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Psychometric Properties of the Body Image Scale in Turkish Ostomy Patients

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This study was presented as an oral proceeding in two congresses, XIV National Colon and Rectum Surgery Congress, VII Congress of Nursing in Colorectal Surgery, May 15–19, 2013, Antalya, Turkey, and the 12th European Council of Enterostomal Therapy Congress, June 23–26, 2013, Palais des Congrès, Paris, France.

PURPOSE: To investigate the validity and reliability of the Body Image Scale in Turkish ostomy patients.
METHODS: This study has a methodological and cross-sectional design. A hundred patients with ostomy lasting for at least 2 months were recruited from an ostomy and wound care unit.
FINDINGS: Confirmatory factor analyses showed that goodness-of-fit indexes were acceptable. Exploratory factor analyses showed that factor loadings of the scale items varied between 0.74 and 0.91, and a single factor was determined. The Cronbach's alpha value of the scale was 0.94. Item-to-total correlation coefficients ranged from 0.75 to 0.91.
CONCLUSION: The Turkish version of the Body Image Scale is a valid and reliable tool for evaluating body image in Turkish ostomy patients.
AMAÇ: Ostomisi olan Türk hastalarında Beden İmajı Ölçeğinin geçerliğini ve güvenirliğini incelemektir.
METHOT: Bu çalışma metodolojik ve kesitsel tipde yapılmıştır. Ostomi ve yara bakım ünitesinden alınan, en az iki aydır ostomisi olan 100 hasta örneklemi oluşturmuştur.
BULGULAR: Doğrulayıcı Faktör analizinde elde edilen iyilik uyum İndeksleri kabul edilebilir düzeydedir. Açıklayıcı faktör Analizinde faktör yükleri 0.74 ile 0.91 arasında değişmekte olup tek faktör elde edilmiştir. Ölçeğin Cronbach Alpha değeri 0.94'dür. Madde- Toplam Puan Korelasyon Katsayıları 0.75 ile 0.91 arasınsında değişmektedir.
SONUÇLAR: Beden İmajı Ölçeğinin Türkçe versiyonu ostomisi olan Türk hastalarının beden imajlarını değerlendirmede geçerli ve güvenilir bir ölçektir.

An ostomy is an external opening created in various surgeries performed for a wide variety of abdominal and pelvic diseases, such as colorectal, bladder, or metastatic prostate cancer, inflammatory bowel disease, trauma, incontinence, and congenital disorders. It can be either temporary or permanent (Sinclair, 2009).

Ostomies can be carried out on the small bowel (ileostomy), the large bowel (colostomy), and the ureters (urostomy) depending on the objective or the site of surgery (Lewis, Heitkemper, Dirksen, O'Brien, & Bucher, 2007). They can be performed for bowel or urinary diversion in both cancer and noncancer patients. In cancer patients, ostomies are most commonly used to treat colorectal and genitourinary cancers (Alabaz & Akçam, 2010; American Cancer Society, 2014). The American Cancer Society estimates that there will be about 96,830

new cases of colon cancer, about 40,000 new cases of rectal cancer, and about 50,310 deaths from colorectal cancer in the United States in 2014 (American Cancer Society, 2014). Colorectal cancer is the second most common cause of cancer death in Europe, with around 215,000 deaths from colorectal cancer in 2012 (12% of the total) (Ferlay et al., 2013). According to statistics issued by the Turkish Ministry of Health, colorectal cancer is the third most common cancer in males (20.8%) and the fourth most common cancer in females (13.5%) (Republic of Turkey, 2010).

Ostomy has been reported to be one of the factors that has a negative effect on the quality of life (QOL) as it prevents individuals from feeling well in terms of physical, psychosocial, and spiritual aspects (Fucini, Gattai, Urena, Bandettini, & Elbetti, 2008). Associated with wellness, body image is an important part of the QOL in ostomy patients (DeFrank, Mehta, Stein, & Baker, 2007; Grant et al., 2011). Ostomy potentially has negative effects on body image given the culture in some societies that favor the "perfect body" (Bohnenkamp, McDonald, Lopez, Krupinski, & Blackett, 2004; Brown & Randle, 2005; Junkin & Beitz, 2005). In several studies, some ostomy patients have been reported to feel that they have poor body image due to situations like odor and leaking, which may attract the attention of others, create unpleasant feelings for others, and expose the person with an ostomy's "incompleteness" (Black, 2004; Corbin, 2003). In addition, body image in ostomy patients is affected by an unpleasant appearance of ostomy, the feeling of embarrassment with ostomy, not likely to be kept under control, and the feeling of being less attractive (Platell, Thompson, & Makin, 2004; Thorpe, McArthur, & Richardson, 2009). Also in other studies, patients reported that they were alienated from their body, their body image changed, and their sexual functions were affected after ostomy (Grant et al., 2011; Manderson, 2005). Studies from the United Kingdom, Australia, and Turkey revealed that patients with ostomy had a poorer body image than those without ostomy (Kılıç, Taycan, Belli, & Özmen, 2007; Sharpe, Patel, & Clarke, 2011; Whistance et al., 2010). In a study in which patients were asked to draw a picture of themselves before and after ostomy, body image was found to be distorted after creation of ostomy (Lev-Wıesel, Zıperstein, & Rabau, 2005). The most recent evidence in the mainstream body image literature shows that this is a multidimensional construct involving cognitive, affective, and behavioral elements (Jakatdar, Cash, & Engle, 2006). Relevant research has revealed that concerns about ostomy are more severe in young and female patients, and as longer time passes after the surgery (Hopwood, Fletcher, Lee, & Al Ghazal, 2001; Kılıç et al., 2007; Szczepkowski, 2002).

Nurses play a key role in identifying body image concerns and ameliorating those concerns by helping patients strengthen their self-image. Nurses also play a role in the design and evaluation of interventions aiming to help patients overcome body image problems. Understanding the medical and psychosocial factors associated with body image will help nurses fulfill these two important roles. Therefore, nurses should address potential body image disturbances. An understanding of factors associated with body image is essential for the nursing care of cancer patients (DeFrank et al., 2007).

The Body Image Scale (BIS), which was developed by Hopwood et al. (2001), is a brief, complete tool that can be used to assess the behavioral, affective, and cognitive components of body image and typical areas of concern in cancer patients. The development of this instrument was based on guidelines similar to those recommended by the Quality of Life Study Group from the European Organization for Research and Treatment for questionnaire module development, and can be used in combination with the Quality of Life Questionnaire (QLQ)-C30 or other tools about QOL, which have a complementary role in QOL assessment in clinical trials or psychosocial research (Sprangers, Cull, Bjordal, Groenvold, & Aaronson, 1993). Out of the 10 items of the scale, 4 comprise the body image subscale of the QLQ-BR 23 module. The validity of the scale has been proven in cancer patients and was found to have good psychometric properties. This suggests that it is an adequate and valid measure of body image in cancer patients (Hopwood et al., 2001). The BIS has been shown to have high reliability and validity in various populations (Bre'dart, Verdier, & Dolbeault, 2007; Moreira, Silva, Marques, & Canavarro, 2010). The Portuguese and French versions of the BIS were used to examine the psychometric properties in a sample of breast cancer patients (Bre'dart et al., 2007; Moreira et al., 2010). The reliability and validity of the BIS were also tested in women with benign gynecological conditions and in patients undergoing surgery for colorectal cancer in the United Kingdom (Stead, Fountain, Napp, Garry, & Brown, 2004; Whistance et al., 2010).

To date, the BIS has not been translated for use in Turkey. Therefore, the purpose of this study is to analyze the psychometric properties of the Turkish version of the BIS in a sample of ostomy patients. When compared with creation of a new scale, adaptation of an available scale is inexpensive, saves time, and helps compare data collected with different versions of a scale (Jamieson, 2004). Using the BIS in Turkish-speaking ostomy patients will contribute to the determination of the degree and dimension of distortion in body image, and evaluation of the effectiveness of interventions directed toward improvement of body image, which result in a higher quality of patient care. It will also allow one to compare body image between Turkish-speaking ostomy patients and ostomy patients from other countries.

Methods

This study has a methodological and cross-sectional design. Ostomy patients were recruited from the ostomy and wound care unit of a university hospital located in the province of Izmir in western Turkey. In the unit, the ostomy and wound care nurses provide patients with basic information about colostomy and ileostomy.

Sample inclusion criteria were voluntary participation, being 18 years or older, not having any hearing or sight problems, being able to understand, speak, and read Turkish, at least having first ostomy created 2 months ago, being conscious of time and place, and having no psychiatric diseases diagnosed. Sample exclusion criteria were having metastatic disease and more than one cancer diagnosis. The sample size was planned before the study was started and as recommended in the literature to obtain reliable estimates. Indeed, the number of observations should be five to ten patients times the number of items in a scale (Şencan, 2005; Tabachnick & Fidell, 1996). The sample size required was, therefore, between 50 and 100 participants. The sample of the study included 100 ostomy patients who fulfilled the sampling criteria and accepted to participate in the study (Table 1). It was a convenience sample.

Table 1. Demographic and Clinical Characteristics of the Ostomy Patients (*n* = 100)

Demographic characteristics		
	$\bar{x} \pm SD$	**Range**
Age (years)	57.27 ± 11.23[a]	23–80
	***n* (100)**	**%**
Gender		
Female	43	43.0
Male	57	57.0
Marital status		
Married	84	84.0
Single	16	16.0
Education level		
Primary school	59	59.0
Secondary school	18	18.0
High school	23	23.0
Employment Status		
Employed	10	10.0
Unemployed	48	48.0
Retired	42	42.0
Clinical characteristics		
Type of ostomy		
Temporary ileostomy	32	32.0
Permanent ileostomy	9	9.0
Temporary colostomy	27	27.0
Permanent colostomy	24	24.0
Urostomy	8	8.0
Causes of ostomy creation		
Cancer	82	82.0
Ulcerative colitis	3	3.0
Crohn's disease	5	5.0
Perforation	5	5.0
Ileus	5	5.0
Chemotherapy		
Received	69	69.0
Not received	31	31.0
Radiotherapy		
Received	44	44.0
Not received	56	56.0
	$\bar{x} \pm SD$	**Range**
Duration of ostomy (months)	18.8 ± 19.43[a]	2–120

[a]Values given are mean ± *SD*.
SD, standard deviation.

Instruments

Data were collected with a demographic and clinical characteristics form, and the BIS.

Demographic and clinical characteristics form. Data about demographic features, including age, gender, marital status, educational level, and employment status, and data about clinical features, including types of ostomy, causes of ostomy, creation and duration of ostomy, and receiving chemotherapy and radiotherapy, were collected.

BIS. The BIS includes 10 items, and was developed to briefly and comprehensively assess the affective (e.g., feeling self-conscious), behavioral (e.g., difficulty in looking at the naked body), and cognitive (e.g., satisfaction with appearance) aspects of body image in cancer patients. It was designed to be used in all types of cancer or treatment (Hopwood et al., 2001).

It is a 4-point scale (0 = not at all and 3 = very much), and the final score is the sum of scores for 10 items, ranging from 0 to 30, with a lower score representing a better body image. The scale had high reliability (Cronbach's alpha 0.93) and good clinical validity based on response prevalence, discriminant validity ($p < .0001$, Mann–Whitney test), and sensitivity to changes ($p < .001$, Wilcoxon signed ranks test). Factor analysis showed a single-factor model (Hopwood et al., 2001).

Procedure

The study was carried out between June 2012 and March 4, 2013. Data were collected through telephone interviews and face-to-face interviews with ostomy patients in an ostomy and wound care unit. It took approximately 10 min to complete both instruments. Demographic data were self-reported by patients, and clinical data were obtained from patients' medical records.

To achieve the linguistic validity of the BIS, it was first translated to Turkish by the researcher whose native language is Turkish. Second, it was translated into English by two linguists with an excellent command of both Turkish and English languages and cultures. Third, the three versions were merged into a single version. Fourth, the resultant Turkish version was back-translated into English by a linguist who had an excellent command of both languages and cultures and who had not seen the English version of the scale before. When the back-translated version of the

scale was compared with the original scale, it was found to be similar, and no changes were made in the latest version.

After completion of content validity of the BIS, it was piloted on 10 ostomy patients having the same characteristics as the study sample. In accordance with the feedback from these patients, item 2 about physical attractiveness, item 3 about dissatisfaction, and item 10 about scarring were made clearer and were written as in the following: item 2: "Do you think that your physical attractiveness has decreased due to your disease or treatment?"; item 3: "Do you feel disappointed with/sad about your physical appearance when you get dressed?"; and item 10: "Do you feel dissatisfied with your scar/appearance of your ostomy?"As a result of these revisions in the scale, the Turkish version of the BIS (BIS-Tr) was obtained.

Data obtained from the piloting study was not included in the analyses of this study. The BIS-Tr was completed again by a group of 40 patients who were included in the study sample for test–retest reliability measurement. The retest was administered approximately 2 weeks after the initial administration.

Statistical Analyses

Data were analyzed using the Statistical Package for Social Sciences 15.0 (SPSS, Inc., Chicago, IL, USA) and LISREL 8 (Scientific Software International, Skokie, IL, USA). Content validity of the BIS-Tr was tested by asking opinions of experts using the content validity index (CVI). Internal consistency of the scale was tested with Cronbach's coefficient and item-to-total correlations (Polit & Beck, 2006).

Stability of the scale was tested by test–retest reliability coefficients and paired samples *t*-test analyses (Akgul, 2005; LoBiondo-Wood & Haber, 2002). Item-to-total correlations and test–retest reliability coefficients were determined using Pearson's correlation coefficient analysis (LoBiondo-Wood & Haber, 2002). Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were used to determine the construct validity of the BIS-Tr, and CFA was done using LISREL 8 (Schreiber, Stage, King, Nora, & Barlow, 2006). For EFA, the principal component analysis and varimax rotation were used (Akgul, 2005).

Ethical Considerations

Permission was obtained via e-mail from Penny Hopwood, who developed the BIS, on November 22, 2011, to be able to test the validity and reliability of the scale in the Turkish ostomy patients. Ethical approval was obtained from the ethics committee of Dokuz Eylul University. Written permission to conduct the research was obtained from the Health Directorate of Dokuz Eylul University Hospital. Before data were collected, patients were informed about the aim and methods of the research, and verbal and written informed consent were obtained from each participant.

Findings

Sample Characteristics

The distribution of the ostomy patients by their demographic and clinical characteristics is presented in Table 1. Patients were aged between 23 and 80 years, with a mean age of 57.27 ± 11.23 years. Of all participants, 57.0% were male, 84.0% were married, 59.0% were primary school graduates, and 48.0% were unemployed. Thirty-two percent of the patients had temporary ileostomy, and the mean duration of ostomy was 18.81 ± 19.43 months (min: 2 months; max: 120 months). Eighty-two percent of the patients had ostomy due to cancer, and 69% and 44% of the patients received chemotherapy and radiotherapy, respectively.

Validity of the BIS-Tr

Content validity. To analyze content validity, a total of seven experts specializing in ostomy patients were requested to offer their opinions about the BIS, the linguistic validity of which was confirmed. Each question in the BIS-Tr was scored by the experts on a 4-point scale: 1 = not relevant, 4 = highly relevant. In accordance with experts' opinions, necessary changes in the items were made. Evaluations of expert opinions were done using CVI (Polit & Beck, 2006). Item content validity index (I-CVI) and scale content validity index (S-CVI) were found to be 0.94.

Construct validity. Construct validity of the BIS-Tr was tested using CFA and EFA.

CFA. In CFA, the goodness-of-fit indices were examined without putting any limitations and adding new connections. The results of the goodness-of-fit indices were as in the following: minimum fit function chi-square (χ^2) was 100.04, degrees of freedom (*df*) was 34, *p* was .00, χ^2/df was 2.94, standardized root mean square residual (S-RMR) was .05, and comparative fit index (CFI) was 0.96.

EFA. The construct validity was also tested using EFA. The Kaiser–Meyer–Olkin (KMO) measure was 0.92, and the Bartlett's test of sphericity significance level was (χ^2 = 872.12; *df* = 45; *p* = .00). EFA showed one component with an eigenvalue of over 1.0, explaining 68.11% of the cumulative variance in this study. As a result of EFA, factor loadings of the BIS items varied between 0.74 and 0.91, and a single factor was determined (Table 2).

Descriptive statistics of the BIS-Tr. The mean score was 12.33 ± 9.86 on the BIS-Tr. The lowest and the highest scores for the BIS-Tr were 0.00 and 30.0, respectively.

Reliability of the BIS-Tr

Item-to-total correlations and Cronbach's alpha reliability coefficient of the BIS-Tr item-to-total correlation coeffi-

Table 2. Results of Exploratory Factor Analysis

	Factor loadings	
Item 1 Have you been feeling self-conscious about your appearance?	0.91	
Item 2 Have you felt less physically attractive as a result of your disease or treatment?	0.87	
Item 3 Have you been dissatisfied with your appearance when dressed?	0.84	
Item 4 Have you been feeling less feminine/masculine as a result of your disease or treatment?	0.84	
Item 5 Did you find it difficult to look at yourself naked?	0.84	
Item 6 Have you been feeling less sexually attractive as a result of your disease or treatment?	0.82	
Item 7 Did you avoid people because of the way you felt about your appearance?	0.80	
Item 8 Have you been feeling the treatment has left your body less whole?	0.77	
Item 9 Have you felt dissatisfied with your body?	0.76	
Item 10 Have you been dissatisfied with the appearance of your scar?	0.74	
Cumulative variance	68.11%	
Kaiser–Meyer–Olkin	0.92	
Bartlett's test of sphericity	χ^2	872.12
	df	45
	p	.00

cients ranged from 0.75 to 0.91 for the BIS-Tr ($p < .05$). Cronbach's alpha coefficient was 0.94 for BIS-Tr (Table 3).

Test–retest reliability coefficient of the BIS-Tr. Test–retest reliability coefficient was 0.85 for the BIS-Tr ($p < .00$). There was no significant difference in the mean scores for the BIS-Tr between the first test and the second test ($p > .05$) (Table 4).

Discussion

In this study, the reliability and validity of the BIS were tested, and the scale was adapted to Turkish culture in a sample of ostomy patients. This study examined linguistic validity, content validity, construct validity, and reliability of the BIS in Turkish ostomy patients.

Linguistic Validity

Translators' knowledge and experience have a great influence on translation (Aksayan & Gözüm, 2002). Therefore, people who have a good command of both languages and who know cultures of both languages should be selected. Translation of a scale from its original version to the target language and its back-translation are the most commonly used methods (Aksayan & Gözüm, 2002; Carlson, 2000). For this reason, the scale was translated into Turkish by two people who know both languages and cultures well, and its back-translation was made by two other people who know both languages and cultures well and who have not seen the scale before. The back-translation was compared with the original BIS by the authors of this paper, and it was found to be compatible with the original scale. Therefore, no changes were made in the Turkish version.

Content Validity

Content validity requires that experts decide whether the items of a scale represent the construct planned to be measured, and create a scale including meaningful items (Ercan & Kan, 2004; Eser, 2007). It is recommended that expert opinion regarding content validity should be requested from three specialists on minimum and 10 specialists on maximum (Polit & Beck, 2006). In this study, the content validity of the scale was tested by requesting a total of seven experts specializing in ostomy patients to offer their opinions about whether the items of the BIS were appropriate. CVI was used to determine whether the experts agreed. It is computed in two ways: I-CVI and S-CVI. I-CVI is determined for each item and should be greater than 0.78. S-CVI is determined for all the items combined of a scale and should be greater than 0.80 (Polit & Beck, 2006). I-CVI and S-CVI values of the BIS-Tr were found acceptable (Polit & Beck, 2006). The values showed an agreement about the items of the BIS-Tr among experts.

Construct Validity

CFA. Construct validity shows the ability of a scale to measure the relevant construct wholly (LoBiondo-Wood & Haber, 2002). In studies on adaptation of scales into different languages and cultures, construct validity is tested with CFA. It tests how the structure of an original scale responds to adaptation.

The results of CFA for the scale were as in the following: $\chi^2 = 1711.93$, $df = 34$ and $p = .00$. A statistically insignificant p value for χ^2 ($p > .05$) shows that the matrix of the variables observed through the model is consistent (Erkorkmaz, Etikan, Demir, Özdamar, & Sanisaoğlu, 2013; Şimşek, 2007). In the present study, CFA showed a significant χ^2 value. However, a significant χ^2 value is an expected result in large samples. Therefore, df is an important measure in χ^2 test, and the ratio of df to χ^2 (χ^2/df) can be used as a consistency measure (Erkorkmaz et al., 2013). The resultant value of lower than 5 for this ratio can be considered a sign of consistency (Harrington, 2009; Schreiber et al., 2006). In

Table 3. Item-to-Total Correlations and Cronbach's Alpha Reliability Coefficient of Body Image Scale–Turkish Version (*n* = 100)

Body Image Scale	Item-to-total correlation *r*	Cronbach's alpha when an item was deleted	Cronbach's alpha
1. Have you been feeling self-conscious about your appearance?	0.82[a]	0.94	0.94
2. Have you felt less physically attractive as a result of your disease or treatment?	0.84[a]	0.94	
3. Have you been dissatisfied with your appearance when dressed?	0.91[a]	0.93	
4. Have you been feeling less feminine/masculine as a result of your disease or treatment?	0.81[a]	0.94	
5. Did you find it difficult to look at yourself naked?	0.77[a]	0.94	
6. Have you been feeling less sexually attractive as a result of your disease or treatment?	0.75[a]	0.94	
7. Did you avoid people because of the way you felt about your appearance?	0.83[a]	0.94	
8. Have you been feeling the treatment has left your body less whole?	0.78[a]	0.94	
9. Have you felt dissatisfied with your body?	0.87[a]	0.93	
10. Have you been dissatisfied with the appearance of your scar?	0.84[a]	0.94	

[a]$p < .05$.

Table 4. Comparisons of Test–Retest Reliability Coefficient and Mean Scores for the Body Image Scale–Turkish Version

	Time 1 $\bar{x} \pm SD$ (*n* = 100)	Time 2 $\bar{x} \pm SD$ (*n* = 40)	*r*/*p*[b]		*t*/*p*[c]	
Body Image Scale	7.30 ± 8.44[a]	6.70 ± 8.43[a]	0.85	.000	0.829	0.412

[a]Values are expressed as mean ± *SD*.
[b]$p < .001$.
[c]$p > .05$.
SD, standard deviation.

the present study, χ^2/df was lower than 5, S-RMR was lower than .08, and CFI was over 0.90, indicating that the model has a high consistency (DiStefano, 2002).

As a result of the CFA conducted for construct validity, a single-factor model was obtained for the BIS-Tr. Factor analyses for the original English version and Portuguese version had a single-factor model as well. Factor loads were found to be between 0.65 and 0.93 (Hopwood et al., 2001; Moreira et al., 2010). The frequently recommended factor loads that explain the relation between items and factors are above .40 (Akgul, 2005; LoBiondo-Wood & Haber, 2002). None of the items of the BIS-Tr were deleted since the factor loading of the items was above .40.

EFA. KMO value is used to determine whether the sample size is sufficient for EFA, and it is expected to be over 0.60 (Baykul, 2000; Polit & Beck, 2010). In the present study, the KMO value of 0.92 indicated that the sample size of the study was sufficient for EFA. Bartlett's test is used to determine whether correlation coefficients in EFA between variables are significant (Baykul, 2000; Polit & Beck, 2010). In this study, since Bartlett's test showed an extremely significant result ($p > .001$), correlation matrix of the items in the scale was considered acceptable for EFA.

Factor loads reveal relations of items with factors, and it is most frequently recommended that items with factor loads lower than .40 should be deleted (Tavşancıl, 2010). Since the factor loads of all the items of the BIS-Tr ranged from 0.74 to 0.91, all the items were kept. Factor loads ranged from 0.68 to 0.83 in the original scale (Hopwood et al., 2001), from 0.73 to 0.90 in the Portuguese version (Moreira et al., 2010), and from 0.67 to 0.87 in the English version (Stead et al., 2004). As in studies on the original scale and its Portuguese version, one factor with an eigenvalue of higher than 1 was obtained in this study. Eigenvalue is the sum of squares of factor loads for each factor. It is anticipated that the variance explained should be 30% or higher in one factor scales and should be higher in multifactor scales (Büyüköztürk, 2002). In the present study, a single factor, explaining 68.11% of the variance, was obtained, which shows that the scale had a strong factor structure. The items explained 57.55% of the total variance in the original scale (Hopwood et al., 2001), 61.18% of the total variance in the Portuguese version of the scale

(Moreira et al., 2010), and 82.7% of the total variance in the English version of the scale.

Reliability

Reliability refers to a consistency between independent measurements of the same thing. In the present study, the Cronbach's alpha coefficient and item-to-total correlations were used to measure internal consistency. Cronbach's alpha coefficient is the coefficient that best indicates the reliability of scales and is an indicator of homogeneity of items (Polit & Beck, 2010). In this study, Cronbach's alpha coefficient was 0.94 for the BIS-Tr, suggestive of the fact that the items are homogeneous and that internal consistency of the scale is high (Polit & Beck, 2010). Cronbach's alpha coefficient was 0.93 for the original BIS developed by Hopwood et al. (2001), and was 0.93 for the Portuguese version in a sample of breast cancer patients (Moreira et al., 2010). Similarly, the BIS-Tr was quite reliable, and the items of the scale were homogeneous. Cronbach's alpha coefficient was also 0.90 in a sample of patients undergoing surgery for colorectal cancer and was 0.89 in a sample of patients with benign gynecological conditions in the United Kingdom (Stead et al., 2004; Whistance et al., 2010).

To conduct item analyses, correlations between scores for each item and the total score on the scale should be made, and to what extent each item is associated with the whole measurement tool should be determined. The-item-to-total correlation coefficient should be positive and higher than .25 (LoBiondo-Wood & Haber, 2002; Polit & Beck, 2010). It is recommended that items with low correlations should be omitted, which is not obligatory though. So that an item can be discarded, the extent to which omission of that item changes Cronbach's alpha coefficient should be determined and mean scores should be estimated (LoBiondo-Wood & Haber, 2002; Polit & Beck, 2010). In this study, item-to-total correlation coefficients ranged from 0.75 to 0.91. Therefore, none of the items were deleted from the BIS-Tr. Item-to-total correlation coefficients of the Portuguese version of the BIS were 0.47–0.86 (Moreira et al., 2010). They were quite high for the BIS-Tr, which indicates that the items have the same characteristic.

Test–retest reliability indicates the power of a measurement tool for providing consistent results in repeated measurements (LoBiondo-Wood & Haber, 2002; Polit & Beck, 2010). Test–retest reliability was completed by a group of 40 patients. In the light of the recommendation to assess stability over a 2- to 6-week period (Tabachnick & Fidell, 1996), the retest was administered approximately 2 weeks after the initial administration. Measurements done 2 weeks apart in this study showed that test–retest reliability coefficient was 0.85 for the BIS-Tr, an indicator of stability of the items across time. Lack of a significant difference between the first and the second measurements ($p > .05$) indicated that the items of the BIS-Tr remain constant across time (Gözüm & Aksayan, 2003; LoBiondo-Wood & Haber, 2002).

Conclusions

The results of this study revealed that the BIS-Tr is a reliable and valid measure of body image concerns in a sample of Turkish-speaking ostomy patients, and it allows a brief and complete assessment both in practice and research. It is easy for both patients and investigators to use and appropriate to compare body image across cultures. Nurses, who have close and regular contact with patients, can help patients cope with present or expected changes in their appearance.

The use of the BIS-Tr should be considered in the evaluation of body image before and after colorectal surgery in Turkey. The BIS-Tr could be an important measure for nurses who take care of ostomy patients because it offers a short and clear assessment of body image. Nurses and other health professionals can offer interventions to ostomy patients, such as counseling, education, psychoeducation, cognitive-behavioral therapy, and support programs, to enhance their body image, sexuality, and QOL. The scale can also be utilized to investigate the effectiveness of these interventions in Turkish-speaking ostomy patients.

Further research is needed to examine the relationship between BIS-Tr scores and weight loss, anxiety and depression, adaptation to ostomy, and sexual function in Turkey. In addition, adaptation of BIS-Tr may be useful in examining body image in other populations of cancer patients.

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