


Normative data and factorial structure of the Turkish version of the Borderline Personality Questionnaire (Turkish BPQ)

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ABSTRACT

Objective: Borderline personality disorder is a psychiatric condition, which is characterized by unstable interpersonal relationships, fear of abandonment, difficulties in regulating emotions, feeling of emptiness, chronic dysphoria and depression, and impulsivity and increased risk-taking behaviors. In this present study, we aimed to translate and establish psychometric properties and factorial validity of the Borderline Personality Questionnaire (BPQ) in a representative Turkish university students sample and obtain normative data for future epidemiological and clinical studies in Turkey.

Methods: Participants were 306 (201 females, 105 males) college students at the Hasan Kalyoncu University in Gaziantep, Turkey. The study protocol was approved by the Ethics Committee of Hasan Kalyoncu University. Sociodemographic information of the participants was collected and Turkish BEST, Turkish BPQ, BDI, PBQ, and State-Trait Anxiety scales were administered. All variables were screened for the accuracy of data entry, missing values, and homoscedasticity using SPSS version 23 for Windows.

Results: The Cronbach's alpha coefficients for the Turkish BPQ were ranging from 0.46 to 0.81. The lowest alpha coefficient was observed for the Abandonment (0.46). For the whole scale, Cronbach's alpha coefficient was found to be 0.89. The test-retest (at after 1 month) correlation coefficients for Impulsivity, Affective Instability, Abandonment, Relationships, Self-Image, Suicide/Self-Mutilation, Emptiness, Intense Anger, and Quasi-Psychotic States were found to be 0.50, 0.77, 0.40, 0.68, 0.72, 0.48, 0.73, 0.74, and 0.62, respectively. A positive and statistically significant correlation was found between the Turkish BPQ and BEST ($r = 0.337, p < .01$), BDI ($r = 0.375, p < .01$), PBQ ($r = 0.322, r < 0.01$), State Anxiety ($r = 0.299, p < .01$), and Trait Anxiety ($r = 0.306, p < .01$) scales. Principal axis factor analyzes with Promax rotation were performed and two-factor solution that accounted for 50.03% of the variance observed.

Conclusions: Our results suggested that Turkish BPQ was a valid and reliable tool with a robust factorial structure to use in clinical population in Turkey.

ARTICLE HISTORY

Received 23 January 2017
Accepted 17 February 2017

KEYWORDS

Borderline personality questionnaire; reliability; validity; factor structure

Introduction

Borderline personality disorder (BPD) is a psychiatric condition, which is characterized by unstable interpersonal relationships, fear of abandonment, difficulties in regulating emotions, feeling of emptiness, chronic dysphoria and depression, and impulsivity and increased risk-taking behaviors. Furthermore, recurring self-injurious and suicidal behaviors are also features of BPD. It starts with early adulthood [1].

According to Videbeck [2], BPD is seen by 2% in the general population, 10% in the emergency service, and 20% in the inpatient. Within personality disorders, BPDs are seen at a rate of 30–60%. Women are suffering from the BPD at a rate more than three times than men. It has been reported that the death rate due to suicide that occurred during disease varies between 6.7% and 8.5% [3]. We still do not know the particular causes of the development of BPD. However, like other most

mental disorders, no single factor can explain this personality disorder's development; instead, it can be declared that multiple factors like biological, psychological, and social all play a role [4–7]. Some studies show the comorbidity of BPD with Axis I psychiatric disorders. Specifically, patients with BPD frequently meet DSM criteria for mood disorders, anxiety disorders, substance abuse, and eating disorders [8]. Furthermore, according to the study conducted by Barrachina et al. [9], nearly 74% of patients with BPD have, at least, one concurrent Axis II disorder. BPD mostly has comorbidity with paranoid, passive-aggressive, avoidant, and dependent personality disorders.

In the literature, there are seven specific measures of Borderline Personality which are adapted to a multidimensional approach to measure borderline personality. These measures are the Zanarini Rating Scale for Borderline Personality Disorder (ZAN-BPD), The

Diagnostic Interview for Borderlines (DBB-R), the McLean Screening Instrument for Borderline Personality Disorder (MSI-BPD), the Borderline Personality Disorder Beliefs Scale (BPDBS), the Borderline Personality Questionnaire (BPQ), and the Borderline Evaluation of Severity over Time (BEST) and Five Factor Borderline Inventory (FFBE) [10]. However, none of the above mentioned scales have been used in Turkey except for Borderline Personality Inventory, which has been developed by Leichsenring [11], which has been translated into Turkish and the reliability and validity study has been conducted by Aydemir et al. [12].

Previously although there are plenty inventories to assess BPD abroad, none of them was completely related to DSM-IV and DSM-5 BPD criteria. In this inventory, using DSM-IV and DSM-5 criteria for the BPD, Poreh et al. have formed a separate subscale for each characteristic that identifies BPD. BPQ was developed by Poreh et al. [13] and its validity and reliability were performed. The BPD criteria are self-evaluated by answering 80 items, which are in “True” or “False” format. The inventory has a separate subscale for each BPD criterion and validity and reliability of the inventory were studied on 763 college students in total [13].

In this present study, we aimed to translate and establish psychometric properties and factorial validity of the BPQ in a representative Turkish university students sample and obtain normative data for future epidemiological and clinical studies in Turkey.

Methods

Study participants

Participants were 306 (201 females, 105 males) college students at the Hasan Kalyoncu University in Gaziantep, Turkey. The study protocol was approved by the Ethics Committee of Hasan Kalyoncu University. Written informed consents were obtained from the participants following the study protocol was thoroughly explained. Exclusion criteria included being diagnosed with psychiatric disorders, using psychotropic drugs, at that moment being under the influence of alcohol or a similar substance in that would affect mental processes. Moreover, 19 participants who gave “socially desirable” responses to Marlowe-Crowne Social Desirability Scale [14] were not included in the study. To examine test-retest reliability, the Turkish BPQ was re-administered to 50 students out of 325 study participants 4 weeks after the baseline administration.

Psychometric measurements

Sociodemographic data form

This form includes demographic variables including gender, age, marital status, number of children, education, location, household members, occupation,

employment status, number of siblings, family history of chronic disease, other known physical illnesses, and previous psychiatric treatments.

Turkish BPQ

The BPQ was developed by Poreh [13] and is a self-report scale composed of 80 items. BPQ Borderline personality traits tested for reliability and validity are evaluated according to DSM-IV criteria. BPQ has a separate subscale for each criterion in DSM-IV. Validity and Reliability of this scale are examined on 763 college students [13]. BPQ scale has nine subscales which are Impulsivity, Instability in affect, Abandonment, Relationships, Self-Image, Suicide/Self-Mutilation Behavior, Emptiness, intense Anger, and Psychosis-like Cases. The Turkish BPQ has been translated into Turkish by Samet Kose, and back-translated into English by Ercan Akin who was blinded to the original items. After establishing semantic equivalence of the BPQ items, the content equivalence of all items was examined, and no items were excluded as being irrelevant to Turkish culture. Final version was approved by Amir Poreh.

Turkish BEST

BEST is a 15-item self-report schedule that is developed by Pfohl et al. in 2009 [15]. This scale is composed of three subscale and Likert-style scale. The purpose of the development of this scale is that to measure the severity and variation of the Borderline personality. The scale consists of items that measure feelings, thoughts, and behaviors and it is used to measure the severity of Borderline personality rather than to diagnose it [15].

Marlowe-Crowne Social Desirability Scale

Marlowe-Crowne Social Desirability scale is a self-report scale composed of 33 items and developed by Crowne and Marlowe in 1960 [14]. The objective for developing this scale is to eliminate socially desirable responses. Falling prey to social desirability may cause us to distort our beliefs and experiences in interviews or on psychological tests. The bias toward responding in socially desirable directions is a source of error in the case study, survey, and testing methods [14].

Beck Depression Inventory (BDI)

Beck Depression Inventory (BDI) is a self-report scale composed of 21 items and measures somatic, emotional, cognitive, and impulsive symptoms of depression [16]. Each item takes a point between 0 and 3. The point that can be taken from inventory varies between 0 and 63 and high points indicate a rise in depressive mood. The scale aims not to diagnosis but convert the symptoms level to objective number [16]. Overall scores for all questions is evaluated like this: a score between 10 and 16 shows low depression symptom, a score between 17 and 29 is middle depressive

symptom, and a score between 30 and 63 is severe depressive symptom. BDI has been adapted into Turkish and the reliability and validity have been examined by Hisli [17].

Personality Belief Questionnaire

The content of PBQ is composed of the items directed to determine one's basic beliefs about oneself, other people, and the world [18]. Original form is about to avoidant, dependent, passive-aggressive, obsessive compulsive, antisocial, narcissistic, histrionic, schizoid and paranoid attitudes, and beliefs and consists of 9 categories, each has 14 question, and 126 items in total [18]. After reading each item, subjects mark the items between zero (I do not believe at all) and four (I believe completely) according to how much it is related to them. The scale is appropriate for evaluation and treatment of person with personality disorder. Turkish BPQ was adapted to the Turkish by Turkçapar and Kose, its validity and reliability were done by Türkçapar et al. [19].

State-Trait Anxiety Inventory

State-Trait Anxiety Inventory was developed by Spielberger et al. [20] and it is a Likert-type scale that measures the level of state and trait anxiety with 20 questions for each. While State Anxiety Inventory evaluates the sensational reaction that shows sudden changes, Trait Anxiety Inventory at the second part of the inventory measures the continuity of the anxiety that people generally show tendency throughout life. Higher scores show higher anxiety level and lower scores show lower anxiety level. The items are ranked between 1 (never) and 2 (completely). The total score obtained from both inventory changes between 20 and 80. Inventory has been introduced to Turkish with a reliability and validity study done by Öner and Le Compte [21].

Statistical analysis

All variables were screened for accuracy of data entry, missing values, and homoscedasticity using SPSS 23. The data had less than 5% of missing items and no pattern was detected. Descriptive statistics was reported using means and standard deviations for continuous variables and frequencies and percentages for categorical variables. A comparison of BPQ scores between the Turkish sample and Poreh's original sample was performed with a one-sample *t* test. Correlation analysis between the BPQ scales and subscales were performed using Pearson's correlation coefficients. The internal consistency of the Turkish BPQ scales and subscales was estimated using Cronbach's alpha coefficients. Based on the theoretical structure, three sets of exploratory factorial analyzes were performed. Principal factor analyzes with Oblimin and Promax rotations were

used. The alpha level of 0.05 was set up to indicate significance.

Results

Sociodemographic characteristics of sample

As it was shown in Table 1 in detail, the average age of 306 participants in the study was 21.19 with a standard deviation of 2.85 and it ranged from 18 to 49. The sample consisted of 201 female (65.7%) and 105 male (34.3%) students. The majority of the students participated in the study were single (96.4%) and 10 (3.3%) were married and 1 student was divorced. The 95.4% of the sample had no grade repetition ever and 4.6% had. The parents of 6 students had divorced, mothers of 4 students and fathers of 14 students were deceased. The detailed demographic characteristics of participants were presented in Table 1.

Descriptive statistics for the Turkish, US, English, and Australian normative samples

Table 2 indicates the means and standard deviations for the BPQ and each of its nine subscales for the Turkish, United States, English, and Australian samples. Male and female means and standard deviations, and

Table 1. Sociodemographic characteristics of the sample.

	N	%
Gender		
Female	201	65.7
Male	105	34.3
Marital status		
Married	10	3.3
Single	295	96.4
Divorced	1	.3
Income (monthly)		
0–500 TL	101	33
500–1000 TL	145	47.4
1000–3000 TL	35	11.4
Above 3000 TL	25	8.2
Grade repetition		
No	292	95.4
Yes	14	4.6
Parent divorce		
No	300	98
Yes	6	2
Mother died or alive		
Alive	302	98.7
Died	4	1.3
Father died or alive		
Alive	292	95.4
Died	14	4.6
Mother's education level		
None	34	11.1
Primary school	136	44.4
Secondary school	44	14.4
High school	54	17.6
Undergraduate	33	10.8
Graduate	5	1.6
Father's education level		
None	11	3.6
Primary school	84	27.5
Secondary school	28	9.2
High school	93	30.4
Undergraduate	79	25.8
Graduate	11	3.6

Table 2. Descriptive statistics for the Turkish, US, English, and Australian normative samples

	Turkish (n = 306)				United States (n = 181)				English (n = 223)				Australian (n = 154)				Significant contrasts		
	Mean	SD	Skew	KR-20	Mean	SD	Skew	KR-20	Mean	SD	Skew	KR-20	Mean	SD	Skew	KR-20	TR vs US	TR vs Eng	TR vs Aus
Impulsivity	1.45	1.44	1.1	0.53	3.16	2.57	1.93	0.66	2.34	1.93	0.79	0.65	1.82	1.72	0.71	0.64	***	***	***
Males	1.89	1.54			3.21	2.24			2.56	1.89			2.35	1.89					
Females	1.22	1.33			3.19	2.73			2.18	1.94			1.65	1.63					
Affective Instability	4.07	2.28	0.31	0.68	2.32	2.05	0.72	0.74	4.30	3.00	0.33	0.83	4.39	3.43	0.24	0.89	***		*
Males	4.14	2.37			2.14	2.17			3.53	2.85			4.03	3.75					
Females	4.04	2.24			2.42	1.98			4.85	3.00			4.50	3.33					
Abandonment	2.57	1.60	0.67	0.46	.91	1.10	1.04	0.65	1.39	1.70	1.61	0.70	1.66	1.73	1.16	0.67	***	***	***
Males	2.68	1.66			1.05	1.00			1.23	1.59			1.24	1.32					
Females	2.51	1.57			.85	1.15			1.51	1.77			1.79	1.82					
Relationships	2.94	2.03	0.48	0.65	3.25	2.75	0.61	0.70	2.00	2.15	1.04	0.79	2.52	2.52	0.83	0.85	**	***	***
Males	3.01	1.86			3.66	2.66			2.03	2.15			2.59	2.61					
Females	2.90	2.11			3.06	2.78			2.00	2.16			2.50	2.50					
Self-Image	1.45	1.69	1.6	0.65	3.30	2.46	0.56	0.68	2.55	2.21	0.99	0.76	2.69	2.42	1.07	0.79	***	***	***
Males	1.64	1.77			3.54	2.49			2.23	1.96			2.08	1.64					
Females	1.35	1.64			3.12	2.39			2.78	2.35			2.88	2.59					
Suicide/Self-Mutilation	.69	1.19	2	0.68	1.28	1.63	1.37	0.71	.98	1.59	1.58	0.81	.86	1.45	1.57	0.77	***	***	*
Males	.91	1.28			1.12	1.52			.88	1.41			.78	1.20					
Females	.57	1.13			1.39	1.69			1.05	1.70			.88	1.52					
Emptiness	3.03	2.11	0.93	0.63	1.77	1.77	0.95	0.73	2.34	2.37	1.24	0.80	2.77	2.57	1.01	0.81	***	***	*
Males	3.20	2.32			2.02	1.75			2.03	2.23			2.76	2.79					
Females	2.94	1.99			1.65	1.77			2.56	2.45			2.77	2.51					
Intense Anger	4.06	2.87	0.27	0.81	3.43	3.20	0.58	0.84	2.74	2.82	0.97	0.85	2.79	2.78	0.67	0.84	***	***	***
Males	4.38	2.85			3.42	3.30			2.90	2.76			2.57	2.64					
Females	3.89	2.87			3.46	3.19			2.62	2.87			2.86	2.83					
Quasi-Psychotic States	2.59	1.84	0.31	0.65	2.13	2.25	1.25	0.65	2.26	1.65	0.53	0.62	1.73	1.39	0.65	0.51	***	**	***
Males	2.99	1.80			2.93	2.52			2.27	1.82			1.92	1.46					
Females	2.38	1.83			1.74	2.04			2.25	1.53			1.68	1.37					
Sum score	22.87	10.7	0.75		21.06	12.9	0.57	0.94	20.84	12.3	0.71	0.92	21.23	13.9	0.63	0.94	**	**	**
Males	24.8	11.8			22.38	14.2			19.66	12.4			20.32	13.3					
Females	21.8	9.9		0.89	20.45	12.2			21.70	12.2			21.51	14.1					

* $p < .05$.** $p < .01$.*** $p < .001$.

Cronbach's alpha coefficients and coefficients of skewness calculated on the full sample, are also presented. Table 2 shows that the BPQ is a reliable scale. Although examining the mean differences between national groups, we carried out separate analyzes of variance for each of the nine subscales and the BPQ sum score. Table 2 also indicates that a statistically significant difference has been observed between Turkish sample and other countries' samples. The Turkish group showed higher scores than the other three groups in terms of Abandonment, Emptiness, Intense Anger, and Quasi-Psychotic States and lower scores in terms of Impulsivity, Self-Image, and Suicide/Self-Mutilation. Affective Instability scores were lower in Turkish sample than the Australian and British samples and higher than the American sample. Relationships scores were lower than the Australian sample and higher than the English sample.

Correlations between BPQ scales and age

The correlation coefficients between the Turkish BPQ and age were shown in Table 3. The correlation coefficients between Emptiness and Relationships ($r = 0.42$, $p < .01$) and Emptiness and Abandonment ($r = 0.45$, $p < .01$) were higher than the correlations between other subscales ($r < 0.39$, $p < .01$). In terms of correlation coefficients between the Turkish BPQ subscales, the correlation coefficients between Emptiness and Self-Image ($r = 0.55$, $p < .01$) between Relationships and Abandonment ($r = 0.53$, $p < .01$), between Emptiness and Affective Instability ($r = 0.49$, $p < .01$), and between Intense Anger and Affective Instability ($r = 0.47$, $p < .01$) were higher than the correlation coefficients between other subscales. On the other hand, there were no statistically significant differences between age and subscales of the Turkish BPQ except for Suicide/Self-Mutilation ($r = 0.18$, $p < .05$).

Internal consistency

The Cronbach's alpha coefficients for the Turkish BPQ subscales were shown in Table 4. The Cronbach's alpha coefficients for the Turkish BPQ were ranging from 0.46 to 0.81. The lowest alpha values were observed for the Abandonment (0.46). For the whole scale, Cronbach's alpha coefficient was found to be 0.89. The Cronbach's alpha coefficients for the Turkish BPQ subscales were relatively consistent within each of the scales.

Test-retest reliability of the Turkish BPQ

Test-retest correlations for the Turkish BPQ scales after 1 month were presented in Table 5 ($n = 50$). The test-retest correlation coefficient for Impulsivity, Affective Instability, Abandonment, Relationships,

Table 3 . Correlations between BPQ scales and age.

Scale	Age	Impulsivity	Affective Instability	Abandonment	Relationships	Self-Image	Suicide/Self-Mutilation	Emptiness	Intense Anger	Quasi-Psychotic States
Age	0.067									
Impulsivity	-0.004	0.288**								
Affective Instability	-0.041	0.261**	0.393**							
Abandonment	-0.061	0.195**	0.372**	0.531**						
Relationships	0.057	0.184**	0.316**	0.345**	0.313**					
Self-Image	0.117*	0.292**	0.331**	0.303**	0.316**	0.319**				
Suicide/Self-Mutilation	0.011	0.227**	0.493**	0.453**	0.420**	0.550**	0.353**			
Emptiness	0.006	0.189**	0.476**	0.271**	0.284**	0.179**	0.293**	0.325**		
Intense Anger	0.018	0.237**	0.264**	0.297**	0.328**	0.197**	0.212**	0.213**	0.158**	

* $p < .05$.

** $p < .01$.

Table 4. BPQ Scales and subscales, mean and SD, and Cronbach's alpha values in Turkish samples.

	Turkish (n = 306)		
	M	SD	α
Impulsivity	1.4	1.4	0.53
Affective Instability	4	5.2	0.68
Abandonment	2.5	1.6	0.46
Relationships	2.9	2	0.65
Self-Image	1.4	1.6	0.65
Suicide/Self-Mutilation	0.6	1.1	0.68
Emptiness	3	2.1	0.63
Intense Anger	4	2.8	0.81
Quasi-Psychotic States	2.5	1.8	0.65
Total BPQ	22.8	10.7	0.89

Table 5. Test-retest correlations for the Turkish BPQ after 4 weeks (n = 50).

	rtt
Impulsivity	0.504**
Affective Instability	0.774**
Abandonment	0.398**
Relationships	0.683**
Self-Image	0.718**
Suicide/Self-Mutilation	0.484**
Emptiness	0.734**
Intense Anger	0.739**
Quasi-Psychotic States	0.623**
Total BPQ	0.672**

Note: rtt, test-retest correlation coefficient.

** $p < .01$.

Self-Image, Suicide/Self-Mutilation, Emptiness, Intense Anger, and Quasi-Psychotic States were found to be 0.50, 0.77, 0.40, 0.68, 0.72, 0.48, 0.73, 0.74, and 0.62, respectively. There were no significant differences between the mean scores of the Turkish BPQ across the 1-month test-retest period.

Table 6. Correlation between age, BPQ, and other scales.

	Age	Total BPQ	Total MCSDS	Total BDI	Total BEST	Total PBQ	State Anxiety	Trait Anxiety
Age								
Total BPQ	NS							
Total MCSDS	NS	-0.253**						
Total BDI	NS	0.375**	-0.355**					
Total BEST	NS	0.337**	-0.249**	0.460**				
Total PBQ	-0.182**	0.322**	-0.207**	0.357**	0.337**			
State Anxiety	NS	0.299**	-0.345**	0.551**	0.351**	0.278**		
Trait Anxiety	NS	0.306**	-0.389**	0.662**	0.387**	0.297**	0.599**	

Note: NS, not significant.

**Correlation is significant at the 0.01 level (two-tailed).

Table 7. The first unrotated factor (PC1) and pattern matrix following principal components analysis and Promax rotation of two factors (F1 and F2), for the Turkish, United States, English, and Australian samples.

BPQ subscale	Turkish sample			U.S sample			Australian sample			English sample		
	PC1	F1	F2	PC1	F1	F2	PC1	F1	F2	PC1	F1	F2
Impulsivity	0.47	-	0.73	0.54	-	0.71	-	-	0.94	-	-	0.83
Affective Instability	0.71	0.67	0.52	0.81	0.51	0.43	0.80	0.79	-	0.77	0.67	-
Abandonment	0.70	0.67	0.50	0.73	0.75	-	0.73	0.84	-	0.73	0.76	-
Relationships	0.68	0.65	0.49	0.78	0.74	-	0.76	0.73	-	0.75	0.71	-
Self-Image	0.61	0.73	-	0.58	0.79	-	0.79	0.82	-	0.73	0.87	-
Suicide/Self-Mutilation	0.60	0.54	0.49	0.40	-	0.77	0.59	0.37	0.51	0.53	0.37	0.31
Emptiness	0.74	0.83	-	0.76	0.86	-	0.83	0.86	-	0.84	0.88	-
Intense Anger	0.55	0.51	0.44	0.55	-	0.71	0.68	0.57	-	0.56	-	0.62
Quasi-Psychotic States	0.48	0.30	0.70	0.68	0.64	-	0.57	0.46	-	0.37	-	0.52
% Variance	39.40	10.63		43.62	12.34		46.95			41.05	13.23	

Note: Scores below 0.30 were replaced with blanks.

Convergent and discriminant validity

Convergent and Discriminant validity were examined by correlation between the BPQ scores and BEST, BDI, PBQ, State-Trait Anxiety scales scores (Table 6). A positive and statistically significant correlation was found between the Turkish BPQ and BEST ($r = 0.337$, $p < .01$), BDI ($r = 0.375$, $p < .01$), PBQ ($r = 0.322$, $r < 0.01$), State Anxiety ($r = 0.299$, $p < .01$), and Trait Anxiety ($r = 0.306$, $p < .01$) scales.

Factor structure of the Turkish BPQ

Principal axis factor analyzes with Promax rotations were performed and two-factor structure was observed. The results were shown in Table 7. The first factor included Affective Instability, Abandonment, Relationships, Self-Image, Suicide/Self-Mutilation, Emptiness, Intense Anger and factor 2 included Impulsivity, Quasi-Psychotic States. These two factors accounted for 39.40% and 10.63% of the variance (50.03% cumulatively).

Discussion

In this study, we aimed to examine the validity, reliability, and factor structure of the BPQ in a Turkish sample. The main results of the study confirmed that the Turkish BPQ was observed to have stable and reliable psychometric properties.

In our sample, the average scores of Abandonment, Emptiness, Quasi-Psychotic States, and Intense Anger subscales of Turkish sample were significantly higher

than the American, English, and Australian samples. However, in terms of Impulsiveness, Self-Image, and Suicide subscales, American, English, and Australian samples showed higher scores than the Turkish sample and this difference was found to be statistically significant. In terms of Affective Instability subscale, Turkish sample showed higher scores than the American sample and lower than the Australian sample. In our Turkish sample, the average scores of Relationships were found to be lower than the American sample and higher than both English and Australian samples. In terms of average scores of subscales, other samples have similar results and they are near to each other, but American sample has significantly different scores than other samples. In the light of these results, it can be claimed that this is due to cultural differences and different evaluation of psychological concepts in different cultures. Table 2 also supports this claim. While in American sample, Impulsiveness, Relationships, Self-Concept, and Suicide/Self-Mutilation subscale scores were higher than other three samples, Affective Instability, Abandonment, and Emptiness subscale scores were found to be lower. However, other than cultural reasons, sample sizes may also be the reason for these differences.

All subscales of Turkish BPQ were positively correlated with each other. The highest correlation coefficient was found between Emptiness and Self-Image subscales. The lowest correlation coefficient was found between Quasi-Psychotic States and Intense Anger. Moreover, only Suicide/Self-Mutilation subscale was found to be positively correlated with age. No other statistically significant correlations were found between Turkish BPQ and age. These results were consistent with Fonseca-Pedrero et al.'s [22] reliability and validity of Spanish BPQ study, in which they found all the subscales of BPQ were positively correlated with each other.

The internal consistency coefficients of the Turkish BPQ scale and subscales show that the scale is reliable. The Cronbach's alpha coefficients for the Turkish BPQ were ranging from 0.46 to 0.89. The lowest alpha values were observed for the Abandonment subscale and the highest Cronbach's alpha coefficient were observed for the Intense Anger. Cronbach's alpha coefficient for the total scale was found to be 0.89. These results showed the internal consistency of the scale. The reason why Abandonment subscale had the lowest Cronbach's alpha coefficient might have been due to factorial structure of the borderline personality, translation problems, or sample size. Additionally, the positive correlation coefficient between the first and the second administration of the Turkish BPQ revealed high test-retest reliability. Both Cronbach's alpha coefficients and test-retest correlation coefficients showed that Turkish BPQ was a reliable scale.

The positive correlation between Turkish BPQ, BEST, BDI, PBQ, and STAI give support to the validity of the scale. Initially, to examine the factorial structure of the Turkish BPQ at the subscale level, we used unrotated principal component analysis. Results showed one-dimensional structure using a condition of Eigenvalues greater than 1 rule for retaining factors. However, this factor solution did not provide a strong fit and the study of original scale has used a two-dimensional structure and this two-factor solution showed a better factor orientation. Then, using a Promax rotation and a principal component method for extraction, the results yielded a two-factor solution. Results showed the first factor consisted of Affective Instability, Relationships, Self-Image, Suicide/Self-Mutilation, Emptiness, and Intense Anger subscales and the second factor consisted of Impulsiveness and Quasi-Psychotic States subscales. These two factors explained 50.03% of the total variance. Previous studies that examined the factor structure of borderline personality indicated that the structure of BPD in non-clinical and clinical samples can range from a one-factor to a six-factor [23–27]. In this present study, we found a one-dimensional solution when we examined the factorial structure and the content of the borderline personality by the Turkish BPQ. Poreh et al. [13] conducted a Principal Component Analysis of the BPQ subscales and found both a single borderline factor and a two-factor solution. In the present study, Impulsivity did not show highest loading on Factor 1 and Self-Image and Emptiness did not show highest loading on the same factor, which is Factor 2. These three subscales were also unambiguously related to Factor 1 and Factor 2 in all samples, respectively (see Table 6). Our results provide support to Poreh et al. [13] and other studies in non-clinical samples that reported borderline personality [28–30]. We also conducted Partial Confirmatory Factor Analysis (PCFA), which sits somewhere between exploratory factor analysis (EFA) and confirmatory factor analysis (PCFA) by using Maximum Likelihood as an Extraction Method. In this analysis, the Residuals are computed between observed and reproduced correlations. The adequacy of sample size was verified using the Bartlett's test of sphericity and the Kaiser–Meyer–Olkin (KMO) measurement of sampling adequacy. Bartlett's test of sphericity was significant (Chi-Square = 7766.169, $df = 3160$, $p = .000$) for the BPQ and the KMO measure of sampling adequacy was acceptable at 0.739. There were 1328 (42.0%) non-redundant residuals with absolute values greater than 0.05. Goodness-of-fit Test was also significant (Chi-Square = 4971.099, $df = 3001$, $p = .000$). The PCFA yielded with two-factor solution in consistent with Poreh et al.'s [13] and our PCA analysis. We agree with Cabrera-Nguyen's [31] approach that the EFA should be followed by CFA using a different sample (or samples)

to evaluate the EFA-informed *a priori* theory about the measure's factor structure and psychometric properties. This is what we plan to do in conducting our clinical studies using the Turkish BPQ in BPD patients and BPD patients who are comorbid with depression.

The results reported in this study should be considered in light of certain limitations. The sample employed in this study was made up of volunteer college students with a limited age range and mostly of women, which to some extent limits the generalization of the results to other samples.

In conclusion, the Turkish version of the BPQ had sound psychometric properties in our sample of Turkish healthy volunteers, including its internal consistency, test-retest reliability, concurrent validity, and factorial structure. The Turkish BPQ will be useful for future studies in different countries to help better understanding normalcy, psychopathology, and personality disorder and to examine the biological, social, and psychological differences in people from different cultures.

Disclosure statement

No potential conflict of interest was reported by the authors.

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