constructive relationship between self-efficacy and coping with the challenges of infertility. Nelson (2010) explored the interaction of infertility-related stress and social support in relationship to infertility self-efficacy. The study showed that infertility-related stress was found to have a significant, negative relationship with infertility self-efficacy, and perceived adequacy of social support was found to have a significant, positive relationship with infertility self-efficacy.

The Personal Information Questionnaire. The Personal Information Questionnaire, which consisted of 13 questions, was used to collect demographic and clinical data. The variables measured were age, highest level of education, length of marriage in years, employment status, and income status, as well as infertility characteristics including prior and current treatments.

Translation Procedure

The English language version of the ISE-SF was translated into Turkish following standard translation methodology (Hilton & Skrutkowski, 2002). Several methodological researchers in Turkey (Aksayan & Gözüm, 2002; Deniz, 2007; Şencan, 2005) developed guidelines for translation and testing of instruments originally developed in other languages. Consistent with the back-translation method first described by Brislin (1970), these guidelines required that an instrument be subjected to a vigorous scientific translation process before they were implemented for use with Turkish populations. Adhering to these guidelines, the back-translation procedure was implemented to translate ISE-SF scale developed by Cousineau et al. (2006) into Turkish.

The translation process used four steps: (a) the ISE-SF scale was first translated from English into Turkish by three Turkish faculty members/researchers who specialized in

obstetrics and gynecological nursing and were proficient in English; (b) the translated instrument was then modified into a format better suited to the structure of the Turkish language; (c) the scale in the Turkish language was then translated back into English by a bilingual native speaker, who did not take part in the first step; and (d) the equivalence of the back-translated scale in English with that of the original scale was further assessed by all the translators and the primary investigator to ascertain whether the conceptual meaning of each item was maintained. Based on this assessment, two items were changed with respect to wording. After modifications, an agreement was reached among the translators that the Turkish Infertility Self-Efficacy–Short Form (TISE-SF) was ready for psychometric properties testing.

Data Collection

The primary author administered the questionnaires to each participant between March and October 2009, in a private room off the waiting hall of the infertility center. The face-to-face method was selected due to the sensitive nature of the subject. It took approximately 15 to 20 minutes for each participant to complete the TISE-SF and the Personal Information Questionnaire.

In the Turkish version of the scale, items were organized into four Likert-type statements and ranked as 1 = *poor fit* to 4 = *excellent fit*, reducing orientation to the center of the scale and ensuring a more precise assessment. All statements in the Turkish version were made affirmative, same as the original version. The range of possible scores was 10 to 40; a higher score indicated a greater agreement with the statement (such as "I can control negative feelings about infertility," yielding a score of 4, indicating a high degree of self-efficacy). Other items included statements such as "I feel confident I can ignore or push away unpleasant thoughts that can upset me during medical procedures," "I can handle mood swings caused by hormonal treatments," "I can control negative feelings about infertility," and "I can cope with pregnant friends and family members."

Pilot Study

The translated scale was first tested with 10 infertile women with similar characteristics of the intended final sample. The pilot test results showed no detectable language problems. In other words, it was determined that the questions could be understood and no changes were made.

Ethical Considerations

Ethics approval was attained from the two ethics committees, one from the School of Nursing, the official sponsor of the research, and the other from the faculty of medicine, the official proprietor of the clinic from which the data were collected. Additionally, corporate approvals were obtained from the university hospital and the infertility center from where the participants were recruited. Finally, an informed consent form was given to all participants and included statements that participation in the study was voluntary, that participants could withdraw with no penalty toward their treatment, and that data collected would be reported as aggregate and kept confidential. In addition, a written permission to translate the ISE-SF into Turkish was obtained from its author, Cousineau (personal communication, January 20, 2010).

Data Analyses

The data were coded and scored and analyzed using SPSS 15.0 (SPSS, Inc., Chicago, IL, USA). Content validity (also known as logical validity) refers to the extent a measure represents all facets of a given social construct (Hilton & Skrutkowski, 2002). Kendall *W* test was employed to measure the content validity with 12 experts judging the meaning of the items. Kendall *W* is a nonparametric statistic for assessing agreement among raters and ranges from 0 (*no agreement*) to 1 (*complete agreement*; Hilton & Skrutkowski, 2002).

Exploratory factor analysis was carried out to test TISE-SF's construct validity. Kaiser–Meyer–Olkin (KMO) was used to analyze sampling adequacy, and Bartlett test of sphericity was also applied to determine whether the correlation matrix was an identity matrix and hence unsuitable for factor analysis. A KMO value >.50 indicates that the sample size is adequate for factor analysis (Watson & Thompson, 2006). Principle component analysis and varimax rotation with Kaiser normalization was used to identify the factor structure of the scale and also to determine whether the variables in the scale could be explained by a smaller number of factors. Statistical criteria guiding the decision of a final component structure were the screen plot, eigenvalues greater than 1.0, percent of variance explained, communalities above .35, and component loadings greater than .40 (Watson & Thompson, 2006).

Reliability was assessed using the corrected item-total correlations and the alpha-if-item deleted procedure. As for corrected item-to-total correlations, items with a coefficient of .30 or above were regarded as homogeneous to the TISE-SF. Internal consistency of the TISE-SF was assessed by determining Cronbach's alpha coefficients. The coefficient value range was 0 to 1. The higher the score, the more reliable the generated scale. The criterion of α > .70 was established as evidence of satisfactory internal consistency reliability (Polit & Beck, 2008).

The sociodemographic data were analyzed using descriptive statistical analysis. The relationship between age and the TISE-SF scores were assessed using correlation analysis. Initially, a one-way analysis of variance was planned to determine the relationship between demographic characteristics and the TISE-SF scores. However, after testing the demographic variables for normality using the

Table 1. Sociodemographics and Infertility Characteristics of Study Participants (*N* = 120).

Sociodemographic Characteristics	*n*	%	*M (SD)*	Range (in years)
Age			31.2 (±5.7)	19-48
19-25 years	21	17.5		
26-35 years	73	60.8		
≥36 years	26	21.7		
Marriage			6.3 (±4.4)	1-23
1-5 years	65	54.2		
5.5-9 years	32	26.7		
≥9.5 years	23	19.1		
Education				
Literate and primary school	55	45.8		
Secondary school	14	11.7		
High school	25	20.8		
University	26	21.7		
Employment				
Housewife (unemployed)	78	65.0		
Employed	42	35.0		
Income (TL = Turkish Liras[a])				
≤1,000 TL	54	45.0		
1,000-1,500 TL	32	26.7		
≥1,500 TL	34	28.3		
Infertility characteristics				
Prior IUI				
Yes	59	49.2		
No	61	50.8		
Prior ART treatment				
Yes	11	9.2		
No	109	90.8		
Treatments				
Hormones	34	28.4		
IUI	46	38.3		
ART	40	33.3		

Note: IUI = intrauterine insemination; ART = assisted reproductive techniques.
a. 1,000 Turkish Liras = US$571.

Kolmogorov–Smirnov test, the distributions were significantly different from normal. Therefore, the Kruskal–Wallis test was used; *p* values ≤.05 were considered statistically significant.

Results

A total of 120 participants completed the questionnaires. Table 1 shows the demographic and fertility characteristics of the participants. The average age of the participants was 31.2 years (*SD* = 5.7, with a range of 19-48 years). The average length of marriage was 6.3 years (*SD* = 4.4; range = 1-23 years), and 54.2% of women were married for 1 to 5 years. About 45.8% of the women had completed only primary school education; the rest completed secondary education or higher. In terms of work status, 65% were homemakers. As Table 1 shows, nearly half, 45.0%, had a monthly income less than 1,000 Turkish Liras (US$571), an income low when compared with the country's standards of living.

Fertility characteristics showed that the average infertility period was 2.7 ± 1.3 years, with a range of 1 to 11 years. The women were receiving infertility treatment on average for 2.3 ± 1.2 years, with a range of 1 to 5 years. The number of women who were previously treated with in vitro fertilization (IVF) was 59 (49.2%), about 22% having received an intrauterine insemination (IUI) application at least once, and another 9.2% having received ART in the past. During the course of data collection, the modes of treatment were as follows: 38.3% IVF, 33.3% intraplasmic sperm injection (ICSI), and 28.4% hormones.

TISE-SF Scores

The average of the total score of the translated scale was 22.6, with a range of 9 to 32, and an *SD* of 5.09. Item means ranged from 2.82 ± 1.01, with a range of 2.22 to 3.22.

Psychometric Properties of the Translated Instrument (TISE-SF)

Content Validity. The content validity of the translated instrument was evaluated with 12 experts: two specialists in reproductive endocrinology and infertility, two academic nurses with expertise in psychiatric and mental health fields and measurement, five nursing faculty members specializing in obstetrics and gynecological nursing, and three nursing faculty members specializing in research and measurement. The experts were asked to evaluate the wording of each item and rank them as follows: 1 = *not suitable*, 2 = *item needs to be revised*, 3 = *suitable but requires minor changes*, 4 = *perfectly suitable*. A Kendall *W* test was conducted to assess for agreement among the 12 experts. Kendall concordance coefficient was found to be .48, showing that the experts were in agreement with each other on the meaning of the statements captured in each item on the scale (*p* = .07).

Construct Validity. Exploratory factor analysis was carried out to test the construct validity of the TISE-SF. First, the sampling adequacy for factor analysis was analyzed with two tests yielding the following results: the KMO test result was .80 and Bartlett's test was 217.91 (*p* < .001), each indicating that the sample was large enough to perform a satisfactory factor analysis as well as for psychometric testing of an eight-item scale.

We then performed a principal component extraction method with varimax rotation to determine the factor structure of the TISE-SF scale and also to ascertain which factor best explained variance. The results showed that component loadings ranged from .41 to .78, with Item 6, "I keep a positive attitude," receiving the highest value. Furthermore, principal component extraction analysis extracted a single component, with an eigenvalue of 3.23, explaining 40.3% of the variance. This component was related to cognitive behavioral techniques; hence, we labeled it "cognitive affect regulation" component—the same component extracted in the original scale (Cousineau et al., 2006).

Table 2. TISE-SF Item-Total Correlations and Results of the Factor Analysis.

TISE-SF item: *I feel confident that I can*:	M (SD)	Factor loadings	Item–total correlation (r)
Factor: Cognitive affect regulation (α = .78)			
1. Ignore or distance myself from all kinds of unpleasant distressing thoughts	2.22 (0.95)	.407	.300
2. Keep a sense of humor	2.87 (0.94)	.656	.522
3. Control negative feelings about infertility	2.74 (0.93)	.564	.425
4. Cope with pregnant friends and family members	2.89 (1.21)	.580	.428
5. Handle personal feelings of anger or hostility	3.11 (0.96)	.683	.522
6. Keep a positive attitude	3.22 (0.87)	.776	.621
7. Lessen feelings of self-blame, shame, or imperfection	3.05 (1.08)	.693	.542
8. Stay relaxed while waiting for appointments or test results	2.49 (1.16)	.652	.515

Reliability. Two statistical methods were used to evaluate the reliability of the scale: (a) item–total correlations to determine the degree to which the individual items on the scale correlated with the total scale score (this analysis is particularly appropriate for identifying those items that poorly correlate with others, and hence could be discarded to reduce the variables to a more manageable number) and (b) Cronbach's alpha to test internal consistency of the scale.

The item–total correlations ranged from .18 to .61. However, two items scored below .30 on the translated instrument. These were Items 3 and 4, "Make meaning out of my infertility experience" and "Accept that my best efforts may not change my/our infertility," respectively. Cousineau et al. (2006) reported that item–total correlations of the original scale were ≥.30 for all items. Therefore, the two items in our data with correlations <.30 were deleted and a second item–total correlation analysis was performed on the remaining eight items. The values of the eight item–total correlations are presented in Table 2. Cronbach's alpha reliability coefficient was performed for the 8-item scale yielding .78, thus showing moderate reliability. The value of the alpha coefficient in any scale is related to the number of items. As item numbers increase so does reliability. Similarly, the size of the sample also affects reliability, and as the sample size increases so does the correlation coefficient (Şencan, 2005).

TISE-SF Demographic Response Patterns

To assess the utility of the TISE-SF as an instrument in identifying women at risk for poor coping with infertility treatment, the relationships between demographic variables age, education, length of marriage, and TISE-SF scale were also evaluated using the Kruskal–Wallis test. The TISE-SF scores of infertile women according to age group were as follows: (a) for the age group of 19 to 25 years, a mean score of 23.3 ±4.2; (b) for the age group of 26 to 35 years, a mean score of 22.6 ± 5.1; (c) and for age group of 36 years and older, a mean score of 22.1 ± 5.7. There were, however, no statistically significant differences in TISE-SF score based on age (χ^2 = .69, df = 2, p = .71).

Similarly, the results of the Kruskal–Wallis analysis indicated that there were no statistically significant differences (χ^2 = 1.51, df = 3, p = .68) in the TISE-SF scores of women who completed elementary school (mean = 22.6, SD = 5.1), secondary school (mean = 21.2, SD = 5.9), high school (mean = 22.3, SD = 5.0), or university (mean = 23.5, SD = 4.5). More interestingly, there was no statistically significant difference (χ^2 = 1.72, df = 2, p = .42) in the TISE-SF scores and years of marriage: 1 to 5 years (mean = 22.1, SD = 5.0), 5.5 to 9 years (mean = 23.2, SD = 5.0), and 9.5 years and longer (mean = 23.1, SD = 5.4).

However, Kruskal–Wallis test analysis did indicate that there was a statistically significant difference between income and TISE-SF scores. The TISE-SF scores of women with monthly incomes of 1,001 to 1,500 TL (mean = 22.0, SD = 5.03) and >1,501 TL (mean = 24.6, SD = 3.92) were higher than the women with monthly incomes of ≤1,000 TL (mean = 21.6, SD = 5.48), showing income levels influenced self-efficacy (χ^2 = 7.64, df = 2, p = .02).

Discussion and Conclusions

Instrument Evaluation

This study supports the cross-cultural validation and psychometric properties of the TISE-SF. The items and response format of the scale were found to be appropriate for infertile Turkish women during the infertility treatment process. According to our analysis, neither age nor education or years of marriage affect self-efficacy scores. However, low income was related to lower self-efficacy scores. These findings are consistent with those reported on the English version of the scale with American participants (Cousineau et al., 2006).

Internal consistency is the most important indicator of scale reliability. Cronbach's alpha coefficient assumptions dictate that each item is a linear component of the total score and that the scale features the facility of computability (Deniz, 2007; Özdamar, 2004). When the internal consistency of the TISE-SF scale was assessed with Cronbach's alpha, a reliable score of .78 was obtained in spite of the fact

that the scale had relatively few items (8). Moreover, the internal consistency coefficients of the items ranged between .73 and .78, indicating the instrument was reliable (Özdamar, 2004; Tezbaşaran, 2008). The internal consistency estimates for the TISE-SF were lower than the original English version of the scale in which Cronbach's α = 0.94 (Cousineau et al., 2006). We searched the literature to compare our findings with other studies that translated the ISE-SF; however, we found only one study by Galhardo et al. (2013), who translated the instrument into Portuguese. The researchers reported that the item-total correlations in the Portuguese version of the instrument ranged from .70 to .88, and a Cronbach alpha of .96. Although still limited, their findings suggest the equivalence of the ISE-SF across cultures.

We have also examined the factor structure of the TISE-SF scale using principal component extraction method with varimax rotation; this yielded a single-factor structure, a component we labeled "cognitive affect regulation." More significantly, the psychometric properties of the Turkish version of the scale were similar to the findings of the original scale (Cousineau et al., 2006). Like the original version of the instrument, the principal component analysis of the Portuguese version of the ISE scale also revealed a single-component structure, with an eigenvalue of 9.93, explaining 63.9% of the variance (Galhardo et al., 2013). These findings indicate that the original scale may be amenable to use in different languages and in different countries. With adherence to formal translation techniques (Brislin, 1970), and vigorous psychometric testing, we believe that this instrument can assist health care professionals in different cultures to assess clients' self-efficacy before and after therapeutic interventions. We believe that the TISE-SF has the potential to become a standard instrument that can be used by health professionals who work with infertile women in Turkey. Also, TISE-SF can be used for Turkish women who are living in different countries.

Culture-Specific Findings

Our analyses suggest that some items of TISE-SF may be culture-specific. For example, in the translated instrument, according to item–total analyses, two items (Item 3, "Make meaning out of my infertility experience," and Item 4, "Accept that my best efforts may not change my/our infertility") showed a low correlation score, less than .30. Other researchers have found that items with low correlations suggest questionable discriminatory powers and should be subjected to further refinement (Özdamar, 2004; Polit & Beck, 2008). Therefore, we removed these two items from the translated instrument. Our additional rationale was that in the Turkish culture, finding a meaning in an undesirable life experience is not as common a coping mechanism as it may be in Western cultures. Generally, Turkish people have a fatalistic approach to life (Kuzulugil, 2010). Hence, the infertile women in the sample may not have been able to

accurately discern the meaning of Item 3. Similarly, Item 4, which is related to accepting infertility as a life experience, may be culturally specific. Since in Turkish culture child-bearing is a task, and a part of being a woman (Kazandı et al., 2011), they may have been unable to accurately interpret the meaning of this item. By eliminating those items with an alpha correlation of <.30, we believe that we arrived at an instrument with moderate reliability. Hence, we recommend that cultural differences be taken into account in translating assessment instruments.

Study Limitations

This study had several limitations. The sample was obtained from infertile women attending a university clinic, who lived in a city, had a moderate-to-good education, and had low-to-moderate income. Hence, the findings should be interpreted with caution. We suggest that the suitability of the TISE-SF for clinical use is further investigated with diverse populations, with those living in nonurban communities, those who do not have the financial means to seek treatment, and with those having had less than primary education. In addition, the testing of the psychometric properties of the TISE-SF should be repeated with larger samples to investigate if its properties are stable.

Finally, to attain homogeneity, this research was performed among infertile women with female factor as the etiology. It is, therefore, suggested that the content validity of the scale as well as its psychometric properties, be tested with secondary infertile groups and also with infertile men.

Implications for Research and Practice

The TISE-SF is a simple, easy-to-use instrument for staff. The TISE-SF may be particularly relevant for use when counseling and designing interventions that include stress management, cognitive–behavioral modification, and psychosocial support for women undergoing infertility treatment. Infertile women who suffer depressive symptoms after failed IVF may particularly benefit from cognitive–behavioral-oriented stress management, and TISE-SF may provide a means to identify relevant areas of skill building. The TISE-SF appears to be a reliable and valid measure to assess infertile women's self-confidence before and during infertility treatments. The psychometric properties of the instrument, however, should be investigated to further assess its suitability for clinical use.

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Declaration of Conflicting Interests

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