# Psychometric Properties of the Persian Version of the Core Beliefs Questionnaire (CBQ)

Esmail Soltani[1] · Quincy J. J. Wong[2] · Ali Sahraian[1] · Seyed Ali Dastgheib[1] · Arash Mani[1] · Ali Shekarpoor[3] · Somayeh Bahmanpoori[4]

## Abstract

The Core Beliefs Questionnaire (CBQ) has three versions (Trait, Contingent, Other) that assess different levels of beliefs about the self. The current study translated these CBQ versions into Persian and psychometrically evaluated these measures. A student sample ($n = 289$) and a sample of individuals with depression ($n = 60$) completed the CBQ and other measures of interest. In both samples, a 17-item one-factor model emerged for all CBQ versions, and each version had good internal consistency. Good test–retest reliability of the CBQ versions was evident in the student sample. The CBQ versions had stronger associations with depression than with social anxiety in the student sample and demonstrated strong associations with depression in the sample with depression. The sample with depression had higher scores on the CBQ compared to the student sample. These findings indicate the potential of these measures in research and clinical contexts to further our understanding of core beliefs in the Iranian population.

**Keywords** Core beliefs · Self · Social anxiety disorder · Depression · Psychometric

Based on the *Diagnostic and Statistical Manual of Mental Disorders*–Fifth Edition (DSM-5; American Psychiatric Association, 2013), the main characteristic of social anxiety disorder (SAD) is a marked fear of social situations in which the individual may be scrutinized by other people. A large number of cognitive behavioral

✉ Esmail Soltani
 ssoltani65@gmail.com

[1] Research Center for Psychiatry and Behavioral Sciences, Shiraz University of Medical Sciences, Shiraz, Iran

[2] School of Psychology, Western Sydney University, Sydney, Australia

[3] Department of Clinical Psychology, Faculty of Education and Psychology, Shiraz University, Shiraz, Iran

[4] Department of Psychology, Islamic Azad University-Shiraz Branch, Shiraz, Iran

conceptualizations of SAD emphasize the role of maladaptive beliefs related to the self and social-evaluative contexts in the maintenance of SAD (Clark & Wells, 1995; Heimberg et al., 2010; Hofmann & Otto, 2008; Wong & Rapee, 2016). Therefore, scales have been designed to assess these beliefs in patients with SAD (e.g., Maladaptive Interpersonal Belief Scale, Boden et al., 2012; Social Thoughts and Beliefs Scale, Turner et al., 2003; Self-Beliefs Related to Social Anxiety, Wong & Moulds, 2011; The Report of Youth Social Cognitions, Wong et al., 2018; for a review, see Wong et al., 2016). These existing scales typically assess maladaptive beliefs about the self framed within a social-evaluative situation (e.g., "If people knew how nervous I get, they would think I was weird"; Boden et al., 2012). However, cognitive theory (Beck, 2011) highlights different levels of beliefs related to the self. In cognitive theory, core beliefs about the self reflect global, generalized, and absolute statements about the self, independent of context (including social-evaluative contexts), and are considered to be the most fundamental level of cognition. In contrast, intermediate beliefs reflect rigid context-dependent attitudes, rules, and assumptions related to the self. To capture both these levels of beliefs within cognitive theory and extend research on existing scales in the social anxiety literature, Wong et al. (2017) developed and validated three versions of the Core Beliefs Questionnaire (CBQ) in English: a 17-item Trait version (fundamental absolute beliefs about the self), a 17-item Contingent version (beliefs about the self related to a specific social-evaluative context), and a 17-item Other version (beliefs about how the self is viewed by others in social-evaluative situations in general). Given the CBQ assesses different levels of beliefs within cognitive theory in contrast to other instruments in the literature, it is critical that the CBQ is validated for use in various languages for various populations, including the Iranian population.

Wong et al. (2017) previously examined the psychometric properties of the CBQ in a clinical sample of individuals with SAD. Their exploratory factor analysis revealed one factor for all versions. Each version had excellent internal consistency (Cronbach's alphas ranged from 0.96 to 0.97). In addition, all three versions showed a positive relationship with social anxiety after controlling for depression. However, the Trait version was more related to depression than social anxiety, the Contingent version had similar correlations with depression and social anxiety, and the Other version was more related to social anxiety than depression. Total scores on each of the CBQ versions also distinguished participants with SAD from participants in a healthy control group that did not have any psychiatric disorder. Finally, the three versions of the CBQ were responsive to change as scores on each version reduced following cognitive behavior therapy for SAD (Wong et al., 2017).

Based on the reviewed literature, the Wong et al. (2017) study is the only psychometric study of the CBQ. Notably, it validated the CBQ in an English-speaking sample of individuals with SAD. However, it would be important to validate the CBQ in other languages for use with other populations, which would help facilitate further research and understanding of beliefs about the self in these groups, as well as potentially inform assessment and treatments involving beliefs about the self in these groups (e.g., cognitive behavioral therapy). Furthermore, although beliefs about the self are important in SAD, these beliefs are also important in depression (e.g., Beck, 1967; Riso et al., 2003). For example, Beck's (1967) cognitive model

of depression highlighted the importance of negative schemas, the content of which can include negative beliefs about the self, the world, and the future. Activation of these negative schemas by negative life experiences results in information processing changes in cognitive domains such as memory, attention, and interpretation, which then drive the symptoms of depression. Given the importance of beliefs about the self in depression, an extension to existing research would be to examine the CBQ in individuals with depression.

To extend the existing literature on the CBQ, this study aimed to validate a Persian version of the CBQ with two samples: (a) initially with a convenience sample of students examining factor structure via exploratory factor analysis (EFA), internal consistency, test–retest reliability, and construct validity, and (b) subsequently with a convenience sample of individuals diagnosed with depression examining factor structure via EFA, internal consistency, construct validity, and discriminative validity. EFA was chosen as the method to examine factor structure in both samples as the Persian CBQ is novel and has not been previously examined, and different factor structures may emerge for the student sample versus the sample with depression. The examination of construct validity was based on available measures administered to the two samples (social anxiety and depression measures for the student sample; depression measure only for the sample with depression). Based on previous studies (e.g., Wong et al., 2017), we predicted for the student sample that each CBQ version would have a one-factor structure, good internal consistency, and good test–retest reliability. Furthermore, we predicted that the Trait version would be more strongly related to depression than social anxiety, the Contingent version would have similar associations with social anxiety and depression, and the Other version would be more related to social anxiety than depression. For the sample with depression, we predicted that each CBQ version would have a one-factor structure and good internal consistency. We also predicted that the Trait, Contingent, and Other versions would each have positive associations with a measure of depression. Finally, we predicted that scores on the CBQ versions would be higher in the sample with depression compared to those of the student sample.

## Method

### Participants

For the student sample, 300 students of Shiraz University of Medical Sciences were recruited via a convenience sampling method in the school year 2017–2018. For the student sample, eligibility criteria were as follows: aged 18 years or older and passed at least one semester at university. There were 11 students who did not make a reasonable attempt to complete the CBQ (i.e., less than 80% items completed). As such, the final sample consisted of 289 students (44.3% female; mean age$=$21.64 years, $SD=3.23$). Notably, the demographic information provided was based on part of the entire sample, as 64 participants did not provide information about their age, and 49 participants did not provide information about gender. From the final sample, the first 30 participants who were willing to be assessed again 4 weeks after the initial

assessment were selected for the evaluation of test–retest reliability. This sample size was based on the moderate sample size requirement of at least 30 participants for the assessment of test–retest reliability (Terwee et al., 2012). Of these 30 participants, one participant subsequently declined to complete the second assessment, leaving 29 students (48.3% female; mean age = 20.85 years, $SD$ = 1.81) in the final subsample for the evaluation of test–retest reliability.

For the sample with depression, 70 individuals with major depressive disorder (MDD) were recruited via a convenience sampling method in Ebnesina and Hafez Hospital of Shiraz in 2021. For the sample with depression, eligibility criteria were as follows: aged 18 years or older, diagnosed with MDD according to psychiatrist diagnosis, and have at least fifth-school education. There were 10 patients who did not make a reasonable attempt to complete the CBQ (i.e., less than 80% items completed). As such, the final sample consisted of 60 individuals (40% female; mean age = 39.10 years, $SD$ = 12.39, mean education = 10.05, $SD$ = 3.67). Although all individuals in this sample had MDD as per the eligibility criteria, it is worthwhile to note that some had MDD with psychotic features and some had MDD with a comorbid substance use diagnosis.

## Measures

### Core Beliefs Questionnaire (CBQ)

The CBQ (Wong et al., 2017) has three versions (Trait, Contingent, Other), each with different instructions. For the Trait version, respondents are asked to state how much they believe each item (e.g., "I am unlikeable"). For the Contingent version, respondents are asked to state how much they would believe each item (e.g., "I am unlikeable") if they realized that an individual they respected had a low opinion of them as a person. For the Other version, respondents are asked to report how much they believe each item reflects what others think of them in social contexts (e.g., "Others think I am unlikeable"). The original Trait, Contingent, and Other versions of the CBQ in English each had 20 items. However, after psychometric evaluation of these CBQ versions, the final English versions each had 17 items (see Wong et al., 2017). In the current study, the original 20-item Trait, Contingent, and Other versions of the CBQ were translated. After contacting the original developers of the CBQ and obtaining the necessary permissions, each questionnaire was translated into Persian by two independent translators (first translator, one of the authors with a PhD degree in clinical psychology; second translator, an English expert who is a native speaker of the Persian language). Then a single version was developed from the two translations and was sent to another English expert, with a MSc degree in the English language and who is a native speaker of the Persian language, to be back-translated into English. Each of the translated questionnaires was then compared with the original text of each of the English CBQ versions, and the necessary modifications were made to the translated version. Following this, three psychologists who are native speakers of the Persian language with a PhD degree and MSc in psychology compared the final translated scales with the original questionnaires

and provided feedback. Based on the feedback at this stage, there were only minor changes made to the writing of specialized words. In the next step, the final Persian version of the questionnaires was administered to a preliminary sample of 20 students who were asked to read the items carefully, determine the ambiguous items, and provide feedback. Based on the feedback at this stage, only a slight change in the writing of the sentences was made. The final Persian versions of the Trait (20 items), Contingent (20 items), and Other versions (20 items) of the CBQ utilize a 6-point Likert-type scale, ranging from 1 (*strongly disbelieve*) to 6 (*strongly believe*). Higher scores indicate more confirmation of negative core beliefs related to the self.

### Social Interaction Anxiety Scale–Straightforward Items (SIAS-S)

The 17-item SIAS-S are rated on 5-point Likert scale (0 = *not at all* to 4 = *extremely*) and assesses anxiety related to social interactions (Mattick & Clarke, 1998). In the current study, a Persian version of the SIAS-S was administered only to the student sample, with higher SIAS-S scores reflecting greater social interactional anxiety. The Persian version of the SIAS-S has good reliability (e.g., Cronbach's alpha = 0.90 in current study) and validity (Tavoli et al., 2012).

### Depression Subscale of the Depression Anxiety Stress Scales (DASS)

The 21-item short form of the DASS are rated on 4-point Likert scale (0 = *Did not apply to me at all* to 3 = *Applied to me very much, or most of the time*) and assesses depression, anxiety, and stress (Lovibond & Lovibond, 1995). In the current study, a Persian version of the DASS was administered only to the student sample, and only the 7-item depression subscale (DASS-D) was used in analyses. Following Lovibond and Lovibond (1995), the DASS-D score was doubled to obtain the full DASS score equivalent, with higher DASS-D scores reflecting higher depression levels. The Persian version of the DASS has good reliability (e.g., Cronbach's alpha for DASS-D = 0.87 in current study) and validity (Samani & Jokar, 2007).

### Beck Depression Inventory–Second Edition (BDI-II)

The 21-item BDI-II are rated on 4-point Likert scale (0 = *not at all* to 3 = *severely*) and assesses the symptoms of depression. In the current study, a Persian version of the BDI-II was administered only to the sample with depression, with higher BDI-II scores reflecting higher depression levels. The Persian version of the BDI-II has good reliability (e.g., Cronbach's alpha = 0.91 in current study) and validity (Stefan-Dabson, et al., 2007).

### Procedure

This research was registered with the Ethics Committee of Shiraz University of Medical Sciences (IR.sums.med.rec.1396.s58). For the student sample, informed consent was obtained from all individual students included in the study.

Participants were then administered the measures of the study (CBQ versions, SIAS-S, DASS-D) in a randomized order. A subsample of students completed the CBQ versions again after 4 weeks for the evaluation of test–retest reliability.

For the sample with depression, informed consent was obtained from all individual patients included in the study. Participants then underwent a diagnostic interview conducted by a psychiatrist. Once eligibility was determined, individuals were administered the measures of the study (CBQ versions, BDI-II) in a randomized order.

## Data Analyses

Preliminary analyses involved the examination of CBQ item score distributions and missing data.

## Student Sample

For the analysis of factor structure, in preparation for exploratory factor analysis (EFA), item-total and inter-item relationships for items within each of the 20-item Trait, Contingent, and Other versions of the CBQ were first examined. We aimed to have parallel forms of the three versions (i.e., they would all have the same items), so performance of items was evaluated across the three versions. For each of the Trait, Contingent, and Other versions of the CBQ, following criteria used in previous research (Wong et al., 2017), it was decided that items with an item-total correlation (i.e., correlation between item score and the scale score) < 0.40 would be excluded from the scale. A low item-total correlation suggests that the item in question does not assess the target construct in a similar way to the other items. For each of the versions of the CBQ, again following criteria used in previous research (Wong et al., 2017), it was also decided that item pairs with an inter-item correlation (i.e., correlation between scores of two items) > 0.80 would be examined for potential content overlap. High content overlap would suggest redundancy (Clark & Watson, 1995), meaning that one of the items of the item pair can be excluded from the scale. Subsequent to this initial review of items, parallel analysis and Velicer's minimum average partial (MAP) test (Velicer, 1976) were used to determine the number of factors to extract for the EFAs. The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity were examined to determine the suitability of the data for factor analysis. All EFAs were conducted using the principal axis factoring extraction method. For the reliability analyses, Cronbach's alpha was used to indicate internal consistency, and the intraclass correlation coefficient (ICC) was used to indicate test–retest reliability (McGraw & Wong, 1996). For the construct validity analyses, zero-order correlations were examined, and differences between the magnitude of correlations were tested for significance using Steiger's (1980) approach.

## Sample with Depression

Examination of factor structure, internal consistency, and construct validity used the same approach as that described for the student sample. For the discriminative validity analyses, *t*-tests were used to compare scores on each of the CBQ versions between the student sample and the sample with depression.

# Results

## Preliminary Analyses

In the student sample and the sample with depression, all 60 CBQ items across Trait, Contingent, and Other versions had acceptable levels of skew (all absolute skewness < 3) and kurtosis (all absolute kurtosis < 10). The only exceptions were item 20 ("I'm defective") of the Trait and Contingent versions in the student sample, although values were just over recommended cut-offs (i.e., absolute skewness = 3.05 and 3.07; absolute kurtosis = 10.22 and 10.54, respectively). In the student sample ($N = 289$), there was no missing data on any of the main measures. In the sample with depression ($N = 60$), there were 98 missing data points out of 4,320 possible (97.73% completion rate). Little's missing completely at random (MCAR) test was not significant, $\chi^2(2137) = 1724.97$, $p = 1.00$, indicating the missing data were MCAR. Given the small amount of missing data and the MCAR result, missing data in the sample with depression were imputed with the expectation–maximization algorithm, a method used to obtain maximum likelihood estimates (Schafer & Graham, 2002).

## Student Sample Analyses

### Item-Total and Inter-item Relationships

All item-total correlations across the Trait, Contingent, and Other versions were ≥ 0.40 (item-total correlations ranged from 0.46 to 0.87), except item 13 on the Trait version ("I'm odd/peculiar," item-total correlation = 0.32). As a result, item 13 was removed from all three CBQ versions. Examination of inter-item correlations revealed that only two item pairs on the Trait version (items 5 and 6 correlated 0.80; items 17 and 18 correlated 0.81), one item pair in the Contingent version (items 17 and 18 correlated 0.85), and one item pair in the Other version (items 17 and 18 correlated 0.87) had high correlations. After examining the content of these item pairs, a decision was made to drop two items from each of the three versions of the CBQ because of similar content (item 6, "I am boring" for Trait and Contingent versions/ "Others think I am boring" for Other version; item 17, "I am undesirable" for Trait and Contingent versions/ "Others think I am

undesirable" for Other version). Overall, 17 items remained for each of the three versions of the CBQ.

## Factor Structure

For the 17 item versions of the CBQ, the MAP test indicated one factor should be extracted for the Trait and Contingent versions, whereas two factors should be extracted for the Other version. Parallel analysis indicated one factor should be extracted for each of the Trait, Contingent, and Other versions. Considering these results on balance (across all versions, five of the tests indicated one factor, and one of the tests indicated two factors), and the principle of parsimony for the ease of interpretation (Fabrigar et al., 1999), a one-factor model was chosen for all CBQ versions. For the EFAs specifying one factor for each 17-item CBQ version, the KMO for the Trait, Contingent, and Other versions of the CBQ were 0.94, 0.96, and 0.95, respectively, all of which were above the suggested minimum of 0.60. Bartlett's test of sphericity was significant for the Trait, Contingent, and Other versions of the CBQ (Trait, $\chi^2(136) = 3395.45$, $p < 0.001$; Contingent, $\chi^2(136) = 3998.18$, $p < 0.001$; Other, $\chi^2(136) = 4377.31$, $p < 0.001$). These results indicated the suitability of the data for factor analysis. The one-factor solution explained 55.12% of the variation in scores on the Trait version, 61.61% of the variation in scores on the Contingent version, and 62.59% of the variation in scores on the Other version. Factor loadings for the final 17-item versions of the CBQ are presented in Table 1, and all factor loadings were greater than the 0.40 minimum required. The remainder of the analyses used these 17-item versions.

## Reliability

The Cronbach's alphas for the Trait, Contingent, and Other versions of the CBQ were 0.94, 0.96, and 0.96, respectively. For test–retest reliability, of the 30 students invited to complete the CBQ versions again 4 weeks after the initial administration, 29 students completed the questionnaires and were included in the analysis. The Trait, Contingent, and Other versions of the CBQ had ICCs of 0.92, 0.71, and 0.81, respectively, all of which were above the recommended minimum ICC of 0.70 (Terwee et al., 2007) indicating satisfactory levels of temporal stability for all three versions.

## Construct Validity

As shown in Table 2, each CBQ version had significant positive correlations with social anxiety and depression levels. Tests of the difference between the correlations showed that the Trait, Contingent, and Other versions each had significantly larger positive correlations with depression than with social anxiety (all |zs|> 2.68, all $p$s < 0.007).

**Table 1** EFA factor loadings for the three versions of the CBQ in the student and clinical samples

| Original item number | Trait | Factor loading student sample | Factor loading clinical sample | Contingent | Factor loading student sample | Factor loading clinical sample | Other | Factor loading student sample | Factor loading clinical sample |
|---|---|---|---|---|---|---|---|---|---|
| 1 | I am unlikeable | .649 | .614 | I am unlikeable | .676 | .685 | Others think I am unlikeable | .712 | .805 |
| 2 | I am foolish | .651 | .770 | I am foolish | .741 | .888 | Others think I am foolish | .776 | .834 |
| 3 | I am inadequate | .797 | .821 | I am inadequate | .861 | .871 | Others think I am inadequate | .845 | .853 |
| 4 | I am inferior | .731 | .758 | I am inferior | .769 | .793 | Others think I am inferior | .781 | .756 |
| 5 | I am uninteresting | .676 | .671 | I am uninteresting | .746 | .743 | Others think I am uninteresting | .756 | .829 |
| 7 | I am dumb/stupid | .680 | .813 | I am dumb/stupid | .727 | .813 | Others think I am dumb/stupid | .712 | .780 |
| 8 | I am a weak person | .783 | .768 | I am a weak person | .781 | .796 | Others think I am a weak person | .785 | .789 |
| 9 | I am incompetent | .768 | .695 | I am incompetent | .846 | .663 | Others think I am incompetent | .801 | .796 |
| 10 | I am unacceptable | .747 | .709 | I am unacceptable | .859 | .786 | Others think I am unacceptable | .798 | .648 |

**Table 1**  (continued)

| Original item number | Trait | Factor loading student sample | Factor loading clinical sample | Contingent | Factor loading student sample | Factor loading clinical sample | Other | Factor loading student sample | Factor loading clinical sample |
|---|---|---|---|---|---|---|---|---|---|
| 11 | I am not a worthwhile person | .809 | .692 | I am not a worthwhile person | .814 | .750 | Others think I am not a worthwhile person | .840 | .856 |
| 12 | I'm a weird person | .440 | .539 | I'm a weird person | .491 | .662 | Others think I'm a weird person | .561 | .720 |
| 14 | I'm unimportant | .832 | .804 | I'm unimportant | .763 | .727 | Others think I'm unimportant | .848 | .841 |
| 15 | I'm physically unattractive | .633 | .560 | I'm physically unattractive | .707 | .716 | Others think I'm physically unattractive | .739 | .595 |
| 16 | I am inept | .787 | .803 | I am inept | .790 | .712 | Others think I am inept | .822 | .868 |
| 18 | I am unlovable | .760 | .795 | I am unlovable | .836 | .785 | Others think I am unlovable | .818 | .730 |
| 19 | I am a failure | .779 | .689 | I am a failure | .846 | .738 | Others think I am a failure | .825 | .667 |
| 20 | I'm defective | .693 | .587 | I'm defective | .760 | .692 | Others think I'm defective | .737 | .630 |

*Note.* Each version of the CBQ originally had 20 items. The final versions of the CBQ as shown in the table each have 17 items

**Table 2** Construct validity of the CBQ in the student and clinical samples

| Variables | BDI-II | SIAS-S | DASS-D | $z$ | $p$ |
|---|---|---|---|---|---|
| Student sample | | | | | |
| CBQ Trait | - | .528** | .651** | 2.85[a] | .004 |
| CBQ Contingent | - | .507** | .626** | 2.68[a] | .007 |
| CBQ Other | - | .448** | .578** | 2.77[a] | .006 |
| Clinical sample | | | | | |
| CBQ Trait | .668** | - | - | | |
| CBQ Contingent | .638** | - | - | | |
| CBQ Other | .582** | - | - | | |

*Note*. Results presented are based on the final 17-item versions of the CBQ. *CBQ* Core Beliefs Questionnaire, *BDI-II* Beck Depression Inventory–Second Edition, *SIAS-S* Social Interaction Anxiety Scale–Straightforward items, *DASS-D* Depression Anxiety Stress Scales–Depression subscale

[a]$z$ statistic comparing magnitude of CBQ correlation with SIAS-S and magnitude of CBQ correlation with DASS-D

**$p < .01$

## Sample with Depression Analyses

### Factor Structure

For each of the 17-item Trait, Contingent, and Other CBQ versions validated in the student sample, both the MAP test and parallel analysis indicated extraction of one factor in the sample with depression. For the EFAs specifying one factor for each CBQ version, the KMO for the Trait, Contingent, and Other versions of the CBQ were 0.85, 0.84, and 0.88, respectively, all of which were above the suggested minimum of 0.60. Bartlett's test of sphericity was significant for the Trait, Contingent, and Other versions of the CBQ (Trait, $\chi^2(136) = 796.93$, $p < 0.001$; Contingent, $\chi^2(136) = 945.31$, $p < 0.001$; Other, $\chi^2(136) = 942.53$, $p < 0.001$). These results indicated the suitability of the data for factor analysis. The one-factor solution explained 54.05% of the variation in scores on the Trait version, 59.69% of the variation in scores on the Contingent version, and 61.40% the variation in scores on the Other version. Factor loadings are shown in Table 1, and all factor loadings were greater than the 0.40 minimum required.

### Reliability

The Cronbach's alphas for the Trait, Contingent, and Other versions of the CBQ were 0.95, 0.96 and 0.96, respectively.

**Construct Validity**

Table 2 shows that each CBQ version had significant positive correlations with depression levels.

**Discriminative Validity**

Table 3 shows the descriptive statistics for the measures of this study for the student sample and the sample with depression. Relative to the student sample, the sample with depression had higher scores on all three versions of the CBQ (all |$ts$|> 5.11, all $p$s < 0.001).

## Discussion

The goal of the present research was to psychometrically evaluate a Persian CBQ composed of Trait, Contingent, and Other versions in two Iranian samples. As predicted in the student sample, a one-factor structure emerged for each CBQ version, with each version composed of 17-items. Each CBQ version also had good internal consistency and good test–retest reliability consistent with predictions. In contrast to predictions, the Trait, Contingent, and Other versions of the CBQ each had significantly larger positive correlations with depression than with social anxiety. For the sample with depression, a one-factor solution again emerged for each CBQ version, as predicted. Each CBQ version had good internal consistency and also positive associations with a measure of depression in line with predictions. Finally, as expected, the sample with depression had higher scores on each CBQ version relative to the student sample.

The factor analysis results in both samples of this study are consistent with those of the original developers of the CBQ (Wong et al., 2017) who also found a 17-item

**Table 3** Descriptive statistics for the main measures for the student and clinical samples

| Variable | Range | Student sample M (SD) | Clinical sample M (SD) | t | p | d |
|---|---|---|---|---|---|---|
| CBQ Trait | 17–102 | 27.98 (12.76) | 47.33 (22.75) | 9.13[a] | < .001 | 1.05 |
| CBQ Contingent | 17–102 | 27.37 (13.17) | 48.62 (24.56) | 9.54[a] | < .001 | 1.08 |
| CBQ Other | 17–102 | 31.98 (16.78) | 45.26 (24.45) | 5.11[a] | < .001 | 0.63 |
| BDI-II | 0–63 | - | 27.94 (14.43) | | | |
| SIAS-S | 0–68 | 18.19 (12.26) | - | | | |
| DASS-D | 0–42 | 8.86 (7.82) | - | | | |

*Note*. Descriptive statistics of the three versions of the CBQ are based on the final 17-item versions. *CBQ* Core Beliefs Questionnaire, *BDI-II* Beck Depression Inventory–Second Edition, *SIAS-S* Social Interaction Anxiety Scale–Straightforward items, *DASS-D* Depression Anxiety Stress Scales–Depression subscale

[a]*t*-test comparing CBQ scores between student and clinical samples

one-factor model for each of the Trait, Contingent, and Other versions of the CBQ in an English-speaking sample diagnosed with SAD. Indeed, the original CBQ versions and the Persian CBQ versions contain the exact same items (i.e., items 6, 13, and 17 were deleted in the Persian versions, consistent with the original versions). It is noteworthy that the one-factor model for each of the CBQ versions in the current study was based on the MAP test and parallel analysis results, where there was some disagreement in the number of factors to extract. All tests indicated extraction of one factor, except for the MAP test for the Other CBQ version which indicated extraction of two factors. One potential explanation for these results is that the MAP test and parallel analysis can produce different results (O'Connor, 2000), with some simulation studies suggesting that parallel analysis is more accurate than the MAP test in determining the number of factors to extract (e.g., Velicer et al., 2000). Hence, it is recommended that factor solutions are based on the weighting of evidence from both tests as well as theoretical considerations (e.g., principal of parsimony; interpretability of factors extracted; O'Connor, 2000; Velicer et al., 2000), consistent with our approach in the current study. Overall, our factor analysis results suggest that the 17-item one-factor model for each CBQ version found in previous research (Wong et al., 2017) can be extended to Iranian samples, in particular student samples as well as samples with depression. The results also suggest that underlying the various negative beliefs about the self captured by each CBQ version is a unidimensional structure.

The satisfactory internal consistency results of each CBQ version in both samples of this study are in line with the original developers of the CBQ (Wong et al., 2017) who found similarly high internal consistencies for the CBQ versions in English (i.e., Cronbach's alphas ranged from 0.96 to 0.97). Importantly, the original developers of the CBQ did not examine test–retest reliability, and this study extends previous literature by showing that in a student sample, the Persian CBQ composed of Trait, Contingent, and Other versions has good test–retest reliability over a 4-week period.

The results regarding the construct validity of the CBQ in the student sample were unexpected. The original developers of the CBQ (Wong et al., 2017) found that the Trait, Contingent, and Other versions each had different relationships with social anxiety and depression in a sample of individuals with SAD (Trait is more related to depression than social anxiety; Contingent had similar associations with depression and social anxiety; Other is more related to social anxiety than depression), but the current study found each CBQ version were more strongly associated with depression than with social anxiety. The difference in results may be due to methodological differences between Wong et al. (2017) and the current study (e.g., English versus Persian CBQ, sample from Australian versus sample from Iran, sample diagnosed with SAD versus student sample), and future research may be able to systematically test these potential factors to explain the discrepant results. The Trait, Contingent, and Other versions of the CBQ in the sample with depression of this study also showed positive associations with depression. Unfortunately, the sample with depression was not administered a measure of social anxiety to allow further tests to clarify the associations of the CBQ versions with depression and social anxiety. Nonetheless, the positive

associations of the CBQ versions with depression in the sample with depression are consistent with cognitive theory and previous research (e.g., Osmo et al., 2018; Riso et al., 2003). These associations also provide initial evidence of construct validity of the Persian CBQ versions in an Iranian sample with depression.

The other key result of the current study was that the sample with depression had higher scores on each CBQ version compared to the student sample. This result is in line with the original psychometric evaluation of the CBQ in English (Wong et al., 2017) which showed a clinical sample of individuals with SAD scored higher on each CBQ version compared to a healthy control group. This result is also again consistent with cognitive theory and previous research (e.g., Riso et al., 2003). Importantly, the CBQ score difference between the student sample and the sample with depression in this study extends evidence of discriminative validity of the CBQ to the Persian version.

There are several key implications of this study. The psychometric properties demonstrated provide initial evidence for the use of the Persian CBQ in the Iranian population. The Persian CBQ may be useful in contexts requiring the assessment of core and intermediate beliefs about the self, including research and clinical contexts. Of course, future evaluations of the Persian CBQ in these contexts will provide further evidence to determine its specific utility. The current study also highlights the importance of translations of assessment tools within the field of psychopathology. Without such translations, our understanding of key constructs in psychopathology is limited to the cultures within which psychometrically validated assessment tools exist.

Limitations of this study should be considered. First, this study evaluated a limited number of psychometric properties of the Persian CBQ versions. Additional evaluation (e.g., confirmatory factor analysis, tests of incremental validity, further tests of construct validity) will provide further psychometric information on the Persian CBQ versions. Second, diagnoses were not obtained for the student sample, and the proportion of individuals in this sample meeting criteria for mental disorders is not known. Third, as mentioned, the sample with depression was only administered the CBQ versions and BDI-II, which limited the tests of construct validity that could be conducted with this sample. Fourth, the sample size of the sample with depression was relatively small, especially considering the EFA conducted. Although there is evidence that EFA can be conducted with small samples (e.g., de Winter et al., 2009), future studies should endeavor to recruit larger samples with depression for future psychometric evaluations of the CBQ. Fifth, our sample with depression had MDD as the main diagnosis and did not have a broad variety of mental disorders, limiting generalizability to clinical populations. Future research could also examine the CBQ in heterogeneous clinical samples.

In conclusion, the current study has demonstrated that the Persian CBQ has good psychometric properties in two Iranian samples. This provides initial evidence justifying the future use of the Persian CBQ. Further research using the Persian CBQ will help to improve our understanding of core and intermediate beliefs about the self and their role in psychopathology in the Iranian population and the clinical contexts in which to use the Persian CBQ.

## Declarations

**Ethical Approval**  This research was registered with IR.sums.med.rec.1396.s58 code by the Ethics Committee of the Shiraz University of Medical Sciences.

**Informed Consent**  Informed consent was obtained from all individual participants included in the study.

**Conflict of Interest**  The authors declare no competing interests.

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