A Community-Partnered, Participatory, Cluster-Randomized Study of Depression Care Quality Improvement: Three-Year Outcomes

Michael K. Ong, M.D., Ph.D., Loretta Jones, M.A., Th.D., Wayne Aoki, Ph.D., Thomas R. Belin, Ph.D., Elizabeth Bromley, M.D., Ph.D., Bowen Chung, M.D., M.S.H.S., Elizabeth Dixon, R.N., Ph.D., Megan Dwight Johnson, M.D., M.P.H., Felica Jones, A.A., Paul Koegel, Ph.D., Dmitry Khodyakov, Ph.D., Craig M. Landry, Ph.D., Elizabeth Lizaola, M.P.H., Norma Mtume, M.A., M.H.S., Victoria K. Ngo, Ph.D., Judith Perlman, M.A., Esmeralda Pulido, B.A., Vivian Sauer, L.C.S.W., Cathy D. Sherbourne, Ph.D., Lingqi Tang, Ph.D., Ed Vidaurri, L.C.S.W., Yolanda Whittington, L.C.S.W., Pluscedia Williams, B.A., Aziza Lucas-Wright, M.Ed., Lily Zhang, M.S., Marvin Southard, D.S.W., Jeanne Miranda, Ph.D., Kenneth Wells, M.D., M.P.H.

Objective: Community Partners in Care, a community-partnered, cluster-randomized trial with depressed clients from 93 Los Angeles health and community programs, examined the added value of a community coalition approach (Community Engagement and Planning [CEP]) versus individual program technical assistance (Resources for Services [RS]) for implementing depression quality improvement in underserved communities. CEP was more effective than RS in improving mental health–related quality of life, reducing behavioral health hospitalizations, and shifting services toward community-based programs at six months. At 12 months, continued evidence of improvement was found. This study examined three-year outcomes.

Methods: Among 1,004 participants with depression who were eligible for three-year follow-up, 600 participants from 89 programs completed surveys. Multiple regression analyses estimated intervention effects on poor mental health–related quality of life and depression, physical health–related

quality of life, behavioral health hospital nights, and use of services.

Results: At three years, no differences were found in the effects of CEP versus RS on depression or mental health–related quality of life, but CEP had modest effects in improving physical health–related quality of life and reducing behavioral health hospital nights, and CEP participants had more social- and community-sector depression visits and greater use of mood stabilizers. Sensitivity analyses with longitudinal modeling reproduced these findings but found no significant differences between groups in change from baseline to three years.

Conclusions: At three years, CEP and RS did not have differential effects on primary mental health outcomes, but CEP participants had modest improvements in physical health and fewer behavioral health hospital nights.

Psychiatric Services 2017; 68:1262–1270; doi: 10.1176/appi.ps.201600488

Depressive disorders are prevalent and a leading cause of adult disability (1), and there are ethnic and racial disparities in depression care quality and outcomes (1–3). In underresourced communities with limited access to services and high stigma in regard to help seeking, individuals often seek support for depression in community-based settings (3,4).

Few data exist on effects of multisector, coalition approaches to implementing depression care quality improvement (QI) across health care and community-based programs in underresourced communities (5,6). Community Partners in Care (CPIC) used a community-partnered participatory research (CPPR) (7,8) framework to examine the added value of a community coalition approach (Community Engagement and Planning [CEP]) versus individual program

technical assistance (Resources for Services [RS]) for depression care QI across multiple health, social, and community sectors in underresourced communities (4,8–11). At six-month client follow-up, CEP was more effective than RS in reducing probabilities of poor mental health–related quality of life, behavioral health hospitalizations, and multiple risk factors for homelessness; increasing physical activity; reducing use of specialty medication visits; and increasing use of primary care and community-based depression services (8). At 12 months, primary longitudinal analyses demonstrated evidence of reductions in poor mental health–related quality of life and behavioral health hospitalizations, but significance levels for these findings were sensitive to statistical modeling techniques (10).

Prior depression care QI studies based on collaborative care identified persistent improvements (12–14); this extension study tested the hypothesis that CEP would show continuation of the 12-month improvements at three-year follow-up for the overall CPIC client sample, two years after study intervention support ceased. Overall, we considered the analyses as exploratory but of potential policy interest, given initiatives promoting collaboration and coordination of patient care between health care and non–health care settings under expanded Medicaid (15) and this study's relatively unique focus on coalition and noncoalition approaches to depression intervention (6).

METHODS

Study Design
Data are from the three-year client follow-up extension study for CPIC (4,8–10). CPIC was a cluster-randomized trial implemented by using CPPR (7,8), which supports community and academic partners in research coleadership through two-way knowledge exchange. CPIC was fielded in South Los Angeles and Hollywood–Metro Los Angeles, with a population of two million and high representation of racial-ethnic minority groups (8). Study design and procedures have been described elsewhere (4,8–11). Funded in 2007, prior to required inclusion of delivery interventions in trial registries, CPIC was not considered a clinical trial by the National Institutes of Health. After participants were enrolled but before the study's three-year continuation, the study was registered (ClinicalTrials.gov NCT01699789). Procedures were approved by institutional review boards of RAND and participating agencies, and written consent was obtained from participants.

Participants and Randomization
Using county lists and partner nominations, we identified agencies offering services identified by community members as relevant to depression (mental health specialty services, primary care, public health services, substance abuse treatment services, social services, faith-based services, park community centers, hair salons, and exercise clubs). Eligible agencies offered services to adults or parents of children and were financially stable—that is, expected to operate for one to three years—and were selected to oversample four subgroups prioritized by participating communities (homeless persons, seniors, African Americans, and persons served in substance abuse treatment programs). Agency and program enrollment occurred from November 6, 2008, through August 17, 2010. In 60 potentially eligible agencies that had 194 programs, 133 programs were confirmed as potentially eligible and randomly assigned (RS, N=65; CEP, N=68). Site visits after randomization to confirm eligibility and finalize enrollment were conducted by staff blinded to assignment; 20 programs were ineligible, and 18 refused. Therefore, 95 programs from 50 consenting agencies enrolled (RS, N=46; CEP, N=49). Zip code–level census tract data indicated that participating and nonparticipating programs were comparable in neighborhood demographic characteristics (p>.10) (8,16).

Within programs, staff blinded to the intervention screened clients for eligibility in waiting rooms or at events over two to three days for each program. Eligibility was based on being at least 18 years of age, speaking English or Spanish, providing contact information, and having depression symptoms (as measured by a score of ≥10 on the eight-item Patient Health Questionnaire, modified [PHQ-8]). Between March 25 and November 18, 2010, staff approached 4,649 adults to assess their eligibility; 4,440 (96%) in 93 programs agreed. Of these, 1,322 (30%) were eligible, and 1,246 (94%) of the eligible adults consented. Of these, 981 (79%) completed baseline telephone surveys conducted by staff blinded to the intervention (April 27, 2010, to January 2, 2011). Enrolled participants were invited to complete six- and 12-month follow-ups, except for those whose previous survey status was in one of the following categories: ill or incarcerated, unable to contact, or deceased at previous survey participation. These results were reported elsewhere (8,10).

For the extension study, between January 14, 2014 and October 14, 2014, we attempted to contact 1,004 participants from 89 programs who were eligible for three-year surveys—that is, enrolled; completed baseline, six-month, or 12-month follow-ups; and neither refused follow-up nor were reported deceased at prior surveys. Of the 1,004 clients, 600 (60%) participated (RS, N=293; CEP, N=307), 24 (2%) were deceased (RS, N=13; CEP, N=11), ten (1%) refused (RS, N=7, CEP, N=3), three (<1%) were ill or incapable (RS, N=2; CEP, N=1), and 367 (37%) were not reached (RS, N=181, CEP, N=186). [A figure showing study recruitment is included in an online supplement to this article.] The mean postbaseline follow-up interval was 1,321 days (median=1,314).

Interventions
Both CEP and RS interventions encouraged use of depression care QI tool kits, based on collaborative care, including manuals for cognitive-behavioral therapy for depression (CBT), clinician assessment and medication management, care management (that is, depression screening, care coordination, patient education, and outcomes tracking), lay health worker support, and team leadership (12,17–20). Tool kit materials were designed so that all staff with direct client contact (paid, volunteer, licensed, and nonlicensed) could benefit, depending on their role. Tool kits were provided in hard copy, on flash drives, and via a Web site (http://www.communitypartnersincare.org/community-engagement/cep) and introduced in kickoff conferences prior to participant enrollment. Providers received an orientation and review of modules relevant to their discipline. [A table in the online supplement presents more information about the interventions and the training.]

RS used a train-the-trainer implementation approach between December 2009 and July 2010, which offered site

visits and 12 webinars of 90 to 120 minutes each covering core principles and skills, along with access to all versions of the tool kits. Expert trainers included psychiatrists, a nurse care manager, a CBT trainer, and QI and community engagement specialists with support staff.

CEP used a coalition implementation approach between December 2009 and July 2011, and invited program administrators across all sectors within a given community to attend two-hour meetings biweekly for four months. The coalitions followed a workbook that outlined intervention goals, principles, and potential sessions and provided information on resources. Planning meetings were co-led by academic and community members. Main activities included reviewing and adapting tool kits to community priorities and culture; developing plans for staff training as a network; training local staff to co-lead QI training sessions with experts; and developing a written plan for QI training, implementation, and maintenance. Each CEP council was provided $15,000 and tool kits (equivalent value of RS resources) to support planning. Final plans featured half- or full-day conferences, follow-up training sessions at sites, telephone and webinar supervision for CBT and case management, and innovations such as alternative medicine training, provider self-care, and resiliency psychoeducation classes led by laypersons to introduce CBT concepts. CEP plans as implemented, compared with RS expert training, led to higher rates of participation in depression QI training by eligible staff (11). Except for one agency with a common waiting room for RS and CEP, lists of enrolled clients were provided to CEP but not RS program administrators for safekeeping in a locked file, consistent with the design for CPIC (12).

All enrolled CEP and RS clients were instructed that they were free to discuss study participation with their provider. All screened participants were given a health and community services resource guide. Clients were free to access any services or programs they wished, regardless of intervention status.

Data Sources and Outcomes

Staff blinded to randomization status administered surveys by telephone to clients at baseline, six months, 12 months, and three years.

Primary outcomes were poor mental health–related quality of life, defined by a 12-item mental composite score (MCS-12) ≤40 and, according to the original protocol, depression as indicated by a score of ≥10 on the PHQ-8 (21). The two community-prioritized outcomes, developed under a prespecified community input process, were physical functioning, defined by a 12-item physical composite score (PCS-12) and behavioral health hospitalization nights—that is, hospitalization for a mental or substance use disorder as measured by total nights hospitalized in the prior six months. This measure differs from prior hospitalization measures (any, any with ≥ nights) from six- and 12-month analyses, due to low hospitalization frequency at three years.

We developed counts of emergency room visits, outpatient visits to primary care providers (PCPs), outpatient services by PCPs for depression, mental health outpatient visits, outpatient visits to a substance abuse treatment agency or self-help group, social services for depression, calls to a hotline for a substance abuse or mental health problem, and days on which a visit to a self-help group for mental health were made. We also measured in the prior six months any outpatient visits to services for depression in the health care sector (primary care or public health, mental health, or substance abuse treatment program) and in the social and community sector (social services program, faith-based program, park community center, exercise program, hotline calls, and other), as well as visits to faith-based services for depression. We developed indicators of use of any antidepressant, any mood stabilizer, any antipsychotic, and any visit for depression (8,12). We developed an indicator of having at least minimally adequate depression treatment, defined as having at least two months of antidepressant use or at least four depression visits across mental health specialty and primary care sectors in six months (12).

Analyses

Models of longitudinal outcomes models using baseline, six-, and 12-month data were previously published (10). For this study, we focused the primary analysis on client status at three-year follow-up, or 2.5 years after the end of the active intervention period, adjusting for baseline covariates. This approach permitted use of multiple imputation as well as use of response weights to account for attrition.

We conducted intent-to-treat analyses with intervention status as the main independent variable, using linear regression for continuous variables, logistic regression for binary variables, or Poisson regression for count variables, adjusted for age, sex, three or more chronic general medical conditions, education, race-ethnicity, family income below the federal poverty level, 12-month alcohol abuse or use of illicit drugs, 12-month depressive disorder, community, and baseline status of outcome. We used item- and wave-level imputation for missing data (22,23) to adjust findings to the three-year eligible sample (1,004 eligible minus 24 deceased=980). We used weights to account for nonenrollment (24,25) and attrition. [Additional information about the analytic procedure is available in the online supplement.]

All analyses used Taylor series linearization with SUDAAN release 11.1 to estimate variability, accounting for clustering (clients within programs), weighting, and multiple imputation. Significance of comparisons was assessed by using contrasts among regression coefficients. Results of regression models are presented as between-group differences for linear regression, odds ratios (ORs) for logistic regression, and incidence-rate ratios (IRR) for Poisson regression with 95% confidence intervals. We illustrated average results adjusted for covariates by using standardized predictions generated from fitted models (25). We used two-sided tests with p<.05 for statistical significance. In the

proposal, we designed the extension study anticipating a sample of 650 for group differences of ≥11%–12% in comparing proportions and standardized effects of ≥.23–.25 for comparing means, to achieve 80% power with alpha of .05 (two-sided) and intraclass correlation coefficient of .01–.04.

Given multiple secondary outcomes (26), we built on the false-discovery-rate (FDR) framework (27) as extended by Yekutieli and Benjamini (28) and used both standard and FDR-adjusted p values (pFDR) in interpreting results across a large number of regression analyses (26–28). Results with pFDR <.05 are viewed as convincing evidence of a difference, and higher pFDR thresholds are considered as suggestive evidence. We separately calculated pFDR for the two primary outcomes, the two community-prioritized outcomes, service use in the health care sector, service use in the social and community sector, medication use, and summary utilization indicators.

We conducted a sensitivity analysis using all waves of data (baseline, six months, 12 months, and three years) without response weights, adjusting for the same set of baseline covariates as in the main analysis. We specified a spline model, with a linear segment between baseline and the first follow-up for initial improvement and another linear segment for the subsequent follow-ups; the two linear segments were specified to join at the first follow-up. In analyzing continuously scaled PCS-12 as the dependent variable, we employed a three-level, mixed-effects regression model by using SAS PROC MIXED. To account for the intraclass correlation due to the multilevel structure, we specified random effects at the clinic level, including random intercepts at the program level and a spatial power covariance structure at the client level to account for the unequal spacing of waves (29). Initial explorations of three-level, random-effects logistic models by using SAS PROC GLIMMIX for binary outcomes yielded unstable estimates for program-specific random effects. We utilized a generalized estimating equation framework with logistic regression models for binary outcomes and Poisson models for count data by using SAS PROC

TABLE 1. Baseline characteristics of participants in Community Partners in Care, by intervention group[a]

Characteristic	Overall (N=980)		RS (N=483)		CEP (N=497)	
	N	%	N	%	N	%
Female	581	58	279	56	302	60
Race-ethnicity						
Latino	396	41	185	39	211	44
African American	469	46	230	47	239	45
Non-Hispanic white	81	9	42	9	39	9
Other	34	4	26	5	8	3
Married or living with partner	223	23	110	22	113	23
Less than high school education	430	44	213	44	217	44
Income below poverty level	723	74	356	74	367	74
Any work for pay at present time	203	21	103	21	100	20
No health insurance	525	54	273	57	252	51
≥3 chronic general medical conditions from list of 18	521	54	255	54	266	54
12-month depressive disorder	605	62	297	62	308	62
Alcohol abuse or use of illicit drugs in past 12 months	383	39	172	36	210	42
Poor mental health–related quality of life[b]	530	54	264	55	267	52
Age (M±SD)	45.4±12.8		44.6±12.4		46.2±13.1	
PHQ-8 score (M±SD)[c]	15.0±4.1		15.1±4.1		14.9±4.1	
MCS-12 score (M±SD)[d]	39.2±7.3		39.1±7.5		39.3±7.2	
PCS-12 score (M±SD)[d]	39.4±7.2		39.4±7.6		39.5±6.8	

[a] RS, Resources for Services (technical assistance to individual programs); CEP, Community Engagement and Planning. Data were multiply imputed. Chi-square tests were used for group comparisons, accounting for the design effect of the cluster randomization (p>.10 for all comparisons).
[b] As measured by a score of ≤40 (1 SD below the population mean) on the 12-item mental composite score
[c] 8-item Patient Health Questionnaire, a measure of depression symptom. Possible scores range from 0 to 24, with higher scores indicating more distress.
[d] 12-item mental composite score (MCS) and 12-item physical composite score (PCS). Possible scores on both range from 0 to 100, with higher scores indicating better mental or physical health, respectively.

GENMOD, specifying exchangeable correlation at the program level. From the estimated spline model, we developed a contrast involving a linear combination of coefficients to test intervention effects at each end point (baseline, six months, 12 months, and three years) and tested differences between intervention groups in change from baseline to six months, 12 months, and three years.

To provide context for anticipated dampening of intervention effects over time, we report information from the main implementation periods (baseline, six months, and 12 months) on the extent to which clients were exposed to elements of their assigned intervention as well as to potential cross-intervention contamination (that is, exposure to the intervention not assigned).

RESULTS

Baseline Characteristics

Clients had similar characteristics across both intervention groups (Table 1). Most clients were from racial-ethnic minority groups, with family incomes below the federal poverty level. Most had a 12-month depressive disorder and multiple chronic general medical conditions.

TABLE 2. Comparison of outcomes and service use at three-year follow-up among participants in Community Partners in Care, by intervention group[a]

	Unadjusted estimate[b]				Adjusted analysis[c]							
	RS		CEP		RS		CEP			CEP versus RS		
Outcome	N	%	N	%	Est.	95% CI	Est.	95% CI	OR	95% CI	p	pFDR[d]
Primary outcome												
MCS-12 ≤40[e]	119	41	131	44	39.4	32.0–47.4	45.0	36.2–54.2	1.3	.7–2.3	.381	.762
PHQ-8 ≥10[f]	195	67	201	66	65.8	58.6–72.3	66.0	60.1–71.5	1.0	.6–1.7	.965	.965
	M	SD	M	SD	Est.	95% CI	Est.	95% CI	Difference	95% CI	p	pFDR[d]
Secondary outcome												
PCS-12 (M±SD)[g,h]	38.5	7.0	39.6	7.0	38.7	37.9–39.5	39.9	39.2–40.6	1.2	.2–2.2	.022	.022
	M	SD	M	SD	Est.	95% CI	Est.	95% CI	IRR[i]	95% CI	p	pFDR[d]
N nights hospitalized for behavioral health reason (M±SD)[g]	1.1	11.4	.2	1.1	1.2	.3–4.6	.2	.1–.4	.2	.1–.8	.020	.022
Service use in past 6 months												
Health care sector												
N of emergency room or urgent care visits	1.7	7.7	1.4	7.7	1.5	1.0–2.2	1.9	.7–4.9	1.2	.4–3.7	.675	.987
N of visits to primary care	4.3	9.4	3.9	6.4	3.9	2.7–5.4	4.1	3.5–4.9	1.1	.8–1.5	.661	.987
N of outpatient visits to primary care for depression services	1.2	5.3	1.0	1.8	1.1	.6–2.1	1.1	.8–1.5	1.0	.5–2.1	.987	.987
N of outpatient mental health visits	5.4	13.3	5.0	13.8	5.5	3.7–8.0	5.6	3.2–9.8	1.0	.7–1.6	.931	.987
N of outpatient visits to a substance abuse treatment agency or self-help group	8.6	29.8	10.2	32.4	11.1	4.7–24.5	12.3	5.6–25.8	1.1	.3–4.0	.826	.987
Social or community sector												
N of social services for depression	.6	3.2	.6	1.5	.6	.3–1.2	.6	.4–.9	1.1	.4–2.7	.838	.838
N of calls to hotline for substance use or mental health problem	.2	2.8	.2	1.1	.2	.1–.6	.3	.1–1.1	1.4	.2–8.6	.732	.838
N of days on which a self-help visit for mental health was made	6.6	18.5	5.8	15.4	6.3	4.1–9.6	5.6	3.4–9.1	.9	.4–1.8	.708	.838
	N	%	N	%	Est.	95% CI	Est.	95% CI	OR	95% CI	p	pFDR[d]
Any faith-based services for depression in the past six months	29	10	43	14	9.4	6.5–13.2	15.2	10.3–21.7	1.8	1.2–2.6	.006	.023
Medication use												
Any antidepressant	91	31	88	29	28.7	22.5–35.9	26.9	19.8–35.4	.9	.5–1.5	.688	.688
Any mood stabilizer	8	3	20	7	2.5	1.1–5.6	6.4	3.1–12.3	2.9	1.0–8.3	.049	.147
Any antipsychotic	65	22	74	24	21.7	16.1–28.7	23.4	17.1–30.9	1.1	.7–1.7	.638	.688

continued

TABLE 2, *continued*

Outcome	Unadjusted estimate[b]				Adjusted analysis[c]							
	RS		CEP		RS		CEP		CEP versus RS			
	N	%	N	%	Est.	95% CI	Est.	95% CI	OR	95% CI	p	pFDR[d]
Summary of service use												
Any visit in health care sector	255	87	258	85	84.2	78.0–88.9	84.3	75.8–90.4	1.0	.5–2.0	.959	.959
Any community-sector visit for depression	82	28	105	35	28.3	23.9–33.2	35.6	30.1–41.5	1.4	1.0–2.0	.042	.127
Any depression treatment[j]	134	46	137	45	43.2	36.1–50.5	43.5	33.9–53.6	1.0	.6–1.7	.947	.959

[a] RS, Resources for Services (technical assistance to individual programs); CEP, Community Engagement and Planning
[b] Raw data without weighting or imputation (N=600)
[c] Adjusted analyses used multiply imputed data at three years (N=980), weighted for the sample eligible for enrollment. Linear regression model for the 12-item physical composite score (PCS-12) (presented as between-group difference), logistic regression models for binary variables (presented as ORs), and Poisson regression models for count variables, adjusted for baseline status of the dependent variable, age, sex, three or more chronic conditions, education, race-ethnicity, family income below the poverty level, 12-month alcohol abuse or use of illicit drugs, 12-month depressive disorder, and community; models accounted for the design effect of the cluster randomization.
[d] pFDR, adjusted p value from the false-discovery-rate procedure; calculated separately for primary outcomes, secondary outcomes, services use from health care sector, social and community sector, medication, and summary utilization
[e] A mental composite score (MCS) ≤40 indicates poor mental health–related quality of life.
[f] A score ≥10 on the Patient Health Questionnaire (PHQ-8) indicates the presence of depression symptoms.
[g] Community-prioritized outcome developed under a community input process
[h] Possible scores range from 0 to 100, with higher scores indicating better physical health.
[i] Incidence-rate ratio
[j] Antidepressant use for at least two months or at least four outpatient visits to mental health or primary care setting for depression services

Three-Year Outcomes

There were no significant differences between the effects of CEP and RS on poor mental health–related quality of life and depression as measured by the PHQ-8 (Table 2). For the community-prioritized outcomes, which were identified by a prespecified participatory process, statistically significant, modest effects were noted for CEP versus RS in improving mean PCS-12 scores (difference in scores=1.2, p=.022) and reducing the number of nights hospitalized for behavioral health reasons (IRR=.2, p=.020); the differences remained significant with a pFDR <.05. For other utilization outcomes, CEP participants were significantly more likely than RS participants to use faith-based depression services (p=.006, pFDR=.023). The results suggested that CEP participants were also more likely than RS participants to use community depression services (p=.042, pFDR=.127) and mood stabilizers (p=.049, pFDR=.147), but no significant differences were found by intervention status for other utilization outcomes.

Sensitivity analyses found that the intervention effect on end status (three years) was significant at p<.05 for the PCS-12 score, number of nights hospitalized for a behavioral health reason, use of any faith-based services for depression, and use of mood stabilizers; however, the differences between intervention groups in change from baseline to three years were either borderline significant (for example, p=.052 for hospital nights) or not significant. For use of any community services for depression, neither end status nor change from baseline was significant in the three-year longitudinal analysis. [Tables presenting results of the sensitivity analyses are included in the online supplement.]

Intervention Exposure and Contamination

Table 3 presents data on the distribution of use of depression services stratified by intervention group and based on the service location reported by the client for depression services at baseline and at six- and 12-month follow-up. Across survey periods for both CEP and RS, the percentage of clients with any exposure in that period to intervention elements associated with their screening site was about 50% at baseline, 40% at six months, and 30% at 12 months. Levels of exposure to services at a site assigned to the other intervention were somewhat higher for six months before baseline for CEP than for RS (19% versus 12%) mostly before client intervention exposure, but levels were modest across interventions at six and 12 months (about 10%).

DISCUSSION AND CONCLUSIONS

This is the first long-term evaluation of outcomes for depressed clients from health- and community-sector programs that either participated in a community coalition–based approach to depression care QI or received technical assistance to individual agencies for depression care QI. To examine three-year client outcomes while accounting

TABLE 3. Depression services use, intervention exposure, and contamination among study participants in Community Partners in Care (CPIC) at baseline and six- and 12-month follow-ups, by intervention group[a]

| Variable | Baseline | | | | Month 6 | | | | Month 12 | | | |
| | RS (N=492) | | CEP (N=489) | | RS (N=380) | | CEP (N=379) | | RS (N=364) | | CEP (N=369) | |
	N	%	N	%	N	%	N	%	N	%	N	%
No depression services used	96	20	101	21	102	27	95	25	132	36	127	34
Received services only from sites not participating in CPIC	112	23	110	22	87	23	115	30	96	26	101	27
Any exposure to the assigned intervention	261	53	241	49	167	44	151	40	112	31	116	31
Any exposure to the nonassigned intervention (contamination)	58	12	91	19	36	9	50	13	33	9	46	12

[a] RS, Resources for Services (technical assistance to individual programs); CEP, Community Engagement and Planning. Percentages do not sum to 100% because of overlap from individuals who used both the assigned and the nonassigned intervention.

for attrition (a Cochrane Collaborative review noted that failure to account for attrition is a design limitation [6]), we used covariate-adjusted end status analyses incorporating attrition weights and multiple imputation. Using this approach, we found no main intervention effect on primary outcomes (depressive symptoms and mental health–related quality of life). We found statistically significant but modest effect sizes on two community-prioritized outcomes (physical health–related quality of life and behavioral health hospitalization nights), both favoring CEP. Improvements in physical health with CEP might be attributable to earlier CEP effects on mental health–related quality of life, physical activity, or social risk factors (8). A reduction in behavioral health hospitalization nights with CEP is consistent with findings at six months and 12 months (8,10). This long-term modest effect on hospitalization nights could reflect effects of CEP on improving physical health–related quality of life or effects of increasing alternative community supports, given the increased use of faith-based depression services by CEP participants at three years. Given the clinical complexity of participants' conditions, evidence of greater use of mood stabilizers could also be a factor in reduction of hospitalization nights, but this finding was sensitive to analytic approach and less significant with FDR adjustment for multiple secondary outcomes. Whether such increases in medication use may be a factor in reduced hospitalization with CEP is a potential area for future research. The findings reflect outcomes two-and-a-half years after the active intervention period ended, reflecting the extent to which the systems sustained intervention elements or clients learned from their initial intervention exposure.

Our analyses of intervention exposure did not yield strong signs of cross-intervention contamination during the active intervention period postbaseline, suggesting that diminishing of intervention differences over time might be better explained by there having been only moderate levels of sustained exposure to assigned intervention elements. During the active intervention period, about 20%–25% of clients did not use any depression services. This would suggest that expectations for intervention effects at three-year follow-up would be for modest differences at best. Given the social and clinical vulnerability of participants, some subpopulations may show more robust long-term intervention effects, an issue for future research.

Limitations include inclusion of only two urban communities, use of self-report measures, moderate follow-up rates and community-sector sample size, and absence of a usual-care control group, which was considered unethical by the partners given known access disparities (2,3). Also, the study identified CPIC clients to administrators in the CEP but not RS conditions (for locked files). The identification of enrolled participants to CEP programs could be part of why CEP had a stronger initial effect on mental health–related quality of life.

Limitations include inclusion of only two urban communities, use of self-report measures, moderate follow-up rates and community-sector sample size, and absence of a usual-care control group, which was considered unethical by the partners given known access disparities (2,3). Also, the study identified CPIC clients to providers in the CEP but not RS conditions. The identification of enrolled participants to CEP programs could be part of why CEP had a stronger initial effect on mental health–related quality of life.

Overall, the primary analysis suggested a potential for modest longer-term effects with CEP versus RS—not on the primary outcomes but on the secondary, community-prioritized outcomes of physical health–related quality of life and behavioral health hospitalization nights. It is likely that sustained differential gains from CEP would require continued active intervention support through more sustained system change across whole communities, which is what might occur with whole-community assignment rather than assignment that splits community organizations from their natural partnerships, or policy support, such as accountable community initiatives for underresourced populations. Given that this is one of the first rigorous studies in the international literature of the added value of a coalition approach to health for racial-ethnic minority communities (6), replication of the study would be valuable, as would efforts to sustain intervention support and delivery, which might more robustly improve outcomes. We note that a similar coalition model was used to support QI in depression services and outcome

recovery following Hurricane Katrina in New Orleans (20,30), which supports the feasibility of achieving coalition building in practice, with the equitable inclusion of patients, families, community members, and providers as coleaders.

AUTHOR AND ARTICLE INFORMATION

Dr. Ong is with the Department of Medicine; Dr. Belin is with the Department of Biostatistics; Dr. Bromley, Dr. Landry, Ms. Lizaola, Ms. Williams, Ms. Zhang, Dr. Miranda, and Dr. Wells are with the Center for Health Services and Society, Department of Psychiatry and Biobehavioral Sciences, David Geffen School of Medicine; Dr. Chung and Dr. Tang are with the Department of Psychiatry and Biobehavioral Sciences, David Geffen School of Medicine; and Dr. Dixon is with the School of Nursing, all at the University of California, Los Angeles (UCLA), Los Angeles. Dr. Ong is also with the Department of Medicine, Department of Veterans Affairs (VA) Greater Los Angeles Healthcare System, Los Angeles. Dr. Bromley is also with the Desert Pacific Mental Illness Research, Education and Clinical Center, West Los Angeles VA Healthcare System, Los Angeles. Ms. Williams is also with Healthy African American Families II, Los Angeles, where Dr. Jones and Ms. Jones are affiliated. Dr. Wells is also with RAND Health, RAND Corporation, Santa Monica, California, where Dr. Koegel, Dr. Khodyakov, Dr. Ngo, Ms. Perlman, and Dr. Sherbourne are affiliated. Dr. Aoki is with Los Angeles Christian Health Centers, Los Angeles. Dr. Johnson is with the Department of Psychiatry, Kaiser Permanente of Southern California, Los Angeles. Ms. Mtume is with Shields for Families, Los Angeles. Ms. Pulido is with L.A. Care Health Plan, Los Angeles. Ms. Sauer is with Jewish Family Services of Los Angeles, Los Angeles. Mr. Vidaurri and Ms. Whittington are with the Los Angeles County Department of Mental Health, Los Angeles. Ms. Lucas-Wright is with the UCLA Clinical and Translational Science Institute and the Charles R. Drew University of Medicine and Science, both in Los Angeles. Dr. Southard is with the Suzanne Dworak-Peck School of Social Work, University of Southern California, Los Angeles. Send correspondence to Dr. Ong (e-mail: michael.ong@ucla.edu). A version of these findings was presented at the National Institute of Mental Health Conference on Mental Health Services Research, Bethesda, Maryland, August 1–2, 2016.

REFERENCES

1. Vos T, Barber RM, Bell B, et al: Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. Lancet 386:743–800, 2015

2. Kessler RC, Chiu WT, Demler O, et al: Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. Archives of General Psychiatry 62:617–627, 2005

3. Miranda J, McGuire TG, Williams DR, et al: Mental health in the context of health disparities. American Journal of Psychiatry 165:1102–1108, 2008

4. Miranda J, Ong MK, Jones L, et al: Community-partnered evaluation of depression services for clients of community-based agencies in under-resourced communities in Los Angeles. Journal of General Internal Medicine 28:1279–1287, 2013

5. Wells K, Miranda J, Bruce ML, et al: Bridging community intervention and mental health services research. American Journal of Psychiatry 161:955–963, 2004

6. Anderson LM, Adeney KL, Shinn C, et al: Community coalition-driven interventions to reduce health disparities among racial and ethnic minority populations. Cochrane Library 6:CD009905, 2015

7. Jones L, Wells K: Strategies for academic and clinician engagement in community-participatory partnered research. JAMA 297:407–410, 2007

8. Wells KB, Jones L, Chung B, et al: Community-partnered cluster-randomized comparative effectiveness trial of Community Engagement and Planning or Resources for Services to address depression disparities. Journal of General Internal Medicine 28:1268–1278, 2013

9. Chung B, Jones L, Dixon EL, et al: Using a community partnered participatory research approach to implement a randomized controlled trial: planning Community Partners in Care. Journal of Health Care for the Poor and Underserved 21:780–795, 2010

10. Chung B, Ong M, Ettner SL, et al: 12-month outcomes of community engagement versus technical assistance to implement depression collaborative care: a partnered, cluster, randomized, comparative effectiveness trial. Annals of Internal Medicine 161 (suppl):S23–S34, 2014

11. Chung B, Ngo V, Ong M, et al: Participation in training for depression care quality improvement: a randomized trial of community engagement or technical support. Psychiatric Services 66:831–839, 2015

12. Wells KB, Sherbourne C, Schoenbaum M, et al: Impact of disseminating quality improvement programs for depression in managed primary care: a randomized controlled trial. JAMA 283:212–220, 2000

13. Wells KB, Sherbourne CD, Miranda J, et al: The cumulative effects of quality improvement for depression on outcome disparities over 9 years: results from a randomized, controlled group-level trial. Medical Care 45:1052–1059, 2007

14. Sherbourne CD, Edelen MO, Zhou A, et al: How a therapy-based quality improvement intervention for depression affected life events and psychological well-being over time: a 9-year longitudinal analysis. Medical Care 46:78–84, 2008

15. Pham HH, Cohen M, Conway PH: The Pioneer accountable care organization model: improving quality and lowering costs. JAMA 312:1635–1636, 2014

16. Stockdale S, Tang L, Pulido E, et al: Sampling and recruiting community-based programs using community-partnered participation research. Health Promotion Practice 17:254–264, 2016

17. Hepner KA, Miranda JM, Woo SM, et al: Building Recovery by Improving Goals, Habits, and Thoughts (Bright): A Group Cognitive-Behavioral Therapy for Depression in Clients With Co-Occurring Alcohol and Drug Use Problems. Group Leader's Manual. Santa Monica, CA, RAND Corporation, 2011

18. Unützer J, Katon W, Callahan CM, et al: Collaborative care management of late-life depression in the primary care setting: a randomized controlled trial. JAMA 288:2836–2845, 2002

19. Miranda J, Chung JY, Green BL, et al: Treating depression in predominantly low-income young minority women: a randomized controlled trial. JAMA 290:57–65, 2003

20. Wennerstrom A, Vannoy SD 3rd, Allen CE, et al: Community-based participatory development of a community health worker mental health outreach role to extend collaborative care in post-Katrina New Orleans. Ethnicity and Disease 21(suppl 1):S1–S45, 51, 2011

21. Kroenke K, Strine TW, Spitzer RL, et al: The PHQ-8 as a measure of current depression in the general population. Journal of Affective Disorders 114:163–173, 2009

22. Rubin D: Multiple Imputation for Nonresponse in Surveys. Hoboken, NJ, Wiley, 1987

23. Lavori PW, Dawson R, Shera D: A multiple imputation strategy for clinical trials with truncation of patient data. Statistics in Medicine 14:1913–1925, 1995

24. Groves RM: Survey Nonresponse. Hoboken, NJ, Wiley-Interscience, 2002

25. Korn EL, Graubard BI: Analysis of Health Surveys. Hoboken, NJ, Wiley-Interscience, 1999

26. Benjamini Y, Yekutieli D: The control of the false discovery rate in multiple testing under dependency. Annals of Statistics 29:1165–1188, 2001

27. Benjamini Y, Hochberg Y: Controlling the false discovery rate: a practical and powerful approach to multiple testing. Journal of the Royal Statistical Society. Series B. Methodological 57:289–300, 1995

28. Yekutieli D, Benjamini Y: Resampling-based false discovery rate controlling multiple test procedures for correlated test statistics. Journal of Statistical Planning and Inference 82:171–196, 1999

29. Littel RC, Milliken G, Stroup W, et al: SAS System for Mixed Models. Cary, NC, SAS Institute, Inc, 1996

30. Springgate BF, Wennerstrom A, Meyers D, et al: Building community resilience through mental health infrastructure and training in post-Katrina New Orleans. Ethnicity and Disease 21(3 suppl 1):S1–S20-9, 2011

Psychiatric Services Seeks Additional Reviewers

Psychiatric Services welcomes new reviewers.

Professionals in the mental health disciplines who are qualified to review are invited to contact the Editor, Lisa B. Dixon, M.D., M.P.H. (psjournal@psych.org). Qualifications include prior publication of articles in your specialty area in peer-reviewed journals; current knowledge of recently published research in that area; familiarity with *Psychiatric Services'* audience and recent publications in your field; and willingness to invest the time needed to thoroughly evaluate the manuscripts you agree to review. In your message, please include a list of representative publications and/or professional activities.

Further information for reviewers can be found at ps.psychiatryonline.org/ps_authors_reviewers#02.