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TURKISH VERSION OF BODY AWARENESS QUESTIONNAIRE: VALIDITY AND RELIABILITY STUDY

ORIGINAL ARTICLE

ABSTRACT

Purpose: The Body Awareness Questionnaire (BAQ) was described as a tool with psychometric properties that thoroughly assessed the concept of body awareness. There is no Turkish version of the scale with validity and reliability. The study aimed to demonstrate the validity and reliability of the Turkish version of the BAQ.

Methods: The study sample consisted of 180 university students (age=21.87±2.36 years, 99 M, 81 F). The BAQ, Self-Consciousness Scale (SCS), and Body Cathexis Scale (BCS) were applied to the participants.

Results: Result of the correlation analysis between the BAQ and the total scores obtained from the SCS and BCS, and the correlation coefficients were determined as 0.802 (p=0.007) and -0.753 (p=0.009), respectively. As a result of the explanatory factor analysis, a measurement tool consisting of 18 items and four sub-groups explaining 66% of the variance was obtained. The test-retest reliability coefficient was 0.830 at 3-day intervals. Cronbach's alpha was calculated as 0.917 to determine internal consistency.

Conclusion: Findings in the study show that the Turkish version of BAQ is valid and reliable.

Key Words: Body Awareness; Reliability; Turkish; Validity.

VÜCUT FARKINDALIĞI ANKETİ'NİN TÜRKÇE UYARLAMASI: GEÇERLİK VE GÜVENİRLİK ÇALIŞMASI

ARAŞTIRMA MAKALESİ

ÖZ

Amaç: Vücut Farkındalığı Anketi (VFA), vücut farkındalığı kavramını tam olarak değerlendiren psikometrik özelliklere sahip bir araç olarak tanımlanmıştır. Ölçeğin Türkçe geçerlik ve güvenirlik versiyonu bulunmamaktadır. Çalışmanın amacı, VFA'nın Türkçe versiyonunun geçerliğini ve güvenirliğini göstermekti.

Yöntem: Araştırmanın örneklemini 180 üniversite öğrencisi (yaş=21,87±2,36 yıl, 99 E, 81 K) oluşturdu. Katılımcılara VFA, Öz-Bilinç Ölçeği (ÖBÖ) ve Vücut Algısı Ölçeği (VAÖ) uygulandı.

Sonuçlar: VFA ile ÖBÖ've VAÖ'den elde edilen toplam puanlar arasındaki korelasyon analizi sonucunda korelasyon katsayıları sırasıyla 0,802 (p=0,007) ve -0,753 (p=0,009) olarak belirlendi. Açıklayıcı faktör analizi sonucunda toplam varyansın % 66'sını açıklayan 18 maddeden ve dört alt gruptan oluşan bir ölçüm aracı elde edildi. Test-tekrar test güvenirlik katsayısı, üç günlük aralıklarla 0,83 idi. İç tutarlılığı belirlemek için Cronbach alfa 0,917 olarak hesaplandı.

Tartışma: Çalışmadaki bulgular VFA'nın Türkçe versiyonunun geçerli ve güvenilir olduğunu göstermektedir.

Anahtar Kelimeler: Vücut Farkındalığı; Güvenirlik; Türkçe; Geçerlik.

INTRODUCTION

Questions like the concepts of our body and the interaction of these concepts with each other led researchers to work in various fields. Body awareness, which is one of these concepts, expresses the individual's awareness about body parts or dimensions in the most basic sense (1). It is key to understanding the interaction of mind and body (1,2). Body awareness may change due to factors such as attention, experience, memory, values, beliefs, conditions, and attitudes. It is also an active concept in life, which can also change with the individual being healthy or not (3,4). Therefore, it is complicated, changeable, educable, and multidimensional.

Body awareness is a concept that focuses on recognizing normal or abnormal processes in the body. It is based on the ability to describe biological and emotional signs. As the body awareness develops in the individual; breathing control, mental control, emotional control, increased coordination, improvement in muscle and joint movements, response predictions due to changes in the body, are expected to improve (2,5). It is also closely related to proprioception and vestibular system. The development of postural control, coordination, and balance support free and rhythmic function in the individual (6). It is necessary to examine all aspects of body awareness that is an essential concept to understand the interaction between mind and body in a more profound way (2,6). Researchers interested in the concept of body awareness have focused on how the individual defines the relationship between the body and body parts. They developed assessment methods related to these, examined the differences between patients and healthy individuals, and mentioned the differences in psychological and physical diseases (7). In addition, it is stated that health professionals use to recognize and explain changes in every aspect of the body of individuals with an awareness of the body, especially early diagnosis and treatment of chronic diseases, which will be beneficial in terms of taking precautions (8).

In recent years, body awareness has emerged as one of the most prominent topics in scientific studies in the field of health. According to the results of these studies, assessment and improvement of body awareness are most beneficial in people with pain, sleep disorders, chronic fatigue, stroke, appetite problems, balance disorder, blindness, low self-confidence, emotional problems, fibromyalgia, disturbed bowel syndrome, schizophrenia, and depression. The most important factor contributing to body awareness in these patients was the increase in quality of life (9-13).

Body awareness level measurement is necessary to assess body awareness and to evaluate the effectiveness of the treatment and the relationship with other parameters. It is essential for assessing these changes and eliminating inadequacies. Health professionals' assessment of body awareness enables the body to be treated holistically during the treatment process and to include methods related to that parameter in the treatment approach (13,14). Mehling et al. stated that the Body Awareness Questionnaire (BAQ) included emotional and physical components more extensively than other measurement tools used in assessing body awareness (15). The BAQ is a self-report scale based on the concept of measuring the individual's beliefs about the sensitivity of normal, abnormal, sensitive, or insensitive body processes, which is commonly used in research for various populations. Shields et al. emphasized that the scales evaluating body awareness, before the BAQ, were limited to the concepts of sensitivity to somatic responses related to the individual's disease processes, other physical symptoms or emotional states and thoughts (1). The BAQ' s broad scope, ease of administration, and holistic evaluation of the body have made it a popular choice among health professionals (15-17).

The literature review did not show a questionnaire that evaluates body awareness in Turkish. The study aimed to adapt the Turkish version of the BAQ, a questionnaire to assess body awareness, to provide cultural adaptation, and to demonstrate its validity and reliability. Therefore, this questionnaire, which we believe that many researchers from different disciplines could use, may contribute to science for body awareness. The most crucial aspect of this study valuable in the literature is that it might be one of the first questionnaires about body awareness in Turkish.

METHODS

Participants

The sample of the study consisted of 180 students, 99 (55%) males and 81 (45%) females who were undergraduate students at Muğla Sıtkı Koçman University Faculty of Health Sciences. The mean age was 21.87±2.36 years, the mean height was 165.45±5.98 cm, the mean body weight was 73.97±15.33 kg, and the mean body mass index was 24.46±4.47 kg/m2). The study was conducted at Muğla Sıtkı Koçman University Faculty of Health Sciences between March 2016 and February 2017. Written informed consent received from participants. In scale adaptation studies, it is recommended to take 5-10 times the number of variables in the scale to calculate the sample size (18). There are 18 variables in the BAQ. Accordingly, a sample of 180 individuals (18 items x 10 times) was considered sufficient to represent the study population. Inclusion criteria for the study were to be literate in Turkish, accept to participate in the evaluation again, and sign the consent form. Exclusion criteria were to have a chronic disease, to have problems with reading and understanding, not to complete the questionnaires.

Measurements

Body Awareness Questionnaire: The BAQ, developed by Stephanie A. Shields, Mary E. Mallory, and Angela Simon in 1989, is a scale that includes physical, emotional and social elements about the sensitivity of a person to normal or abnormal body conditions and processes and questioning the sensitivity to physical reactions. Before the development of the scale, the study was started with the establishment of a pool of 52 items covering different concepts. After the validity and reliability tests were conducted with the participation of many university students, the original 18-item version was developed. The questionnaire consists of four subgroups. These are (1) prediction of body responses, (2) sleep-wake cycle, (3) prediction at the onset of disease, and (4) pay attention to changes and reactions in the body process. Participants were asked to score between 1 and 7 values for every 18 statements (1=Not at all true of me, 7=Very true of me). The total score to be taken from the survey can be 126 or at least 18. In the survey, the rating is made as a total score. The higher the score, the better the body awareness level (1). The BAQ has been translated into other languages in several articles with validity and reliability studies by various researchers in a healthy and patient population (19,20). For the Turkish validation study, permission was obtained from Stephanie A. Shields via e-mail.

Self-Consciousness Scale: The first of dimensions of the Self-Consciousness Scale (SCS) is the special self-consciousness consisting of nine items. The second dimension is the social self-consciousness consisting of seven items. The last part consists of 6 items of social anxiety. The participants were asked to evaluate the items with a 4-point Likert-type scale (1=Disagree, 4=I totally agree). The high scores obtained from each dimension mean that the participants' awareness of that dimension is high (21,22). Shields et al. used the SCS in the validity and reliability study of the original BAQ (1). The permission was obtained from Neslihan Rugancı, who validated the scale in Turkish, via e-mail (22).

Body Cathexis Scale: Secord and Jourard created the Body Perception Scale (BPS) scale in 1953. It is an evaluation method that aims to determine the satisfaction level of the individual from 40 different body parts or functions. The form of the BPS used in our country is a five-point Likert type assessment tool consisting of 40 items (1=I like it, 2=I like it quite, 3=I am undecided, 4=I don't like, 5=I don't like it at all). The higher the total score of the scale, the lower the satisfaction level of the individual from body parts or functionality, and the lower the score, the higher the satisfaction level (23,24). Hovardaoğlu translated the scale into Turkish in 1989, and permission was obtained from Hovardaoğlu via e-mail (24).

Adaptation Study to Turkish: The translation procedure of the questionnaire into Turkish was based on the method proposed by Beaton et al. (25). Four independent translators translated the questionnaire into Turkish. The professors and field experts living in the United States have also been translated back to the original. In order to reach a consensus in the translation, the translators synthesized the reverse translations. Finally, the translator committee determined the inconsistencies and differences in

meaning checked the English and Turkish versions of the translation, and the Turkish prefinal version was shaped.

Preliminary Application of Research: In order to determine the conciliation of the prefinal version, which was finalized as a result of the scope validity analysis, the 30 students who had an undergraduate education in Muğla Sıtkı Koçman University Faculty of Health Sciences, who were eligible for inclusion criteria and were not included in the sample were applied. Individuals were asked to evaluate the items that they had difficulty in understanding the scale, suitability to Turkish, readability, and item order between 1-4 points. Evaluating the feedback of the cases formed the final version of the questionnaire.

Collecting the Data: The participants' demographic data were recorded with a personal information form prepared by the researchers. The SCS and BCS used as the gold standard for the validity and reliability of the BAQ. In the beginning, it was emphasized that participation in the study was voluntary. The BAQ was administered to the participants twice in three days intervals.

Statistical Analysis

Statistical Package for Social Science (SPSS Ltd., Chicago, IL, USA) 20.0 software package and SAS package program (Statistical Analysis System, Version 9, SAS Institute, Cary, North Carolina, USA) were used in the analysis of the data obtained from the study. In the evaluation of the data, the opinion of the statistician was taken. In the analysis of the data, descriptive information about the subjects was shown in numbers and percentages. The cultural adaptation was determined by the pilot study method. The validity of language, scope, criteria, and the structure was examined. Language validity was questioned with translation-back translation method, criterion validity with simultaneous validity method, construct validity with Kaiser-Mayer-Olkin (KMO) index, Barlett test, Explanatory Factor Analysis method. Principal Components Method was used to determine the number of factors. In the reliability analysis, internal consistency, time invariance, and item analysis were performed. Cronbach's alpha was used to determine internal consistency, and test-retest method was used to

determine invariance over time. The original scale was taken as a reference in determining the duration for the test-retest method. Results were evaluated by the Intraclass Correlation Coefficient (ICC) method. In all statistics, p significance value was taken as <0.05, and the correlation coefficient r >0.60 was interpreted as a high correlation.

RESULTS

Criterion Validity of the Turkish Version of the BAQ: When the correlation between the total scores of the scales used to determine the criterion validity was examined, there was a statistically significant and positive between BAQ and SCS (r=0.802, p=0.007), a statistically significant and negative direction between BAQ and BCS (r=-0.753, p=0.009).

Construct Validity of Turkish Version of the BAQ: The KMO index, which is a measure of the suitability of BAQ substances for Principal Component Method, was obtained at a perfect fit level of 0.867 (Bartlett's Chi-square =5702.870; p<0.01).

As a result of the explanatory factor analysis, a measurement tool consisting of 18 items and four sub-groups explaining 66% of the total variance was obtained, and the items in the sub-dimensions were found to be compatible with the items in the original form (Table 1).

Test-Retest Reliability of the Turkish Version of BAQ: The test-retest technique was used to analyze the invariance of the measuring instrument over time. Results were evaluated by the ICC method. For the test-retest method, 90 students were re-administered three days after the first application. Correlation analysis was performed between test and retest scores. There was a statistically significant correlation between test and retest scores of BAQ (ICC=0.830).

Internal Consistency: In our study, Cronbach's alpha coefficient was calculated to test the internal consistency of the BAQ. Cronbach's alpha value was found to be 0.917, which is close to 1.00, indicating that the questionnaire has a high internal consistency.

Table 1: Factor Loads and Cronbach Alfa Values of the Body Awareness Questionnaire.

Turkish BAQ Items		Factor Loads				Cronbach Alfa If Item Deleted
Vücut Sürecindeki Değişiklikler ve Tepkilere Dikkat						
I (1)	Yiyecek çeşitlerine tepki verme	0.75				0.91
I (4)	Yiyecek ve enerji seviyesi	0.81				0.91
I (10)	Mevsimsel ritmler	0.60				0.92
I (13)	Yorgunluğa karşı tepki	0.54				0.91
I (14)	Hava değişikliklerine karşı tepki	0.62				0.91
I (16)	Egzersiz ve enerji seviyesi	0.74				0.91
Vücut Tepkileri Tahmini						
I (2)	Berelenmeyi tahmin etme		0.63			0.92
I (3)	Fiziksel zorlamaları tahmin etme		0.68			0.91
I (8)	Uykusuzluğun etkilerini tahmin etme		0.40			0.91
I (11)	Enerji seviyelesini tahmin etme		0.78			0.91
I (12)	Uyku kalitesini tahmin etme		0.59			0.91
I (15)	Uyku ihtiyacını tahmin etme		0.70			0.92
I (16)	Egzersiz ve enerji seviyesi		0.67			0.91
Uyku-Uyanıklık Döngüsü						
I (7)	Açlık/uykusuzluğun yarattığı yorgunluğu ayırt etme			0.45		0.91
I (8)	Uykusuzluğun etkilerini tahmin etme			0.55		0.92
I (9)	Gün içindeki aktivite döngüsü			0.69		0.91
I (15)	Uyku ihtiyacını tahmin etme			0.50		0.91
I (17)	Uyku zamanı			0.86		0.91
I (18)	Açlık durumunda vücut tepkileri			0.66		0.92
Hastalık başlangıcı						
I(5)	Grip olacağını tahmin etme				0.74	0.92
I (6)	Ateşi olduğunu algılama				0.80	0.91
I (7)	Açlık/uykusuzluğun yarattığı yorgunluğu ayırt etme				0.60	0.91
I (10)	Mevsimsel ritmler				0.49	0.91
% Described Variance		24.13	19.00	9.84	13.2	
Cronbach's Alfa: 0.917						

I: Item, BAQ: Body Awareness Questionnaire.

DISCUSSION

Turkish BAQ is the first Turkish questionnaire about body awareness and might fill an essential gap in Turkey. The BAQ, which was developed in 1989, has been a questionnaire widely used in the field of physiotherapy and rehabilitation in recent years among Turkish researches (26,27). The study's method and results were discussed with the original study of the questionnaire, with a summary of the Swedish and Hungarian versions.

In this study, university students were selected as the population. The original version of the question-naire was also conducted with university students (1). The 369 university students participated in the development of the original scale; 450 individuals participated in the reliability study. In the Swedish version study, participants consisted of 120 university students and 120 patients with rheumatoid arthritis (19). The Hungarian version included 140 individuals practicing regular yoga and 227 healthy individuals (20). Although the original scale was developed on healthy individuals, the questionnaire developers stated that the BAQ could be used in healthy and non-healthy populations.

The criterion validity of the Turkish version of the BAQ was examined by the concurrent validity method. The gold standard scales are the SCS and the BCS. The Self-Consciousness Scale was used as if in the original study of the validity and reliability of the BAQ. The BCS is an accepted parallel form of the Body Perception Scale, which is used in the original version of the BAQ. When the correlation between BAQ and SCS was examined, a statistically significant relationship was found between the two questionnaires (1). This analysis showed that the Turkish version of the BAQ was concurrent criterion validity and that the scale was able to measure the level of body awareness in a population of healthy university students.

As a result of factor analysis, four factors with eigenvalue >1.00 were obtained, and it was found that these factors explained 66% of the total variance. When the literature is examined, it is seen that the variance rates should be between 40 and 60% (28). The high variance ratio in this study shows that the Turkish version of the BAQ has a strong factor structure. The adapted scale was found to be in agreement with the factor structure of the original scale. Factor loads of the scale items ranged between 0.405 and 0.812. In Shields et al. study, factor loadings ranged from 0.386 to 0.802. These values are similar to the factor loads found on the original scale (1).

It is stated in the literature that factor loads should be 0.30 and above. Based on these results, it could be interpreted that the Turkish version of the 18-item BAQ has been provided with construct validity. In the original validity and reliability study of BAQ, two models consisting of four factors and six factors were included. The questionnaire developers stated that they provide validity in these two models, the 4-factor model gives better results, and they form the BAQ by designing four sub-groups (1).

The test-retest method was used to determine the stability of the scale over time. If the measurement tool is applied to the subjects at different times, the subjects' responses to the items are expected to be consistent. Pearson correlation analysis was performed to evaluate the findings. The literature states that at least 30 individuals or at least half of the total number of cases are required for test-retest. In this study, the scale was administered to the participants at 3-day intervals. Shields, the original developer of the questionnaire, recommended the choice of time between the tests. Shields reported via e-mail that the BAQ is a questionnaire that measures qualifications and personal characteristics, not the situation; the 3-day break would be appropriate as the population was university students. In the original version, the test-retest time was two weeks, and in the Swedish version, it was three days (1,19).

The correlation value between the test and retest results of the questionnaire was r=0.830, and p<0.001 was found to be statistically significant. This result showed that the respondents gave consistent answers to the items in the test and retest applications, and the reliability of the Turkish version of BAQ was high. In the original version of the questionnaire, the correlation value between the test-retest results was found to be r=0.800. In the Hungarian version r=0.820 and r=0.800 in the Swedish version. It can be concluded that the BAQ has high reliability in time invariance in different cultures and populations (1,19,20).

Cronbach's alpha coefficient calculates the consistency between the items, and its value should be between 0.70 and 1.00 for reliability. In the Turkish version of BAQ, Cronbach's alpha value was 0.917. The scale was found to be very reliable as the value was very close to 1.00. Cronbach's alpha value was found to be 0.923 in the original version and 0.870 in the Swedish version study (1,19).

According to the findings, the BAQ is a valid and reliable tool in Turkish society. Turkish version of the BAQ can be suggested that it can be used as a data collection tool in assessing the level of body awareness in researches, it could be used in studies related to determining the factors affecting the level of body awareness, and its validity and reliability in different populations can be repeated. The BAQ, as a gold standard questionnaire in the evaluation of the multidimensional concept of body awareness, does not contain any item related to the person's postural awareness and balance. Researchers could also evaluate posture and balance in their assessment of body awareness or add

items related to physical dimensions when creating a survey in the field of body awareness.

Conflict of Interest: We have no conflict of interest to disclose.

Ethical Approval: Muğla Sıtkı Koçman University Scientific Research and Publications Ethics Committee approved the study (Approval Date: 22.02.2016 and Approval Number 16/16)

Peer-Review: The authors will comply with the editor's decision on this matter.

Author Contributions: Concept - SK, Supervision – BB, Resources and Financial Support – SK, BB; Materials - SK, BB; Data Collection and/or Processing - SK, Analysis and/or Interpretation – SK, BB; Literature Research - SK; Writing Manuscript - SK, BB; Critical Review - BB.

Informed Consent: The students included in the study were informed about the study's methodology, and written informed consent was obtained for participation in the study.

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