The Depressive Psychopathology Scale: presentation and initial validation in a sample of Peruvian psychiatric patients

Johann M. Vega-Dienstmaier,[1] *Santiago Stucchi-Portocarrero,*[2] *Nancy Valdez-Huarcaya,*[3] *Miriam Cabra-Bravo,*[2] *and Maria I. Zapata-Vega*[4]

Suggested citation Vega-Dienstmaier JM, Stucchi-Portocarrero S, Valdez-Huarcaya N, Cabra-Bravo M, Zapata-Vega MI. The Depressive Psychopathology Scale: presentation and initial validation in a sample of Peruvian psychiatric patients. Rev Panam Salud Publica. 2011;30(4):317–26.

ABSTRACT

Objective. *Presentation and validation of the Depressive Psychopathology Scale (DPS), a new, Spanish-language psychometric inventory, in a sample of Peruvian psychiatric patients.*
Methods. *From 1999 to 2001, the DPS, Zung Self-rating Depression Scale (ZSDS), and Major Depressive Disorder (MDD) module of the Structured Clinical Interview for DSM-IV Disorders (SCID) were administered to 226 nonpsychotic outpatients referred to the National Institute of Mental Health in Lima, Peru, for their initial clinical evaluation. In the evaluation, attending psychiatrists 1) corroborated the general diagnosis and presence or absence of MDD and 2) rated depression severity based on clinical opinion and on Clinical Global Impression—Severity scale criteria.*
Results. *Mean time to complete the DPS was 7.22 minutes (standard deviation, 3.99). Cronbach's alpha value was 0.86. For diagnosis of MDD, based on the SCID, area under receiver operating characteristic curve (AUROC) was 0.872 and the selected cutoff score (26/27) had 81.32% sensitivity and 80% specificity; based on the attending psychiatrists' evaluation, AUROC was 0.832 and the selected cutoff score (25/26) had 77.67% sensitivity and 72.32% specificity. The DPS was significantly correlated with the ZSDS (rho = 0.8, P < 0.001). Some DPS items ("depression worse in the morning," "appetite disturbances," "mood reactivity," and "hypersomnia") showed low loadings on the five factors extracted through principal component analysis and/or did not significantly correlate with depression parameters.*
Conclusions. *The DPS can predict MDD and has convergent validity, as shown by its correlation with the ZSDS. However, additional psychometric studies are recommended to simplify and improve it.*

Key words Psychiatric status rating scales; depression; validation studies; Peru.

[1] Department of Psychiatry and Mental Health, Universidad Peruana Cayetano Heredia, Lima, Peru. Send correspondence to: Johann M. Vega-Dienstmaier, johannvega@yahoo.com; johann.vega.d@upch.pe
[2] Instituto Nacional de Salud Mental "Honorio Delgado-Hideyo Noguchi," Lima, Peru.
[3] Pontificia Universidad Católica del Perú, Lima, Peru.
[4] Mount Sinai School of Medicine, Elmhurst Hospital Center, New York, United States of America.

Depression was estimated as the fourth leading cause of disease burden in the year 2000, representing a major public health problem worldwide (1). Availability of reliable and valid assessment instruments is crucial for the screening of mental disorders in primary care and the advancement of mental health research. Numerous instruments have been designed specifically for the assessment of depression. However, most have been developed in English and later translated into other languages, including Spanish.

Validation of Spanish-language versions of widely used depression scales—including the Hamilton Depression Rating Scale (HAM-D), the Montgomery-Åsberg Depression Rating Scale (MADRS),

the Beck Depression Inventory (BDI), the Zung Self-rating Depression Scale (ZSDS), and the Center for Epidemiologic Studies Depression Scale (CES-D)—can be found in the international literature (2–6).

A recent literature review concluded that evidence for diagnostic accuracy of Spanish-language depression screening instruments was found only for the CES-D and the Primary Care Evaluation of Mental Disorders (PRIME-MD) (for primary care patients), the Geriatric Depression Scale (GDS) (for elderly patients), and the Edinburgh Postnatal Depression Scale (EPDS) and Postnatal Depression Screening Scale (PDSS) (for postpartum patients). The study and development of brief depression tests for Spanish-speaking populations has thus been recommended (7).

Language and other cultural factors may not be the only elements that need to be taken into account in the validation of depression scales in Latin America. As pointed out by Bagby et al. (8), the established scales lack broad psychometric evaluations, and may be deficient in assessing depression as it is currently conceptualized. For example, the HAM-D, generally considered the "gold standard" for assessing depression for more than four decades, has come under recent scrutiny because it includes items with poor inter-rater and retest reliability, and poor content validity, and fails to capture depression according to modern classification systems such as the Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) (9). The authors refer to two potential alternatives (the Inventory for Depressive Symptomatology (IDS) and the MADRS, which are designed to address HAM-D deficiencies) but suggest that a better solution may be the development of new instruments based on current knowledge of depression, taking advantage of current psychometric and statistical advances, since neither of these two scales was developed using contemporary psychometric methods (8).

The current study was carried out to meet the need for the development of a new scale for the assessment of depression, in Spanish, taking account of Peruvian linguistic and cultural aspects and utilizing the standardized criteria of the DSM-IV (including atypical and melancholic features) (9) as well as the ICD-10 (International Classification of Diseases, 10th revision) (10).

MATERIALS AND METHODS

Psychiatric measures and sources of clinical information

Depressive Psychopathology Scale (DPS).[5] The DPS is a new instrument developed by the principal investigator (PI) and lead/corresponding author of the current study (JMVD) and reviewed in collaboration with other mental health researchers. The items are based on diagnostic criteria from two standardized classification systems: the ICD-10 (10) and the DSM-IV (9). DPS items were based on DSM-IV criteria for Major Depressive Episode (DPS items 1, 2, 4, 5, 7, 8, 9, 11, 12, 14, 15, 18, 19, and 20); melancholic features (DPS items 1, 3, 7, 8, 9, 16, 17, and 18); and atypical features (DPS items 1, 4, 6, 10, and 17); and on ICD-10 Depressive Episode symptomatology (DPS items 1, 2, 5, 7, 12, 13, 15, 18, 19, and 20). The resulting self-rated instrument is composed of 20 items referring to symptoms experienced in the last 2 weeks. With the exception of items 1 and 16 (which are scored from 0 to 2) and item 20 (scored from 0 to 4), items are scored from 0 to 3. Other than items 1 and 20 (which measure severity of depressive symptoms), ratings are based on frequency of symptoms.

Zung Self-rating Depression Scale (ZSDS). The ZSDS (11) is a widely used self-rating instrument composed of 20 items. Items are scored from 1 to 4 according to the severity of the symptom. The sum of the item scores is then multiplied by 10 and divided by 8. The resulting total score ranges from 25 to 100. The Spanish-language version of the ZSDS was validated in Spain (5) and standardized in Peru (12).

Major Depressive Disorder (MDD) module of the Structured Clinical Interview for DSM-IV Disorders (SCID). The MDD module of the SCID is a semi-structured diagnostic interview designed to assist clinicians, researchers, and trainees in making DSM-IV diagnosis of depression (13).

Clinical Global Impression–Severity scale (CGI-S). The CGI-S is a seven-point scale for assessing the severity of mental illness (depression, in the current study) according to the clinical experience of the rater, who classifies the patient into one of seven categories: 1 ("not at all depressed"); 2 ("borderline depressed"); 3 ("mildly depressed"); 4 ("moderately depressed"); 5 ("markedly depressed"); 6 ("severely depressed"); or 7 ("extremely depressed"). A significant correlation has been shown between the CGI-S and the HAM-D in patients with depression (14).

Clinical evaluation. All study subjects underwent a clinical assessment as described below in "Step 2."

Training of the study team

Prior to the beginning of the study, the interviewers were trained by the PI. The training included three phases: 1) team meetings, in which the PI explained the procedures for enrolling and obtaining the consent of the subjects and administering the instruments; 2) administration of the SCID MDD module by the PI to 10 outpatients, in the presence of the interviewer team, followed by a discussion of the experience; and 3) administration of the SCID MDD module and other study instruments by the interviewers, under the supervision of the PI, followed by discussion of the experience and the solicitation of feedback.

Subjects and procedures

This study was conducted from 1999 to 2001 in the Department of Adult and Geriatric Psychiatry at the "Honorio Delgado–Hideyo Noguchi" National Institute of Mental Health ("HD-HN" NIMH), which is affiliated with Cayetano Heredia Peruvian University, and located in the northern area of the capital city of Lima in Peru. The study protocol was reviewed and approved by the "HD-HN" NIMH institutional board. All participants provided written consent to enroll in the study.

The study sample included 226 ambulatory patients between the ages of 18 and 60 years, of any gender, who had come to "HD-HN" NIMH for their first visit and clinical evaluation and were capable of consenting to participate in the study. Those who had current or previously known psychosis and bipolar disorder (based on information obtained during the clinical interview or on prior

[5] Sample copies available from the corresponding author upon request.

documented information) or were incapable of providing consent due to extreme psychiatric pathology or cognitive deficits, and illiterates, were excluded.

Subjects were evaluated using a two-step assessment:

- **Step 1.** A team of interviewers (three psychiatry residents, one psychiatric nurse, and two psychologists) explained the nature of the research to prospective subjects and requested their written consent to participate in the study. Subjects who provided written consent were asked to complete/respond to the following instruments: 1) the DPS, and an evaluation form for rating its ease of use; 2) the ZSDS; and 3) the SCID MDD module. Because the DPS and the ZSDS are self-rated, interviewer responsibilities for those instruments were limited to 1) registering the time needed to complete the DPS and 2) verifying that all answerable items from both scales had been completed (unanswerable items—those for which, after additional explanation, the subjects were unable to determine an appropriate response—were left blank).
- **Step 2.** As part of the initial clinical evaluation, subjects were assigned to psychologists or residents working in the Diagnostic and Evaluation Unit of the "HD-HN" NIMH for intake assessment. Later, each case was presented to one of eight attending psychiatrists. The attending psychiatrist conducted a face-to-face interview to 1) corroborate the main diagnosis, 2) determine the presence or absence of MDD, and 3) rate the subject's depression severity as one of five categories ("no depressive symptoms"; "depressive disorder but no major depression"; "major depression, mild"; "major depression, moderate"; and "major depression, severe"), based on his/her clinical opinion, and as one of seven categories (described above) based on the CGI-S.

Neither the staff responsible for the intake assessment nor the attending psychiatrists had access to the results obtained during Step 1 of the study (the administration of the DPS, the ZSDS, and the SCID MDD module) prior to their clinical evaluation.

Statistical analysis

The evaluation parameters used in the statistical analysis of the DPS included the following:

- Feasibility (acceptability, quality of data, ease of use, and time required for completion)
- Internal structure, including:
  - Internal consistency (Cronbach's alpha coefficient)
  - Factor structure (extracted through principal component analysis with eigenvalues > 1 and rotated through varimax with Kaiser's normalization)
- Convergent validity, based on Spearman's correlations between:
  - DPS items and corresponding (similar) items in the ZSDS
  - DPS individual item and overall scores and three different parameters: 1) the overall ZSDS score, 2) the attending psychiatrist's rating of depression severity (one of five categories), and 3) the CGI-S score for depression severity (to further evaluate convergence in terms of disorder severity)
- Discriminant validity, using two methods:
  - Comparison (through analysis of variance [ANOVA]) of mean overall DPS scores for 1) patients with and without MDD (according to the SCID and the attending psychiatrist's diagnosis) and 2) subgroups of patients with different severity of depressive symptoms (based on both the CGI-S score and the attending psychiatrist's rating)
  - Calculation, for the diagnosis of MDD (based on SCID criteria and on the attending psychiatrist's evaluation), of the area under receiver operating characteristic curve (AUROC) and sensitivity, specificity, number needed to diagnose (NND, 1/(sensitivity – (1 – specificity)) (15)), and positive and negative likelihood ratios (LR+ and LR–) for selected DPS cutoff scores, and determination of the optimum cutoff score.

Statistical analyses were performed using SPSS version 12 (IBM, Armonk, NY, USA).

RESULTS

Characteristics of the study subjects

A total of 226 subjects were included in the study—94 male (41.6%) and 132 female (58.4%). The mean age was 28.49 years, with a standard deviation (SD) of 9.25, and the mean educational level was 12.9 years (SD = 2.36). The marital status breakdown was 59.1% single, 30% married or living together, 10% divorced or separated, and 0.9% widowed.

Out of the 226 subjects, 218 completed the DPS, 197 the ZSDS, and 224 the SCID MDD module. The diagnosis resulting from the initial clinical evaluation was fully documented in 223 cases.

According to the attending psychiatrists, MDD was diagnosed in 109 patients. In this group of depressed patients, other DSM-IV Axis I (principal clinical disorder) comorbid conditions included social phobia (16.5%), generalized anxiety disorder (9.2%), dysthymic disorder (8.3%), panic disorder with agoraphobia (8.3%), obsessive-compulsive disorder (5.5%), panic disorder without agoraphobia (2.8%), bulimia nervosa (1.8%), anxiety disorder not otherwise specified (0.9%), anorexia nervosa (0.9%), hypochondriasis (1.8%), and other mental disorders (11%).

Among the other 114 individuals without MDD, the diagnosis included social phobia (29.8%), dysthymic disorder (14%), generalized anxiety disorder (17.5%), panic disorder with agoraphobia (14%) and without agoraphobia (14%), obsessive-compulsive disorder (7.9%), depressive disorder not otherwise specified (7.9%), adjustment disorder (6.1%), anxiety disorder not otherwise specified (3.5%), bulimia nervosa (2.6%), hypochondriasis (1.8%), anorexia nervosa (0.9%), dissociative disorder (0.9%), and other mental disorders (27.2%).

Feasibility (acceptability, quality of data, ease of use, and time required for completion)

Four subjects (who met the inclusion criteria) refused to participate in the study. The number of subjects who completed the DPS was significantly greater than the number of subjects who completed the ZSDS (96.46% versus 87.17%; $\chi^2 = 12.98$, degrees of freedom [df] = 1, $P < 0.001$). For the

DPS, two patients (0.9%) each failed to respond to the "restlessness" and "early morning awakening" items, and one patient (per item) (0.4%) failed to respond to the "psychomotor retardation," "irritability," "difficulty with concentration/trouble thinking," "lack of optimism," "indecisiveness," "sadness," "suicidal thinking," "leaden paralysis," "rejection sensitivity," "depression worse in the morning," and "mood reactivity" items. For the remaining seven items, the data was complete (i.e., there were no missing responses). In comparison, for the ZSDS, 9 patients (4%) failed to complete the "fatigue" item; 8 (3.5%) skipped the "insomnia" and "suicidal thinking" items; 7 (3.1%) skipped "depression worse in the morning," "crying spells," "weight loss," and "palpitations"; 6 (2.7%) skipped "gastrointestinal symptoms," "hopelessness," "indecisiveness," and "feelings of emptiness"; 5 (2.2%) skipped "low appetite," "loss of libido," "nervousness," "irritability," "low self-esteem," and "difficulty doing usual things"; and 4 (1.8%) skipped "sadness," "trouble thinking," and "anhedonia."

The vast majority of subjects reported that the DPS items seemed easy to understand (94.5%) and that the responses were easy to rate (90.3%). Most subjects (92.4%) reported that they would be willing to respond to the questionnaire again during their next visit to "HD-HN" NIMH. Negative feedback was minimal (7.1% said the questionnaire had too many items, 3.3% said the items themselves were too long, and 12.2% said too much time was required to complete all of the items).

The mean time required by the subjects to complete the DPS was 7.22 minutes (SD = 3.99), with a median of 6 minutes, and 95% of subjects completed it in less than 15 minutes.

Factor structure

Based on principal component analysis, the DPS comprises five main factors: 1) "depression" ("sadness," "feelings of guilt," "irritability," "rejection sensitivity," "low self-esteem," and "suicidal thinking"); 2) "anergia" ("hypersomnia," "fatigue," "leaden paralysis," and "psychomotor retardation"); 3) "uneasiness" ("restlessness," "indecisiveness," and "difficulty with concentration/trouble thinking"); 4) "insomnia" ("sleep disturbances" and "early morning awakening"); and 5) "absence of positive affects" ("lack of optimism" and "anhedonia") (the "anhedonia" item also showed a relatively strong loading (≥ 0.40) on the "uneasiness" factor) (Table 1). Three items ("appetite disturbances," "depression worse in the morning," and "mood reactivity") showed low loadings (< 0.40) on all five factors. Spearman's correlations between "depression" and other factors were as follows: 0.472 for "anergia," 0.541 for "uneasiness," 0.294 for "insomnia," and 0.464 for "absence of positive affects" (all $P < 0.01$).

Internal consistency

The internal consistency analysis of the 20 DPS items yielded an overall Cronbach's alpha value of 0.86. In comparison, the 20 ZSDS items yielded an overall alpha value of 0.83 for the same sample. The alpha values for the five factors were as follows: "depression," 0.76; "anergia," 0.702; "uneasiness," 0.63; "insomnia," 0.681; and "absence of positive affects," 0.538.

TABLE 1. Depressive Psychopathology Scale (DPS): five factors[a] and their loading scores for 20 items in study of Peruvian psychiatric outpatients (*n* = 218), Lima, Peru, 1999–2001

DPS item	Factor loadings				
	Depression	Anergia	Uneasiness	Insomnia	Absence of positive affects
1. Appetite disturbances	0.28	0.26	–[b]	–	–
2. Sleep disturbances	–	–	0.29	0.79	–
3. Early morning awakening	–	–	–	0.81	–
4. Hypersomnia	–	0.59	–	–	–
5. Fatigue	0.26	0.70	–	0.22	–
6. Leaden paralysis	–	0.82	–	–	–
7. Anhedonia	0.27	0.21	0.44	–	0.46
8. Restlessness	0.26	–	0.47	0.24	–
9. Psychomotor retardation	–	0.61	0.33	–	–
10. Rejection sensitivity	0.53	–	0.35	–	–
11. Irritability	0.73	–	–	–	–
12. Difficulty with concentration/ trouble thinking	–	–	0.81	–	–
13. Lack of optimism	–	–	–	–	0.85
14. Indecisiveness	0.25	–	0.71	–	–
15. Sadness	0.58	–	0.36	0.26	–
16. Depression worse in the morning	–	–	–	–	–
17. Mood reactivity	0.23	0.29	0.21	–	0.22
18. Feelings of guilt	0.67	–	–	–	–
19. Low self-esteem	0.59	0.31	0.29	–	–
20. Suicidal thinking	0.58	–	–	–	–
% of variance	14.12	12.13	11.50	9.08	6.15

[a] Extracted through principal component analysis and rotated using varimax with Kaiser's normalization. Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy = 0.857. $P < 0.001$ based on Bartlett's test of sphericity.
[b] Loadings ≤ 0.2 were eliminated from the table.

TABLE 2. Convergent validity of depression screening scales: correlations between items from the Depressive Psychopathology Scale (DPS) and the Zung Self-rating Depression Scale (ZSDS) in study of Peruvian psychiatric outpatients, Lima, Peru, 1999–2001

DPS item	Corresponding ZSDS item	Spearman's correlation value[a]	*n*
1. Appetite disturbances	5. Low appetite	0.297	221
	7. Weight loss	0.218	219
2. Sleep disturbances	4. Insomnia	0.677	218
3. Early morning awakening	4. Insomnia	0.491	216
4. Hypersomnia	NA[b]		
5. Fatigue	10. Fatigue	0.566	217
	12. Difficulty doing usual things	0.459	221
6. Leaden paralysis	NA		
7. Anhedonia	6. Loss of libido	0.087[c]	221
	20. Anhedonia	0.323	222
8. Restlessness	13. Restlessness	0.427	219
9. Psychomotor retardation	NA		
10. Rejection sensitivity	NA		
11. Irritability	15. Irritability	0.576	220
12. Difficulty with concentration/ trouble thinking	11. Trouble thinking	0.435	221
13. Lack of optimism	14. Hopelessness	0.439	219
14. Indecisiveness	16. Indecisiveness	0.379	219
15. Sadness	1. Sadness	0.602	221
	3. Crying spells	0.497	218
16. Depression worse in the morning	2. Depression worse in the morning	0.123[c]	218
17. Mood reactivity	NA		
18. Feelings of guilt	NA		
19. Low self-esteem	17. Low self-esteem	0.533	221
	18. Feelings of emptiness	0.381	
20. Suicidal thinking	19. Suicidal thinking	0.454	217
	8. Constipation		
	9. Palpitations		

[a] $P < 0.01$ (unless otherwise indicated).
[b] NA: not applicable.
[c] $P > 0.05$.

Convergent validity

Six DPS items and two ZSDS items had no corresponding items in the opposite scale. Correlations between corresponding items across both scales are shown in Table 2. Statistically significant correlations ($P < 0.01$) were found for all pairs of corresponding items except two: "depression worse in the morning" (both scales), and "anhedonia" (DPS) and "loss of libido" (ZSDS).

The overall DPS score was significantly correlated with the following parameters: the overall ZSDS score (rho = 0.804, $P < 0.001$); the CGI-S score for depression severity (rho = 0.621, $P < 0.001$); and the attending psychiatrist's rating of depression severity (rho = 0.589, $P < 0.001$). Correlations between each DPS item and the other parameters of depression are shown in Table 3.

Discriminant validity

Table 4 shows mean DPS scores classified by groups based on the presence/ absence of depression (according to the SCID and the attending psychiatrist's evaluation) and the severity of depression (based on the CGI-S score and the attending psychiatrist's rating). Mean scores for the ZSDS for the above-mentioned groups are also shown for comparison. As shown, mean DPS scores are significantly higher among those classified as depressed versus those classified as nondepressed (according to the SCID and the attending psychiatrist's evaluation) ($P < 0.001$), and a significant statistical difference was found across subgroups for depression severity ($P < 0.001$).

ROC analysis and psychometric measures (sensitivity, specificity, NND, LR+, and LR–) for selected DPS cutoff scores for MDD diagnosis (according to the SCID and the attending psychiatrist's evaluation) are shown in Tables 5 and 6, respectively.

When the SCID MDD module was used as the gold standard, the AUROC was 0.872 (standard error [SE] = 0.024); the lowest NND (1.54) corresponded to a cutoff score of 28/29, with a sensitivity of 76.92% and specificity of 88%; and equilibrium between sensitivity (81.32%) and specificity (80%) was found for a cutoff score of 26/27. When using the attending psychiatrist's diagnosis as the gold standard, the AUROC was 0.832

TABLE 3. Convergent validity: correlations (Spearman's rho)[a] between DPS[b] individual item and overall scores and three other measures of depression (overall ZSDS[c] score, CGI-S[d] score, and attending psychiatrist's rating of depression severity) in study of Peruvian psychiatric outpatients, Lima, Peru, 1999–2001

DPS item	ZSDS	CGI-S	Psychiatrist's rating of depression severity
1. Appetite disturbances	0.372 (*n* = 197)	0.284 (*n* = 214)	0.289 (*n* = 216)
2. Sleep disturbances	0.545 (*n* = 197)	0.343 (*n* = 214)	0.399 (*n* = 216)
3. Early morning awakening	0.404 (*n* = 196)	0.328 (*n* = 212)	0.347 (*n* = 214)
4. Hypersomnia	0.126[e] (*n* = 197)	0.018[e] (*n* = 214)	–0.008[e] (*n* = 216)
5. Fatigue	0.584 (*n* = 197)	0.505 (*n* = 214)	0.490 (*n* = 216)
6. Leaden paralysis	0.423 (*n* = 197)	0.430 (*n* = 213)	0.392 (*n* = 215)
7. Anhedonia	0.473 (*n* = 197)	0.377 (*n* = 214)	0.413 (*n* = 216)
8. Restlessness	0.346 (*n* = 195)	0.221[f] (*n* = 212)	0.200[f] (*n* = 214)
9. Psychomotor retardation	0.470 (*n* = 196)	0.416 (*n* = 213)	0.361 (*n* = 215)
10. Rejection sensitivity	0.364 (*n* = 196)	0.306 (*n* = 213)	0.253 (*n* = 215)
11. Irritability	0.403 (*n* = 196)	0.332 (*n* = 213)	0.281 (*n* = 215)
12. Difficulty with concentration/trouble thinking	0.366 (*n* = 196)	0.246 (*n* = 213)	0.210[f] (*n* = 215)
13. Lack of optimism	0.453 (*n* = 196)	0.297 (*n* = 213)	0.277 (*n* = 215)
14. Indecisiveness	0.511 (*n* = 196)	0.331 (*n* = 213)	0.311 (*n* = 215)
15. Sadness	0.534 (*n* = 196)	0.463 (*n* = 213)	0.411 (*n* = 215)
16. Depression worse in the morning	0.057[e] (*n* = 197)	0.005[e] (*n* = 213)	0.022[e] (*n* = 215)
17. Mood reactivity	0.537 (*n* = 196)	0.364 (*n* = 213)	0.424 (*n* = 215)
18. Feelings of guilt	0.371 (*n* = 197)	0.286 (*n* = 214)	0.288 (*n* = 216)
19. Low self-esteem	0.618 (*n* = 197)	0.501 (*n* = 214)	0.426 (*n* = 216)
20. Suicidal thinking	0.452 (*n* = 197)	0.306 (*n* = 213)	0.319 (*n* = 215)
Overall DPS score	0.804 (*n* = 193)	0.621 (*n* = 206)	0.589 (*n* = 208)

[a] $P < 0.001$ (unless otherwise indicated).
[b] DPS: Depressive Psychopathology Scale.
[c] ZSDS: Zung Self-rating Depression Scale.
[d] CGI-S: Clinical Global Impression–Severity scale.
[e] $P > 0.05$.
[f] $P < 0.005$.

(SE = 0.028) and the lowest NND (1.82) corresponded to a cutoff score of 30/31. Equilibrium between sensitivity (77.67%) and specificity (72.32%) was found for a cutoff score of 25/26.

DISCUSSION

According to the results of the current study, the newly developed instrument known as the DPS adequately detects MDD, has a good convergent validity, and is easy to use.

ROC analysis supports the discriminant validity of the DPS, demonstrating its ability to differentiate individuals with MDD from those without it (according to the SCID and the attending psychiatrist's evaluation). In addition, the DPS AUROC (> 0.8) is good compared with curves found for other scales (6, 16, 17). A cutoff score of 26/27, with a sensitivity and specificity of at least 80% for MDD (according to the SCID), is proposed.

The convergent validity of the DPS was demonstrated based principally on its strong correlation (0.8) with the ZSDS—a widespread psychometric measure for depression. Correlations between the DPS

TABLE 4. Discriminant validity: analyses of mean overall DPS[a] and ZSDS[b] scores for diagnosis (presence or absence of depression) and severity criteria, based on the SCID,[c] the attending psychiatrist's evaluation, and the CGI-S,[d] in study of Peruvian psychiatric outpatients, Lima, Peru, 1999–2001

Diagnosis/severity criteria	Category	*n*	DPS score (SD[e])	*n*	ZSDS score (SD)
Major Depressive Disorder (MDD)					
SCID	Present	91	32.91 (7.40)	81	69.43 (8.95)
	Absent	125	20.43 (8.17)	116	55.58 (10.14)
			$F = 132.88$, $P < 0.001$		$F = 97.81$, $P < 0.001$
Attending psychiatrist's evaluation	Present	103	31.57 (8.74)	91	67.79 (10.19)
	Absent	112	20.36 (7.94)	103	55.49 (10.24)
			$F = 97.2$, $P < 0.001$		$F = 70.13$, $P < 0.001$
Severity of depression					
Attending psychiatrist's evaluation	No depression	30	16.70 (8.30)	26	50.77 (9.77)
	Other depressive disorder	72	22.11 (6.89)	67	56.74 (8.93)
	MDD, mild	14	25.64 (8.44)	16	64.69 (6.65)
	MDD, moderate	87	31.43 (9.00)	75	68.15 (10.64)
	MDD, severe	5	39.00 (7.91)	5	76.00 (5.55)
			$F = 26.63$, $P < 0.001$		$F = 24.74$, $P < 0.001$
CGI-S	1 = Not at all depressed	28	16.68 (8.44)	24	51.51 (9.60)
	2 = Borderline depressed	27	18.85 (6.85)	26	53.46 (9.38)
	3 = Mildly depressed	40	22.48 (6.41)	39	58.43 (8.43)
	4 = Moderately depressed	70	28.97 (8.15)	64	65.02 (9.32)
	5 = Markedly depressed	32	34.00 (9.26)	25	71.25 (12.69)
	6 = Severely depressed	9	35.00 (8.69)	9	71.94 (7.63)
	7 = Extremely depressed	NA[f]	NA	NA	NA
			$F = 24.44$, $P < 0.001$		$F = 18.48$, $P < 0.001$

[a] DPS: Depressive Psychopathology Scale.
[b] ZSDS: Zung Self-rating Depression Scale.
[c] SCID: Structured Clinical Interview for DSM-IV Disorders, Major Depression Disorder (MDD) module.
[d] CGI-S: Clinical Global Impression–Severity scale.
[e] SD: standard deviation.
[f] NA: not applicable.

and both the CGI-S score (0.621) and the attending psychiatrist's rating of depression severity (0.589) were also strong (and statistically significant).

Furthermore, the vast majority of subjects had no difficulty completing the DPS. Acceptability of the instrument was also suggested by the fact that only a minimal number of subjects declined to participate in the study, more than 96% of subjects completed all items, and a significantly higher number of subjects responded to the DPS versus the widely used ZSDS. In addition, the time required to complete the instrument (7 minutes on average) seems rather brief when compared with other widely used depression scales such as the CES-D, which requires 5 minutes; the BDI, which takes 5–10 minutes; and the MADRS, the HAM-D, and the IDS, which take 15 minutes, 15–20 minutes, and 15–30 minutes, respectively (11).

Extracting factors through principal component analysis showed that most items could be reasonably grouped into five domains: "depression," "anergia," "uneasiness," "insomnia," and "absence of positive affects."

Review of the literature revealed that, in some cases, other established depression instruments have up to five dimensions (e.g., the HAM-D (18)), similar to the multifactor structure found in the DPS. In addition, symptoms identical or similar to those of the core "depression" factor in the DPS ("sadness," "feelings of guilt," "low self-esteem," and "suicidal thinking") can be found in other instruments such as the CES-D ("sadness," "depressive mood," "could not get going," "life had been a failure," and "crying" (16, 19–21); the ZSDS ("depressed mood," "crying," "personal devaluation," and "suicidal rumination") (22); the HAM-D ("depressed mood," "feelings of guilt," "suicidality," and "worthlessness") (18); the Schedules for Clinical Assessment in Neuropsychiatry (SCAN) ("depressed mood," "loss of self-esteem," and "suicidality") (23); and the European screening instrument for depression in the elderly, known as the EURO-D ("depressed mood," "suicidality," "guilt," and "tearfulness") (17). Review of other factors reported for the above-mentioned scales showed similarities with other DPS factors. For example, the DPS "uneasiness" factor is similar to the "anxiety" factor in the SCAN (23), HAM-D (18), and ZSDS (22), and the DPS "absence of positive affects" factor is similar to both the EURO-D "factor 4" (17) and the CES-D "positive affect" factor (16, 19–21). Other corresponding factors include the DPS "anergia" factor and the "problems initiating behaviors" factor of the CES-D (16), and the DPS "insomnia" factor and the "sleep disturbance" factor of the HAM-D (18).

Five DPS items were problematic in terms of correlation with the depression parameters and/or factor structure: 1) "depression worse in the morning" (melancholic symptom), which had weak loadings on all factors and failed to significantly correlate with the corresponding item in the ZSDS and other parameters of depression, such as the overall ZSDS score, the CGI-S score, and the attending psychiatrist's rating of depres-

TABLE 5. Discriminant validity: ROC[a] analysis and psychometric measures (sensitivity, specificity, NND,[b] and LR+/LR–[c]) for selected DPS[d] cutoff scores for diagnosis of MDD[e] (based on SCID[f] criteria) in study of Peruvian psychiatric outpatients,[g] Lima, Peru, 1999–2001

Cutoff score	Sensitivity	1 – specificity	Specificity	NND	LR+	LR–
2/3	1.0000	0.9760	0.0240	41.6667	1.0246	0.0000
4/5	1.0000	0.9680	0.0320	31.2500	1.0331	0.0000
10	1.0000	0.8960	0.1040	9.6154	1.1161	0.0000
11/12	1.0000	0.8720	0.1280	7.8125	1.1468	0.0000
15/16	1.0000	0.7200	0.2800	3.5714	1.3889	0.0000
16/17	0.9890	0.6800	0.3200	3.2361	1.4544	0.0343
19/20	0.9560	0.5520	0.4480	2.4750	1.7320	0.0981
20/21	0.9451	0.4960	0.5040	2.2269	1.9054	0.1090
24/25	0.8681	0.3120	0.6880	1.7981	2.7825	0.1917
25/26	0.8352	0.2800	0.7200	1.8013	2.9827	0.2289
26/27	0.8132	0.2000	0.8000	1.6308	4.0659	0.2335
27/28	0.7912	0.1440	0.8560	1.5451	5.4945	0.2439
28/29	0.7692	0.1200	0.8800	1.5403	6.4103	0.2622
29/30	0.7363	0.1120	0.8880	1.6019	6.5738	0.2970
30/31	0.6813	0.0960	0.9040	1.7085	7.0971	0.3525
34/35	0.3626	0.0480	0.9520	3.1783	7.5549	0.6695
35/36	0.3407	0.0320	0.9680	3.2398	10.6456	0.6811
39/40	0.1868	0.0080	0.9920	5.5924	23.3516	0.8197
40/41	0.1648	0.0080	0.9920	6.3761	20.6044	0.8419
44/45	0.0659	0.0080	0.9920	17.2610	8.2418	0.9416
45/46	0.0549	0.0000	1.0000	18.2000	–[h]	0.9451

[a] ROC: receiver-operating characteristic.
[b] NND: number needed to diagnose.
[c] LR+/LR–: positive/negative likelihood ratios.
[d] DPS: Depressive Psychopathology Scale.
[e] MDD: Major Depressive Disorder.
[f] SCID: Structured Clinical Interview for DSM-IV Disorders, Major Depression Disorder (MDD) module.
[g] 91 with MDD and 125 without MDD (with 10 excluded because of missing values).
[h] Non-calculable.

sion severity; 2) "hypersomnia" (atypical feature), which did not correlate significantly with any of the depression parameters; 3) "mood reactivity" and 4) "appetite disturbances," which showed low factor loadings based on principal component analysis; and 5) "anhedonia," which had moderate loadings on two distinct factors and a nonsignificant correlation with the ZSDS' corresponding item "loss of libido." The low loadings of the "appetite disturbances" item may be attributable to its measurement of both increased and decreased appetite and the fact that its rating scale differs from that of most other items.

Further studies using this new scale could help determine if the five items listed above contribute to the measurement of depression in this population, and if any of them should be eliminated or modified in a revised version of the instrument.

One potential limitation of the current study is the fact that nondepressed subjects participating in it had other conditions, such as anxiety disorders and other psychopathology, that could have elevated the cutoff scores for discriminating between depressed and nondepressed patients and thus resulted in an underestimation of sensitivity and specificity in relation to other studies comparing depressed subjects with non-psychiatrically ill individuals. In addition, because psychotic patients were excluded from the study, it was not possible to evaluate the ability of the DPS to discriminate between depression and psychotic disorders such as schizophrenia.

This study suggests the DPS has strong convergent and discriminant validity and is highly acceptable, efficient (requiring only about 7 minutes to complete), and easy to use. However, before the scale can be recommended for clinical use, further studies are needed to improve and simplify it (e.g., eliminating items with deficits related to either the factor structure or the correlation with depression parameters). Psychometric assessment of the DPS using statistical methods based on Item Response Theory is another recommended area of research.

Acknowledgments. The authors express their gratitude for the contributions of the following professionals: Andrea Rubini, Javier Saavedra, Bernardo Guimas, Héctor Vidal, Freddy Vásquez, José Carlos San Martín, Abel Sagástegui, Guido Mazzotti, Ricardo Chirinos, and María del Carmen Díaz.

TABLE 6. Discriminant validity: ROC[a] analysis and psychometric measures (sensitivity, specificity, NND,[b] and LR+/LR–[c]) for selected DPS[d] cutoff scores for diagnosis of MDD[e] (based on the attending psychiatrist's evaluation) in study of Peruvian psychiatric outpatients,[f] Lima, Peru, 1999–2001

Cutoff score	Sensitivity	1 – specificity	Specificity	NND	LR+	LR–
1	1.0000	1.0000	0.0000	–[g]	1.0000	–
2/3	1.0000	0.9732	0.0268	37.3333	1.0275	0.0000
4/5	1.0000	0.9643	0.0357	28.0000	1.0370	0.0000
10	0.9806	0.9018	0.0982	12.6909	1.0874	0.1977
11/12	0.9806	0.8750	0.1250	9.4713	1.1207	0.1553
14/15	0.9806	0.7768	0.2232	4.9068	1.2624	0.0870
15/16	0.9612	0.7232	0.2768	4.2026	1.3290	0.1403
19/20	0.8932	0.5625	0.4375	3.0239	1.5879	0.2441
20/21	0.8738	0.5089	0.4911	2.7408	1.7169	0.2570
23/24	0.8155	0.3661	0.6339	2.2249	2.2278	0.2910
24/25	0.8058	0.3036	0.6964	1.9910	2.6545	0.2788
25/26	0.7767	0.2768	0.7232	2.0003	2.8061	0.3088
26/27	0.7184	0.2232	0.7768	2.0193	3.2186	0.3625
27/28	0.6990	0.1607	0.8393	1.8576	4.3495	0.3586
28/29	0.6796	0.1339	0.8661	1.8326	5.0744	0.3699
29/30	0.6505	0.1250	0.8750	1.9030	5.2039	0.3994
30/31	0.6311	0.0804	0.9196	1.8158	7.8533	0.4012
31/32	0.5340	0.0536	0.9464	2.0816	9.9676	0.4924
32/33	0.4757	0.0446	0.9554	2.3197	10.6563	0.5488
35/36	0.3204	0.0268	0.9732	3.4060	11.9612	0.6983
36/37	0.2816	0.0268	0.9732	3.9251	10.5113	0.7382
39/40	0.1650	0.0089	0.9911	6.4053	18.4854	0.8425
40/41	0.1456	0.0089	0.9911	7.3152	16.3107	0.8621
41/42	0.1262	0.0000	1.0000	7.9231	–	0.8738

[a] ROC: receiver-operating characteristic.
[b] NND: number needed to diagnose.
[c] LR+/LR–: positive/negative likelihood ratios.
[d] DPS: Depressive Psychopathology Scale.
[e] MDD: Major Depressive Disorder.
[f] 103 with MDD and 112 without MDD (with 11 excluded because of missing values).
[g] Non-calculable.

REFERENCES

1. Ustün TB, Ayuso-Mateos JL, Chatterji S, Mathers C, Murray CJ. Global burden of depressive disorders in the year 2000. Br J Psychiatry. 2004;184:386–92.
2. Bobes J, Bulbena A, Luque A, Dal-Ré R, Ballesteros J, Ibarra N; Grupo de Validación en Español de Escalas Psicométricas. Evaluación psicométrica comparativa de las versiones en español de 6, 17 y 21 ítems de la Escala de valoración de Hamilton para la evaluación de la depresión. Med Clin (Barc). 2003;120(18):693–700.
3. Lobo A, Chamorro L, Luque A, Dal-Ré R, Badia X, Baró E; Grupo de Validación en Español de Escalas Psicométricas. Validación de las versiones en español de la Montgomery-Asberg Depression Rating Scale y la Hamilton Anxiety Rating Scale para la evaluación de la depresión y de la ansiedad. Med Clin (Barc). 2002;118(13):493–9.
4. Wiebe JS, Penley JA. A psychometric comparison of the Beck Depression Inventory-II in English and Spanish. Psychol Assess. 2005; 17(4):481–5.
5. Aragonès Benaiges E, Masdèu Montalà RM, Cando Guasch G, Coll Borràs G. Validez diagnóstica de la Self-Rating Depression Scale de Zung en pacientes de atención primaria. Actas Esp Psiquiatr. 2001;29(5):310–6.
6. Camacho PA, Rueda-Jaimes GE, Latorre JF, Navarro-Mancilla AA, Escobar M, Franco JA. Validez y confiabilidad de la escala del Center for Epidemiologic Studies–Depression en estudiantes adolescentes de Colombia. Biomedica. 2009;29(2):260–9.
7. Reuland DS, Cherrington A, Watkins GS, Bradford DW, Blanco RA, Gaynes BN. Diagnostic accuracy of Spanish language depression-screening instruments. Ann Fam Med. 2009;7(5):455–62.
8. Bagby RM, Ryder AG, Schuller DR, Marshall MB. The Hamilton Depression Rating Scale: has the gold standard become a lead weight? Am J Psychiatry. 2004;161(12):2163–77.
9. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 4th ed. Washington: American Psychiatric Association; 1994.
10. World Health Organization. The ICD-10 classification of mental and behavioral disorders: clinical descriptions and diagnostic guidelines. Geneva: WHO; 1992.
11. Yonkers KA, Samson J. Mood disorders measures. In: Rush AJ Jr, Pincus HA, First MB, Blacker D, Endicott J, Keith SJ, et al., editors. Handbook of psychiatric measures. Washington: American Psychiatric Association; 2000.
12. Novara J, Sotillo C, Warthon D. Estandarización y correlación de las escalas de Beck, Hamilton y Zung para depresión en

población de Lima Metropolitana. Lima: Instituto Nacional de Salud Mental "Honorio Delgado-Hideyo Noguchi"; 1985.
13. First MB, Spitzer RL, Gibbon M, Williams JBW. Structured Clinical Interview for DSM-IV Axis I Disorders, Clinician Version (SCID-CV). Washington: American Psychiatric Press; 1996.
14. Guy W. Clinical Global Impressions (CGI) Scale. In: Rush AJ Jr, Pincus HA, First MB, Blacker D, Endicott J, Keith SJ, et al., editors. Handbook of psychiatric measures. Washington: American Psychiatric Association; 2000.
15. How good is that test? II [Internet]. Bandolier. 1996;3(5):1–3. Available from: http://www.medicine. ox.ac.uk/bandolier/band27/b27-2.html Accessed 28 July 2010.
16. Batistoni SS, Neri AL, Cupertino AP. Validade da escala de depressão do Center for Epidemiological Studies entre idosos brasileiros. Rev Saude Publica. 2007;41(4):598–605.
17. Jirapramukpitak T, Darawuttimaprakorn N, Punpuing S, Abas M. Validation and factor structure of the Thai version of the EURO-D scale for depression among older psychiatric patients. Aging Ment Health. 2009;13(6):899–904.
18. Milak MS, Parsey RV, Keilp J, Oquendo MA, Malone KM, Mann JJ. Neuroanatomic correlates of psychopathologic components of major depressive disorder. Arch Gen Psychiatry. 2005;62(4):397–408.
19. Villalobos Galvis FH. Estructura factorial y propiedades psicométricas de una escala de depresión en universitarios de Colombia. Rev Panam Salud Publica. 2010;27(2):110–6.
20. Canady RB, Stommel M, Holzman C. Measurement properties of the centers for epidemiological studies depression scale (CES-D) in a sample of African American and non-Hispanic White pregnant women. J Nurs Meas. 2009;17(2):91–104.
21. Makambi KH, Williams CD, Taylor TR, Rosenberg L, Adams-Campbell LL. An assessment of the CES-D scale factor structure in black women: the Black Women's Health Study. Psychiatry Res. 2009;168(2):163–70.
22. Romera I, Delgado-Cohen H, Perez T, Caballero L, Gilaberte I. Factor analysis of the Zung self-rating depression scale in a large sample of patients with major depressive disorder in primary care. BMC Psychiatry. 2008;8(1):4.
23. Korszun A, Moskvina V, Brewster S, Craddock N, Ferrero F, Gill M, et al. Familiality of symptom dimensions in depression. Arch Gen Psychiatry. 2004;61(5):468–74.

Manuscript received on 21 August 2010. Revised version accepted for publication on 20 April 2011.

RESUMEN

La Escala de Psicopatología Depresiva: presentación y validación inicial en una muestra de pacientes psiquiátricos peruanos

Objetivo. Presentación y validación de la Escala de Psicopatología Depresiva (EPD), un nuevo inventario psicométrico en lengua española, en una muestra de pacientes psiquiátricos peruanos.

Métodos. De 1999 al 2001, se administraron la EPD, la Escala de Autoevaluación de la Depresión de Zung (ZSDS) y el módulo correspondiente al Trastorno Depresivo Mayor (TDM) de la Entrevista Clínica Estructurada para trastornos del DSM-IV (SCID) a 226 pacientes ambulatorios no psicóticos derivados al Instituto Nacional de Salud Mental de Lima para su evaluación clínica inicial. En la evaluación, los psiquiatras responsables 1) corroboraron el diagnóstico general y la presencia o ausencia de TDM, y 2) clasificaron la gravedad de la depresión con base en la opinión clínica y los criterios de gravedad de la Escala de Impresión Clínica Global.

Resultados. El tiempo medio para completar la EPD fue de 7,22 minutos (desviación estándar, 3,99). El valor del índice alfa de Cronbach fue de 0,86. Para el diagnóstico del TDM, basado en el SCID, el área bajo la curva ROC (de eficacia diagnóstica) fue de 0,872, y la puntuación discriminatoria seleccionada (26/27) mostró una sensibilidad de 81,32% y una especificidad de 80%; con base en la evaluación de los psiquiatras responsables, el área bajo la curva ROC fue de 0,832, y la puntuación discriminatoria seleccionada (25/26) mostró una sensibilidad de 77,67% y una especificidad de 72,32%. La EPD se correlacionó significativamente con la ZSDS (rho = 0,8, $P < 0,001$). Algunos elementos de la EPD ("depresión peor por la mañana", "alteraciones del apetito", "reactividad del estado de ánimo" e "hipersomnia") mostraron cargas bajas de los cinco factores extraídos mediante el análisis de los componentes principales o no se correlacionaron significativamente con los parámetros de depresión.

Conclusiones. La EPD puede predecir el TDM y tiene validez convergente, tal como lo demuestra su correlación con la ZSDS. Sin embargo, se recomienda realizar estudios psicométricos adicionales con objeto de simplificarla y mejorarla.

Palabras clave Escalas de valoración psiquiátrica; depresión; estudios de validación; Perú.