Factor Structure of the Beck Depression Inventory—II in a Medical Outpatient Sample[1]

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This study examined the factor structure of the Beck Depression Inventory—II (BDI-II) in a sample of 127 individuals referred by their primary care physicians. Using exploratory factor analysis with oblique rotation, a 2-factor model appeared to be the most parsimonious representation of the data. The rotated factors accounted for approximately 53% of the variance. Consistent with previous research, the first factor was interpreted as a somatic–affective dimension and the second factor reflected a cognitive dimension. The correlation between these 2 factors was .79. It appears possible to divide the BDI-II into subscales to facilitate interpretation in medical patients.

KEY WORDS: Beck Depression Inventory—Second Edition; factor analysis; depression.

The prevalence of depression in primary care medical patients is estimated to be as high as 20% (Zung, Broadhead, & Roth, 1993). Given that untreated depression in medical patients is associated with greater functional impairment and higher mortality rates, the identification and treatment of depression is important (Eisenberg, 1992). Unfortunately, researchers have demonstrated that depression frequently remains undetected (Coyne, Schwenk, & Fechner-Bates, 1995), suggesting that screening for depression may be advisable. A number of instruments can be used for this purpose. The most common of these is the Beck Depression Inventory, and its current revision, the Beck Depression Inventory—Second Edition (BDI-II; Beck, Steer, & Brown, 1996).

Aspects of the reliability and validity of the BDI-II have been supported by research, but its factor structure has varied across studies (Arnau, Meagher, Norris, & Bramson, 2001). A number of studies have been interpreted to support two factors, which roughly reflect cognitive symptoms and somatic symptoms, whereas other research has supported a three-factor model. Only one study has investigated the psychometric properties of the BDI-II in medical outpatient samples, so existing research might have limited generalizability to this population. The purpose of this study was to further explore the factor structure of the BDI-II in a medical outpatient sample.

METHOD

The sample consisted of 80 women and 47 men referred by their primary care physicians in Vancouver, British Columbia. These individuals presented with fairly minor medical conditions. At the time of referral, the physicians categorized their patient as "not depressed" (40%), "may be depressed" (25%),

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and "clearly depressed" (35%). All patients were administered the Structured Clinical Interview for *DSM-IV* (SCID-I). The SCID-I is a semi-structured interview designed to establish *DSM-IV* Axis I diagnosis. The version of the SCID-I used in this study was the nonpatient (NP) research version 2.0, August 1998 revision (First, Spitzer, Gibbon, & Williams, 1998). Approximately one third of the patients had no Axis I diagnosis (35%). Major depressive disorder, dysthymia, or depressive disorder NOS was diagnosed in 37% of the sample. Depression in remission or other minor depressive conditions were diagnosed in 10%, and other psychiatric disorders, including some subthreshold diagnoses, were identified in 18% of participants. The mean age of the sample was 36.5 years ($SD = 11.4$). All participants completed the BDI-II and underwent SCID interviewing as part of a study on depression in primary care.

RESULTS AND DISCUSSION

Item responses were analyzed using exploratory factor analysis. The resulting scree plot and eigenvalues suggested that a two-factor model would most appropriately summarize the data. Because previous research has indicated a high degree of correlation between factors, an oblique (oblimin) rather than orthogonal rotation was applied. The first factor that emerged was interpreted to primarily reflect somatic–affective symptoms of depression, and included the following items, which are listed from highest to lowest factor loadings: tiredness or fatigue, changes in sleeping patterns, loss of interest in sex, loss of pleasure, loss of interest in activities, low energy, irritability, agitation, sadness, concentration problems, and changes in appetite (see Table I).

The second factor was interpreted to primarily reflect cognitive symptoms and included self-criticalness, past failure, worthlessness, punishment feelings, crying, pessimism, guilty feelings, suicidal thoughts or wishes, and self-dislike. One item, indecisiveness, loaded on both factors. The rotated solution accounted for 53% of the total variance. The correlation between factors was .79.

Only one published study has explored the factor structure of BDI-II in primary care medical patients (Arnau et al., 2001). That study found two first-order factors, somatic-affective and cognitive, as well as an underlying second-order factor of depression. Our results appear similar. We found support for a two-factor model, reflecting somatic-affective and

Table I. Rotated Factor Coefficients for the BDI-II Items

BDI-II Items	Factor 1: Somatic–affective	Factor 2: Cognitive
Tiredness or fatigue	.89	[a]
Changes in sleeping pattern	.78	[a]
Loss of interest in sex	.77	.42
Loss of pleasure	.74	[a]
Loss of interest in activities	.73	[a]
Irritability	.66	[a]
Loss of energy	.66	[a]
Agitation	.62	[a]
Sadness	.57	.22
Concentration difficulty	.49	−.31
Changes in appetite	.32	.28
Self-criticalness, blame	.23	−.93
Pessimism	.27	−.55
Past failure	[a]	−.92
Worthlessness	[a]	−.82
Punishment feelings	[a]	−.81
Crying	[a]	−.64
Guilt	.18	−.55
Suicidal thoughts or wishes	[a]	−.53
Self-dislike	.33	−.47
Indecisiveness	.38	.39

[a] Pattern matrix weights less than .15 were suppressed.

cognitive symptoms of depression. In addition, the high correlation between the factors may indicate the presence of an underlying second-order factor.

Studies with community subjects and university students, in contrast, found that cognitive and affective symptoms load together, and emerge as the first factor (Beck et al., 1996; Dozois, Dobson, & Ahnberg, 1998; Griffiths, Boddy, Woodward, & Iverson, 2001; Steer & Clark, 1997; Whisman, Perez, & Ramel, 2000). The factor structure seems fairly consistent across healthy samples, but varies with medical patients. The preliminary evidence for a two-factor structure for the BDI-II suggests that it might be possible to divide the BDI-II into somatic and cognitive subscales. A number of researchers have argued that this might be appropriate in medical patients, who may demonstrate elevation on somatic symptoms as a result of their medical problem (e.g., Clark & Steer, 1994). Others have argued that this is not necessary (e.g., Aikens et al., 1999). To resolve this issue, it is recommended that future studies evaluate the validity of the total score and the factor scores.

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