Improving Depression Care for Older, Minority Patients in Primary Care

Patricia A. Areán, PhD, Liat Ayalon, PhD,* Enid Hunkeler, MA,† Elizabeth H.B. Lin, MD, MPH,‡ Lingqi Tang, PhD,§ Linda Harpole, MD,¶ Hugh Hendrie, MD,‖ John W. Williams, Jr., MD, MHSc,**¶ and Jürgen Unützer, MD, MPH§*

Objective: Few older minorities receive adequate treatment of depression in primary care. This study examines whether a collaborative care model for depression in primary care is as effective in older minorities as it is in nonminority elderly patients in improving depression treatment and outcomes.

Study Design: A multisite randomized clinical trial of 1801 older adults comparing collaborative care for depression with treatment as usual in primary care. Twelve percent of the sample were black (n = 222), 8% were Latino (n = 138), and 3% (n = 53) were from other minority groups. We compared the 3 largest ethnic groups (non-Latino white, black, and Latino) on depression severity, quality of life, and mental health service use at baseline, 3, 6, and 12 months after randomization to collaborative care or usual care.

Principal Findings: Compared with care as usual, collaborative care significantly improved rates and outcomes of depression care in older adults from ethnic minority groups and in older whites. At 12 months, intervention patients from ethnic minorities (blacks and Latinos) had significantly greater rates of depression care for both antidepressant medication and psychotherapy, lower depression severity, and less health-related functional impairment than usual care participants (64%, 95% confidence interval [CI] 55–72 versus 45%, CI 36–55, $P = 0.003$ for antidepressant medication; 37%, CI 28–47 versus 13%, CI 6–19, $P = 0.002$ for psychotherapy; mean = 0.9, CI 0.8–1.1 versus mean = 1.4, CI 1.3–1.5, $P < 0.001$ for depression severity, range 0–4; mean = 3.7, CI 3.2–4.1, versus mean = 4.7, CI 4.3–5.1, $P < 0.0001$ for functional impairment, range 0–10).

Conclusions: Collaborative Care is significantly more effective than usual care for depressed older adults, regardless of their ethnicity. Intervention effects in ethnic minority participants were similar to those observed in whites.

Key Words: depression, collaborative care, ethnic minorities, older adults

(*Med Care* 2005;43: 381–390)

Depressive disorders in older minorities constitute a major public health concern. Although studies of the general geriatric population show that the prevalence for major depression and dysthymia is between 5% and 10%,[1] the rates of these disorders are estimated to be slightly higher in older Latinos[2,3] and slightly lower in older blacks.[4,5] Depressive disorders are associated with increased morbidity and mortality in older adults and in younger minority groups,[6] but there are limited data on their impact on older minorities.

Although depressive disorders are treatable in older adults and in minority populations, few older minorities use mental health services.[7] Barriers to utilization include stigma, limited financial, and geographical access to specialty mental health services; distrust of mental health providers; and lack of culturally competent services.[8–10] Older minorities tend to seek help for depression in nonmental health settings, particularly primary care medicine.[11] Several studies have shown that the management of depression in primary care, regardless of age or ethnic group, is hampered by a lack of system level resources, such as limited access to specialty mental health care, insufficient provider time for initiating treatment, and providing the close follow-up needed to improve outcomes.[12,13]

Collaborative care (CC) models were developed to specifically address the resource limitations in primary care

From the *Department of Psychiatry, University of California, San Francisco, San Francisco, California; the †Division of Research, Kaiser Permanente of Northern California, Oakland, California; the ‡Center for Health Studies, Group Health Cooperative, Seattle, Washington; the §UCLA Neuropsychiatric Institute, Los Angeles, California; the ¶Department of Medicine, Duke University, Durham, North Carolina; the ‖Regenstrief Institute of Health Care, University of Indiana Center for Aging Research, Indianapolis, Indiana; and the **Center for Health Services Research in Primary Care, Department of Veterans Affairs, VAMC, Durham, North Carolina.

Supported by grants from the John A. Hartford Foundation, the California Healthcare Foundation, the Hogg Foundation, and the Robert Wood Johnson Foundation.

The views expressed in this article are those of the authors and do not necessarily represent the views of the Department of Veterans Affairs.

Reprints: Patricia A. Areán, PhD, UCSF Department of Psychiatry, 401 Parnassus Avenue, San Francisco, CA 94143. E-mail: pata@lppi.ucsf.edu.

ISSN: 0025-7079/05/4304-0381

medicine. According to these models of care, access to quality depression treatment is facilitated through a combination of provider education, patient activation, systematic treatment monitoring, mobilization of community resources, and ready access to mental health services within the target system of care. Although there are several variations of CC in existence, coordination of services in all models is performed primarily through a depression care manager, who helps to coordinate treatment decisions and facilitate patient use of depression intervention.[13–15] A number of studies have already investigated the utility of CC and found that the coordination of mental health services through primary care medicine results in greater access to and use of mental health services in older adults and younger minorities than if depression care is managed as usual or is referred out to the community.[16–20] These data suggest that the integration of mental health services into primary care medicine also would benefit older minorities.

Despite promising results in older adults and minority populations, there are several factors specific to older minorities populations that may complicate the use of a CC model for depression. First, older minorities tend to be sicker and more disabled than older whites,[21,22] which could prevent them from easily accessing regular appointment and follow-ups. Although telephone follow-up is a feasible method for overcoming functional barriers to services use,[23] many older minorities may not have home telephones or may have difficulties communicating with staff using a telephone. Second, ethnic minorities tend to have greater stigma and fear of mental illness and mental health services than nonminorities.[24–25] Third, older minorities may be less likely to tolerate antidepressant treatment.[26,27] Fourth, models developed for white populations may not be culturally sensitive enough to be acceptable or effective for older minorities.[28,29]

In this article, we examined whether depressed older adults from the 2 largest ethnic minority groups (black and Latino) receive similar benefits from CC for depression in primary care as do whites. Specifically, we report on use of antidepressants and counseling, clinical outcomes (depression and health related functional impairment), and satisfaction with services during a 1-year period. We hypothesized that CC is more effective than usual care (UC) but that effects on clinical outcomes and service use are smaller for minorities compared with older whites.

METHODS

Data for this work are derived from the Improving Mood-Promoting Access to Collaborative Treatment (IMPACT) study.[14] The IMPACT study was a multisite, randomized trial comparing a primary care based CC model to UC in primary care. The study was conducted in 7 study sites in 5 states, representing 8 different health care organizations and 18 primary care settings. The IMPACT model has been described in detail elsewhere.[14] Briefly, this intervention follows a collaborative, stepped care approach to managing depression. The model involves implementation of a number of system changes: primary care provider education about evidence-based treatment of late-life depression; a depression care manager who works with the patient and primary care provider to activate patients in the management of their depression, provides ongoing mood and medication monitoring based on evidence-based treatment guidelines, and provides brief psychotherapy (Problem-solving Treatment of Primary Care; PST-PC); the use of a clinical information tracking system to assist the care manager and the primary care provider in making treatment decisions; and ready access to a psychiatrist who provides consultation on complicated cases.

Sample

Participants were selected from 18 primary care clinics belonging to 8 health care organizations in 5 states. For a detailed description of recruitment, screening, and sampling strategies see Unützer et al.[17] Participants were 60 years or older, identified as meeting criteria for major depression or dysthymia according to the Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (SCID).[31] They agreed to participate in the study using written informed consent forms approved by the Institutional Review Boards at all study sites. One thousand eight hundred and one primary care patients with major depression or dysthymia were identified and agreed to participate in the trial; all spoke English. Of the 1801 that participated, 1388 were white, 222 (12%) were black, 138 (8%) were Latino (primarily of Mexican origin), and 53 (3%) listed their ethnicity as "other" (Table 1). Because the relatively small "other" category consisted of participants from diverse ethnic affiliations, no analyses were conducted on this group. Although the groups were balanced on most demographic characteristics at baseline, we found that there were fewer women in the Latino sample than there were in other ethnic groups. Blacks were slightly younger than participants from the other ethnic groups; however, the actual age differences were small. Blacks also were less likely to have at least a high school education than the other ethnic groups and were less severely depressed at baseline than Whites and Latinos but tended to have a more chronic course, as evident by having at least 2 previous episodes of depression.

Although the study sample was not stratified on ethnicity, the large sample size allowed for equal representation of ethnic groups in the 2 treatment conditions and we found no significant differences in demographic or clinical characteristics between intervention and control subjects in any of the 3 ethnic groups examined.

TABLE 1. Baseline Patient Characteristics by Ethnic Group*

Sample Characteristics	All (n = 1748)	White (n = 1388)	Black (n = 222)	Latino (n = 138)	Group Test, *P* Value†
Randomized to collaborative care	879 (50)	709 (51)	114 (51)	56 (41)	0.07
Recruitment method: referral	856 (49)	705 (51)	64 (29)	87 (63)	< 0.01
Female	1131 (65)	913 (66)	153 (69)	65 (47)	< 0.01
Mean (SD) age	71.2 (7.5)	71.7 (7.5)	68.9 (7.1)	70.6 (7)	< 0.01
Married or living with partners	816 (47)	674 (49)	62 (28)	80 (58)	< 0.01
At least high school graduate	1409 (81)	1192 (86)	130 (59)	88 (64)	< 0.01
Depression status (SCID diagnosis)					0.05
Major depression	300 (17)	252 (18)	25 (11)	23 (16)	
Dysthymia	529 (30)	416 (30)	79 (35)	34 (25)	
Major depression and dysthymia	919 (53)	720 (52)	118 (53)	81 (59)	
2 or more previous episodes of depression	1235 (71)	955 (69)	180 (81)	100 (73)	< 0.01
Mean (SD) HSCL-20 depression score (range, 0–4)	1.7 (0.6)	1.7 (0.6)	1.5 (0.6)	1.8 (0.7)	< 0.01
Any thoughts of suicide	241 (14)	199 (14)	20 (9)	21 (15)	0.09
Positive result on cognitive impairment screener	610 (35)	435 (31)	126 (57)	49 (36)	< 0.01
Positive result on anxiety screener	499 (29)	386 (28)	68 (30)	46 (34)	0.3
Mean (SD) chronic disease count (of a list of 10)	3.2 (1.7)	3.2 (1.7)	3.4 (1.9)	3.3 (1.7)	0.18
Mean (SD) health-related functional impairment (range, 0–10)	4.6 (2.6)	4.6 (2.6)	4.7 (2.8)	4.9 (2.7)	0.32
Any antidepressant use in the past 3 months	747 (43)	594 (43)	91 (41)	62 (45)	0.74
Any specialty mental health visits or psychotherapy in the past 3 months	144 (8)	123 (9)	9 (4)	12 (9)	0.06
Satisfaction with depression care (% excellent, very good)‡	299 (52)	226 (50)	52 (60)	21 (48)	0.29

*Data are presented as percentage unless otherwise indicated.

†Comparing difference across 3 ethnic groups from multiple imputed data. For each of 3 ethnic groups (white, black, and Latino), there were no significant baseline differences between intervention and control groups (data are not shown).

‡Only assessed in individuals who reported depression care in past 3 months.

Intervention

Once patients were randomized to CC, they received a 20-minute video and written information about late-life depression. The patients were then met with a depression clinical specialist (DCS) in the primary care clinic, typically a nurse or a psychologist trained in the CC model. The DCS collected psychosocial information on the patient, discussed the educational materials, and discussed treatment options for depression. Based on patient's preference, the DCS then supported the patient in the use of antidepressant medications prescribed by their regular primary care provider (PCP) or provided a course of PST-PC. Ongoing depression monitoring modeled after the Agency for Health Care Policy and Research guidelines for the treatment of depression in primary care, which consists of monitoring patients every 2 weeks during the acute phase of treatment and then monthly contacts for 1 year after stabilization of depression was provided. A consulting psychiatrist met weekly with the DCS and was available to help with cases that were more complex or nonresponsive to initial treatment. Most patients initiated a course of either antidepressant medication or PST-PC. If the patient did not show a significant clinical response after 4–6 weeks, the DCS, PCP and consulting psychiatrist discussed additional treatment options, and the addition of another antidepressant or PST-PC was given. If the patient still did not improve, other treatment options were considered, including referral to specialty mental health.

It is important to note that there were very few cultural accommodations made to the CC intervention. Adjustments for diversity were limited to reference of elderly from different ethnic backgrounds in the educational video and written materials. All participants in this trial had access to the same materials and interventions.

Control subjects were encouraged to continue in care as usual. This could have been continuing care with their primary care provider or any mental health specialty provider of their choosing or not receiving any mental health treatment at all. No services were withheld from this group, and no special services were provided by the study team.

Data Collection

Data reported are from baseline, 3-, 6-, and 12-month follow-up. Baseline data were collected before randomization by trained interviewers using a computer-assisted interview. A telephone survey research group conducted blind follow-up interviews at 3, 6, and 12 months. Overall response rates were 90% at 3 months, 87% at 6 months, and 83% at 12 months. For the white sample, response rates were 91% at 3 months, 89% at 6 months, and 87% at 12 months. For the black sample, response rates were 90% at 3 months, 85% at 6 months, and 84% at 12 months. For the Latino sample, response rates were 93% at 3 months, 90% at 6 months, and 86% at 12 months. No significant differences were found in the response rates among the 3 ethnic groups at any of the assessment time points.

Baseline and Outcome Assessment

At the baseline assessment, we collected information on sociodemographic characteristics and DSM-IV diagnoses of major depression or Dysthymia via the Structured Clinical Interview for DMS-IV,[30] depression severity with the Hopkins Symptom Checklist–20 (HSCL-20[32]), and functional impairment with the Sheehan Disability Scale.[32] We also administered the Cornell Service Use Index[33] to collect data on depression-related service use 3 months before identification. The HSCL-20 demonstrated good reliability in the 3 ethnic groups: Cronbach's alpha for whites 0.83; Cronbach's alpha for blacks 0.81; Cronbach's alpha for Latino 0.87.

Outcome of interest for this study were use of antidepressant medications or psychotherapy, as measured by the Cornell Service Use Index, satisfaction with depression care, as indicated by the percentage of people who answered "excellent" or "very good," depressive symptoms, treatment response, as indicated by a decrease of 50% or more in HSCL-20 score from baseline, treatment remission, as indicated by HSCL-20 score smaller than 0.5, and health-related functional impairment as rated by the Sheehan Disability Scale.

Statistical Methods

We used bivariate analyses to compare participants from the 3 ethnic groups (white, black, and Latino) on baseline demographic and clinical variables. In bivariate analyses, we used χ^2 tests for categorical variables, and t-tests and F-tests in analysis of variance for continuous variables. Similar analyses were conducted to compare participants from the intervention and control groups stratified by ethnicity. Intervention and control patients did not differ at baseline in demographic and clinical variables for the overall sample and for each ethnic group, except for education, which was significantly associated with intervention condition for the Latino group.

We used preplanned, a priori contrasts to examine the differential intervention effects by ethnic group. We conducted regression and logistic regression analyses through generalized estimating equations (GEE) models[34] using 3-, 6-, and 12-month follow up data, specifying an exchangeable working correlation structure to account for the within-subject correlation over time. To examine differential intervention effects by ethnic group, in the GEE models, we treated time as a categorical variable, and assessed differential effects of time, intervention condition, ethnicity, and their interactions. We controlled for patient baseline characteristics, including age, gender, marital status, education, recruitment method (screening or referral), participating study organizations, 2 or more previous episodes of depression, positive result on cognitive impairment screener, HSCL-20 depression score, overall functional impairment, and any previous depression treatment. To test intervention effects within each ethnic group at each time point, we conducted pairwise 2-sided t-tests for comparing intervention versus UC by ethnicity status and obtained adjusted group estimates for each treatment group[35] from the GEE models.

To determine whether intervention is as effective in minorities as it is in whites, we also grouped the black and Latino minorities together and contrasted them with whites. GEE models similar to the ones described previously were applied to examine the interaction effects of intervention with ethnic minority status.

We used a multiple imputation technique to account for item-level and unit-level nonresponse and the uncertainty in the imputed values.[36] Variables examined in this study had item level missingness rates of less than 2%. The unit nonresponse rates for the 3-, 6-, and 12-month follow-ups were 9.8%, 12.8%, and 17%, respectively. We used a combination of a predictive mean matching method for item nonresponse[37] and the approximate Bayesian bootstrap[38] for unit nonresponse. Details of missing data imputation are presented in Tang et al.[39] We created 5 imputed data sets and each of 5 complete data sets was then analyzed using standard complete-data methods. The results across 5 imputed data sets were combined by averaging and standard errors were adjusted to reflect both within-imputation variability and between-imputation variability.[40]

RESULTS

Baseline Analyses

Patient baseline characteristics are presented by ethnicity in Table 1. Because the literature on mental health services in minority populations suggests that disparities in service use exist between minorities and whites, we ran comparative analyses on mental health service use and use of antidepressant medication for the 3 months prior to randomization. Although blacks had the lowest rates of specialty

mental health service use in the 3 months prior to study randomization (4%), this rate was not statistically different ($P = 0.06$) from the rates reported whites (9%) and Latinos (9%). Fewer than half (41% of the black sample, 43% of the white sample, and 45% of the Latino sample) indicated that they had used antidepressant medications in the 3 months prior to randomization (Table 1). Differences between these rates were not statistically significant ($P = 0.74$).

Process of Care

By the 12-month assessment period, older minorities who received CC used far more guideline concordant depression services (antidepressant medications or psychotherapy) than older minorities in UC (64%, 95% confidence interval [CI] 55–72 versus 45%, CI 36–55, $P = 0.003$ for antidepressant; 37%, CI 28–47 versus 13%, CI 6.5–19, $P = 0.002$ for psychotherapy). They also reported greater satisfaction with mental health services than older minorities in UC (72%, CI 63–81 versus 45%, CI 34–57, $P < 0.0001$).

Table 2 reports adjusted percentages for CC and UC by ethnic group. Overall, the magnitude of intervention effects on processes of care is similar across the 3 ethnic groups, and we did not observe a statistically significant interaction between intervention status and ethnic group in GEE models. However, stratified analysis by ethnic group demonstrated that the effects of CC on processes of care are particularly notable in the older Latino group (Fig. 1). Latinos who received CC were significantly more likely to use antidepressant medication and psychotherapy than Latinos in UC (68%; CI 54–81 versus 44%; CI 31–56, $P = 0.015$ for antidepressant medication; 42%; CI 26–57 versus 12%; CI 3–21, $P = 0.005$ for psychotherapy; Table 2, Figs. 1 and 2). Older blacks also benefited from CC. Although older blacks who received CC did not have significantly greater antidepressant use than older blacks in UC (62%; CI 52–72 versus 46%; CI 34–59, $P = 0.036$), they were more like to use psychotherapy than older blacks in UC (35%; CI 24–46 versus 14%; CI 6–22, $P = 0.01$ at 12-month; Table 2, Fig. 2). Older vlacks in CC reported greater satisfaction with their depression care than those in UC (72%; CI 61–82 versus 42%; CI 28–56, $P = 0.001$; Table 2).

Clinical Outcomes

Depression

No significant interactions were found between intervention and ethnic group for 3 depression outcomes (mean HSCL-20 depression score, complete remission of depressive symptoms defined as HSCL-20 score less than 0.5, and response defined as at least 50% drop in HSCL-20 depression score from baseline). The results from the GEE models comparing intervention effects between minorities and whites indicated that the intervention effects in minorities are of similar magnitude as those in whites. Older minorities who received CC had significantly better depression outcomes as measured by the HSCL-20 depression severity score, significantly higher rates of treatment response, and significantly higher rates of remission than minorities in UC (mean = 0.94, CI 0.8–1.1 versus mean = 1.4, CI 1.3–1.5, $P < 0.0001$, for depression severity; 50%, CI 41–58 versus 18%, CI 12–25, $P < 0.0001$, for treatment response; 30%, CI 22–38 versus 8%, CI 4–13, $P < 0.0001$, for remission). Table 2 reports adjusted percentages for depression outcomes in the 3 ethnic groups. It shows that blacks had the largest intervention versus control differences in depression score (mean = 0.9; CI 0.07–1 versus mean = 1.4; CI 1.3–1.5, $P < 0.001$; Table 2, Fig. 3), although this difference did not statistically differ from whites and Latinos.

Functioning

Table 2 also reports the adjusted means for health related functional impairment in the 3 ethnic groups. The intervention effects were again of similar magnitude across the 3 ethnic groups, and we did not observe statistically significant interactions between intervention status and ethnic group. The GEE models predicting health-related functional impairment demonstrated that blacks who received CC had substantially better functional outcomes than did blacks in UC (mean = 3.6; CI 3.0–4.2 versus mean = 4.7; CI 4.1–5.2 $P = 0.005$). Latinos also benefited from CC, although the effects on health-related functioning in this group appear to be somewhat smaller than those in blacks and the differences between intervention and control subjects in this subgroup (mean = 3.9; CI 3.1–4.6 versus mean = 4.7; CI: 4.1–5.3, $P = 0.089$) were not statistically significant, most likely because of limited power in this small subgroup.

DISCUSSION

Several position papers and policy documents have indicated that insufficient resources and lack of culturally competent care compromise not only the quality of depression management in minority populations but are associated with worse clinical outcomes.[41] Our results show that a CC model for depression in primary care is an effective way to increase evidence-based depression treatments and outcomes in older minorities. Specifically, the present study indicates that an individualized treatment that is designed to meet the specific needs and preferences of the patient is highly effective in treating depressed ethnic minorities, despite the fact that this treatment makes only minor adaptations to meet the cultural needs of the different ethnic groups.

We are encouraged by the similar benefits of CC in all 3 ethnic groups, particularly in use of depression treatments. Latinos treated in CC were more likely to be taking an antidepressant medication and attending psychotherapy than Latinos receiving care as usual. Although blacks receiving CC were not more likely to use antidepressant medication than blacks in UC, they did use far more psychotherapy.

TABLE 2. Adjusted Estimates of Depression Care and Clinical Outcomes in the Three Ethnic Groups*

	White			Black			Latino		
	UC Adjusted % (95% CI)	CC Adjusted % (95% CI)	*P* Value	UC Adjusted % (95% CI)	CC Adjusted % (95% CI)	*P* Value	UC Adjusted % (95% CI)	CC Adjusted % (95% CI)	*P* Value
Any antidepressant use									
3-mo follow-up	48 (45–52)	65 (62–68)	< 0.001	49 (40–58)	55 (47–63)	0.31	47 (37–57)	61 (51–72)	0.062
6-mo follow-up	49 (45–53)	65 (61–69)	< 0.001	50 (41–60)	61 (52–71)†	0.081	47 (37–57)	62 (49–75)	0.061
12-mo follow-up	50 (45–54)	66 (62–70)	< 0.001	46 (34–59)	62 (52–72)	0.036	44 (31–56)	68 (54–81)	0.015
Any psychotherapy or specialty mental health visits									
3-mo follow-up	18 (15–21)	45 (41–48)	< 0.001	12 (5–19)	41 (30–51)	< 0.001	20 (12–29)	46 (33–59)	0.002
6-mo follow-up	12 (10–15)	40 (36–43)	< 0.001	14 (6–21)	38 (29–48)	< 0.001	13 (6–21)	32 (19–45)	0.011
12-mo follow-up	16 (14–19)	44 (40–48)	< 0.001	14 (6–22)	35 (24–46)	0.01	12 (3–21)	42 (26–57)	0.005
Satisfaction with depression care (excellent/very good)‡									
3-mo follow-up	52 (46–57)	78 (75–81)	< 0.001	50 (38–61)	72 (63–81)	0.003	41 (27–54)	74 (63–86)	< 0.001
12-mo follow-up	49 (45–54)	76 (72–79)	< 0.001	42 (28–56)	72 (61–82)	0.001	50 (35–65)	71 (58–85)	0.035
Response (at least 50 decrease in HSCL-20 depression score from baseline)									
3-mo follow-up	15 (12–18)	32 (28–35)	< 0.001	12 (4–20)	38 (27–48)	< 0.001	16 (8–25)	26 (14–38)	0.173
6-mo follow-up	30 (26–34)	48 (45–52)	< 0.001	34 (23–44)	56 (46–66)	0.004	35 (22–47)	45 (30–60)	0.3
12-mo follow-up	19 (16–23)	43 (39–48)	< 0.001	23 (13–33)	54 (43–65)	< 0.001	14 (6–21)	42 (28–56)	< 0.001
Remission (HSCL-20 depression score less than 0.5)									
3-mo follow-up	5 (3–7)	15 (12–18)	< 0.001	6 (1–10)	19 (12–27)	0.004	4 (0–9)	16 (7–26)	0.026
6-mo follow-up	17 (14–20)	30 (26–33)	< 0.001	18 (10–26)	33 (24–42)	0.012	16 (7–25)	28 (15–41)	0.127
12-mo follow-up	8 (6–11)	24 (20–27)	< 0.001	8 (2–14)	33 (23–43)	< 0.001	9 (2–16)	25 (14–37)	0.014
HSCL-20 depression score (range, 0–4)									
3-mo follow-up	1.45 (1.4–1.5)	1.17 (1.1–1.2)	< 0.001	1.5 (1.3–1.6)	1.1 (1–1.3)	< 0.001	1.5 (1.3–1.6)	1.2 (1.1–1.4)	0.026
6-mo follow-up	1.2 (1.1–1.3)	0.93 (0.9–1)	< 0.001	1.2 (1.1–1.4)	0.9 (0.7–1)	< 0.001	1.2 (1–1.4)	0.9 (0.7–1.1)	0.106
12-mo follow-up	1.39 (1.3–1.4)	1 (0.9–1.1)	< 0.001	1.4 (1.3–1.5)	0.9 (0.7–1)	< 0.001	1.4 (1.3–1.5)	1 (0.8–1.2)	0.002
Overall functional impairment (range, 0–10)									
3-mo follow-up	4.4 (4.2–4.6)	3.8 (3.6–4)	< 0.001	4.6 (4–5.1)	3.6 (3–4.1)	0.006	4.8 (4.2–5.4)	4 (3.3–4.6)	0.055
6-mo follow-up	4 (3.9–4.3)	3.8 (3.6–4)	0.019	4.5 (4–5)	4 (3.5–4.7)	0.255	4 (3.7–5)	4 (3.1–4.5)	0.262
12-mo follow-up	4.5 (4.3–4.7)	3.6 (3.3–3.8)	< 0.001	4.7 (4.1–5.2)	3.7 (3–4.2)	0.005	4.7 (4.1–5.3)	3.9 (3.1–4.6)	0.089

*GEE linear regression and logistic regression models adjusted for age, gender, marital status, education, recruitment method (screening or referral), participating study organizations, and baseline clinical variables (ie, 2 or more prior episodes of depression, positive result on cognitive impairment screener, HSCL-20 depression score, overall functional impairment, and any prior depression treatment). Inferences were calculated by the multiple imputation inference technique.[33]

†Black intervention significantly different from white, $P = 0.03$.

‡Satisfaction with depression care was not assessed at 6 months.

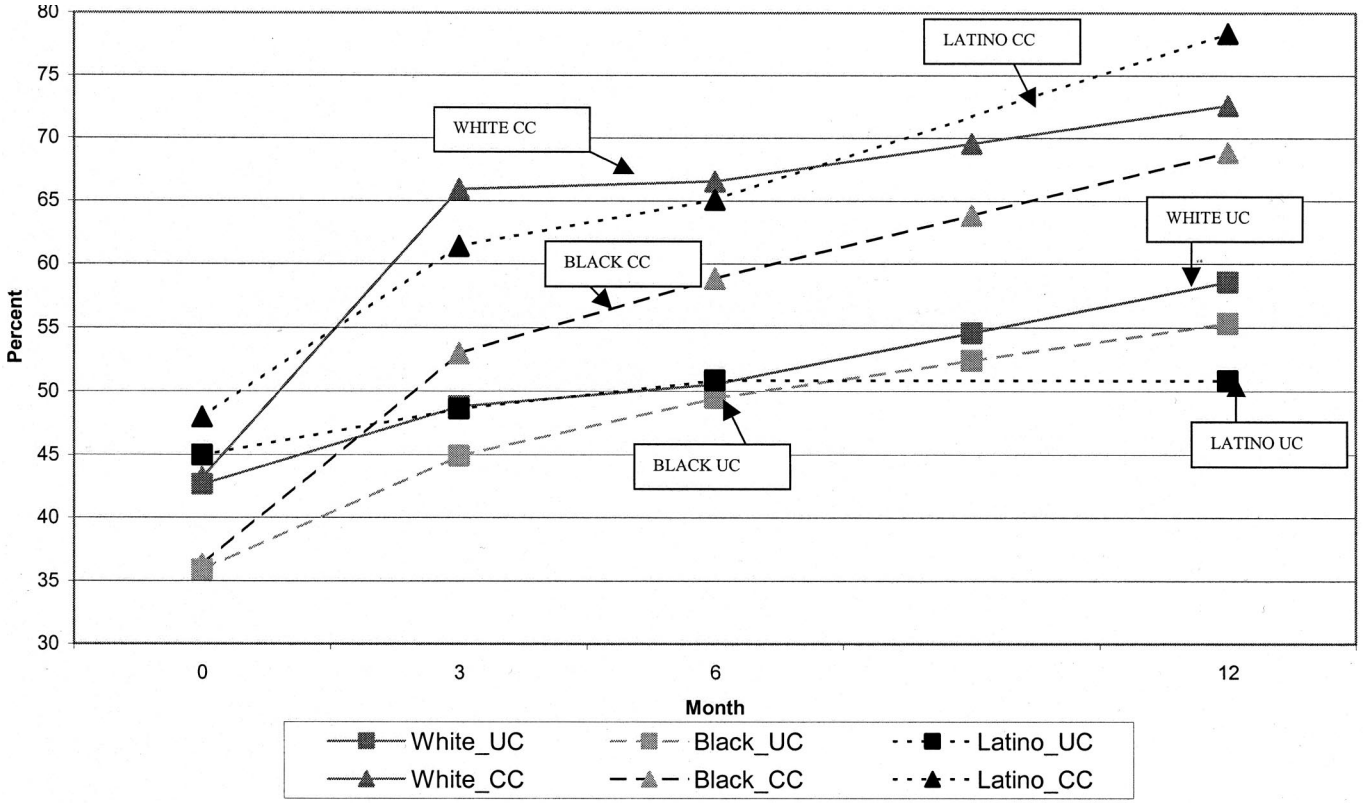

FIGURE 1. Antidepressant use.

Previous research has shown that blacks tend to prefer psychotherapy to medications when presented with treatment options for depression but that despite these preferences, blacks in UC are unlikely to receive the treatment of their choice.[42] Thus, CC models that allow for the provision of brief psychotherapy in primary care may improve blacks' access to their preferred treatment and result in better depression management. Further work is needed to understand and improve black elders' acceptance and use of antidepressant medications. Our findings suggest, however, that by providing greater access to preferred treatments, older minorities are more likely to make use of these services, and clinically benefit from improved access.

Our study also shows that CC had a significant effect on depression and health related functional impairment in all ethnic groups. Minority elders assigned to UC were far less likely to experience reduction in depressive symptoms and improvements in functioning than minorities in CC. Blacks in this study seemed to derive particular benefit from CC. Blacks in care as usual experienced almost no improvement in depression severity from baseline over the course of 12 months, despite similar rates of depression treatment to other ethnic groups in UC. It appears that greater access to care management and counseling services provided by the DCSs in CC may have been particularly beneficial for blacks.

Latinos in CC also had better resolution of depression over time than Latinos in UC. Intervention effects on health related functional impairment in Latinos were of similar magnitude to those observed in whites, but intervention and control differences in this outcome were not statistically significant for Latinos, most likely due to the smaller sample size in this subgroup which limits power. Although some have suggested that existing depression interventions may not be as effective in Latinos because of insufficient cultural adaptations,[8,9] in this study, Latinos in CC derived substantial benefit from the intervention that was similar to those seen in the 2 other ethnic groups. Given the recent positive outcomes for young Latino women in other studies,[43] future research should look specifically at the efficacy of CC, brief psychotherapies and antidepressant medication in a larger sample of older Latinos.

Our study suggests that ethnic minority elderly derive significant benefit from CC for depression even in the absence of substantial cultural adaptations of the intervention. Although CC in this study was not adapted for ethnic minorities, the structure of the intervention implicitly addressed certain barriers that may contribute to under use of services by older minorities. First, provision of services in a nonmental health setting, such as primary care medicine addresses stigma and trust barriers. Older minorities tend to be wary of

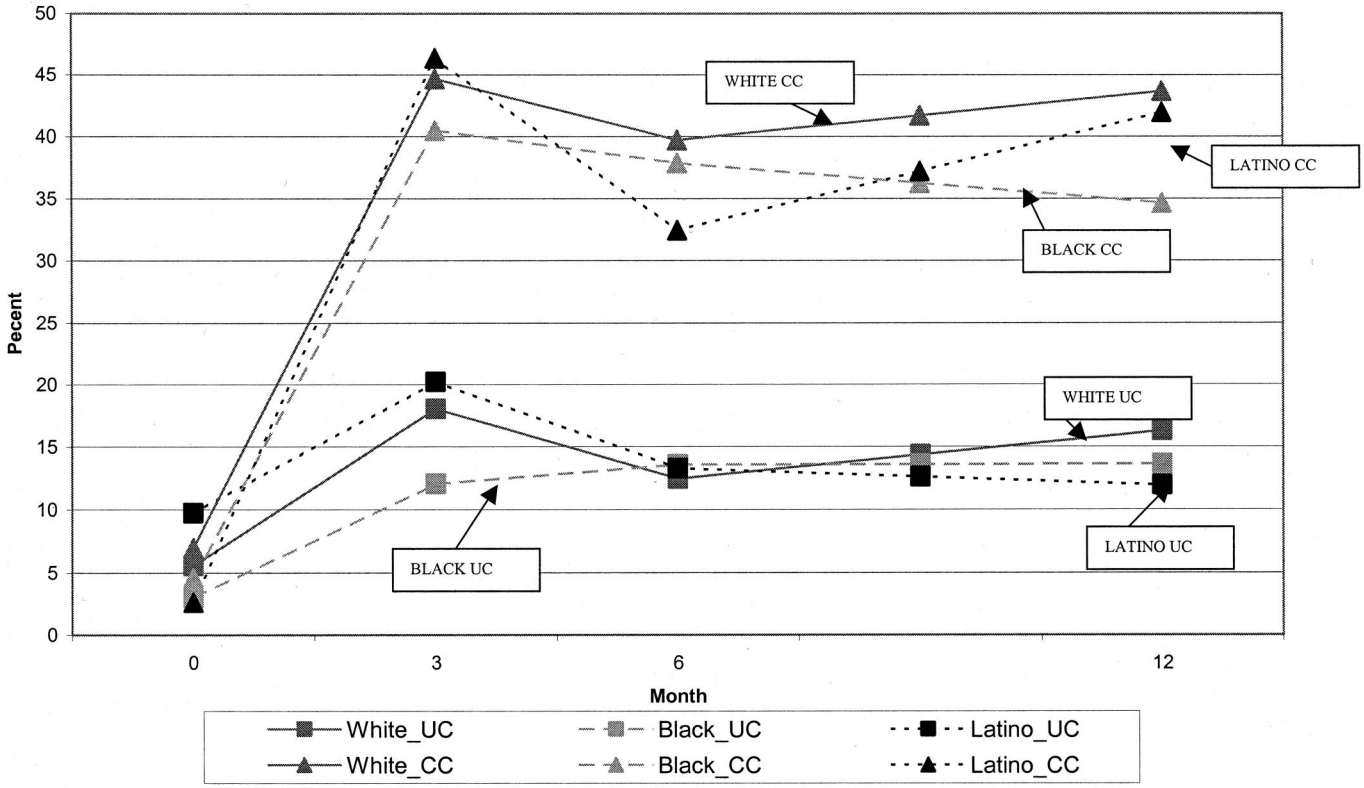

FIGURE 2. Use of counseling or psychotherapy.

the mental health system and are more likely to seek services from their primary care physician.[44] Second, access to a depression care specialist who could provide individualized education about depression and its treatment may have resulted in assuaging the fears and concerns older minorities have about mental illness. Thus, patient education was tailored to the specific concerns of the patients. Third, depression care managers were able to provide basic case management to facilitate use of services by older minorities. Depression specialists were, for example, able to provide information about transportation options, medication donation programs and referrals to respite care services. Finally, depression specialists were able to provide on-site assessment of depression and were able to readily respond to patient treatment preferences for antidepressant medications or psychotherapy.

Limitations

This sample was derived from a study of depression management in all older adults and was not designed specifically to examine intervention effects in ethnic minorities, nor was the sample stratified by ethnicity. Although this study includes the largest sample of depressed older minorities in a treatment trial for depression to date, the possibility of selection bias should be considered when reviewing the results. As in any clinical trial, it is possible that this study attracted a unique group of patients. However, the multisite nature of the study, the low rates of attrition, and the fact that patients' characteristics are representative of the general population are reassuring. Second, while we had sufficient power to detect intervention effects on processes of care in all 3 ethnic groups, we were underpowered to detect effects on health related functioning in the relatively small group of Latinos. Third, the Latino population was all English speaking and thus may have been more acculturated than older Latinos in the United States. Generalizability to monolingual Spanish-speaking elderly is therefore limited. Last, we evaluated service use by patients' self-report. There is some evidence that self-reported service use by older adults is subject to recall error, however the error in reporting services tends to be small and in the direction of under-reporting.[45]

CONCLUSION

In conclusion, CC for late-life depression improves access to depression treatment and clinical outcomes among depressed older primary care patients from diverse ethnic groups. For black subjects, whose depression showed little improvement with the treatments provided in UC, the integration of care management and counseling services into

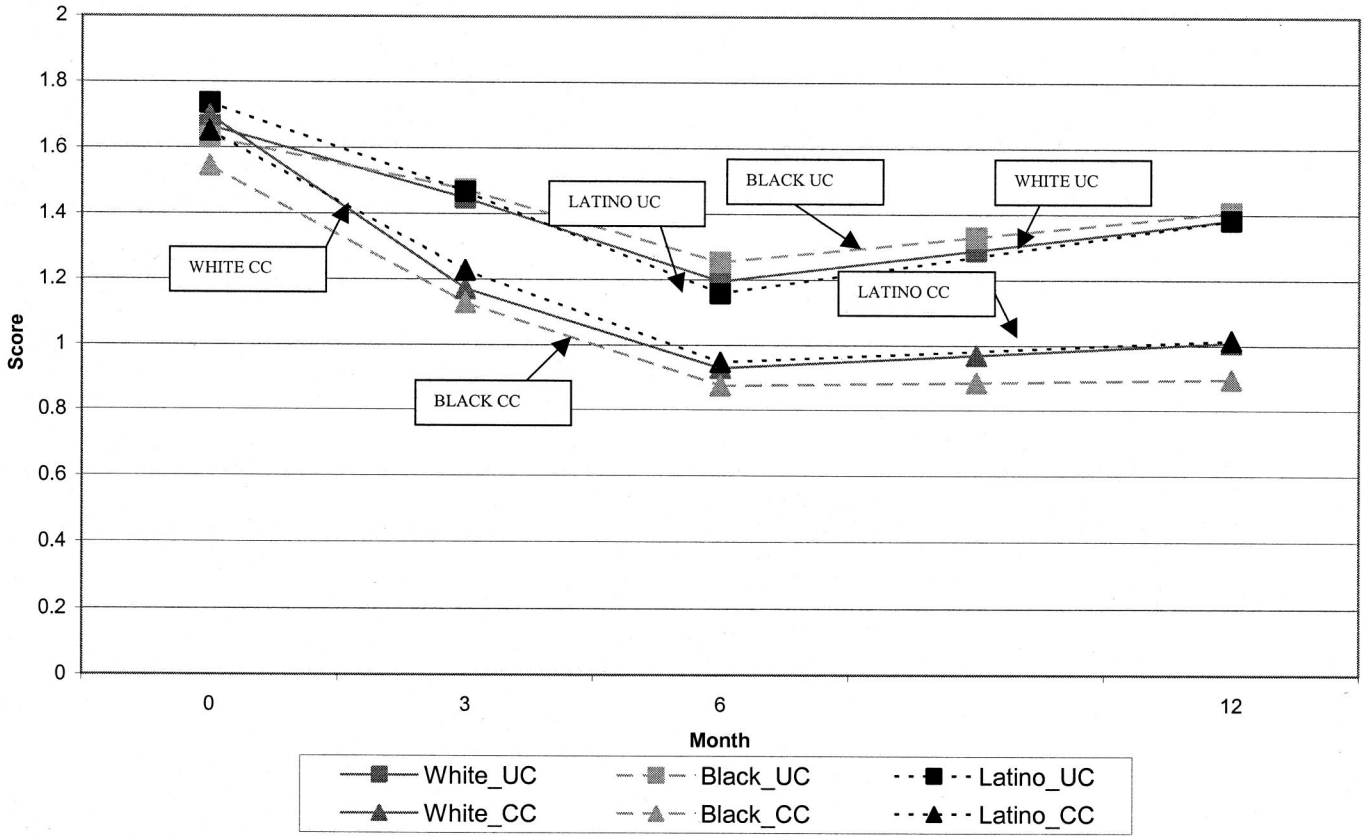

FIGURE 3. Mean SCL-20 Depression Score.

primary care may have been particularly helpful in overcoming depression symptoms and improving health related functioning. For Latino subjects, CC also resulted in greater access to depression specific treatments than UC and in substantial clinical improvements during the course of 12 months. Future investigation should advance findings of this study to better understand efficacious components of this model and the effectiveness of CC in larger samples of depressed older Latinos.

ACKNOWLEDGMENTS

The IMPACT Investigators include (in alphabetical order): Patricia Areán, PhD (Co-PI); Thomas R. Belin, PhD; Noreen Bumby, DO; Christopher Callahan, MD (PI); Paul Ciechanowski, MD, MPH; Ian Cook, MD; Jeffrey Cordes, MD; Steven R. Counsell, MD; Richard Della Penna, MD (Co-PI); Jeanne Dickens, MD; Michael Getzell, MD; Howard Goldman, MD, PhD; Lydia Grypma, MD (Co-PI); Linda Harpole, MD, MPH (PI); Mark Hegel, PhD; Hugh Hendrie, MB, ChB, DSc (Co-PI); Polly Hitchcock Noel, PhD (Co-PI); Marc Hoffing, MD (PI), MPH; Enid M. Hunkeler, MA (PI); Wayne Katon, MD (PI); Kurt Kroenke, MD; Stuart Levine, MD, MHA (Co-PI); Elizabeth H.B. Lin, MD, MPH (Co-PI); Tonya Marmon, MS; Eugene Oddone, MD, MHSc (Co-PI); Sabine Oishi, MSPH; R. Jerome Rauch, MD; Michael Sands, MD; Michael Schoenbaum, PhD; Rik Smith, MD; David C. Steffens, MD, MHS; Christopher A. Steinmetz, MD; Lingqi Tang, PhD; Iva Timmerman, MD; Jürgen Unützer, MD, MPH (PI); John W. Williams Jr., MD, MHS (PI); Jason Worchel, MD; and Mark Zweifach, MD.

We would like to acknowledge the contributions and support of patients, primary care providers, and staff at the study coordinating center and at all participating study sites, which include: Duke University, Durham, NC; The South Texas Veterans Health Care System, The Central Texas Veterans Health Care System, and The San Antonio Preventive and Diagnostic Medicine Clinic; Indiana University School of Medicine, Indianapolis, IN; Health and Hospital Corporation of Marion County; Group Health Cooperative of Puget Sound in cooperation with the University of Washington, Seattle, WA; Kaiser Permanente of Northern California, Oakland and Hayward, CA; Kaiser Permanente of Southern California, San Diego, CA; Desert Medical Group, Palm Springs, CA. This study is the result of work supported in part with patients, resources, and the use of facilities at the South

Texas Veterans Health Care System and the Central Texas Veterans Health Care System.

We would also like to acknowledge the contributions the IMPACT study advisory board (Lydia Lewis, Lisa Goodale, ACSW; Richard C. Birkel PhD; Howard Goldman, MD, PhD; Thomas Oxman, MD; Lisa Rubenstein, MD, MSPH; Cathy Sherbourne PhD; Kenneth Wells MD, MPH), and outstanding programming support by Tonya Marmon, MS.

REFERENCES

1. Koenig HG, Blazer DG. Epidemiology of geriatric affective disorders. *Clin Geriatr Med*. 1992;8:235–251.
2. Falcon LM, Tucker KL. Prevalence and correlates of depressive symptoms among Hispanic elders in Massachusetts. *J Gerontol B Psychol Sci Soc Sci*. 2000;55:S108–S116.
3. Gonzalez HM, Haan MN, Hinton L. Acculturation and the prevalence of depression in older Mexican Americans: baseline results of the Sacramento Area Latino Study on Aging. *J Am Geriatr Soc*. 2001;49:948–953.
4. Robins LN, Regier DA. *Psychiatric Disorders in America: The Epidemiologic Catchment Area Study*. New York: Free Press; 1991.
5. Somervell P, Leaf P. Weissman MM, et al. The prevalence of major depression in black and white adults in five United States communities. *Am J Epidemiol*. 1989;130:725–735.
6. Penninx BW, Geerlings SW, Deeg DJ, et al. Minor and major depression and the risk of death in older persons. *Arch Gen Psychiatry*. 2001;58:221–227.
7. Swatrz MS, Wagner HR, Swanson JW, et al. Administrative update: utilization of services I: comparing use of public and private mental health services: the enduring barriers of race and age. *Community Ment Health J*. 1998;34:133–144.
8. Abe-Kim JS, Takeuchi DT. Cultural competence and quality of care: Issues for mental health service delivery in managed care. *Clin Psychol*. 1996;3:273–295.
9. Alegria A, Canino G, Rios R, et al. Inequities in use of specialty mental health services among Latinos, African Americans and non-Latino Whites. *Psychiatr Serv*. 2002;53:1547–1555.
10. Lau AW, Gallagher-Thompson D. Ethnic minority older adults in clinical and research programs: Issues and recommendations. *Behav Ther*. 2002;25:10–11.
11. Pingatore D, Snowden L, Sansone RA, et al. Persons with depression symptoms and the treatments they receive: a comparison of primary care physicians and psychiatrists. *Int J Psychiatry Med*. 2001;31:41–60.
12. Callahan CM. Quality improvement research on late life depression in primary care. *Med Care*. 2001;39:772–784.
13. Von Korff M, Unützer J, Katon W, et al. Improving care for depression in organized health care systems. *J Fam Pract*. 2001;50:530–531.
14. Wagner EH, Austin BT, Von Korff M. Organizing care for patients with chronic illness. *Milbank Quarterly*. 1996;74:511–544.
15. Katon W, Von Korff M, Lin E, et al. Population-based care of depression: effective disease management strategies to decrease prevalence. *Gen Hosp Psychiatry*. 1997;19:169–178.
16. Wang PS, Berglund P, Kessler R. Recent care of common mental health disorders in the United States. Prevalence and conformance with evidence-based recommendations. *J Gen Intern Med*. 2000;15:284–292.
17. Unützer J, Katon W, Callahan C, et al. Collaborative care management of late-life depression in the primary care setting: a randomized controlled trial. *JAMA*. 2002;288:2836–2845.
18. Miranda J, Chung YJ, Green BL, et al. Treating depression in predominantly low-income young minority women: a randomized controlled trial. *JAMA*. 2003;290:57–65.
19. Bartels S, Zubritsky C, Ware J, et al. Engaging older adults in mental health services through primary care: A randomized trial comparing integrated and enhanced referral care for depression, anxiety, and at-risk alcohol use. *Am J Psychiatry.* In Press.
20. Bruce ML, Ten Have TR, Reynolds CF 3rd, et al. Reducing suicidal ideation and depressive symptoms in depressed older primary care patients: a randomized controlled trial. *JAMA* 2004;291:1081–1091.
21. Carrasquillo O, Lantigua RA, Shea S. Differences in functional status of Hispanic versus non-Hispanic white elders: data from the Medical Expenditure Panel Survey. *J Aging Health*. 2000;12:342–361.
22. Ostchega Y, Harris TB, Parsons VL, et al. The prevalence of functional limitations and disability in older persons in the US: data from the National Health and Nutrition Examination Survey III. *J Am Geriatr Soc*. 2000;48:1132–1135.
23. Hunkeler EM, Meresman JF, Hargreaves WA, et al. Efficacy of nurse telehealth care and peer support in augmenting treatment of depression in primary care. *Arch Family Med*. 2000;9:700–708.
24. Cooper-Patrick L, Powe NR, Jenckes MW, et al. Identification of patient attitudes and preferences regarding treatment of depression. *J Gen Intern Med*. 1997;12:431–438.
25. Sussman LK, Robins LN, Earls F. Treatment-seeking for depression by black and white Americans. *Soc Sci Med*. 1987;24:187–196.
26. Whaley AL. Ethnic and racial differences in perceptions of dangerousness of persons with mental illness. *Psychiatr Serv*. 1997;48:1328–1330.
27. Whaley A. Cultural mistrust and mental health services for African Americans: a review and meta-analysis. *Counsel Psychol*. 2001;29:513–531.
28. Blazer DG, Hybels CF, Simonsick EM, et al. Marked differences in antidepressant use by race in an elderly community sample: 1986–1996. *Am J Psychiatry*. 2000;157:1089–1094.
29. Blank MB, Tetrick FL 3rd, Brinkley DF, et al. Racial matching and service utilization among seriously mentally ill consumers in the rural South. *Community Mental Health J*. 1994;30:271–281.
30. Chalifoux Z, Neese JB, Buckwalter KC, et al. Mental health services for rural elderly: Innovative service strategies. *Community Mental Health J*. 1996;32:463–480.
31. First, MB, Spitzer RL, Gibbon M, et al. *Structured Clinical Interview for DSM-IV Axis I Disorders (SCID)*. Washington, DC: American Psychiatric Press, INC; 1996.
32. Derogotis LR, Lipman RS, Covi L. SCL-90: an outpatient psychiatric rating scale. *Psychopharmacol Bull*. 1973;9:13–28.
33. Sheehan DV, Harnett-Sheehan K, Raj BA. The measurement of disability. *Int Clin Psychopharmacol*. 1996;11(Supp 3):89–95.
34. Meyers BS, Sirey J, Bruce ML. Who goes where? Clinical and sociodemographic predictors of service site in mental health outpatients. Poster presented at: National Institute of Mental Health Conference on Improving the Condition of People with Mental Illness; September 5, 1997; Washington DC.
35. Liang KY, Zeger SL. Longitudinal data analysis using generalized linear models. *Biometrika*. 1986;73:13–22.
36. Graubard BI, Korn EL. Predictive margins with survey data. *Biometrics*. 1999;55:652–659.
37. Rubin DB. *Multiple Imputations for Non-Response in Surveys*. New York: J Wiley and Sons; 1987.
38. Little RJ. Missing data adjustments in large surveys. *J Business Econ Stat*. 1988;6:287–301.
39. Lavori P, Dawson R, Shera D. A multiple imputation strategy for clinical trials with truncation of patient data. *Statist Med*. 1995;14:1913–1925.
40. Tang L, Belin T, Song J. A comparison of imputation methods for missing data in a multi-center randomized clinical trial: the IMPACT study. Proceeding of the Health Policy Statistics Section of the American Statistical Association. 2002:3430–3435.
41. Lasser KE, Peters RH, Morrison-Rodriquez B. Do minorities in the United States receive fewer mental health services than whites? *Intern J Health Serv*. 2002;32:567–578.
42. Dwight-Johnson M, Sherbourne CD, Liao D, et al. Treatment preferences among depressed primary care patients. *J Gen Intern Med*. 2000;15:527–534.
43. Araya R, Rojas G, Fritsch R, et al. Treating depression in primary care in low-income women in Santiago Chile: a randomized controlled trial. *Lancet*. 2003;143:1–7.
44. Areán PA, Alvidrez JA, Barrera A, et al. Would older medical patients use psychological services? *The Gerontologist*. 2002;32:21–35.
45. Ritter PL, Stewart AL, Kaymaz H, et al. Self-reports of health care utilization compared to provider records. *J Clin Epidemiol*. 2001;54:136–41.

