MEN'S SEXUAL HEALTH

Evaluation of Psychometric Properties of the Persian Version of Brief Male Sexual Function Inventory: A Cross-Sectional Study

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ABSTRACT

Introduction: Male sexual dysfunction is a common problem, and there are many self−report questionnaires for measuring sexual function among men; however, the Brief Male Sexual Function Inventory (BSFI) is a tool that has 5 subscales, which is more complete than others. a validated self−report questionnaire, in the local language with modest expressions is required for men.

Aim: To determine the validity and reliability of the Persian version of the BSFI among men.

Methods: This cross-sectional study was conducted on 200 males. The sampling process was performed in several stages from health centers. After the accomplishment of the standard process of back-translating the questionnaire from English to Persian, its face, content, and construct validity were evaluated. The collected data were analyzed using confirmatory factor analysis, multivariate analysis of variance, and Pearson correlation coefficient. To determine the reliability of the instrument, the test-retest method was used with 2 weeks interval and the Cronbach's alpha coefficient method was applied to check the internal homogeneity.

Main Outcome Measures: Reliability (internal consistency and test-retest) and validity were assessed

Results: According to the research findings, confirmatory factor analysis had an acceptable fit. By modifying the measurement model and fitting the final model, the fitting indices were obtained as the following: Chi-square statistic = 21.63, NPAR = 36, $P = .001 > 0.05$; Tucker-Lewis index = 0.956; comparative fit indices = 0.976; Normed Fit Index = 0.952; and root mean square error of approximation = 0.068. These values indicated that the obtained model had a good fit for the data. Moreover, Cronbach's alpha and intra-cluster correlation coefficients of the whole questionnaire were calculated at 0.893 and 0.893, respectively (confidence interval between 0.811−0.950), showing the internal consistency of the items in the whole questionnaire and domain.

Conclusion: The BSFI questionnaire showed a 5-factor structure similar to the original structure and the 11-item Persian version of the questionnaire of male sexual function can be considered a valid and reliable tool to assess the level of male sexual function. **Rezaei N, Sharifi N, Fathnezhad-Kazemi A, et al. Evaluation of Psychometric Properties of the Persian Version of Brief Male Sexual Function Inventory: A Cross-Sectional Study. Sex Med 2021;XX:XXXXXX.**

Key Words: Sexual function; Men; Validity; Reliability

INTRODUCTION

One of the most important aspects of life is the sexual function, which has a significant impact on the body, mind, social behaviors, and quality of life.[1] Sexual function is a set of expressions of sexual desire, sexual arousal, and orgasm that occur continuously and regularly in an individual or couple.[1,2] Sexual dysfunction is a complex phenomenon, which refers to a disorder in each stage of sexual response, leading to the permanent or recurrent decrease in sexual desire and arousal, pain during intercourse, problem or inability to reach sexual climax.[3,4] The prevalence of sexual dysfunction varies between men and women. For women, the prevalence is reported to be 20−69%.[5]

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Sexual desire has also been reported differently in older men, Its prevalence in men 60 years and older is reported to be between 50.3 and 92% and 16% and 80% for men older than 70 years., and 38% and 50% for men above 80 years. of age.[6]

Numerous factors, such as partner problems and relationships between couples, individual vulnerabilities (eg, low self-esteem or body image), psychiatric problems (eg, depression, anxiety, or stress), and medical issues (diabetes and heart disease) can affect sexual function.[7] Many researchers believe that sexual function is one of the basic aspects of the individual's quality of life and impaired sexual function leads to mood disorders, decreased sexual satisfaction, and reduced quality of marital relationship.[8−10] The results of a study showed that male sexual function decreased with aging.[11] The components of male sexual function include sexual desire, erection, and ejaculation. The most common problem in the stimulation phase is related to the difficulty in getting an erection or maintaining it, and common problems with the orgasm phase include premature ejaculation and delayed or inhibited ejaculation.[11,12]

`The results of a study conducted by Nichols et al showed that 91% of men had a sexual relationship over 60 years, satisfactory sexual intercourse was recognized as necessary to maintain a favorable relationship between couples, and the majority of participants agreed with counseling and adjuvant therapies to increase sexual activity.[13] Sexual health is a vital and essential part of human well-being and its relatively high prevalence of related disorders has hampered family life.[14] Therefore, it is highly important to use reliable tools in identifying individuals with these disorders and determining their type. There are various tools employed to measure sexual function among males, such as the Brief Male Sexual Function Inventory (BSFI). This questionnaire consists of 5 subscales including libido, erection, ejaculation, problem assessment, and general satisfaction. Compared to other tools, such as the Male Sexual Health Questionnaire, it also examines the problem assessment and overall satisfaction and sexual desire with fewer questions, while, more diverse areas. The literature review showed that this instrument has not been verified in Iran so far and in most studies using this questionnaire, only its translation and face validity were considered sufficient. The present study is designed to answer the following questions:

- What are the characteristics of psychometrics in the Male Sexual Function Questionnaire?
- To what extent does the translated questionnaire of men's sexual function have face validity, content and structure?
- To what extent is the translated questionnaire of men's sexual function internal consistency and stability?

Aims: To translate, adapt cross−culturally and to evaluate the psychometrics of the BSFI to be able to design a native and standard tool for measuring men's sexual performance in this important group of society.

MATERIALS AND METHODS

Study Design and Participants

This cross-sectional study was conducted on the males referring to health centers in Ilam, Iran, in several stages, 2020 (30 January to 10 November). The sampling process was performed using the multi-stage sampling method, in which, initially, a list of all health centers in Ilam was prepared. Among those health centers, based on the population covered by them and the number of households referring to them, several centers with high populations and different geographical distribution in the city were randomly chosen, which were study clusters. Subsequently, based on the population covered by each cluster or center, a quota was allocated to each center.

In the next stage, based on the records of each household and the inclusion criteria, eligible individuals were listed, numbered using the Randomizer software, and randomly selected and entered into the study based on the available quota. The inclusion criteria were having consent to participate in the study; being literate; being monogamous; lacking surgery during the last 3 months; living with the current spouse for at least the last 6 months; living in Ilam; lacking any sores or lumps in the genitals; lacking chronic illnesses, such as cardiovascular disease, diabetes, urinary incontinence, and low back pain; lacking heart attack or stroke in the past 3 months; lacking a history of complicated heart attack or stroke; lacking any type of mental illness in any couple; no history of stressors in the last 3 months (eg, an accident, death of a family member). On the other hand, the participants who did not complete the questionnaire were excluded from the study.

The required permission was obtained from the Vice Chancellor for Research of Ilam University of Medical Sciences, Ilam, Iran, and presented to the provincial health center and the heads of health centers in Ilam. Afterward, the researcher referred to selected centers affiliated with the Ilam University of Medical Sciences, and the sampling process was performed based on the inclusion criteria. A trained male asker was considered for sampling, and the necessary explanations about the purpose and method of the study were provided to the research samples by the researcher's assistance. Informed consent was obtained from the participants' and the translated version of the BSFI was distributed among them to completed. It was noteworthy that the questionnaire was completed by interviewing each individual privately by a same-gender person using their local language.

Sample Size

The sample size, based on the researchers' point of view, was determined as 5 samples for each phrase to perform factor analysis.[15,16] Some researchers have proposed the sample size of 200 cases as sufficient.[17] Based on the number of items in the questionnaire, the sample size of 155 subjects was determined, and finally, to check the construct validity, the sampling was continued until reaching the sample size of 200 participants to complete the questionnaire.

Study Instruments

The BSFI consists of 5 subscales of sexual desire (2 items), erection (3 items), ejaculation (2 items), problem assessment (3 items), and general satisfaction (1 item). Each item is scored on a 5-point Likert scale from 0 to 4. The average score related to each part is calculated, according to which, the score of each part is obtained as the sum of the total score of the subsets of that part. In this respect, a lower score represents lower sexual performance.[18] In addition to the sexual function questionnaire, a researcher-made demographic information form was designed distributed among the research samples.

Validity Evaluation Process

This stage included the translation process, face validity, content validity, and construct validity.

Translation into Persian. Initially, permission was obtained from the developers of the tool to prepare an equivalent Persian version. Subsequently, the questionnaire was translated separately by 2 reproductive health experts, and in addition to comparing the 2 versions, a Persian version was also prepared. The purpose of this stage was to remove the ambiguity and reach a common understanding by the respondents of the questionnaire. The questionnaire was then back-translated by 2 fluent English speakers who were not aware of the content of the initial questionnaire. Eventually, the English back-translated version was compared with the original questionnaire, and a final version of the questionnaire was prepared after the translation was confirmed.

Content Validity. To evaluate the content validity, the opinions of 10 experts in the field of reproductive health, obstetricians, psychologists, and urologists were examined, and the content validity ratio (CVR) and content validity index (CVI) were calculated to quantitatively evaluate the content validity. In this regard, to calculate the CVR, individuals were asked to determine the necessity of each phrase based on a 3-point Likert scale (it is necessary; it is useful, however, not necessary; and it is not necessary), and then, based on the Lawshe table, the minimum acceptable value was estimated at 0.62.[19] Moreover, to evaluate the CVI according to the Waltz and Basel method, 3 criteria, including simplicity, specificity and clarity are used to evaluate each phrase in the questionnaire according to a 4-point Likert scale (1−4). Accordingly, if the scores of each of the phrases in the questionnaire are greater than or equal to 0.62, the phrase is kept in the questionnaire.[20]

Face Validity. Face validity is an objective judgment of the structure of an instrument. In the present study, quantitative and qualitative methods were used to determine face validity. For this purpose, to evaluate the questionnaire qualitatively, it was distributed among 20 eligible males and the level of difficulty (phrases and words), the degree of appropriateness (appropriateness and the optimal relationship of the phrases with the dimensions of the questionnaire), and ambiguity (possibility of misunderstanding from phrases or the existence of inadequacies in the meanings of words) were examined. In the quantitative evaluation stage, the importance of each item was investigated[21] and the highest score was determined at 4.

Construct Validity. Construct validity reveals what concept is measured in the instrument. This type of assessment shows whether the scale in question is what it is supposed to measure. A scale or construct is a valid or stable one whose expressions are explicitly loaded on the construct. There is a lot of evidence to measure the construct validity of tools, among which the most important one is recognized as the factor analysis. In this study, to evaluate the construct validity, confirmatory factor analysis was used.

Reliability of the Instrument

Internal correlation and test-retest were applied to determine the reliability of the instrument. Cronbach's alpha coefficient is used to measure internal correlation and represents the fit of a group of expressions that measure a construct. The stability of the sexual function checklist was examined using test-retest in 20 eligible men with 2 weeks interval. Spearman's rank correlation coefficient was used to calculate the reliability coefficient and the intraclass correlation coefficient was calculated for the items. In most cases, a reliability score of >0.70 is acceptable; nevertheless, the reliability coefficient in the range of 0.85−0.95 is more desirable.[22] It is worth mentioning that this number was not included in the sample size of the construct validity section.

Ethical Considerations

Necessary permissions were obtained from Ilam University of Medical Sciences and the provincial health center. The questionnaires were distributed among the participants after obtaining informed consent from them. The present article is derived from the research plan approved by the meeting of the Research Council of Ilam University of Medical Sciences with the ethical code of IR.MEDILAM.REC.1398.163. It should be noted that the permission to use the questionnaire was obtained through the necessary correspondence with MAPI Research Trust Institute.

Statistical Analysis

To analyze the results, structural equation modeling based on the maximum likelihood method was used in AMOS software. The most common statistical fit indices of the model were calculated, including absolute fit indices (Chi-square statistic [CMIN]), parsimony correlation indices (root mean square error of approximation [RMSEA]), parsimonious normed fit index), and comparative fit indices (CFI), Bentler-Bonett Normed Fit Index (NFI), Tucker-Lewis index (TLI). If the Chi-square index is not statistically significant, it indicates the appropriate fit of the model; however, this index is usually significant in larger

Table 1. Demographic characteristics of research samples

Variable	Number (%)
Age (y)	
20–29	7 (3.5)
30–39	61 (30.5)
40–49	73 (36.5)
50–59	45 (22.5)
>60	14 (7)
Education	
Diploma and lower	86 (43)
University	114 (57)
Job	
Unemployed	10 (5)
Self-employment	87 (43.5)
Employee	92 (46)
Retired	11 (5.5)
History of death or divorce of spouse	
Yes	9 (4.5)
No	191 (95.5)
Adequacy of family income	
It does not provide enough life	51 (25.5)
It suffices to some extent	64 (32)
Suffices	75 (37.5)
More than enough	10 (5)

Distribution frequencies and percentages of the Demographic characteristics of research samples.

Table 2. Descriptive overview of the dimensional BSFI

Dimensions	Mean(SD)
Sexual drive	2.16 (0.82)
Erections	2.69 (0.98)
Ejaculations	3.61 (0.90)
Problem assessment	3.25 (0.99)
Overall satisfaction	2.92 (0.94)
Total Mean score	2.93 (0.75)

Distribution Mean and standard deviation (SD) of Brief Male Sexual Function Inventory (BSFI).

samples, and therefore, is not considered a suitable indicator for the suitability of the model. Values close to number 1 for the TLI, NFI, and CFI indices, values greater than 0.5 for the parsimonious normed fit index, and values less than or equal to 0.05 for the RMSEA index indicate good fitness.

The collected data were analyzed using the SPSS software (Statistical Package for the Social Sciences, version 16.0, SPSS Inc, Chicago, Illinois, USA) and AMOS software (version 16, IBM., USA). The significance level for all statistical tests was set at 0.05, and all tests were 2-sided.

RESULTS

The statistical analysis performed on 200 research samples revealed that the mean(SD) scores of age, working hours per day, and length of marital life were obtained at 44.28(9.08), 7.30 (3.123), and 16.48(11.24), respectively. The majority of participants belonged to the age group of 40–49 years (36.5%), were self-employed (43.5%), held university education (57%), and could afford the living expenses (37.5%) (Table 1). According to Table 2, the mean(SD) of the total BSFI score was estimated at 2.93(0.75) and the lowest score was related to sexual desire.

In the quantitative content-validity analysis, the CVR was found to be between 0.9 and 1 and the calculated numbers for CVI were between 0.8 and 1. After the accomplishment of the face and content validity, 11 items were examined for confirmatory factor analysis. By modifying the measurement model and fitting the final model, the fitting indices were obtained as the following: CMIN = 21.63, NPAR = 36, $P = .001 > 0.05$; TLI = 0.956; CFI = 0.976; NFI = 0.952; and RMSEA = 0.068. These values indicated that the obtained model had a good fit for the data.

Based on the results obtained from Table 3, all item coefficients were significant at the error level of 1% ($P < .01$). It was revealed that items 1, 6, 9 had the highest regression coefficients with standard coefficients of 0.946, 0.879, and 0.863, respectively, and item 4 with a coefficient of 0.435 had the lowest regression weight in measuring sexual function. Figure 1 depicts

Table 3. Regression coefficients for model paths

Paths	Non-standard coefficients	Standard coefficients	Standard deviation	Critical value	*P* value
Sexual drive→Q1	1.00	0.863	-	-	.000
sexualdrive→Q2	0.941	0.809	0.095	9.875	.000
Erection→Q3	1.211	0.620	0.174	6.966	.000
Erection→Q4	1.00	0.435	-	-	.000
Erection→Q5	1.519	0.716	0.262	5.792	.000
Ejaculation→Q6	1.225	0.946	0.082	14.941	.000
Ejaculation→Q7	1.00	0.831	-	-	.000
Problemassessment→Q8	0.984	0.650	0.104	9.438	.000
Problemassessment→Q9	1.120	0.879	0.091	12.252	.000
Problemassessment→Q10	1.000	0.778	-	-	.000
Overalsatisfaction→Q11	1.000	-	-	-	.000

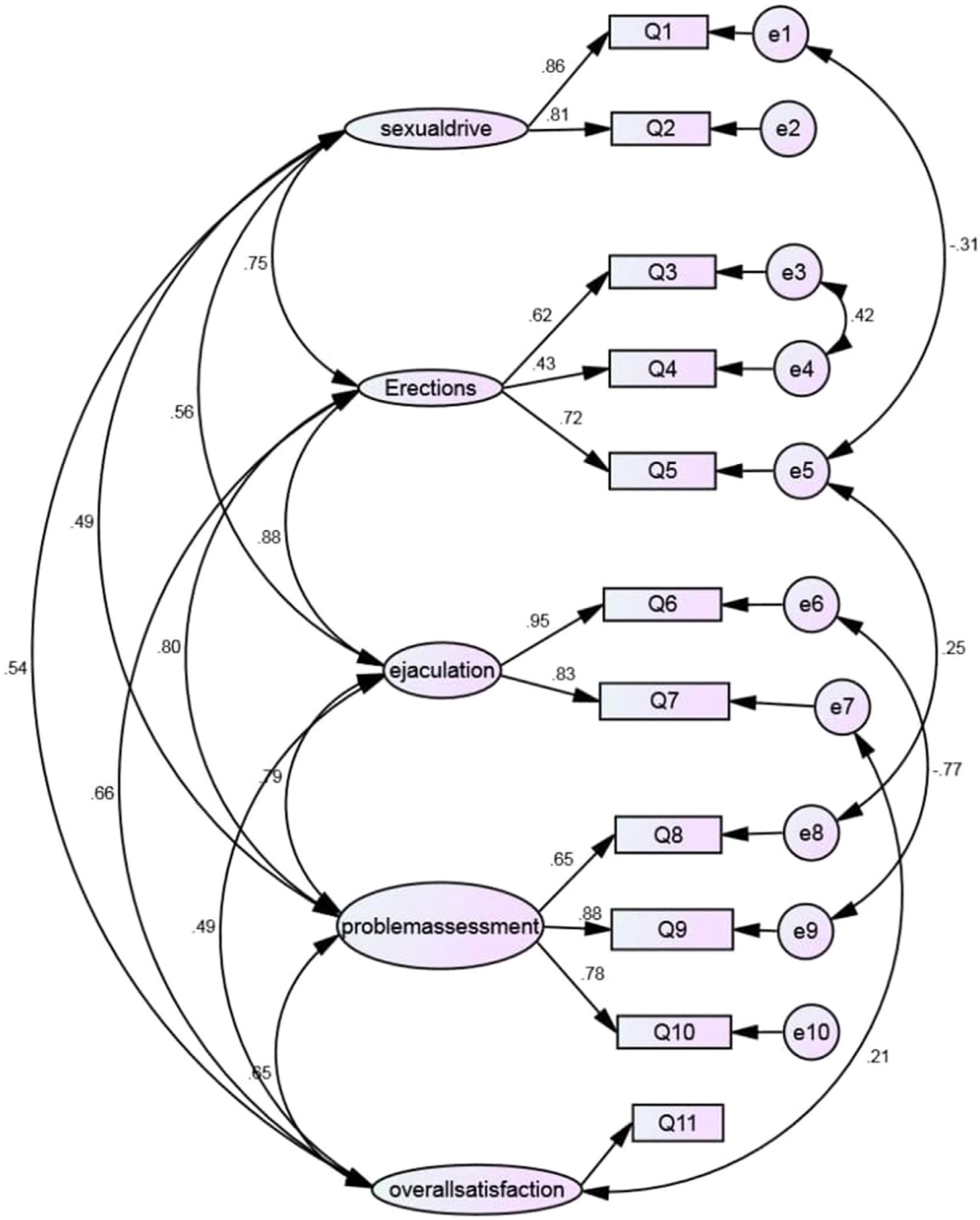

Figure 1. The final structural model of the modified model of the 11-item sexual function tool in men.

the final model for measuring sexual function based on the eleven studied variables. According to the final model, there was a correlation between items 3 and 4 as well as items 5 and 8. In this model, 3 variables were extracted with eigenvalues higher than 1.0. It was revealed 3 latent variables after rotation had special values of 6.34, 1.66, and 1.20, respectively (Table 4). In total, the 3 extracted factors could explain 80% of the total variance structure for sexual function.

To determine the validity of the research tool, the internal consistency test method was utilized. Table 5 presents the calculated Cronbach's alpha coefficients for the total and individual factors of the instrument after the fulfillment of factor analysis. The Cronbach's alpha and intra-cluster correlation coefficients of the whole questionnaire were calculated at 0.893 and 0.893, respectively, with the confidence interval between 0.811 and 0.950 (Table 5)

Table 4. Principal component analysis with varimax rotation

	1	2	3
Q1: You have had sexual desire for the past 30 days	-0.090	0.296	-0.046
Q2: How would you rate your level of sexual drive	-0.133	0.353	-0.053
Q3: How often have you had partial or full sexual erections when you were sexually stimulated in any way?	-0.174	0.260	0.300
Q4: When you had erections, how often were they firm enough to have sexual intercourse	-0.096	-0.240	0.871
Q5: How much difficulty did you have getting an erection during the past 30 days	0.161	0.060	0.062
Q6: How much difficulty have you had ejaculating when you have been sexually stimulated	0.041	0.212	-0.056
Q7: How much did you consider the amount of semen you ejaculated to be a problem for you	0.063	0.189	-0.118
Q8: To what extent have you considered a lack of sex drive to be a problem for you	0.593	-0.522	0.089
Q9: To what extent have you considered your ability to get and keep erections to be a problem	0.284	-0.031	-0.095
Q10: To what extent have you considered your ejaculation to be a problem	0.220	0.088	-0.160
Q11: How satisfied have you been with your sex life	0.048	0.144	-0.031
Percentage of variance explained	31.38	20.78	18.47

Extraction method: Principal component analysis.
Rotation method: Varimax with Kaiser normalization.

DISCUSSION

Sexual dysfunction is a problem that occurs at every stage of the sexual response cycle and causes people to be dissatisfied with sexual activity.[23] Male's sexual behavior has certain complexities that are created and directed by internal and external factors, and their sexual dysfunction is introduced, studied, and reported in different types. Considering the fact that sexual health plays a considerable role in the quality of life of men and the relatively high prevalence of related disorders can affect the life of couples, the application of reliable tools to identify individuals with such disorders and determine their type is highly important. The present study was conducted to evaluate the psychometric properties of the BSFI questionnaire in the Persian language and its compliance with the culture and conditions of Iran.

In the current research, BSFI showed a 5-factor structure similar to the original structure. The validity and reliability of the back-translated questionnaire were evaluated after confirming its translation into Persian. The most important results indicated that the BSFI questionnaire was reliable for measuring male sexual function. The homogeneity of domains was examined using Cronbach's alpha coefficient, rendering for the value of 0.893, with the confidence interval between 0.811 and 0.950, showing that this index was acceptable in all 5 domains (libido = 0.89, erection = 0.82, ejaculation = 0.78, problem assessment = 0.81, and general satisfaction = 0.96). Based on the results of confirmatory factor analysis, 5 areas of the present questionnaire were published by O'Leary in 1995.[18]

Table 5. Assessing the correlation, validity and internal consistency of the questionnaire domain

Domain	Cronbach's alpha	ICC	CI 95%
sexual desire	0.897	0.897	0.796–0.995
Erections	0.828	0.828	0.678–0.923
Ejaculations	0.780	0.780	0.566–0.903
Problem assessment	0.812	0.812	0.647–0.915
Overall satisfaction	0.960	0.960	0.899–0.984
Total Mean score	0.893	0.893	0.811–0.950

CI = Confidence Interval; ICC = intra-class correlation.

The researchers investigated the psychometrics of the BSFI questionnaire on men referring to a general practitioner and complaining of sexual dysfunction. Accordingly, the BSFI questionnaire was clinically useful for releasing self-report results of different dimensions of sexual function and expressing an overall score. It was also revealed that the different areas of the questionnaire had strong correlations and the internal correlation evaluated by the Cronbach's α was between 0.62–0.95.

Furthermore, to determine the reliability of the instrument, a test-retest was performed after a 1-week interval, which rendered for the correlation coefficients of 0.79–0.90 for the domains. The findings of the present study were in line with those of the mentioned research regarding this. Additionally, the results of a study conducted by Micheleton et al (2006) in the United States showed that the BSFI questionnaire had acceptable validity and reliability and that the BSFI was a short screening tool to assess sexual function that could be used for most research purposes. Regarding, the first 10 items of the questionnaire had the highest variance related to male sexual function.[24]

The determination of fitting the final model using confirmatory factor analysis revealed that the fitting indices were obtained as the following: CMIN = 21.63, NPAR = 36, $P = .001 > .05$; TLI = 0.956; CFI = 0.976; NFI = 0.952, and RMSEA = 0.068. These values indicated that the obtained model had a good fit for the data.

Furthermore, according to the scores obtained from different dimensions of the BSFI questionnaire, the mean total score was low and the lowest scores were related to the libido and erection subscale. Likewise, according to a study carried out by Mykletun

et al, low scores were related to libido.[24] Based on the results of a study conducted by Farnia et al, the mean total score of the questionnaire was obtained lower than that in the present study, and the lowest scores were reported for erection and general satisfaction.[25]

The literature review of epidemiological articles on sexual dysfunction showed that the prevalence of erectile dysfunction was between 3% and 9% among males. The prevalence of sexual desire disorder in men is estimated to be about 15% for the general population and 5% for clinical cases. It is also reported that orgasmic disorders are less common in men and are estimated to be 3−8% in males who refer for receiving treatment for sexual problems and 1−10% in the whole society.[26−29] In a systematic review study, sexual dysfunction in healthy old men was associated with loss of sexual desire, which has been reported more with age.[6] Sexual dysfunction in men increases slightly with age, which in addition to age-related physiological factors, psychosocial factors can also be associated with sexual interest and other sexual problems.[30,31]

It should be noted BSFI as a questionnaire tool, it should not be substituted for a clinical interview. But, it can be quickly completed and scored, providing the health care provider with real-time feedback that will help him or her judge the necessity for further assessment and the most likely areas of problems with sexual functioning.

Finally, an established limitation of the Final version of BSFI is its inability to quantify the sexual function of sexually inactive and unmarried men, because we only examined men who were sexually active and married. Also, normative data of the BSFI in other cities of Iran need to be established to facilitate comparisons between cultures. In addition, another limitation of the study was that criterion validity was not used. It is suggested that future research address this issue.

CONCLUSION

The results of the present study regarding the localization of the BSFI questionnaire were indicative of its internal stability and compatibility and acceptable validity. Since the present study was the first study conducted in Iran that its validity was determined through face, content, and construct validity and the results of confirmatory factor analysis showed the validity of this questionnaire, researchers can use the Persian version of this standard questionnaire in their studies.

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