

Journal of Psychology of woman

2022, Volume 3, Issue 2, Pp. 1-12

Assessing the internal structure of the Body Esteem Scale (BES) in a female population: a factor analysis study

Ghasem Abdolpoor^{1*} & Arezoo Lashkari²

Abstract

The body esteem scale is a 35-item self-report questionnaire prepared to measure a person's beliefs about the body. This questionnaire consists of three subscales of sexual attractiveness, concern about weight and physical condition. This study aimed to investigate the psychometric properties of the Persian version of the Body Esteem Questionnaire on women. The research method was a correlation. The statistical population was all Iranian women between 18 and 50 in 2021. Five hundred fifty people were selected by the available sampling method and answered questionnaires about body esteem (BES-1986), Rosenberg self-esteem (RSE-1965), and women's sexual inhibition and arousal scale (SES-W-2006). The reliability of the questionnaire was calculated using the internal consistency method. The results of reliability calculation using Cronbach's alpha coefficient were higher than 0.70. Exploratory factor analysis also showed that the three-factor solution has a better fit, whose factors are: sexual attractiveness, concern about weight, and physical condition. Construct validity with confirmatory factor analysis showed that the three-factor model of the scale has a good fit in Iranian women's society. Based on the results of this research, the body esteem scale has adequate reliability and validity and can be used in research and clinical interventions.

Keywords: *Body esteem, sexual performance, sexual attractiveness, reliability, validity*

Cite this article as:

Abdolpoor, Gh., & Lashkari, A. (2022). Assessing the internal structure of the Body Esteem Scale (BES) in a female population: a factor analysis study. *JPW*, 3(2): 1-12.



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1. **Corresponding author:** PhD in clinical psychology. Faculty of Humanities, Shahid University, Tehran, Iran.
2. PhD in Clinical Psychology. Faculty of Psychology and Educational Sciences, Shahid Beheshti University, Tehran, Iran.

Introduction

The body, seen from a psychological point of view, is not a homogeneous structure. When discussing the body, the experience, or the perception of it, we must refer to concepts such as "body self" and "body image" (Lipuska & Lipuska, 2013). The body is the psychological structure that forms an integral part of the individual's self (Izidorzki & Binuska, 2008). The body itself can be defined as a way to experience and represent the physical self in the mind, which is of fundamental importance in forming a person's personality (Miraska & Saxon-Abda, 2013). In contrast, "body image is a multifaceted psychological experience of embodiment" that includes thoughts, beliefs, feelings, and evaluative behaviors related to one's physical appearance (Cash, 2004). Body esteem, one of the important dimensions of self-esteem, refers to the self-evaluation of the body (Frost, French, Oswald, & Shields, 2018). Accurate understanding and evaluation of body esteem is of particular importance. Because dissatisfaction with the body is associated with a set of behavioral and psychological problems, including low self-esteem (Erickson et al., 2009), eating disorders (Reiner et al., 2013), social anxiety (Sterlen and Harjeves, 2005), depression (Johnsdatter et al., 2008), and anabolic steroid abuse (Parent et al. et al., 2013).

Age and gender are two factors that significantly explain the variation in the way of feeling and understanding the body as well as the role of this process. In the first years of life, a person develops his body schema, a coherent sense of his body, and beliefs about his body image, which are later used to describe his appearance (Camos-Costa, Arjaos, & Horne, 2011).

Body esteem is formed and changed by various social and psychological influences. Among these external factors, sociocultural pressure on body image from parents, media, and peers (triple effect) has been investigated by many researchers (Yoo, Shin, Kim, 2019; Walvis, Davis, Bachols, Obeid et al., 2019; Ormsby, Owen, Bogal, 2019). Their studies reported that the significant influence of others on body image leads to negative effects on people's perception and internalization of their body image, as well as on their overall body satisfaction. In particular, the effects of cyberspace leave many negative effects at any age (Shin, Yoo, Kim, 2017; Lee & Lee, 2019).

The development of body esteem is associated with the psychological mechanism of self-concept, which is now considered a complex concept consisting of structural dimensions (e.g. self-concept clarity) and content evaluation (e.g. self-esteem; positive or negative judgments about oneself). . Apart from the discussion of how a person's self-concept corresponds to the self, self-concept manifestly (Campbell, 1990; Campbell, Trapnell, Hein, Katz, et al., 1996) refers to how clearly a person can define himself and such a definition. How consistent and stable a person is until the end of life (Kang and Hong, 2012). Therefore, people who have a clear self-concept have consistent internal standards of self and a clear identity and are less influenced by external standards (Vertanain, D., 2013). In contrast, individuals with more ambiguous self-concepts tend to rely on external criteria to determine their identity.

Based on a meta-analysis of research literature and questionnaires as well as their own findings, Stefanel Franzoy and

Stephanie Shields (1984) provided evidence that different areas of body esteem are relevant for men and women. With this hypothesis in mind, they created a body esteem scale that allows one to assess the quality of the subject's attitude towards his body. This scale includes 35 items that are grouped into three gender-specific subscales. Subscales for women include sexual attractiveness, weight concern, and body condition, while men's body esteem is assessed concerning physical attractiveness, upper body strength, and physical condition. Each statement of the body esteem scale can be scored using a 5-point Likert-type scale, where one corresponds to having strong negative feelings, 5 to having strong positive feelings, and 3 represents a neutral midpoint.

In women, the subscale of sexual attractiveness refers to the perception of body parts whose image cannot be changed by exercise (such as the shape of lips and breasts). The attitude towards these body parts is associated with an emphasis on female sexuality, and their image can be corrected only by cosmetic methods (for example, make-up). In contrast, the weight concern subscale refers to completely different components of appearance: body parts whose image can be improved by exercise or diet. Finally, the third subscale, physical condition, is related to parameters such as endurance, strength, and agility (Franzoi et al., 1986). The body esteem scale quickly became popular, not only because of its form, which is easy and quick to administer but also because of its psychometric properties. The research showed that the results obtained with this scale correlate with general self-esteem. Also, studies have been conducted to investigate BES's internal consistency and

test-retest reliability as well as construct, convergent and divergent validity (Beltran et al., 2022; Smith et al., 2022).

It is clear that the body esteem scale has become a multidimensional and gender-specific body evaluation measure for a series of related clinical and social studies during the last 30 years. However, body esteem is a culturally sensitive construct. That is, the body parts and body functions that men and women consider important when evaluating themselves are likely to change based on cultural changes in the standards that define attractive and healthy gendered bodies (Frost, French et al., 2018). The increasing attention of intercultural perspectives to psychological phenomena has increased the need to provide different language versions of standardized tools in a cultural context. According to the said information, we are looking for whether the body esteem scale of the women's version in Iranian women's society has good psychometric properties or not.

Method

This research is applied in terms of its purpose and in terms of methodology, it is in the ranks of descriptive research of correlation type. The statistical population of the current study includes all women aged 18 to 54 who were working in different universities in Tehran and Tabriz. The sample consisted of 550 people (310 people for exploratory factor analysis; 260 people for confirmatory factor analysis) who completed the scale online. The research entry criteria include being a woman, being 18 years old and older, and not being homosexual. Klein (2015) recommends a sample size of at least 200 people; He also considers the rule of 5 to 10 people for each parameter in factor analysis to be ideal for calculating the sample size.

Considering that the number of model parameters was 76 parameters; Therefore, the sample size should be in the range of 380 to 760. Considering the collection of these views, the sample size of the study was 580 people. To deal with the impact of missing data on the results, people who did not answer more than ten percent of the questions were excluded from the analysis. Therefore, out of the total of 580 questionnaires collected, 19 questionnaires were excluded due to incomplete answers and lack of entry criteria, and 11 questionnaires were excluded during the data analysis stage due to outliers. The statistical analysis of the study has been done on 550 people. The reason for choosing these inclusion criteria is the characteristics of the sample in the original research, which was designed as a tool. The researcher gave a short explanation about the research to the participants and they were invited to participate in the research. After signing the written consent form, the participants were asked to answer the questionnaires of this research. The average and standard deviation of the age of the sample of the current research is 33.84, 6.84 and the age range is 55-18. The characteristics of the current research sample are given in Table 1. As expected, people have a high level of education. Almost 5% of the participants had a diploma, 28% had a diploma, 39% had a bachelor's degree, 29% had a master's degree, and 1% of the participants had a doctorate level. 98% of the participants had menstrual cycles and 2% experienced menopause. 19.7% of participants under 2 years and 27.2% of people between 3-5 years were in a relationship. 26.8% and 13.4% of the sample were in a relationship between 6 to 10 and 11 to 15 years,

respectively. Finally, 13% of people over the age of 16 had relationships with each other.

Materials

1. Body Esteem Questionnaire (BES).

This scale was designed by French et al. (1986). The Body Esteem Questionnaire is a scale in which participants rate their positive and negative feelings about 35 different body parts (e.g., thighs) and functions (e.g., libido) on a Likert scale from (1 = completely negative feelings) to 5 (completely positive feelings) show. This scale covers three areas related to body image, sexual attractiveness (with questions 1, 3, 6, 11, 13, 20, 21, 22, 26, 28, 31, 32, 34), weight concerns (2, 8, 10, 14, 16, 23, 24, 25, 29, 35) and physical conditions (4, 5, 7, 9, 12, 15, 17, 30, 33). Questions 18, 19, 28 are scored only for men. which has internal consistency using Cronbach's alpha coefficient of 0.78, 0.87, 0.82 respectively. Higher scores in each of the subscales indicate positive body esteem.

2. Rosenberg self-esteem questionnaire (RSE).

The Rosenberg Self-Esteem Questionnaire includes 10 self-report items and each statement of this scale includes a four-point Likert scale (strongly disagree, disagree, agree, strongly agree). The scores of the above options are considered to be 3, 2, 1, 0 respectively. The sum of the scores of 10 questions, which ranges from 0 to 30, is considered as a person's self-esteem score (Rosenberg, 1965). The research results of Palman and Alik (2000) reported its retest correlation coefficient at a two-week interval of 0.84 (cited by Mohammadi, 2014). Also, Mohammadi (2005) investigated the psychometric indices of this scale in Iranian society and reported the validity of this scale through Cronbach's alpha method, retesting and dichotomization

as 0.69, 0.78, and 0.68 respectively. In addition, it has a significant positive correlation with Cooper Smith's self-esteem scale of 0.61. Rosenberg's self-esteem scale was used to check the convergent validity with body esteem scale.

3. Sexual inhibition and arousal questionnaire. Sexual Inhibition and Arousal Questionnaire was designed by **Graham et al.** (2006) to evaluate women's stimulating and inhibiting responses. The sexual inhibition and arousal questionnaire of women is a widely used and valid 36-question scale. The questions were placed on a 4-point Likert scale from (1=strongly agree) to (4=strongly disagree), and lower scores indicate more inhibited responses and greater arousal. The factor analysis results show that the questionnaire consists of 2 higher level factors, "sexual inhibition and arousal," and 8 lower level factors. Five of these lower-level factors, i.e. the factors of arousal ability (with questions 15, 17, 19, 20, 24, 25, 26, 30, 32), power of sexual dynamics (with questions 2, 6, 27, 28), smell (with questions 22, 23), sexual partner characteristics (with questions 5, 8, 10, 12), position (with questions 3, 4, 7, 13), related to sexual arousal factor and 3 importance factors Communication (with questions, 1, 11, 14, 16, 21, 33), concerns about sexual performance (with questions 9, 18, 29, 31) and possible arousal (with questions 34, 35, 36) related to the agent It is sexual inhibition. The internal similarity of the sexual arousal factor using Cronbach's alpha is 0.70, while the average internal similarity of sexual inhibition is 0.55. Normative data from the Sexual Inhibition and Arousal Questionnaire suggest that average scores on all factors indicate normal functioning and very high scores indicate potentially problematic functioning.

Implementation. In order to perform a cross-cultural adaptation of this criterion, according to Muniz (2013), we went through a multi-step process to verify the equivalence of the original and back-translated versions. First, a forward translation of the questionnaire from English to Farsi was done independently by two experts in the field of the sectional field who have a good knowledge of both English language and psychometric knowledge. Then the two translated versions were compared, and a single provisional Farsi version was produced. The provisional Farsi version was back-translated into English by an independent bilingual translator who had yet to see the original English version of the BES. After that, all three translators compared the provisional English version of the English version with the original questionnaire and produced the original Persian version of the BES following linguistic and cultural adaptations. The Persian version of BES was tested in a preliminary study with ten men and women to identify any possible problems in understanding and interpreting the questionnaire items. The final Persian version of BES was administered to all participants. The research was carried out in different universities in Tehran and Tabriz. In this way, the researchers went to the universities of Tehran and Tabriz, and the purpose of the research was explained to the working women. Those who expressed their consent completed the questionnaires. Participants did not receive any financial reward, but detailed information about their sexual performance status would be sent to motivate participants. In order to collect data for the retest, the questionnaire was randomly sent again via email to 54 women. Except for the test and retest part, the

questionnaires were filled in with pencil and paper.

Findings

Table 1 shows the mean, standard deviation, and internal consistency using Cronbach's alpha based on the three-factor model. The table shows that the subscale of concern

about weight and physical condition have the highest and lowest mean and standard deviation, respectively. Cronbach's alpha coefficients are between 0.76 and 0.86, indicating this questionnaire's high reliability.

Table 1: Mean, standard deviation and internal consistency of BES questionnaire subscales

| Subscales | | | |
|----------------------|-------|--------------------|-------------------|
| N=550 | | | |
| | Mean | Standard deviation | Chronbach's Alpha |
| Sexual attraction | 32/49 | 8/87 | 0/86 |
| Concern about weight | 50/05 | 9/02 | 0/82 |
| Physical condition | 16/33 | 5/74 | 0/76 |

Table 2 shows the correlations between BES subscales in the total sample. Like the English version, all correlations are

significant and their range is between 0.13 and 0.44.

Table 2: Pearson correlation between subscales based on the three-factor model

| Subscales | 1 | 2 | 3 |
|----------------------|--------|-------|---|
| Sexual attraction | 1 | | |
| Concern about weight | 0/44** | 1 | |
| Physical condition | 0/37** | 0/13* | 1 |

Convergent validity was achieved through the correlation of the BES scales (based on the three-factor model) with the subscales of the self-esteem questionnaire and the sexual inhibition and arousal scale (Table 3). The correlation coefficients between the self-esteem scale and sexual arousal of SES-W are higher than the correlation coefficients of other

subscales. For example, the correlation coefficient between the self-esteem scale and all body esteem subscales is high. The sexual arousal factor in the SES-W questionnaire has a high correlation of 0.30 with the subscale of sexual attractiveness and weight concern (P<0.05).

Table 3: Correlations showing the convergent and discriminant validity of the body esteem questionnaire

| Scale | Sexual attraction | Concern about weight | Physical condition |
|-------------------|-------------------|----------------------|--------------------|
| Self-esteem scale | **0/68 | **0/65 | **0/59 |
| sexual arousal | **0/31 | **0/35 | *0/14 |
| sexual inhibition | 0/08- | 0/10- | 0/02- |

P<0/05**, P<0/01*

The construct validity of the BES scale was performed through exploratory factor analysis. First, the adequacy of the sample size was confirmed through the Kaiser-Meyer-Olkin sampling adequacy test and Bartlett's sphericity test. The KMO test was (0.84) which was satisfactory and Bartlett's test was statistically significant ($\chi^2=4228.36$, P<0.000). In factor analysis, loadings greater than 0.40 were

considered significant. Then, principal components analysis of orthogonal rotation was done with Varimax method. Pebble's diagram suggested a three-factor solution; Therefore, the questions were limited to 3 factors. Diagram 1 shows the gravel diagram. The eigenvalues of three factors are higher than one, and the eigenvalues of the first to fourth factors are 8.26, 2.43, and 2.12, respectively. Three factors

explain 40.03 percent of the total variance, and the first to third factors explain 15.46, 13.75, and 11.24 percent of the common variance, respectively. In this regard, out of 35 questionnaire items, 13 related to items 1, 3, 6, 11, 13, 20, 21, 22, 26, 28, 31, 32 and 34 were loaded on the first factor. This factor was called sexual attraction, according to the content of the

questions. Questions 4, 5, 7, 9, 12, 15, 17, 30, 33 were loaded on the second factor and items 2, 8, 10, 14, 16, 23, 24, 25, 29 and 35 were loaded on the third factor. They were named for concerns about weight and physical condition, respectively. Table 4 shows the factor weights of each item after Varimax rotation.

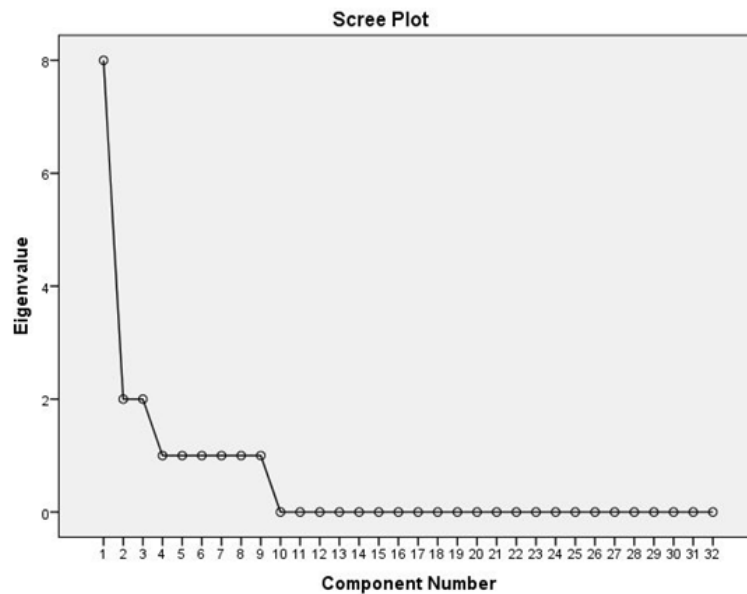


Figure 1. Scree Plot

Table 4: Principal components analysis with varimax rotation based on the three-factor model (N=310)

| questions | Factor 1 | Factor 2 | Factor 3 |
|--------------------------------|----------|----------|----------|
| 1. Body odor | 0/38 | | |
| 3. Nose | 0/53 | | |
| 6. Lips | 0/59 | | |
| 11. Ears | 0/47 | | |
| 13. Chin | 0/52 | | |
| 20. Chest | 0/61 | | |
| 21. The appearance of the eyes | 0/58 | | |
| 22. Species | 0/52 | | |
| 26. Sexual desire | 0/48 | | |
| 28. Sexual organs | 0/58 | | |
| 31. Sexual activity | 0/48 | | |
| 32. Body hair | 0/54 | | |
| 34. Face | 0/45 | | |
| 4. Physical endurance | | 0/60 | |
| 5. Reflexes | | 0/31 | |
| 7. Muscle power | | 0/82 | |
| 9. Energy level | | 0/65 | |
| 12. Shoulders | | 0/47 | |
| 15. Physical fitness | | 0/49 | |

| | | | |
|--|--|------|------|
| 17. Agility | | 0/80 | |
| 30. Health | | 0/54 | |
| 33. Physical conditions | | 0/42 | |
| 2. Appetite | | | 0/38 |
| 8. Waist circumference | | | 0/48 |
| 10. Thighs | | | 0/75 |
| 14. Body structure | | | 0/72 |
| 16. Buttocks | | | 0/58 |
| 23. Rump | | | 0/75 |
| 24. Legs | | | 0/69 |
| 25. Shape or figure | | | 0/81 |
| 29. The appearance of the stomach | | | 0/61 |
| 35. Weight | | | 0/46 |

The construct validity of the BES scale was also checked through Lisrel software. Maximum likelihood was used to estimate the data.

Diagram 2 shows the three-factor model of BES.

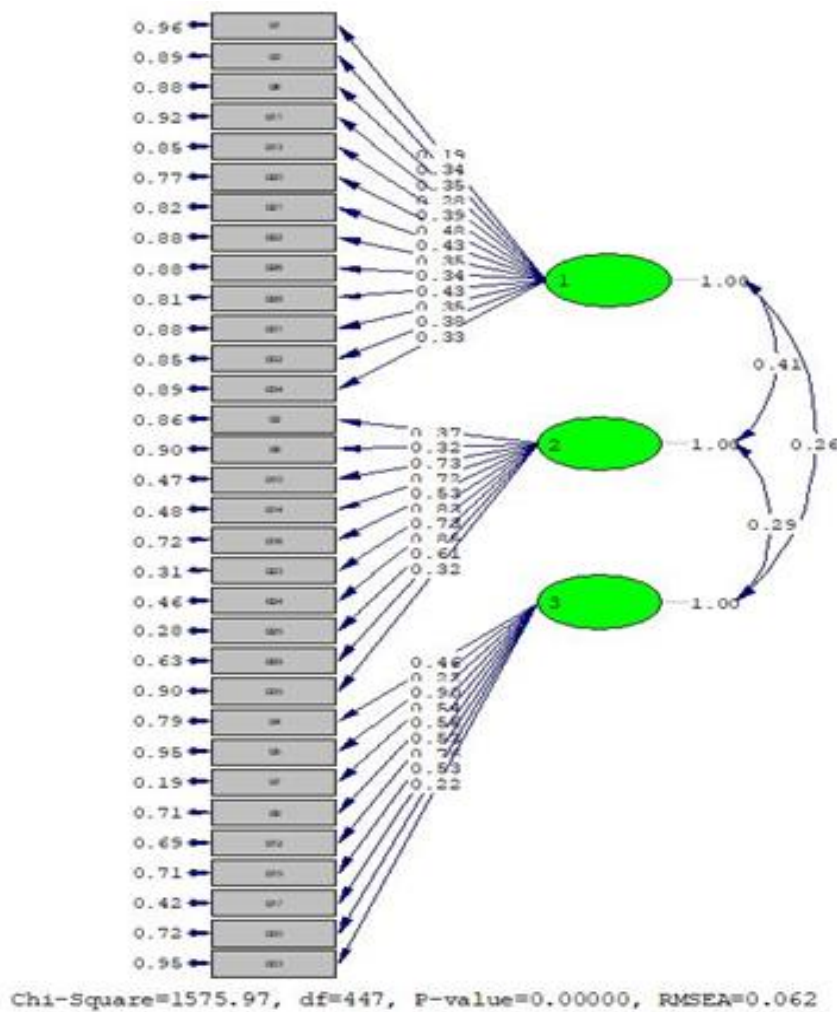


Figure 2. Confirmatory factor analysis of the scale

For the fitting of the 3-factor model, the chi-square indices (2χ), the chi-square ratio on the

degrees of freedom ($df\chi/2$), the comparative goodness-of-fit index, the variance estimation

error-index, the goodness-of-fit index, the comparative goodness-of-fit index, and the residual mean square were used. For models with a large sample (above 200 people), chi-square is almost always statistically significant. This issue contradicts with this article, which is recommended for the structural equation modeling method of large groups. For this reason, other fit indices are used to fit the models. The NFI, GFI, and CFI indices are closer to the value of 1, or in other words,

higher than 0.90, indicating the optimal fit of the model. The $2/df\chi$ index lacks a fixed criterion for an acceptable model, but if it is smaller than 3, it indicates a good fit. The RMSEA index indicates a good fit when it is smaller than 0.08. The closer the RMR index is to zero, the better the fit of the model. According to the mentioned contents, the fit indices show the model's desirability. As shown in Table 5, the 3-factor model discovered in this research shows a very good fit.

Table 5. Fit Indexes

| Fit Index | df | 2χ | $2/df\chi$ | RMSEA | CFI | NFI | GFI | RMR |
|------------------------|-----|---------|------------|-------|------|------|------|------|
| Obtained values | 447 | 1575/97 | 3/52 | 0/06 | 0/93 | 0/92 | 0/87 | 0/78 |

Based on the research literature on convergent validity, it is expected that the body esteem questionnaire has a positive correlation with the self-esteem scale. It is also expected that sexual arousal components positively correlate with self-esteem. While the components of sexual inhibition negatively correlate with self-esteem, as expected.

expected that the body esteem components have a negative correlation with the sexual inhibition subscale and a positive correlation with the behavioral activation subscale. The results related to the convergent and discriminant validity of the body esteem questionnaire are presented in Table 6. As can be seen, most of the obtained correlations are in the expected direction.

In the discussion of differential validity, in line with the research literature, it is

Table 6: Correlations of the convergent and discriminant validity of the body esteem questionnaire

| Scale | Sexual attraction | Concern about weight | Physical condition |
|--------------------------|-------------------|----------------------|--------------------|
| Self-esteem scale | **0/68 | **0/65 | **0/59 |
| sexual arousal | **0/31 | **0/35 | *0/14 |
| sexual inhibition | 0/08- | 0/10-* | 0/02- |

$P < 0/05^{**}$, $P < 0/01^{*}$

Table 7. Cronbach's alpha and retest coefficients of the body esteem questionnaire and its subscales

| Scale | Cronbach's Alpha | Retest coefficient |
|----------------------|------------------|--------------------|
| Body-esteem scale | 0/83 | 0/73 |
| Sexual attraction | 0/87 | 0/76 |
| Concern about weight | 0/70 | 0/81 |
| Physical condition | 0/85 | 0/80 |

The test-retest reliability coefficient for the body esteem questionnaire after 28 days (for 54 people) is equal to 0.78, and the internal

consistency of the entire questionnaire is equal to 0.73 using Cronbach's alpha method.

Discussion

Growing evidence shows that body esteem concerns are common among Iranian women. However, until now, there are no valid measures to assess body esteem for use among this population. This research aimed to investigate the psychometric properties of the Persian version of the Body Esteem Questionnaire on the non-clinical population of women. The results showed that the Persian form of this questionnaire has strong internal consistency and acceptable construct validity. Experts confirmed face validity. The highest and lowest mean and standard deviation were assigned to the subscales of concern about weight and physical condition. In general, the average of the subscales is comparable to the main research. The reliability coefficients based on the three-factor model were in the range of 0.76 to 0.86, indicating this questionnaire's reliability. Self-esteem questionnaires and SES-W were used to obtain convergent validity. The correlations between the similar subscales were significant and showed that the questionnaire has good validity. Correlations between body esteem subscales were also calculated, but their values were not high. This shows that these subscales measure different symptoms of body esteem dimensions and this concept has different dimensions. Exploratory factor analysis showed that this questionnaire has three factors in the population of Iranian married women, which are: sexual attractiveness, concern about weight, physical condition. Confirmatory factor analysis also showed the fit of this model. Some sources believe that body image is a multidimensional term, of which body esteem is one component (Cragan et al., 2013).

In the national literature, some tools for measuring body image are currently available in Persian. For example, we can refer to the body image scale of Brown et al. (1990) and Stankard's body image scale (1983). However, as we mentioned in the introduction, in today's literature, body image and body esteem are considered different concepts in terms of focus and sub-dimensions.

In general, the results of this study have shown that the Iranian version of BES is a valid and reliable measurement tool. As in the original version, the factor structure of the BES consists of 3 dimensions. Therefore, a useful tool for clinical evaluation, efficacy studies in pathological groups, and research in normal adult populations have been made available in Iranian literature. In addition to showing the multidimensionality of body esteem and gender differences in its conceptualization, the present study has created a reliable and valid criterion for the concept of body esteem. One of the limitations of the present study was that the body esteem scale measures a person's beliefs about his body in a self-reported manner. Another limitation of the current research is that the research sample is limited to married women, so caution should be taken in generalizing the findings to other people. The main limitation of the present study was the non-screening of the research subjects in terms of having psychiatric diagnoses. Although this issue was investigated through self-reporting in the questionnaires, it may be useful to screen the subjects with diagnostic tools and clinical interviews.

Ethics

In this research, ethical standards including obtaining informed consent, ensuring privacy and confidentiality were observed.

Acknowledgement

The cooperation of all participants in the research is thanked and appreciated.

Conflict of Interest

According to the authors, this article has no financial sponsor or conflict of interest.

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