

Yeung AS, Howarth S, Raymond Chan, Sonawalla S, Nierenberg A, Fava M. Use of the Chinese version of the Beck Depression Inventory for Screening Depression in Primary Care. J Nerv & Ment Dis; 190: 94-99, 2002.

USE OF THE CHINESE VERSION OF THE BECK DEPRESSION INVENTORY
FOR SCREENING DEPRESSION IN PRIMARY CARE

Albert Yeung, M.D., ScD., (1,2) Shauna Howarth, A.B., (1)

Raymond Chan, B.S. (2), Shamsah Sonawalla, M.D., (1)

Andrew A. Nierenberg, M.D., (1) Maurizio Fava, M.D. (1)

Running Title: Depression Screening among Chinese-Americans

SEND PROOFS TO:

Dr. Yeung

Depression Clinical and Research Program

50 Staniford St., Suite 401

Boston, MA 02114

Footnotes

1. Depression Clinical and Research Program, Massachusetts General Hospital, 50 Staniford St., Suite 401, Boston, MA 02114. Send reprint requests to Dr. Yeung.
2. South Cove Community Health Center, Boston.

This work was supported by Fellowship Grant 5T32MH19126-10 from the American Psychiatric Association Program for Minority Research Training in Psychiatry

Abstract

Many Asian-Americans are unfamiliar with depression and its treatment. When depressed, they generally seek treatment from their primary care physicians and complain about their physical symptoms, resulting in under-recognition and under-treatment of depression. This study evaluates the effectiveness of the Chinese version of the Beck Depression Inventory (CBDI) for screening depression among Chinese-Americans in primary care.

Five hundred and three Chinese-Americans in the primary care clinic of a community health center were administered the CBDI for depression screening. Patients who screened positive ($\text{CBDI} \geq 16$) were interviewed by a psychiatrist using the Structured Clinical Interview for DSM-III-R, patient version (SCID-I/P) for confirmation of the diagnosis. Patients who screened negative ($\text{CBDI} < 16$) were randomly selected to be interviewed using the depression module of the SCID-I/P. The results of the SCID-I/P interview were used as the standard for evaluating the sensitivity and specificity of the CBDI.

Eight hundred and fifteen Chinese-Americans in a primary care clinic were approached and 503 completed the CBDI. Seventy-six (15%) screened positive ($\text{CBDI} \geq 16$) and the prevalence of major depression was 19.6% using extrapolated results from SCID-I/P interviews. When administered by a native speaking research assistant, the

CBDI has good sensitivity (0.79), specificity (0.91), positive predictive value (0.79) and negative predictive value (0.91).

Despite the commonly believed tendency to focus on physical symptoms rather than depressed mood, Chinese-Americans are able to report symptoms of depression in response to a questionnaire. The CBDI, when administered by research assistants, has good sensitivity and specificity in recognizing major depression in this population. Lack of interest among Chinese-American patients to use the CBDI as a self-rating instrument has limited its use for depression screening in primary care settings.

Introduction

Depression is a prevalent illness among patients attending primary care health clinics. Katon and Schulberg (1992) reviewed previous studies and concluded that 5-10% of patients seen in primary care meet criteria for major depression. Misdiagnosis and under-diagnosis of depressive disorders are common issues in primary care (Rost et al., 1998). Up to 50% of patients with depressive disorders do not receive an accurate diagnosis (Prestidge and Lake, 1987). Although the results from randomized clinical trials have shown the efficacy of antidepressant medication and specific psychotherapy in treating major depression, epidemiological studies of community and primary care populations reveal that only 1 in 3 patients with major depression receive treatment. (U.S. Department of Health and Human Services, 1993). Unrecognized and untreated depression is associated with loss of work time, poorer intimate relationships, less satisfying social interaction, disability days, physical illness, and more clinical visits (Fredman et al., 1988). Untreated depression is also associated with high medical costs and multiple medically unexplained symptoms (Simon et al., 1995).

Despite the steady increase in diversity in the U.S. population, there is a paucity of data on mental illnesses among minority populations, especially Asian-Americans. The ECA study in the 1980s (Paykel, 1992) failed to over-sample Asians and reported no data on Asian Americans. Takeuchi et al. (1998) published the only study on depression among Asian-Americans and found that the lifetime and twelve-month prevalence rates of major depression among Asian-Americans in the community are 6.9% and 3.4%

respectively. There has been no study on the prevalence of depression among Asian-Americans seen in primary care health clinics. As a result of different cultural backgrounds and upbringings, the illness beliefs and help-seeking behaviors of depressed Asian-Americans are substantially different than those of Americans with western origins. Kleinman (1982) studied primary care patients in China in the 1980's and found that depressed Chinese patients predominantly present with somatic symptoms rather than emotional symptoms. One may argue that such tendency of depressed Asians to under-report their depressed mood and instead focus on their physical symptoms might affect the ability to detect their depression. When suffering from mental illnesses, Asian-Americans typically do not seek treatment until late in the course of the illness (Lin 1978). Active screening may be the best practical method to recognize depression among Asian-Americans. The Beck Depression Inventory is a valid and widely used instrument that measures the severity of depression (1961). Zheng et al. (1988) tested the Chinese translated version of the BDI (CBDI) among depressed Chinese patients and questioned if the instrument, developed within western culture, was sensitive to cultural differences and was applicable to a Chinese population. This study evaluates the usefulness of using the CBDI for depression screening among Chinese-Americans attending primary care health clinics.

Methods

Subjects: Subjects were Chinese-Americans who attended South Cove Community Health Center (South Cove), an urban community health center located in the Northeastern part of the U.S. South Cove serves low-income Asian immigrants who face financial, linguistic, and cultural barriers to health care. In 1999, South Cove provided 77,811 medical encounters and had 11,751 patients, with 5,897 (50%) from the Adult Medicine (Primary Care) Clinic. The populations served are predominantly Asians (92%); other ethnic groups include African American (1%) and Caucasian (1%). The information for the ethnicity of six percent of patients is not available. The ethnicity of the patients was determined by self-report. Subjects of this study had to be able to read Chinese or speak any one the four Chinese dialects including Mandarin, Cantonese, Taiwanese and Toisanese. Subjects also had to be 18 years of age or older and they had to sign a written consent to participate in the study. Patients who had unstable medical conditions or were unable to be interviewed were excluded. Patients who were illiterate and had difficulty understanding questions read aloud to them were also excluded from the study.

Procedure

The method of convenient sampling was used. Data were collected between May 1998 and November 1999. Patients were asked to fill out the CBDI while they were in the waiting area of the primary care clinic at South Cove. For patients who were illiterate, we offered to read the items of the inventory to them. As most patients appeared to be reserved and unwilling to participate at least initially, we were concerned that the

impersonal approach of leaving patients with the instrument to fill out on their own would not work well with less acculturated Asian-Americans. To increase the study feasibility, we decided to have our research assistants sit down next to the patients, introduce himself/herself, explain the nature of the study and obtain consent, and then administer the questionnaire to the patient by reading the items of the inventory to him/her. Using this modified approach, we were able to enroll a higher number of patients. Therefore, the CBDI was used as a research assistant-administered instrument instead of a truly self-report instrument.

All of the patients who scored 16 or higher on the CBDI were scheduled to be interviewed with the Structured Clinical Interview for DSM-III-R, patient version (SCID-I/P) (First et al., 1995). A portion of the patients who scored below 16 on the CBDI were randomly selected to be interviewed with the depression module of the SCID-I/P. Patients who were found to have major depression in the SCID-P interview were encouraged to discuss the illness with their primary care physicians for treatment options. No treatment for depression was provided in this study.

Instruments

1. Chinese version of the Beck Depression Inventory (CBDI). The BDI is a self-report scale for depression and is widely used to measure the severity of depression for research purposes (Beck, 1961). The CBDI was translated into Chinese and back translated into English by Chinese psychiatrists (Zheng et al., 1988). The procedures of translation and back-translation were continued until the back-translated BDI

corresponded closely to the original Beck Depression Inventory. Correlation coefficient of CBDI (using Cronbach's alpha) was found to be 0.85 (Zheng and Lin, 1991).

2. Structured Clinical Interview for DSM-III-R, patient version (SCID-I/P. The SCID-I/P was translated into Chinese by researchers in the National Cheng Kung University Medical College in Taiwan and was used in a cross-cultural study on Neurasthenia by Zheng et al. (1997). SCID-I/P interviews were performed by the principal investigator (ASY), who is a native Chinese-speaking psychiatrist with formal SCID training. He is currently a staff psychiatrist working in the Depression Clinical and Research Program (DCRP) at the Massachusetts General Hospital and routinely performs SCID interviews in English as part of the routine clinical research activities. A previous study of the inter-rater reliability with the SCID-I/P among staff psychiatrists at the DCRP yielded a kappa of 0.78 for mood disorders (Fava et al., 2000).

Statistical Analyses

In this study, the SCID-I/P interview results were used as the standard by which the CBDI was evaluated. The sensitivity, specificity, positive predictive power and negative predictive value were the indexes used to show the validity of the screening instruments. Sensitivity is the chance that the screening instrument recognizes MDD cases; specificity is the chance that the screening instrument recognizes non-MDD cases; positive predictive value is the chance that people who are screened positive by the screening instrument actually have MDD; and negative predictive value is the chance that

people who are screened negative by the screening instrument do not have MDD.

Receiver Operating Characteristic (ROC) curve analysis was performed to assess the overall accuracy of the screening instruments. Using various cut-off scores, patients were categorized as being cases and non-cases according to the screening instrument, with a pair of sensitivity and specificity values at each cut-off score. The area under the ROC curve is calculated by plotting sensitivity on the Y axis and “1-specificity” on the X axis. The area under ROC curve of 1.0 indicates a perfect instrument and an area under the ROC curve of 0.5 means that the instrument performs no better than chance alone (Hanley and McNeil, 1982) for case recognition.

Results

Eight hundred and fifteen patients in the South Cove primary care clinic waiting area were approached, of which 503 (62% of the 815 patients approached, mean age was 50 ± 17.0 , 304 females and 185 males) consented to take part in the study and were administered the CBDI. Among the 503 patients, 76 (15%) had a CBDI score of 16 or above and were considered to have screened positive for depression, and the remaining 427 (85%) patients had CBDI scores below 16 and were considered to have screened negative for depression. Fifty-three (70%) of the 76 patients who were screened positive for depression agreed to be SCID-P interviewed; 42 (79%) were found to have MDD and 11 (8%) had no MDD. One hundred and twenty seven (30%) of the 427 patients who were screened negative were randomly selected to be interviewed with the MDD module of the SCID-P; 11 (9%) were found to have MDD and 116 (91%) had no MDD (figure 1). Extrapolating the results of SCID interviews which showed that 79% of those who screened positive and 9% of those who screened negative had MDD, the prevalence of depression among Chinese-Americans in the primary care clinic at South Cove was 19.6%.

Using the MDD diagnoses obtained from SCID-P interview as the standard, the sensitivity, specificity, positive predictive value and negative predictive values were 0.79, 0.91, 0.79, and 0.91 respectively (table 1). The area under the ROC was found to be 0.94 (s.e.: 0.028), indicating excellent accuracy of the CBDI for screening depression among Chinese-Americans.

⁺ $[(76 \times 0.79) + (427 \times 0.09)] / 503$

Figure 1 and Table 1 about here

Discussion

The CBDI, when administered by research assistants, was found to be effective in recognizing depression among Chinese-Americans in primary care. It has high sensitivity and positive predictive value, as well as high specificity and negative predictive value. There were 11 MDD cases missed by the CBDI. The mean CBDI score of these cases was 10 ± 3.7 . These cases had a sufficient number of depression symptoms (≥ 5) to satisfy DSM-III-R diagnostic criteria for major depression, but the intensity of their depression was mostly mild to moderate. None of these cases reported passive or active suicidal ideation.

Zheng et al. (1988) examined the CBDI and questioned its validity when applied to the Chinese population. They used the CBDI to study 329 depressed patients in China and found that it had good internal reliability (Cronback alpha=0.846). However, the item of Loss of Libido in the CBDI correlated only weakly with the CBDI's total score, and the items of Sense of Punishment, Sense of Hate, Self Accusations, Crying Spells, Irritability, and Somatic Preoccupation correlated poorly with the intensity of depression measured by the total score of the Chinese Version of Hamilton Depression Rating Scale. Also, three of the six factors from the principal component analysis of the CBDI were unexplainable in terms of the clinical features of depression. Zheng et al. concluded that even though the CBDI was semantically correct when translated into Chinese, it still

could not be effectively applied in clinical and research settings because some of the translated items may be unfamiliar or obscure to Chinese patients.

In this study, instead of analyzing individual items of the CBDI for its internal consistency, we investigated its predictive validity in recognizing patients with DSM-III-R defined major depression based on semi-structured interview using the SCID. When administered by interviewers, the CBDI was found highly effective in detecting depression among Chinese patients. The discrepancy in the results of this study compared to Zhang's may be due to the use of different validation methods. It may also demonstrates that contents of self-reporting is highly contextually dependent (Cheng 1995, Kirmayer and Young, 1998), influenced by when and how self-reporting was done and whether interviewers were involved. By using the CBDI as a research assistant-administered instrument, we may have incorporated familiar cultural meanings to CBDI items and decreased the cultural bias inherent with using self-report inventories translated from the west, and thus, increased the sensitivity and specificity of the CBDI.

Despite potential benefits of using interviewers to administer the CBDI, we need to point out that this study was initially intended to test the CBDI as a self-rating instrument for depression screening. In the beginning of the study, when we informed patients about our study and requested them to fill out the CBDI, we received very little cooperation. We then resorted to asking research assistants to administer the CBDI. Instead of handing out the CBDI and waiting for patients to return the questionnaire, research assistants introduced themselves and tried to establish a rapport with patients,

explained the nature of the study, and then read the questions to patients and asked for their response. This more personal approach yielded a relatively high rate of study participation (62%). Our experience highlights the difficulty of screening depression among Chinese-Americans in primary care and suggests that it may not be practical to use the CBDI as a self-rated instrument for depression screening in this population.

In addition to issues of cost and availability, use of interviewers for screening can lead to biases. Interviewers may not present questions in the same way or use identical wordings every time they talk to a patient. Interactions between interviewers and patients may influence patients' response. Some patients may deny their symptoms while others offer socially desirable answers in the presence of an interviewer (Kinzie and Manson, 1987). In this study, interviewers used different dialects instead of the same written language (there is only one written Chinese language despite numerous dialects are being used) which could be a source of potential biases. To examine possible confounding effects associated with the use of different dialects, it would be interesting to find out if patients using different Chinese dialects had different rates of depression. However, information on language use is only available on patients who screened positive and received the SCID interview. The lack of relevant data has prevented us from performing such an analysis.

Our study also found evidence that the prevalence of MDD is high among Chinese-Americans patients in primary care. Extrapolating results from SCID interviews, we estimated that 19.6% of Chinese-Americans in primary care have MDD. The high

prevalence of MDD in this population may be partly explained by the fact that this is a group of new immigrants facing multiple adverse conditions including language barriers, low paying jobs, long working hours, and general difficulties with acculturation. Many of these individuals hold jobs with no sick leave or medical benefits and they tend not to seek medical attention unless they suffer from obvious physical symptoms. A similar study done by DCRP at the Massachusetts General Hospital on a Hispanic population in a community health center with patients from comparable social backgrounds showed a similarly high prevalence of depression (Mischoulon et al., 2001).

The high prevalence of depression identified among Chinese-Americans supports the findings from the WHO international study on depression (Ustun and Sartorius, 1995), which concluded that a cluster of core depression symptoms are identifiable across that all ethnic groups. Our study also shows that despite the fact that many Asian-Americans do not spontaneously complain of emotional symptoms, they do readily report their depressive symptoms when they are asked specifically about them. Lee (1997) and Simon et al. (1999) suggested that the tendency to report somatic symptoms is a behavior encouraged by many primary care physicians who show more interest in physical rather than psychological symptoms. In this study, patients had no problems revealing their mood symptoms and were not reluctant to talk about their psychological problems, when they were approached in a non-judgmental and supportive manner. Asian-Americans, with high prevalence of depression and extremely low rates of illness identification and help-seeking behaviors, may require routine screening of depression in primary care to improve recognition and treatment of depression.

Future efforts to screen for depression among Chinese-Americans may consider using shorter self-rating scales to increase patient participation. It is possible that a scale with 2-3 items which capture core symptoms of depression will be sufficient. Use of a brief self-report scale has great appeal since it is much cheaper to use and it also prevents potential biases associated with interviewers and use of different dialects. Further research is needed to design and validate such a scale to provide practical means of screening to improve recognition and treatment of depression among Chinese-Americans.

Conclusion

The CBDI, when administered by interviewers, has good sensitivity and specificity for screening MDD among Chinese-Americans in primary care. Low interest among Chinese-Americans to use the CBDI as a self-rating instrument has limited its use as an efficient and inexpensive instrument for depression screening. To successfully screen for depression among Chinese-Americans, a shorter self-rating scale is needed.

Acknowledgement

The author would like to thank Joyce Yin, Kam Lam, and Owen Chow for translating research instruments into Chinese, and is indebted to the South Cove Community Health Center for its support in carrying out this study. This study was supported by fellowship grant 5T32MH19126-10 from the American Psychiatric Association Program for Minority Research Training in Psychiatry.

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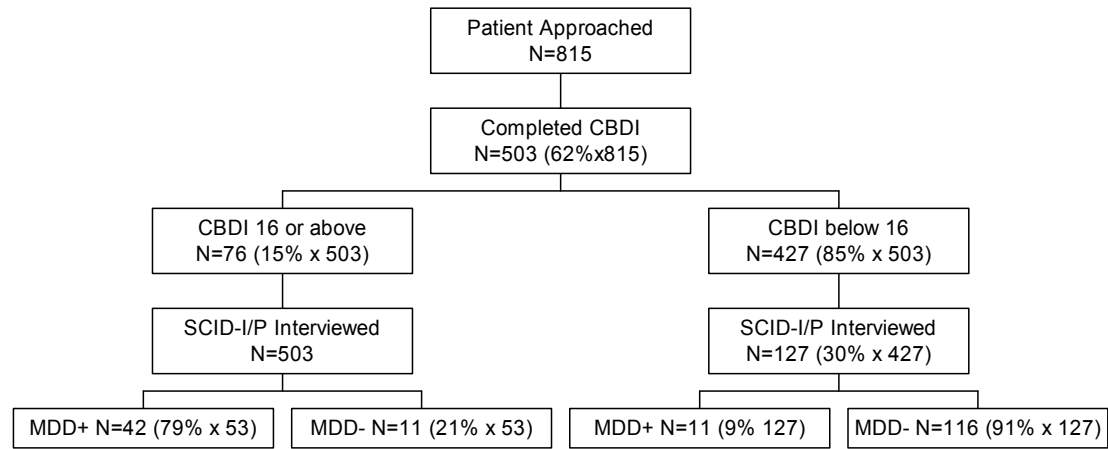
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Table 1. Validity of the CBDI for depression screening

		CBDI		Total	
		+	-		
SCID	+	42	11	53	Sensitivity = $42/53 = 0.79$
	-	11	116	127	Specificity = $116/127 = 0.91$
Total		53	127	180	PPV = $42/53 = 0.79$
					NPV = $116/127 = 0.91$

Figure 1. Screening for Depression using the Chinese version of the Beck Depression Inventory (CBDI)



MDD+ Patients with DSM-III-R Major Depression
MDD- Patients without DSM-III-R Major Depression