



Hubley Depression Scale for Older Adults (HDS-OA): Reliability, Validity, and a Comparison to the Geriatric Depression Scale

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INTRODUCTION

Many of the measures currently used to screen for depression in older adults have not been designed specifically for this population and thus have limitations. To date, there is only one commonly used self-rated depression measure designed for use with older adults. This measure is the 30-item Geriatric Depression Scale (GDS; Yesavage et al., 1983).

The GDS is a self-administered screen for depressive symptoms, composed of items that focus on affective and cognitive symptoms that have been experienced over the past week. The measure uses a yes-no response format. The GDS has been shown to be a useful screening tool for depression in older adults due to its high specificity and sensitivity (Katona & Livingston, 2000), but the measure is not based on Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR; APA, 2000) criteria for depression. Therefore, an accurate and efficient screening measure of depression for older adults is required for use in clinical and research settings.

The Hubley Depression Scale for Older Adults (HDS-OA; Hubley, 1998) is a more recently developed, freely available, and shorter measure of depression for older adults. The HDS-OA is a 16-item screen that is consistent with DSM-IV-TR criteria for depression (Hubley, 1998). It uses a yes/no response format, large font size, and reminders of the reference period. The HDS-OA was designed to be an efficient and accurate alternative to the longer GDS, the GDS-15 (Sheikh & Yesavage, 1986) and the longer, non-population specific depression screen, the Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996).

PURPOSE OF STUDY

This study examined the psychometric properties of the 16-item Hubley Depression Scale for Older Adults (HDS-OA). It was anticipated that the HDS-OA would show (a) satisfactory reliability, (b) stronger correlations with convergent than discriminant measures, (c) a significant difference between depressed and non-depressed group scores, (d) high sensitivity and specificity, and (e) equal or better performance than the GDS and GDS-15.

METHOD

Participants

Group 1: 25 individuals (7 men, 18 women) aged 63-93 ($M = 79.2$, $SD = 7.4$) were diagnosed with a Major Depressive Episode (MDE), dysthymia, or depressive disorder not otherwise specified (NOS) at the time of measure administration. These individuals were recruited through clinical sources. Those with depression due to a general medical condition (GMC) or substance use (SU) or those experiencing psychoses were excluded from the study.

Group 2: another 25 individuals aged 65-92 ($M = 79.4$, $SD = 7.2$) were non-depressed participants of similar ages and exact genders as compared to the depressed group. These individuals were recruited through community-based sources.

Measures

Hubley Depression Scale for Older Adults (HDS-OA; Hubley, 1998): 16-item screening measure for depression in older adults using DSM-IV-TR criteria. It uses a yes/no response format and reminders of the 2-week time frame. Scores range from 0 to 16.

Geriatric Depression Scale (GDS; Yesavage et al., 1983): 30-item measure of depressive symptoms in older adults. A yes-no response format is used. Scores range from 0 to 30, with a conventional cut score of 10 (Rapp, Parisi, Walsh, & Wallace, 1988). The GDS-15 (Sheikh & Yesavage, 1986) is comprised of items 1, 2, 3, 4, 7, 8, 9, 10, 12, 14, 15, 17, 21, 22, and 23. These items were extracted, analyzed, and compared to the HDS-OA in the same way as data from the GDS.

Beck Anxiety Inventory (BAI; Beck & Steer, 1993): 21-item, multiple-choice inventory that measures the severity of an individual's anxiety over the past week and designed to discriminate anxiety from depression (Beck, Epstein, Brown & Steer, 1988). It was used as a discriminant measure in this study.

Structured Clinical Interview for DSM-IV-TR Axis-I Disorders, Non-patient Version (SCID-I/NP; First, Spitzer, Gibbon, & Williams, 2007): semi-structured interview, based on the DSM-IV-TR, used to diagnose Axis-I mood disorders in adults. The SCID-I/NP was used to confirm the absence of psychotic symptoms and a current mood disorder (i.e., MDE, bipolar disorder, dysthymic disorder, depressive disorder NOS, or mood disorders due to a GMC or SU) in the community-based individuals.

Mini-Mental State Examination (MMSE; Folstein, Folstein, & McHugh, 1975): quickly administered screen for cognitive impairment. Scores lower than 24 indicate potential cognitive impairment. A cut score of 18 was chosen to exclude individuals with moderate to severe cognitive impairment. The lower cut score accommodated for lower education levels, increasing levels of cognitive impairment in older adults, and the decreased effort that depressed individuals demonstrate in making decisions (Folstein, Anthony, Parhad, Duffy, & Gruenberg, 1985).

Demographics Form: information on age, birth date, ethnicity, marital status, education level, single item self-rated current overall health from the MOS 36-item short form health survey (SF-36; Ware & Sherbourne, 1992), and current anti-depressant medication usage was collected to describe the sample.

Procedure

Individuals in the depressed group were recruited first from 5 geriatric outpatient clinics and in-patient units at participating hospitals in Vancouver. Individuals in the non-depressed community group were

then recruited to match the genders and ages of subjects in the depressed group to control for group differences. All participants signed an informed consent form and completed the HDS-OA, GDS, BAI, MMSE, and demographics form. The administration of these measures to both groups was counter-balanced using a digram-balanced approach to limit practice or fatigue effects. In the community sample, a trained research assistant first completed informed consent and administered the questionnaires, then the first author conducted the SCID-I/NP interview. This ensured that the interviewer was blind to the results of the measures to limit experimenter effect and criterion contamination.

RESULTS

Internal Consistency

Internal consistency reliability of HDS-OA scores was .88. Cronbach's alphas for the GDS and GDS-15 scores were .93 and .88, respectively.

Convergent and Discriminant Validity

Convergent validity was assessed by calculating Pearson product-moment correlation coefficients (r) between the scores of the HDS-OA and those of the GDS and GDS-15. The relationship between the scores on the HDS-OA and GDS was positive, strong, and statistically significant with a correlation of .89. Similarly, the correlation of scores between the HDS-OA and GDS-15 was .86.

Discriminant validity was assessed using Pearson product-moment correlation coefficients (r) to examine the relationship between the scores of the HDS-OA and scores from the MMSE, BAI, and self-ratings of physical health (see Table 1). Convergent and discriminant validity coefficients are evaluated relative to one another.

Criterion Validity

Group Differences. Group differences were examined using the non-parametric Wilcoxon Signed Rank Test because the paired samples parametric test assumption of normality of scores was violated for the non-depressed group. A large statistically significant difference was found between the depressed ($Mdn = 8.0$) and non-depressed ($Mdn = 1.0$) group scores for the HDS-OA, $z = -4.38$, $p < .001$, $r = .62$. A large statistically significant difference was also revealed between the depressed ($Mdn = 17.0$) and non-depressed ($Mdn = 2.0$) group scores for the GDS, $z = -4.38$, $p < .001$, $r = .62$. Similarly, a large statistically significant difference was found between the depressed ($Mdn = 8.0$) and non-depressed ($Mdn = 1.0$) group scores for the GDS-15, $z = -4.38$, $p < .001$, $r = .62$.

AUC, Sensitivity, Specificity. To determine the ability of the HDS-OA to identify true cases of depression, the Microsoft Excel statistical program Analyse-It was used to conduct a receiver operating characteristic (ROC) curve analyses based on group scores. For each possible cut score, the ROC curve plots the proportion of true positives and false positives (Swets, Dawes, & Monahav, 2000). The resulting area under the curve (AUC) provides a measure of accuracy. An AUC of .80 or greater indicates that a measure is a useful case-finding screen (Holmes, 1998). Based on a depression diagnosis or a SCID-I/NP confirmed absence of depression, cut scores were evaluated for sensitivity and specificity and an optimum cut score was determined for each depression measure. The AUC for the HDS-OA was .99 ($p < .001$). A cut score of 5 yielded a balance between sensitivity (92.0%) and specificity (100.0%), with emphasis placed on selecting a cut score that accurately identified depressed individuals (i.e., sensitivity). Specificity, in contrast, is the percentage of individuals accurately identified as non-depressed out of those diagnosed as non-depressed. The AUC for the GDS was .98 ($p < .001$). A cut score of 9 yielded a balance between sensitivity (92.0%) and specificity (96.0%). The AUC for the GDS-15 was .94 ($p < .001$). A cut score of 4 yielded a

balance between sensitivity (80.0%) and specificity (96.0%). See Tables 2 to 4 for sensitivity and specificity of the HDS-OA, GDS, and GDS-15 for a range of cut scores.

CONCLUSIONS

Findings revealed high internal consistency for the HDS-OA, evidence of convergent validity with the GDS and GDS-15, evidence of discriminant validity with measures of anxiety, cognitive status, and self-rated health scores, and a significant difference between group scores, indicating the ability of the HDS-OA to differentiate between individuals with and without depression. In these analyses, the HDS-OA performed as well as the GDS and GDS-15. The HDS-OA, at a cut score of 5, revealed a better balance of sensitivity and specificity than the GDS and especially the GDS-15 at their best cut scores.

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Table 1
Discriminant Validity Coefficients for HDS-OA, GDS, and GDS-15

Measure	BAI ^a	MMSE	Self-rated Health
HDS-OA	.67 (.000)	-.39 (.005)	-.43 (.005)
GDS	.71 (.000)	-.38 (.006)	-.49 (.000)
GDS-15	.67 (.000)	-.43 (.002)	-.48 (.000)

Note: Level of two-tailed statistical significance is denoted in brackets () below each correlation.

^aAlpha for the BAI was .89

Table 2
Sensitivity and Specificity of Cut Scores on the HDS-OA

Cut Score ^a	Sensitivity	Specificity
1	100	48.0
2	100	76.0
3	100	84.0
4	96.0	92.0
5	92.0	100
6	80.0	100

^a Max. score on the HDS-OA = 16

Table 3
Sensitivity and Specificity of Cut Scores on the GDS

Cut Score ^a	Sensitivity	Specificity
4	100	60.0
6	96.0	68.0
7	96.0	80.0
9	92.0	96.0
10	84.0	96.0
11	80.0	100

^a Max. score on the GDS = 30

Table 4
Sensitivity and Specificity of Cut Scores on the GDS-15

Cut Score ^a	Sensitivity	Specificity
1	100	36.0
2	96.0	64.0
3	88.0	76.0
4	80.0	96.0
5	76.0	100
6	64.0	100

^a Max. score on the GDS-15 = 15