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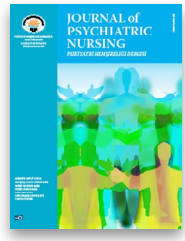

Original Article

Reliability and validity of adaptation to the Turkish of the Bermond-Vorst Alexithymia Questionnaire and developing of Turkish short form

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Abstract

Objectives: Alexithymia is one of the important concepts used in the description of psychopathology. The aim of Study 1 was to adapt the Bermond-Vorst Alexithymia Questionnaire (BVAQ) to Turkish and to examine its validity and reliability, and the aim of Study 2 to develop the Turkish short form of this scale.

Methods: In Study 1, a community sample of 600 people between the ages of 18 and 73 for pilot application; and for the main application, a community sample of 766 people aged 17–66 was used. In Study 2, there was a community sample of 213 people aged 18–57, and 43 university students for test-retest. For criterion validity, 137 university students were applied Toronto Alexithymia Scale (TAS-20), Toronto Empathy Scale (TES) and Warwick Edinburgh Mental Well-Being Scale (WEMWBS) together with BVAQ.

Results: In study 1, internal consistency analysis and exploratory factor analysis results were found to be sufficient, whereas the confirmatory factor analysis results the fit indexes were not sufficient. In Study 2, the exploratory and confirmatory factor analysis results and criterion correlations for validity were at a very good level. The internal consistency analysis and test-retest correlations were sufficient for reliability.

Conclusion: The 40-item form of BVAQ, and developed the first time the Turkish short form is a valid and reliable scale that can be used in our country. However, it has been obtained that the short form provides statistically better results. In addition, strong correlations with TAS-20 are important in terms of demonstrating that BVAQ can be used to evaluate alexithymia, such as TAS-20.

Keywords: Alexithymia; BVAQ; reliability; short form; validity.

What is presently known on this subject?

- The concept of alexithymia is one of the important concepts in the literature in terms of its relationship with psychiatric and psychological disorders.

What does this article add to the existing knowledge?

- There is only one scale evaluating alexithymia in our country.

What are the implications for practice?

- With this study, it is aimed to increase the variety of scales of alexithymia and to bring the second most important alexithymia scale in the world to Turkish.

The concept of alexithymia, which means the "no words for emotions" and attracts attention in psychoanalytic therapy practices, is defined as a decrease in fantasizing as well as a limited capacity to describe and express emotions verbally.[1] Alexithymiaconsists of five essential features: (1) difficulty in recognizing the feelings of someone else; (2) difficulty in expressing their feelings verbally; (3) insufficiency or inability to experience emotions; (4) failure to tend to imagine the feelings of others or to think as externally oriented; and (5) a poor capacity for fantasizing or symbolic thinking.[2] Alexithymia, which is a clinically attracting case, was initially defined

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in concern with psychosomatic diseases, however, it was then understood that alexithymia was not only specific to psychosomatic disorders. This has led to consider alexithymia as a risk factor for medical, psychiatric, or behavioral problems.[2] When the literature is reviewed, it was observed that high alexithymia levels are associated with psychosomatic diseases,[3] depressive disorders,[4] anxiety disorders,[5] substance abuse,[6] and personality disorders.[7] This and similar studies are important in terms of showing that alexithymia should be considered as a risk factor for psychopathologies. There are two generally accepted contemporary approaches throughout the world for explaining the structure of alexithymia. These are called as Toronto and Amsterdam models. The psychoanalytically oriented Toronto model accepts that there are four components associated with alexithymia. These are difficulty in recognizing one's own emotions, difficulty in identifying emotions, externally oriented thinking, and limited fantasizing.[8] This four-component structure is evaluated by Structured Interview for Toronto Alexithymia;[8] 20-Item Toronto Alexithymia Scale (TAS-20) evaluates three components other than difficulty in fantasia or imagination.[9] As it is, TAS-20 is classified as category 3 as a scale evaluating only the cognitive side of alexithymia. However, Sifneos emphasized the importance of affective components of alexithymia.[10] In Amsterdam model, a five-component structure is recommended that takes place under two subscales as affective and cognitive. In order to evaluate these five components, Vorst and Bermond[11] developed a 40-Item Bermond-Vorst Alexithymia Questionnaire (BVAQ) containing five sub-scales. Emotionalizing and fantasizing represent the affective dimension in the questionnaire, while identifying, analyzing, and verbalizing correspond to the cognitive dimension. In the present study, although the issue is considered in the scope of both scales, there are many scales[12] that are prepared to measure alexithymia and are developed using various methods such as the scales scored by the observer, self-report scales, projective tests, and analysis of speech samples, and numerous psychometric limitations[13] regarding these scales are in question. The most preferred two scales in the evaluation of alexithymia are TAS-20 and BVAQ. TAS-20, one of the scales of Toronto model, was translated into Turkish, and its validity and reliability study was conducted. Despite it is well-accepted in the world, BVAQ, representing the Amsterdam model, has not been translated into Turkish yet. TAS-20 and BVAQ are the most frequently used scales in the evaluation of alexithymia and the most important difference between these two scales is that BVAQ has an emotionalizing sub-scale and emotionalizingand fantasizing were parallel to none of sub-factors of TAS-20 and the most important superiority of BVAQ over TAS-20 is that BVAQ evaluates both cognitive and affective aspects of alexithymia. Also, although beyond the scope of this study, Vorst and Bermond[11] suggest that there are two sub-types of alexithymia. People with type I alexithymia have difficulties regarding both cognitive alexithymia and affective alexithymia, and people with type II alexithymia only have difficulty with cognitive alexithymia. When considered in this respect, it can be specified that BVAQ measures alexithymia better than TAS-20. The authors of the BVAQ criticized TAS-20 for the reasons such as the incomplete evaluation of alexithymia (in three dimensions instead of five) and that there are different numbers of items in the sub-scales causing the sub-dimensions not to have an equal effect when calculating the total alexithymia score.[11] In addition, it is also suggested that the reliability of externally oriented thinking sub-scale of TAS-20 is low.[14] BVAQ was translated into many languages and used in numerous studies.[15–19] However, there are also negative opinions about BVAQ, such as that there are not enough validity and reliability studies,[20,21] the validity of the emotivity sub-scale is not supported,[22] and it is wrong to include the fantasizing sub-scale in the model.[23] Despite both TAS-20 and BVAQ have reproachable properties, Luminet, Bagby, and Taylor,[24] emphasized that both scales are suitable tools for clinical purposes with sufficient validity and reliability. When the evaluations only made on these two scales are examined, many issues for discussion draw attention in the measurement of alexithymia. The most important matter in question is whether the self-report measures are sufficient to evaluate alexithymia.[25] Although this criticism is accepted as correct for all the self-report measures, self-report scales are mostly used due to the failure of the conduction of many studies without reaching clinical samples. Another point to be emphasized is that the literature of alexithymia is increasing, especially abroad (for example, Lumley et al.[21] stated that it is more than 1400) and although many scales related to alexithymia are developed, the number of studies in Turkey is limited and only TAS-20 is used in these studies. In this context, Turkish adaptation of BVAQ is conducted by considering its contribution in the scale variety and that BVAQ has features such as including the emotivity sub-scale of alexithymia and contributing to a more comprehensive evaluation. Also, the present study will create a new reference point for the discussions regarding the psychometric properties of BVAQ and will also provide opportunity to contribute to international scientific studies through the researches to be carried out using this scale. Two studies are introduced together in the study. The first study involves the introduction of an alternative measurement tool, which can be used by clinicians and researchers in Turkey in order to evaluate alexithymia, into Turkish and thus, the testing of psychometric properties of BVAQ. The second study was conducted due to the fact that the fit indices of the confirmatory factor analysis performed for the compliance of the long form of the scale with Turkish culture were not at an acceptable level. In the present study, depending on the idea that instead of disrupting the original item number of the scale, the aim is to develop Turkish short form of BVAQ and to conduct its validity and reliability study by obtaining permission from its authors in order prevent the participants from getting bored in the application of the scale and thus provide more accurate answers.[26]

Study 1

Materials and Method

Sample: In the first study, two groups of samples, of which one can be described as a pilot application, were used. First sample group consisted of 600 people with ages varying between 18 and 73 years old (Av.=35.73; sd.=13.13) as 403 were women (67.2%) and 197 were men (32.8%). By University of Health Sciences students since this data set that was collected by snowball sampling method by applying to the university students and their relatives was evaluated in order to make the final arrangements for the translation of the scale, the results of this data set were not presented in the study. The second sample group that was obtained by the scale created over Google forms consisted of a population sample including 766 people, after eliminating the extreme values, between 17 and 66 years old (33 did not specified their age) (Ave.=30.92; sd.=10.66) as 545 were women (71.1%) and 221 were men (28.9%). Of the participants, 15 (2%) stated that they were primary school graduates, 20 (2.6%) secondary school graduates, 113 (14.8%) high school graduates, and 618 (80.7%) university graduates and 68 (8.9%) were at low-income level, 643 (83.9%) at medium-income level, and 55 (7.2%) at high-income level. Measurement tools in the study, demographic information form, that was prepared to obtain the information of the participants such as age, gender, income, and educational status, and the BVAQ were used.

Bermond-Vorst Alexithymia Questionnaire (BVAQ): BVAQ was first developed by Bermond et al.[11] in order to measure five dimensions of alexithymia. An expanded form was prepared by using both parallel forms of BVAQ, which consisted of two parallel forms (A and B) of each including 20 items (40 items in total). BVAQ is a 5-point Likert scale and every dimension of BVAQ consists of 8 items and half of them are reversing entries. Emotionalizing, fantasizing represent the emotionalizing dimension, and identifying, analyzing, and verbalizing represent the cognitive dimension. Minimum 40 and maximum 200 points can be collected in the scale. Cronbach Alpha values of BVAQ, with numerous reliability and validity analyses, were found as 0.70 and over. As a result of the confirmatory factor analysis conducted in the study of Bermond et al.,[19] it was observed that independent two-factor structure as affective and cognitive, was verified and it was determined that the fit indices of this model were at an acceptable level (df=28; chi-square=116.28; SRMR=.066; NFI=.93; CFI=.94 CAIC= 784).

Procedure

Before starting the study, permission of Bob Bermond, primary author of the scale, was taken for adaptation on 27.09.2018. After obtaining the necessary permission from the author, the translation of the Bermond-Vorst Alexithymia Questionnaire (BVAQ) into Turkish was carried out by an associate professor in psychology and three psychologists of whom two were fluent in English and the most appropriate items were selected from these three translations and the translation of the scale was evaluated by an English teacher in terms of compatibility with the original. Afterwards, a back translation was made by two doctor academicians who was fluent and had a command of both languages, in psychology field. After the back translation was completed, some changes were made according to the suggestions of the author by sending it to the primary author of the scale. Subsequent to the pilot study, the translations of the items were evaluated again with the author of the scale, and the final version of the scale was formed after re-editing. While the translation process was in progress, ethical permission was taken from University of Health Sciences Scientific Research Ethics Committee. Data collection process was conducted between March and July 2019 for the pilot study and 40-item BVAQ. In the statistical analyses performed in SPSS v.20 and AMOS 18 programs, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were used for the construct validity of the scale, Pearson correlation coefficients for criterion-related validity, and Cronbach Alpha coefficients for reliability.

Results

Validity Findings

Construct Validity: Before AFA, that was conducted by using Varimax rotation, the results of Kaiser-Meyer Olkin (KMO) test (.85) and Barlett's test (8799,79; $p<0.000$, $\chi^2/sd=4.43$], that were applied to detect whether the data were compatible for factor analysis, were found significant and according to the adaptive values calculated by the same analysis, Root Mean Square Error of Approximation (RMSEA)=0.067 [0.065–0.069 in 90% confidence interval]; Goodness-of-Fit Index (GFI)=0.81; Adjusted Goodness-of-Fit Index (AGFI)=0.79) it was found that this adaptation was not perfect or did not confirm the structure of the model. According to second-level DFA, the fit indices obtained ($\chi^2(sd=739)=2815.83$, $p<0.000$, $\chi^2/sd=3.81$) were found significant. However, according to the adaptive values calculated by the same analysis (RMSEA=0.061 [0.058–0.063 in 90% confidence interval]; GFI=0.82; AGFI=0.80), it was detected that this adaptation was not perfect or in other words, the fit indices obtained did not confirm the structure of the model.

Reliability Findings

Internal Consistency Reliability: In the internal consistency analysis conducted to examine the reliability of the scale, it was found that the Cronbach Alpha values were between .72 and .81 and the scale had a sufficient level of internal consistency (Table 1).

Table 1. BVAQ exploratory factor analyses, item mean and standard deviation scores, subscale mean and standard deviation scores and internal consistency analysis results

Items	Mean	SD	F1	F2	F3	F4	F5
BVAQ-38	2.12	.88	.70				
BVAQ-28	2.17	.89	.68				
BVAQ-13	2.11	1.19	.67				
BVAQ-8	2.44	1.04	60				
BVAQ-18	2.39	1.10	.59				
BVAQ-33	2.03	.88	.57				
BVAQ-3	1.99	.94	.57				
BVAQ-23	2.32	1.06	.54				
BVAQ-11	2.62	1.19		.76			
BVAQ-21	2.72	1.19		.66			
BVAQ-6	2.68	1.11		.64			
BVAQ-26	2.49	1.06		.64			
BVAQ-36	3.33	1.06		.58			
BVAQ-31	2.21	.97		.55			
BVAQ-1	2.61	1.16		.47			
BVAQ-16	2.55	1.02		.32			
BVAQ-39	2.39	1.00			.77		
BVAQ-9	2.53	1.21			.70		
BVAQ-29	2.49	0.99			.66		
BVAQ-14	2.46	1.10			.65		
BVAQ-19	2.31	.80			.57		
BVAQ-4	2.66	1.08			.54		
BVAQ-34	2.52	1.09			.48		
BVAQ-24	3.19	1.11			.42		
BVAQ-22	1.70	.91				.74	
BVAQ-12	2.15	1.06				.72	
BVAQ-37	2.75	1.18				.68	
BVAQ-27	3.60	1.31				.66	
BVAQ-32	2.52	1.16				.64	
BVAQ-7	2.60	1.27				.54	
BVAQ-17	2.80	1.29				.46	
BVAQ-2	2.02	1.13				.37	
BVAQ-35	2.55	.98					.62
BVAQ-20	1.99	.79					.60
BVAQ-5	2.10	.83					.55
BVAQ-25	2.45	.93					.54
BVAQ-10	2.19	.87					.53
BVAQ-40	1.83	.73					.48
BVAQ-30	2.02	.82					.44
BVAQ-15	2.40	1.04					.39
Eigenvalue			5.66	4.35	2.90	2.33	1.69
Variance (%)			14.14	10.86	7.23	5.81	4.24
Subscale mean			17.57	21.21	20.54	20.13	17.50
Subscale standard deviation			4.87	5.74	5.20	5.72	4.07
Internal consistency coefficient (Alpha)			0.79	0.81	0.77	0.76	0.72

*P<.05. **p<.01. F1: BVAQ-Verbalizing; F2: BVAQ-Emotionalizing; F3: BVAQ-Fantasizing; F4: BVAQ-Identifying; F5: BVAQ-Analyzing. BVAQ: Bermond-Vorst Alexithymia Questionnaire; SD: Standard deviation.

Discussion

The present study was carried out to adapt the Bermond Vorst Alexithymia Scale, which can be accepted as a new measurement tool than TAS-20, into Turkish and to examine its psychometric properties. Although it was first defined in 1970, it can be seen that the concept of alexithymia, which has been included in the literature since the 1990s, is considered as a risk factor for psychopathology and over thousands of studies have been conducted.[21] Almost all these studies used the TAS-20 scale. However, as mentioned in the introduction, it is known that the "expressive thinking" sub-scale of TAS-20 does not have sufficient reliability.[14] In a recent study conducted by the researcher, it was determined that the reliability coefficient of this sub-scale was not at a sufficient level. However, TAS-20 can still be characterized as the most practicable scale in the evaluation of alexithymia. Nevertheless, it is a non-negligible reality that an alternative measurement tool that can be used to measure alexithymia, will make a great contribution to the field. Also, in TAS-20, there is no sub-scale for alexithymia in which the emotionalizing dimension could be evaluated. Based on all these considerations, it has been considered that BVAQ, which is a scale including the emotionalizing dimension that was not included in TAS-20 and which is thought to allow a more comprehensive evaluation of alexithymia and is internationally accepted, is considered to be introduced into Turkish. Although the reliability of the BVAQ has been verified in all the previous studies, some studies have confirmed the structure of the scale in CFA, which is used to verify the five-factor structure of the scale,[15] while others have determined low fit indices.[27] In the study regarding the adaptation to Japanese, only AFA was applied without CFA and similar results with the original study were obtained by eliminating 10 items.[18] In the current study, the results of internal consistency analysis were found to be quite high (between .72 and .81) as in all other studies. In AFA, when forced into a 5-factor structure, while a result was obtained with the same factor structure as the original scale in terms of sub-scales into which the items were loaded, with the factor loads ranging from .32 to .78; unfortunately, the fit indices confirming the original scale structure could not be supported in CFA, which was made to evaluate the adaptation of the scale to Turkish culture. However, the fit indices obtained were lower than the values obtained by Bermond et al.,[15] but they are one-to-one compatible with the values in the study of Müller et al.[20] (Sample study findings are RMSEA=0.062, lowest (LO 90)=0.058, highest (HI 90)=0.066; current study findings are RMSEA=0.067, LO 90=0.065, HI 90=0.069; RMSEA=0.061, LO 90=0.058, HI 90=0.063) and these values were interpreted as acceptable. As in TAS-20, although the discussions on BVAQ still continue, it is considered that both scales have validity and reliability for being used in clinical studies.[24] In a study comparing the BVAQ, TAS-20, and Observer Alexithymia Scale (VAS) in patients with eating disorders, no difference was found between the results obtained from all the three scales.[28] However, the current study was conducted by using the BVAQ-B form. Similarly, in another study conducted at an earlier date, the BVAQ-B form showed a better fit with TAS-20 than the BVAQ-A form.[21] However, the authors of the scale developed a 40-item scale by combining the two forms of the BVAQ[11] and 40-item version of the scale has been used in the new studies. As a result, unlike TAS-20, BVAQ is accepted as a measurement tool that should be considered for measuring alexithymia more comprehensively (emotionalizing dimension) and understanding the interactions with the variables related to psychopathology such as empathy and emotional regulation through the emotionalizing dimension in the scale. In the current study, when the internal consistency analysis and AFA results are forced to the number of factors specified in the original scale, it is considered that new studies should be conducted for the CFA results of the scale, although the items are loaded with their own sub-scales. However, it is seen that the BVAQ has enough psychometric properties to be used in clinical studies.

Study 2

Research data in many scientific fields are obtained by using the self-report scales. However, the participants may withdraw filling the long scales due to the limited time as they cause the participants to get bored and carelessly mark the items. When such practical concerns are considered, the researchers generally prefer to develop shorter assessment tools.[26] Therefore, development of short forms of a newly developed scale after a short time is increasingly common. From this point of view, the results of Study 1 were shared with the authors of the scale, because it was easier to use and the lack of acceptable results could not be obtained in the fit indices in CFA, Study 2 was conducted with the permission of the authors for the development of the short form of the BVAQ. The aim of Study 2 was to develop the short form of BVAQ and to examine the psychometric properties of the short form, and to present a more practical scale to the researchers.

Materials and Method

Sample: Sample of the second study consisted of a total of 213 people with an age interval between 18 and 57 years old (Ave.=25.17; sd.=7.33) as 24 (11.3%) were primary school graduates, 71 (33.3%) secondary school or high school graduates, and 118 (55.4%) were university graduates, and 159 (74.6%) were women and 54 (25.4%) were men. Approximately half of the participants in the data, which were collected by the snowball method (83, 39%), were University of Health Sciences students and the remaining (130, 61%) were the relatives and friends of the researcher and the students. In addition, BVAQ and also TAS-20, Toronto Empathy Scale, and Warwick Edinburgh Mental Well-Being Scale were applied to a total of 43 university students between 18 and 29 years old (Ave.=20.19; sd.=2.51) of whom 28 (65.1%) were women and 15 (34.9%) were men, for test-retest and to a total of 137 university stu-

dents including the 43 students to whom test-retest was applied for convergent validity, as 118 were women and 19 were men. 10 Measurement Tools The demographic information form prepared to obtain the age, gender, and educational information of the participants in the study, the following scales were used in order to examine BVAQ and the criterion validity of BVAQ.

Toronto Alexithymia Scale (TAS-20): Validity and reliability study of the Turkish form of TAS-20, for which the short form was developed by Bagby et al., was conducted by Güleç et al.[29] TAS-20, which is a Likert-type self-report scale including 20 items that are scored between 1 and 5, consists of three sub-scales as the difficulty in recognizing emotions, difficulty in expressing emotions, and expressive thinking.[29]

Toronto Empathy Scale (TES): TES is a 5-point Likert type scale including 16 items that was developed by Sprenget al. As a result of the exploratory factor analysis that was conducted within the scope of the Turkish validity and reliability study of the scale, it was found that the scale has a one-dimensional structure, and the fit indices values of the model was found to be at an acceptable level according to the confirmatory factor analysis results (x^2/sd=3.67, GFI=.94, NFI=.91, CFI=.94, RMR=.052, RMSEA=.067). Cronbach alpha internal consistency coefficient was fond as .79. The reliability coefficient calculated within the scope of test-retest was detected as 0.73.[30]

Warwick-Edinburgh Mental Well-Being Scale (WEMWBS): The scale was developed by Tennant et al.[31] and adapted into Turkish by Keldal.[32] The scale in the form of a 5-point Likert

Table 2. BVAQ confirmatory and exploratory factor analysis, item total correlation, subscale mean and standard deviation scores, and internal consistency analysis results

Items	Item total correlation	CFA	F1	F2	F3	F4	F5
14. When I get sad at something, I talk to others about my feelings.	.82	.80	.90				
5. It is difficult for me to talk about my feelings to others even if they are my friends.	.83	.94	.90				
1. I like to tell others about how I feel.	.76	.74	.86				
11. People often say that I should talk more about my feelings.	.76	.80	.85				
15. Unexpected events often drown me to emotions.	.75	.74	.85				
8. When my friends argue violently around me, I get emotional.	.72	.77	.84				
3. When I see someone crying uncontrollably, I remain unresponsive.	.68	.70	.83				
18. I accept my disappointments leaving my feelings aside.	.69	.71	.78				
6. I use my imagination often.	.73	.81		.86			
12. I nearly never fantasize.	.73	.72		.83			
19. When I don't have something to do, I daydream.	.65	.72		.82			
16. I think fantasizing about imaginary things and stories is a waste of time.	.58	.66		.72			
7. When I start feeling overwhelmed, I usually know the reason for that.	.72	.62		.85			
2. When I feel tense, I remains unclear which feelings cause that.	.67	.60		.82			
17. When I am hard on myself, I don't know whether I'm sad, scared or unhappy.	.68	.61		.78			
20. When I am in a good mood,I know whether I'm enthusiastic or cheerful or joyful.	.67	.63		.78			
10. When I feel restless, I try to figure out why I feel that way.	.62	.57			.75		
4. I should try to understand my feelings.	.53	.45			.73		
9. When I feel bothered, I don't bother myself further by questioning the reason.	.47	.44			.70		
13. When emotions are in question, there is not much to be understood.	.61	.60			.70		
Eigenvalue			4.90	3.15	2.57	2.07	1.34
Variance (%)			24.46	15.74	12.85	10.35	6.70
Subscale mean			9.63	9.79	8.29	8.58	7.71
Subscale standard deviation			3.44	3.18	3.18	2.68	2.38
Internal consistency coefficient (Alpha)			0.91	0.86	0.84	0.85	0.76

*P<.05, **p<.01. F1: BVAQ- Verbalizing; F2: BVAQ- Emotionalizing; F3: BVAQ- Fantasizing; F4: BVAQ- Identifying; F5: BVAQ-Analyzing. BVAQ: Bermond-Vorst Alexithymia Questionnaire, CFA: Confirmatory Factor Analysis.

type scale with 14 items has a single dimension and the total internal consistency coefficient of the scale is 0.89. Bermond-Vorst Alexithymia Questionnaire (BVAQ): Information is given above.

Procedure

Before starting Study 2, Bob Bermond, the primary author of the scale, was informed about the request to develop a short form and his approval was obtained. Afterwards, items with a high factor load and simpler language were preferred by using the initial study data, and the final version of the short form was developed by selecting 20 items, as half of them were reverse items as in the original structure of the scale. Data collection process for the short form was conducted between September and October 2019.

Results

Validity Findings

Construct Validity: In order to determine the compliance of data for factor analysis before AFA, the results of Kaiser-Meyer Olkin (KMO) test (.83) and Barlett's test (2071.43; p<.000) were evaluated and found significant. According to the AFA results, which were subject to Varimax rotation, 5 factors were found with an eigenvalue higher than 1. It was seen that these factors explained 70.09% of the total variance and the items were loaded on the factors specified in the original scale (Table 2).

Both first level and second level CFA were conducted to test the construct validity of the scale using AMOS 18. The scale has good adaptive values in both models. Chi-square value calculated for model-data compliance in the first-level DFA was as χ^2(sd=160)=228.4256, p<0.000, CMIN/DF=1.43. Other fit indices of the model were detected as RMSEA=0.044 (0.031–0.057 at 90% confidence interval); GFI=0.90; CFI=0.96; IFI=0.96 and no modification was required to verify the model (Fig. 1). The fit indices obtained in second-level DFA were as follows: χ^2(sd=169)=254.0632, p<0.000, CMIN/DF=1.50; RMSEA=0.048 (0.036–0.061 at 90% confidence interval); GFI=0.89; CFI=0.96; IFI=0.96 and no modification was done to verify the model (Fig. 2). Thus, it can be stated that BVAQ is a valid scale in the context of both models.

Criterion-Related Validity: In order to examine the validity of the BVAQ, the correlation coefficients of the scale with both its own sub-scales and the other scales were found to be at a significant level with each other, however, while the TAS-Expressive thinking showed a weak and positive correlation with BVAQ-Analyzing, a moderate positive correlation was found

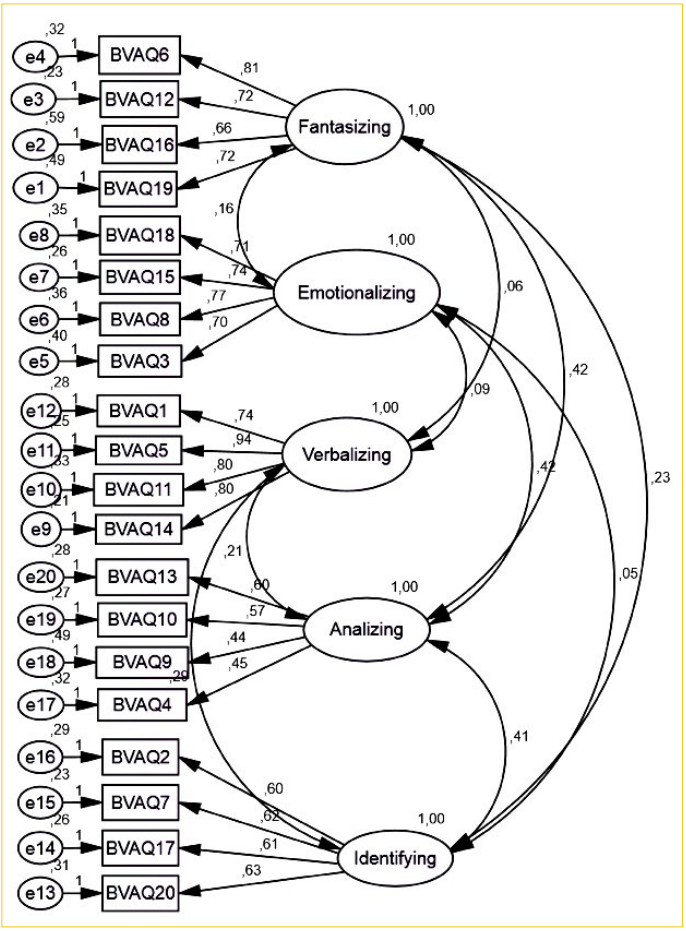

Figure 1. BVAQ First Order Confirmatory Factor Analysis Results.

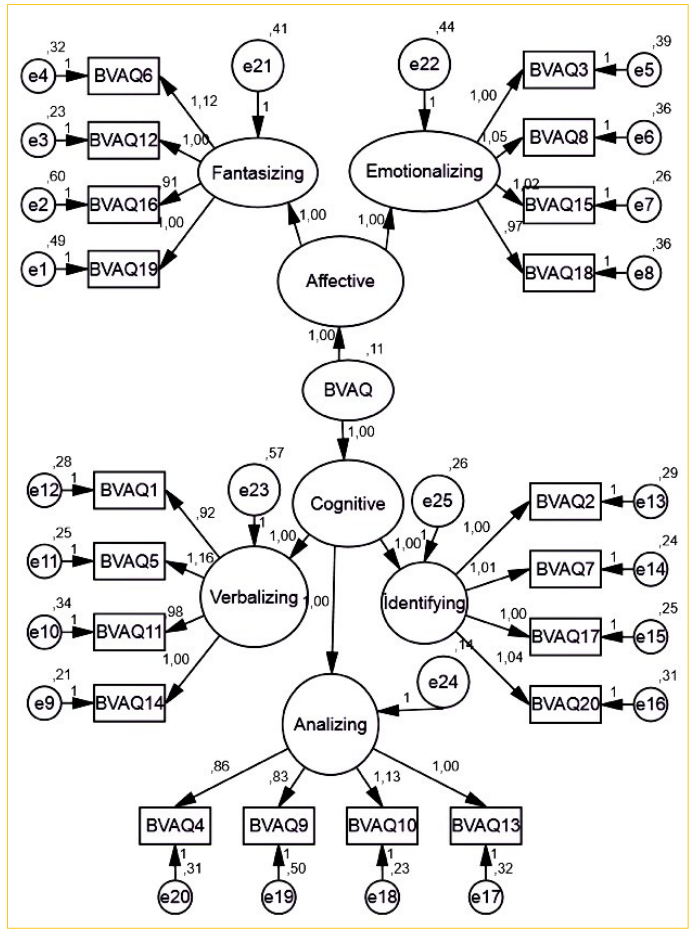

Figure 2. BVAQ Second Order Confirmatory Factor Analysis Results.

between TAS-Expressing Emotions and BVAQ-Verbalizing and TAS-Emotion Identification, and BVAQ-Identifying. There was a moderate negative correlation between TES and the BVAQ-Analysis, and a moderately significant correlation with the BVAQ-Emotionalizing in the negative direction. A negative and moderately significant correlation was found between the other convergent scale WEMWBS and BVAQ-Verbalizing, and BVAQ-Identifying. Among the sub-factors of BVAQ, while no correlation was found between BVAQ-Verbalizingand BVAQ-Fantasizing and BVAQ-Identifying and BVAQ-Emotionalizing, a negative correlation between BVAQ-Recognizing and BVAQ- Fantasizing and a positive correlation between other sub-factors were found (Table 3).

Reliability Findings

Internal Consistency Reliability: In the internal consistency analysis conducted to examine the reliability of the scale, it was found that the Cronbach Alpha values were between .76 and .91 and the scale had a sufficient level of internal consistency (Table 2).

Test-Rest Reliability: According to the results obtained by the application of BVAQ with an interval of 2 weeks, the application was repeated with 43 participants with an interval of 2 weeks in order to determine the consistency of the sub-factors within the correlations via retest. Table 3 shows the results of the test-retest application and it was determined that the correlation values between two applications were significantly positive.

Discussion

The present study was carried out in order to develop the short form of the Bermond-Vorst Alexithymia Scale and to examine its psychometric properties. The study for the development of short form of BVAQ was conducted by considering both the validity and reliability of the scale in the short form because the adaptation of the scale to the Turkish culture was not at an acceptable level in CFA for the long form, and the provision of a scale that can be applied more easily for the practitioners and researchers who will use the scale thanks to the number of items.

BVAQ was developed as a 40-item scale in two forms, form A and form B, in its initial version[11] and the studies conducted by using form B provided more reliable results.[12] However, after the scale was converted into a single scale with 40 items by the authors, the fit indices were found to be sufficient in a comprehensive study by Bermond et al.[15]

In the current study, according to the AFA results conducted to

Table 3. Subscale and Convergent Test Correlations and Test-Retest Correlation Results

BVAQ subscales	Convergent validity scales	Convergent validity correlation coefficients
BBVAQ-Verbalizing	TAS-Difficulty in expressing emotions	.58**
BVAQ-Identifying	TAS-Difficulty in recognizing emotions	.59**
BVAQ-Analyzing	TAÖ- Expressive thinking	.31**
BVAQ-Fantasizing		
BVAQ- Emotionalizing		
BVAQ-Verbalizing	TES	-0.15
BVAQ-Identifying	TES	-0.16
BVAQ-Analyzing	TES	-0.27**
BVAQ-Fantasizing	TES	-0.12
BVAQ- Emotionalizing	TES	-0.36**
BVAQ-Verbalizing	WEMWBS	-.27**
BVAQ-Identifying	WEMWBS	-.50**
BVAQ-Analyzing	WEMWBS	-.04
BVAQ-Fantasizing	WEMWBS	-.02
BVAQ- Emotionalizing	WEMWBS	.13

	1	2	3	4	5
1. BVAÖ-Sözelleştirme	**.82****	.26**	.16**	.05	.08
2. BVAÖ-Tanıma		**.73****	.31**	.18**	.05
3. BVAÖ-Analiz Etme			**.61****	.33**	.36**
4. BVAÖ-Hayal Kurma				**.59****	.14*
5. BVAÖ-Duygusallaştırma					**.54****

Bold results are test-retest correlation results. *P<.05, **p<.01. BVAQ: Bermond-Vorst Alexithymia Questionnaire; TAÖ: Toronto Alexithymia Scale; TEÖ: Toronto Empathy Scale; WEMWBS: Warwick-Edinburgh Mental Well-Being Scale.

determine the factor structure of the scale, it was determined that the scale has a 5-factor structure as in the original study. These 5 factors explained 70.09% of the total variance with a quite high rate. Items were loaded on the factors specified in the original scale[11,15] and the factor loads were also at a high level. In the first study, when the scale items were forced into 5 factors, a structure similar to the original scale occurred again, however, 9 factors with an eigenvalue above 1 were detected. In the current study, 5 factors with an eigenvalue above 1 were determined without forcing to 5 factors. In the confirmatory factor analysis, excellent goodness-of-fit indexes were determined both in the first level CFA, where the relationships between latent variables were included in the model, and in the second level CFA, in which a higher factor (cognitive and affective dimensions) predicted by the latent variables was included in the model. Obtaining better results when compared to the fit indices in the first study showed that the short form has a stronger structure. This can be caused by the fact that when choosing items for the short form, items having a high factor load and a plain and a relatively better comprehensibility in terms of language were selected. Also, Cronbach alpha scores and test-retest correlation results obtained in the study also support the reliability of the scale. Similarly, it was observed that three sub-scales, which were accepted to be parallel with TAS-20, showed a positive and significant correlation, and negative correlations were found with TES and WEMWBS as expected, in the correlation analysis performed for criterion validity. Especially the positive correlation between TAS-20 and the specified scales is important in terms of showing the validity of the scale due to the reason that they are two scales that are considered to measure the same variable.

BVAQ has been translated into many languages and verified to be a valid and reliable tool at an acceptable level,[15–17] however, 10 items were eliminated during the adaptation study to Japanese[18] and low fit indices were found in the study of Culhane et al.[27] Thus, although finalized results could not be obtained in terms of BVAQ validity analyses, it can be considered as a current and reliable scale. As specified in the first study, there are also some studies in which the other strong scale, TAS-20, could not be exactly verified regarding the measurement of alexithymia (see, 14). Thus, it is thought that it is particularly important to provide an alternative measurement tool that can be used in the evaluation of alexithymia regarding the clinical and scientific fields; and especially using these two tools in the same study can be useful both in terms of testing the psychometric properties of the scales and evaluating the emotionalizing dimension of alexithymia, which is not included in TAS-20. Also, in a recent study, Perth Alexithymia Questionnaire (PAQ), which is a newer scale than these two scales that evaluates alexithymia, was used together with TAS-20 and BVAQ. In the current study, in five different samples, it was detected in the exploratory factor analysis performed for the three alexithymia scales using TAS-20, BVAQ and PAQ, and depression anxiety and stress levels that BVAQ and PAQ were loaded on a factor different from the psychological symptoms, however, DTZ sub-dimension of TAS-20 was loaded on the same factor with the psychological symptoms. Thus, it was determined that PAQ and BVAQ were relatively better self-report scales in order to distinguish alexithymia from psychological symptoms.[33]

The most important limitation of the study is that it was not conducted with a clinical sample. Nevertheless, the fact that nearly half of the sample consisted of the university students and a small number of primary school graduates constitute a limitation in terms of testing the comprehensibility of the scale. In addition, the controversial position of self-report scale use is also in question for the current study.

As a result, scale adaptation studies have difficulties arising from the adaptation to the languages and also, the cultural differences due to their nature. When both studies are considered together, the 40-item form of BVAQ is reliable but requires further studies regarding its validity, while the short form created by the researcher using the Turkish long form of the scale has shown stronger psychometric properties. However, it can be specified that both versions of the scale have sufficient psychometric properties in terms of use in the research and under clinical settings. It is determined that BVAQ, which is a newer and more comprehensive scale when compared to TAS-20, can be used in a valid and reliable way in Turkey for the evaluation of alexithymia. In addition, the short form that occurred as a result of the second study is also important, because it is the first short form study conducted for BVAQ and shows that the scale may have a stronger structure.

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