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Psychometric properties of the Polish version of the Body Attitude Test

Anna Brytek-Matera, Michel Probst

Summary

Background. Polish studies have not been focused on measures which assess attitude toward one's own body. The purpose of the present study was to develop the Polish version of the Body Attitude Test (BAT) and examine its reliability.

Methods. The study included 48 patients with anorexia nervosa, 39 patients with bulimia nervosa as well as 115 female university students who had never suffered from any eating disorder. The mean age was 18.69 years (*SD* = 3.52) in women with anorexia nervosa, 22.28 years (*SD* = 3.79) in women with bulimia nervosa as well as 20.53 years (*SD* = 1.79) in women without a current eating disorder. The mean duration of illness was 3.31 years (*SD* = 2.71) in patients suffering from anorexia nervosa and 5.10 years (*SD* = 2.92) in patients with bulimia nervosa, respectively.

Results. The BAT demonstrates satisfactory levels of internal reliability (α = 0.892). The BAT was strongly related with the Eating Disorder Inventory subscales: drive for thinness ($r = 0.687$, $p < 0.001$), ineffectiveness ($r = 0.643$, $p < 0.001$) and body dissatisfaction ($r = 0.634$, $p < 0.001$) and the Self-Esteem Inventory subscale: familial self-esteem ($r = -0.601$, $p < 0.001$).

Discussion. The results support the criterion validity of the BAT which is able to differentiate clinical from non-clinical subjects.

Conclusions. The Polish version of the BAT could be used as an appropriate measure assessing subjective attitude towards the body in women with and without eating disorders in Poland.

Body Attitude Test / body image / eating disorders

INTRODUCTION

Body image is defined as a multidimensional construct composed of perceptual (e.g. body size estimation), cognitive (thoughts and beliefs about the body), affective (feelings about one's own body; e.g. body dissatisfaction), and behavioural components (e.g. body checking) [1]. More concrete the construct body image consists of four dimensions: (1) a global subjective satisfaction or dissatisfaction with one's appearance; (2) an affective distress concerning appearance (emotions about one's appearance); (3) cognitive aspect of body image (person's engagement in one's appearance, thoughts and beliefs about one's body and body image schemas) and (4) behavioural avoidance reflective of body dissatisfaction (avoidance of particular situations and/or environments due to their elicitation of body image concerns) [2]. Cash and Deagle [3] argue that attitudinal measures of body image have a greater capacity to distinguish between a clinical and non-clinical population compared with perceptual distortion measures.

Anna Brytek-Matera[1], **Michel Probst**[2]: [1]University of Social Sciences and Humanities, Campus in Katowice, Poland: [2]KU Leuven; Faculty of Kinesiology and Rehabilitation Sciences, Research Group for Adapted Physical Activity and Psychomotor Rehabilitation, Belgium.
Correspondence address: abrytek-matera@swps.edu.pl
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One of the widely used attitudinal methods of body image is the Body Attitude Test (BAT) [4]. The BAT is a self-report questionnaire meant for assessing subjective body experience and attitude toward one's own body [4]. In Poland, there is a lack of good psychometric instruments measuring body image.

The aim is to assess the psychometric properties of the Polish version of the BAT among women with and without eating pathology. More concrete, the normality, the alpha Cronbach and the BAT's construct stability as well as the convergent, divergent and criterion-related validity (i.e. did the BAT sufficiently differentiates between Polish patients suffering from eating disorders and female healthy controls) will be assessed. Based on previous studies in different languages, we hypothesize that the Polish version of the BAT is consistent and that it fulfils the basic criteria of validity.

SUBJECTS AND METHODS

Subjects

The total group with eating disorders was 87 female outpatients. Diagnoses were made using the structured interview based on DSM-IV-TR criteria [5]. The group included 48 patients with anorexia nervosa (AN) and 39 patients with bulimia nervosa (BN). The patients were tested at the beginning of the treatment.

A control group (CG) consisted of 115 female non-clinical university students (from Silesian region). Recruitment criteria for healthy controls were following: (a) female without a current eating disorder recruitment only having an index of weight-for-height (BMI) not more greater than 25 kg/m^2 because these principal cut-off points point to overweight (according to the World Health Organization's classification), which is mostly connected with obesity and (b) adult participants. The present study includes women aged at least 18 years of age, and at most 25 years of age. This group was specially chosen for comparison because body image concern in young adults is also common [6]. The response rate was 100% of those contacted. The detailed participants' characteristics are summarized in Table 1. The participation in the study was voluntary and all participants signed an informed consent. The study was approved by the ethical committee.

METHODS

The Body Attitude Test [4] is intended to measure the subjective body experience and the attitude toward one's body. The scale is originally developed for female patients suffering from eating disorders but can be used for other clinical and non-clinical females and men [7]. The Body Attitude Test consists of 20 items to be scored on a six-point scale. With the exception of the negatively keyed items (4 and 9), items are scored ranging from always (5) to never (0). The maximum score is 100, and the higher the score, the more deviating the body experience is [4]. Former repeated analysis [4] yielded a stable four-factor structure: (1) negative appreciation of body size, (2) lack of familiarity with one's own body, (3) general dissatisfaction, and (4) a rest factor. This factor structure was confirmed in other studies [8-10]. Reliability measured by internal consistency demonstrated satisfactory levels of internal reliability (alpha = 0.93). The factor-total correlation for the subscales ranges

Table 1. Differences in general characteristics of the patients with anorexia nervosa (AN), bulimia nervosa (BN) and the control group (CG)

Variable	AN (N = 48)	BN (N = 39)	CG (N = 115)	ANOVA F	p
Age (year)	18.69 ± 3.52	22.28 ± 3.79	20.53 ± 1.79	18.63	0.001[a]
Body Mass Index (kg/m^2)	17.34 ± 2.40	22.46 ± 4.08	20.88 ± 3.34	37.03	0.001[a]
Height (cm)	163. 79 ± 6.12	166.49 ± 6.24	166.66 ± 5.45	4.33	0.01
Actual weight (kg)	46.51 ± 6.80	62.21 ± 10.86	58 ± 7.63	44.60	0.001[a]
Ideal weight (kg)	44.37 ± 5.32	51.61 ± 6.54	54.71 ± 7.01	43.59	0.001[b]
Duration of illness (year)	3.31 ± 2.71	5.10 ± 2.92	–	7.54	0.01

[a] = AN vs. BN vs. CG; [b] = AN vs. BN and AN vs. CG

from 0.88 to 0.90 [4]. The short-term test–retest reliability (interval 1 week) in female high school and university students (N = 67; M = 18 years, SD ± 5.3) and patients with eating disorder (N = 31; M = 24 years, SD ± 6.8) ranged from r = 0.87–0.92 for the total score and from r = 0.72–0.95 (all $p < .01$) for the subscales [4]. The critical score that determines the bound vary between patients and non-patients was established at 36 using Shrout and Fleiss' model [11].

The BAT has good convergent validity with existing body experience related questionnaires, general psychopathological phenomena and complaints and personality traits [12, 13]. Research shows that the BAT differentiates between patients with eating disorders and community samples (female students, women with and without fertility problems) [4, 12]. Results between female and male nonclinical subjects revealed significant difference of the BAT between gender [14]. The BAT also differentiates between different types of eating disorder. A comparison of the different types of eating disorders shows that restricting anorexia nervosa patients obtain the lowest scores and patients with bulimia nervosa the highest [4, 7]. A positive linear relationship exists between the BAT total scores and the body mass index (BMI) [15].

Within the group of patients with eating disorders, the BAT distinguish patients with and without self-harming behaviour [16]. Further significant differences were found between laxative abusers and non-abusers and between physically abused and the non-abused participants [17]. Binge eating disorders patients with alexithymia reported higher scores on BAT than non-alexithymia [18]. The BAT is also a good predictor of dissociative experiences and global therapy outcome [15]. The BAT can be used to evaluate progress in treatment [10] The BAT and the EDI are sensitive enough to detect clinically body image changes pre and post treatment [19]. The questionnaire is currently available in different languages without copyright costs [8-10, 19-22]. Normative data of patients with eating disorder (N = 650) and students (N = 200) are available [12, 14].

All 20 items from the Polish and English version of the BAT are presented in Table 2. – *on next page*.

To assess aspects closely related to the eating disorders, we used, beside the BAT, several other self-reporting questionnaires.

The Eating Disorder Inventory (EDI) [23] is a widely used questionnaire aimed at assessing the psychological characteristics of anorexia nervosa and bulimia nervosa: drive for thinness, bulimia, body dissatisfaction, ineffectiveness, perfectionism, interpersonal distrust, interoceptive awareness and maturity fears. The Polish version of the EDI was adapted by Żechowski [24].

The Self-esteem inventory (SEI) [25] uses a 58-question battery over a variety of topics and asks subjects whether they rate someone as similar or dissimilar to themselves. The SEI a widely used measure evaluating attitudes regarding the self in general (e.g. "There are lots of things about myself I'd change if I could"), social (e.g. "I'm popular with people my own age"), family (e.g. "My family expects too much of me") and professional/academic (e.g. " I'm proud of my work") areas of experience. The Polish version of the SEI was adapted by Brytek-Matera [26].

The Hospital Anxiety and Depression Scale (HADS) [27] is a widely-used 14-item self-report scale designed to briefly measure current anxiety and depressive symptomatology in non-psychiatric hospital patients. It excludes somatic symptoms, therefore avoiding potential confounding by somatic symptoms [27]. There are independent subscales for anxiety and depression. Scores on each scale can be interpreted in ranges: normal (0-7), mild (8-10), moderate (11-14) and severe (15-21). The HADS is considered to be reliable and valid measure of anxiety and depression. The authors [27] regard a scores of 11 or higher to indicate probable "caseness" of mood disorder on the anxiety or depression subscales, and a score of 8-10 being just suggestive of a disorder. The Polish version of the HADS was adapted by Majkowicz, de Walden-Gałuszko and Chojnacka-Szawłowska [28].

Procedure

The BAT was translated from British English to Polish using a standard forward-backward translation procedure. The English version of the BAT was first translated into Polish (by two translators who made independently translation

Table 2. Polish and English version of the Body Attitude Test

1. Kiedy porównuję się z rówieśnikami, jestem niezadowolona ze swojego ciała (*When I compare myself with my peers' bodies, I'm dissatisfied with my own*)
2. Moje ciało jest zdrętwiałe (*My body appears to be a numb thing*)
3. Mam wrażenie, że moje biodra są zbyt szerokie (*My hips seem too broad to me*)
4. Czuję się dobrze w moim ciele (*I feel comfortable within my own body*)
5. Bardzo chciałabym być szczuplejsza (I *have a strong desire to be thinner*)
6. Uważam, że mój biust jest zbyt duży (*I think my breasts are too large*)
7. Mam skłonność do maskowania mojego ciała (np. przez noszenie luźnych ubrań) (*I'm inclined to hide my body (for example by loose clothing*)
8. Kiedy patrzę na siebie w lustrze, jestem niezadowolona ze swojego ciała (*When I look at myself in the mirror, I'm dissatisfied with my own body*)
9. Potrafię łatwo odprężyć się (zrelaksować się) fizycznie (*It'seasy for me to relax physically*)
10. Myślę, że jestem za gruba (*I think I'm too thic*k)
11. Moje ciało jest dla mnie ciężarem (*I feel my body as a burden*)
12. Czuję się tak, jakby moje ciało nie należało do mnie (*My body appears as if it's not mine*)
13. Pewne części mojego ciała wydają mi się nabrzmiałe (*Some parts of my body look swollen*)
14. Moje ciało jest dla mnie zagrożeniem (*My body is a threat for me*)
15. Mój wygląd fizyczny jest dla mnie bardzo ważny (*My bodies appearance is very important to me*)
16. Mój brzuch wygląda, jakbym była w ciąży (*My belly looks as if I'm pregnant*)
17. Odczuwam napięcie/niepokój w moim ciele (I *feel tense in my body*)
18. Jestem zazdrosna o wygląd fizyczny innych osób (*I envy others for their physical appearance*)
19. W moim ciele dzieją się rzeczy, które mnie przerażają (niepokoją) (*There are things going on in my body that frighten me*)
20. Przeglądam się (swoją sylwetkę) w lustrze (*I observe my appearance in the mirror*)

of the same questionnaire), and then back translated into English (by a native English speaker without reference to the English original).

Our research, in the first stage, had a random selection among university female students (N = 119). Second stage had an advisable selection. Among all women, we found a group of 4 young women with bulimia nervosa. They were excluded from our research due to an eating disorder. We used a clinical interview to ascertain that there were no women with a diagnosis of both anorexia and bulimia nervosa. Finally, the control group consisted of 115 healthy women who agreed to take part in the research. The criteria for inclusion of a healthy participant in the control group were the female sex, the absence of an eating disorder and the age (from late adolescence to young adulthood).

Statistical Analysis

All complete data were entered into a database and analyzed using Statistical Package for the Social Sciences (SPSS version 19.0 for Windows). For the test of normality the Kolgomorov Smirnov test was used. The internal reliability of the scale was examined through the Cronbach's alpha coefficient. The relations between the different questionnaires were evaluated by Pearson's correlation coefficient. We used the following classification for the intercorrelations according to Surwillo [29]: 0-39 = low; 0.40-0.69 = moderate to substantial and 0.70-1 = high to very high. The between group results were compared using analysis of variance (one way ANOVA). In each variable separately, we used post hoc Tukey's Honestly Significant Difference. A significance level (p) of 0.05 (two-tailed) was assumed.

RESULTS

Reliability

Kolmogorov Smirnov test of normality showed that in the eating disorder group the total score

Table 3. Internal consistency of the Polish version of the Body Attitude Test (BAT)

	N/ items	AN (N=48)	BN (N=39)	CG (N=115)
BAT total score	20	0.90	0.85	0.87
BAT factor 1 "Negative appreciation of body size"	7	0.91	0.72	0.80
BAT factor 2 "Lack of familiarity with the body"	7	0.63	0.70	0.68
BAT factor 3 "General dissatisfaction"	4	0.73	0.69	0.80

AN = anorexia nervosa; BN = bulimia nervosa; CG = control group

and all the subscales, in the non-clinical group the total score and factor 3 had a normal distribution.

Table 3 showed the internal reliability (alpha Cronbach) for the total score and the original subscales for the whole and for the eating disorder group and non-clinical group separately. The factor-total correlation for the subscales (except the rest factor) ranges for the three groups from 0.81 to 0.92.

Comparison among three groups

The results in Table 4 revealed that patients with eating disorders (anorexia and bulimia nervosa) presented a more negative body experience than female control. The total BAT score was significantly different between patients with AN and female control as well as between the BN sample and female control ($F_{(2, 188)} = 142.69$, $p < .000$). Factor 1 (negative appreciation of body size) showed significant difference between the clinical and the control group ($F_{(2, 199)} = 79.74$, $p < .001$). In addition, there were statistically significant differences between each group on factor 2 (lack of familiarity with one's own body) ($F_{(2, 189)} = 160.78$, $p < 0.000$) and factor 3 (general dissatisfaction) ($F_{(2, 198)} = 85.82$, $p < 0.000$).

As for the EDI, there were statistically significant differences between each group on Bulimia subscale ($F_{(2, 195)} = 120.34$, $p < 0.000$). The scores obtained in the different EDI subscales, that is the Drive for thinness subscale ($F_{(2, 195)} = 170.86$, $p < .000$), the Body dissatisfaction subscale ($F_{(2, 195)} = 83.64$, $p < .000$), the Ineffectiveness subscale ($F_{(2, 195)} = 79.88$, $p < 0.000$), the Perfectionism subscale ($F_{(2, 195)} = 17.75$, $p < 0.000$), the Interpersonal distrust subscale ($F_{(2, 195)} = 29.44$, $p < 0.000$), the Interoceptive awareness subscale ($F_{(2, 195)} = 119.47$, $p < 0.000$) and the Maturity fear subscale ($F_{(2, 195)} = 27.21$, $p < .000$) were significantly different between patients with AN and female control as well as between the BN sample and female control.

As for the SEI, there were statistically significant differences between each group on familial self-esteem ($F_{(2, 199)} = 34.22$, $p < 0.000$). General self-esteem ($F_{(2, 199)} = 74.77$, $p < 0.000$), social self-esteem ($F_{(2, 199)} = 26.99$, $p < 0.000$) showed significant difference between the clinical and the control group. Professional self-esteem was significantly different between patients with BN and female control ($F_{(2, 199)} = 11.07$, $p < 0.000$).

As for the HADS, anxiety subscale ($F_{(2, 197)} = 39.93$, $p < 0.000$) and depression subscale ($F_{(2, 197)} = 68.97$, $p < 0.000$) were significantly different between patients with AN and control group as well as between the BN sample and control group. Table 4 – *next page*.

Intercorrelations between the Body Attitude Test and other eating disorders related psychological variables

Analyses were carried out to examine the correlations between the BAT and other measures: the Eating Disorder Inventory [23], the Self-Esteem Inventory [25] and the Hospital Anxiety and Depression Scale [27] and in all patients with eating disorders (N = 87) and separately in clinical subgroups (Table 5 – *next page*).

The BAT total score correlates highly with duration of illness ($r = 0.702$, $p < 0.001$) and moderately with Body Mass Index ($r = 0.499$, $p < 0.001$).

Table 4. Comparison of the BAT, the EDI, the SEI and the HADS between the group with anorexia nervosa (AN) and bulimia nervosa (BN) and the control group (CG)

	AN (N = 48) M ± SD	BN (N = 39) M ± SD	CG (N = 115) M ± SD	AN vs BN	AN vs CG	BN vs CG
BAT total score	62.14 ± 17.87	68.67 ± 13.57	29.79 ± 13.10	ns	0.001	0.001
BAT factor 1	20.33 ± 10.16	25.05 ± 5.67	9.38 ± 6.66	0.01	0.001	0.001
BAT factor 2	19.59 ± 6.13	21.00 ± 5.73	7.16 ± 4.21	ns	0.001	0.001
BAT factor 3	12.68 ± 4.04	14.20 ± 4.02	6.33 ± 3.62	ns	0.001	0.001
EDI-Drive for thinness	13.72 ± 5.69	15.44 ± 5.03	2.37 ± 3.88	ns	0.001	0.001
EDI-Bulimia	5.74 ± 5.76	12.31 ± 1.41	1.41 ± 2.02	0.001	0.001	0.001
EDI-Body dissatisfaction	16.72 ± 7.24	19.38 ± 6.22	6.33 ± 5.95	ns	0.001	0.001
EDI-Ineffectiveness	13.35 ± 7.03	13.26 ± 6.74	3.85 ± 3.46	ns	0.001	0.001
EDI-Perfectionism	7.76 ± 4.17	8.90 ± 4.59	4.94 ± 3.71	ns	0.001	0.001
EDI-Interpersonal distrust	6.93 ± 4.87	6.82 ± 5.49	2.19 ± 3.44	ns	0.001	0.001
EDI-Interoceptive awareness	12.78 ± 6.66	13.49 ± 7.63	1.80 ± 2.76	ns	0.001	0.001
EDI-Maturity Fear	9.63 ± 5.72	7.26 ± 5.66	3.90 ± 3.62	ns	0.001	0.001
SEI-General self-esteem	10.23 ± 5.64	8.96 ± 5.15	18.36 ± 4.71	ns	0.001	0.001
SEI-Social self-esteem	4.79 ± 2.04	5.23 ± 2.18	6.85 ± 1.54	ns	0.001	0.001
SEI-Familial self-esteem	4.15 ± 2.73	± 1.98	5.77 ± 2.18	0.001	0.001	0.001
SEI-Professional self-esteem	4.27 ± 2.06	3.33 ± 1.95	4.99 ± 1.88	ns	ns	0.001
SEI-Lie scale	3.06 ± 1.70	2.82 ± 1.25	3.22 ± 1.59	ns	ns	ns
HADS-Anxiety	12.85 ± 4.82	13.36 ± 3.95	7.70 ± 4.04	ns	0.001	0.001
HADS-Depression	9.66 ± 4.86	9.67 ± 4.50	3.33 ± 2.89	ns	0.001	0.001

BAT = Body Attitude Test; EDI= Eating Disorder Inventory; SEI= Self-esteem Inventory; HADS = Hospital Anxiety and Depression Scale; M ± SD = Mean and standard deviations; ns = no statistically significant difference

Table 5. The relation between the BAT and the EDI, the SEI and the HADS in the group of eating disorders

	Patients with eating disorders (N = 87)	Patients with anorexia nervosa (N = 48)	Patients with bulimia nervosa (N = 39)
	BAT-Total		
BAT factor 1	0.900***	0.957**	0.933***
BAT factor 2	0.822***	0.481**	0.284
BAT factor 3	0.825***	0.952**	0.878***
EDI-Drive for thinness	0.687***	0.867**	0.432**
EDI-Bulimia	0.469***	0.715**	0.316
EDI-Body dissatisfaction	0.634***	0.844**	0.478**
EDI-Ineffectiveness	0.643***	0.807**	0.573***
EDI-Perfectionism	0.442***	0.518**	0.313
EDI-Interpersonal distrust	0.380***	0.624**	0.453**
EDI-Interoceptive awareness	0.594***	0.809**	0.603***
EDI-Maturity Fear	0.324***	0.518**	0.332*
SEI-General self-esteem	-0.598***	-0.798**	-0.645***
SEI-Social self-esteem	-0.211	-0.519**	-0.384*
SEI-Familial self-esteem	-0.601***	-0.667**	-0.640***
SEI-Professional self-esteem	-0.535***	-0.519**	-0.369*
SEI-Lie scale	-0.069	-0.150*	-0.139
HADS-Anxiety	0.571***	0.718**	0.581***
HADS-Depression	0.502***	0.742**	0.652***

BAT = Body Attitude Test; EDI = Eating Disorder Inventory; SEI = Self-esteem Inventory; HADS = Hospital Anxiety and Depression Scale; Pearson correlation coefficient: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

DISCUSSION AND CONCLUSION

Till now, appropriate measurements in Polish assessing subjective attitude towards the body in women with and without eating disorders are limited. The purpose of this study was to evaluate the psychometric properties of the Polish version of the Body Attitude Test, an international reliable and valid instrument, among women with and without eating disorders. The BAT consistency of the Polish version presented the internal validity criteria. This results are in agreement with other BAT-studies [8-10, 19-22] in other languages. In agreement with other studies [8, 9, 13], our results showed that the BAT had satisfactory convergent validity. Substantial positive correlations between the BAT and three subscales of the EDI: Drive for thinness, Ineffectiveness and Body Dissatisfaction were found. Moreover, the BAT total score correlated highly with duration of eating disorders.

The BAT sufficiently differentiates between Polish patients suffering from eating disorders and nonclinical participants and as expected, both AN and BN patients present a more negative body experience and attitude towards their body than the group without eating disorders. The results support the criterion validity of the BAT which is able to differentiate clinical from non-clinical subjects.

In contrary to the literature [9, 30], AN and BN patients did not show differences in body attitude but in this study the patients with AN scored more negative than in other studies. These results could be an argument for the transdiagnostic theory of eating disorder [31] in which a division within ED subdiagnoses are not so relevant. The relation with body attitude and self-esteem and depression is in agreement with the literature [32-36].

Further research (i.a. factor analysis) with a greater sample size of ED could confirm and underpin our results.

The Polish version of the Body Attitude Test, a questionnaire specially developed for the assessment of patients with eating disorders, has excellent internal consistency and indicates that the negative body attitude expressed on the BAT is related to other signs of negative body experience. The BAT differentiates between clinical and non-clinical subjects.

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