



Beck Depression Inventory: Establishing the Reliability and Validity of the Kurdish Version Among Earthquake Survivors of Kermanshah, Iran

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Abstract

Background: Because of the dramatic rise in mental disorders after Kermanshah earthquake among earthquake survivors of all age groups, paying attention to the mental health of survivors and identifying their mental disorders such as depression are highly essential. Thus, there is a need for valid screening measures for the common mental conditions among the earthquake survivors.

Objectives: This study aimed to validate the Kurdish version of Beck depression inventory (BDI) among the earthquake survivors of Kermanshah.

Methods: First, the Kurdish version of BDI was prepared using the forward-backward method. Then, the prepared BDI questionnaire was distributed among 138 earthquake survivors selected through the stratified random sampling method in Javanrud and Salas cities of Iran. The reliability and internal consistency of the Kurdish version of BDI were evaluated using the test-retest correlation coefficient and intraclass correlation coefficient. Data analysis was performed using SPSS version 18.

Results: The Kurdish version of BDI had desirable internal consistency (Cronbach's alpha = 0.66 to 0.89), test-retest reliability ($r = 0.86$), intraclass correlation coefficient (ICC = 0.66) and discriminant validity among earthquake survivors with depression symptoms as the clinical samples and the control group (mean BDI = 14.43 vs. 7.76; $P \geq 0.001$).

Conclusions: This study indicated that the Kurdish version of the BDI-21 is a valid, reliable and appropriate instrument to be used as a depression screening measure among the Kurdish population of Kermanshah.

Keywords: Validity, Reliability, Kurdish Version, Beck Depression Inventory

1. Background

On November 12, 2017 at 21:48 Iran standard time an earthquake with a moment magnitude of 7.3 occurred on the Iran-Iraq border, with the Iraqi Kurdish city of Halabja, and Kurdish dominated places of Ezgeleh, Salas-e Babajani county, and Kermanshah province in Iran. This earthquake was the most destructive natural disaster in Kermanshah during recent years. According to the official toll, at least 630 people were killed (mostly in Iraq's Kurdish Halabja area and the Iranian Kurdish dominated province of Kermanshah) and more than 8,100 were injured. Some towns and villages were so badly destroyed, for example, at least 85% of houses collapsed in Salas-e Babajani and Sarpol-e Zehab, that many local inhabitants were settled in temporary tent communities (1-4). In addition to deaths, physical injuries and economic losses caused by strong earthquakes often result in serious mental health outcomes (5, 6).

Earthquake is a common natural disaster in the world, which is life-threatening, based on its severity and can impose psychological effects such as depression (7, 8). There is no doubt that because of its devastating consequences, depression in general is an important health problem among survivors. Depression is associated with increased risk of morbidity, increased risk of suicide, decreased physical, cognitive and social functioning and self-neglect (8-10). The physical symptoms of depression such as chronic joint pain, limb pain, back pain, gastrointestinal problems, tiredness, sleep disturbances, psychomotor activity changes and appetite changes can have a profound effect on the quality of life of earthquake survivors (11, 12).

There are several measures of depression, such as the Beck depression inventory (BDI), that are widely used in different countries. BDI has become a commonly used instrument in multicenter clinical trials to assess psychiatric

disorders, especially among natural disaster survivors. The BDI was developed by Beck and Steer (1986) and has been widely used in many countries both in community-based studies and in clinical studies.

2. Objectives

This study was conducted at the earthquake-stricken cities of Salas-e Babajani and Javanrud in Kermanshah province to assess the reliability and validity of the BDI among earthquake survivors.

3. Methods

The sample group of survivors was selected based on the inclusion and exclusion criteria. The inclusion criterion was survivors who were settled in the damaged cities. Survivors who had not received psychological and medical treatment for depression symptoms prior to this study, survivors aged less than 18 years old, those who were illiterate or patients with any chronic and acute diseases were excluded from the study.

The BDI was designed to assess the severity of depression among psychiatric patients. This inventory measures cognitive, affective, somatic, neuro-vegetative and endogenous aspects of depression. The self-report questionnaire is rated on a four-point scale ranging from 0 (no symptom) to 3 (severe symptom). The items were designed to assess only the severity of depression and not to reflect any particular theory of depression. The 21 symptoms and attitudes assessed by the BDI include mood, pessimism, sense of failure, self-dissatisfaction, guilt, punishment, self-dislike, self-accusation, suicidal ideas, crying, irritability, social withdrawal, indecisiveness, body image change, work difficulty, insomnia, fatigability, loss of appetite, weight loss, somatic preoccupation and loss of libido.

BDI scores are obtained by summing the ratings given by the responder for each of the 21 items. The overall depression scores range from 0 to 63 and are normally divided into four categories. Scores of 0 to 9 are considered within the normal range or asymptomatic, scores 10 to 15 indicate mild depression, scores 16 to 23 indicate moderate depression and scores 24 to 63 indicate extremely severe depression. The questionnaire is easily administered and takes about 5 - 10 minutes to complete.

In this study, the psychometric properties of the BDI were assessed in two different sample groups. Validity and reliability were studied in a group of survivors with depression symptoms as the clinical samples (N = 98) and control clients without symptoms of depression (N = 40). Management of cases based on clinical criteria such as medical history and physical and rectal examinations was performed by a psychiatrist (Ph.D). The survivors were then required

to complete the Kurdish version of the BDI. The questionnaire was self-administered, and if necessary, guidance was provided by one of the authors. The clinical samples were scheduled for six weeks after the first administration of the BDI to complete the questionnaire again. The Cronbach's alpha coefficient was used to assess the internal consistency of the BDI (13). Test-retest reliability was also assessed using the correlation coefficient derived from the analysis of variance (ANOVA) model (14).

4. Results

We evaluated the face and content validity of the questionnaire. Six psychologists from Hamraz Counseling Center of Jansrud and University of Payam-e Noor were selected using the convenience sampling method. For establishing the face validity of the questionnaire, we requested the experts to write their comments about the location of the items, correct scaling and grammatical structure of each item and the necessity of adding new items or removing any of the existing items. Regarding content validity, we requested the experts to review the questionnaire and assess each item based on four criteria, namely relevancy, clarity, simplicity and necessity. CVR was calculated based on the responses to the necessity of questions (nE) using the formula of $CVR = (nE - N/2) / (N/2)$. To determine the cut-off point for CVR, Lawshe's table was used (15). According to Lawshe, for 10 professionals, the minimum required CVR for each item is 0.62.

Content validity index (CVI) was used based on the Waltz and Bausell content validity index (16). CVI for each item was obtained by dividing the number of professionals who rated the items as compatible or fully compatible with each criterion (relevancy, clarity and simplicity) by the total number of professionals. The average value of the three criteria was used as the total CVI for each item. The minimum required CVI for each item was 0.79 (17).

The mean age of the clinical samples and control groups was 33.67 ± 7.57 and 30.04 ± 10.29 years, respectively. Most of the subjects in the clinical samples and control groups were female (54.4% and 56.7%, respectively). Survivors with depression symptoms were significantly more depressed as compared to the control patients ($P < 0.0001$).

Internal consistency of the Kurdish version of the BDI was high for all the BDI items indicating a high level of homogeneity among the items. The internal consistency shows the resulting values of Cronbach's alpha for the scale when an individual item is excluded from the analysis. Test-retest reliability was assessed in 98 patients with a six-week interval and the total scores of BDI had an ICC of 0.86 ($P < 0.001$; Table 1).

Cronbach's alpha: note that Cronbach's alpha value given for each item represents the effect of removing that

Table 1. Mean Test-Retest Score, Intraclass Correlation Coefficient and Internal Consistency for the Individual Items of the Kurdish Version of Beck Depression Inventory

BDI Items	Intraclass Correlation Coefficient (ICC) ^a	Internal Consistency ^b	Mean Test Score \pm SD	Mean Retest Score \pm SD	Mean Difference \pm SD	95% Confidence Interval	
						Lower	Upper
1	0.85	0.85	0.32 \pm 0.96	0.86 \pm 0.95	0.41 \pm 0.74	0.37	0.03
2	0.82	0.82	0.92 \pm 0.70	0.39 \pm 0.61	0.16 \pm 0.57	0.30	0.02
3	0.77	0.77	0.53 \pm 0.51	0.13 \pm 0.43	0.14 \pm 0.35	0.25	0.00
4	0.83	0.83	0.20 \pm 0.45	0.16 \pm 0.37	0.07 \pm 0.43	0.14	0.16
5	0.60	0.60	0.24 \pm 0.60	0.51 \pm 0.66	0.08 \pm 0.47	0.17	0.07
6	0.84	0.84	0.43 \pm 0.71	0.55 \pm 0.67	0.04 \pm 0.60	0.01	0.16
7	0.84	0.84	0.59 \pm 0.63	0.56 \pm 0.63	0.09 \pm 0.46	0.16	0.07
8	0.77	0.77	0.47 \pm 0.44	0.18 \pm 0.43	0.01 \pm 0.36	0.01	0.18
9	0.84	0.84	0.16 \pm 0.53	0.35 \pm 0.62	0.06 \pm 0.53	0.01	0.09
10	0.79	0.79	0.29 \pm 0.41	0.29 \pm 0.45	0.07 \pm 0.43	0.13	0.17
11	0.72	0.72	0.21 \pm 0.21	0.87 \pm 0.98	0.05 \pm 0.97	0.18	0.15
12	0.68	0.68	0.72 \pm 0.95	0.33 \pm 0.95	0.01 \pm 0.92	0.14	0.24
13	0.70	0.70	0.34 \pm 0.16	0.04 \pm 0.13	0.01 \pm 0.17	0.16	0.02
14	0.69	0.69	0.02 \pm 0.62	0.39 \pm 0.65	0.07 \pm 0.54	0.10	0.03
15	0.57	0.57	0.46 \pm 0.44	0.21 \pm 0.53	0.05 \pm 0.43	0.08	0.03
16	0.73	0.73	0.27 \pm 0.53	0.21 \pm 0.63	0.06 \pm 0.52	0.03	0.03
17	0.66	0.66	0.28 \pm 0.50	0.34 \pm 0.59	0.01 \pm 0.50	0.04	0.09
18	0.73	0.73	0.35 \pm 0.60	0.56 \pm 0.47	0.01 \pm 0.55	0.14	0.12
19	0.82	0.82	0.54 \pm 0.54	0.18 \pm 0.85	0.03 \pm 0.36	0.16	0.11
20	0.87	0.87	0.14 \pm 0.44	0.30 \pm 0.50	0.02 \pm 0.88	0.18	0.30
21	0.67	0.67	0.32 \pm 0.47	0.45 \pm 0.47	0.13 \pm 0.48	0.04	0.02
Total Score	0.86	0.86	8.02 \pm 5.82	7.37 \pm 5.69	0.41 \pm 4.08	0.37	0.37

^a P < 0.001 for all confident correlation.^b P < 0.001 for all confident correlation.

item from the calculation of the alpha value.

The result of the discriminant validity between the clinical and control groups is shown in Table 2. We noted significant differences between the two groups in the total scores of BDI. The clinical samples group were more depressed (mean BDI = 14.43) than the control group (mean BDI = 7.76) who were asymptomatic (Table 2).

5. Discussion

The present study aimed to explore the reliability and validity of the Kurdish version of the BDI among Kurdish earthquake survivors. The questionnaire demonstrated good internal consistency and construct validity in this population group. All the correlations of the BDI with the other measures that are conceptually related to depression were significantly positive. These correlations provide strong evidence for the BDI's construct validity among the Kurdish earthquake survivors sample. Considering that major depression is one of the most common mental disorders in earthquake survivors (18-20), there is a need for reliable and valid screening measures of depression that are based on culture and language of the people. Undoubtedly, the use of brief and psychometrically-sound depression instruments that are normalized based on the native

culture and language of a community will facilitate the detection and treatment of depression, especially among disaster survivors (21-23).

The current study provides evidence that the Kurdish version of the BDI is a reliable and valid instrument for screening depression among Kurdish earthquake survivors of Kermanshah province with depression symptoms.

However, our study had some limitations that should be recounted here. First, the sample size was relatively small, which limits the interpretation of the results and introduces the possibility of overestimating the magnitude of associations. In addition, the study findings may not be generalizable to other populations, such as psychiatric inpatients or outpatients from other medical clinics. Future studies are needed to address these limitations by recruiting a larger cohort of samples from diverse clinical settings, such as primary care, specialty clinics and inpatient units. Moreover, it will be beneficial to extend this research to other commonly used depression instruments and assess their psychometric properties in other countries in order to establish their cross-cultural validity.

Footnotes

Conflict of Interests: None declared.

Table 2. Discriminant Validity of Beck Depression Inventory Items

BDI Items	Survivors with Depression Symptoms ^a	Control ^a	Mean Difference ± SD	95% Confidence Interval		P Value
				Lower	Upper	
1	1.51 ± 0.11	0.50 ± 0.10	1.01 ± 0.15	0.70	1.31	0.0001
2	0.77 ± 0.84	0.62 ± 0.11	0.15 ± 0.14	0.12	0.42	0.0001
3	0.51 ± 0.086	0.62 ± 0.11	0.15 ± 0.13	0.11	0.40	0.26
4	0.46 ± 0.067	0.16 ± 0.052	0.30 ± 0.085	0.13	0.46	0.001
5	0.61 ± 0.061	0.48 ± 0.077	0.13 ± 0.098	0.066	0.32	0.19
6	1.15 ± 0.086	0.52 ± 0.087	0.63 ± 0.13	0.38	0.88	0.0001
7	1.02 ± 0.08	0.48 ± 0.077	0.54 ± 0.12	0.31	0.78	0.0001
8	0.28 ± 0.054	0.10 ± 0.051	0.18 ± 0.074	0.031	0.33	0.05
9	0.80 ± 0.075	0.30 ± 0.66	0.50 ± 0.11	0.28	0.71	0.0001
10	0.82 ± 0.078	0.30 ± 0.065	0.52 ± 0.11	0.30	0.74	0.0001
11	0.81 ± 0.11	0.70 ± 0.15	0.11 ± 0.19	0.26	0.48	0.56
12	0.63 ± 0.13	0.26 ± 0.11	0.37 ± 0.17	0.037	0.71	0.05
13	0.02 ± 0.018	0 ± 0	0.025 ± 0.018	0.01	0.061	0.16
14	0.67 ± 0.07	0.50 ± 0.096	0.17 ± 0.12	0.062	0.40	0.15
15	0.59 ± 0.056	0.28 ± 0.064	0.32 ± 0.085	0.15	0.48	0.0001
16	0.49 ± 0.065	0.32 ± 0.097	0.17 ± 0.11	0.25	0.69	0.0001
17	0.68 ± 0.061	0.30 ± 0.065	0.38 ± 0.093	0.20	0.57	0.0001
18	1.01 ± 0.069	0.54 ± 0.087	0.47 ± 0.11	0.25	0.69	0.0001
19	0.27 ± 0.062	0.22 ± 0.077	0.046 ± 0.099	0.15	0.24	0.64
20	0.77 ± 0.11	0.42 ± 0.099	0.035 ± 0.15	0.064	0.64	0.05
21	0.63 ± 0.055	0.64 ± 0.082	0.17 ± 0.099	0.022	0.37	0.08
Total Scores	14.43 ± 0.88	7.76 ± 0.74	6.67 ± 1.15	4.39	8.95	0.0001

^a Values are expressed as mean ± SD.

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