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Research Article

Psychometric Properties of the Korean Version of the Infertility Self-Efficacy Scale

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SUMMARY

Purpose: The Infertility Self-Efficacy scale (ISE) is an instrument used to identify infertility-related self-efficacy. The purpose of this study was to assess the reliability and validity of the Korean version of the ISE developed by Cousineau et al. in 2006.

Methods: The translated instrument was pilot-tested and administered to 314 women and men with a diagnosis of infertility. For estimating reliability, test–retest and the internal consistency reliability coefficients were calculated. Validity was evaluated through content validity, concurrent validity, and construct validity with exploratory and confirmatory factor analyses.

Results: The internal consistency reliability was satisfactory (Cronbach's alpha = .92, item-total correlations = .44–.80), and the intra-class correlation coefficient was .84 ($p < .001$). The overall content validity index was 98.1%, and the concurrent validity coefficient (correlations between the ISE scale and general self-efficacy scale) was .31 ($p < .001$). The final model's fit indexes were acceptable (CFI = .96, NFI = .93, RMSEA = .07, GFI = .94, and SRMR = .03), indicating good construct validity.

Conclusion: The Korean version of the ISE has high reliability (stability and homogeneity), and good content, concurrent, and construct validity (EFA and CFA). Validated Korean version of the ISE may help nurses identify infertility-related self-efficacy.

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Introduction

Self-efficacy is defined as “an individual's judgment of his or her capabilities to organize and execute a course of action [1].” Individuals with high levels of self-efficacy are likely to recognize themselves as having the essential skills to solve their problems [2], and these beliefs can affect how they think, feel, and act [2]. These positive effects of self-efficacy have been demonstrated in many women's health areas, including breastfeeding [3], oncology [4,5], and infertility [6].

Especially, infertility and its treatment can have a negative effect on women and men with infertility [7–10]. In Korean culture, which is based on Confucianism, carrying on a family line is highly valued; therefore, failure of pregnancy can lead to intra- and interpersonal difficulties, sexual problems, an unexpected

infertility stress, uncomfortable change in family and social networks, and financial burden on the couple [10–12]. Infertile couples may have a difficulty in overcoming this stressful condition and suffer emotional problems, such as depression and anxiety [8–10]. However, according to the self-efficacy theory, men and women with high self-efficacy tend to cope with infertility with positive emotions and a constructive attitude [1,2,6]. They may also have confidence in infertility treatments related to the medical procedures, such as daily injections, blood and sperm sampling, and transvaginal ultrasound scan [13]. Therefore, they tend to perceive infertility as a task, rather than a threat.

The most commonly used psychological health measurements assessing negative emotions in infertility studies are, for example, the State-Trait Anxiety Inventory [14], the Beck Depression Inventory [15], the Fertility Problem Inventory [16], and the Ways of Coping [17]. However, these scales tend to be either problem- or distress-focused [6]. Recently, some studies have reported that positive emotions, such as self-efficacy, resilience, and optimism, could be helpful to increase the number of fertilized eggs and

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embryo transfer [18]. However, most measures of these constructs have been developed for the general population or individuals who are not affected by infertility. Moreover, the validity of some measures has not yet been confirmed. Furthermore, such measures may not be sufficiently sensitive or specific to reflect the unique characteristics of men or women with infertility. Therefore, it is needed to develop the specific measures of infertility-related self-efficacy.

The Infertility Self-Efficacy (ISE) scale developed by Cousineau et al. [6] is the first instrument that measures perceptions of patients with infertility regarding their ability to involve in an integrative performance in the aspects of cognition, emotion, and behaviors which are connected to the infertility medical treatment. And Cousineau et al. [6] suggested that the ISE had high estimated internal consistency, excellent test–retest reliability, convergent with conceptual similar scales, discriminant validity with conceptual dissimilar scales, and good face validity. The ISE scale has been translated into diverse languages and shown to be valid in many studies. Galhardo et al. [19] reported the psychometric properties and factor structure of the Portuguese version of the ISE, using principal component analysis, confirmatory factor analysis (CFA), internal consistency, and test–retest reliability analysis. And Arslan-Ozkan et al. [20] evaluated that the Turkish version of the ISE may be useful in measuring ISE in the population of Turkish women. Nevertheless, no published studies have confirmed the reliability and validity of the Korean version of the ISE (K-ISE) scale. Although it is true that the factor structure of the ISE scale may be changed according to translation or cultural aspects of applied populations, only some studies have reported the factorial structure [19,20]. We conducted the present study to examine the psychometric properties of the K-ISE scale in a Korean sample of infertile patients.

Methods

Study design

This was a methodological study aimed to examine reliability and validity of the Korean version of the ISE developed by Cousineau et al. [6].

Setting and samples

From March through June 2016, this study was conducted at one of the largest infertility hospitals in Seoul, Korea, which performs approximately 400 artificial reproduction procedures per month. The study participants were Korean infertile patients as a target population and the patients who received infertility treatment in Cheil General hospital. The following inclusion criteria were used to determine participation in the study: (1) patients who were diagnosed with infertility by an obstetrician; (2) patients who had received procedures or treatment related to infertility more than once; (3) primary infertile patients who had not given birth; and (4) patients who understood the purpose of the study and agreed in writing to participate in the study. In addition, secondary infertile patients and patients who suffered from other diseases or any mental disorder were excluded because such conditions could have an effect on ISE among study participants.

Determining the sample size for factor analysis will vary depending on the research. However, it has generally been accepted that a sample of 150 to 400 is optimal when conducting a factor analysis using the maximum likelihood method [21].

Mitchell [22] suggested that the sample size for a factor analysis should be 10 to 20 times the number of scale questions. In this study, the number of items was 16; thus, 160–320 participants would be considered as an optimal sample size. We recruited 320 men and women with infertility who met the inclusion criteria. Two patients withdrew from the study, and four patients were excluded from the analysis because of incomplete questionnaires. Ultimately, 314 patients with infertility participated in this study, which was deemed a sufficient sample size for conducting factor analyses.

Measurements

General characteristics of the participants included gender, age, education level, employment status, religion, family monthly income, marital period, infertility treatment period, financial burden of infertility treatment, and infertility cause.

This study used the ISE scale developed by Cousineau et al. [6] to measure the self-efficacy of infertile patients. The scale consists of 16 questions to measure infertile patients' perceptions regarding their ability to involve in an integrative performance in the aspects of cognition, emotion, and behaviors which are associated with the infertility medical treatment. The ISE scale requires respondents to indicate respondents' degree of agreement with each item on a nine-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (9). The overall score ranges from 16 to 144, where the higher the score, the higher the ISE. The reliability of the initial scale was Cronbach $\alpha = .96$ [6].

To assess concurrent validity, we used a general Self-Efficacy scale developed by Sherer et al. [23]. The Self-Efficacy scale consists of 17 questions that are responded to on a five-point scale. The overall score ranges from 17 to 85, where the higher the score, the higher the general self-efficacy. The reliability of the initial scale was Cronbach $\alpha = .86$ [23].

Ethical consideration

The Research and Ethics Committee of Kyung Hee University approved this study's protocol (KHSIRB-16-019). The data were collected after the researcher explained to the participants the purpose and the procedure of this study, the research method, the benefits and disadvantages of this study, rewards and anonymity, and the possibility of participation in and cessation of this study by their autonomous decision making. They were then asked to read and sign the consent form.

Translation and content validity

This study proceeded after receiving permission from Cousineau et al. [6], who developed the ISE scale. The scale was translated from English into Korean by two bilingual professors who majored in nursing in accordance with translation methodology [24]. Another two experts who majored in nursing and obstetrics reviewed and compared the appropriateness of words or expressions and the clarity of translation, and identified any questions that needed revising because of cultural differences. Subsequently, the scale was translated back from Korean into English by a Korean American whose mother tongue is English and who is also fluent in Korean. The translated scale was checked by the researcher and the translator with the original scale in English to confirm that the meaning of each question was accurate.

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