Published in final edited form as:

J Immigr Minor Health. 2018 October ; 20(5): 1182–1189. doi:10.1007/s10903-017-0663-8.

The effect of a behavioral weight-loss intervention on depressive symptoms among Latino immigrants in a randomized controlled trial

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INTRODUCTION

Latinos constitute the largest minority group in the United States (Humes et al., 2011), and suffer disproportionately from obesity (Ogden et al., 2015) and obesity-related comorbidities such as diabetes (Menke et al., 2015). Approximately 43% of Latinos are classified as obese compared to 35% of non-Hispanic whites (Ogden et al., 2015). Additionally, Latinos have higher rates of mild and moderate depressive symptoms than non-Hispanic whites (Pratt & Brody, 2014), and they face disparities in access to and quality of mental health care (Gonzales et al., 2010). These statistics are important because recent meta-analyses have shown significant positive correlations between obesity and depression (de Wit et al., 2010; Luppino et al., 2010). Coexistence of the two conditions may exert synergistic adverse effects on intervention engagement and effectiveness, with one condition worsening the other (Faith et al., 2011; Ladwig et al., 2006; Werrij et al., 2006).

Behavioral lifestyle interventions are recommended by the U.S. Preventive Services Task Force for obese adults (LeFevre, 2014) as they have been found to reduce cardiometabolic risk through modest (5–10%) yet clinically significant weight loss and promotion of physical activity (Jensen et al., 2014). Research from behavioral lifestyle intervention trials has

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Conflict of interest:

Author Sophia Colombari Figueroa declares that she has no conflict of interest. Author Randall Stafford declares that he has no conflict of interest. Author Catherine Heaney declares that she has no conflict of interest. Author Lisa Rosas declares that she has no conflict of interest.

Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

shown that they can also have a positive impact on mood (as measured by symptoms of depression) (Busch et al., 2013; Fabricatore et al., 2011; Linde et al., 2011). For example, in a randomized trial comparing a behavioral weight-loss intervention alone or combined with cognitive-behavioral depression management, participants in both treatment programs demonstrated similarly improved mood, suggesting that the behavioral weight-loss treatment had a generalized effect on symptoms of depression (Linde et al., 2011). In a meta-analysis of different types of weight loss trials (e.g., lifestyle modification, diet alone, pharmacotherapy) that reported change in symptoms of depression, Fabricatore et al., 2011 found that lifestyle behavioral interventions resulted in significantly greater reductions in symptoms of depression compared to control and non-dieting interventions. The impact of lifestyle interventions on mood appears to not be associated with weight loss itself, suggesting that other elements of the intervention such as cognitive and behavioral changes may improve mood (Fabricatore et al., 2011). Behavioral weight-loss interventions may improve mood due to theoretical underpinnings such as Social Cognitive Theory (SCT) (Bandura, 1986). Interventions informed by SCT often utilize strategies such as behavioral activation, problem solving skills, and cognitive restructuring, which are also used in the treatment of depression. Additionally, the majority of behavioral lifestyle interventions for weight loss are delivered in group format, which may play a key role in the reduction of depressive symptoms through social support delivered by fellow group members and intervention providers (Fabricatore et al., 2011). However, few culturally-congruent behavioral lifestyle interventions have been rigorously evaluated among Latinos or Latino immigrants (Corona et al., 2016). Thus, there is little evidence of the effect of behavioral weight-loss interventions on depressive symptoms among Latino immigrants (Kieffer et al., 2013).

The current study utilized data from a randomized clinical trial that tested the effectiveness of two behavioral lifestyle interventions compared to usual care among obese Latino immigrant adults. (Drieling et al., 2011). The three-arm trial compared a case management approach with and without community health worker support to usual primary care in a community health center setting. At the conclusion of the trial, there were no significant differences in the primary outcome of weight loss between treatment groups and the control group at 24 months (Rosas et al., 2015). Given that depressive symptomatology was identified as an important *a priori* secondary outcome, this study provides a unique opportunity to examine the effect of behavioral weight-loss interventions on symptoms of depression among this vulnerable population. In this study, we hypothesized that the case management intervention alone and combined with community health worker support would decrease symptoms of depression relative to usual care over 24 months.

METHODS

Study Design and Participants

To assess the potential impact of a behavioral weight-loss intervention on depressive symptoms among Latino immigrants, we used data from the Vivamos Activos Fair Oaks (VAFO) trial. VAFO was a community-based randomized controlled trial (RCT) designed to evaluate the effectiveness of two behavioral weight-loss interventions: clinic-based case

management counseling (CM), either alone or in combination with community health worker support (CM+CHW), in comparison to a usual primary care (UC) control, over a 24-month period. The study design details have been described in detail previously (Drieling et al., 2011).

To participate in the study, individuals had to meet the criteria of 1) being obese (BMI=30–55), 2) having at least one cardiovascular heart disease (CHD) risk factor, 3) self-identifying as Latino/a, 4) being 18 years of age or older, and 5) receiving primary care at the Fair Oaks Adult Clinic (a satellite community health clinic of the San Mateo County Health System in CA). Exclusion criteria included 1) inability to speak Spanish, 2) unwillingness to attempt weight loss, and 3) suffering from psychiatric disorders requiring antipsychotic medications or multiple psychotropic medications (Drieling et al., 2011).

VAFO was based on the proven Diabetes Prevention Program (Knowler et al., 2002) and was culturally adapted through a participatory process (Drieling et al., 2011). Cultural adaptations included surface-level changes such as providing the intervention in Spanish with facilitation from bilingual/bicultural staff and employing culturally-congruent diet and physical activity examples. In addition, the intervention included adaptations addressing social determinants of health relevant to the local Latino immigrant population. For example, participants were provided with data on the price of healthy food options at various local markets, assistance signing up for produce from the local food bank, attention to mental health concerns that might impair participation, and low-cost access to Zumba and other group exercise classes.

Briefly, both interventions involved 15 group sessions and 4 one-on-one sessions over a 12-month intensive phase followed by 3 group sessions and 1 one-on-one session over a 12-month maintenance phase. Those randomized to the CM+CHW arm received 7 home visits from a CHW over the course of the 24 months. The clinical trial's primary outcome was change in weight at 24 months, and the results for this outcome are described elsewhere (Rosas et al., 2015). Depressive symptomatology was one of several *a priori* secondary outcomes. The Stanford University and San Mateo Medical Center (SMMC) Institutional Review Boards granted approval for the study and all participants provided written informed consent in Spanish.

While none of the intervention components directly addressed depressive symptoms, the interventionists in both treatment groups employed several supportive strategies such as reminding participants to use positive outcome expectations as motivation, and establishing confidence in performing behaviors individually (self-efficacy) and with group support (collective efficacy) (Drieling et al., 2011). The interventionists also promoted the development of social support networks by facilitating group problem-solving, goal-setting, and role-playing activities, encouraging interactions outside group sessions, and including family members and friends in some session activities (Drieling et al., 2011). Additionally, the CHW's semistructured visits expanded upon CM sessions by offering tailored support to participants in their own home and neighborhood environments. These sessions included topics such as evaluation of fat in cooking as well as identifying exercise locations in and around the home (Drieling et al., 2011).

Data Collection and Measures

Depressive symptomatology was measured with the Center for Epidemiologic Studies-Depression (CES-D) scale (Iowa 11×3 version) (Carpenter et al., 1998). Results from a study examining the feasibility of using short versions of the CES-D with Latino immigrants suggest that these versions are reliable and that no precision is lost compared to the full version (Grzywacz, 2006). The scale consists of eleven items, with three response options each, assessing the frequency of depressive symptoms experienced during the past week. Examples of items include: “I could not get going,” “My sleep was restless,” and “I felt sad.” Items framed positively such as “I was happy” and “I enjoyed life” were reversed scored. Scores for each item were then added to give a total score ranging from 0 to 22, with a higher score indicating more depressive symptoms. Follow-up assessments after baseline data collection occurred at 6, 12, 18, and 24 months.

Other data collected included sociodemographic factors such as gender, age, food security as measured by the 6-Item Food Security Assessment (U.S. Department of Agriculture, 2012), income, educational attainment, length of time in the U.S., and marital status; clinical factors such as diabetes; and behavioral and psychosocial factors such as steps per day as measured by a 7-day pedometer record, obesity-related impairment as measured by the Obesity-Related Problems Scale (Karlsson et al., 2003), and self-reported health perception. Participants in the three study arms received pedometers upon randomization, and pedometer data were collected at each of the baseline and follow-up data collection visits, except for the 18-months appointment, which was conducted on the phone.

Analysis

CES-D data was collected from 174 participants at the end of the 24-month study, with 33 (16%) of the original 207 participants being lost to follow-up. A Kruskal-Wallis test was used to determine whether baseline depressive symptoms were associated with loss to follow-up. Given that these were not significantly associated, data analysis was undertaken without imputation of the 33 missing values.

CES-D scores were analyzed as a continuous variable. A descriptive analysis of CES-D scores at baseline was conducted to better understand the associations of sociodemographic, clinical, and behavioral and psychosocial factors with depressive symptoms in this population. Sociodemographic variables analyzed included gender, age, food security, poverty level as measured by federal guidelines (U.S. Department of Health and Social Services, 2014) based on household income divided by household size, educational attainment, length of time in the U.S., and marital status. The clinical variables examined were BMI and diagnosis of diabetes. Behavioral and psychosocial variables tested were number of steps, obesity-related impairment, and health perception. CES-D scores at baseline were not normally distributed, thus, the Kruskal-Wallis test was used to test for significant associations.

Generalized estimating equation (GEE) models of CES-D scores over 24 months using all available follow-up data, controlling for baseline CES-D scores, were conducted to determine the effect of the interventions on depressive symptoms. Log-transformed CES-D

scores were used for these GEE analyses because raw CES-D scores were not normally distributed. These were then exponentiated back for presentation in the tables. Two contrasts were analyzed: 1) UC vs. CM, and 2) UC vs. CM+CHW. Subsequently, effect modification by other key variables such as poverty level and food security were also analyzed by including them as cross products in the GEE models. These variables were chosen as factors that may have moderated the effect of the interventions on depressive symptoms based on previous findings in the depression literature (Plant & Sachs-Ericsson, 2004; Pratt et al., 2014). Beta coefficients, confidence intervals, and p-values from the interaction models were derived using the 'lincom' command in Stata.

Finally, sensitivity analyses were conducted to test the robustness of the results. The GEE models were repeated adding a term to control for health perception, which was significantly different among intervention groups. In order to account for possible outliers, GEE models were also repeated after excluding participants whose CES-D scores changed by more than ten points.

RESULTS

A total of 207 participants were randomized: 41 to UC, 84 to CM, and 82 to CM+CHW. CES-D scores were available for 84% of participants (n=174) at 24 months. Loss to follow-up was not associated with treatment group assignment at baseline (17.9% for CM vs. 17.1% for CM+CHW vs. 9.8% (N=4) for UC, P value=0.48).

There were no significant differences in sociodemographic, clinic, and behavioral and psychological factors between study arms at baseline, except for health perception (better in CM+CHW, Table I).

Descriptive Analysis of Baseline CES-D Scores

Participants reported a mean baseline CES-D score of 7.1 ± 4.6 [SD] out of 22 possible points with 37% of participants reporting a score ≥ 9 (Drieling et al., 2014), which indicates possible clinical depression (Carpenter et al., 1998).

Sociodemographic factors: At baseline, females had significantly higher mean CES-D scores (7.6 ± 4.6) compared to males (5.4 ± 4.2 , $p < 0.01$). Participants who were married or living as married (6.5 ± 4.4) experienced significantly lower depressive symptoms than those who were single, divorced, separated or widowed (8.3 ± 4.9 , $p = 0.01$). Food insecurity ($p < 0.01$) and income below the 100% Federal Poverty Level (FPL) ($p < 0.01$) were associated with higher CES-D scores. Participants with lower educational attainment ($p = 0.64$) and shorter length of time in the US ($p = 0.25$) had higher mean CES-D scores; however, the difference was not statistically significant. Age was also not associated with CES-D scores at baseline ($p = 0.54$) (Table II).

Clinical factors: Neither BMI nor diabetes was associated with CES-D scores at baseline (Table II).

Behavioral and psychological factors: Participants whose pedometers reported a mean of 5000 steps per day experienced less depressive symptoms (Mean CES-D score 6.6 ± 4.5) than those who reported <5000 steps per day (7.9 ± 4.7 , $p=0.04$). Greater impairment in the Obesity-Related Problems Scale ($p<0.01$) and worse self-reported health ($p=0.01$) were associated with higher mean CES-D scores (Table II).

Change in CES-D Scores at 24 Months of Follow-Up

Generalized estimating equation (GEE) models predicting CES-D scores over 24 months controlling for baseline scores revealed that mean CES-D scores were lower for both intervention groups compared to the control group (Table III). However, these differences were not statistically significant.

Change in CES-D Scores at 24 Months of Follow-Up Stratified by Poverty Level

In GEE models predicting CES-D scores over 24 months that included a cross product between treatment group and poverty level, the interaction terms were significant for both the CM group with poverty level ($p\text{-value}=0.01$) and for the CM+CHW group with poverty level ($p\text{-value}=0.003$). Participants in both treatment groups who reported annual incomes below 100% of the FPL had a decrease in CES-D scores over 24 months compared to UC (Table IV). For CM participants below 100% of the FPL, this decrease was borderline statistically significant (B coefficient=0.78; 95% CI: 0.61, 1.00; $p=0.05$). For CM+CHW participants below 100% of the FPL, CES-D scores decreased significantly (B coefficient=0.72; 95% CI: 0.55, 0.93; $p=0.01$; Figure 1). There was not a clear pattern of change in CES-D scores among participants who reported incomes between 100% and 400% of the FPL.

Change in CES-D Scores at 24 Months of Follow-Up Stratified by Food Security

In GEE models predicting CES-D scores over 24 months that included a cross product between treatment group and food security, food security was not found to be an effect modifier. Therefore, results stratified by food security level are not presented.

Sensitivity analysis

Controlling for health perception, which was significantly different among intervention groups, did not significantly affect the GEE results. The exclusion of possible outliers, participants whose CES-D scores changed by more than ten points from baseline to 24 months, also did not significantly affect the results for participants below 100% of the FPL. However, this exclusion did affect the results for participants between 100–400% of the FPL. After excluding the outliers, participants between 100% and 400% of the FPL in both treatment groups had a significant decrease in CES-D scores over 24 months compared to UC.

DISCUSSION

This study found that a behavioral weight-loss intervention for Latino immigrants incorporating case management and community health worker support significantly reduced depressive symptoms relative to usual care among the poorest participants at 24 months.

Most notably, over 24 months of follow up, participants below 100% of the FPL in the CM +CHW intervention experienced a mean decrease of approximately two points in the CES-D scale, as calculated by transforming the coefficient into the raw score scale. This is a substantively important change roughly corresponding to a decrease in one grade of frequency in two items on the CES-D scale, or a decrease from “most of the time” to “none of the time” in one item.

These findings make new contributions to the sparse literature on the effect of behavioral weight-loss interventions on depressive symptoms among obese Latinos. A similar intervention aimed at reducing risk factors for obesity and diabetes among low-income pregnant Latinas through group sessions focused on healthy eating and exercise, as well as the support of CHWs, also decreased depressive symptoms (Kieffer et al., 2013). The authors suggested that the social support provided by the interventionists and peer participants was a key factor in the reduction of depressive symptoms (Kieffer et al., 2013). Behavioral weight-loss interventions may be a particularly culturally congruent treatment for depressive symptoms in this population, because Latino cultural values favor non-pharmaceutical therapy for mental health conditions (Cooper et al., 2003; Dwight-Johnson et al., 2000; Givens et al., 2007). Furthermore, the CHW may play a particularly important role in delivering behavioral lifestyle interventions for low-income Latino immigrants (Balcázar et al., 2009; Balcázar et al., 2010; Joshu et al., 2007).

The VAFO intervention reduced depressive symptoms only among the poorest participants, not in the full sample. This finding is important because national estimates found that people living below the FPL are more than twice as likely to have depression than those at or above the FPL (Pratt & Brody, 2014). The Reserve Capacity Model posits that individuals of higher socioeconomic status are better endowed with resilient psychosocial and other resources that protect them from the psychological effects of stress (Gallo, 2009). While the interventions did not directly address depressive symptoms, they strongly encouraged the development of assets such as self-efficacy, problem-solving, and social support networks. Perhaps participants who are poorer experienced a greater improvement because the behavioral techniques employed by the interventions provided them with the opportunity to develop these assets, while higher SES participants already possessed them to a greater extent. Among higher SES participants, those randomized to CM and CM+CHW showed similar or worsened depressive symptoms at 24-months compared to those randomized to UC, which likely contributed to why there was no significant association detected in the full sample.

The primary limitation of this study relates to the fact that it is a secondary analysis of a randomized controlled trial originally designed and powered to detect significant differences in weight loss among the study arms. Even though approximately 37% of participants had a baseline CES-D score ≥ 9 , which is the cutoff to indicate possible depression in the Iowa 11 $\times$ 3 version utilized, the majority of participants had a CES-D score <9 . Testing the CM and CM+CHW behavioral interventions in a sample of individuals with a baseline CES-D score ≥ 9 would yield more conclusive results about the interventions’ potential for treating depression. However, the focus of this secondary analysis is on mood as measured by depressive symptoms rather than depression as a diagnosed condition.

Future research directions based on these findings include further exploration of how the specific behavioral strategies employed in lifestyle interventions may positively impact mood as well as testing novel interventions that combine proven therapies for weight loss and depression. The significant reduction in depressive symptoms among CM+CHW participants below 100% of the FPL suggests that the practical social support tailored to the specific needs and environments of participants provided by the CHW may have played a major role. However, further research that carefully measures the potential mediators that lead behavioral weight-loss interventions to reduce depressive symptoms among Latinos is necessary. Additionally, testing novel interventions aimed at treating comorbid depression and obesity among Latinos is also needed. Combining evidence-based interventions for both conditions in the primary care setting may be one possible approach.

In conclusion, a behavioral weight-loss intervention providing individual and group case management sessions and in-home support from a community health worker reduced depressive symptoms among Latino immigrants with family incomes below 100% of the FPL. Results from this secondary analysis suggest that behavioral weight-loss interventions decrease depressive symptoms among obese Latinos at the lowest income levels. A key policy implication of these findings is support for integration of case managers and community health workers into health systems potentially through reimbursement for their services by health insurance companies.

Funding:

This study was funded by National Heart, Lung, and Blood Institute grant no. R01 HL089448, and the REDCap data management tools were supported by the National Institutes of Health (grant no. UL1 RR025744).

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Table I

Baseline characteristics of study participants: Vivamos Activos Fair Oaks (VAFO), North Fair Oaks, California.

	Total (n=207)		UC (n=41)		CM (n=84)		CM+CHW (n=82)		P-value
Characteristics	n	(%)	n	(%)	n	(%)	n	(%)	
Sociodemographic									
Gender									0.97
Male	48	(23.2)	9	(22.0)	20	(23.8)	19	(23.2)	
Female	159	(76.8)	32	(78.1)	64	(76.2)	63	(76.8)	
Age, Mean (SD)	46.9	(11.0)	47.6	(10.4)	47.8	(11.8)	45.7	(10.5)	0.53
Food security									0.33
High	101	(48.8)	17	(41.5)	42	(50.0)	42	(51.2)	
Low	80	(38.7)	21	(51.2)	32	(38.1)	27	(32.9)	
Very low	26	(12.6)	3	(7.3)	10	(11.9)	13	(15.9)	
Federal poverty level									0.90
Below 100%	135	(65.2)	28	(68.3)	54	(64.3)	53	(64.6)	
100%–400%	72	(34.8)	13	(31.7)	30	(35.7)	29	(35.4)	
Educational attainment									0.10
Less than high school	153	(73.9)	33	(80.5)	66	(78.6)	54	(65.9)	
High school or more	54	(26.1)	8	(19.5)	18	(21.4)	28	(34.2)	
Length of time in the US									0.70
Less than 5 years	16	(7.8)	1	(2.4)	8	(9.5)	7	(8.8)	
5 to 10 years	47	(22.9)	10	(24.4)	18	(21.4)	19	(23.8)	
10 or more years	142	(69.3)	30	(73.2)	58	(69.1)	54	(67.5)	
Marital status									0.95
Married	139	(67.2)	28	(68.3)	57	(67.9)	54	(65.9)	
Unmarried	68	(32.9)	13	(31.7)	27	(32.1)	28	(34.2)	
Clinical									
Body Mass Index (BMI)									0.95
30–34	106	(51.2)	22	(53.7)	42	(50.0)	42	(39.6)	
35–39	64	(30.9)	11	(26.8)	26	(31.0)	27	(32.9)	
40	37	(17.9)	8	(19.5)	16	(19.1)	13	(15.9)	
Mean BMI (SD)	35.5	(5.2)	34.9	(4.4)	36.0	(5.7)	35.3	(5.0)	0.17
Diabetes									0.94
No	118	(57.0)	23	(56.1)	47	(56.0)	48	(58.5)	
Yes	89	(43.0)	18	(43.9)	37	(44.1)	34	(41.5)	
Behavioral and psychological									
CES-D									0.14
<9	131	(63.3)	30	(73.2)	47	(56.0)	54	(65.9)	
9	76	(36.7)	11	(26.8)	37	(44.1)	28	(34.2)	
Mean score (SD)	7.05	(4.6)	6.80	(4.1)	7.31	(4.5)	6.91	(5.1)	0.29
Steps per day									0.14

Characteristics	Total (n=207)		UC (n=41)		CM (n=84)		CM+CHW (n=82)		P-value
	n	(%)	n	(%)	n	(%)	n	(%)	
<5000	130	(62.8)	31	(75.6)	52	(61.9)	47	(57.3)	0.10
5000	77	(37.2)	10	(24.4)	32	(38.1)	35	(42.7)	
Obesity-related problems									
Mild impairment	116	(56.0)	23	(56.1)	54	(64.3)	39	(47.6)	
Moderate to severe impairment	91	(44.0)	18	(43.9)	30	(35.7)	43	(52.4)	0.04 *
Health perception									
Excellent or very good	22	(10.6)	5	(12.2)	6	(7.1)	11	(13.4)	
Good	85	(41.1)	13	(31.7)	30	(35.7)	42	(51.2)	
Fair or poor	100	(48.3)	23	(56.1)	48	(57.1)	29	(35.4)	

* Findings statistically significant at P<0.05

Table II

Baseline CES-D scores by socioeconomic, clinical, and behavioral and psychological characteristics of study participants: Vivamos Activos Fair Oaks (VAFO), North Fair Oaks, California.

Characteristic	n	Mean	(SD)	P value ^a
Sociodemographic				
Gender				<0.01 *
Male	48	5.42	(4.22)	
Female	159	7.55	(4.64)	
Age				0.54
18–34	27	6.37	(4.56)	
35–54	129	7.56	(4.78)	
55+	50	6.08	(4.17)	
Food security				<0.01 *
High	101	5.57	(3.78)	
Low	80	7.95	(4.84)	
Very low	26	10.04	(4.94)	
Federal poverty level				<0.01 *
Below 100%	135	7.83	(4.72)	
100% – 400%	72	5.60	(4.10)	
Educational attainment				0.64
Less than high school	153	7.17	(4.73)	
High school or more	54	6.72	(4.35)	
Length of time in the US				0.25
Less than 5 years	16	9.13	(5.68)	
5 to 10 years	47	6.98	(4.48)	
10 or more years	142	6.73	(4.45)	
Marital status				0.01 *
Married	139	6.45	(4.36)	
Unmarried	68	8.29	(4.93)	
Clinical				
Body Mass Index (BMI)				0.41
30–34	106	6.87	(4.59)	
35–39	64	7.66	(4.67)	
40	37	6.54	(4.67)	
Diabetes				0.80
No	118	7.06	(4.42)	
Yes	89	7.04	(4.91)	
Behavioral and psychological				
Steps per day				
<5000	130	7.91	(4.74)	0.04 *
5000	77	6.55	(4.50)	

Characteristic	n	Mean	(SD)	P value ^a
Obesity-Related Problems Scale				<0.01 *
Mild impairment	116	6.16	(4.21)	
Moderate to severe impairment	91	8.19	(4.90)	
Health perception				0.01 *
Excellent or very good	22	5.23	(3.82)	
Good	85	6.45	(4.45)	
Fair or poor	100	7.97	(4.77)	

* Findings statistically significant at P<0.05

^aP values were obtained with the Kruskal-Wallis test given that baseline CES-D scores were not normally distributed

Table III

GEE model predicting CES-D scores over 24 months of follow-up controlling for baseline scores.

	Coefficient	(95% CI)	P value
24 months			
CM	0.94	(0.75, 1.18)	0.61
CM+CHW	0.89	(0.71, 1.12)	0.32
UC	Reference		

Table IV

GEE model predicting CES-D scores over 24 months of follow-up stratified by poverty level controlling for baseline scores.

	Below 100% FPL			100%–400% FPL		
	Coefficient	(95% CI)	P value	Coefficient	(95% CI)	P value
CM	0.78	(0.61, 1.00)	0.05	0.80	(0.58, 1.11)	0.19
CM+CHW	0.72	(0.55, 0.93)	0.01 [*]	0.80	(0.60, 1.08)	0.15
UC	Reference			Reference		

^{*} Findings statistically significant at P<0.05