

Recent epidemiologic studies have found that most patients with mental illness are seen exclusively in primary care medicine. These patients often present with medically unexplained somatic symptoms and utilize at least twice as many health care visits as controls. There has been an exponential growth in studies in this interface between primary care and psychiatry in the last 10 years. This special section, edited by **Wayne J. Katon, M.D.**, will publish informative research articles that address primary care-psychiatric issues.

Prevalence of major depressive disorder among Chinese-Americans in primary care

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Abstract

An epidemiological study in Los Angeles showed that Chinese Americans had lower rates of depression compared to the U.S. national estimates. This study surveys the prevalence of major depressive disorder (MDD) among Asian-Americans in the primary care setting. A two-phase epidemiological survey was performed in the primary care clinic of a community health center in Boston, MA, which provides treatment to under-served Asian-Americans. Participants were Chinese Americans in the waiting area of the primary care clinic, 18 years of age or older, who spoke any one of the four commonly used Chinese dialects. The Chinese version of the Beck Depression Inventory (CBDI) was used for initial screening. All consenting patients who screened positive (CBDI ≥ 16) and a fraction of those who screened negative (CBDI < 16) were interviewed by a bilingual and bicultural psychiatrist with the Structured Clinical Interview for DSM-III-R, patient version, for confirmation of the diagnosis of MDD. There were 815 in the primary care clinic that were approached, of which 503 patients (62% female, mean age 50 ± 17 years) filled out the CBDI in the initial phase of depression screening. Extrapolating the results from the SCID-P interviews, the prevalence of MDD among Asian-Americans in the primary care setting was estimated to be $19.6\% \pm 0.06$. MDD is common among Asian-Americans in primary care settings. The prevalence of MDD is comparable to or higher than those found in the U.S. nonminority populations. © 2004 Elsevier Inc. All rights reserved.

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Introduction

1.

Asian-Americans are one of the fastest growing populations in the United States. According to the 2000 U.S. Census, the number of individuals who were classified under the ethnic category of 'Asian-American' has increased from 7.3 million to 10.1 million during the past decade [1,2]. Asian-Americans, who are comprised of individuals from diverse ethnic backgrounds and countries of origin, now represent 4% of the U.S. population.

A review of the literature shows that there is a lack of published data on the prevalence of depression among Asian-Americans, both in the community and in primary care settings. Takeuchi et al. [3] conducted a large-scale community-based study of depression among Chinese Americans in the Los Angeles County using the Composite International Diagnostic Interview [4] as the diagnostic instrument. He found the lifetime prevalence of major depression among Chinese Americans was 6.9%, much lower than the national estimate of 17.1% [5]. To our knowledge, no other prevalence studies of Asian-Americans, either in the community or in primary care settings have been published.

Because the literature on Asian-American mental health is so sparse, it can be informative to turn to and extrapolate

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from studies done in Hong Kong, Taiwan, or mainland China that examine the prevalence of depression among Chinese populations. These studies can then be used to estimate the prevalence of depression in Chinese Americans. Two epidemiological studies in the 1980s in the community reported low prevalence of depression among Chinese populations in Asia. Hwu et al. [6] reported a 1.5% lifetime prevalence among ethnic Chinese in Taiwan. This was the lowest rate reported among the 10 countries in the Cross-National Collaborative Study on Depression [7]. A community survey conducted by Chen et al. [8] on Chinese in Hong Kong found a 1.29 to 2.4% of lifetime prevalence of depression. This rate is notably lower than the rates of lifetime depression among U.S. populations reported in the ECA study (5.8% in New Haven, CT, 2.9% in Baltimore, 4.4% in St. Louis, and 5.6% in Los Angeles) [9]. These findings generated much academic speculation and discussions as to whether depression could be a 'rare' psychiatric condition in ethnic Chinese.

To study prevalence of depression in the primary care across nations, the WHO conducted a collaborative study on "Psychological Problems in General Health Care" in 14 countries using a two-stage sampling [10]. Initial screening was performed with the General Health Questionnaire (GHQ-12) followed by standardized in-person interview using the Composite International Diagnostic Interview (CIDI-PHC) [11]. Diagnosis was based on ICD-10 [12] and DSM-III-R criteria [13]. The study found that there were wide variations in the rates of depression among primary care patients in these countries, ranging from 2.6% (Nagasaki) to 29.5% (Santiago). Prevalence of ICD-10 depression among Chinese in Shanghai was found to be 4.0%, compared to the average prevalence of 10% across all centers. This rate was the second lowest ranking among 14 centers, only higher than the prevalence rate of 2.6% in Nagasaki, Japan.

The findings of low prevalence of depression among Chinese and Japanese patients in the WHO Collaborative Study have brought about many questions: Are there constitutional factors, environmental factors (such as diet) and/or cultural factors that protect Asian populations from depression? Can low prevalence of depression explain low utilization rates of mental health services by Asian-Americans [14]? On a broader scale, is psychiatric nosology developed in the West suitable for application in the East [15]? Can clinical research instruments developed in English, when adequately translated, accurately assess depressive symptoms among Asians? Do depressed Asian patients present with similar symptoms as their western counterparts? Do Asian patients readily report depressive symptoms in an interview?

Additional epidemiological studies, however, have demonstrated that depression is more common among Chinese than previously suggested. Cheng [16] conducted a community survey in Taiwan in the community and found that prevalence of depression was 8.5%. Chong et al. [17] stud-

ied Taiwanese elders in the community and reported the 1-month prevalence of major depression was 5.9%. Lee et al. [18] studied postpartum depression among Chinese women in a hospital in Hong Kong and reported the 3-month prevalence rate for major depression was 6.1%, arguing that depression is not rare in contemporary Hong Kong Chinese women. In fact, these studies suggest that the occurrence of depression among Chinese is comparable to that in the community populations in the U.S. and in European countries, which ranged from 5 to 10%, according to a literature reviewed by Katon and Schulberg [19]. These studies suggest that the magnitude of the public health challenge of treating depression among Chinese Americans is larger than initially considered.

In an earlier study [20], we found that Chinese Americans when depressed, prefer to seek help from their primary care physicians and rarely seek mental health services. To be able to improve treatment of depression for the Chinese Americans, it is important to understand the prevalence of depression in the primary care setting. The present study investigates the current prevalence of depression among Chinese Americans in the primary care clinic of an urban community health center in the U.S.

2. Methods

2.1. Subjects

Subjects were Chinese-Americans who attended South Cove Community Health Center (South Cove), an urban community health center located in the Boston area. 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%) patients from the Adult Medicine (Primary Care) Clinic. The populations served are predominantly Asians (92%); other ethnic groups include African Americans (1%) and Whites (1%). The information for the ethnicity of the remaining six percent of patients is not available. The ethnicity of the patients was determined by self-report. Subjects of this study were 18 years of age or older and were able to read Chinese or speak any one the four Chinese dialects including Mandarin, Cantonese, Taiwanese, and Toisanese. All subjects signed a written consent form before participation in the study. Exclusion criteria were as follows: subjects who were unable to read and had difficulty understanding questions read aloud to them; subjects who had unstable medical conditions; and subjects who were unable to be interviewed because of language barriers.

2.2. Procedure

The method of convenient sampling was used. Data were collected between May 1998 and November 1999. Patients

were asked to fill out the Chinese version of the Beck Depression Inventory (CBDI) while they were in the waiting area of the primary care clinic at South Cove. For patients who were unable to read, the research assistant administered the questionnaire and read the items of the inventory to them. The research assistant also assisted patients who needed help with the questionnaire to facilitate the administration of the scale.

All of the patients with CBDI scores of 16 or higher were scheduled to be interviewed with the Structured Clinical Interview for DSM-III-R, patient version (SCID-I/P) [21]. One hundred and twenty-seven 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 met MDD criteria based on the full SCID-P interview or on the SCID-P MDD module were encouraged to discuss the illness with their primary care physicians for treatment options. No treatment for depression was provided in this study.

3. Instruments

3.1. 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 [22]. The CBDI was translated into Chinese and back translated into English by Chinese psychiatrists [23]. 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 [24]. The sensitivity, specificity, positive and negative powers of the CBDI were found to be 0.79, 0.91, 0.79, and 0.91, respectively. The area under the Receiver Operating Characteristic (ROC) curve was found to be 0.94 (s.e.: 0.028), indicating excellent accuracy of the CBDI for screening depression among Chinese-Americans [25].

3.2. 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. [26]. 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 [27].

4. Statistical analyses

The demographic characteristics of the subjects were summarized using descriptive statistics. The characteristics of those who were interviewed with the SCID were compared with those who were not interviewed using *t* tests and χ^2 tests.

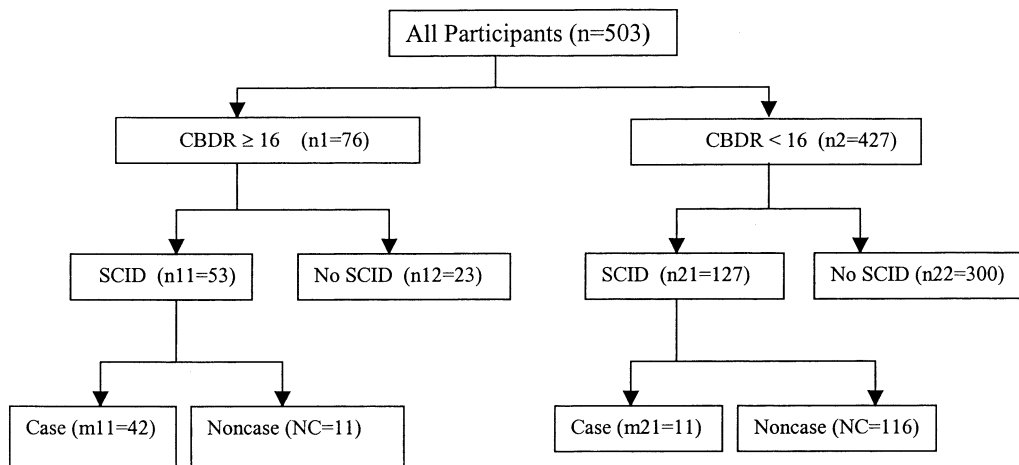
Current prevalence of Major Depressive Disorder (MDD) was estimated using reverse weighting as described by Dunn [28]. The formulas for the weighted prevalence and its variance are summarized in Table 1. Statistical analyses were performed using SPSS software.

5. Results

There were 815 patients in the South Cove primary care clinic waiting area approached, of which 503 (62%) (304 females and 199 males) consented to take part in the study and were administered the CBDI. The ages of subjects were distributed widely in this study (in the age brackets: 21–40 (30%), 41–60 (31%), 61–80 (28%); mean age 50 ± 17.0 years). 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 screened positive for depression agreed to be SCID-P interviewed; of these, 42 (79%) were found to have MDD and 11 (8%) had no MDD. There were 127 (30%) of the 427 patients who screened negative randomly selected to be interviewed with the MDD module of the SCID-P; of these, 11 (9%) were found to have MDD and 116 (91%) had no MDD (Table 1).

Extrapolation of the results from the SCID-P interviews suggests that if all the 503 patients who completed the BDI had been interviewed with the SCID, the numbers of all true positives and all false negatives would have been 60.2 and 38.4, respectively. The estimated prevalence of depression among Chinese-Americans in the primary care clinic at South Cove was $19.6\% \pm 0.06$ (Table 1). The average age of the subjects who received the SCID (or MDD module of SCID) interview was 48 ± 16 years (62% female) and the average age of subjects who did not receive the SCID (or MDD module of SCID) interview was 51 ± 17 years (also 62% female). There were no significant differences in age (*F* value 1.92, *P* = .166) and the gender distribution (χ^2 = 0.98, *P* = 1.0) between these two groups of subjects.

Table 1



$$\text{True positive rate (TPr)} = \frac{m11}{n11}$$

$$\text{All true positive (TP)} = \frac{m11}{n11} \times n1$$

$$\text{False negative rate (FNr)} = \frac{m21}{n21}$$

$$\text{All false negatives (FN)} = \frac{m21}{n21} \times n2$$

$$\text{Estimated numbers of cases} = \text{TP} + \text{FN}$$

$$= (\text{TPr} \times n1) + (\text{FNr} \times n2)$$

$$= \left(\frac{m11}{n11} \times n1 \right) + \left(\frac{m21}{n21} \times n2 \right)$$

$$\text{Estimated Prevalence (Pr)} = \frac{\left(\frac{m11}{n11} \times n1 \right) + \left(\frac{m21}{n21} \times n2 \right)}{n}$$

$$\text{Variance of Pr (VPr)} = \left[\left(\frac{n1}{n} \right)^2 \times \frac{m11/n11 \times [1 - (m11/n11)]}{n11} \right]$$

$$+ \left[\left(\frac{n2}{n} \right)^2 \times \frac{m21/n21 \times [1 - (m21/n21)]}{n21} \right]$$

$$+ \left[\left(\frac{n1}{n} \right) \times \left(\frac{n2}{n} \right) \times [(m11/n11) - (m21/n21)]^2 \right]$$

6. Discussion

The results of this study show that depression is a prevalent illness among Asian-Americans treated in the primary care setting. We found that the prevalence of depression was 19.6%, substantially higher than the 5 to 10% previously reported by Katon and Schulberg [19] in their review of studies conducted in primary care settings. In an earlier study from our group, we found that depressed White, Hispanic and Chinese patients identified by the same two-phase survey described in this study were very comparable in their depressive symptom profiles [29]. The results of this earlier study and the current study suggest that screening instruments developed in the West are capable of eliciting psychiatric symptoms in Asian-Americans. Also, it is possible to administer research methodology and psychiatric diagnoses originally developed in Western or European-based communities to other populations in the world. The findings of these studies also support that MDD is a universal phenomenon, and not unique to populations in the West.

Our finding of a high prevalence of depression in the primary care settings adds to the growing evidence that depression is common among Asians and/or Asian-Americans [16,17]. According to a recent epidemiological study [30], mainland China has one of the highest suicide rates in the world; estimates suggest that the population-based rate is over 300,000 completed suicides annually. With the strong relationship between suicide and depression [31] the high suicide rate among Chinese suggests that depression is highly prevalent in this population, or at least among certain subgroups of the Chinese. These findings are, however, inconsistent with results from previous epidemiological studies showing low prevalence of depression among Chinese populations [6,8,10]. Many questions on cross-cultural comparisons of the epidemiology of depression remain unanswered.

In the Cross-National Collaborative Study on Depression, the 12-month prevalence of depression among ethnic Chinese in Taiwan was 0.8%, which ranked the lowest among all centers, and was seven times lower than the prevalence in New Zealand, which ranked the highest among all centers [7]. In the same study, the 12-month prevalence of depression in Korea, another Asian country, was 2.3%, about three times as high as the prevalence of depression in Taiwan, and ranked second lowest amongst other centers in Western countries. It was proposed that cultural differences or different risk factor profiles across countries may have affected the expression of depression, leading to the differences in the rates of major depression among centers [7]. "Cultural differences" is a broad concept, which could refer to differences among patients from different countries in labeling or reporting their mood symptoms. It is also possible that clinicians from different countries used different thresholds in accepting whether certain

depressive symptoms were significant or of subclinical nature.

In the WHO Collaborative Study of depression in primary care [11] which used a screening instrument followed by standardized interviews, there were also wide variations in the prevalence of depression among the 15 centers. The prevalence of depression among Chinese patients in the primary care setting was 4.0%, which ranked second lowest, only trailed by that found among Japanese in Nagasaki. Four possible explanations were proposed to explain the differences in prevalence of depression between centers in the WHO Collaborative Study [10]: 1) true differences in prevalence; 2) differences in concepts of illness; 3) differences in the tendency to seek help in each culture; 4) and demographic differences in the help-seeking populations. The investigators concluded that, across cultures, there were true differences in prevalence of depression. Simon et al. later [32] re-analyzed the data from the WHO Collaborative Study and assert that large cross-national variations in depression prevalence may reflect true prevalence differences or differences in diagnostic threshold across centers.

It is possible that there has been a temporal trend of increasing depression among Chinese and Chinese Americans in the past several decades, which may explain the diverging results from different prevalence studies. Temporal trends are variations in rates over time, which can be age, period, or cohort trends. In this study, with the wide age distribution of the subjects, it is unlikely that the increase in the rate of depression was because of an age trend or changes within a specific cohort (or subset) of the Chinese American population. Medical sociologists have postulated that changes in Chinese societies may explain a period effect of an increasing trend of depression among Chinese populations [18]. Using Hong Kong as an example, Lee and colleagues pointed out that rapid industrialization has brought unprecedented changes in family structure, gender roles, labor markets, socio-moral values, cultural identity, and health and housing, all of which could have a heavy toll on the mental health of the population. Many subjects in our study came from Hong Kong or parts of China that have been undergoing rapid changes in traditional and socio-cultural values. As new immigrants in the U.S., many of them face language difficulties, low paying jobs, and adjustment and acculturation problems that could also be related to the high rate of depression in this population.

We may not be able to fully explain the difference in the rates of depression in different epidemiological studies, because of the use of different sampling techniques, diagnostic instruments, targeted populations with different socio-demographic characteristics, and research personnel in different studies. Nonetheless, there is growing evidence to support that depression is common among Asians Americans and Asians, which poses a significant public health problem in the U.S. and in Asian countries. This problem is compounded by the lack of awareness of depression among many Asians and Asian-Americans who are influenced by

traditional medical beliefs that conceptualize depression differently than the Westerners. They tend to under-report their depressive symptoms and are reluctant to receive treatment from mental health professionals [20]. Efforts to educate about depression, systematically screen and identify depressed Asian-Americans in primary care settings, and to successfully engage them into treatment are challenges that lie ahead.

There are several limitations to this study. It needs to be emphasized that this study recruited Chinese Americans who attended a primary care clinic. Patients in the medical treatment setting tend to have mood symptoms secondary to their medical conditions. The results we have reported do not reflect the prevalence of depression of Chinese-American population in the community. Convenient sampling was used for patient recruitment, which could have led to biased sampling. Similarly, only 62% of patients who were approached were willing to complete the CBT, the first of the 2-stage sampling procedure. The limited rate of participation by subjects might have missed many depressed patients who, perhaps partly because of being depressed, were unwilling to participate in the study leading to under-estimation of the prevalence of depression.

Not all the patients received full SCID-I/P interview; more than half of the patients were administered only the depression module that could have missed diagnosing patients with bipolar disorder. With the relatively small number of depressed patients enrolled in this study, any misclassification in the diagnosis could have led to a substantial effect on the extrapolated prevalence of depression among this population.

The subjects of this study were recent immigrants undergoing multiple challenges including financial pressures, language barriers, and acculturation issues, which might have precipitated depression among those who were predisposed. The results of this study may not be generalizable to other groups of Chinese-Americans or Asian-Americans.

In summary, we have demonstrated that the prevalence of depression among Asian-Americans in the primary care setting is comparable to or higher than that observed in White populations in similar settings, and that Western-developed diagnostic instruments are useful in the assessment of this population. Efforts to educate patients about depressive disorders, systematically screen for depression in primary care settings, and engage these patients into treatment are needed to improve treatment of depression among Asian-Americans.

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