

Published in final edited form as:

Int J Cult Ment Health. 2010 ; 3(1): 34–42. doi:10.1080/17542860903533640.

Demographic influences and suggested cut-scores for the Beck Depression Inventory in a non-clinical Spanish speaking population from the US-Mexico border region

S. E. Dawes^{a,b}, P. Suarez^a, F. Vaida^a, T. D. Marcotte^a, J. H. Atkinson^{a,b,c}, I. Grant^{a,b}, R. Heaton^{a,b}, M. Cherner^{a,b,*}, and the HNRC group

^aHIV Neurobehavioral Research Center, Department of Psychiatry, University of California, San Diego, USA

^bDepartment of Psychiatry, University of California San Diego, San Diego, USA

^cVA San Diego Healthcare System, San Diego, USA

Abstract

The Beck Depression Inventory-I (BDI-I) is a self-report measure of depressive symptomatology that is widely used in both research and clinical settings. While the Spanish language version of the BDI-I is frequently used in the USA, there are currently no available guidelines to determine depressive symptomatology base rates in Spanish speaking populations using this instrument. In the present study, base rates of depressive symptoms and demographic influences on the BDI-I were measured in a non-clinical Spanish speaking population from the US-Mexico border region. A sample of 198 neurologically normal Spanish speaking individuals, mostly of Mexican decent, completed the BDI-I as part of a larger neuropsychological norming study. The results indicated that while there were no effects of age or education on overall BDI-I scores, those with lower education tended to report higher severity of individual symptoms. Consistent with findings in other populations, women endorsed a greater number of depressive symptoms. Therefore separate cut-scores were derived for men and women to represent these differences. Future research should assess the impact of acculturation and socioeconomic stressors on the BDI scores in this mostly immigrant population.

Keywords

depression; cross-cultural assessment; Spanish-speaking; Hispanic; score cut-points; normative

Introduction

The Beck Depression Inventory (BDI-I: Beck & Steer, 1987) is among the most widely utilized questionnaires to assess the presence and severity of self-reported depressive

© 2010 Taylor & Francis

*Corresponding author. mcherner@ucsd.edu.

Notes on contributors

Sharron Dawes, PhD, is a Postdoctoral Research Fellow at the Advanced Center for Innovation in Services and Interventions Research (ACISIR) in the Department of Psychiatry at the University of California San Diego (UCSD).

Paola Suarez, MA, is a graduate student in the Neuropsychology Track of the SDSU/UCSD Joint Doctoral Program in Clinical Psychology in San Diego, CA.

Mariana Cherner, PhD, is an Associate Professor of Psychiatry and Director of the Interdisciplinary Research Fellowship in NeuroAIDS at UCSD, as well as Chair of the International Liaison Committee of the International Neuropsychological Society.

symptomatology. Many studies (for example Beck, Steer, & Garbin, 1988; Lightfoot & Oliver, 1985) have examined the psychometric properties of the English version, finding it to be a sensitive instrument to these symptoms. English speaking samples have also been evaluated with regard to the influence of demographic variables with few significant findings. In various clinical populations, statistically significant but arguably clinically irrelevant correlations (due to low values) with the BDI-I total scores were found with age (in a mixed diagnostic sample: Beck & Steer, 1984) and gender (Emery, Steer, & Beck, 1981; Shaw, Steer, Beck, & Schut, 1979). No significant correlations have been found between education and BDI-I total scores. However, issues of cross-cultural applicability were not addressed in these findings.

Bonicatto, Dew and Soria (1998) argued that cultural influences may lead to important differences in the conceptualization and expression of depressive symptoms. Until they examined the psychometric properties of a Spanish version of the BDI-I in Argentina, only one study had explored this instrument in Spanish speakers. In Spain, Conde, Esteban and Useros (1976) assessed the reliability and validity of the Spanish version of the BDI-I, finding good internal consistency, split-half and test-retest reliability and convergent validity with a global rating of depression (Zung, 1965). The sample utilized in this study consisted of 250 normal individuals and 61 psychiatric patients, but no further information is given about the sample or the BDI-I scores for the sample.

Bonicatto, Dew and Soria (1998) endeavored to examine the psychometric properties of the Spanish BDI-I and its appropriateness for use with an Argentinean population. Their study examined the reliability, validity and factor structure of the BDI-I with a sample of 608 community dwellers from the city of La Plata, who were not in any psychiatric treatment at the time of participation. The authors concluded that the Spanish version of the BDI-I used in Argentina had acceptable levels of internal consistency and reliability and displayed a relatively homogenous item set. Moreover, they found high concurrent validity as measured by the correlation between BDI-I and the Symptom Checklist-90 as well as good construct validity as the result of a moderately strong positive correlation between the BDI-I and hopelessness. The authors concluded that this version of the BDI-I was adequate to assess self-reported depressive symptomatology in Spanish speakers.

It has been reported that Latino populations within the USA are less likely to endorse depressive symptoms than their non-Hispanic white counterparts. This lower base-rate of symptomatology has been noticed among Mexican-Americans that are immigrants to the USA, who have levels of depressed mood similar to the rates in Mexico City, rather than the significantly higher rates that are found in the USA, as measured by a structured clinical interview in a community epidemiological study (CIDI: Demyttenaere et al., 2004). A review of findings from five recent large-scale studies indicated lower rates of depressive symptoms reported in those Hispanics who had immigrated versus US-born Hispanics (Escobar, Huyos-Nervi, & Gara, 2000). Lewis-Fernandez, Das, Alfonso, Weissman and Olfson (2005) suggest that these differences in symptom reporting are due to language barriers (e.g. English as a second language); health literacy barriers (e.g. monolingual Spanish speakers being less likely to seek medical care, especially when there is no access to Spanish speaking providers); somatic presentations of major depressive disorder; and use of cultural idioms of distress (e.g. depressive symptoms described as nerves or brain-ache).

Despite the frequent use of Spanish translations of the BDI-I in clinical and research settings throughout the USA, we are not aware of any study that has assessed the influence of demographic variables on the Spanish BDI-I or the legitimacy of using cut-scores derived from the English BDI-I to determine depressive symptomatology among Spanish speakers in the USA. Only a few studies, conducted in other Spanish speaking countries, have addressed

the relevance of English cut-scores or influence of demographic variables (Bonicatto et al., 1998; Novy, Stanley, Averill, & Daza, 2001; Penley, Wiebe, & Nwosu, 2003; Suarez-Mendoza, Cardiel, Caballero-Uribe, Ortega-Soto, & Marquez-Marin, 1997). To our knowledge there are no published studies assessing the psychometric properties of the BDI-I in the USA with a healthy Hispanic population. As a result, little is known about the interpretation or manifestation of depressive symptomatology in non-patient groups of Spanish Speaking immigrants as measured by the BDI. Therefore, we aim to determine the base rates and demographic influences on reported depressive symptoms in a non-clinical sample of Spanish speakers from the US-Mexican border region. From these data we will generate cut-scores for the detection of depressive symptoms in this population to illustrate the cross-cultural influences on scores.

Methods

Subjects

The sample consisted of 198 (55% women) native Spanish speakers predominately of Mexican descent (98%) from the border regions of Arizona and California, who were recruited as part of a larger normative study of neuropsychological tests. Participants were selected on the basis of having reason to spend time in the USA on a regular basis (e.g. for work, school or place of residence). We excluded individuals with self-reported history of neurologic (e.g. seizure disorder, traumatic brain injury with loss of consciousness >30 min, cerebrovascular accident, Parkinson's disease), medical (e.g. insulin dependent diabetes, renal failure, hypertension), developmental (e.g. learning disability, mental retardation) or substance abuse problems, as well as those with history of psychosis.

In order to obtain a representative sample, efforts were made to recruit subjects into equal sized cells according to gender and pre-set age and education ranges. The resulting sample ranged in age from 19 to 55 years ($M = 36.7$, $SD = 9.68$) with educational attainment between 0 and 20 years ($M = 10.15$, $SD = 4.23$). All participants completed a consent to participate document in Spanish, according to local Institutional Review Board guidelines.

Instrument

The BDI-I is a 21-item inventory that asks respondents to identify the presence of depression symptoms experienced during the past seven days. Each item is scored on a 4-point scale of increasing severity (scored from 0 to 3), with a maximum total score of 63 points. For example, for an item targeting anhedonia, the response corresponding to the absence of the symptom (i.e. severity of 0) is 'I enjoy life as much as always,' while the highest intensity response (severity of 3) is 'Everything bores me'. The cut-points for the BDI-I Total score, as suggested by Beck and Steer (1987), are as follows: 0–9 'minimal', 10–16 'mild', 17–29 'moderate' and 30 'severe' depression. English version BDI-I items may also be divided into Cognitive and Somatic subscales made up of the sum of items 1 to 14 and 15 to 21, respectively. The Spanish version of the BDI-I was translated in 1993 by The Psychological Corporation based on the original. This version appears to be the most commonly used with Spanish speakers.

Statistical analysis

The relationship between the BDI-I scores and the demographic variables was evaluated using *t*-tests. Non-parametric percentiles and 95% bootstrap (based on 1000 samples) confidence intervals were computed for the BDI-I cut-scores, separately for men and women.

Results

Descriptive statistics for the BDI-I scores were initially calculated on the entire sample. Based on the diagnostic ranges in the BDI-I manual, results indicated that 79.3% had minimal or no symptoms, 14.6% reported mild symptoms, 5.6% reported moderate symptoms and only one person fell within the severe range. Table 1 shows the total, cognitive and somatic scores, the number of symptoms endorsed and the level of severity endorsed for each item. Table 2 indicates the percentage of respondents that endorsed each of the items (i.e. choosing a response coded >0). The five most frequently reported items; endorsed by greater than 25% of the sample, were increased guilt, loss of interest in sex, sleep problems, agitation and irritability.

We then assessed the influence of age, education and gender on the total, cognitive and somatic scores. As shown in Table 3, gender was the only demographic variable that influenced scores significantly, with the average total score for women being almost three points higher than men's. Women outscored men by two points on the cognitive scale and almost one point on the somatic scale. Women also endorsed approximately two more symptoms, but the overall level of symptom severity was similar to men's. Table 4 shows the number of men and women that fall into each of the established ranges for severity of depressive symptomatology based on the English-speaking samples in the original manual.

The only other demographic influence was between education and level of endorsement ($r = -.18, p < .05$), indicating a weak relationship between lower education and endorsement of items at a higher level. Given the influence of gender on all BDI-I scores, it was necessary to determine appropriate cut-scores for men and women separately for self-reported depressive symptomatology. Potential cut-scores (with 95% confidence intervals) are shown in Table 5 for men and women, based on the distribution of scores using a bootstrap procedure.

Discussion and conclusion

In this study, we examined the base rates of item endorsement and level of scores on the Spanish language version of the BDI in a sample of healthy participants from the US-Mexican border region. Given the results and the indicated gender differences in reported symptomatology, we show separate cut-scores based on the distribution of scores for men and women. These scores were generated to show how this healthy, non-care-seeking sample from the US-Mexican border responded to the BDI-I as a guide for deciding on clinically meaningful elevations.

Mean scores on the BDI-I in our sample were lower than those reported in the BDI-I Manual (Beck & Steer, 1987). Although it is possible that this may be due to the lack of a non-clinical sample in the manual, this is consistent with other published studies (Escobar et al., 2000) and also may be related to the cultural differences, such as somatic presentation. It was also noted that by utilizing the cut-scores provided in the original manual only 6% of participants in this sample were classified as being at least Moderately depressed (score >16). This base rate is very low for even a normal population in the USA (Pence, Miller, Whetten, Eron, & Gaynes, 2006).

In previous work, fewer than 10% of Hispanic women have been found to report depressive symptomatology at the mild level or worse, compared to 32% in white American women in the same primary care setting, with the Latinas reporting mainly somatic symptomatology (Hoppe, Leon, & Realini, 1989). The present study had similar findings. Of the women who participated, only 8% reported at least a moderate level of depressive symptomatology, based on the BDI-I manual cut-scores, with most of the items endorsed being from the Somatic rather than the Cognitive scale. Somatic symptomatology has been regarded as a

typical way in which depressive symptomatology presents in Latinas (Lewis-Fernandez et al., 2005). Alternatively, it is possible that Latinas are more prone to attending to and reporting somatic complaints that do not reflect depression specifically but, rather, indicate distress in a more general sense (e.g. in response to stress associated with socioeconomic problems, immigration, displacement etc).

The findings of Beck and Steer (1984) with regard to the lack of gender differences in depression differ from an abundance of more recent literature showing findings to the contrary (e.g. Dalgard et al., 2006; Piccinelli & Wilkinson, 2000; Salonkangas, Vaahtera, Pacriev, Sohlman, & Lehtinen, 2002). While authors agree that women endorse more depressive symptoms than men, a causal model for this difference has not been agreed upon. In their review of the literature on potential risk factors that may explain gender differences, Piccinelli and Wilkinson (2000) found that a number of determinants including adverse life events, prior depressive or anxiety disorders and social roles may explain the greater symptom endorsement by women, while genetic and biological factors seem to have little influence. Dalgard et al. (2006), in their large multinational study ($n > 8800$), found that the relationship between history of negative life events, availability of social support and depressive symptoms is similar for men and women. However, in the face of an adverse life event, women without social support were more likely to be depressed (based on BDI score cutpoints of 12 or 19) than were men under similar conditions. Salokangas et al. (2002) argue that the main factor that causes the discrepancy in gender-related scores on depression inventories is related to gender-bias in the nature of the items on the inventories: for example, it is more socially acceptable for women to indicate that they cry or feel guilty than it is for men and, therefore, they are more likely to endorse these items on the BDI-I, leading to higher scores. In the present study, we also found that gender was the main influence on the symptom reporting, with women scoring higher than men by two to three points on average, depending on the outcome.

The most frequently endorsed items in our sample overall were increased feelings of guilt, changes in sleep patterns and loss of interest in sex. These three items were endorsed by more than 30% of the respondents. This differs from previous work with a mixed-Latin American sample from the San Francisco Bay area (Azocar, Arean, Miranda, & Munoz, 2001), in which the most frequently endorsed items were feelings of punishment, tearfulness and loss of interest in one's appearance.

The lower rates of depressed mood among Latinos have also been linked to the influence of acculturation to the USA, which was not assessed in this study. We did correlate BDI scores with proportion of lifetime spent in the USA and found no relationship ($r = -0.023$). Lewis-Fernandez et al. (2005) suggest that higher acculturation is a risk factor for depressive symptomatology in Mexican-Americans coming to primary care clinics because of the adaptation to mainstream values and pressures. These added pressures include, but are not limited to, more expectations of socioeconomic gain, higher stress level related to job pressures, less reliance on family structures and changes in intergeneration relationships. An epidemiological study conducted by Burnam et al. (1987) found an increased risk of depressed mood in a non-white Hispanic sample born in the USA, and therefore considered to be more acculturated, compared to those that just immigrated and considered to be less acculturated. Other studies, however, have not shown associations between acculturation and rates of depressed mood. For example, Cuellar and Roberts (1997) showed that socioeconomic status (SES) was most influential, with lower SES increasing the likelihood of depressive symptoms being reported.

In the present study, a range of cut-points was given based on the distribution of scores. This was done to illustrate to those clinicians working with Latino immigrants the range of BDI

scores that are unusual in a non-care-seeking population and thus can help to identify those at risk for depressed mood based on the sensitivity versus specificity needs of their setting.

Our study is limited by a lack of background data to determine the impact of religious beliefs, SES and acculturation on BDI-I scores. Another significant limitation was the lack of an independent measure of depression, such as a diagnostic instrument based on the Diagnostic and Statistical Manual of Mental Disorders-IV. As such, validation of the cut-scores with an independent measure of depression is not possible in the present study; however, future research should aim to do so against another diagnostic instrument or method that has been validated for use with Spanish-speaking Hispanics from the US-Mexico border region. Nevertheless, the data generated in this study may assist those working with Spanish speaking populations, especially those of Mexican origin, to identify those at risk of depressed mood using the Spanish version of the BDI. Although Latinos currently immigrating and living in the USA come from heterogeneous backgrounds, it is imperative to recognize how their manifestations of depressive symptomatology may differ from those of the dominant culture, in order to provide appropriate mental health care.

References

- Azocar F, Arean P, Miranda J, Munoz RF. Differential item functioning in a Spanish translation of the Beck Depression Inventory. *Journal of Clinical Psychology*. 2001; 57:355–365. [PubMed: 11241365]
- Beck AT, Steer RA. Internal consistencies of the original and revised Beck Depression Inventory. *Journal of Clinical Psychology*. 1984; 40:1365–1367. [PubMed: 6511949]
- Beck, A.; Steer, RA. Beck Depression Inventory manual. San Antonio, TX: The Psychological Corporation; 1987.
- Beck AT, Steer RA, Garbin M. Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. *Clinical Psychology Review*. 1988; 8:77–110.
- Bonicatto S, Dew AM, Soria JJ. Analysis of the psychometric properties of the Spanish version of the Beck Depression Inventory in Argentina. *Psychiatry Research*. 1998; 79:277–285. [PubMed: 9704874]
- Burnam MA, Hough RL, Escobar JI, Karno M, Timbers DM, Telles CA, et al. Six-month prevalence of specific psychiatric disorders among Mexican Americans and non-Hispanic whites in Los Angeles. *Archives of General Psychiatry*. 1987; 44:687–694. [PubMed: 3498452]
- Conde N, Esteban T, Useros E. Estudio critico de la fiabilidad y validez de la E.E.C. de Beck para la medida de la depresión [Study of the reliability and validity of the Beck E.E.C. as a measures of depression]. *Archivos de Neurologia*. 1976; 39:313–338.
- Cuellar I, Roberts RE. Relations of depression, acculturation and socioeconomic status in a Latino sample. *Hispanic Journal of Behavioral Sciences*. 1997; 19:230–238.
- Dalgard OS, Dowrick C, Lehtinen V, Vazquez-Barquero JL, Casey P, Wilkinson G, et al. Negative life events, social support and gender difference in depression: A multinational community survey with data from the ODIN study. *Social Psychiatry, Psychiatry, and Epidemiology*. 2006; 41:444–451.
- Demyttenaere K, Bruffaerts R, Posada-Villa J, Gasquet I, Kovess V, Lepine JP, et al. Prevalence, severity and unmet need for treatment of mental disorders in the World Health Organization World Mental Health Surveys. *Journal of the American Medical Association*. 2004; 291:2581–2590. [PubMed: 15173149]
- Emery GD, Steer RA, Beck AT. Depression, hopelessness and suicidal intent among heroin addicts. *International Journal of the Addictions*. 1981; 16:425–429. [PubMed: 7275395]
- Escobar JI, Huyos-Nervi C, Gara MA. Immigration and mental health: Mexican Americans in the United States. *Harvard Review Psychiatry*. 2000; 8:64–72.
- Hoppe S, Leon R, Realini J. Depression and anxiety among Mexican Americans in a family health center. *Social Psychiatry & Psychiatric Epidemiology*. 1989; 24:63–68. [PubMed: 2499054]

- Lewis-Fernandez R, Das AK, Alfonso C, Weissman M, Olfson M. Depression in US Hispanics: Diagnostic and management considerations in family practice. *Journal of the American Board Family Practice*. 2005; 18:282–296.
- Lightfoot SL, Oliver JM. The Beck Inventory: Psychometric properties in university students. *Journal of Personality Assessment*. 1985; 49:434–436. [PubMed: 4045689]
- Novy DM, Stanley MA, Averill P, Daza P. Psychometric comparability of English- and Spanish-language measures of anxiety and related affective symptoms. *Psychological Assessment*. 2001; 13:347–355. [PubMed: 11556271]
- Pence BW, Miller WC, Whetten K, Eron JJ, Gaynes BN. Prevalence of DSM-IV-defined mood, anxiety and substance use disorders in an HIV clinic in the southeastern United States. *Journal of Acquired Immune Deficiency Syndromes*. 2006; 42:3, 298–306.
- Penley JA, Wiebe JS, Nwosu A. Psychometric properties of the Spanish Beck Depression Inventory-II in a medical sample. *Psychological Assessment*. 2003; 15:569–577. [PubMed: 14692850]
- Piccinelli M, Wilkinson G. Gender differences in depression: Critical review. *Behavioral Journal of Psychiatry*. 2000; 177:486–492.
- Salonkangas KR, Vaahtera K, Pacriev S, Sohlman B, Lehtinen V. Gender differences in depressive symptoms: An artifact caused by measurement instruments? *Journal of Affective Disorders*. 2002; 68:215–220. [PubMed: 12063149]
- Shaw B, Steer RA, Beck AT, Schut J. Structure of depression in heroin addicts. *British Journal of Addiction*. 1979; 74:295–303.
- Suarez-Mendoza A, Cardiel MH, Caballero-Uribe CV, Ortega-Soto HA, Marquez-Marin M. Measurement of depression in Mexican patients with rheumatoid arthritis: Validity of the Beck Depression Inventory. *Arthritis Care and Research*. 1997; 10:194–199. [PubMed: 9335631]
- Zung WW. A self-rating depression scale. *Archives of General Psychiatry*. 1965; 12:63–70. [PubMed: 14221692]

Table 1

Mean value and range of scores on the BDI-I for the total sample.

BDI-I Measure	Mean (SD)	Range
Total score	5.62 (5.94)	0-34
Cognitive scale	3.67 (4.29)	0-27
Somatic scale	2.57 (2.32)	0-14
Number of items endorsed	4.49 (4.49)	0-19
Level of symptom severity*	1.27 (0.41)	1-3

Note: *among items with score 1.

Table 2

Prevalence of depressive symptoms endorsed.

Item no	Symptom	% Endorsing
1	Sadness	21.2
2	Pessimism	13.1
3	Past failure	15.2
4	Loss of pleasure	25.8
5	Guilt	38.4
6	Punishment feelings	9.1
7	Self-dislike	12.1
8	Self-criticism	25.2
9	Suicidal ideation	11.6
10	Crying	16.1
11	Agitation	28.3
12	Loss of interest	20.2
13	Indecisiveness	26.3
14	Worthlessness	25.3
15	Loss of energy	14.6
16	Changes in sleep patterns	36.9
17	Irritability	26.8
18	Changes in appetite	15.1
19	Weight loss	10.1
20	Concern about health	25.2
21	Loss of interest in sex	31.3

Table 3

Gender differences on BDI-I scores.

BDI-I Measure	Men (n389) Mean (SD)	Women (n3109) Mean (SD)	F
Cognitive scale	2.62 (3.30)	4.52 (4.80)	10.12*
Somatic scale	2.06 (2.31)	2.92 (2.28)	4.98*
Number of items endorsed	3.31 (3.60)	5.45 (4.92)	11.66*
Symptom severity level	1.21 (0.43)	1.31 (0.39)	2.07

Note: * $p < .05$.

Table 4

Distribution of gender by diagnostic ranges of the original English language BDI-I.

Diagnostic range	Men n (%)	Women n (%)
Minimal (039)	80 (90)	77 (71)
Mild (10316)	6 (7)	23 (21)
Moderate (17329)	3 (3)	8 (7)
Severe (30363)	0 (0)	1 (1)
Total	89 (100.0)	109 (100)

Table 5

Proposed Spanish language BDI-I cut-scores for men (M) and women (W) with 95% confidence intervals based on bootstrap (1000 samples).

Percentile	Total score		Cognitive		Somatic		No. items endorsed	
	M	W	M	W	M	W	M	W
75th	7 (6, 9)	10 (8, 12)	4 (3, 6)	6 (4, 7)	3 (2, 5)	4 (3, 5)	5 (4, 6)	8 (6, 9)
80th	7 (5, 8)	11 (9, 14)	4 (2, 5)	7 (5, 9)	3 (3, 4)	4 (3, 5)	6 (5, 8)	9 (7, 11)
85th	8 (6, 9)	14 (12, 17)	6 (4, 8)	9 (7, 11)	3 (2, 4)	5 (4, 6)	7 (6, 9)	12 (10, 15)
90th	9 (7, 11)	15 (12, 18)	8 (6, 11)	10 (7, 12)	4 (3, 6)	5 (4, 6)	8 (6, 10)	14 (13, 17)
95th	12 (5, 16)	19 (14, 22)	10 (7, 13)	14 (10, 18)	5 (4, 7)	7 (6, 9)	9 (5, 12)	14 (11, 16)