



Psychometric Properties and Validation of Body Appreciation Scale (BAS)

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Abstract

Objectives: The purpose of this paper was to assess the psychometric properties of BAS-2 among university students in Urmia, Iran.

Methods: This is a descriptive-exploratory study that specifically aims at validating tests. The current research goes under the rubric of standardization studies. The study population consists of university students in Urmia in the academic year of 2014 - 2015 and after providing the Persian version of the target scale using translation and back translation, the approved version of the BAS-2 as well as multidimensional body-self relations questionnaire, body dysmorphic metacognitive questionnaire, and Yale-Brown obsessive compulsive scale (modified for body dysmorphic disorder) administered to 400 university students in Urmia have been selected through quota sampling. Data were analyzed using descriptive statistics, face, content, construct and convergent validity, Cronbach's alpha, and split-half reliability with SPSS and AMOS Graphics softwares.

Results: The results indicated that Cronbach's alpha coefficient and split-half reliability were 0.87 and 0.83, respectively. The face, content, construct, and convergent validity of the BAS-2 were confirmed to be in consistent with other instruments. The results of CFA to obtain the construct validity indicated that every 10 items showed high factor loading with the total score. BAS-2 scale has an acceptable validity and reliability and is applicable to research and clinical settings in Iranian context.

Conclusions: It can be concluded that BAS-2 is a psychometrically sound positive body image measure.

Keywords: Psychometric Properties, Body Appreciation Scale (BAS), Validity, Reliability

1. Background

Satisfaction with body image and positive attitude toward the body is one of the criteria regarding mental health (1). The concept of body image pertains to an inner experience which encompasses the presence of positive emotions and lack of negative ones (2). Cash defines body image as personal feelings about the figure and appearance (3).

Body image means feelings, perception, attitude, and values regarding the body and its functions (4). In addition, a key element in quality of life is attitude; which includes body image, attitudes about treatment, and disease symptoms (5). Body image is the most important part of self-concept, due to the fact that one's physical appearance is the first property that is judged by others (6).

Evaluating body satisfaction and desired body image has great significance in predicting potential problems in the future (7). Hence, this study is an attempt to introduce a new comprehensive instrument for measuring body sat-

isfaction. Psychometric properties are also discussed in this study.

Body image has been studied by many researchers, recently, where body satisfaction has been the main variable (8, 9). Body satisfaction is defined as respect for the body and also the acceptance of optimal view regarding the body (10).

Satisfaction with body image has a particular importance due to the fact that satisfaction with body mass has a positive relationship with self-esteem and self-confidence; even small changes in the body image can have a large impact on one's character (11). While body image is a multidimensional construct, it is often defined as a degree of satisfaction with physical appearance (size, shape, and general appearance) (7). This image was formed at birth, evolves as the individual grows up, and changes during the course of life (12).

In their research, Amidi et al. showed that although there is a significant relationship between body mass and satisfaction with body image, satisfaction scores of girls re-

vealed that only skinny and tall girls were satisfied with their appearance and that in spite of the fact that most girls had normal height and weight, they were not satisfied with their body and wanted to be taller (13).

Given the points mentioned above, assessing satisfaction with body image is very important in research and clinical works. In Iran, some researchers invented research instruments to determine the rate of satisfaction with body image. There are problems regarding the validity and reliability of such instruments. In other cases, the instruments were standard tools with certain limitations.

For example, Amidi et al., in their study to measure satisfaction with body image, designed and applied a questionnaire containing 17 items. Only content validity was measured using an experts' opinions (13).

In the study conducted by Mohammadi and Sajadinejad, the Littleton et al. scale questionnaire was used to measure satisfaction with body image. Validation of the questionnaire in Iran was not reported, therefore, researchers used Cronbach's alpha to report its reliability, and correlation between two factors for the validation of the questionnaires in Iran (14).

Bahram et al. applied a researcher-made self-descriptive questionnaire to measure satisfaction with body image, with reliability measured in a small random sample with a pilot method using Cronbach's alpha. No information is available in the field of psychometric properties (15).

Body dysmorphic metacognitive questionnaire includes four factors: Metacognitive control strategies (about appearance), objectivity of thoughts (thoughts intersection), positive and negative metacognitive beliefs, and safety behaviors regarding body dysmorphic, respectively. This instrument was developed by Rabie et al. and assesses cognitive components of body dysmorphic disorder; however, it does not measure satisfaction with healthy body (16).

Yale-Brown obsessive compulsive scale modified for body dysmorphic disorder (BDD) (17) is a 12-item self-report instrument that measures the severity of symptoms of body dysmorphic disorder and has a two-factor rank structure and two additional questions. The factors include: (1) Obsessions and (2) compulsion obsessions; the two additional questions are about insight and avoidance. In Iran, Rabie et al. standardized the Persian version of BDD-YBOCS. This questionnaire measures body dissatisfaction and ignores the positive component of body satisfaction (18).

The body image questionnaire includes 46 items that are answered in a 5-degree scale (from very dissatisfied to very satisfied). This questionnaire measures six components i.e. appearance, orientation, shape, fitness, fitness orientation, mental weight, and body satisfaction (19).

Given the above consideration, this study aimed at the introduction and standardization of a tool to assess body satisfaction entitled body appreciation scale (BAS-2) in cases of Iran. The scale was developed by Sooto and Garcia in 2002. The original version included 81 items. After the items with same meanings were identified, the number of items was reduced to 43. The 43-items version was given to several nurses, psychologists, psychiatrists, and mental health professionals in order to assess its content validity and appropriateness of the content and the component under study. Then, the scale was changed to 39 items. Since this scale was a self-report measure and a person's opinion is asked about the situation, according to the experts, the name of the scale was changed from the rating scale of body image to the scale of satisfaction with body image.

BAS scale has also shown test-retest reliability in a period of three weeks in American women. Data analysis supports one-dimensional factor structure of BAS in samples of male and female students from the United States, England, and Germany; moreover, it spans through exploratory and confirmatory factor analysis (20-24).

According to the explanations above, since there is no standardized questionnaire that can measure body satisfaction in our country and questionnaires used had some limitations, a standard, highly valid questionnaire is essential to measure body satisfaction. Accordingly, the primary objective of the current study was to evaluate the psychometric properties of the BAS-2 among the students in the University of Urmia, Iran in the academic year of 2014 - 2015.

2. Methods

This research is a descriptive-exploratory study and is specifically taken into account as validation of tests. In the first stage, after contacting the author and permission for copyright, we received the original version of the questionnaire. Then, the English version was carried out using progressive methods by three psychology experts fluent in English; back translation into English was done by a psychology expert familiar with the Persian language. Finally, reform and cultural adaptation was conducted on the questionnaire. After preparing body satisfaction scale, multi-dimensional body image questionnaire, body dysmorphic metacognition questionnaire, and Yale-Brown OCD scale modified for dysmorphic disorder were used as other instruments in the study. First, reliability was measured on the preliminary sample and finally, the main one was selected. In order to apply the principles of ethical research, the researcher explained the research objectives to the participants and asked them to complete the questionnaire.

The study population consist of university students in Urmia in the academic year of 2014 - 2015. The study sample was selected using quota sampling technique (i.e. samples were included from all the universities in Urmia). Urmia has the following universities: University of Urmia, University of Technology, Payam Noor University, Islamic Azad University, Applied Science University, and private universities. The total population was about 90000 students (according to the Wikipedia encyclopedia 2014).

The required sample volume was obtained using Cochran formula for sample size and the online calculation was carried out using the following address: (<http://www.parsmodir.com/db/research/cochran.php>).

Given the population of 90000 people and the confidence of 0.05, the exact sample size was obtained as 382.531436166 to prevent loss of sample and rounding the number, 400 were considered for the study.

The main objective of this study was to validate BAS (25). Accordingly, the main questionnaire of the current study was BAS; dysmorphic metacognition questionnaire and Yale-Brown scales were applied to assess divergent validity for body dysmorphic disorder and multidimensional body image questionnaire was used to assess concurrent validity.

2.1. Body Appreciation Scale-2

The scale was developed by Avalos in 2002. The original version included 81 items. After the items with same meanings were identified, the number of items was reduced to 43. The 43-item version was given to several nurses, psychologists, psychiatrists, and mental health professionals in order to assess its content validity and appropriateness of the content and the component under study. Then, the scale was changed to 39 items. In the initial implementation of the scale, three questions were identified as unclear questions by the participants and were eliminated from the scale. After the first exploratory factor analysis was conducted, 10 items of the scale were removed due to low correlation coefficient. In the second run of the exploratory factor analysis, three more items were removed and 23 substances remained, eventually. Discriminated validity of the scale indicates the power to distinguish people into two groups: High and low. The reliability of the questionnaire was obtained using test-retest technique. The correlation coefficient between the two runs was 0.71 (26). In this study, the reliability of the scale was calculated equal to 0.91 using Cronbach's alpha coefficient.

Discriminate validity of the scale managed well to discriminate between the fit and dysmorphic groups. The factor validity of the scale was performed on 361 students using varimax rotation, which showed a general factor of

KMO coefficient was obtained as 0.89, which shows the sufficiency of the sampling. Since the scale is a self-reporting scale and seeks one's view in relation to body condition and body mass, using the experts' opinions, the scale changes to body appreciation scale.

The new version of the instrument was finally published by Tylka et al. (9). In this version, the items were reduced to 10 items and the subscales were removed from the questionnaire. Psychometric properties were appropriate in the study by Tylka and colleagues (9).

2.2. Multidimensional Body-Self Relations Questionnaire

Multidimensional body-self relations questionnaire included 46 items, which are answered in a 5-point scale from very dissatisfied to very satisfied. The questionnaire evaluates 6 components i.e., appearance, shape orientation, fitness, fitness orientation, body weight, and body satisfaction (27). Answers were ranked on a 7-point scale from 1: Strongly disagree to 7: Strongly agree.

Rahati determined the validity and reliability of the MBSRQ for Iranian samples. Cronbach's alpha coefficient and subscales of ABS, SW, FE, FO, AO, and AE for female subjects were 0.60, 0.76, 0.46, 0.79, 0.80, and 0.81, respectively and in total, they were 0.88, 0.67, 0.79, 0.57, 0.83, and 0.84. In this study, the obtained Cronbach's alpha coefficient was 0.80 (28).

2.3. Body Dysmorphic Metacognitive Questionnaire

Body dysmorphic metacognitive questionnaire includes four factors: Metacognitive control strategies (about appearance), objectivity of thoughts (thoughts intersection), positive and negative metacognitive beliefs, and safety behaviors regarding body dysmorphic. Metacognitive control strategies are those assigned by the individual to control the activities of their cognitive system. Each item of the questionnaire has been adjusted according to literature reviews, theoretical researches, and clinical experience with patients with body dysmorphic researchers. First, researchers prepared questions to assess body dysmorphic disorder metacognition. Some of these questions were prepared using metacognitive problems by Cooper and Osman described in patients with body dysmorphic disorder. The rest of the questions were prepared using metacognitive questionnaires on emotional disorders such as thought intersection questionnaire and clinical and research experience with patients suffering from body dysmorphic disorder. In order to assess face and content validity, three experts studied it and after applying their views, as a result, we removed 20 items that could not measure body dysmorphic metacognition with regard to their views. Then in terms of a preliminary study,

30 students were asked about the comprehensibility of the questions, hence 10 more items believed to be incomprehensible by most participants were removed. Finally, 34 items were implemented and whose psychometric properties were investigated. After the questionnaires were completed by participants and the results were analyzed, three more questions were removed due to low loading factor. At the end, 31 questions remained, which had good validity and reliability. In this test, the participant is asked to respond in the form of a four-point Likert scale regarding the experience of thoughts and ideas about the dysmorphics of their appearance in the last two weeks. Scoring of the questionnaire was from one to four (16).

2.4. Yale-Brown Obsessive Compulsive Scale Modified for Body Dysmorphic Disorder

This is a 12-item self-report instrument that measures the severity of symptoms of body dysmorphic disorder and has a two-factor structure as well as two additional questions. The factors include: (1) Obsessions and (2) compulsive obsessions and two additional questions about insight and avoidance. Respondents show their agreement on any of the items on Likert scale from strongly disagree to strongly agree. Phillips et al., reported good test-retest reliability for the questionnaire (17).

Test-retest reliability in a period of one week was acceptable ($r = 0.88$). Cronbach's alpha coefficient for internal consistency was obtained as 0.80 indicating high internal consistency of this scale. BDD-YBOCS had a positive correlation with the scores of global assessment of functioning (GAF) in "DSM" ($r = -0.51$). Compared to graded brief psychiatric rating scale (BPRS), diagnosis validity was acceptable ($r = 0.19$) (17). In Iran, Rabie et al., has standardized the Persian version of BDD-YBOCS. Their results showed that BDD-YBOCS, the Iranian version of validity and reliability, is outstanding (18).

Data analysis was done using descriptive statistics, face, content, construct and convergent validity, Cronbach's alpha and split-half reliability, and applying SPSS and AMOS Graphics softwares.

3. Results

The mean age and Standard deviation (SD) of the subjects are in the range of 25.82 and 6.76, and the mean number of family members of the participants are 5 persons. The frequency of men is $n = 316$ and the frequency of women is $n = 84$.

The mean score of BAS and standard deviation in the sample are 39.34 and 8.03, respectively. The mean score of body dysmorphic and standard deviation in the sample

are 15.87 and 7.52, the mean score of body dysmorphic MCT and standard deviation in the sample are 65.94 and 24.27, and finally, the mean score of multi-dimensional body self-relations and standard deviation in the sample are 153.52 and 22.08, respectively.

According to Table 1, correlations between BAS-2 and body dysmorphic questionnaire as well as body dysmorphic metacognitive questionnaire are -0.20 and -0.21, respectively, indicating the divergent validity of the questionnaire. In addition, its correlation with multidimensional body self-relations questionnaire was equivalent to 0.42, which shows the concurrent validity of the questionnaire.

The results suggest the raw score of 45 as the best cut point proposed to detect high body satisfaction, which is equal to the score of $T = 60$.

3.1. Construct Validity

3.1.1. Model (1): The Results of Confirmatory Factor Analysis of BAS-2

According to the original version of the BAS-2, all of the items form the general factor of body satisfaction and the scale does not have any subscales. Accordingly, based on a confirmatory measurement model, the analysis was entered into AMOS and its standard and non-standard coefficients were extracted.

As can be seen in the Figure 1, all the items have a significant relationship with the factors and that all the items go under the rubric of the general factor and have good internal consistency. Item 4, with the factor loading of 0.86 and item 10 with the factor loading of 0.63, had the highest and lowest fit with the general factor. The results of this model also show that 10 items assess the same structure; therefore, it can be said that the factor has been saturated and the factors obtained have been fitted with the data, therefore, we can say that the scale has good construct validity.

The values in Table 2 show that the assumption of the structural model, i.e. the multivariate normality of the data is proven (1.82), and there is consistency between the covariance matrix observed and the generated loading.

In the above model, Chi-square value is significant after modification. Although favorable assumption is that the index is non-significant, this index is essentially sensitive to sample size and will be significant in large sample sizes; therefore, it is not considered an important index for researchers. Indices of GFI, AGFI, RMSR, and RMSEA show the overall fit of the model.

Index CMIN/DF is equivalent to 8.66, DF equals 35, and P is equal to 0.001. In addition, CMIN is equal to 303.21, RMR equals 0.90, PGFI is 0.93, and the other two indices i.e. NCP and AIC are 268.21 and 363.21, respectively.

Table 1. Matrix of Correlations Among BAS-2, Body Dysmorphic, Body Dysmorphic Metacognitive, and Multi-Dimensional Body Self-Relations Questionnaires

	1	2	3	4
BAS-2	1			
Body dysmorphic	-0.202 ^a	1		
Body dysmorphic metacognitive	-0.219 ^a	0.619 ^a	1	
Multi-dimensional body self-relations	0.426 ^a	-0.13 ^b	-0.27 ^a	1

^aP < 0.01.
^bP < 0.05.

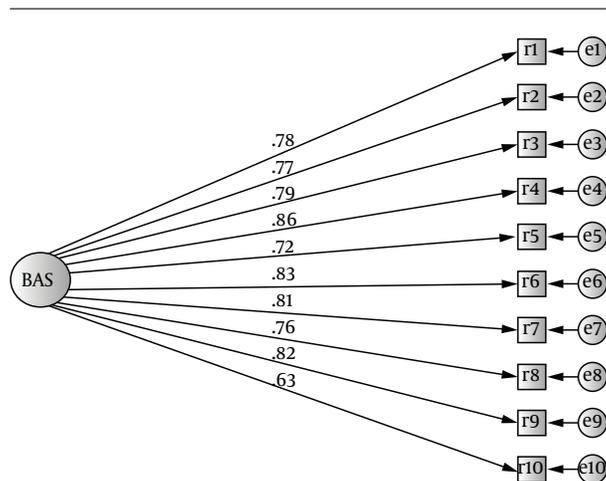


Figure 1. Loading factor of the items of BAS-2

GFI equal to 0.91 and AGFI equal to 0.90 are other indicators of the overall fitness of the model, which represent the overall fitness of the model. RMSEA (root mean square error of approximation) that values of CFI and TLI above 0.90 confirms the comparative indexes of the above model. Parsimony indices of the model are given in Table 2. The values of PCFI and PNFI are 0.58 and 0.53, respectively. The P close value reached 0.33. The value above 0.10 is good for the model. In general, results suggest overall indices of the model. In general, results suggest that overall indices of the model, as well as comparative and parsimony indices of the model, are fit, therefore, we can conclude that the hypothetical model is confirmed and it is well fit with the sample data.

To evaluate the reliability of BAS-2 questionnaire, the internal consistency method of Cronbach's alpha and split-half reliability were used. Cronbach's alpha (0.93) and split-half reliability (0.88) indicates that the scale (BAS-2) enjoys a good reliability. Intra-class correlations were obtained for items in the range of 0.928 to 0.938, which is indicative of a strong relationship of the items with each other.

Table 2. Parsimony Indices

Parsimony Indices	Score
CMIN/DF	8.66
DF	35
P	0.001
CMIN	303.21
P close	0.33
RMSEA	0.077
TLI	0.92
RMR	0.90
CFI	0.90
GFI	0.91
AGFI	0.90
PGFI	0.93
PCFI	0.58
NCP	268.21
AIC	363.21
PNFI	0.53

4. Discussion

This study aimed at assessing the validity and reliability of BAS-2 (9) in an Iranian sample.

The BAS-2 has improved three constraints of the original BAS. First, BAS-2 has eliminated separate versions for sex, which was in the original BAS and facilitated management in research and clinical functions. Second, the main parts of BAS, with relatively low factor loadings were rewritten or replaced for parts with stronger loadings on latent factor of body valuation (all parts of BAS-2 have now been loaded in high degree on the latent factor). Third, BAS-2 reflects positive current understanding of the structure of body image, while the original BAS had been developed considerably before studies on positive body image, were conducted.

In addition, BAS-2 has three cases less than the original version, which can accelerate data collection for re-

searchers in the shortest time possible, along with maintaining structural integrity. These attributes make BAS-2 as a viable option for both researchers and clinicians. Therefore, this study aims at evaluating the psychometric properties of BAS-2 in an Iranian sample.

The current study indicated that BAS-2 enjoys suitable reliability and validity. In this study, to assess convergent validity, correlation with multi-dimensional body image was used so that the results showed that the correlation between BAS-2 and multi-dimensional body image is equal to 0.426 indicating good convergent validity between the two scales. These results are consistent with the results stated in the previous studies with similar instruments. The results of the model also showed that 10 questions measure a unit structure; therefore, it can be said that the factor has been saturated and the obtained factors are fit with the data. As a result, it can be said that the model has good construct validity. Similar and consistent results were obtained from the study by Tylka through M-Plus Software indicating that confirmatory analysis is fit well for this measure and the indices of fitness are appropriate for both sexes (23). Similar results with the original BAS were observed in western countries such as the United States (20, 23, 29, 30), Germany (22), and some non-western countries such as Brazil (31), Malaysia (32), and Indonesia (33) for women. The inverse relationship between body valuation and BMI may reflect the culture of underweight orientation in these countries (34, 35).

While the original 13-item BAS is a strong psychological tool for body valuation in the western samples, BAS-2 shows the current knowledge regarding positive body image more (9). This study indicated that the psychometric properties of BAS-2 are suitable for the whole sample of universities of Urmia. The results of correlation analysis related to the negative correlation coefficients revealed divergent validity of the questionnaire between BAS-2 questionnaire and body dysmorphic as well as body dysmorphic metacognition. In addition, its correlation with multi-dimensional body image questionnaire indicates the concurrent validity of the questionnaire. The results of confirmatory factor analysis also confirmed the main factors based on the defined structures and saturated. These results show the construct validity of BAS-2 questionnaire in the Iranian sample. In addition, the results of Cronbach's alpha analysis revealed that the BAS-2 questionnaire has an appropriate reliability.

In addition, the BAS-2 has an easy scoring system. These characteristics would make BAS-2 a suitable choice for researchers that need to assess the valuation of the body in research, clinical, prevention, and educational areas.

It is recommended to pay attention to the diversity of samples so that other professional groups should also

be evaluated by this tool, and if possible, completely random sampling method should be used. Moreover, if possible, the factor model of this study can be compared with other available models; besides, the discriminate analysis method is to be used to evaluate the diagnostic validity, in a way that there will be the possibility of grouping people with upper and lower body satisfaction.

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Footnotes

Authors' Contribution: All authors had an equal role in design, work, statistical analysis, and manuscript writing.

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