

# Depression Care Management for Chinese Americans in Primary Care: A Feasibility Pilot Study

Kenny Kwong · Henry Chung · Karen Cheal ·  
Jolene C. Chou · Teddy Chen

Received: 17 March 2011 / Accepted: 11 October 2011 / Published online: 21 October 2011  
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**Abstract** This study describes a culturally relevant intervention using a collaborative depression care model to integrate mental health and primary care services for depressed low income Chinese-Americans at a community health center. A total of 6,065 patients were screened for depression. Of the 341 who screened positive, 57 participated and were randomly assigned to receive either enhanced physician care with care management (32) or enhanced physician care only (25). All enrolled participants were assessed at baseline and 4 monthly follow-up visits for depression, physical and mental health functioning, and perceived stigma toward receiving depression care, to determine the impact, if any, of their mental health treatment. Both groups reported significant reduction of depressive symptoms and improved mental health functioning from baseline to follow-up assessments although there was no significant difference between the two groups.

Although the study found no advantage to adding the care management component in the treatment of depression, screening and assertive treatment of immigrant Chinese Americans who tend to underutilize mental health services is important and consistent with the increased adoption of team based care models in patient centered medical homes. High refusal rates for enrollment in the study have implications for future study designs for this group.

**Keywords** Chinese-Americans · Depression · Care management · Access

## Introduction

Depression and anxiety disorders are common and have a substantial negative impact on functioning and quality of life. The National Comorbidity Survey interviewed a household probability sample of 8,098 individuals aged 15–54 years, and found that only 27.7% of those with major depression reported receiving outpatient services in health care sectors (general medical and/or specialty mental health); similarly only 31.8% with generalized anxiety disorder reported receiving such services (Kessler et al. 1999). However, data from a survey of a national sample of 1,636 adults with a probable 1-year depressive or anxiety disorder found that 80.8% had seen a primary care provider during that time (Young et al. 2001). Although primary care provider visits were common, receipt of formal mental health services was not. Among individuals with a probable depressive or anxiety disorder only 25.6% received any antidepressant or anti-anxiety medication and 31.3% received some counseling (Young et al. 2001). In recognition of the opportunity to intervene in medical settings and with substantial evidence indicating such

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K. Kwong (✉)  
Silberman School of Social Work at Hunter College, 2180 Third  
Avenue @ 119th Street, Room 425, New York, NY 10035, USA  
e-mail: kkwong@hunter.cuny.edu

H. Chung  
Department of Psychiatry and Behavioral Sciences,  
Albert Einstein College of Medicine, 1300 Morris Park Avenue,  
Bronx, NY 10461, USA

K. Cheal  
3843 Wellington Drive, North Cazenovia, NY 13035, USA

J. C. Chou  
Rutgers University Center for State Health Policy,  
112 Paterson St, New Brunswick, NJ 08901, USA

T. Chen  
Mental Health Bridge Program, Charles B. Wang Community  
Health Center, 268 Canal Street, New York, NY 10013, USA

interventions were effective, the US Preventive Services Task Force (USPSTF) has therefore recommended systematic screening for depression in clinical settings with appropriate systems in place to ensure effective treatment and follow-up (Pignone et al. 2002).

Under-recognition and undertreatment of mental-health conditions may be more pronounced among racial and ethnic minority groups (US Department of Health and Human Services 2001; Miranda and Cooper 2004). Studies have shown that the prevalence of moderate-to-severe depression among low-income Chinese American primary care patients is 4.1% (Chen et al. 2006) whereas the prevalence of major depressive disorder (MDD) among immigrant Chinese Americans in a primary care setting in Boston is 19.6% (Yeung et al. 2004). Another study also found a high prevalence (1-year incidence of about 10%) of MDD among Chinese Americans attending primary care clinics (Hsu et al. 2005). However, Chung et al. (2003) found that primary care providers significantly underdiagnosed depressive symptom distress among Asian Americans compared with Latinos, despite the similar prevalence found in these two groups. Even in the presence of a diagnosis, the Surgeon General's report (US Department of Health and Human Services 2001) finds that Asian Americans severely underutilize mental health services, with a tendency to use mental health services as a last resort. Stigma associated with mental disorders and treatment, somatization, and a lack of awareness of psychological distress are some of the reasons hypothesized for this underutilization by Asian Americans (US Public Health Service, Office of the Surgeon General 2001). Consequently, several studies have indicated high levels of mental health needs in the Asian-American community, including high rates of suicidal ideation among older Asian-American primary care patients (Bartels et al. 2002), and high levels of depressive symptom distress among Asian-American primary care patients (Chung et al. 2003; Yeung et al. 2004). Therefore, screening for depression and providing evidence-based depression management are especially relevant for Asian Americans. Indeed, previous health service utilization research suggests that mental health services centered in the community can improve patterns of utilization and outcomes for Asian-American patients (Hu et al. 1991; Yeh et al. 1994). Primary health care clinics in the community, in particular, have been identified as an important setting for the detection and treatment of mental illness for Asian-American populations and other racial or ethnic minority groups (US Public Health Service, Office of the Surgeon General 2001).

To that end, this paper describes a culturally and linguistically relevant intervention using a collaborative care management model to integrate mental health and primary care services to address depression and/or anxiety among

Chinese American adults. In developing the intervention for Chinese Americans, Wagner's Chronic Care Model (Von Korff et al. 1997; Wagner et al. 1996) was adapted to provide a systematic intervention while incorporating cultural factors for the target population. Even among Chinese Americans who have access to or receive mental health treatment through primary care, the care management model has been shown to be more effective in that setting in terms of patient engagement in and adherence to mental-health treatment (Belnap et al. 2006). This pilot study sought to determine if this finding translated to a low income, low literacy, immigrant Chinese-American population.

## Methods

### Overview of Design

The study was conducted at a federally qualified community health center (FQHC) situated in the Chinatown neighborhoods in New York City. This FQHC delivers comprehensive primary care to more than 30,000 Chinese adults aged over 18, the majority of whom live at or below the federal poverty line.

The pilot study was originally designed as a randomized controlled trial to recruit a total of 150 participants and to randomly assign them to one of two study arms: depression care managed by primary care physicians only (enhanced physician care) and depression care managed by both a care manager and a primary care physician (care management). The planned objective of the randomized trial was to assess the feasibility and effectiveness of care coordination between a primary care physician and a care manager, as compared with depression care by a primary care physician only, in the treatment of depression and/or anxiety disorders. However, of a total 6,065 patients who were screened for depression and/or anxiety, only 341 (5.6%) screened positive with the PHQ-9 even when using a lower cut off point (8 points or above) (Spitzer et al. 1999, 2000; Kroenke et al. 2001). Of these 341 patients who screened positive, 189 of them (55%) refused to participate in the study and 95 (28%) did not meet the eligibility criteria. Only 57 of them (17%) agreed to participate in the study, and they were randomly assigned to either the enhanced physician care group (25 participants) or to the care management group (32 participants). Because of the unexpectedly high refusal rate and lower-than-expected depression prevalence, we were unable to recruit enough participants for both treatment arms over a 2-year period to attain appropriate statistical power for the randomized trial. Due to the relatively small sample size and modest effect sizes between the two treatment arms, we could not draw meaningful conclusions with the original study hypotheses.

However, the study may provide insight into the mental-health treatment response in a primary care setting for this population as both groups received active treatment (as described below in the collaborative depression care intervention model) from their primary care physicians, even in the absence of a care manager. Therefore, in this paper, we assess all enrolled participants (57) at baseline and at four follow-up visits with several outcome measures that include depression, anxiety, physical and mental-health functioning, quality of life, and perceived stigma toward receiving mental-health care to determine the impact, if any, their mental-health treatment had. We also discuss the feasibility of providing collaborative depression care in a primary care setting targeting Chinese immigrants, with the goal of developing recommendations and strategies for improving the delivery of depression care and access to mental health services for this population. This study may help inform the feasibility of implementing the concept of patient-centered medical home (Backer 2009) that may lead to better mental health care for Chinese immigrant populations.

#### Participant Criteria, Recruitment and Consent

To be eligible, a patient must screen positive on PHQ-9 (8 points or above) and be confirmed with the Mini International Neuropsychiatric Interview (M.I.N.I) (Sheehan et al. 1998). Previous studies (Chen et al. 2006; Huang et al. 2006) found that only a small proportion of Chinese Americans have a clinically significant level of depression symptoms as indicated by a score of 10 points or above on the PHQ-9. Because PHQ-9 is based on *DSM-IV* criteria, it is possible that the PHQ-9 is less sensitive when screening for mild depression (Chen et al. 2006). Therefore a lower cut off point was used in this study to identify more Chinese patients who might be at risk of depression. Patients who had dementia, heavy alcohol use, bipolar disorder, persistent mental illness such as psychosis, or who were actively suicidal, or currently receiving mental health care were excluded from the study.

During each adult patient's clinic visit, the PHQ-4, the depressed mood and anhedonia questions of the PHQ-9 (Kroenke et al. 2003) and two additional screening questions for the presence of anxiety and sleeping difficulties, were given. Respondents with a positive response to any of the 4 items were administered the full version of the PHQ-9 by a research assistant. Patients scoring  $\geq 8$  on the PHQ-9 were approached for consent to participate in the study. If a patient did not want to proceed, the research assistant would explain the benefits of receiving mental health treatment, encourage the patient to receive mental health treatment at the health center, provide an informational brochure regarding the study, and reiterate the open

invitation were the patient to become interested in participating in the future.

Following the signing of the consent form, the research assistant conducted a face-to-face interview with the participant to assess eligibility. This process involved a battery of assessment tools including M.I.N.I. mental health scales (Sheehan et al. 1998) to confirm the presence of major depressive disorder (MDD), anxiety disorders, bipolar disorder, psychotic disorders, and alcohol abuse; Short Blessed Test (Katzman et al. 1983) to rule out cognitive disturbances; and Paykel scale (Paykel 1983) for the presence of active suicide risk. Patients who met the criteria for MDD, generalized anxiety disorder, and/or panic disorder were deemed eligible to participate in the study.

#### Collaborative Depression Care Intervention for All Enrolled Participants

Modifications to primary care practice followed the recommendations of Wagner's Chronic Care Model (Von Korff et al. 1997; Wagner et al. 1996), which emphasizes collaboration and coordination among various physician and nonphysician professionals and addresses systemic factors pertinent to effective care, such as redesign of the service delivery system, buy-in by medical leadership, improvement of the medical information system to enhance patient follow-up, enhancement of patient self-management support activities, and linkage of patients with community resources. Belnap and colleagues (2006) reviewed several published randomized controlled studies of depression care management and found that assigned nonphysicians had a major helping role in the depression treatment process in primary care settings. The results of these studies showed that the collaborative care in the treatment of depression decreased the patients' symptoms of depression as well as increased the patients' adherence to treatment. Strategies effective in improving patient outcome were those with complex interventions that incorporated clinician education, an enhanced role of the nurse, and a greater integration between primary and specialty care (consultation-liaison with mental health specialists) (Gilbody et al. 2003).

The collaborative care treatment protocol designed for all enrolled participants in this study lasted 12 weeks and included the following: the use of a structured depression assessment and monitoring tool (PHQ-9, Kroenke et al. 2001) to screen patients for increased risk for major depression; active monitoring of symptoms of depression, suicidality, and patient adherence to treatment and outcomes; education of patients about adherence to treatment regimens; and proactive collaboration or consultation between primary care providers and mental health specialists. The primary care providers (PCPs) chose among three different levels of treatment options according to their

skills and assessment of depression symptom severity, and patient preference. For level 1, physician discussed depression treatment with patients with mild depression (watchful waiting). For level 2, physicians prescribed anti-depressant medications and educated patients about side-effects of medications. For level 3, the physician introduced self-management goals in the context of depression or anxiety care. Each higher level beyond level 1 included the interventions of each prior level(s).

Physicians could consult with mental health specialists if the patient showed signs of moderate to high depression severity or if the patient had suicidal ideation and/or a psychiatric emergency. As part of the intervention, the participating providers received standardized training from mental health specialists in the use of the chronic care model, depression diagnosis and evidence-based pharmacological treatment, as well as the use of depression treatment algorithms. To incorporate the self-management aspect of the intervention, each participant received a set of bilingual (both English and Chinese) self-help materials: *Depression Facts & Risk Factors*, *Depression Self Management*, and *Medication Information & Compliance*. All these educational materials were field tested for their cultural relevancy and literacy appropriateness.

#### Care Management Group (Care Manager Plus Physician)

For the group of participants (32) assigned to the care management group receiving depression care by both a physician and a care manager, they were seen at weeks 2, 6, and 12 for depression care. The care manager explained basic ideas about the care management model and scheduled regular visits for the participant with a PCP. The care manager coordinated depression care with PCPs and performed the following functions: reinforcing physicians' treatment instructions to the patient; serving as a communication bridge between PCPs and patients; providing patient with educational materials; setting up patient appointments with PCPs in the advent of side effects; reviewing safety plan with patient in case of emergency; using PHQ-9 as a tool to follow-up with the patient; teaching self management skills; and monitoring patient progress of achieving self-management goals.

#### Enhanced Physician Care Group (Physician Only)

Unlike the structured and planned visits and activities as specified in the care management group, the physician and the patient in the enhanced physician care group (25 participants) jointly decided which treatment regimen they considered appropriate, and how often and when the patient would receive follow-up. The PCP was responsible for all

aspects of the patients' treatment, including monitoring of patient progress, providing patients with educational materials, and monitoring self-management goals.

#### Measures

All enrolled participants were assessed at baseline and 4 monthly follow-up visits with the following measures: PHQ-9 (depression), Beck Anxiety Scale (Beck and Steer 1990), SF12 (Ware et al. 1996), Quality of Life, Enjoyment, & Satisfaction Questionnaire (Q-LES-Q) (Endicott et al. 1993), and their perceived stigma toward receiving mental health care. All participants rated their overall satisfaction toward receiving depression care. In addition, process data were also examined in each group. This included completion rate, the number of no-show visits, the number of physician visits completed, use of medications, and levels of treatment options chosen.

The study protocol was approved by the New York University Medical Center Institutional Review Board. There are no known conflicts of interest and all authors certify responsibility for the manuscript.

#### Statistical Analysis

Demographic characteristics were summarized for the study population using frequency distributions for categorical data and means for continuous data. A two-group *t* test, for continuous data, or a Chi-square test of association, for categorical data, was used to test for differences between the two study arms at baseline. For each study arm, unadjusted comparisons of mean 4-month changes (from the intake to the 4-month follow-up) in Q-LES-Q, PCS, MCS, Beck Anxiety Score, and PHQ-9 for all study participants were made with paired *t* tests. The differences (if any) between the two study arms with respect to changes in outcome measures, numbers of completed visits, and numbers of no-show appointments were assessed using *t* tests. Changes in patient-reported stigma from intake to 4-month follow-up were also computed. Chi-square tests of association were used for unadjusted comparisons of patient satisfaction at study end, treatment level, medication use, and study completion by study group.

## Results

### Participant Characteristics

A total of 6,065 patients who presented for an annual physical examination or regular follow-up at a community health center were screened for depression and/or anxiety with PHQ-4, with 2,074 (34.2%) having a depressive,

anxious or sleep problem on presentation. Of the 341 patients who subsequently screened positive on the PHQ-9 (8 points or above), 57 of them consented for enrollment in the study. The study sample contained 32 participants randomly assigned to the care management group receiving depression treatment by both a care manager and a physician and another 25 randomly assigned to enhanced physician care. Examining the entire sample, the average age of participants was 47.4 years ( $SD = 16.3$ ) and more than two-thirds (68%) were female. The majority (86%) received a high school education or less. Approximately two-thirds (68%) spoke poor or no English and only 37% reported being employed. The majority of participants (82%) reported their health as fair or poor and only 28% stated they perceived a great deal or quite a lot of love and support from family and friends. Table 1 contains the demographic data broke down by group. The care management and enhanced physician care groups did not differ significantly in their demographic characteristics.

#### Process and Outcome Assessment

Table 2 contains process data for the entire sample and also by group, including completion rate, the number of

no-show visits, the number of physician visits completed, use of medications, and treatment level used. The mean number of visits during the study for the entire sample was 3.64 ( $SD = 1.3$ ), and 84% of the participants completed the study. There was a mean of 0.26 no-show visits ( $SD = 0.55$ ). Only 60% of participants took medication as instructed. More patients had the more intensive level-3 intervention (40%) compared with 37% for the level-2 treatment and 23% for the level-1 treatment, indicating that more patients either wanted it or needed it. A smaller proportion of participants in the enhanced physician care group used medication (48%) compared to the care management group (71.4%) ( $P = 0.08$ ). The care management group had significantly more visits per patient with an average number of 4 visits over the course of the study ( $SD = 1.4$ ) compared with an average of 3.2 for enhanced physician care ( $SD = 0.93$ ) ( $P < 0.05$ ). The two groups did not differ significantly in the average number of no-show visits ( $P = 0.78$ ), rate of treatment completion ( $P = 0.97$ ), and levels of treatment options used ( $P = 0.63$ ) (Table 2).

The majority of participants in both study arms indicated mild or no stigma toward receiving mental health care in primary care settings and did not report significant change

**Table 1** Demographic characteristics of care management and enhanced physician care group participants

Characteristic	Enhanced physician care	Care management	Total	<i>P</i> value
Mean age (SD)	50 years (16.5)	45.4 years (16)	47.4 years (16.3)	0.86
Gender				0.28
Male	6 (24%)	12 (37.5%)	18 (32%)	
Female	19 (76%)	20 (62.5%)	39 (68%)	
Living status				0.31
Live alone	6 (24%)	4 (12.5%)	10 (18%)	
Live with one or more persons	19 (76%)	28 (87.5%)	47 (82%)	
Self-reported health				0.19
Very good/good	2 (8%)	8 (25%)	10 (18%)	
Fair/poor	23 (92%)	24 (75%)	47 (82%)	
Education				0.48
High school or less	20 (80%)	28 (90%)	48 (86%)	
College graduate	5 (20%)	3 (10%)	8 (14%)	
Employment status				0.91
Employed	9 (36%)	12 (37.5%)	21 (37%)	
Unemployed/retired/unable to work/other	16 (64%)	20 (62.5%)	36 (63%)	
English fluency				0.55
Fluent/good/fair	7 (28%)	11 (35.5%)	18 (32%)	
Poor/not at all	18 (72%)	20 (64.5%)	38 (68%)	
Perceived friend and family love				0.24
A great deal/quite a bit	9 (36%)	7 (22%)	16 (28%)	
Some	16 (64%)	25 (78%)	41 (72%)	

No significant differences among variables

**Table 2** Process data for care management and enhanced physician care group samples

Variable	Care management (n = 32)	Enhanced physician care (n = 25)	Total (n = 57)	<i>P</i> value***
Visits completed: mean (SD)	4 (1.4)	3.2 (.93)	3.64 (1.3)	0.03*
No-shows visits: mean (SD)	0.28 (.58)	0.24 (.52)	0.26 (.55)	0.78
Final program status:				0.97
Number of participants completed	27 (84%)	21 (84%)	48 (84%)	
Lost to follow-up/physician or self-referred to mental health	5 (16%)	4 (16%)	9 (16%)	
Medication use				0.08
Yes	20 (71.4%)**	12 (48%)	32 (60%)	
No	8 (28.6%)**	13 (52%)	21 (40%)	
Treatment level				0.63
Level 1 (discuss diagnosis only)	5 (18%****)	7 (29%****)	12 (23%)	
Level 2 (discuss diagnosis & prescribe medication)	11 (39%)	8 (33%)	19 (37%)	
Level 3 (discuss diagnosis, medication, and self-management)	12 (43%)	9 (38%)	21 (40%)	

\*  $P < 0.05$

\*\* Only 28 participants in the care management group were prescribed with medication

\*\*\* Comparing enhanced physician care with care management

\*\*\*\* Level of intervention was documented on only 28 participants in care management group and 24 participants in enhanced physician care group

in their stigma level from baseline to follow up (data not shown). At baseline the majority of the respondents in the care management group reported mild to no difficulty initiating mental health treatment if others knew (91%), talking to their PCP about mental health problems (97%), talking to a mental health professional about mental health problems (94%), feeling that others would treat them differently (69%), and feeling embarrassed about mental health problems (59%) and with this level of difficulty fluctuating minimally over the duration of the study. A similar pattern was also observed in the enhanced physician care group over time.

The two treatment groups did not differ significantly in the level of satisfaction with their depression care (Table 3). The majority of the entire sample reported receiving considerable depression care (74%), having their conditions explained and questions answered (81%), and that the treatment they received was convenient (85%). Approximately two-thirds of participants were satisfied with their medication treatment. Of those who used medications, the majority were satisfied with the information they received about side effects of medications (67%).

Table 4 contains outcome data for the two study arms combined. There was clinically significant improvement for three of the major clinical outcomes. There was a 4.2-point reduction (an improvement) in PHQ-9 between baseline and the 4-month follow-up ( $P < 0.0001$ ) and a 4.1-point reduction (an improvement) in the Beck Anxiety score ( $P < 0.0001$ ). The Mental Component Score (MCS)

of the SF-12 had a 9.1-point increase (an improvement) ( $P < 0.0001$ ). An increase of two or more points for the MCS is considered clinically significant, and the changes observed in the PHQ-9 and Beck Anxiety also indicate significant clinical improvement. The only outcome that did not significantly change over the course of the study was the Physical Component Score (PCS) of the SF-12 with a 0.95-point increase ( $P = 0.48$ ).

Table 5 contains the major clinical outcomes for all participants by study arm. The care management group had an average decrease in PHQ-9 of 4.1 points while the enhanced physician care group experienced a decrease of 5.2 points ( $P = 0.51$ ). The Beck Anxiety score decreased by 6.1 points on average in care management group and by 5.1 points in enhanced physician care ( $P = 0.76$ ). The mental component score of the SF-12 also showed improvement, with the MCS increasing by an average of 11.1 points in care management group and by 7.9 points in enhanced physician care group ( $P = 0.35$ ). The PCS increased by 2.2 points in the care management group but decreased by 0.2 points in the enhanced physician care group ( $P = 0.49$ ). Despite the fact that the care management group had more visits per patient and had a higher proportion of participants use medication compared to the enhanced physician care group, the improvements in these outcome measures did not differ significantly between the two study arms. This lack of difference may have been due to spillover effects of enhanced physician training and consultation with mental health specialists since

**Table 3** Results: satisfaction toward receiving depression care

Satisfaction measure	Care management	Enhanced physician care (%)	Total	<i>P</i> value
Received considerable depression care				0.89
Expectations met or exceeded	22 (73%)	18 (75%)	40 (74%)	
Didn't meet expectations	8 (27%)	6 (25%)	14 (26%)	
Conditions explained, questions answered				0.13
Expectations met or exceeded	27 (90%)	16 (70%)	43 (81%)	
Didn't meet expectations	3 (10%)	7 (30%)	10 (19%)	
Treatment convenient				0.43
Expectations met or exceeded	27 (90%)	18 (78%)	45 (85%)	
Didn't meet expectations	3 (10%)	5 (22%)	8 (15%)	
Medication				0.79
Expectations met or exceeded	10 (67%)	9 (64%)	19 (66%)	
Didn't meet expectations	5 (33%)	5 (36%)	10 (34%)	
Informed about side effects				0.89
Expectations met or exceeded	11 (69%)	9 (64%)	20 (67%)	
Didn't meet expectations	5 (31%)	5 (36%)	10 (33%)	

Not all 57 participants in this study completed all the items of the satisfaction measure

**Table 4** Clinical outcomes, both groups combined

$\Delta$ , Baseline to final follow-up Clinical measure	$\Delta$ (SD)	<i>P</i> value
PHQ-9	-4.2 (5.8)	<0.001
Beck anxiety	-4.1 (7.7)	<0.001
Mental component (SF12)	9.1 (10.8)	<0.001
Physical component (SF12)	0.95 (9.8)	0.48

**Table 5** Major clinical outcomes

$\Delta$ , Baseline to final follow-up	Care management $\Delta$ (SD)	Enhanced physician care $\Delta$ (SD)	<i>P</i> value
PHQ-9	-4.1 (5.6)	-5.2 (6.1)	0.51
Mental health component (SF12)	11.1 (13)	7.9 (8.3)	0.35
Physical component (SF12)	2.2 (11.2)	-0.2 (9.8)	0.49
Beck anxiety score	-6.1 (7.4), n = 16	-5.1 (8.1), n = 13	0.76

randomization in this study was at patient level or because the time frames of outcome measures was too short to detect the real difference between the two study groups.

## Discussion

In this report we presented the development, implementation, and results of a pilot collaborative depression

treatment program that was based on the Chronic Care Model and culturally tailored to the Chinese immigrants in NYC. Of more than 6,000 patients who were screened in this study, 5.6% of them were screened positive with PHQ-9 using a lower cut off point (8 points or above). This rate of depression is generally consistent with that found in a previous study with a different patient cohort in the same study site (Chen et al. 2006) using 10 points or more as the cut-off point (4.1%). Of those who screened positive, only 16.7% agreed to participate in the study. The unexpected and extremely high refusal rate suggests that patient engagement is one of the biggest hurdles when working with an immigrant Chinese-American population. The findings from this group of Chinese immigrants did not support the assertion of depression as a stigmatized condition. Similar to the findings of Yeung's (2004) study, the majority of participants indicated mild or no stigma towards receiving mental health care in primary care settings and did not report significant change in the stigma level from baseline to follow up. It should be noted that the health center where treatment for depression was offered is not a mental health clinic but a well known community based primary care health center. The lower stigma level may also be a reflection of self-selection bias, as patients who agreed to participate may embody lower levels of stigma than those who refused to participate.

The patients' refusal may reflect the group's lack of interest in participating in a research study. It may also reveal that even in the presence of a depression or anxiety diagnosis, Chinese-American immigrants may have many barriers that prevent them from receiving mental-health treatment. These barriers could include practical barriers such as lack of health insurance, inability to make

copayments for doctors' visits and medications, difficulties in arranging transportation (Yeung et al. 2010), as well as a belief that the diagnosis is not serious. The study by Miranda et al. (2004) with Latino and African American depressed patients also found that they faced serious barriers to mental health care such as inability to take time off of work to come to treatment. Recognizing these barriers and gaining knowledge of this decision making process can help inform primary care practices for approaching the topic of mental health treatment with Chinese immigrant populations.

Efforts to educate patients about depression, systematically screen, rescreen, and identify depressed Chinese Americans in primary care settings, and to successfully engage them in treatment are challenges that lie ahead. Since many of the patients presented with less severe anxiety and depression, a simple addition of a short mental-health screen for routine screening and rescreening, and distribution of depression educational materials at future medical visits may prove beneficial and possibly sufficient when formal treatment is refused. Because of the high refusal rate, the research team launched a follow-up study to discern factors that contributed to their refusals to participate at the program. The detailed findings of that study will be reported separately.

In contrast with the difficulty of motivating depressed patients to start treatment, the study had more success in keeping patients in treatment once they were enrolled. In this study, 84% of participants completed the study successfully and the no-show rate was minimal, suggesting that the intervention model may help depressed Chinese immigrant patients adhere to treatment. The majority of participants in both groups were highly satisfied with depression care they received. Many appeared to benefit from active depression treatment by primary care physicians with or without a care manager.

The outcome data showed that collaborative depression treatment decreased the patient's symptoms of depression as well as increased the patient's adherence to treatment. The collaborative care model was successful in ameliorating patient depression and anxiety symptoms in 12 weeks. The continued success of such model in improving depression treatment outcomes depends in large part on the support and cooperation of primary care providers, availability of mental health specialists to provide consultation, and strong buy-in of the medical leadership. To institute routine depression screening in primary care, the medical community needs to commit staff and information technology resources to collect and track screening data, provide standardized training on the use of collaborative care model, and make mental health professionals available for consultation. Primary care providers play an important role in detecting and treating depressed ethnic minority patients

to achieve optimal clinical outcomes (Miranda et al. 2004). However, in today's high-volume and fast-paced primary care practices, it is unrealistic to expect primary care providers to be responsible for all aspects of treatment. Therefore the inclusion of care management support in depression treatment may be especially important in sustaining depression care in primary care settings.

The present study has several significant limitations. First, this was a pilot study with a very small sample size and was statistically underpowered for the original research hypotheses, which limits our ability to detect statistically significant differences between two treatment arms. Because of the extremely high refusal rate, only 57 patients participated in the present study. Given the small sample size and the potential self-selection bias, participants in the present study may not be representative of the immigrant Chinese adult population in general. Despite these limitations, this pilot study provides initial data to inform the development of collaborative depression care programs targeting this population.

The results of the study underscore the difficulties in conducting randomized trials for mental health care in an immigrant population. Such integration is challenging in a practical world, where community-based primary care centers do not necessarily have the resources to employ additional personnel for sustaining interventions. The preliminary results of the effects of the collaborative treatment with or without care management is encouraging. A collaborative care model appears to be effective and feasible in treating depression for Chinese Americans in the primary care setting. In light of the difficulties in enrolling patients in this randomized study despite the limited duration and intensity of research follow-up, different study designs may need to be considered for future research. With the development of team-based models of care in primary care settings, such as patient-centered medical homes, employing collaborative care strategies for depression may be an important approach for improving access to depression care for immigrant Chinese populations who tend to underutilize formal mental health services.

**Acknowledgments** The authors thank the Charles B Wang Community Health Center staff, especially the members of the steering committee, for their valuable support and contribution. We want to thank Sarah Yip, the care manager, and Cheong Lam and Moonphia Lee, research assistants, for their help in conducting this study. This study was supported by the Center for the Study of Asian American Health of New York University and sponsored by the Grant P60-MD0005-38 from the National Center for Minority Health and Health Disparities, National Institutes of Health.

## References

- Backer, L. A. (2009). Building the case for the patient-centered medical home. *Family Practice Management*, 16(1), 14–18.



- Bartels, S. J., Coakley, E., Oxman, T. E., Constantino, G., Oslin, D., Chen, H., et al. (2002). Suicidal and death ideation in older primary care patients with depression, anxiety, and at risk alcohol use. *American Journal of Geriatric Psychiatry, 10*(4), 417–427.
- Beck, A. T., & Steer, R. A. (1990). *Manual for the beck anxiety inventory*. San Antonio: Psychological Corporation.
- Belnap, B. H., Kuebler, J., Upshur, C., Kerber, K., Mockrin, D. R., Kilbourne, A. M., et al. (2006). Challenges of implementing depression care management in the primary care setting. *Administration and Policy in Mental Health and Mental Health Services Research, 33*(1), 65–75.
- Chen, T. M., Huang, F. Y., Chang, C., & Chung, H. (2006). Using the PHQ-9 for depression screening and treatment monitoring for Chinese Americans in primary care. *Psychiatric Services, 57*(7), 976–981.
- Chung, H., Teresi, J., Guarnaccia, P., Meyers, B. S., Holmes, D., Bobrowitz, T., et al. (2003). Depressive symptoms and psychiatric distress in low income Asian and Latino primary care patients: Prevalence and recognition. *Community Mental Health Journal, 39*(1), 33–45.
- Endicott, J., Nee, J., Harrison, W., & Blumenthal, R. (1993). Quality of life enjoyment and satisfaction questionnaire: A new measure. *Psychopharmacology Bulletin, 29*, 321–326.
- Gilbody, S., Whitty, P., Grimshaw, J., & Thomas, R. (2003). Educational and organizational interventions to improve the management of depression in primary care: A systematic review. *JAMA, 289*(23), 3145–3151.
- Hsu, G. L. K., Wan, Y. M., Adler, D., Rand, W., Choi, E., & Tsang, B. Y. P. (2005). Detection of major depressive disorder in Chinese Americans in primary care. *Hong Kong Journal of Psychiatry, 15*(3), 71–76.
- Hu, T., Snowden, L., Jerrell, J., & Nguyen, T. D. (1991). Ethnic populations in public mental health: Services choice and level of use. *American Journal of Public Health, 81*(11), 1429–1434.
- Huang, F. Y., Chung, H., Kroenke, K., Delucchi, K. L., & Spitzer, R. L. (2006). Using the patient health questionnaire-9 to measure depression among racially and ethnically diverse primary care patients. *Journal of General Internal Medicine, 21*(6), 547–552.
- Katzman, R., Brown, T., Fuld, P., Peck, A., Schechter, R., & Schimmel, H. (1983). Validation of a short orientation-memory-concentration test of cognitive impairment. *American Journal of Psychiatry, 140*, 734–739.
- Kessler, R. C., Zhao, S., Katz, S. J., Kouzis, A. C., Frank, R. G., Edlund, M., et al. (1999). Past-year use of outpatient services for psychiatric problems in the National Comorbidity Survey. *American Journal of Psychiatry, 156*, 115–123.
- Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2001). The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine, 16*(9), 606–613.
- Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2003). The patient health questionnaire-2: Validity of a two-item depression screener. *Medical Care, 41*(11), 1284–1292.
- Miranda, J., & Cooper, L. A. (2004). Disparities in care for depression among primary care patients. *Journal of General Internal Medicine, 19*, 120–126.
- Miranda, J., Schoenbaum, M., Sherbourne, C., Duan, N., & Wells, K. (2004). Effects of primary care depression treatment on minority patients' clinical status and employment. *Archives of General Psychiatry, 61*, 827–834.
- Paykel, E. S. (1983). Methodological aspects of life events research. *Journal of Psychosomatic Research, 27*, 341–352.
- Pignone, M. P., Gaynes, B. N., Rushton, J. L., Burchell, C. M., Orleans, C. T., Mulrow, C. D., et al. (2002). Screening for depression in adults: A summary of the evidence for the US preventive services task force. *Annals of Internal Medicine, 136*(10), 765–776.
- Sheehan, D. V., Lecrubier, Y., Sheehan, K. H., Amorim, P., Janaviss, J., & Weiller, E., et al. (1998). The Mini-international neuro-psychiatric interview (M.I.N.I.): The development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD 10. *Journal of Clinical Psychiatry, 59*(Suppl 20), 22–33; quiz 34–57.
- Spitzer, R. L., Kroenke, K., Williams, J. B. W., & the Patient Health Questionnaire Primary Care Study Group. (1999). Validity and utility of a self-report version of PRIME-MD: The PHQ primary care study. *The Journal of the American Medical Association, 282*(18), 1737–1744.
- Spitzer, R. L., Williams, J. B., Kroenke, K., Hornyak, R., McMurray, J., & for the Patient Health Questionnaire Obstetrics–Gynecology Study Group. (2000). Validity and utility of the PRIME-MD patient health questionnaire in assessment of 3,000 obstetric–Gynecologic patients: The PRIME MD patient health questionnaire obstetrics–Gynecology study. *American Journal of Obstetrics and Gynecology, 183*(3), 759–769.
- US Department of Health and Human Services. (2001). *Mental health care for Asian Americans and Pacific Islanders: A supplement to mental health—Surgeon General's report* (pp. 107–126). Rockville: US Department of Health and Human Services.
- US Public Health Service, Office of the Surgeon General. (2001). *Mental health: Culture, race, and ethnicity: A supplement to mental health: A report of the Surgeon General*. Rockville: US Department of Health and Human Services, Public Health Service, Office of the Surgeon General.
- Von Korff, M., Gruman, J., Schaefer, J., Curry, S., & Wagner, E. (1997). Collaborative management of chronic illness. *Annals of Internal Medicine, 127*(12), 1097–1102.
- Wagner, E., Austin, B., & Von Korff, M. (1996). Organizing care for patients with chronic illness. *Milbank Quarterly, 74*(4), 511–544.
- Ware, J. E., Kosinski, M., & Keller, S. D. (1996). A 12 item short form health survey: Construction of scales and preliminary tests of reliability and validity. *Medical Care, 34*(3), 220–233.
- Yeh, M., Takeuchi, D. T., & Sue, S. (1994). Asian-American children treated in the mental health system: A comparison of parallel and mainstream outpatient service centers. *Journal of Clinical Child Psychology, 23*, 5–12.
- Yeung, A., Chan, R., Mischoulon, D., Sonawalla, S., Wong, E., Nierenberg, A., et al. (2004). Prevalence of major depressive disorder among Chinese-Americans in primary care. *General Hospital Psychiatry, 26*(1), 24–30.
- Yeung, A., Shyu, I., Fisher, L., Wu, S., Yang, H., & Fava, M. (2010). Culturally sensitive collaborative treatment for depressed Chinese Americans in primary care. *American Journal of Public Health, 100*(12), 2397–2402.
- Young, A. S., Klap, R., Sherbourne, C. D., & Wells, K. B. (2001). The quality of care for depressive and anxiety disorders in the United States. *Archives of General Psychiatry, 58*, 55–61.