



## Research Article

## Validation of a Korean Version of Fertility Problem Inventory



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## ARTICLE INFO

## Article history:

Received 27 September 2013

Received in revised form

29 December 2013

Accepted 24 March 2014

## Key words:

infertility  
reliability and validity  
stress

## SUMMARY

**Purpose:** The Fertility Problem Inventory (FPI) is a screening instrument used to identify infertility-related stress. The purpose of this study was to assess the reliability and validity of the Korean version of the FPI.

**Methods:** Forward–backward translation of the FPI from English to Korean was conducted. The translated instrument was pilot-tested and administered to 259 women with infertility. Test-retest reliability was conducted and the internal consistency coefficient was determined. Validity was evaluated through content validity, construct validity with confirmatory factor analysis, discriminant validity, and convergent validity.

**Results:** The internal consistency was satisfactory (Cronbach's alpha = .92, item-total correlations = .60–.92). The overall content validity index was 96.9%, signifying that the FPI had good content validity. The model fit indexes were acceptable (goodness of fit index = .92, adjusted goodness of fit index = .91, normal fit index = .95, comparative fit index = .93, and root mean square error of approximation = .05), indicating good construct validity. The intercorrelations were significant, although low to moderate in size (.20–.59). The correlation between the FPI and depression ranged from .32 to .51 ( $p < .001$ ), while the correlation between the FPI and the fertility-related quality of life ranged from  $-.35$  to  $-.58$  ( $p < .001$ ).

**Conclusion:** The Korean version of the FPI has high reliability, and good content, construct, discriminant, and convergent validity. A validated Korean version of the FPI may help nurses identify infertility-related stress and administer appropriate nursing interventions to Korean women with infertility.

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## Introduction

Infertility refers to failure to conceive, even if individuals have had unprotected intercourse for a year or more (Zegers-Hochschild et al., 2009). Infertility affects approximately 9–15% of couples worldwide (Boivin, Bunting, Collins, & Nygren, 2007).

Research on infertility shows that women with infertility experience not only individual psychological distress, such as feelings of inadequacy, depression, grief, guilt and stigma (Onat & Beji, 2012; Park, 1995; Slade, O'Neill, Simpson, & Lashen, 2007), but also marital distress such as an impaired sexual life, marital dissatisfaction and poor marital communication (Gourounti, Anagonostopoulos, & Vaslamatzis, 2011; Onat & Beji; Valsangkar, Bodhare, Bele, & Sai, 2011). In addition, women with infertility may feel isolated and neglected in an environment that highly values parenthood, and thus, may withdraw from their family and

friends (Moura-Ramos, Gameiro, Canavarro, & Soares, 2012; Wilson and Kopitzke, 2002). Their social relationships may also be negatively affected because of the social pressure to achieve parenthood and distress due to other couples' pregnancies and childbirths (Cousineau & Domar, 2007; Moura-Ramos et al., 2012). This distress can affect the rate of pregnancy, success rate of infertility treatment, and drop-out rate. Matthiesen, Frederiksen, and Ingerslev (2011) found that infertility-related stress, state anxiety, and trait anxiety may reduce the rate of pregnancy when they conducted research on the relationship between infertility distress and the outcome of assisted reproductive technology through meta-analysis. Olivius, Friden, Borg, and Bergh (2004) have reported that 30% of couples with infertility ended treatment prematurely because of the psychological burden. Thus, infertility can give rise to psychological distress in varying forms among individuals, in their marital and social lives, and may affect subsequent pregnancy and the success of infertility treatment. Therefore, strategies and interventions aimed at reducing infertility-related stress are needed. In addition, a valid and reliable tool to measure infertility-related stress is essential.

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Researchers have developed various instruments that measure infertility stress. Bernstein, Potts, and Matlox (1985) developed the Infertility Questionnaire, which measures psychological dysfunction in the areas of self-esteem, blame/guilt, and sexuality. The Fertility Problem Stress Inventory, developed by Abbey, Andrews, and Halman (1991), assesses different life domains that are disrupted by fertility problems. The Infertility Distress Scale assesses self-reported fertility-related stress among males with infertility (Pook, Rohrle, & Krause, 1999). In addition, many other tools measure fertility adjustment (Glover, Hunter, Richards, Katz, & Abel, 1999) and concerns regarding fertility treatment (Klonoff-Cohen & Natarajan, 2007). In South Korea, Kim, Park, and Jang (1995) developed the Infertility Stress Scale that comprises value feeling, obsession, sexual satisfaction, meanings of parenthood, marital satisfaction, family adaptation, and social adjustment. However, most measures are made up of one or two dimensions, or have been developed for general populations, but not individuals affected by infertility. For example, fertility-related stress is often assessed through general measures of anxiety and depression. Moreover, the validity of some measures has yet to be confirmed. Therefore, such measures may not be sensitive or specific enough to reflect the unique characteristics of women with infertility, which have multidimensional aspects (Boivin et al., 2007; Gourounti et al., 2011; Moura-Ramos et al., 2012; Newton, Sherrard, & Glavac, 1999).

The Fertility Problem Inventory (FPI), developed by Newton et al. (1999), is an instrument that measures infertility-related stress. This is a multidimensional measure that identifies infertility-related stress in five different domains, namely, social concern, sexual concern, relationship concern, the need for parenthood, and rejection of a child-free lifestyle. The FPI has subsequently been translated into diverse languages and has been shown to be valid in many studies (Gourounti et al., 2011; Moura-Ramos et al., 2012; Peterson, Newton, & Rosen, 2003; Slade et al., 2007; van der Broeck, D'Hooge, Enzlin, & Demyttenaere, 2010). Despite its wide use in research, no published studies have confirmed the reliability and validity of the Korean version of the FPI.

We conducted this study in order to translate the FPI, and subsequently confirm the reliability and validity of the Korean version. A validated FPI, as intended by this study, may help health professionals, including nurses, to identify high stress and adjustment difficulties among women with infertility. In turn, this would enable health professionals to give the required individualized support and therapeutic interventions to affected women (Verhaak et al., 2007). The results from this study will be used as baseline data for understanding women with infertility and couples with such problems.

## Methods

### Study design

This was a methodological study aimed at assessing the reliability and validity of the Korean version of the FPI developed by Newton et al. (1999).

### Setting and samples

This study was conducted between May and August 2013 in one of the largest infertility hospitals in Seoul, Korea, which performs approximately 400 artificial reproduction procedures per month. Women with infertility who visited the infertility clinic for medical treatment formed part of the study sample. Inclusion criteria were as follows: (a) women who had been diagnosed with infertility by

an obstetrician or medical doctor, (b) women with primary or secondary infertility without parity history, and (c) women who had previously undergone one or more infertility treatment.

The effect size was estimated by G\*power 3.0. For an effect size of .30 and an alpha of .05 (two-tailed) with a power of .9, a minimum of 112 participants were required for a correlation analysis. In addition, confirmatory factor analysis (CFA), aimed at determining construct validity, required a minimum of 230 participants who were five times the number of questionnaire items. Ultimately, 265 women with infertility were recruited in anticipation of possible attrition. Data were subsequently collected from 259 participants; 6 participants were excluded from the study because of incomplete responses on the questionnaires.

### Ethical consideration

The Research and Ethics Committee of Kyung Hee University approved this study protocol (KHSIRB-13-009). All the respondents were informed of the objectives of the study and consented to participation. They were also assured that the data that they provide would be treated as confidential and used in this study only, and that their decision to withdraw from the study would not compromise the standard of care that they receive at the clinic. All the participants signed the informed consent documents prior to the initiation of this project.

### Measurements

General characteristics included age, educational level, employment status, religion, and socioeconomic status. Characteristics that are related to fertility included marital period, infertility treatment period, financial burden of the infertility treatment, and the cause of the infertility.

The FPI (Newton et al., 1999) is a 46-item, self-administered, multidimensional measure that identifies infertility-related problems in five homogeneous domains, namely, social concern, sexual concern, relationship concern, the need for parenthood, and the rejection of a childfree lifestyle. A composite score derived by summing all five domain scores is interpreted as providing a global measure of perceived infertility-related stress. The FPI requires respondents to indicate their degree of agreement with each item on a 6-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (6). The overall score ranges from 46 to 276, where the higher the score, the higher the fertility-related stress.

Depression was measured using the Beck Depression Inventory (BDI), developed by Beck (1967), and translated into Korean by Lee and Song (1991). The BDI is a 21-item, self-reported measure, that measures items on a 4-point Likert scale, where the higher the score, the higher the level of depression.

The fertility-related quality of life (FertiQoL) measure, developed by the European Society of Human Reproduction and Embryology and the American Society of Reproductive Medicine, has been translated into several languages, including Korean. The measure consists of 34 items that could collectively indicate the impact of fertility problems on quality of life. In addition, a core section relating to personal and interpersonal quality of life ("Core FertiQoL") and an optional section relating to treatment ("Treatment FertiQoL") form part of the measure. The Core FertiQoL is a 24-item, self-reported measure consisting of four domains: emotional (6 items), mind-body (6 items), relational (6 items), and social (6 items). The Treatment FertiQoL assesses quality of life during treatment, including any medical intervention or consultation according to the treatment environment (6 items) and treatment tolerability (4 items). The FertiQoL comprises items on a 5-point Likert scale, where the higher the score, the lower the

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