**Validation of the Brief Edinburgh Depression Scale (BEDS) in Mexican Population with Advanced Cancer in a Palliative Care Service**

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**ABSTRACT**

*Objective:* Depression in palliative advanced cancer patients is common, but often goes unrecognized. One of the first steps towards improving detection is the development of tools that are valid in the specific language and setting in which they are to be used. The Brief Edinburgh Depression Scale (BEDS) is a sensitive case-finding tool for depression in advanced cancer patient and developed in the United Kingdom. There are no validated instruments to identify depression in Mexican palliative patients. Our aim was to validate the Spanish-language version of the BEDS in Mexican population with advanced cancer. *Method:*We conducted a cross-sectional study with outpatients from the palliative care unit at the Instituto Nacional de Cancerología in Mexico City. The Mexican BEDS was validated against a semi-structured psychiatric clinical interview according to the Diagnostic and Statistical Manual of Mental Disorders 5th edition classification criteria for major depressive disorder (MDD). The interviewer was blind to the BEDS score at the time of the assessment. *Results:*Seventy subjects completed the scale and interview. Women represented 71.4% of the sample and median age of subjects was 56.5 years (range, 20-85 years).. The prevalence of MDD according to the psychiatric interview was 20%. The most valid cutoff for defining a case of depression was a score > 5 out of 18 on the Mexican BEDS, which gave a sensitivity of 85.7% and specificity of 62.5%. The scale´s Cronbach’s alpha was 0.71. *Conclusion*:Major depressive disorder is frequent in Mexican palliative patients. The Spanish-language Mexican version of the BEDS is the first valid case-finding tool in advanced cancer patients in this setting.

**KEYWORDS:**Brief Edinburgh Depression Scale (BEDS), depression, advanced cancer, screening, palliative care.

**INTRODUCTION**

Patients with advanced cancer face a complex array of physical, social, psychological and spiritual situations related to their disease and treatments (Allende-Pérez & Verástegui-Avilés, 2013). These factors contribute to a significant number suffering from mental disorders; with adjustment disorders, delirium, major depression, and anxiety disorders being the most common (Chochinov, 2001; Li, Fitzgerald, & Rodin, 2012; Mehta & Roth, 2015). In cancer settings, clinical depression is a treatable cause of serious additional suffering and distress in these patients (Chochinov, 2001; Wilson et al., 2007). There are two core symptoms of depression according to the Diagnostic and Statistical Manual of Mental Disorder (5th ed.; DSM-5; American Psychiatric Association, 2014), namely depressed mood and a marked loss of interest or pleasure in most or all activities. To qualify as a major depressive disorder (MDD), 1 of these 2 core symptoms must be present for at least 2 weeks, along with at least 4 other depressive symptoms. The other symptoms include appetite or sleep disturbance, psychomotor agitation or retardation, decreased energy, feelings of worthlessness or guilt, difficulties with memory or concentration, and suicidal ideation (American Psychiatric Association, 2014), which makes the diagnosis of depression a challenge in patients attending services with palliative care for cancer (Li, Fitzgerald, & Rodin, 2012).

Depression prevalence rates differ depending on the cancer population studied, the diagnostic criteria applied, and the timing and method of assessment (i.e., self-report vs. structured interviews; Chochinov, Wilson, Enns, & Lander, 1994; Chochinov, 2001; Carr et al., 2002; Wilson et al., 2007; Mitchell et al., 2011, 2012). Major depression has been found to occur in approximately 16.5%, 95% CI [13.1–20.3], of patients in palliative care settings (Mitchell et al., 2011). It has been associated with poorer health-related quality of life, lower performance status, reduced treatment adherence, more severe physical symptoms such as pain, fatigue, and drowsiness; and perhaps even increased mortality (Lloyd-Williams, Dennis, & Taylor, 2004; Wilson et al., 2007; Kroenke et al., 2010; Rhondali et al., 2012; Arrieta et al., 2013). Furthermore, depressed cancer patients are more likely to have a prominent persistent desire for death (Wilson et al., 2016).

Unfortunately, depression is sometimes viewed as being an appropriate reaction in cancer patients, so it is often overlooked and left untreated by professionals in palliative and non-palliative settings (Chochinov, 2001; Fallowfield, Ratcliffe, Jenkins, & Saul, 2001; Sharpe et al., 2004). In order to try and improve recognition, a first step could be the development of tools to help identify cases of depression in patients with advanced cancer (Lloyd-Williams, Shiels, & Dowrick, 2007). These tools must balance validity of assessment against brevity to avoid burdening frail patients (Chochinov, Wilson, Enns, & Lander, 1997).

The Brief Edinburgh Depression Scale (BEDS) was constructed from the Edinburgh Postnatal Depression Scale (EPDS), a 10-item self- rating scale, as a case-finding tool for depression specifically in patients with advanced cancer (Cox, Holden, & Sagovsky, 1987; Lloyd-Williams et al., 2007). The abbreviated version consists of 6 items, each rated on a 4-point scale, and gives a sensitivity of 72% and specificity of 83% with a cutoff score of 6 out of 18 and was designed for palliative care patients (Lloyd-Williams et al., 2007). The BEDS has been studied and used in the United Kingdom and other European countries (Rayner, Price, Hotopf, & Higginson, 2011; Ziegler et al., 2011; Mitchell et al., 2012; Rhondali et al., 2012; Lloyd-Williams, Cobb, O’Connor, Dunn, & Shiels, 2013; Rhondali, Chirac, Celles, & Filbet, 2014). Additionally, it has been translated and validated in French and Korean (Lee et al., 2009; Rhondali, Girard, Saltel, Lloyd-Williams, & Filbet, 2012).

In Mexico there are no validated, brief instruments to identify cases of depression in Mexican palliative patients (Landa-Ramirez, Cardenas-Lopez, Greer, Sanchez-Roman, & Riveros-Rosas, 2014). There is an unmet need to improve detection practices so that patients with depression may get opportune access to care, especially since interventions have shown to have an impact in reducing depression severity and improving anxiety, quality of life, role functioning, and even survival (Walker et al., 2014; Prescott et al., 2017).

The main goal of this study was to validate the Spanish-language Mexican version of the BEDS in Mexican population with advanced cancer in a palliative care service.

**METHODS**

This study was approved by the local Institutional Review Board (IRB) and Ethics Committee (registration numbers 017/004/CPI and CEI/1114/17, respectively). All patients gave written consent.

**Subjects**

Consecutive patients were recruited from September 2016 to March 2017, at the outpatient area of the palliative care service at the Instituto Nacional de Cancerología (INCan) in Mexico City. The sample size was estimated based on the number of items on the scale, considering 10 participants for each component of the instrument (*N* = 60; Nunnally & Bernstein, 1995). Patients were eligible if they understood written and spoken Spanish, were 18 and older, had an Eastern Cooperative Oncology Group (ECOG) Performance Status (Oken et al., 1982) score of 0, 1 or 2, and a Karnofsky (Yates, Chalmer, & McKegney, 1980) index of 50% or better. Participants were required to complete the self-assessment scale and respond to an interview. Those with any uncontrolled physical symptom, cognitive impairment, delirium, psychosis, cerebral metastases or current antidepressant treatment were excluded.

**Procedure**

Baseline information was obtained from medical records. The Spanish-language BEDS´ items were transcribed from the previously validated, Spanish translated Mexican version of the Edinburgh Postnatal Depression Scale (EPDS; Alvarado-Esquivel, Sifuentes-Alvarez, Salas-Martinez, & Martínez-García, 2006; Alvarado-Esquivel, Sifuentes-Alvarez, & Salas-Martinez, 2014a, 2014b).

Participants completed the BEDS in the waiting room. Afterwards, they underwent a semi-structured clinical interview according to the DSM-5 (American Psychiatric Association, 2014) criteria for major depressive disorder (MDD). The interview was conducted by a psychiatrist who was blind to the BEDS score at the time of the assessment. Depression was defined as a dichotomous variable based on the presence or absence of MDD.

**Statistical Analysis**

Quantitative variables were reported as mean ± standard deviation when the distribution was normal and as median and range (min., max.) when it was not. Categorical variables were expressed as absolute and relative frequencies. Cronbach’s alpha coefficient was used to examine the internal reliability of the scale. In order to assess the accuracy of the instrument to discriminate between cases and not cases of depression, we performed Receiver Operating Characteristic (ROC) Analysis. Sensitivity and specificity values were used to estimate the criterion validity of different threshold scores of BEDS compared to the reference standard (DSM-5 MDD diagnosis). Prevalence was also determined at various cutoff points (as a percentage). All analyses were performed using STATA version 12.1 software (StataCorp. 2011).

**RESULTS**

The sample comprised of 70 participants, with a median age of 56.5 years (range, 20-85 years). Fifty (71%) were female and had 8 years (range, 0-22 years) of formal education. Most participants were married or cohabitating (55.7%, *n* = 39) and had an ECOG Performance Status score of 1 (55.7%). The most frequent oncological diagnosis was gynecological (24.3%, *n* = 17), urological (20%, *n* = 14) and breast cancer (15.7%, *n* = 11). The clinical and sociodemographic characteristics of the sample are described in Table 1.

The reliability of the translated BEDS, as assessed by Cronbach's alpha coefficient of internal consistency, ranged from 0.63 for item 3 to 0.73 for item 6, with an *α* = 0.71 result for the complete Mexican BEDS (Table 2).

The definition of case using > 6 score, has a sensitivity of 64.3% and a specificity of 75%. In contrast, lowering the cutoff point to > 5 increases sensitivity to 85.7% with 62.5% specificity. Results of the different threshold scores indentifying depresion in BEDs are shown in Table 3.

The prevalence of depression identified by the DSM-5 interview was 20% (*n* = 14). When the Mexican version of the BEDS was employed, with a threshold score of 5, 20.5% of palliative advanced cancer patients were identified as cases of depression (Table 3).

ROC analysis found the area under the curve for the scale to be 0.826, 95% CI [0.719–0.933], *p* < .0001, which represents good accuracy to discriminate between cases and not cases of depression (Figure 1).

**DISCUSSION**

The development of psychometric scales is necessary for the evaluation of complex phenomena such as depression. However, most of these tools are created in other countries and precludes their usage in our language and population. To assess if the instrument works in the same way in different scenarios, it must be validated in the setting it is required to be used. This is especially important in populations with particular characteristics, such as patients with advanced cancer in palliative care, in whom the cancer symptomatology and physical symptoms of depression may overlap. In an effort to improve depression detection, there has been increasing interest in the use of screening and case-finding tools. The results in our study support the Mexican BEDS as a valid case-finding tool for depression in patients with advanced cancer in a palliative care unit.

In the original study, the cutoff score > 6 gave a sensitivity of 72% and specificity of 83% (Mari Lloyd-Williams et al., 2007). In our results that cutoff point yielded lower sensitivity and specificity values. The > 7 score was the most stable, with 64.3% sensitivity and 87.5% specificity. However, considering the impact of depression on a frail population with multiple risk factors, an approach that increases diagnosis and, subsequently, proper treatment, may be more useful. Therefore, a higher sensitivity could be better suited to reduce the proportion of missed cases at the expense of false positives. The cutoff score > 5 had 85.7% sensitivity and 62.5% specificity, which is likely to be more useful for identifying patients who need a more in-depth assessment of their mood.

The prevalence of depression in Mexican palliative patients is unknown. In this study we obtained a prevalence of major depressive disorder, according to the DSM-5 interview, of 20%. However, due to the non-probabilistic sampling and sample size, this prevalence may not properly describe our population. Furthermore, we only approached palliative care patients who were cognitively lucid, with higher performance status, and able to tolerate an interview. Since cognitive impairment and disabling illness may be associated with depression, the actual prevalence could be higher than the one we found. When the Mexican BEDS was utilized with a threshold score of 5, it identified 20.5% of advanced cancer patients as cases of depression, which reflects good criterion validity.

The Spanish-translated BEDS had a Cronbach´s alpha coefficient of 0.71, which is considered acceptable. This result may be affected by the number of items on the scale - in a brief assessment, the value of alpha is reduced. The reliability of the translated version was similar to that reported by other authors ( Lloyd-Williams et al., 2007; Lee et al., 2009; W Rhondali et al., 2012).

The Spanish-language Mexican BEDS is the first case-finding tool for depression validated in Mexican patients with advanced cancer in palliative care. We suggest using > 5 as a cutoff score to improve detection of cases.

**DISCLOSURES**

**Conflicts of Interest**

O. Rodríguez-Mayoral has participated as sub investigator for Eli Lilly and FORUM Pharmaceuticals. All other authors declare no conflicts of interest.

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**AUTHORSHIP CONTRIBUTION**

OR-M secured the scale´s author consent for the project, participated in the conception and design of the work, data collection and analysis, and drafting and revision of the article. BR-O participated in the conception and design of the work, data collection and analysis, and drafting and revision of the article. LA-H contributed to the critical revision and drafting of the article. AP-N was involved in data analysis and drafting the article. E-V contributed to the critical revision and drafting of the article. SA-P participated in the drafting and critical revision of the study. ML-W contributed to the critical revision of the article.

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**TABLES AND FIGURE**

Table 1. Clinical and sociodemographic characteristics of the participants (*N* = 70)

|  |  |  |  |
| --- | --- | --- | --- |
| Patient characteristics (*N* = 70) | | Median | Range  (min., max.) |
| Age (years) | | 56.5 | 20-85 |
| Schooling (years) | | 8 | 0-22 |
|  | | Frequency  (*n*) | Frequency  (%) |
| Gender | |  |  |
|  | Female | 50 | 71.4 |
|  | Male | 20 | 28.6 |
| Marital status | |  |  |
|  | Married/Cohabitating | 39 | 55.7 |
|  | Separated/Divorced | 8 | 11.4 |
|  | Single | 12 | 17.1 |
|  | Widowed | 11 | 15.7 |
| Religious affiliation | |  |  |
|  | Catholic | 51 | 72.9 |
|  | Jehovah´s Witnesses | 5 | 7.1 |
|  | Other Christian | 11 | 15.7 |
|  | Unaffiliated | 2 | 2.9 |
|  | None | 1 | 1.4 |
| Previous occupation | |  |  |
|  | Self-employed | 19 | 27.1 |
|  | Agriculture | 1 | 1.4 |
|  | Employed | 18 | 25.7 |
|  | Student | 2 | 2.8 |
|  | Homemaker | 30 | 42.9 |
| Oncologic diagnosis | |  |  |
|  | Head and neck | 5 | 7.1 |
|  | Gastrointestinal | 9 | 12.9 |
|  | Gynecological | 17 | 24.3 |
|  | Hematologic | 2 | 2.9 |
|  | Liver and bile ducts | 2 | 2.9 |
|  | Breast | 11 | 15.7 |
|  | Skin and soft tissue | 8 | 11.4 |
|  | Lung | 2 | 2.9 |
|  | Urological | 14 | 20.0 |
| Karnofsky | |  |  |
|  | 50 | 3 | 4.3 |
|  | 60 | 6 | 8.6 |
|  | 70 | 21 | 30.0 |
|  | 80 | 19 | 27.1 |
|  | 90 | 18 | 25.7 |
|  | 100 | 3 | 4.3 |
| ECOG | |  |  |
|  | 0 | 4 | 5.7 |
|  | 1 | 39 | 55.7 |
|  | 2 | 27 | 38.6 |

*Note.* ECOG = Eastern Cooperative Oncology Group.

Table 2. BEDS Cronbach´s alpha coefficient for internal consistency

|  |  |  |
| --- | --- | --- |
| Item | No. of observations | Alpha |
| 1 | 70 | 0.6724 |
| 2 | 70 | 0.6519 |
| 3 | 70 | 0.6349 |
| 4 | 70 | 0.6743 |
| 5 | 70 | 0.6428 |
| 6 | 70 | 0.7337 |
| Cronbach´s Alpha | | 0.7117 |

Table 3. Criterion validity and prevalence of BEDS identified depression at different threshold scores

|  |  |  |  |
| --- | --- | --- | --- |
| Cutoff score | Sensitivity  (%) | Specificity  (%) | Prevalence  (%) |
| ( > 0 ) | 100 | 0.0 | 24.3 |
| ( > 1 ) | 100 | 14.3 | 24.3 |
| ( > 2 ) | 100 | 28.6 | 24.3 |
| ( > 3 ) | 100 | 42.9 | 24.3 |
| ( > 4 ) | 92.9 | 53.6 | 23.1 |
| ( > 5 ) | 85.7 | 62.5 | 20.5 |
| ( > 6 ) | 64.3 | 75.0 | 16.6 |
| ( > 7 ) | 64.3 | 87.5 | 16.6 |
| ( > 8 ) | 57.1 | 89.3 | 15.4 |
| ( > 9 ) | 28.6 | 92.9 | 10.2 |
| ( > 10 ) | 21.4 | 94.6 | 6.4 |
| ( > 12 ) | 14.3 | 100 | 2.6 |
| ( > 15 ) | 7.1 | 100 | 1.3 |
| ( > 15 ) | 0.0 | 100 | 0.0 |

Figure 1. ROC Curve. Area under the curve (AUC) = 0.8259.

