



Examining the psychometric properties of the behavioral emotion regulation questionnaire - Persian version (BERQ-PV) among Iranians

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Abstract

Emotion regulation has been dichotomized into two related but distinct domains, namely cognitive and behavioral. There has been an emphasis on the development of measures that evaluate these emotion regulation domains separately. Recently the Behavioral Emotion Regulation Questionnaire (BERQ) was developed. The present study aimed to assess the psychometric properties of a Persian version of the BERQ (BERQ-PV) among an Iranian sample. We investigated the dimensionality, reliability, and validity of the BERQ-PV among participants from the general population ($n = 556$) and clinical patients ($n = 92$). The confirmatory factor analysis supported the five-factor model. The internal consistency (Cronbach's $\alpha = .59-.78$) and test-retest reliability ($r = .63-.82$) of the subscales were acceptable. The significant correlations between the BERQ-PV subscales and depression, anxiety, and stress supported concurrent validity, and the correlations with measures of cognitive emotion regulation implied convergent validity. The significant disparity among the clinical and non-clinical sample groups on the BERQ-PV was suggestive of discriminant validity. Findings indicate that the BERQ-PV is a psychometrically sound measure for assessing the behavioral process of emotion regulation.

Keywords Behavioral emotion regulation · Assessment · BERQ · Coping

Emotion regulation refers to individual's automatic or deliberate efforts to manage and respond to positive and negative emotional experiences (Gross, 1998, 2013; Liu & Thompson, 2017; Thompson, 1994). Decades of research demonstrate the inextricable role of emotion regulation in human adaptation to challenging life experiences (Eisenberg et al., 2000; Gross, 1999). Encountering adverse life events (e.g., loss and grief, childhood abuse and neglect, maltreatment, etc.) throughout the lifespan has been associated with psychological disorders (e.g., depression, anxiety, posttraumatic stress disorder, suicidal behaviors) (Harper et al., 2014; Kraaij & De Wilde,

2001; Pompili et al., 2014; Rafnsson et al., 2006; Wingo et al., 2015). While effective emotion regulation strategies can buffer against these negative outcomes and promote adaptive psychological adjustment (Compas et al., 2001), difficulties with emotion processing, sensory processing and emotion regulation are associated with affective disorders and other psychological conditions (Liss et al., 2008; Lopez & Denny, 2019; McMahan et al., 2019; Serafini et al., 2017; Stikkelbroek et al., 2016).

There are many approaches to the regulation of emotions, including biological, social, behavioral, unconscious, and conscious cognitive processes (Garnefski et al., 2001). While the broad concept of emotion regulation is beneficial in understanding the emotion system, the fusion of different aspects of emotion regulation under this broad term has been posed as a barrier to empirically investigating the pathways and processes of emotion regulation. Consequently, researchers have focused on differentiating and operationalizing discrete components of emotion regulation, such as cognitive and behavioral components (Garnefski et al., 2001; Kraaij & Garnefski, 2019). Garnefski et al. (2001) suggest that there are clear distinctions between how an individual 'thinks' to regulate emotions and how emotions are regulated through behaviors. Thus, researchers have developed measures that

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separately assess cognitive and behavioral emotion regulation. The Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski et al., 2001) was developed to focus solely on cognitive emotion regulation approaches. The CERQ has now demonstrated appropriate psychometric properties among different cultural groups, including Iran (Abdi et al., 2012; Besharat & Bazzazian, 2014; Domínguez-Sánchez et al., 2013; Esmacili et al., 2018; Ranjbar et al., 2021; Zhu et al., 2008).

Alongside cognitions, behavior plays a critical role in coping with stressful events to regulate emotions (Kraaij & Garnefski, 2019). Individuals can cope with stressful experiences and strong emotions by engaging in adaptive or maladaptive behaviors aimed to manage and regulate emotion (Compas et al., 2017). In order to assess behavioral emotion regulation, Kraaij and Garnefski (2019) developed the Behavioral Emotional Regulation Questionnaire (BERQ). The BERQ was developed by using existing coping measures, “transforming” non-behavioral coping strategies into behavioral dimensions and adding new behavioral strategies to formulate behavioral facets of emotion regulation. The BERQ is a psychometrically sound (Kraaij & Garnefski, 2019; Tuna, 2020; Zhao et al., 2020) self-report questionnaire including five conceptually distinct scales (i.e., *seeking distraction*, *active approaching*, *seeking social support*, *withdrawal*, and *ignoring*). In support of criterion-related validity, several subscales closely correlate with depression and anxiety symptoms. For instance, a moderate to strong positive association was observed between withdrawal and symptoms of depression (Kraaij & Garnefski, 2019).

Present Study

As far as we are aware, there is currently no assessment tool available in Persian that explores the behavioral emotion regulation strategies employed in response to stressful events. Previous research in Iran (e.g., Ashori & Jalil-Abkenar, 2020; Rajabi Khamesi et al., 2021; Ranjbar et al., 2021) has shown substantial similarities between Iranian samples’ cognitive emotion regulation strategies as those employed by Western samples. However, without a Persian version of a valid and reliable measure of behavioral emotion regulation strategies, these investigations cannot extend to evaluating the behavioral emotion regulation strategies used by Iranian individuals.

Therefore, the current study aimed to adapt and evaluate the psychometric properties of a Persian version of the BERQ (BERQ-PV). We also sought to explore gender differences in the use of behavioral emotion regulation strategies, as these differences may play a role in the emergence and exacerbation of psychopathology (e.g., depression, anxiety, etc.). This is important because gender differences are commonly explored

in the context of coping strategies (Daryna et al., 2019; Kelly et al., 2008; Liddon et al., 2018; Meléndez, 2012) and have recently been examined for behavioral emotion regulation strategies (Zhao et al., 2020). We hypothesized that: 1) the suggested 5-factor structure of the BERQ would be an acceptable fit for the acquired Iranian data; 2) the BERQ-PV would have good internal consistency and temporal stability; 3) the BERQ-PV would have good concurrent validity, as indexed by adaptive strategies (i.e., seeking distraction, active approaching, and seeking social support) being negatively associated with psychological distress; and 4) the BERQ-PV would demonstrate adequate convergent validity, as indexed by less adaptive strategies (i.e., withdrawal, ignoring) being positively associated with negative cognitive emotion regulation strategies (i.e., self-blame, rumination, catastrophizing) and adaptive strategies (i.e., seeking distraction, active approaching, and seeking social support) being positively associated with positive cognitive emotion regulation strategies (refocus on planning, positive reappraisal). Our final aim focused on the ability of the BERQ-PV to differentiate between clinical and non-clinical samples, which was included in an effort to examine discriminative validity. Following the approach of researchers investigating the psychometric properties of the CERQ (e.g., Feliu-Soler et al., 2017) and given depression and anxiety are disorders characterized by impaired emotion regulation (e.g., Cisler et al., 2010; Joormann & Stanton, 2016), we compared the BERQ-PV scores between patients with distinct levels of depressive and anxiety symptoms and a non-clinical healthy community sample to establish the discriminant validity of the BERQ-PV. We hypothesized that the clinical sample would score significantly higher on the BERQ-PV than the non-clinical sample (Hypothesis 5).

Method

Participants

The sample consisted of two subgroups, including 1) healthy general community participants ($n = 556$) and 2) a clinical sample comprised of individuals with a diagnosis of anxiety or depression ($n = 92$). Participants in the clinical group were individuals with a clinical primary diagnosis of major depressive disorder ($n = 49$, male $n = 23$, female $n = 26$) and anxiety disorder ($n = 43$, male $n = 17$, female $n = 26$). Table 1 displays socio-demographic characteristics for both groups. Inclusion criteria for the clinical group were having received a clinical diagnosis of major depressive disorder or an anxiety disorder within the past two years by a clinical psychologist or psychiatrist; not using medication within the past six months to treat the depression or anxiety, and no diagnosis of a comorbid disorder. The inclusion criterion for the general healthy

Table 1 Participant Socio-Demographic Characteristics

		Community Group <i>n</i> =556	Clinical Group <i>n</i> =92	Statistics for Group Differences
Gender (<i>n</i> , %)	Male	284 (51%)	40 (43%)	χ^2 (1, <i>n</i> =648)=1.82, <i>p</i> =.17
	Female	272 (49%)	52 (56%)	
Age, <i>M</i> (<i>SD</i>)		28.35 (8.42)	30.10 (8.07)	<i>t</i> (646) = 1.85, <i>p</i> =.06, <i>d</i> = .21
Marital status (<i>n</i> , %)	Single	198 (35%)	33 (35%)	χ^2 (2, <i>n</i> =648)=2.93, <i>p</i> =.40
	Married	272 (49%)	48 (52%)	
	Divorced/separated	86 (15%)	11 (12%)	
Education (<i>n</i> , %)	Less than high school diploma	73 (13%)	14 (15%)	χ^2 (3, <i>n</i> =648)=.33, <i>p</i> =.56
	High school diploma	197 (35%)	30 (32%)	
	Bachelor's degree	194 (35%)	27 (29%)	
	Postgraduate Degree	92 (16%)	21 (23%)	
Job status (<i>n</i> , %)	Student	137 (24%)	27 (29%)	χ^2 (4, <i>n</i> =648)=4.88, <i>p</i> =.30
	Office worker	79 (14%)	7 (7%)	
	Laborer	32 (6%)	5 (5%)	
	Self- employed/freelancer	132 (23%)	18 (20%)	
	Unemployed	176 (31%)	35(38%)	

community sample was never having been diagnosed with a psychiatric condition.

The general community sample and clinical sample were both recruited using internet advertisements. However, the advert for the clinical group specified that researchers were looking for participants with a diagnosis of depressive and anxiety disorders to take part in the research. The advertisement stated that the study sought men and women over the age of 18 years who had a clinical diagnosis of anxiety or depression within the last two years. Those who contacted the researcher were selected if they met the inclusion criteria. After clustering the overall sample into the two sub-groups (healthy community and clinical), the researchers obtained consent from the participants to review general practitioner medical files. Medical files were used to confirm documented clinical diagnosis of major depressive disorder or an anxiety disorder within the past two years.

Procedure

The original English version of the BERQ was translated into Persian (also called Farsi) by two independent psychologists who are fluently bilingual in both English and Persian languages. Second, the BERQ was back-translated into English by an independent translator. Third, a professor of psychology from Tabriz University checked the face validity of the translated version and resolved discrepancies between the original and back-translated versions of the BERQ. The final version was adopted; BERQ-Persian Version (BERQ-PV). Then participants in both groups were recruited via online advertising in northwest Iran. Each participant provided informed consent, and participation in the study was entirely voluntary, and no remuneration was provided to the participants. The

second measurement (reliability analysis) took place four weeks later by sending participants the BERQ-PV via email.

Measures

Behavioral Emotion Regulation Questionnaire (BERQ) The BERQ was developed to assess the behavioral tendencies of individuals in response to stressful life events. It is a 20-item self-report questionnaire that includes five conceptually distinct subscales: seeking distraction (e.g., *I engage in other, unrelated activities*), withdrawal (e.g., *I avoid other people*), actively approaching (e.g., *I get to work on it*), seeking social support (e.g., *I ask someone for advice*), and ignoring (e.g., *I behave as if nothing is going on*) (Kraaij & Garnefski, 2019). Each subscale consists of four items, and participants respond to each item using 5-point Likert scales ranging from 1 (*almost never*) to 5 (*almost always*). The total scale score is calculated by summing up the item scores in each subscale with scores ranging from 4 to 20, with higher scores on subscales representing a greater propensity to use that strategy. Kraaij and Garnefski (2019) reported Cronbach alphas ranging from .86 to .93 and test-retest reliability ranging from .47 to .75 for BERQ subscales. The validity and reliability of culturally adapted versions of the BERQ have been demonstrated in two studies in Turkey and China (Tuna, 2020; Zhao et al., 2020).

Cognitive Emotion Regulation Questionnaire (CERQ) The Persian version of the CERQ was administered to assess cognitive emotion regulation strategies used by individuals in response to stressful life events (Garnefski et al., 2001, 2007; Moyal et al., 2014). The CERQ is a 36-item self-report questionnaire that contains nine 4-item dimensions; self-

blame (e.g., *I feel that I am the one to blame for it*), blaming others (e.g., *I feel that basically the cause lies with others*), acceptance (e.g., *I think that I must learn to live with it*), refocusing on planning (e.g., *I think of what I can do best*), positive refocusing (e.g., *I think about pleasant experiences*), rumination (e.g., *I dwell upon the feelings the situation has evoked in me*), positive reappraisal (e.g., *I look for the positive sides to the matter*), putting into perspective (e.g., *I tell myself that there are worse things in life*), and catastrophizing (e.g., *I continually think how horrible the situation has been*). Responses to items are provided on 5-point Likert scales ranging from 1 “(almost) never” to 5 “(almost) always”, with scores ranging from 4 to 20 and higher scores indicating a greater frequency of use of that specific cognitive emotion regulation strategy. Garnefski et al. (2001) reported adequate reliability of the total CERQ scale ($r = .92$) and subscales (ranging from $r = .66$ to $.83$). The Cronbach’s alpha was reported to be $.93$ (Garnefski et al., 2007; Moyal et al., 2014). The Persian version of the CERQ has also been found to have good internal consistency (Cronbach’s alphas for the nine subscales ranging from $.64$ to $.82$) and construct validity (Abdi et al., 2012).

Depression, Anxiety and Stress Scale (DASS-21) The DASS-21 is a self-report instrument consisting of three subscales assessing symptoms of depression (e.g., *I felt down-hearted and blue*), anxiety (e.g., *I felt I was close to panic*), and stress (e.g., *I found it hard to wind down*). Responses to items are provided on 4-point Likert scales that range from 0 to 3 (0 = *does not apply to me at all* to 3 = *applies to me very much or most of the time*). To yield equivalent scores to the long form of the DASS, the overall score for three subscales is calculated as the score of each subscale multiplied by two, and scores range from 0 to 42 (Lovibond & Lovibond, 1995). Studies have demonstrated a three-factor structural solution for the DASS and adequate convergent and discriminant validity (Brown et al., 1997; Lovibond & Lovibond, 1995). The Cronbach alpha coefficient of the original version ranged between $.88$ to $.96$ (Brown et al., 1997). Subsequent studies have supported the validity and reliability (i.e., internal consistency, test-retest reliability) of the DASS-21 among both clinical and non-clinical samples (Antony et al., 1998; Brown et al., 1997; Crawford & Henry, 2003; Lovibond & Lovibond, 1995). Psychometric properties of the Persian version of the DASS has been examined among Iranian adults, and results confirmed its three-factor structure and adequate reliability (Moghaddam et al., 2008; Sahebi et al., 2005).

Data Analysis Plan

Data analyses were conducted using SPSS 21.0.0. First, to examine the construct validity of the BERQ-PV (Hypothesis 1), adopting the same approach as the two previous studies

investigating the psychometric properties of culturally adapted BERQ (Tuna, 2020; Zhao et al., 2020), we conducted a confirmatory factor analysis (CFA). Then CFA with maximum likelihood estimation was used on the Pearson correlation matrix to examine the different factorial models of BERQ-PV. We examined the one-general, two-general, and five-factor model for BERQ-PV. The one-factor model was tested to examine whether all items loaded only on one general behavioral emotion regulation strategy. The two general factor model probed if items loaded onto negative and positive emotion regulation strategies. The five-factor model examined the five distinct behavioral emotion regulation strategies. The results of the chi-squared test (χ^2) of model fit and the following four most cited model fit indices (Brown, 2015) were used to evaluate model fit: comparative fit index (CFI), non-normed fit index (NNFI), root mean square error of approximation (RMSEA), and standard root mean square residuals (SRMR). According to Hu and Bentler (1999), CFI and NNFI values above $.90$ were considered well-fitting models. With respect to RMSEA and SRMR, values below $.08$ were used to indicate a reasonable fit.

Next, the means and standard deviations of BERQ-PV subscales were calculated, and the intercorrelation of subscales was explored. To examine Hypothesis 2, the internal consistency (i.e., Cronbach’s alpha) and temporal stability (i.e., test-retest reliability) of the BERQ-PV were examined. For internal consistency, we adopted a Cronbach’s α of $.60$ as adequate for exploratory research (Hair et al., 1998). In terms of test-retest reliability, we adopted Cicchetti’s (1994) guidelines whereby $.40$ to $.59$ was defined as fair, $.60$ to $.74$ was defined as good, and above $.75$ as excellent. To examine concurrent validity (Hypothesis 3), Pearson and partial correlations of BERQ-PV with DASS-21 scores were calculated. Convergent validity (Hypothesis 4) was examined by analyzing correlations between the BERQ subscales and CERQ subscales.

The measurement invariance across gender and clinical/non-clinical samples was performed on the revised five-factor model following four steps. The first step was to establish the configural invariance model. After configural invariance was supported, a metric invariance model was defined. Third, scalar invariance was tested, and finally, residual invariance was examined. We utilized insignificance of the change in χ^2 for the two nested models ($\Delta\chi^2$ criterion; Reise et al., 1993), a $< .01$ decrease criterion in CFI for nested models (Cheung & Rensvold, 2002; Rutkowski & Svetina, 2017) and $\Delta\text{RMSEA} < .01$ criterion for invariance evaluation (Rutkowski & Svetina, 2017). Following assessing measurement invariance, discriminant validity was examined by known-groups using Student’s t-tests to compare the clinical and non-clinical (community) samples on the BERQ-PV (Hypothesis 5). Finally, in terms of our exploratory analyses

examining gender differences, latent factors were compared employing a multivariate analysis of variance (MANOVA).

Results

Descriptive Statistics

Descriptive statistics for the study variables are presented in Supplementary Table 1. Before examining hypothesis, we compared the clinical and nonclinical samples on the DASS-21. As expected, we found that the clinical group reported significantly greater depression, $t(646) = 4.30, p < .01, d = .69$, anxiety, $t(646) = 4.74, p < .01, d = .52$, and stress, $t(646) = 4.69, p < .01, d = .54$, and total DASS score, $t(646) = 4.94, p < .01, d = .56$, than the community sample group.

CFA

Based on Kraaij and Garnefski (2019), the following three models were tested to examine the factor structure of the BERQ-PV; the one-factor solution in which all items are loaded onto one factor (behavioral emotion regulation), two-factor solution in which items are loaded onto negative and positive behavioral regulation strategies, and the five-factor solution in which items loaded onto five different factors (*seeking social support, ignoring, withdrawal, actively approaching, seeking distraction*). As shown in Table 2, the χ^2 statistic was significant for both the one- and two-factor models of the BERQ-PV. Moreover, for both models, the χ^2/df value was greater than 3, indicating an inadequate fit of the data. Further, the CFI, NNFI ($< .90$), RMSEA, and SRMR ($> .10$) were all indicative of a very poor fit of data to the model. However, the findings showed significant χ^2 statistics concerning the five-factor model, and χ^2/df was close to 3. The CFI and NNFI ($< .90$) indices were near the cut-off point, and RMSEA, SRMR ($> .10$) suggested an adequate fit of the data.

The modification indices (MIs) were inspected to modify the model in order to develop the model further, and certain parameters were applied to the model, according to MIs. Modifications were not implemented simultaneously, but rather we estimated the model after each modification. First, the deletion of item 1 and item 16 was considered due to the low standardized factor loading, but re-specification indicated no change in the indices after the removal of these items. Then six parameters were added, including covariance between error terms of items 4 and 9, items 9 and 14, items 18 and 20, items 7 and 12 with *social support* latent variable, and error term of item 16 with *withdrawal* latent variable. Following these modifications, the χ^2/df , CFI, NNFI ($\geq .90$), RMSEA, and SRMR ($< .08$) values become satisfactory and indicative of a good model fit. Standardized factor loadings for the revised five-factor model were all statistically significant. They ranged from .34 (item 1, *distraction* subscale) to .91 (item 14, *social support* subscale) with a mean loading of .62, suggesting that items generally converged meaningfully to the scales as expected. Except for items 1 and 16, all standardized factor loadings were above .40. See Fig. 1 for standardized factor loading estimates.

Inter-Correlations among the BERQ-PV Subscales

The correlations among the BERQ-PV subscales ranged from .01 to .41. Three of the ten correlations were not significant, and the remaining significant correlations were small to medium in magnitude, suggesting that the subscales were relatively independent (see Supplementary Table 2).

Reliability of BERQ-PV

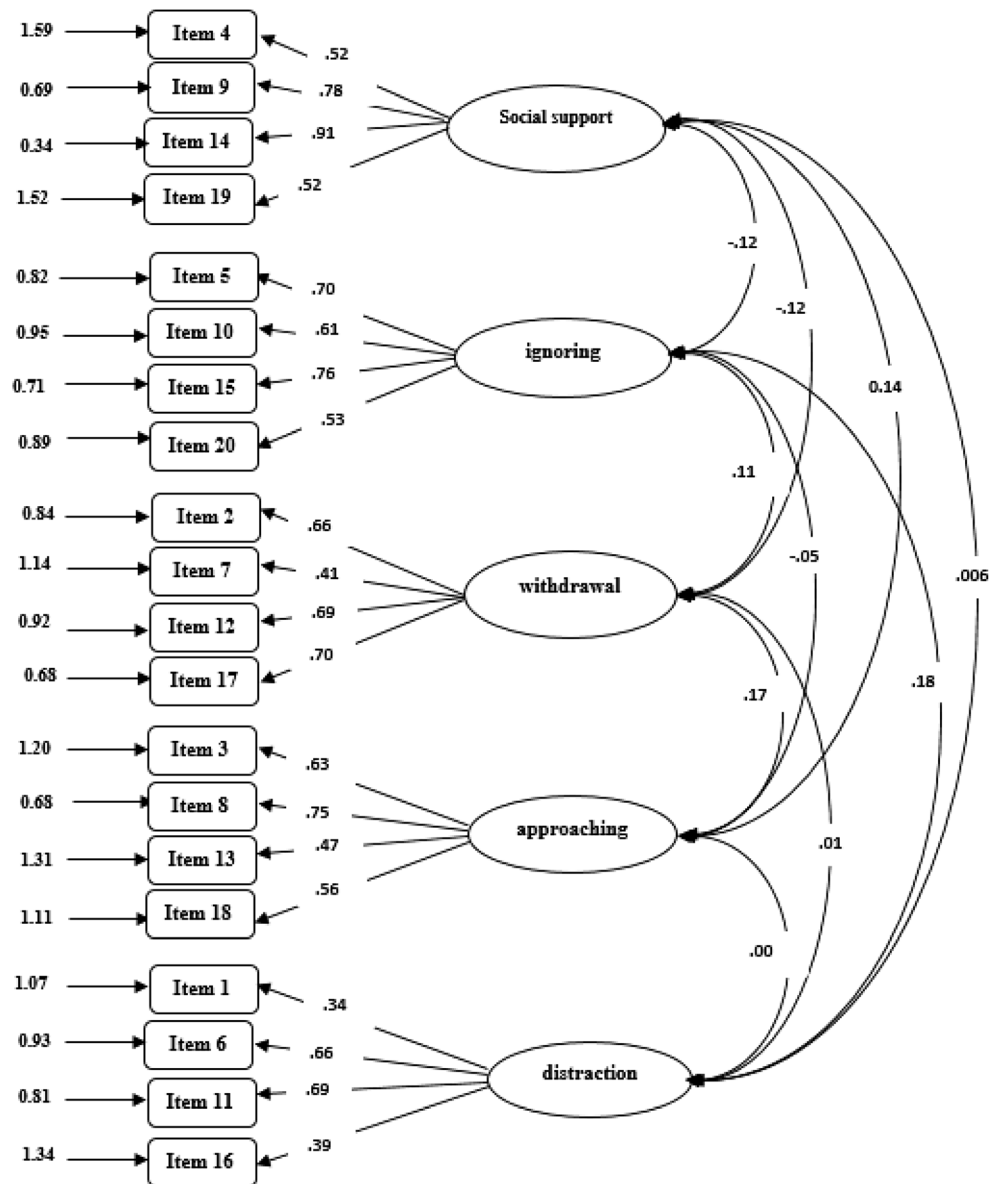
The Cronbach's alpha of the BERQ-PV was .61 ($p < .001$). Furthermore, the findings suggested that deletion of an item did not increase the alpha value. This indicated that each item contributed to the internal consistency of the scale, and none of the items had to be deleted. The Cronbach's alphas of the

Table 2 Fit Indices for Different Factorial Structure of the BERQ-PV

Model	χ^2	χ^2/df	CFI	NNFI	RMSEA	SRMR
One general factor model	1935.03*	11.38	.32	.24	.13	.14
Two general factor model	1364.97*	8.07	.54	.48	.11	.11
Five-factor model	532.02*	3.32	.85	.83	.06	.07
Five factor model- revised	384.61*	2.49	.91	.89	.05	.06

BERQ = Behavioral Emotion Regulation Questionnaire; CFI = comparative fit index; NNFI = non-normed fit index; RMSEA = root mean square error of approximation; SRMR = standard root-mean-square residuals; * = $p < .05$

Fig. 1 Factor loadings and Error Variances for Items of the Behavioral Emotion Regulation Questionnaire-Persian Version (BERQ-PV)



subscales were adequate for *withdrawal* ($\alpha = .70$, 95% CI [.66, .74]), *actively approaching* ($\alpha = .66$, 95% CI [.61, .70]), *seeking social support* ($\alpha = .78$, 95% CI [.75, .81]) and *ignoring* ($\alpha = .74$, 95% CI [.70, .77]). The Cronbach alpha for *seeking distraction* was just below our specified threshold ($\alpha = .59$, 95% CI [.53, .64]). The temporal stability of the BERQ-PV was tested using a test-retest of a sample of 47 participants after a four-week interval. Test-retest reliability coefficients were found to be good; BERQ-PV total score $r = .71$, 95% CI [.50, .92]; *seeking distraction* $r = .71$, 95% CI [.50, .92], *withdrawal* $r = .71$, 95% CI [.50, .92], *actively approaching* $r = .66$, 95% CI [.44, .89], *seeking social support* $r = .82$, 95% CI [.65, .99], and *ignoring* $r = .63$, 95% CI [.40, .86]. These values indicated that the BERQ-PV has adequate temporal stability.

Concurrent, Convergent, and Discriminant Validity

In terms of concurrent validity, as presented in Table 3, the BERQ-PV subscales, with the exception of Ignoring, were significantly correlated with depression, anxiety, and stress. After controlling for the other subscales, the Partial correlations were congruent with the Pearson correlation results.

In terms of convergent validity, as shown in Table 4, although some of the correlations were not significant, there was a significant correlation between many of the BERQ-PV and CERQ subscales. Most of the CERQ subscales were moderate to strongly correlated with *seeking distraction*, *withdrawal*, and *actively approaching*, but were poorly correlated with *seeking social support* and *ignoring*.

Table 3 Pearson and Partial Correlations between the Behavioral Emotion Regulation Questionnaire-Persian Version (BERQ-PV) and Depression, Anxiety, and Stress Scale-21 (DASS-21)

	Depression		Anxiety		Stress	
	Pearson r	Partial r	Pearson r	Partial r	Pearson r	Partial r
Seeking distraction	-.19**	-.21**	-.09**	-.11**	-.16**	-.14**
Withdrawal	.45**	.38**	.41**	.35**	.44**	.40**
Actively approaching	-.20*	-.09*	-.19**	-.11**	-.17**	-.08*
Seeking Social support	.13**	.17**	.16**	.20**	.17**	.19**
Ignoring	.08*	.10**	.09*	.07	<.001	<.001

Note. * = $p < .05$; ** = $p < .01$

Prior to testing discriminant validity, we examined the measurement invariance of the scores among two groups (clinical vs. community). The configural model was supported by acceptable fit indices, CFI > .90, RMSEA .05, showing a similar pattern of item loadings on latent factors between two groups. Full metric invariance was supported as insignificant $\Delta\chi^2$, Δ CFI < -.01 and Δ RMSEA < .015 criterion being met, indicating each item contributed to the latent variable to a similar degree across groups. Scalar invariance was supported fully, as an acceptable model fit, including insignificant $\Delta\chi^2$, Δ CFI < -.01 and Δ RMSEA < .015, revealing equivalence on item intercepts. Finally, residual levels of invariance were also supported, insignificant $\Delta\chi^2$, Δ CFI < -.01 and Δ RMSEA < .015 criterion was met, demonstrating that latent factor and residuals were equivalent across groups (For further details, see [Supplementary Table 3](#)). Since the results endorsed full measurement invariance at all levels, group comparison for discriminant validity by known-groups was performed. We compared the BERQ-PV scores of the non-clinical community group ($n = 556$) and clinical group ($n = 92$) to examine the discriminant validity by known-groups of the BERQ. As

shown in [Table 5](#), the clinical group reported significantly less use of *seeking distraction*, and significantly greater *withdrawal*, *seeking social support*, and total BERQ score, $t(645) = 2.36$, $p < .01$, $d = .26$) compared to the non-clinical community sample. However, there were no significant group differences in *actively approaching* and *ignoring*.

Gender Difference

The measurement invariance among the groups was used before comparing men and women on the BERQ-PV. As for the invariance across gender, the configural model was supported based on acceptable fit indices, CFI > .90, RMSEA < .05, indicating a similar pattern of loadings of items on the latent factors across gender groups. Full metric invariance was supported as insignificant $\Delta\chi^2$, Δ CFI < -.01 and Δ RMSEA < .015 criteria was met, indicating each item contributed to the latent variable to a similar degree across groups. Scalar invariance was supported fully, as acceptable model fit, including insignificant $\Delta\chi^2$, Δ CFI < -.01 and Δ RMSEA < .015, revealing equivalence on item intercepts. Finally, residual levels of

Table 4 Correlations between the Behavioral Emotion Regulation Questionnaire-Persian Version (BERQ-PV) subscales and Cognitive Emotion Regulation Questionnaire (CERQ) subscales

		BERQ-PV Subscales					
		Seeking Distraction	Withdrawal	Actively Approaching	Social support	Ignoring	BERQ-PV total
CERQ Subscales	Self-blame	-.04	.29**	.03	.14**	.06	.21**
	Acceptance	.11**	.29**	.03	.14**	.19**	.33**
	Rumination	.09*	.31**	-.01	.25**	.01	.21**
	Positive focus	.45**	-.33**	.20**	-.02	.19**	.19**
	Refocus on planning	.29**	-.33**	.38**	.01	.04	.15**
	Positive reappraisal	.33**	-.29**	.26**	<.001	.12**	.16**
	Perspective taking	.31**	-.16**	.14**	.08*	.06	.17**
	Catastrophizing	-.13**	.46**	-.11**	.17**	.10*	.21**
	Blame	-.09*	.22**	<.001	.20**	.03	.16**

* = $p < .05$; ** = $p < .01$

Table 5 Discriminant validity by known-groups results (clinical versus non-clinical) on the Behavioral Emotion Regulation Questionnaire-Persian Version

Scale	Clinical Group	Non-Clinical Community Group	Group Differences
Seeking distraction	10.49 (3.28)	9.83 (3.67)	$t(646)=1.90, p<.05, d=.19$
Withdrawal	8.55 (3.57)	10.04 (4.16)	$t(646)=3.60, p<.01, d=.38$
Actively approaching	12.38 (3.61)	12.23 (3.85)	$t(646)=.36, p=.71, d=.04$
Seeking Social support	11.05 (3.39)	12.36 (4.37)	$t(646)=2.65, p<.01, d=.33$
Ignoring	8.62 (3.69)	8.94 (3.88)	$t(646)=.76, p=.44, d=.08$
BERQ-PV total score	51.09 (8.78)	53.43 (9.01)	$t(645)=2.36, p<.01, d=.26$

BERQ-PV = Behavioral Emotion Regulation Questionnaire-Persian Version.

invariance were also supported, according to $\Delta CFI < .01$ and $\Delta RMSEA < .015$ criteria, although $\Delta \chi^2$ was significant, suggesting that latent factors and residuals were equivalent across gender groups (For further details, see [Supplementary Table 4](#)). As these findings support measurement invariance, mean difference comparison of males and females in latent variables was conducted. The one-way MANOVA was significant, Wilks' $\Lambda = .96, F(5, 548) = 4.68, p = .000, \eta_p^2 = .04$. There were significant gender differences in *withdrawal*, $F(1, 552) = 4.63, p < .05, \eta_p^2 = .01$, and *seeking social support*, $F(1, 552) = 8.49, p < .01, \eta_p^2 = .01$, with women scoring significantly higher on *withdrawal* ($M = 8.88, SD = 3.68$) and *seeking social support* ($M = 11.60, SD = 4.49$) than men ($M = 8.23, SD = 3.45$ and $M = 10.52, SD = 4.25$, respectively).

Discussion

The current study demonstrated that the BERQ-PV had adequate validity (concurrent, convergent, discriminant) and reliability (internal consistency, temporal stability). Regarding the dimensionality of the BERQ-PV, while neither the one-factor (i.e., behavioral emotion regulation) nor the two-factor models (positive and negative behavioral emotion regulation) were a reasonable match for the data, the five-factor model demonstrated a good fit. In order to achieve greater refinement, we examined modification indices (MIs) to modify the model and specific parameters were added to the model according to the MIs. Standardized factor loadings for the updated five-factor model were all statistically significant following these adjustments. These findings concur with the original BERQ study results (Kraaij & Garnefski, 2019) and Turkish and Chinese modifications of the BERQ (Tuna, 2020; Zhao et al., 2020), in which the five-factor model was found to be the best fit for the data.

We found that there was adequate reliability for the BERQ-PV. There was adequate internal consistency for the overall BERQ-PV (Cronbach's $\alpha = .61$) and its subscales; seeking distraction (Cronbach's $\alpha = .59$), withdrawal (Cronbach's $\alpha = .70$), actively approaching (Cronbach's $\alpha = .66$), seeking social support (Cronbach's $\alpha = .78$) and ignoring (Cronbach's

$\alpha = .74$). There was also adequate temporal stability of the BERQ-PV, with test-retest reliability (four weeks) of the BERQ-PV being .71 for the BERQ-PV total and .71 for seeking distraction, .71 for withdrawal, .66 for actively approaching, .82 for seeking social support, and .63 for ignoring. These internal consistencies observed in the current study were slightly lower than those observed in the original BERQ study, where Cronbach's alphas ranged from .86 to .93 (Kraaij & Garnefski, 2019). However, the test-retest reliabilities of the BERQ-PV were similar to that found in the original BERQ study (.47 to .75) (Kraaij & Garnefski, 2019). Our findings are also relatively consistent with the reliability findings of the two previous studies that culturally adapted the BERQ for Chinese and Turkish samples (Tuna, 2020; Zhao et al., 2020).

Regarding the BERQ-PV subscales, we found that the three theoretically adaptive strategies (seeking distraction, actively approaching, and seeking social support) were used more commonly by participants than the less adaptive strategies (withdrawal and ignoring). These results are consistent with previous BERQ studies examining the English, Turkish and Chinese versions (Garnefski et al., 2002; Kraaij & Garnefski, 2019; Tuna, 2020; Zhao et al., 2020). We also found that the BERQ-PV subscales were relatively independent, with three of the ten subscales not being significantly correlated and small to moderate associations observed for the remaining subscales. This aligns with the original and Chinese versions of the BERQ, in which small to moderate associations between the subscales were also found (Kraaij & Garnefski, 2019; Zhao et al., 2020). Tuna (2020), however, documented correlation coefficients ranging from .04 to .52 among the subscales of the Turkish BERQ.

The BERQ-PV demonstrated strong validity. In terms of concurrent validity, there was support for our hypothesis; seeking distraction and actively approaching strategies were negatively associated with the DASS subscales and withdrawal was positively associated with DASS subscales. However, in contrast to our hypothesis, seeking social support was positively associated with DASS subscales and ignoring was not significantly associated with DASS subscales. These findings are partially consistent with previous findings. Previous

studies have similarly found that seeking distraction and actively approaching had small to moderate negative relationships, while withdrawal had a positive relationship with depression and anxiety (Kraaij & Garnefski, 2019; Tuna, 2020; Zhao et al., 2020). In contrast to our findings, previous studies have found a negative correlation between seeking social support and depression and anxiety (Kraaij & Garnefski, 2019; Zhao et al., 2020) and a positive correlation between ignoring and depression and anxiety (Kraaij & Garnefski, 2019; Zhao et al., 2020). Thus, within the emerging literature, withdrawal and actively approaching have been consistently found to be positively associated with depression and anxiety symptoms. However, the findings are less consistent for the remaining subscales. Before any inferences can be drawn, further research is needed. It is possible that these inconsistent findings reflect cultural variation in emotion regulation strategies (De Vaus et al., 2018; Jobson et al., 2019; Nagulendran & Jobson, 2020). For instance, seeking social support is heavily influenced by culture (Kim et al., 2006; Taylor et al., 2004). Furthermore, our positive association between seeking social support and symptoms may be accounted for by the stress-mobilizing theory, where high stress induces individuals to seek social support (Singh & Dubey, 2015). Thus, those with higher levels of psychological distress may be more likely to seek social support as a help-seeking strategy.

There was evidence for convergent validity of the BERQ-PV. As predicted, there were moderate to strong correlations between scores on the CERQ subscales and seeking distraction, withdrawal, and actively approaching, but the CERQ subscales were poorly correlated with seeking social support and ignoring. Zhao et al. (2020) and Kraaij and Garnefski (2019) reported small to moderate correlations between the BERQ and CERQ subscales. Overall, these findings indicate that behavioral and cognitive emotion regulation are connected but distinct mechanisms.

Regarding the discriminant validity by known-groups, we found that the clinical group demonstrated significant differences when compared to the community sample in seeking distraction, withdrawal, social support, and the overall BERQ-PV score. There were no significant group differences in actively approaching or ignoring. Researchers to date have not compared clinical and non-clinical samples on the BERQ. Thus, our research is unique in this respect and prospective studies should delve further into clinical populations to devise greater understanding and effective interventions for clinical groups.

Finally, we found gender differences in withdrawal and seeking social support, with females scoring significantly higher on both strategies than males. This finding aligns with previous studies that have also found gender differences in emotion regulation strategies (e.g., Nolen-Hoeksema & Aldao, 2011; Zhao et al., 2020). In the instance of behavioral emotion regulation, Zhao et al. (2020) similarly found that

Chinese females scored significantly higher on withdrawal and seeking social support than Chinese males. These differences may reflect cultural and societal influences regarding the appropriateness of seeking social support in response to emotional expression, with it being more acceptable for women than for men (Cai et al., 2017; Zhao et al., 2020). Zhao et al. (2020) also propose that women may also be more likely to suspend the processing of emotion by avoidance and withdrawal, while for men, avoidance may be less likely encouraged. Further research is needed to examine the influence of gender on behavioral emotion regulation.

Developing psychometrically sound measures of emotion regulation for use in different cultural contexts is imperative, as emotion regulation plays a critical role in human adaptation to challenging life experiences (Eisenberg et al., 2000). Moreover, engaging in effective emotion regulation strategies can buffer against negative psychological outcomes and promote adaptive adjustment (Compas et al., 2001), while emotion regulation difficulties are associated with psychological disorders (e.g., Lopez & Denny, 2019; Stikkelbroek et al., 2016). As there are many approaches to the regulation of emotions (Garnefski et al., 2001), it is important that researchers and clinicians focus on differentiating, operationalizing, and measuring discrete components of emotion regulation (Garnefski et al., 2001; Kraaij & Garnefski, 2019). Our study extends the existing literature; the BERQ-PV is a reliable and valid measure of behavioral emotion regulation which, alongside the Persian Version of the Cognitive Emotion Regulation Questionnaire (Esmaeili et al., 2018), will enable researchers and clinicians to have a greater understanding as to how cognitions and behavior play a role in the regulation of emotion following stressful experiences among Persian samples. Culturally valid measures of behavioral emotion regulation are important because there are clear differences between how an individual ‘thinks’ to regulate emotions (as measured by the CERQ) and how emotions are regulated through behaviors (as measured by the BERQ) (Garnefski et al., 2001). Furthermore, culturally adapted measures are essential as there are cultural variations in emotion regulation and its association with psychological adjustment (De Vaus et al., 2018; Jobson et al., 2019; Nagulendran & Jobson, 2020). Therefore, the BERQ-PV is a psychometrically adequate measure of behavioral emotion regulation that allows researchers and clinicians to continue investigations of emotion regulation and its role in the development, maintenance, and treatment of psychopathology among Persian samples.

There are several limitations worth noting. First, we assessed study variables using only self-report measures and did not include other sources of information (e.g., clinical diagnostic interviews). Future research should use these other data collection approaches. Second, the design of our study was cross-sectional, making it impossible to draw conclusions about the causality of the relationships. Third, while strengths

of the study included the use of a broad, representative community sample, the first investigation of the psychometric properties of BERQ-PV in Iran, and the first BERQ study including both clinical and non-clinical samples, care needs to be taken when generalizing findings. Despite these limitations, the present study was the first investigation of the psychometric properties of the translated and adapted BERQ-PV for Iranian culture. The BERQ-PV may be a useful tool for researching cognitive and behavioral coping and its link to well-being or psychopathology in Iranian culture. This may be particularly helpful for directing the fundamental content of Cognitive Behavioral Therapy (Kraaij & Garnefski, 2019). On the basis of the present results, it can be concluded that the BERQ-PV is a reliable and valid measure of behavioral emotion regulation that can be used to evaluate behavioral emotion regulation strategies against stressful events in Iranian samples.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s12144-021-02010-0>.

Data Availability The datasets generated during and/or analyzed during the current study are available from the corresponding author upon request.

Declarations

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval We confirm that this study followed ethical approval.

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