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A Validity and Reliability Study on the Persian Version of the Core Beliefs Inventory (CBI)

Mahdieh Barzegari-Soltan-Ahmadi[1] (MSc), Hamid Yaghubi[1] (PhD), Mohammad Gholami-Fesharaki[2] (PhD)

1. Department of Clinical Psychology, Faculty of Humanities, Shahed University, Tehran, Iran
2. Department of Biostatistics, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran

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Corresponding Author:
Hamid Yaghubi,
Department of Clinical Psychology,
Faculty of Humanities,
Shahed University,
Tehran,
Iran
E-mail: yaghubi@shahed.ac.ir

Abstract

Introduction: Trauma may have psychopathological effects, but also improvements that are considered beneficial (i.e., posttraumatic growth). An influence on people's beliefs is needed for significant progress to occur, and can be calculated by the Core Beliefs Inventory (CBI).
The aim of the present study was to examine the validity and reliability of the Persian version of the CBI.
Method: In a cross-section study, the Persian version of the CBI was submitted to 211 university students in the year 2021. Confirmatory Factor Analysis (CFA), reliability and predictive validity were used for the psychometric properties. For evaluating the predictive validity, the Posttraumatic Growth Inventory (PTGI) was used. The SPSS version 21, AMOS version 18 and PLS version 2 were also used to analyze the data.
Results: Cronbach's alpha and composite reliability for CBI were 0.84 and 0.94 respectively. The CFA (RMSEA=0.026, relative Chi–square =1.77, GFI=0.962, AGFI=0.918) showed adequate construct validity of the CBI. More results also showed that the CBI score significantly predicted the of PTGI score ($r=0.25$, $p<0.001$) and good convergent validity (AVE=0.61).
Conclusion: The results of the research revealed the validity and reliability of the Persian version of the CBI questioner at a very desirable level, thus making it a valid and reliable instrument in evaluating the core beliefs.

Keywords: Core Beliefs Inventory (CBI), Validity, Reliability, Psychometric Properties

Introduction

Most people experience a traumatic event in their life such as significant injury, serious illness, physical or sexual violence, or the loss of a loved one [1, 2]. Affected individuals may suffer from various post-event stress symptoms such as fear, anxiety, grief, sadness, frustrations, anger, pain, cardiovascular problems, sleep problems and fatigue [3, 4]. Although experiencing a traumatic event can have negative effects on a person's mental health, there is growing research evidence that negative and traumatic life events do not necessarily have lasting negative effects and can sometimes have positive consequences. [5]. These positive outcomes have been studied in various studies with terms such as benefit finding, stress related growth, thriving and self-renewal but most researchers are more inclined to use the term Post-Traumatic Growth (PTG) to describe such positive changes. PTG is defined as the positive changes that individuals experience as a result of their cognitive efforts to cope with challenging and stressful situations, during which a person's psychological function grows [6, 7].
One of the important factors for PTG is the occurrence of events that present a challenge to the core beliefs that comprise the person's assumptive world [8]. Core beliefs are

defined as a "general set of beliefs a person has about the universe, how it works, and the individual's place in it" [10]. When highly traumatic situations occur and the person is driven to reexamine core beliefs, the emotional processing involved in coping with this challenge to existing beliefs is what makes it possible to recognize positive changes and experience PTG [11-13].

The Core Beliefs Inventory (CBI) was developed to measure the extent to which core beliefs were disrupted after a traumatic event in 2010 [14]. It is a self-report scale with nine items with a six-point scale ranging from ''not at all'' (0) to ''a very great degree'' (5) focusing on religious and spiritual beliefs, human nature, relationships with other people, meaning of life, and personal strengths and weaknesses. A study (describing the development of this instrument) indicated that the internal reliability was good (αtime1=.82; αtime2=.87) and the test-retest reliability was acceptable (r=.69) [14]. Findings from studies using CBI confirm the theoretical model of post-traumatic growth [14-16] and it has been translated into Portuguese and Polish and its psychometric properties have been reported as desirable [17, 18]. However, this scale has not been translated into Persian and its psychometric properties have not been studied in this culture.

Therefore, this study has been carried out with the aim to study the validity and reliability of the Persian version of the CBI.

Method

Initially, a translation into Persian was carried out by four independent translators trained in the field of psychology. After an agreement was reached between the translators, a final version was prepared, which in turn was translated into English by a Persian-English translator. The comparison between the two versions was performed again by the four researchers and, after agreement between the parties, the Persian version of the CBI was constructed. Then, a pilot analysis was performed with a small number of students (n=17) in separate groups to adapt the CBI to the Persian version.

This cross-sectional study was done in Shahed University in 2021 and the sample of this study was 250 students of this university who had experienced traumatic events in the last three years which were selected by convenience sampling method and questionnaires were sent to them using Google form. The sample size was considered as sufficient with regards to the fact that 20 case were considered for each question 9×20=180 [19]. Also, as the researchers wanted to be sure about optimal sample size, 250 questionnaires were distributed. The inclusion criteria of this study included the occurrence of the traumatic event in the last three years and absence of mental disorders. From among the 250 participants, some were excluded from the study because they did not report the date of the event, about an event that occurred more than three years ago, or suffered from mental disorders and 211 questionnaires entered in the final analysis.

The SPSS version 21, AMOS version 18 and PLS version 2 were used to analysis the data. Descriptive and analytic statistics was used. Numeric data were shown as mean and SD and categorical variables data were shown as number and percentage. For statistical analysis, CFA and correlation were used. A P-value less than 0.05 has been considered as significantly different.

The tools used in this study were as follows:

Demographic Information: Demographic questions assessed age, gender, education, field, mental disorder, and traumatic event information such as the nature of the traumatic event and when the traumatic event occurred.

Posttraumatic Growth Inventory (PTGI): The PTGI is a 21-item scale assessing possible positive changes that emerge after traumatic experiences [20]. Items in this self-administered questionnaire were rated on a six-point Likert scale (0 = "I did not experience this change as a result of my crisis", 5 = "I experienced this change to a very great degree as a result of my crisis"). Thus, the total score can range from 0 to 105, with higher scores indicating greater posttraumatic growth.

The original version comprises the following factors: new possibilities, relationship with others, personal strength, spiritual change and appreciation of life. The development study reported adequate internal validity (α = 0.90) and reliability with the test-retest method (r = 0.71). The five factors explained 55% of the variance. Before filling in the PTGI, respondents were asked to answer to the following questions as well: "Think of the most negative experience/trauma that happened to you in the past five years". According to a study in Iran [21], the validity of this scale were observed using CFA and the reliability was observed using Cronbach's α (α =0.92). In this study, the participants read the text about the aim of the study and they were assured of their privacy.

Core Beliefs Inventory (CBI): The CBI is a self-report scale with a nine-item with six-point scale ranging from ''not at all'' (0) to ''a very great degree'' (5) focusing on religious and spiritual beliefs, human nature, relationships with other people, meaning of life, and personal strengths and weaknesses [14].

The respondents are instructed to select the most striking and difficult event of his life and to consider the impact this event had on individuals. The scores range from 0 to 45, with higher scores indicating a greater tendency to challenge one's core beliefs. The CBI has demonstrated good reliability and validity [14] and the Portuguese version of the CBI reported a Cronbach's alpha of 0.85 to 0.88 for the total scale [22].

To assess the construct validity, we performed the CFA using asymptotically distribution-free method estimation. It was evaluated by fit indices of Chi-square statistic, Goodness Fit Index (GFI>0.9), Adjusted Goodness Fit Index (AGFI>0.9), the Root Mean Square Error of Approximation (RMSEA<0.05) and relative chi square (Chi –square /DF<2) [23, 24].

To explore the predictive validity and convergent validity, we carried out the Pearson correlation analysis and Average Variance Extracted (AVE). The predictive validity was also evaluated with respect to the PTGI [26]. In this study, to evaluate the reliability, the Cronbach's alpha and Composite Reliability [26, 27] were used. The missing data has been estimated by the regression method. The SPSS

version 23, AMOS version 22 and PLS version 2 were used to analysis the data.

Results

In general, a total sample of 211 individuals with mean ± SD of age was 23.2 ± 9.4 including 19 males (9%) and 192 females (91%) who were recruited in the study. The 158 (75%) participants were undergraduate students and 53 (25%) were postgraduate or PhD students. Stressful events reported included death of a close relative/friend (24%), serious relationship issues (29%), serious medical issues (18%), motor vehicle accidents (7%), school problems, typically involving academic probations and suspensions (15%) and a variety of other events (7%). The time since the stressful event ranged from two month to 36 months.

The mean ± SD of CBI total score was 28.95±8.36. The correlation between the CBI questions was reported in Table 1. The CFA was also conducted to assess the factorial structure of the CBI questionnaire and the results were reported in Figure1. The RMSEA=0.026 (<0.0.5), relative Chi–square =1.77 (<2), GFI=0.962 (>0.9), and AGFI=0.918 (>0.9) indicated excellent goodness of fit results for this data. More results also showed that the CBI score significantly predicted the PTGI score (r=0.25, p<0.001) and good convergent validity (AVE=0.61). The reliability of CBI according using Cronbach's alpha and composite reliability index were 0.84 and 0.94, respectively.

Table1. The Correlation between CBI Questions

	CBI1	CBI2	CBI3	CBI4	CBI5	CBI6	CBI7	CBI8	CBI9
CBI1	1.00								
CBI2	0.59	1.00							
CBI3	0.36	0.45	1.00						
CBI4	0.44	0.40	0.59	1.00					
CBI5	0.21	0.27	0.46	0.37	1.00				
CBI6	0.29	0.32	0.42	0.46	0.66	1.00			
CBI7	0.33	0.37	0.46	0.44	0.49	0.64	1.00		
CBI8	0.14	0.20	0.24	0.19	0.22	0.35	0.46	1.00	
CBI9	0.26	0.26	0.46	0.42	0.57	0.58	0.51	0.36	1.00
Mean	2.77	2.98	3.2	3.3	3.48	3.6	3.6	2.73	3.28
SD	1.46	1.37	1.36	1.34	1.31	1.28	1.24	1.65	1.38

Table 2. Factor Loadings in Addition Corrected Item Total Correlation of CBI

Q	Title	Item Factor	Corrected item total correlation
1	Because of the event, I seriously examined the degree to which I believe things that happen to people are fair.	0.39	0.62
2	Because of the event, I seriously examined the degree to which I believe things that happen to people are controllable.	0.45	0.75
3	Because of the event, I seriously examined my assumptions concerning why other people think and behave the way that they do.	0.66	0.69
4	Because of the event, I seriously examined my beliefs about my relationships with other people.	0.57	0.76
5	Because of the event, I seriously examined my beliefs about my own abilities, strengths and weaknesses.	0.74	0.74
6	Because of the event, I seriously examined my beliefs about my expectations for my future.	0.85	0.73
7	Because of the event, I seriously examined my beliefs about the meaning of my life.	0.73	0.72
8	Because of the event, I seriously examined my spiritual or religious beliefs.	0.37	0.76
9	Because of the event, I seriously examined my beliefs about my own value or worth as a person.	0.69	0.69

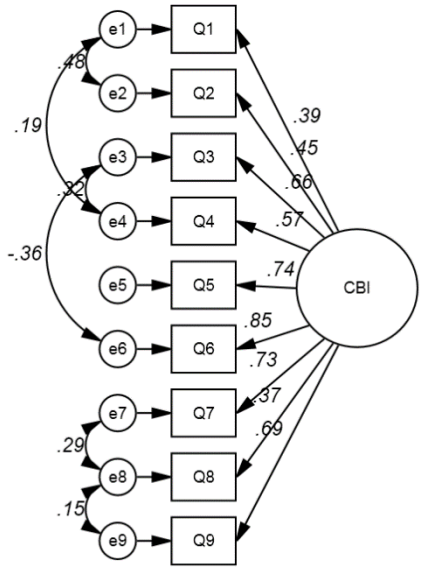

Figure 1. Standard factor load of CFA.

Discussion

The disruption of core belief has been considered as a decisive factor in the initiation of the posttraumatic growth process because it can induce an individual to revise an event, change their beliefs, and present a new meaning to the trauma but the extent of this disruption had never been measured before the development of CBI. The core beliefs inventory is designed to assess the individual's examination of core beliefs in the aftermath of a traumatic experience.

This study is the first validation study of the Persian version of CBI (PCBI). The mean and standard deviation of the CBI in this study's sample were higher than the values reported in the main instrument validation article [15] and was also higher than those reported in other studies [16,17, 28].

The CFA of PCFI showed an excellent goodness fit index (RMSEA=0.02, relative Chi–square =1.77, GFI=0.96, AGFI=0.91). The RMSEA=0.026 (<0.05), relative Chi–

square =1.77 (<2), GFI=0.96 (>0.9), and AGFI=0.91 (0.9) indicated excellent goodness of fit results for this data.
Adequate internal consistency was found for the global scale, with Cronbach's α = 0.84, similar to the one found in the normative study also involving a university population [14, 17, 21].
The statistical analysis findings did not contribute to the exclusion of any component, as all items displayed satisfactory factor loads for inclusion in the single factor model. Therefore, after the occurrence of a traumatic incident, there is no rationale to accept a model of more than one factor to measure the shaking of the convictions of an individual (the key object of the CBI). The correlations between the CBI and PTGI, which evaluates posttraumatic development, investigated predictive validity. Significant associations were observed between CBI and posttraumatic growth interventions of greater severity, as in the standard initial research [14, 17].
Associations between these variables were also found in other studies conducted with other populations [16, 30].
According to this study, the Persian version of the CBI has good reliability and validity indicators, and is a valid instrument for the Iranian population and can contribute to a deeper understanding of the phenomena of post-traumatic development. However, some limitations must be considered when analyzing the results of this study. For example, some characteristics of the sample are present that restrict the understanding of core beliefs challenges to a predominantly female, young, urban and highly educated sample. Another important limitation was the fact that the sample was not clinical, with a limited number of participants scoring above clinical thresholds in the concurrent measures applied. Future study into the CBI's psychometric properties should concentrate on clinical groups of varying levels of schooling. Furthermore, additional analyses (test-retest, divergent validity) might benefit the CBI's psychometric properties. Also, the Covid-19 pandemic has already affected the world, and this pandemic can be considered as a trauma in some people. Ojiaku, Iorfa, Mefoh, Ezeuzo, Odinko have recommended that psychological well-being in the COVID-19 era should be prioritized and considered by governments and other stakeholder [31]. It seems that understanding the underlying mechanisms of post-traumatic growth and standardizing the Persian version of existing instruments in this field and improving these instruments in future research can help achieve this goal.

Conclusion

The results of the research revealed the validity and reliability of the PCBI at a very desirable level, thus making it a valid and reliable instrument in evaluating the core beliefs.

Conflict of Interest

The authors have no funding or conflicts of interest to disclose.

Ethical Approval

The Ethics Committee of Shahed University approved the protocol of the study (approval no. IR.SHAHED.REC.1400.043).

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