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The Quick Inventory of Depressive Symptomatology, Clinician Rated and Self-report:

A Psychometric Assessment in Chinese Americans With Major Depressive Disorder

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Abstract

This study aimed to investigate the psychometric properties of the Chinese translations of the Quick Inventory of Depressive Symptomatology (QIDS₁₆), including the Clinician-Rated (QIDS-C₁₆), Self-report (QIDS-SR₁₆), and Interactive Voice Response (QIDS-SR-IVR₁₆) formats. Thirty depressed Chinese Americans were assessed with Chinese translations of the QIDS-SR₁₆, QIDS-SR-IVR₁₆, and QIDS-C₁₆. Cronbach alpha estimates of internal scale consistency on the QIDS-SR₁₆, QIDS-SR-IVR₁₆, and QIDS-C₁₆ were 0.70, 0.74, and 0.79, respectively. Intercorrelations among the measures were QIDS-SR₁₆ and QIDS-SR-IVR₁₆, $r = 0.79$; QIDS-SR₁₆ and QIDS-C₁₆, $r = 0.61$; and QIDS-SR-IVR₁₆ and QIDS-C₁₆, $r = 0.69$ (all p values < 0.01). The areas under the curve for the receiver operating characteristics of the QIDS-SR₁₆ and QIDS-SR-IVR₁₆ were 0.78 (95% confidence interval, 0.61–0.95) and 0.81 (95% confidence interval, 0.65–0.96), respectively. The respective screening sensitivities/specificities were 0.73/0.74 and 0.86/0.58. The Chinese translations of the QIDS₁₆ have adequate psychometric properties and may be useful tools for depression screening.

Keywords

Depression; Chinese; psychometrics; severity of illness index; psychiatric status rating scales

Major depressive disorder (MDD) is common among Chinese Americans, who tend to underuse mental health services (US Department of Health and Human Services, 2001). When they have depression, they frequently seek help from primary care practitioners (PCPs) (Chen et al., 2002) rather than from mental health professionals. Substantial underrecognition of MDD in this patient population continues despite efforts aimed at increasing awareness of this disorder among PCPs and patients (Yeung et al., 2006). The use of appropriate instruments for depression screening and for monitoring treatment progress may improve both recognition and treatment of depression among this underserved population (Yeung et al., 2010).

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The 30-item Inventory of Depressive Symptomatology (IDS) was developed in 1982 and was designed to measure signs and symptoms of *DSM-III* major depressive episode. It reflects the *DSM* focus on symptom frequency, rather than intensity, and all symptoms are equally weighted and rated from 0 to 3, with higher ratings indicating greater severity. The Quick IDS (QIDS₁₆) was developed in 2000 by selecting 16 items from IDS that assessed the nine *DSM-IV* diagnostic symptom domains: sad mood, poor concentration, self-criticism, suicidal ideation, anhedonia, energy/fatigue, sleep disturbance, decrease/increase in appetite/weight, and psychomotor agitation/retardation. It is available in Clinician Rating (QIDS-C₁₆) and Self-report (QIDS-SR₁₆) forms. Previous studies have shown that both QIDS-C₁₆ and QIDS-SR₁₆ have good internal scale consistency (coefficient $\alpha = 0.85$ and 0.86 , respectively) (Trivedi et al., 2004) and are sensitive measures of change in depression severity associated with effective treatments (Rush et al., 2006b). In addition, both instruments are valid depression screening instruments for patients at different developmental stages, including the elderly (Doraiswamy et al., 2010) and adolescents (Bernstein et al., 2010). Lamoureux et al. (2010) reported that a cutoff score of 13 or 14 on the QIDS-SR₁₆ performs adequately as a depression screening instrument in primary care medical patients (sensitivity, 76.5%, and specificity, 81.8%). In a study of less educated, socially disadvantaged populations, Bernstein et al. (2007) compared the QIDS-SR₁₆ with the QIDS-C₁₆ and found that the QIDS-SR₁₆ is a satisfactory substitute for the more time-consuming QIDS-C₁₆.

One advantage of the QIDS-C₁₆ and the QIDS-SR₁₆ is that they are available online in multiple languages. To our knowledge, there have been no published studies on the psychometric properties of the Chinese translations of the QIDS-C₁₆ and the QIDS-SR₁₆ when used by Chinese or Chinese American patients. In this study, we hypothesized that the Chinese translations of the QIDS-C₁₆, the QIDS-SR₁₆, and the telephone auditory interactive voice response self-report format (QIDS-SR-IVR₁₆) will have adequate psychometric properties for assessing depression severity and that the QIDS-SR₁₆ and QIDS-SR-IVR₁₆ can be successfully used for MDD screening among depressed Chinese Americans.

Aims of the Study

This study aimed to examine the psychometric properties of the Chinese translations of the QIDS₁₆, in both its traditional visual format and in an interactive voice response telephone format. This study also examined the accuracy of these translated instruments in screening for depression among Chinese Americans.

METHODS

Subjects

All participants provided written informed consent before enrollment. The study was approved by the institutional review board at the Massachusetts General Hospital in Boston, MA. Participants were recruited from the behavioral health clinic of South Cove Community Health Center (South Cove) between July 2009 and December 2010. South Cove is a federally funded community health center in Boston's Chinatown that treats underserved patients who face financial, linguistic, and cultural barriers to health care. In 2010, South Cove saw more than 25,000 patients and provided service for more than 140,000 medical encounters. The population served was predominantly immigrant Asian Americans (96%), of which the majority were Chinese Americans. Study participants were adult Chinese Americans with a current MDD diagnosis as determined by the MDD module of the Chinese-Bilingual Structured Clinical Interview for *DSM-IV* Disorders, Patient Version (CB-SCID-I/P). All were enrolled in a study investigating the characteristics of speech in

patients with depression. They were 18 to 80 years old, recently started or about to begin a new treatment regimen for MDD, and had a QIDS-C₁₆ score of 10 or greater at baseline. Patients were excluded if they had hypothyroidism, dementia, active suicidal ideation deemed unsafe by the research psychiatrist for outpatient treatment, and a history of or current *DSM-IV* diagnosis of organic mental disorder, schizophrenia, schizoaffective disorder, delusion disorder, psychotic disorders not otherwise specified, or bipolar disorder. Patients with mood congruent or mood incongruent psychotic features or with a history of substance dependence disorders including alcohol, active within the last 12 months, were also excluded.

Treatment

Treatment of MDD was provided by clinicians at South Cove based on their clinical decisions (with no influence from the research protocol). Treatment can include psychopharmacology and/or psychotherapy.

Assessments

In the context of the study investigating the characteristics of speech in patients with depression, participants were assessed during office visits at baseline, week 4, and week 8. The Chinese translations of the QIDS-C₁₆ and the QIDS-SR₁₆ were used for the assessments. An interactive voice response automated telephone format was also developed to obtain self-reported symptom severities (QIDS-SR-IVR₁₆) and recorded in both Mandarin Chinese and Cantonese, a language commonly used among Chinese Americans. The subjects completed the Chinese translation of the QIDS-SR₁₆ and the QIDS-SR-IVR₁₆ at each visit and were interviewed by a bilingual psychiatrist using the Chinese translation of the QIDS-C₁₆ and the MDD module of the CB-SCID-I/P. It was anticipated that some of the participants would have responded to treatment by week 8 and their QIDS scores would decrease compared with baseline assessments; data from week 8 were identified a priori for the analysis of scale psychometrics to maximize the range of scores across all of the measures evaluated. Scale psychometrics of the Chinese translations of the QIDS-C₁₆, QIDS-SR₁₆, and the QIDS-SR-IVR₁₆ were compared.

Instruments

The QIDS (Trivedi et al., 2004; Rush et al., 2003) is a rating scale that assesses the nine criterion symptom domains designated by the American Psychiatric Association's (2000) *DSM-IV* to diagnose a major depressive episode. There are 16 items in the adult versions of the QIDS₁₆ measuring the nine criterion symptom domains (sleep, sad mood, appetite/weight, concentration/decision making, self-view, thoughts of death or suicide, general interest, energy level, and restlessness/agitation) that define a major depressive episode according to the *DSM-IV*. The scores for three domains (sleep, appetite/weight, and restlessness/agitation) are based upon the maximum score (most pathological) of two or more questions. Each of the remaining domains is rated by a single item. All domains are scored from 0 to 3, with higher scores reflecting greater psychopathology. Total QIDS scores range from 0 to 27 (Rush et al., 2003), with scores of 5 or lower indicative of no depression, scores from 6 to 10 indicating mild depression, 11 to 15 indicating moderate depression, 16 to 20 reflecting severe depression, and total scores greater than 21 indicating very severe depression. The Chinese translations of the QIDS-C₁₆ and the QIDS-SR₁₆ were obtained from the official QIDS Web site (<http://www.ids-qids.org/>). Translation of the instrument adopted the standard linguistic validation process, which comprises seven steps: 1) conceptual definition, 2) forward translation, 3) backward translation, 4) pilot testing (cognitive interviews, review by clinician), 5) international harmonization to ensure consistency and to enhance cross-cultural comparability, 6) proofreading, and 7) report (<http://www.mapi-institute.com/linguistic-validation/methodology>). In this study, two

QIDS-SR₁₆ formats were used: a paper format with Chinese translation, which patients read and completed in questionnaire format, and an automated telephone format using interactive voice response technology (QIDS-SR-IVR₁₆), in which patients listened to the questions recorded in either Mandarin or Cantonese Chinese and responded to by pressing keys on a touchtone telephone.

The CB-SCID-I/P was translated into Chinese and validated by researchers in China (Sugaya and Nomura, 2008). Questions on different axis I disorders were asked exactly as translated, and each disorder was based on the individual criteria from the *DSM-IV*. All subjects referred to this study had been diagnosed with MDD by their referring clinician on the basis of a clinical interview. The principal investigator (A.Y.) is a native Chinese-speaking psychiatrist with formal SCID training and conducted the patient interviews using the MDD module of the CB-SCID-I/P to confirm current MDD diagnoses. The principal investigator was blind to patients' self-reported scores on QIDS-SR₁₆ and QIDS-SR₁₆-IVR, which were collected independently by other research staff.

Data Analyses

Internal scale consistencies were assessed for QIDS-C₁₆, QIDS-SR₁₆, and QIDS-SR-IVR₁₆ using Cronbach alpha (Cronbach, 1951). Pearson correlations were computed to examine the associations between the total scores on the QIDS-C₁₆, QIDS-SR₁₆, and QIDS-SR-IVR₁₆. All statistical tests were conducted using SPSS and were evaluated as two-sided tests with significance levels set at $p = 0.05$.

To evaluate the diagnostic screening validity of the QIDS-SR₁₆ and QIDS-SR-IVR₁₆, the sensitivity and specificity of the two scales at different cutoff scores were computed and compared with the psychiatrist diagnosis from the CB-SCID-I/P interview, which served as the definitive gold standard. Sensitivity is the probability that the screening instrument correctly recognizes true MDD cases, whereas specificity is the probability that the screening instrument correctly rejects non-MDD cases. Receiver operating characteristic (ROC) curve analysis was performed to assess the overall accuracy of the QIDS-SR₁₆ and QIDS-SR-IVR₁₆. With the use of various cutoff scores, patients were categorized as being either cases or noncases based on the screening instrument score, with a pair of sensitivity and specificity values indicated at each cutoff score. The area under the ROC curve is calculated by plotting sensitivity on the y-axis and "false alarm rate" ($1 - \text{specificity}$) on the x-axis. An area under the ROC curve of 1.0 indicates a perfect instrument, and an area under the ROC curve of 0.5 means that the instrument performs at chance rates of case identification (Hanley and McNeil, 1983). The validity of the QIDS-C₁₆ as an MDD screening instrument was not assessed because both the QIDS-C₁₆ and the CB-SCID-I/P interviews were performed by the same research psychiatrist (A.Y.).

RESULTS

A total of 52 Chinese American patients were enrolled between July 2009 and November 2010; 30 (24 women and 6 men; mean [SD] age, 51.0 [14.8] years; range, 24–80 years) completed all three QIDS at week 8 (Table 1). No differences were evident in age, education, marital status, employment status, or medication treatment between the 30 completers and the 22 patients who did not return for the week 8 visit. Completers were more likely to be women (80% vs. 50%) and had higher rates of treatment with psychotherapy (40% vs. 9%) when compared with those who did not complete all three assessments. At baseline, the mean (SD; range) scores on the QIDS-SR₁₆, QIDS-SR-IVR₁₆, and QIDS-C₁₆ were 14.2 (4.0; 3–23), 16.2 (4.0; 10–24), and 14.9 (2.8; 9–20), respectively. Assessments of psychometric properties of the scales were based on data collected at week 8: The mean (SD; range) scores on the QIDS-SR₁₆, QIDS-SR-IVR₁₆, and QIDS-C₁₆ at

week 8 were 10.0 (4.1; 1–19), 11.5 (5.4; 1–22), and 9.0 (4.4; 1–19), respectively. Cronbach alpha estimates of internal scale consistency were 0.70, 0.74, and 0.79, respectively. Intercorrelations among the measures were QIDS-SR₁₆ and QIDS-SR-IVR₁₆, $r = 0.79$; QIDS-SR₁₆ and QIDS-C₁₆, $r = 0.61$; QIDS-SR-IVR₁₆ and QIDS-C₁₆, $r = 0.69$ (all p values < 0.01). Using psychiatrist diagnosis of MDD as the gold standard, the areas under the curve of the ROC of the QIDS-SR-IVR₁₆ and QIDS-SR₁₆ were 0.81 (95% confidence interval, 0.65–0.96) (Figure 1) and 0.78 (95% confidence interval, 0.61–0.95) (Figure 2), respectively. The respective screening sensitivities/specificities were 0.73/0.74 and 0.86/0.58, using a total score cutoff of 10 as the case finding criterion. ROC analysis of the QIDS-C₁₆ was not conducted because the same interviewer completed the ratings for both the QIDS-C₁₆ and the MDD module of the CB-SCID which generated the MDD diagnosis.

DISCUSSION

The QIDS₁₆ scale is a relatively new depression rating scale with several positive features. It assesses all nine *DSM-IV* symptom criterion domains and weights each of the symptoms equally. In addition, the QIDS₁₆ is available both as a clinician and self-rated instrument with the same items and layout for each. For the self-reported QIDS₁₆, we studied both the written version (the QIDS-SR₁₆) and the auditory interactive voice response version (the QIDS-SR-IVR₁₆). These instruments offer clinicians and patients different formats for assessing depression symptoms based on their preferences. In the English-speaking population, the QIDS-C₁₆, QIDS-SR₁₆, and QIDS-SR-IVR₁₆ have shown adequate psychometric properties (Rush et al., 2006a, 2006b, 2003; Trivedi et al., 2004) and have been used to assess depression symptoms in different studies, including the Sequenced Treatment Alternatives to Relieve Depression study (Sinyor et al., 2010), the largest clinical trial in the United States on treatment-resistant depression. Findings from the current study suggest that the Chinese translations of the QIDS-SR₁₆, QIDS-SR-IVR₁₆, and QIDS-C₁₆ also have adequate psychometric properties when used among immigrant Chinese Americans. This offers clinicians serving Chinese Americans empirical support for using these instruments in their practices as depression screeners or as assessments for monitoring treatment progress. Many Chinese Americans are immigrants and have limited English proficiency; thus, the Chinese versions of the QIDS₁₆ instruments are important tools for serving Chinese Americans who are more comfortable being assessed in their native language. The availability of these Chinese translated instruments (QIDS-C₁₆ and QIDS-SR₁₆) online at the official QIDS Web site (<http://www.ids-qids.org/>) makes them readily accessible for clinicians, patients, and the lay public.

The demonstrated sensitivity and specificity of the QIDS-SR₁₆ and the QIDS-SR-IVR₁₆ support their use for depression screening among high-risk populations, such as patients in primary care clinics, because depressed Chinese American patients tend to seek help from their PCPs rather than mental health professionals. The application of these instruments can reduce the underrecognition of depression, a major public health challenge among minority immigrants (Yeung et al., 2006). The QIDS-SR-IVR₁₆ format is particularly useful for monitoring patients remotely, as well as for patients with lower education levels who may have difficulty understanding the questions in written form. The Chinese translations of the QIDS-C₁₆, QIDS-SR₁₆, and QIDS-SR-IVR₁₆ can also be useful for routine monitoring of symptoms during depression treatment, as previous studies have shown that measurement-based treatment is associated with improved outcomes (Trivedi et al., 2007). When compared with the QIDS-C₁₆, the self-report formats (QIDS-SR₁₆ and the QIDS-SR-IVR₁₆) are preferable because they do not require clinicians' time and are therefore less costly to use (Rush et al., 2006a), and they can be used as tools for patients' self-monitoring between clinical visits.

Favorable outcomes regarding use of the QIDS₁₆ instruments among Chinese Americans have important significance in cross-cultural psychiatry. These findings are consistent with our previous studies indicating that depression screening and assessment instruments developed in the West can work well among underserved Asian immigrants (Yeung et al., 2008, 2002). This observation suggests that depressed patients across ethnic groups share a core group of symptoms despite observations that people from different cultures often hold very different views or conceptions about the disorder (Yeung and Kam, 2005).

There were several limitations of this study. It was a relatively small study with a limited sample size. Nevertheless, the analyses performed, including the calculation of Cronbach alpha, Pearson correlations, diagnostic sensitivity and specificity, and the ROC analysis, found the psychometric characteristics of the Chinese translations of the QIDS₁₆ to be adequate. Second, we used only the MDD module of the CB-SCID-I/P to confirm patients' diagnoses, not the full CB-SCID-I/P interview. We relied on the clinicians at the South Cove clinic to perform psychiatric assessments in their clinical practices to rule out the presence of other major psychiatric disorders before patients were referred to this study. The referring clinicians were highly experienced clinicians; we believe that misclassification rates were low. Another limitation is that participants enrolled in this study were underserved Chinese immigrants, with low levels of acculturation. Therefore, results from this study may not generalize to Chinese Americans who are more acculturated or to other groups of Asian Americans.

The Chinese translations of the QIDS-SR₁₆, QIDS-SR-IVR₁₆, and the QIDS-C₁₆ have adequate psychometric properties when used among underserved Chinese Americans and may be used as screening instruments or as treatment monitoring tools to assess depression severity among Chinese Americans.

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DISCLOSURES

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FIGURE 1. Receiver operating characteristic (ROC) curve(s) for the 16-item Quick Inventory of Depressive Symptomatology, Self-report, Interactive Voice Response.

FIGURE 2.
Receiver operating characteristic (ROC) curve(s) for the 16-item Quick Inventory of
Depressive Symptomatology, Self-report.

TABLE 1

Demographics of Study Completers Who Finished All Three Assessments (QIDS-C, QIDS-IVR, QIDS-SR)

Study Completers (<i>n</i> = 30)	
Sex, %	
Male	20
Female	80
Age, mean (SD), y	50.97 (14.8)
Employment status, %	
Unemployed	50
Employed	9
Retired/student	6
Education, %	
Elementary school	10
High school	63.3
College or above	26.7
Marital status, %	
Not married	60
Married	40
Psychotherapy treatment, %	
No psychotherapy	60
Receiving psychotherapy	40
Medication treatment, %	
No medication	16.7
Medication	83.3

QIDS, Quick Inventory of Depressive Symptomatology; C, clinician rated; IVR, interactive voice response; SR, self-report.