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Validity and Reliability of Sexual Behavior of Infertile Women Questionnaire: Investigating the Development and Psychometric Properties

Mahshid Bokaie[1], Masoumeh Simbar[2*], Seyed Mojtaba Yassini Ardekani[3]

Abstract

Objectives: Sexual behavior is considered an important aspect of marital life and is influenced by attitudes, experiences, actions, feelings, and thoughts. The present study aimed to develop a valid and reliable questionnaire to evaluate several aspects of sexual behavior of infertile women (SBIW).

Materials and Methods: The current mixed sequential exploratory study was performed in two phases. In the qualitative phase, a preliminary questionnaire was developed based on in-depth interviews with 15 childless women and 8 specialists who were selected by purposeful sampling technique. In addition, qualitative and quantitative SBIW questionnaire was measured by internal consistency and test-retest.

Results: In the qualitative phase, a primary questionnaire including 113 items was constructed. Finally, the items of the questionnaire were reduced from 113 to 77 items. The SBIW questionnaire was classified into 5 categories investigating the effects of infertility diagnosis, infertility treatment, common beliefs, sexual response cycle and related factors, and the women's husbands, relatives, family, community, and education on sexual behavior of these infertile women Further, each investigator could use each part he wished to. S-CVI (sum of content validity index) and S-CVR (sum of content validity ratio) were obtained as 0.86 and 0.68, respectively. Eventually, the Cronbach α = 0.862 and the ICC (intraclass correlation) was obtained 0.928 for the SBIW.

Conclusions: In general, it was identified that the SBIW is a valid and reliable instrument which can be used to assess several dimensions of SBIW and is probably considered a useful instrument during infertility consulting and investigations.

Keywords: Sexual behavior, Infertility, Female, Psychometric properties

Introduction

A handful of researchers believe that sexual behavior is a significant dimension of marital life which is affected by the human's attitudes, experiences, actions, feelings, and thoughts (1-3). If a sexual relationship is undesirable it leads to a sense of failure, frustration, and lack of composure. In addition, it can cause decreased desire and sexual performance, along with physical problems and medication (4). The dominant culture of a community is regarded as one of the most important factors which affect the individuals' sexual behavior (5,6). Women and men establish their gender identity and sexual behavior in the context of the gender role of their community, and cultural stereotypes define what is normal sexual behavior for men and women of that society (7). Many cultural challenges arise from detecting those Iranian women who use socio-culturally sexual expressions. They may adhere to different methods for perceiving the sexuality which are not simply understandable by the other cultures (8, 9). According to Hasanpoor-Azghdy et al, the sexual activity of the infertile women is possibly affected by the culture, disease, and the cost of treatment. Further, these women may have various sexual experiences (11). Furthermore, the effect of myths on sexual behavior should not be ignored, especially among infertile women (12,13) The sexual behavior of this population has different physiological, cultural, social, and familial dimensions (14) and is influenced by the diagnostic process and infertility treatment level, common beliefs about infertility, sexual response cycle, and socio-cultural background. Therefore, designing a specific questionnaire related to infertile women's sexual behavior is required in order to evaluate all the aspects of their sexual life (15). Accordingly, the current study sought to develop a valid and reliable questionnaire regarding the sexual behavior of the infertile women. This questionnaire, to the best of our knowledge, is considered a unique instrument designed in the world.

Materials and Methods

A sequential exploratory design was used for the purpose of the present mixed-method study (16) which was conducted in the infertility center of Yazd. The

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[1]Research Center for Nursing and Midwifery Care, Shahid Sadoughi University of Medical Sciences, Yazd, Iran. [2]Midwifery & Reproductive Health Research Center, School of Nursing & Midwifery, Shahid Beheshti University of Medical Sciences, Tehran, Iran. [3]Department of Psychiatry, A Research Center on Addiction and Behavioral Sciences, Shahid Sadoughi University of Medical Sciences, Yazd, Iran.
***Corresponding Author:** Masoumeh Simbar, E-mail: msimbar@gmail.com

participants included women who were experiencing infertility by both male and female factors. The inclusion criteria included speaking Persian, being married and interested in participating and having a 2-year history of infertility. The exclusion criteria were an unwillingness to complete the questionnaire.

Moreover, this study was implemented in 2 qualitative and quantitative phases. In the first step, the questionnaire was designed and in the quantitative step, psychometric properties of the instrument were evaluated. Additionally, the required data were collected during January-February, 2015

Qualitative Phase: Designing the Questionnaire

In-depth interviews were conducted with 15 infertile women and 8 key informants. In addition, the related literature was reviewed regarding collecting the required data in for developing the intended questionnaire. Based on the results of the qualitative phase, the items, as well as an explanation of the sexual behavior and its subscales were constructed. A content analysis was performed to explain the infertile women's perceptions and their sexual behavior. Further, a semi-structured guide questionnaire contained the following open-ended questions:

- How was your experience of sexual behavior?
- What does sexual behavior mean to you?
- Would you please explain your sexual experiences after infertility?

Interview guide questions were developed after several pilot interviews and counseling with experts and finally, were revised. The participants were included in the study by purposeful sampling method (17). Furthermore, MAXQDA software, version 10 was used to manage the obtained data. Moreover, interviews were conducted with 8 key informants (i.e., 3 infertility specialists, one psychiatrist, one psychologist, one urologist, one midwife, and one nurse) in order to complete the concept and dimensions of sexual behavior as viewed by infertile women and to develop the items. Additionally, a widespread review of the related studies was performed using PubMed, Science Direct, and Google Scholar, as well as several Persian databases including Scientific Data Base (SID). The keywords used for the search encompassed *sexual behavior*, *infertility*, *sexuality*, *qualitative study*, and *psychometry*. This search included articles and questionnaires related to infertile sexual behavior. In addition, the extracted codes were applied to develop the items of the sexual behavior of infertile women (SBIW) questionnaire, and the categories were reflected as its subclass. Eventually, the generated items and subscales were modified several times and then, the primary questionnaire was prepared for assessing the psychometric properties.

Quantitative Phase: Evaluation of Psychometric Properties

In this phase, a quantitative study was implemented to assess the psychometric properties of the SBIW questionnaire including evaluating the face and content validity, as well as measuring the reliability of the questionnaire (18).

Face Validity

The face validity was measured qualitatively and quantitatively through investigating the perspectives of 18 infertile women by using the convenience sampling method. Face-to-face interviews were performed to determine the complexity, relevance, and ambiguity of the items and to assess the qualitative face validity (19). Then, the items were altered according to the infertile women's viewpoints. Further, the participants were asked to define the importance of each item on a 5-point Likert-type scale in order to evaluate the quantitative face validity. Furthermore, the item impact score for each item was designed using the following formula (19):

Item Impact = Frequency in percentage × Importance

The items with an item impact score lower than 1.5 were omitted (20).

Content Validity

The questionnaires were assessed by 8 key informants in the fields of sexual and reproductive health, health education, gynecologist, psychiatrist, psychologist, and Infertility specialist in order to qualitatively and quantitatively determine the content validity (CV) of the SBIW instrument. To this end, the key informants were asked for justice the items regarding the placement of the items, grammar, choice of vocabulary, and scoring. Then, the content validity ratio (CVR) and content validity index (CVI) were calculated (18). The number of specialists required to define the content validity can range from 2 to 20 specialists (16). Therefore, a total of 15 specialists were requested to examine each item with regard to its importance, clarity, simplicity, and relevance. A 3-point Likert-type scale (i.e., essential, useful but not essential, and not essential) was employed to evaluate the importance of the items. Moreover, a 4-point Likert-type scale (i.e., not related, partially related, related, and completely related) was used concerning the relevance of the items (19). Based on Lawshe's table (19), the CVR score of 0.49 or above is deliberated significant ($P < 0.05$). Additionally, items with a CVI higher than 0.79, between 0.70 and 0.79, and lower than 0.70 are considered suitable, needing modification, and unacceptable, respectively (18). The sum of the content validity ratio (S-CVR) and the sum of the content validity index (S-CVI) were obtained through the calculation of the mean of CVR and CVI items.

Reliability

To check the reliability of SBIW questionnaire, internal consistency, as well as stability was calculated through Cronbach's Alpha and the correlation coefficient of the

intraclass correlation (ICC) coefficient, along with test-retest, respectively (21). Creswell (22) believed that evaluating the reliability of an instrument needs a sample of 25 respondents. In an effort to confirm the internal consistency, the questionnaire was handed to 26 eligible infertile women who were selected through a convenience sampling technique. In addition, the correlation of the scores of the 2 tests with a 3-week interval was computed for 15 participants chosen using a convenience sampling method in order to assess the stability through the test-retest method. Ultimately, the SPSS software, version 21 was applied to perform all the statistical analyses.

Results

Findings of the current study are explained in 2 parts.

First Phase (Designing the Questionnaire)

Interviews with the infertile women and key informants (i.e., specialists), along with the literature review led to the description related to the concept of sexual behavior in 5 subscales:

A. The impact of an infertility diagnosis on sexual behavior;
B. The influence of infertility treatment on sexual behavior;
C. The common myths;
D. The sexual response cycle and related factors;
E. The effects of the behaviors of the husbands, relatives, and community on the sexual behavior of the infertile women.

Credibility, transferability, confirmability, and dependability were applied for the rigor of the data collection according to Guba and Lincoln's criteria (23). The initial question pool included 115 items including items extracted from the interviews with infertile women (n = 91), in-depth interviews with key informants (n = 20), and the literature review (n = 4). Moreover, a 5-point Likert-type scale was assigned to the items of each subscale ranging from 1 (strongly disagree/never) to 5 (strongly agree/always). Finally, 2 items were merged and the instrument was constructed containing 113 items.

Second Phase (Assessing Psychometric Properties)

This step was related to the assessment of face and content validity, along with reliability. To this end, 19 items were modified based on the infertile women' suggestions while 4 items were omitted. The maximum and minimum impact scores were 4.1 and 0.8, respectively. At this step, 4 items were removed since they obtained an item impact score lower than 1.5. Finally, a number of 109 items passed the content validity measurement phase. As regards the content validity, key informants' perspectives led to the revision of 8 items. Additionally, CVR and CVI were calculated and 22 items were lost since CVR was lower than 0.49 and 11 items were removed because their CVI was less than 0.7. In addition, S-CVI and S-CVR turned out to be 0.86 and 0.68, respectively. Eventually, a 77-item questionnaire was constructed. A summary of the instrument development and psychometric evaluation is illustrated in Figure 1.

Reliability

Both internal consistency and stability of the SBIW questionnaire were measured in order to confirm the reliability. Internal consistency was evaluated by Cronbach α (0.809) and, after using test-retest, the ICC coefficient of the whole instrument was estimated 0.928 which was statistically significant.

Table 1 demonstrates the results of the reliability assessment of the questionnaire. The instrument was confirmed after checking its validity and reliability.

Describing the SBIW Questionnaire and Scoring Procedures

The questionnaire was based on a 5-point Likert-type scale ranging from 1 to 5. Table 2 represents the raw and total scores of the SBIW in whole questionnaire and each subscale. The scores range from 77 to 385. Some questions are reverse scored. These items include 21-24, 28-29, 33-34, 46-47, 52-56, and 63-75 (online Supplementary file 1, Table S1). In general, a higher score indicates more desirable sexual behavior.

Scoring

The scoring of the questionnaire range from 77 to 385. Generally, a higher score demonstrated more desirable sexual behavior. Several questions were scored reversely. The items were 21-24, 28-29, 33-34, 46-47, 52-56, and 63-75.

Discussion

The study introduced a valid and reliable scale for assessing the sexual behavior of infertile women (SBIW). The questionnaire contained 5 subscales. According to the authors, this is the first specific questionnaire designed for investigating the sexual behavior for infertile women.

Yaghmaei et al developed and measured psychometric properties of "Quality of Life Questionnaire in Infertile Couple". The questionnaire included physical, psychological, spiritual, economic, emotional, sexual, and social aspects. The reliability and test re-test results were estimated 0.71-0.95 and 0.94-0.81, respectively. This instrument with 95 items on a 5-point Likert-type scale. Higher scores represented a better quality of life in infertile women (24). This questionnaire was particularly designed for infertile couples and measured by Likert scale while only one of its dimensions was related to sex and the author did not address the questionnaire in her article. However, Namdar et al investigated the quality of life and general health of infertile women, who experienced anxiety, social dysfunction, and depression during their life (23), using Yaghmai's questionnaire.

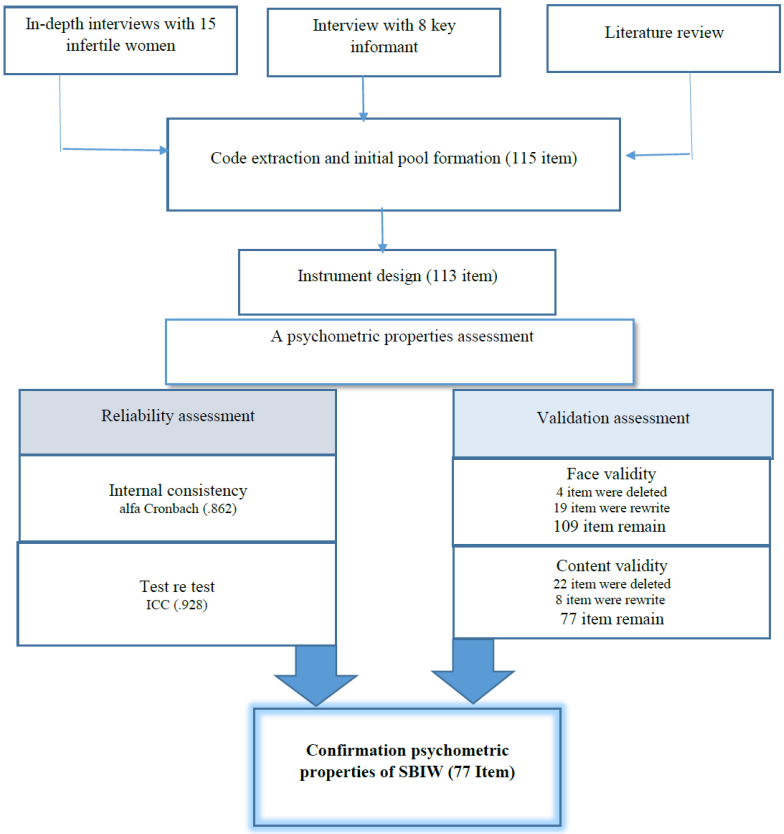

Figure 1. A Summary of the Instrument Development and Psychometric Evaluation.

Similarly, SBIW questionnaire was designed with respect to the SBIW and measured by a Likert-type scale. Further, various aspects concerning the SBIW measured by this instrument. Both questionnaires included a lot of questions (i.e., 77 questions in SBIW and 95 questions in "Quality of Life Questionnaire in Infertile Couple"), which were considered as one of the weaknesses of these 2 instruments.

Noll et al developed a 44-item self-report questionnaire in order to measure sexual activity and attitudes of the fertile women. The sexual activity was evaluated by 7 questions and sexual attitude included 6 subscales. Furthermore, the instrument enjoyed a good degree of and reliability and its validity was assured (25). The questionnaire included 2 parts evaluating issues such as love, intimacy, before play, and pornography, as well as sexual abuse and fear of pregnancy. It was suitable for the sexual behavior of teenagers. However, the scoring of different questions was difficult in this instrument, which was regarded as its week point.

Moreover, Rosen et al designed and validated "female sexual function index" . The instrument had 19 items on 6 domains including desire, arousal, lubrication, orgasm, satisfaction, and pain. Desire and arousal domains were measured by 5 degrees Likert (1-5) while lubrication, orgasm, and pain domains, as well as sexual satisfaction (0 or 1 to 5) were evaluated by 6 degrees Likert (0-5). The validity and reliability of this questionnaire were estimated at 0.86 and 0.82, respectively. Additionally, a zero score indicated that the woman had no sex during the past 4 weeks. This is a short self-report questionnaire used to measure female sexual function in the past 4 weeks. In addition, the maximum and cut-off point scores of this questionnaire were obtained 60 and 26, respectively. In female sexual function index, 26 and a higher score indicated a better sexual function in women (26). Mohammadi et al determined the reliability and validity of the Persian version of the Rosen's questionnaire. This instrument contained 19 items examining 6 domains (validity = 0.70 and reliability = 0.85). In this active instrument, the cut-off point was obtained 28. Therefore, the score of 28 and higher indicated good sexual function among Iranian women. The small number of questions, as well as attention to the effects of diagnosis and treatment of infertility on sexual function was considered the strong points of this questionnaire.

Further, Rust et al tailored a questionnaire to investigate the sexual satisfaction of infertile couples (GRISS, Golombok Rust Inventory of Sexual Satisfaction). It encompassed 7 subscales and 28 short questions on a 6-point Likert scale. The authors expressed good validity and reliability of all the subscales. Values 1 to 9 were assigned to the items and the higher scores represented more sexual problems (28). GRISS questionnaire was

Table 1. The Cronbach α and ICC in Each Subscale and Whole Questionnaire

Subscale	Cronbach α	ICC
The impact of an infertility diagnosis on sexual behavior (10 questions)	0.762	0.879
The influence of infertility treatment on sexual behavior (10 questions)	0.782	0.894
The common Myths (6 questions)	0.699	0.865
The sexual response cycle and related factors (42 questions)	0.711	0.762
The effects of the behaviors of the husbands, relatives, and community on sexual behavior of infertile women (9 questions)	0.796	0.831
The whole questionnaire	0.809	0.928

Abbreviation: ICC, Intraclass correlation.

Table 2. The Raw and Total Scores of SBIW in the Whole Questionnaire and Each Subscale

Subscale	Range From 100	Raw Range
The impact of an infertility diagnosis on sexual behavior (10 questions)	0-100	10-50
The influence of infertility treatment on sexual behavior (10 questions)	0-100	10-50
The effects of the behaviors of the husbands, relatives, and community on sexual behavior of infertile women (9 questions)	0-100	9-45
The common Myths6 (questions)	0-100	6-30
The sexual response cycle and related factors (42 questions)	0-100	42-210
The whole questionnaire	0-100	77-385

particularly designed for estimating the sexual satisfaction of infertile women. Similarly, SBIW questionnaire was particularly developed for evaluating the SBIW. This is a strong point of both questionnaires. However, no validity or reliability was reported for the GRISS questionnaire, which was one of its drawbacks.

Finally, Bovion et al constructed and validated the fertility quality of life (FertiQoL) instrument. This questionnaire included 36 items (i.e., 24 core, 10 treatment-related, and 2 physical health items). The Cronbach's reliability statistics for the core and subscales were acceptable in the range of 0.72 and 0.92. Dural et al expressed the effect of infertility on the quality of life of women. They sought to validate the Turkish version of the FertiQoL questionnaire. This scale focused on hospital anxiety and depression of infertile women (30).

Limitations of the Study

Several infertile women who were unable to refer to the infertility center may have other sexual behaviors. Therefore, the results of the study may not be generalizable. Accordingly, similar research focusing on larger sample sizes is subject to further investigation. The unwillingness of the infertile women's husbands to contribute to the interview may be considered as another limitation of this study.

Conclusions

In general, women with specific problems require specific consulting. Therefore, the SBIW questionnaire is recognized as a valid and reliable questionnaire which can be used to assess the SBIW. This valid and reliable instrument contains 77 items and is an easy to answer the questionnaire. Although the SBIW was designed and evaluated based on the Iranian culture and context, it can be applied by health care specialists with a similar religion and culture, and within the same context throughout the world.

Conflict of Interests

Authors declare that they have no conflict of interests.

Ethical Issues

The Ethics Committee of Shahid Beheshti University of Medical Sciences approved the current study (SBMUZ. Rec.1394.7). Further, the aims and processes of the study were explained to the participants and written informed consent was obtained before contributing in the study. Furthermore, the participants were assured of the confidentiality of the collected data and the opportunity of withdrawal from the project whenever they wished to.

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