Assessment of Anxiety and Depression in Primary Care: Value of a Four-Item Questionnaire

Michael R. Rickels, MD; Sarosh Khalid-Khan, MD; Robert Gallop, PhD; and Karl Rickels, MD

Context: Standard questionnaires (eg, Primary Care Evaluation of Mental Disorders [PRIME-MD]; Hopkins Symptom Checklist [HSCL]) can be used to assess anxiety and depression in patients. However, such survey tools are typically lengthy and are therefore not used often in primary care.

Objective: To determine the value of a four-item anxiety and depression screening questionnaire as a diagnostic assessment tool in family practice.

Methods: Two self-administered patient questionnaires—PRIME-MD and 25-item HSCL—were provided to a random sample of adult patients at three family practices in Philadelphia, Pa. A subset of patients who endorsed at least one of four anxiety and depression stem items in the PRIME-MD questionnaire were interviewed using the PRIME-MD clinician evaluation guide. The HSCL anxiety and depression clusters were used as the standard measures of emotional symptomatology. Sensitivity and specificity for the four stem items to detect evidence of anxiety or mood disorders were established using the structured interview as the diagnostic gold standard.

Results: A total of 211 patients participated in the present study. Lowest levels of emotional symptomatology were seen in patients who did not endorse any of the stem items, while highest levels were seen in patients who endorsed anxiety and depression items. Findings were statistically significant (P<.0001). Endorsement of at least three of the four stem items differentiated best between patients with and without an anxiety or mood disorder (P<.001), achieving high sensitivity (78%) and specificity (95%).

Conclusion: A four-item screening tool based on PRIME-MD anxiety and depression stem questions can alert family physicians to potential anxious or depressive symptomatology in the patient and the need for continued evaluation and possible treatment.


Anxiety and depression are psychiatric disorders frequently seen in family practice. A 2005 national survey reported 12-month prevalence estimates of 18.1% for anxiety and 9.5% for depression. Because these disorders are costly, recognizing these conditions and treating afflicted patients are of substantial public health interest.

In addition, 1-year prevalence of family practice patients with anxiety or depression is considerably higher than that of subthreshold diagnoses, patients in both groups can benefit from treatment.

Several screening tools have been recommended for use in family practice to identify potential patients who have anxiety or depression. However, none are regularly used.

One of the most frequently studied self-administered surveys is the Hopkins Symptom Checklist (HSCL), which is an established rating scale to assess anxiety and depression symptomatology. Although a short 25-item version of the HSCL can clearly identify patients with anxiety or depression who might be in need of treatment, this tool is still too long for use in family practice.

Likewise, the original Primary Care Evaluation of Mental Disorders (PRIME-MD) and the revised self-administered PRIME-MD Patient Health Questionnaire have proven helpful in clinical settings, but physicians’ time constraints limit the use of such tools.

The present study was initiated to evaluate the usefulness of a concise screening tool in family practice—specifically, if it could help family physicians determine whether or not to explore a patient’s emotional state and assess his or her need for treatment.

Methods

The study protocol was approved by the institutional review board at the University of Pennsylvania in Philadelphia. Oral informed consent was obtained from all participants.

Several half-day sessions were randomly distributed among the three participating family practices, which were all located in Philadelphia, Pa. A single half day session occurred in either the morning or afternoon and lasted between 3.5 to 4 hours. During each session, patients, who had regular appointments with their family physicians, were asked to
participate in the present study. Patients were required to be aged 18 years or older and be able to speak and read in English.

**Self-Administered Survey Instruments**

Two self-administered survey instruments were completed by participants: (1) the PRIME-MD patient questionnaire,\(^17\) and (2) the 25-item HSCL.

The PRIME-MD questionnaire, which patients completed first, consists of 26 items. Participants were asked to respond “yes” or “no” to indicate their agreement (or disagreement) with several statements related to their health. The following four anxiety and depression stem items in PRIME-MD were the focus of the present study:

- □ little interest or pleasure in doing things
- □ feeling down, depressed, or hopeless
- □ “nerves” or feeling anxious or on edge
- □ worrying about a lot of different things

Responses were scored accordingly for these four stem items: each “yes” answer was tallied as one point, and each “no” answer was tallied as zero points.

After completing the PRIME-MD questionnaire, patients were asked to fill out the 25-item HSCL. This survey tool comprises five anxiety, six panic, five social phobic, and nine depression items. Patient responses are rated on a scale from “0” (not at all) to “3” (extremely).

**Patient Interview**

Patients who completed the two questionnaires, endorsed at least one of the four anxiety and depression stem items, and had time to speak to the interviewer were administered the structured interview during the same session.

A trained interviewer (M.R.R.) administered the PRIME-MD clinician evaluation guide,\(^17\) which was revised for compatibility with DSM-IV and allows for DSM-IV–defined diagnoses of various mental disorders, including major and minor depressive disorder, partial remission of major depressive disorder, dysthymia, bipolar disorder, panic disorder, generalized anxiety disorder, anxiety not otherwise specified, and alcohol or substance abuse. Although the evaluation guide includes a section on somatoform disorders, such conditions were not assessed for the present study.

**Survey Questionnaire**

After the self-administered questionnaires and PRIME-MD clinical evaluations were completed, participants were asked to complete a five-item questionnaire regarding medication use and respondent interest in a treatment study for patients with anxiety disorders.

**Statistical Analysis**

Association of the combined score of the four PRIME-MD anxiety and depression stem items was used to detect psychiatric disorders in family practice patients. Endorsement of the four stem items served as our diagnostic instrument with results obtained from the PRIME-MD diagnostic structured interview serving as the gold standard. The modified HSCL served as a second standard to assess the validity of our four-item diagnostic instrument to predict an anxiety or depression diagnosis.

To quantify the association between the diagnostic test (PRIME-MD patient questionnaire) and gold standard diagnosis (PRIME-MD clinician evaluation), sensitivity and specificity were derived. Sensitivity and specificity are, respectively, the chance a true positive and a true negative will be identified as such.\(^19\) These statistical tools summarize the performance of a diagnostic test with a positive or negative outcome as determined by a gold standard. When we consider the number of items endorsed as quantitative, a standard approach to summarizing the test’s performance is to examine all possible cutpoints. Each cut-point yields an estimated sensitivity and specificity. As the cut-point varies, the locus yields a bow-shaped receiver operating characteristic (ROC) curve, which displays the performance of all possible decision rules.

Reported descriptive and inferential statistics were dependent on the type of data under consideration. For contingency table data and categorical data, Chi-square (\(\chi^2\)) tests of independence were used to statistically test the association of the diagnostic measure with the gold standard diagnosis. In the presence of small or empty cells in the tests of categorical variable, the \(\chi^2\) test was replaced by the Fisher exact test. Tests of differences in continuous clinical characteristics were investigated using analysis of variance (ANOVA). For all outcomes, model assumptions and goodness of fit were assessed. All analyses were conducted using SAS statistical software (version 9.1; SAS Institute Inc, Cary, NC).

**Results**

A total of 215 patients were asked to complete the self-administered questionnaires. Four patients declined, resulting in a refusal rate of less than 2%.

Of the 211 patients who completed both questionnaires, 81 (38%) did not indicate the presence of a stem item (Group 1); 67 (32%) endorsed either anxiety or depression items (Group 2); and 63 (30%) endorsed anxiety and depression items (Group 3). Groups did not differ substantially by sex (69% female), marital status (53% married), race (66% white), education (59% had a high school degree or less), or age (mean [SD], 45 [16] years).

Using the HSCL with an established rating scale as our standard self-rating instrument, we compared these three groups of patients (*Table*). Lowest symptomatology was seen in patients who endorsed no stem items on the PRIME-MD patient questionnaire. Highest symptomatology was seen in patients who endorsed anxiety and depression stem items.

Although 130 patients endorsed at least one anxiety or depression item, only 71 patients were available for the structured interview. Of these participants, 17 (24%) endorsed one
item; 14 (20%), two items; 24 (34%), three items; and 16 (23%), four items.

Of the 71 interviewed patients, 50 (70%) were diagnosed as having a psychiatric condition as defined by DSM-IV. Fourteen patients had comorbid major depressive disorder and generalized anxiety disorder; 8, anxiety not otherwise specified; 7, generalized anxiety disorder; 7, partial remission of major depressive disorder; and 4, minor depressive disorder. Bipolar disorder, panic disorder, and alcohol, substance abuse, and eating disorders were not diagnosed.

The presence or absence of a DSM-IV–defined mental disorder as determined by the structured interview was compared with the number of PRIME-MD patient questionnaire anxiety and depression stem items endorsed. As presented in the ROC curve (Figure), a score of three or four was determined to indicate the presence of a psychiatric disorder: 39 (78%) of 50 patients who endorsed three or more stem items were diagnosed as having a psychiatric disorder (sensitivity, 78%). In addition, 20 (95%) of 21 patients were correctly identified as not having a psychiatric disorder (specificity, 95%) (\(\chi^2=29.34; P<.0001\)).

We also noted that of the 22 patients who endorsed the PRIME-MD item “your eating is out of control,” all but 1 patient also endorsed anxiety or depression items—specifically, 13 patients endorsed two items and 8 endorsed three or four items (\(\chi^2=12.1; P<.0007\), where \(P\) value is from a Fisher exact test).

Of the 50 patients with a DSM-IV diagnosis, 16 patients were on psychiatric medications, but none of the 21 patients without a psychiatric diagnosis were (\(\chi^2=5.42; P<.05\)). As expected, the HSCL anxiety and depression scores were higher in patients with a psychiatric diagnosis than in those without (anxiety, 1.61 vs 0.89; depression, 1.23 vs 0.38). Both comparisons were statistically significant based on the student t test (\(P<.001\)).

Comment
The ROC curve presented in the Figure illustrates the sensitivity and specificity results of the various cut-off scores for the four anxiety and depression stem items. As previously described for the 3-point cut-off, sensitivity is 78% (39 out of 50) and specificity is 95% (20 of 21). Sensitivity would remain high (90%) with a 2-point cut-off, but specificity would decrease (57%). In other words, 9 patients without a psychiatric disorder would be considered to have one.

In choosing the optimal cut-off score, we were concerned with misdiagnosis resulting in pointless assessments and treatments, which may be not only unnecessary and inconvenient but also physically, mentally, and economically draining.

Table
Assessment of Anxiety and Depression in Primary Care:
Mean (SD) Scores of Patient Response to 25-Item HSCL
by Endorsement of PRIME-MD Stem Items (N=211)*

<table>
<thead>
<tr>
<th>PRIME-MD Stem Items</th>
<th>Anxiety or Depression (n=67)</th>
<th>Anxiety and Depression (n=63)</th>
<th>None (n=81)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSCL Symptomatology</td>
<td>0.74 (0.53)</td>
<td>1.13 (0.78)</td>
<td>0.19 (0.28)</td>
</tr>
<tr>
<td>Anxiety Cluster</td>
<td>0.37 (0.31)</td>
<td>0.96 (0.66)</td>
<td>0.13 (0.18)</td>
</tr>
<tr>
<td>Depression Cluster</td>
<td>0.32 (0.19)</td>
<td>0.71 (0.50)</td>
<td>0.11 (0.14)</td>
</tr>
<tr>
<td>Total†</td>
<td>0.32 (0.19)</td>
<td>0.71 (0.50)</td>
<td>0.11 (0.14)</td>
</tr>
</tbody>
</table>

* Mean (SD) scores represent average patient scores on the 25-question Hopkins Symptom Checklist (HSCL) by patient endorsement of four stem items in the Primary Care Evaluation of Mood Disorders (PRIME-MD).
† The 25-item HSCL assesses the presence of five anxiety, six panic, five social phobia, and nine depression symptoms. Therefore, the total includes panic and phobia symptomatology.
Therefore, we sought a high threshold of sensitivity and decided on a cut-off score of 3 (ie, endorsing three of the four anxiety and depression items) to identify a patient who may have DSM-IV anxiety or depressive disorder. Such patients may benefit from further assessment and treatment of their anxiety and depression symptoms with psychiatric medication.

There are a couple of limitations to the present study. One limitation may be that the four anxiety and depression questions were administered as a part of the 26-item PRIME-MD and were not administered alone. However, the questionnaire provides its items in five clearly delineated sections (somatization, eating, depression, anxiety, and alcohol use), thus clearly separating the anxiety and depression items from the other items.

Another possible limitation to our proposed survey tool is that the four items cannot differentiate between anxiety and depression. However, we feel that the four stem items we described can alert physicians to potential mood disorder symptomatology. Therefore, we recommend the following guidelines for family physicians:

- A patient who endorses zero or one of the four stem items does not need further assessment of his or her emotional symptoms.
- A patient who endorses two items (ie, endorsement of either two anxiety, two depression, or one anxiety and one depression items) should be monitored for possible worsening of emotional symptoms.
- A patient who endorses three or four items, the family physician should explore the patient’s emotional symptoms further, including an assessment of predominance of either anxiety or depressive symptoms, symptom severity, symptom duration, time course, and degree of functional impairment. This assessment will enable the family physician to determine the appropriate course of therapeutic intervention.

Conclusion

A four-item patient checklist based on the PRIME-MD questionnaire as described in the present study may serve as a practical instrument to alert family physicians to potential anxious or depressive symptomatology in patients as well as the need for continued evaluation and possible treatment.

References


