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CME Objective

After studying this article, you should be able to:

- Intensify treatment efforts for depression in patients with demographic, economic, and clinical factors that may decrease response

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Demographic, Economic, and Clinical Correlates of Depression Treatment Response in an Underserved Primary Care Population

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ABSTRACT

Objective: To examine demographic, economic, and clinical correlates of depression treatment outcomes in a rural low-income population served by federally qualified health centers (FQHCs).

Method: The current study utilized data collected during a pragmatic comparative effectiveness trial (N = 364) that was conducted at 9 FQHC clinics between November 2007 and June 2009. Participants were randomly assigned to either telemedicine-based collaborative care or practice-based collaborative care. Depression severity was measured at baseline and at 12-month follow-up using the Hopkins Symptom Checklist (SCL-20) and used to categorize outcomes as nonresponse, partial response, full response, and remission. The associations between demographic, economic, and clinical variables and outcomes were estimated using bivariate analyses and multinomial logistic regression.

Results: 287 participants (78.8%) completed the 12-month follow-up assessment. Among these, 127 participants (44.25%) did not respond to treatment, 53 (18.47%) experienced partial response, 47 (16.38%) experienced full response, and 60 (20.91%) experienced remission. Of the 7 demographic characteristics examined, only gender had a significant ($P < .05$) effect on outcomes. Of the 2 economic variables examined, income was not associated with outcomes, while individuals without health insurance reported higher response rates than those with public health insurance ($P < .05$). Among the 13 clinical variables examined, baseline depression severity, physical and mental health status, number of prior depression episodes, and comorbid generalized anxiety had a significant ($P < .05$) effect on outcomes.

Conclusions: Low treatment response rates and treatment response heterogeneity continue to be significant challenges to clinicians treating depression in low-income underserved populations facing multiple barriers to care. Baseline depression severity and chronicity, health status, and comorbid anxiety appear to have a consistent effect on treatment outcomes in depression.

Trial Registration: ClinicalTrials.gov identifier: NCT00439452

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Heterogeneity in depression treatment outcomes is common and poses a significant challenge to clinicians. Response rates with guideline-concordant antidepressant monotherapy are only about 50%.^{1,2} Individuals with residual symptoms are likely to have a more severe and chronic course of illness,^{3,4} impaired psychosocial functioning,⁵ and an increased frequency of suicidal ideations.^{6,7} Demographic and economic factors influencing depression treatment response have received

- Despite demonstrated effectiveness of collaborative care management, depression response and remission rates continue to be low, posing significant challenges to mental health providers.
- Prior depression episodes, comorbid anxiety, and poor physical health status are significant prognostic predictors of depression response.
- Findings from this study suggest that federally qualified health centers are able to deliver equivalent depression outcomes to uninsured patients.

heightened attention in recent years.⁸⁻¹⁰ Several studies have identified characteristics such as age,¹¹⁻¹³ gender,¹²⁻¹⁵ race,^{2,8} marital status,¹² level of education,^{2,12,16,17} employment status,² and household income^{2,16} as associated factors that influence treatment outcomes in depression. Similarly, clinical characteristics such as severity of depression, age of depression onset, number of prior depression episodes, family history of depression, and comorbidities (such as panic disorder, generalized anxiety disorder [GAD], posttraumatic stress disorder, and substance use disorder)^{2,8} have also been described as risk factors for lower rate of treatment response.^{13,18}

However, findings across studies are inconsistent,^{8,9} warranting further systematic research with regard to treatment response heterogeneity. Furthermore, most of the participants in the published clinical trials were recruited from urban centers predominantly serving individuals with private health insurance.² Little is known about the factors that influence depression treatment outcomes in rural underserved populations facing major barriers to care, such as long travel distances, lack of health insurance, and stigmatizing attitudes,^{19,20} that may contribute to low response rates to depression treatment.

To address this knowledge gap, we examined the role of demographic, economic, and clinical factors in depression treatment response heterogeneity among individuals receiving depression care in federally qualified health centers (FQHCs).

METHOD

Study Setting and Participants

The current study utilized data collected during a pragmatic comparative effectiveness trial that was conducted at 9 FQHC clinics between November 2007 and June 2009. The study is registered with ClinicalTrials.gov (identifier: NCT00439452). All participants in the study were randomly assigned to either telemedicine-based collaborative care (TBCC) or practice-based collaborative care (PBCC). None of the participating clinics had on-site mental health specialists. For the purpose of this study, we included patients randomized to both arms (N = 364). Data were collected via blinded telephone interview with 364 participants at baseline and for 287 respondents (78.8%) at the 12-month follow-up. Details about the interventions and inclusion and exclusion

criteria are described in a previously published article.²¹ Briefly, both PBCC and TBCC utilized a Depression Care Manager. In PBCC, the Depression Care Managers received no clinical supervision from a mental health specialist, whereas in TBCC, they received weekly supervision from the TBCC team. Specifically, in the TBCC arm, patients received stepped care, whereby treatment intensity was increased for patients failing treatment. If the patient did not respond to the initial antidepressant, the telephone pharmacist conducted a medication history and provided medication management as needed. If the patient did not respond to 2 trials, a telepsychiatry consultation was scheduled. At any time, patients had access to cognitive-behavioral therapy (CBT) delivered via interactive video, and patients failing an antidepressant trial were specifically encouraged to initiate and complete CBT.

Measures

Depression severity (dependent variable) was measured at baseline and at 12-month follow-up using the Hopkins Symptom Checklist (SCL-20).^{22,23} SCL-20 scores range from 0 to 4, with higher scores indicating more severe depression. Using the baseline and 12-month follow-up SCL-20 scores, the dependent variable was specified as 4 mutually exclusive categories that reflect how clinicians typically judge the outcomes of an antidepressant trial: remission, full response, partial response, and no response.²⁴ Remission was defined as a follow-up SCL-20 score < 0.5. Full response was defined as a $\geq 50\%$ improvement in SCL-20 scores between baseline and follow-up and a follow-up SCL-20 score ≥ 0.5 . Partial response was defined as an increase $\geq 25\%$ but $\leq 50\%$ in SCL-20 scores between baseline and follow-up, and a follow-up SCL-20 score ≥ 0.5 . No response was defined as < 25% increase in SCL-20 scores between baseline and follow-up, and a follow-up SCL-20 score ≥ 0.5 .

Demographic, economic, and clinical correlates were specified as explanatory variables. Baseline demographic, economic, and clinical prognostic factors were measured using the Depression Outcomes Module.^{25,26} Psychiatric comorbidity was measured with the Mini International Neuropsychiatric Interview.^{27,28} Social support was measured using the Duke Social Support and Stress Scale.^{29,30} Health status was measured using the 12-item Short Form Health Survey for Veterans and summarized into the physical component summary (PCS) and mental component summary (MCS) scores.^{31,32} In addition, because randomization to the TBCC group was such a strong predictor of outcomes,²¹ it was included as a covariate even though demographic, economic, and clinical variables did not differ significantly ($P < .05$) across study arms. The study was approved by the University of Arkansas for Medical Sciences Institutional Review Board. All participants were informed of the risks and benefits of their participation and provided written informed consent.

Statistical Analysis

All patients completing the 12-month follow-up were included in the analysis (n = 287). Eleven percent of data

Table 1. Baseline Demographic, Economic, and Clinical Variables^a

	Total Sample (N = 364)
Demographic variables	
Age, mean (SD), y	47.2 (12.6)
Male, n (%)	67 (18.4)
Caucasian, n (%)	261 (71.7)
High school graduate, n (%)	265 (73.0)
Employed, n (%)	129 (35.5)
Married, n (%)	162 (44.5)
Social support, n (%)	
Low	142 (39.0)
Medium	111 (30.5)
High	111 (30.5)
Economic variables	
Annual household income, n (%)	
< \$10,000	104 (29.7)
\$10,000–\$14,999	84 (24.0)
\$15,000–\$19,999	56 (16.0)
\$20,000–\$29,999	61 (17.4)
≥ \$30,000	45 (12.9)
Insurance, n (%)	
Public insurance	110 (30.2)
Private insurance ^b	69 (18.9)
No insurance	185 (50.8)
Clinical and casemix characteristics	
SCL-20 (depression severity score, 0–4), mean (SD) ^c	1.9 (0.7)
Physical component score (0–100), mean (SD) ^d	36.9 (13.4)
Mental component score (0–100), mean (SD) ^e	31.3 (11.2)
No. of chronic physical illnesses, mean (SD)	4.6 (2.6)
No. of prior depression episodes, mean (SD)	4.2 (1.6)
Family history of depression, n (%)	209 (58.2)
Age at depression onset < 18 y, n (%)	144 (41.0)
Prior depression treatment, n (%)	276 (75.8)
Current major depressive disorder, n (%)	303 (83.2)
Current dysthymia, n (%)	12 (3.3)
Current panic disorder, n (%)	32 (8.8)
Current generalized anxiety disorder, n (%)	231 (63.5)
Current posttraumatic stress disorder, n (%)	58 (15.9)
Telemedicine-based collaborative care, n (%)	179 (49.2)
Current at-risk drinking, n (%)	20 (5.5)

^aSome numbers do not add up to the total number of patients because of missing data, and some percentages do not add up to 100 because of rounding.

^bPrivate insurance and any combination of public and private insurance.

^cHigher scores indicate more severe depression.

^dHigher scores indicate better physical health.

^eHigher scores indicate better mental health.

Abbreviation: SCL-20 = Hopkins Symptom Checklist.

were missing at baseline and were imputed using PROC MI in SAS 9.3 (SAS Institute Inc). Using no response as the reference category, bivariate analyses were used to examine differences in casemix factor means (*t* test) and proportions (χ^2) across outcome categories. Multinomial logistic regression analysis was used for the multivariate analysis. Similar to logistic regression analysis, multinomial logistic regression analysis estimates odds ratios for mutually exclusive outcome states. We chose to base the analysis on a nominal distribution (which assumes nonordered outcome states) rather than an ordinal distribution (which assumes ordered/ranked outcome states) so that, for each casemix factor, separate odds ratios (ORs) would be estimated for the remission, full response, and partial remission outcome categories compared to the no response category. Ordered logistic regression would have yielded greater statistical

power than the multinomial logistic regression. However, it relies on the proportional odds assumption, which restricts the effect of each casemix factor to be constant across all outcome categories. The proportional odds assumption was tested, and our data violated this assumption. The multinomial logistic regression was estimated using PROC LOGISTIC and PROC MIANALYZE in SAS 9.3.

RESULTS

Demographic, economic, and clinical characteristics of the baseline sample are presented in Table 1. At the 12-month time point, 287 patients (78.8%) were retained; 177 (61.7%) were receiving antidepressants; 141 (84.9%) were adherent to antidepressants (taking antidepressants $\geq 80\%$ of days during the last month); and 105 (61.4%) were receiving either usual or high doses of the antidepressant medications. Both the response and remission rates were higher at 12 months compared to 6 months. Specifically, response rate was 29.9% at 6 months and 36.2% at 12 months. The remission rate was 17.3% at 6 months and 20.9% at 12 months. Of those patients completing the 12-month follow-up, 127 participants (44.25%) did not report response to treatment, 53 (18.47%) experienced only partial response, 47 (16.38%) reported full response, and 60 (20.91%) experienced remission. Table 2 presents the results of the bivariate analysis. Only 1 demographic variable (gender) was significantly associated with treatment outcomes. A significantly lower percentage of males experienced a full response compared to nonresponse. Both economic factors were significantly associated with treatment outcomes. The proportion of individuals with public insurance had a relatively low likelihood of experiencing a full response. Likewise, the individuals with annual household incomes less than \$10,000 had a relatively low likelihood of experiencing a full response. Five of the 13 clinical variables were significantly associated with treatment outcomes. For baseline SCL-20 scores, there was a clear nonlinear effect on treatment outcomes. Mean baseline SCL-20 scores were significantly higher for those experiencing a partial and full response, yet significantly lower for those in remission, compared to patients in the nonresponse outcome category. In addition, compared to patients in the nonresponse outcome category, individuals reporting remission had significantly higher baseline PCS scores (indicating better physical health status) and a lower number of prior depression episodes. Compared to individuals in the nonresponse outcome category, a significantly lower percentage of individuals with comorbid GAD experienced full remission compared to those without GAD. A significantly higher percentage of participants randomized to the TBCC intervention experienced full response and remission compared to those randomized to PBCC.

Results of multinomial logistic regression analysis are summarized in Table 3. When adjusting for all casemix factors simultaneously, only 2 nonclinical characteristics (insurance status and gender) were significantly correlated with treatment outcomes. Being male significantly and substantially lowered the likelihood of experiencing a full

Table 2. Correlates of Depression Treatment Outcomes Compared to No Response at 12 Months (bivariate analysis)^a

	No Response (reference)	Partial Response	Full Response	Remission
Demographic variables				
Age, mean, y	49.51	48.79	48.30	46.53
Male, n (%)	31 (24.4)	9 (17.0)	2 (4.26)*	8 (13.3)
Caucasian, n (%)	85 (66.9)	43 (81.1)	38 (80.85)	40 (66.7)
High school graduate, n (%)	90 (71.4)	38 (71.7)	36 (76.60)	45 (75.0)
Employed, n (%)	42 (33.1)	19 (35.9)	18 (39.13)	24 (40.0)
Married, n (%)	53 (41.7)	30 (56.6)	25 (53.19)	24 (40.0)
Social support, n (%)				
Low	51 (40.2)	21 (39.6)	17 (36.17)	24 (40.0)
Medium	40 (31.5)	15 (28.3)	14 (29.79)	17 (28.3)
High	36 (28.4)	17 (32.1)	16 (34.04)	19 (31.7)
Economic variables				
Annual household income, n (%)				
< \$10,000	47 (39.0)	9 (17.3)	7 (15.2)*	16 (27.6)
\$10,000–\$14,999	28 (23.1)	19 (36.5)	10 (21.7)*	15 (25.9)
\$15,000–\$19,999	15 (12.4)	9 (17.3)	8 (17.4)*	8 (13.8)
\$20,000–\$29,999	18 (15.0)	7 (13.5)	13 (28.3)*	11 (19.0)
≥ \$30,000	13 (10.7)	8 (15.4)	8 (17.4)*	8 (13.8)
Insurance, n (%)				
Public insurance	47 (37.01)	16 (30.19)	7 (14.89)*	20 (33.33)
Private insurance ^b	19 (14.96)	11 (20.75)	11 (23.40)*	12 (20.00)
No insurance	61 (48.03)	26 (49.06)	29 (61.70)*	28 (46.67)
Clinical and casemix characteristics				
SCL-20 (depression severity score, 0–4), mean ^c	1.85	2.07*	2.29*	1.60*
Physical component score (0–100), mean ^d	33.73	34.80	38.19	39.60*
Mental component score (0–100), mean ^e	31.51	30.65	29.67	33.88
No. of chronic physical illnesses, mean	4.95	5.08	4.28	4.27
No. of prior depression episodes, mean	4.40	4.22	4.33	3.88*
Family history of depression, n (%)	75 (60.0)	31 (59.6)	31 (66.0)	29 (49.2)
Age at depression onset < 18 y, n (%)	49 (40.8)	24 (46.2)	16 (36.4)	19 (32.8)
Prior depression treatment, n (%)	93 (73.2)	45 (84.9)	40 (85.1)	41 (68.3)
Current panic disorder, n (%)	12 (9.5)	7 (13.2)	2 (4.3)	4 (6.7)
Current generalized anxiety disorder, n (%)	81 (63.8)	37 (69.8)	36 (76.6)	28 (46.7)*
Current posttraumatic stress disorder, n (%)	19 (15.0)	10 (18.9)	6 (12.8)	9 (15.0)
Telemedicine-based collaborative care, n (%)	44 (34.7)	20 (37.7)	31 (66.0)*	43 (71.7)*
Current at-risk drinking, n (%)	7 (5.51)	2 (3.8)	2 (4.3)	1 (1.7)

^aSome numbers do not add up to the total number of patients because of missing data, and some percentages do not add up to 100 because of rounding.

^bPrivate insurance and any combination of public and private insurance.

^cHigher scores indicate more severe depression.

^dHigher scores indicate better physical health.

^eHigher scores indicate better mental health.

* $P < .05$.

Abbreviation: SCL-20 = Hopkins Symptom Checklist.

response to treatment (OR = 0.08; 95% CI, 0.02–0.44; $P < .05$). There was a similar trend for remission, but the effect did not reach statistical significance. Having public health insurance also significantly lowered the likelihood of experiencing a full response (OR = 0.37; 95% CI, 0.17–0.82; $P < .05$) compared to having no insurance. With regard to clinical correlates, the most robust effect on depression response was the baseline severity of depression. Having a higher severity of depression at baseline was associated with a greater likelihood of having a full response (OR = 8.06; 95% CI, 3.03–21.42; $P < .05$). In contrast, having a higher number of prior depression episodes was associated with a lower likelihood of experiencing a full response (OR = 0.71; 95% CI, 0.51–0.98; $P < .05$). Having higher baseline PCS scores (OR = 1.05, 95% CI, 1.01–1.10; $P < .05$) and MCS scores (OR = 1.07; 95% CI, 1.01–1.13; $P < .05$) was significantly associated with having a higher likelihood of a full response,

and having higher baseline PCS scores was also significantly associated with a higher likelihood of experiencing remission (OR = 1.06; 95% CI, 1.02–1.11; $P < .05$). In contrast, having comorbid GAD at baseline was associated with a lower likelihood of experiencing remission (OR = 0.39; 95% CI, 0.16–0.96; $P < .05$). Finally, consistent with previous findings,²¹ controlling for clinical and sociodemographic factors, being randomized to the TBCC intervention increased the likelihood of experiencing a full response (OR = 2.93; 95% CI, 1.83–4.67; $P < .05$) and remission (OR = 3.08; 95% CI, 2.03–4.66; $P < .05$) compared to being randomized to PBCC.

DISCUSSION

The study revealed 4 significant findings about the outcomes of low-income individuals who received depression care in FQHCs. First, only about 35% of study participants experienced either full response or remission by the 12-month follow-up period, despite randomization to collaborative care. Second, among the demographic variables, only gender appeared to have a significant impact on the outcomes. Third, individuals with public insurance had significantly lower rates of response than individuals with no insurance. Fourth, clinical variables that were significantly associated with outcomes included baseline severity of depression, prior depression episodes, physical and mental health status, and presence of comorbid generalized anxiety.

The combined remission and response rates in this study were lower when compared to other pivotal studies of enhanced depression treatment such as the Sequenced Treatment Alternatives to Relieve Depression (STAR*D) trial.² The reasons for a considerably lower treatment response/remission rate may be multifold. Participants in this study were primarily recruited from a rural disadvantaged population that faced many barriers to treatment. Risk factors for nonresponse (eg, public health insurance, comorbid GAD, poor physical health and mental health status) were more prevalent in this rural sample compared with the more urban STAR*D sample.²

The results of this study indicate male gender as the most important demographic risk factor for nonresponse. This finding is consistent with findings from the STAR*D trial, which showed better treatment outcomes for females.² However, a meta-analysis by Entsuah et al³³ found gender to

Table 3. Correlates of Depression Treatment Outcomes Compared to No Response at 12 Months (multivariate analysis)

	Partial Response, Odds Ratio (95% CI)	Full Response, Odds Ratio (95% CI)	Remission, Odds Ratio (95% CI)
Demographic variables			
Age in years	0.99 (0.95–1.02)	1.00 (0.96–1.04)	0.97 (0.94–1.01)
Male	0.61 (0.24–1.56)	0.08 (0.02–0.44)*	0.37 (0.13–1.05)
Caucasian	1.60 (0.66–3.86)	1.33 (0.43–4.14)	1.30 (0.56–3.03)
High school graduate	1.06 (0.48–2.34)	1.18 (0.42–3.31)	0.99 (0.42–2.33)
Employed	0.81 (0.34–1.97)	0.51 (0.19–1.37)	0.65 (0.27–1.59)
Married	1.28 (0.58–2.85)	0.80 (0.30–2.13)	0.63 (0.27–1.47)
Social support			
Low	Reference	Reference	Reference
Medium	0.94 (0.56–1.60)	1.25 (0.68–2.31)	1.01 (0.59–1.74)
High	1.00 (0.59–1.70)	1.00 (0.53–1.88)	0.70 (0.39–1.26)
Economic variables			
Annual household income			
< \$10,000	Reference	Reference	Reference
\$10,000–\$14,999	1.70 (0.87–3.33)	0.89 (0.38–2.08)	1.03 (0.48–2.17)
\$15,000–\$19,999	1.25 (0.56–2.80)	1.19 (0.45–3.18)	1.08 (0.44–2.63)
\$20,000–\$29,999	0.89 (0.40–2.00)	2.09 (0.92–4.74)	1.50 (0.65–3.47)
≥ \$30,000	1.10 (0.39–3.09)	1.99 (0.61–6.48)	1.24 (0.40–3.81)
Insurance			
Public insurance	0.83 (0.45–1.51)	0.37 (0.17–0.82)*	0.73 (0.39–1.38)
Private insurance ^a	1.18 (0.56–2.48)	1.25 (0.52–2.99)	1.12 (0.50–2.51)
No insurance	Reference	Reference	Reference
Clinical and casemix characteristics			
SCL-20 (depression severity score, 0–4)	1.96 (0.96–3.98)	8.06 (3.03–21.42)*	1.04 (0.51–2.11)
Physical component score (0–100)	1.02 (0.98–1.06)	1.05 (1.01–1.10)*	1.06 (1.02–1.11)*
Mental component score (0–100)	1.02 (0.97–1.07)	1.07 (1.01–1.13)*	1.03 (0.98–1.08)
No. of chronic physical illnesses	1.09 (0.92–1.29)	1.00 (0.81–1.23)	1.05 (0.87–1.26)
No. of prior depression episodes	0.76 (0.57–1.01)	0.71 (0.51–0.98)*	0.90 (0.68–1.19)
Family history of depression	0.71 (0.32–1.54)	0.86 (0.33–2.23)	0.45 (0.20–1.03)
Age at depression onset < 18 y	1.27 (0.57–2.83)	0.92 (0.34–2.47)	0.65 (0.27–1.55)
Prior depression treatment	1.84 (0.69–4.90)	3.07 (0.88–10.72)	1.33 (0.53–3.32)
Current panic disorder	1.05 (0.33–3.30)	0.28 (0.05–1.62)	0.68 (0.16–2.85)
Current generalized anxiety disorder	0.86 (0.35–2.12)	0.78 (0.26–2.30)	0.39 (0.16–0.96)*
Current posttraumatic stress disorder	0.88 (0.31–2.49)	0.31 (0.09–1.14)	1.67 (0.53–5.30)
Telemedicine-based collaborative care	1.20 (0.82–1.75)	2.93 (1.83–4.67)*	3.08 (2.03–4.66)*
Current at-risk drinking	1.06 (0.17–6.43)	0.32 (0.03–3.17)	0.21 (0.02–2.23)

^aPrivate insurance and any combination of public and private insurance.

* $P < .05$.

Abbreviation: SCL-20 = Hopkins Symptom Checklist.

have a nonsignificant association with treatment outcomes, whereas other studies⁸ have reported that women have poorer outcomes compared to men. Even though the clinical relevance of this nonmodifiable risk factor is uncertain, the results from our study suggest a need for further research focused on identifying under what conditions gender is associated with depression outcomes.

Among the economic factors, results indicated that individuals with public health insurance (primarily Medicaid) had poorer outcomes than individuals with no insurance, which appears counterintuitive. The role of insurance in influencing treatment outcomes has received relatively little attention in the literature. Our findings are consistent with the findings from the STAR*D trial in that it also suggested a possible role for health insurance status in treatment outcomes. Persons with public health insurance had the lowest odds of response compared to those with no insurance and private insurance.² Furthermore, studies have reported that individuals with public health insurance tend to have a longer duration of current depression episode, greater medical comorbidity,³⁴ and higher treatment attrition rates.¹⁶

FQHCs have a mission to treat all patients regardless of ability to pay and to help their uninsured patients obtain free or discounted medications. Our results clearly indicate that FQHCs were able to deliver equivalent depression outcomes for their uninsured patients compared to their privately insured patients. The fact that patients with public health insurance have worse outcomes than the uninsured probably reflects the strict eligibility criteria for Arkansas Medicaid, which requires recipients to have a disability or other significant risk factor (eg, pregnancy, single parent, foster care).

The estimated impact of clinical casemix factors in the disadvantaged patients enrolled in this study was similar to those observed in other more studied populations.^{2,8} Of the 13 clinical characteristics that were analyzed in this study, 6 factors had a significant effect on treatment outcomes. The baseline severity of depression had the largest impact on treatment outcomes. The bivariate analysis revealed a significant nonlinear trend for baseline depression severity across the 3 outcome categories. In multivariate analysis, baseline severity was significantly and substantially correlated with treatment response. A 1-point increase in the SCL-20 score at baseline resulted in an 8-fold increase in the odds of experiencing full response compared to nonresponse. While these

results seem inconsistent with the findings from the majority of the published studies,⁸ our definition of response differs from the definitions used in those studies in an important way. Because our outcome categories were specified to be mutually exclusive, those in remission were not included in the full response category. In contrast, most studies do include those patients experiencing remission in their full response outcome category.² Thus, our findings are not necessarily inconsistent with the literature that suggests that a higher severity of depression at baseline is associated with lower response rates.⁸

Consistent with the literature, our results indicate that there is a positive association between physical and mental health status at baseline and depression treatment outcomes.^{8,35} Of the 4 psychiatric comorbidities we examined, only GAD had a significant negative impact on outcomes. This effect was moderately large with respect to remission. Thus, it appears that while GAD is not necessarily a risk factor for nonresponse, it can be a barrier to achieving full remission of symptoms. Finally, number of prior depression episodes was found to be a significant risk factor, with each additional

episode lowering the odds of experiencing a full response. Although the literature is inconclusive, several studies have reported similar findings.⁸ The clinical relevance of this finding is paramount. Individuals with a high number of prior depression episodes at baseline may represent a treatment-refractory subgroup. Further research is needed to find out if early intervention in such individuals has a positive effect on the response rates.

In this study, nonmodifiable factors such as age and race were not associated with treatment outcomes. Published findings have largely been inconclusive about whether age is a risk factor for depression treatment, although more studies than not report poorer outcomes for those 50 years and older.⁸ The STAR*D trial² reported significantly lower remission rates for African Americans compared with Caucasians. Even though race was not significantly associated with treatment outcomes in our study, Caucasians had a higher likelihood of response and remission (Table 3).

Socioeconomic status has also received considerable attention in published literature. For instance, findings from the STAR*D trial suggest that high level of education, employment, and high level of income are positive predictors of response.² In this study, socioeconomic status showed no effect on outcomes. Again, our results indicate that FQHCs were able to deliver equivalent depression outcomes to their patients with lower socioeconomic status.

The findings of our study should be interpreted in light of certain limitations. This study used a secondary analysis of a relatively small sample, which resulted in marginal statistical power to detect small effect sizes. Even though this study adopted a well-recognized definition of the 4 outcome categories,²⁴ there is no consensus on the use of this categorization, making it difficult to draw generalized comparisons across various studies that used different definitions. Furthermore, this study analyzed outcomes after a 12-month intervention period, which is substantially longer than other published studies in this area. Notwithstanding these limitations, this study adds to the literature by comprehensively examining a wide range of demographic, economic, and clinical variables that could have a potential impact on depression treatment response in an underserved population facing multiple barriers to care.

Disclosure of off-label usage: The authors have determined that, to the best of their knowledge, no investigational information about pharmaceutical agents that is outside US Food and Drug Administration–approved labeling has been presented in this article.

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POSTTEST

To obtain credit, go to PSYCHIATRIST.COM (Keyword: August) to take this Posttest and complete the Evaluation.

1. Which demographic variable was associated with a significantly lower percentage of patients experiencing a full response to depression treatment compared with no response?
 - a. Younger age
 - b. Male sex
 - c. High school completion
 - d. Current employment
2. Among patients experiencing no response to depression treatment, the greatest proportion had which annual household income level?
 - a. < \$10,000
 - b. \$10,000 to \$14,999
 - c. \$15,000 to \$19,999
 - d. \$20,000 to \$29,999
3. Among patients experiencing depression remission, the greatest proportion had which insurance?
 - a. Public insurance only
 - b. Private insurance only or both private and public insurance
 - c. No insurance
4. Both Ms A and Mr B earn more than \$20,000 per year and have private insurance. Which patient will probably require more intensive treatment for the current episode of major depressive disorder (moderate severity) than the other patient?
 - a. Ms A, who is experiencing her first depressive episode, is in good physical health, and has no comorbid psychiatric illnesses
 - b. Mr B, who has had several depressive episodes, has poor physical health, and has comorbid generalized anxiety disorder