

# COMMUNITY ENGAGEMENT AND PLANNING VERSUS RESOURCES FOR SERVICES FOR IMPLEMENTING DEPRESSION QUALITY IMPROVEMENT: EXPLORATORY ANALYSIS FOR BLACK AND LATINO ADULTS

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**Objective:** Racial/ethnic minorities experience disparities in depression<sup>1</sup> and there is a paucity of evidence-based interventions to improve depression care access and outcomes. Community Partners in Care (CPIC) is a community-partnered study of depression care quality improvement (QI) in under-resourced, urban communities: Community Engagement and Planning (CEP) for multi-sector coalitions, and Resources for Services (RS) for program technical assistance.<sup>2</sup> CEP demonstrated benefits for the overall CPIC study population; effects for Black and Latino sub-populations are unknown.

**Methods:** This sub-analysis examines outcomes for 409 Latino and 488 Black (non-Latino) adults recruited from 90 programs who completed baseline or 6-month follow-up. Regression analyses were used to estimate CEP vs RS intervention effects on primary (Mental Health Related Quality of Life [MHRQL], Patient Health Questionnaire-9 [PHQ-9]) and community-prioritized (mental wellness, physical activity, risk for homelessness) outcomes at 6-months.

**Results:** Baseline characteristics did not differ significantly by intervention in either group. In the adjusted analysis for Black adults, CEP resulted in decreased odds of poor MHRQL (OR: .62, 95% CI=.41-.94, P=.028) with a trend for reducing homelessness risk (OR: .60, .35-1.05, P=.69). For Latino adults, CEP resulted in greater probability of mental wellness (OR: 1.81, 1.05-3.13, P=.034) and a trend for increased physical activity (OR: 1.52, .93-2.49, P=.091).

## INTRODUCTION

Mental health care inequity persists for people of color in the United States and is evident in greater barriers to mental health care access, decreased rates of initiation of treatment, and greater functional impairment as a result of untreated or inadequately treated mental illness.<sup>3-5</sup> Given the

considerable impact of social determinants of mental health as well as cultural, linguistic, and historical factors on engagement and outcomes for these populations, interventions that increase access to traditional models of mental health care<sup>6</sup> or to evidence-based psychopharmacology<sup>7</sup> alone, without specific attention to the strengths and needs of these

**Conclusions:** Exploratory analyses of CEP for depression quality improvement suggests significant 6-month benefits in mental health outcomes for Black and Latino participants and trends for improvement in community-prioritized outcomes for both groups. Findings may inform research in multi-sector coalitions to promote equity in depression care. *Ethn Dis.* 2019;29(2):277-286; doi:10.18865/ed.29.2.277

**Keywords:** Depression; Minority Groups; Disparity; Equity; Community-Based Participatory Research

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communities, will likely be insufficient in overcoming the disparities.

Collaborative care (CC) as a model for enhanced interdisciplinary care has been extensively studied within primary care (PC) settings and has demonstrated initial efficacy in depression treatment, including additional benefit to minority groups<sup>8</sup> and with particular benefit when culturally tailored and/or combined with language concordant interventions.<sup>9-11</sup> Of note however, PC-based

interventions,<sup>15</sup> have brought to attention the potential limitations of PC-based treatment<sup>9</sup> and have prompted exploration of new models.<sup>16</sup>

### Community Partners in Care (CPIC)

CPIC<sup>2</sup> was a group-level randomized trial designed to compare the efficacy of two expanded (multi-sector) collaborative care models of depression quality-improvement (QI) in under-resourced minority-majority communities. Resources for Services (RS), an active treatment, served as the evidence-informed control and offered technical assistance to participating agencies (including webinars and site visits) to guide effective use of a “toolkit” of resources related to depression care (including bilingual materials related to psychotropic prescribing, psychotherapy interventions, staff skill-building, and patient education). The RS model relied on an expert-led training methodology where agency-identified staff received depression toolkit training over a 4-6 month period and thereafter oriented their agency peers to the resources without input or revision from other community agencies. Community Engagement and Planning (CEP), alternatively, promoted coalitions of leadership from various local agencies to collaborate through a community-partnered participatory process<sup>17,18</sup> in adapting, implementing, and providing oversight of training and services guided by the depression toolkit. In the CEP model, leadership and staff were provided the same 4-6 month training as RS participants, but were then followed for an additional 12 months,

including collective follow-up training and networking across sites.<sup>19</sup>

In order to capture the breadth of social service sectors represented in the Hollywood/ Metro and South Los Angeles communities as well as the complex social and health needs of residents, 95 agencies across 5 sectors were recruited. Agencies represented included: ambulatory care medicine; outpatient mental health and substance use treatment; homelessness services; as well as other social services (faith-based organizations [FBO], local parks and recreation, senior centers, etc.). Community members and clients, blinded to the intervention arm of agencies, were screened for depressive symptoms (thereby identifying clients at risk not only for depressive disorder, but also for high-utilization or inadequate treatment) and enrolled to become participants in the 9 months following agency training. In order to replicate real-world comorbidity and service utilization, clients were broadly included (despite co-morbidities to depression, including substance use, and with as few as possible exclusion criteria). Additionally, following their enrollment, clients were not limited in accessing other agencies during the study period (regardless of initial treatment arm designation). As a result of direct community involvement, CPIC evaluated both “main” outcomes related to clinical depression (Mental Health Related Quality of Life [MHRQL] and Patient Health Questionnaire [PHQ]) as well as “community-identified” outcomes related to mental wellness, physical activity, and homelessness (and/or associated risk factors for homelessness). At 6 months, CEP-enrolled partici-

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CC faces limitations due to baseline disparities in PC-engagement across communities and, even in the case of participation, dissimilar rates of clinical benefit.<sup>12,13</sup> Namely, minority participants have been noted as less likely to benefit at the same rate as White participants regarding functional progress.<sup>12-14</sup> These persistent disparities across race/ethnicity, despite PC-based CC in-

pants were noted to have improved mental health-related quality of life, mental wellness, physical activity, and use of FBO program participation relative to RS-enrolled adults.

Although CPIC was specifically designed to examine the efficacy of CEP vs RS in underserved communities of color, and most study participants self-identified as Black (non-Latino) or Latino, the differential effect of CEP and RS in these two racial/ethnic communities has not been directly examined. The aim of this study was to conduct an exploratory analysis to examine the consistency of overall study findings at 6-months in specific racial/ethnic groups, including both “main” (clinical) as well as “community-prioritized” outcomes.

## METHODS

### Study Design and Population

This is an exploratory analysis of 6-month outcomes for the adult participants in CPIC<sup>2</sup> who self-identified as Black (non-Latino) or Latino (all language preferences and/or backgrounds — persons who identified heritage or nativity from Mexico, El Salvador, Guatemala, etc). Central elements of the CPIC study include a community-partner council composed of community members (leaders as well as lay persons) and academics who guided the conception and implementation of the entire study, as outlined by community-partnered participatory research (CPPR),<sup>20</sup> and a study design that evaluated efficacy of two active interventions of expanded collaborative care (the inclusion of service or-

ganizations across multiple sectors including non-health care agencies).

Agency recruitment took place between the Hollywood/Metro and South Los Angeles regions and took place over a two-year period (Nov 2008-Aug 2010). Although 95 programs were initially enrolled, the final analytic sample represents 90 programs across 5 service sectors were enrolled, paired into units or clusters, and randomized by cluster to either RS or CEP treatment arms. In recognition of patterns in real-world utilization of service agencies for underserved communities of color (and in order to enhance external validity), CPIC was designed to maximize study integrity without placing restrictions on participants seeking needed support. As such, programs with strong baseline referral relationships were randomized as a cluster, as were programs in close proximity to each other and that provided a complementary service.

Consenting clients were recruited by blinded study staff and subsequently enrolled into CPIC based on at least moderate depressive symptoms (PHQ-8  $\geq$  10) and willingness to provide contact information. Of the total CPIC participant pool, this sub-analysis included adults who self-identified as either (non-Latino) Black or Latino. This study and all procedures were approved by the institutional review boards at RAND and participating agencies.

### Interventions

As described above, both interventions represent an “active” approach to collaborative care and depression QI via expanded models. In the Resources

for Services (RS) arm, staff administrators were trained to become trainers via a series of expert-led workshops (including webinars, consultations, and site visits) on the implementation of depression QI guided by the CPIC depression toolkit (specifically tailored by the CPPR council). The Community Engagement and Planning (CEP) arm similarly provided training in the depression toolkit, and recruited agency staff liaisons who participated in a collective effort to review and adapt toolkits over the study duration. This effort was geared toward iterative efforts to align resources included in the toolkit to the strengths and needs of each organization and included, for example, the incorporation of alternative therapies, and new training modules.<sup>19</sup> All participant surveys and intervention materials, including educational videos, were available in English and Spanish. The Council overseeing the study included providers and community members of diverse backgrounds and were encouraged to consider adaptations of interventions and implementation for cultural characteristics of the community, and strategies to engage diverse providers and client/patient participants in using intervention strategies.

Once randomized, clients were encouraged, but not mandated to access agencies of the same intervention arm. To monitor use across interventions, CEP program administrators were provided with a list of participants and the fidelity of intervention assignment was tracked over time.<sup>21</sup>

### Measures

Baseline measures included both demographic and clinical outcomes.

Demographic data included age, sex, education level, income, work-status, variables related to housing (including co-habitation, recent homelessness), and self-identified race / ethnicity. Classified for this sub-analysis, racial/ethnic groups included Latino (any), Black (non-Latino). Chronic physical health was captured as having  $\geq 3$  of 18 chronic physical health conditions (eg, diabetes, hyperlipidemia, chronic kidney disease, or heart disease). Mental health assessment included, the Patient Health Questionnaire (PHQ) for depressive symptoms (PHQ-8 for screening and PHQ-9 for follow-up), as well as the Mini-International Neuropsychiatric Interview-6 (MINI) to assess for probable affective, anxiety, or substance use disorders by DSM 4 criteria, and the 12-item Short Form Health Survey (SF-12) to gauge physical and mental health related quality of life at baseline and follow-up.

### Outcomes

The primary outcomes for this secondary analysis were poor MHRQL, defined as Mental Component Summary (MCS) scores  $\leq 40$ , and probable depression (PHQ-9  $\geq 10$ ) at 6-month follow-up. Secondary outcomes, as prioritized by community partners included indicators of mental wellness (self-report of feeling “calm” or “peaceful,” “having energy,” or “being happy” at least sometime in the prior 4 weeks) and an emphasis on housing (with attention toward current homelessness or having  $\geq 2$  homelessness risk factors: no place to stay  $\geq 2$  nights, recent eviction, financial crisis, or food insecurity in the prior 6 months), and

being at least physically active from a single item. Finally, outcomes for utilization by sector were monitored and included according to both health care and community-sector encounters for depression. Health care sector visits for depression included accessing primary care, emergency or urgent care, mental health or substance use specialty outpatient visits, and behavioral health hospitalizations for depression and/or drug or alcohol concerns. Community sector visits for depression included agencies related to homelessness, substance use, social/community services (including parks and senior centers), and faith-based organizations (FBO – including both places of worship and social service agencies sponsored by organized religious traditions). Depression-related visits were instances in which clients reported interest in information, counselling, referral, or medication management for depression or emotional problems.

### Statistical Analysis

We compared baseline characteristics of Latino (any) and Black (non-Latino) participants as separate groups via bivariate analysis to ensure adequate randomization within each racial/ethnic group across treatment arms (RS vs CEP). We conducted an intention-to-treat analysis using regression analyses (logistic regression for binary outcomes and Poisson regression models for continuous outcomes) to examine intervention effects (RS vs CEP). Models controlled for baseline status of the dependent variable, age, education, 12-month depressive disorder, and community.

CPIC used non-response weighting to address missing data in cases of either non-enrollment of eligible clients and attrition following enrollment.<sup>22</sup> Additionally, CPIC used both hot-deck multiple imputation and approximate Bayesian bootstrap to address item and unit non-response, respectively.<sup>23,24</sup> This sub-analysis additionally relied upon a Taylor series linearization with a *subpopn* statement in SUDAAN version 11.1 (RTI International, Research Triangle, NC), that would account for the clustering of clients within programs, weighting, and multiple imputations.<sup>24,25</sup> Significance by intervention was determined by regression coefficient and results of regression models were presented according to regression type (either odds ratios [OR] or incident rate ratios [IRR] for logistic or Poisson regression respectively) where both used a 95% CI. To strengthen analysis, imputed data were supplemented with unadjusted raw measures.

In addition to a stratified analysis, we also performed an interaction analysis using the full sample including indicators of intervention status, race/ethnicity (Black or Latino), and their interaction.

## RESULTS

### Study Population

Of the 1018 total participants included in CPIC, 897 (88%) self-identified as either (non-Latino) Black (488) or Latino (409). As shown in Table 1, at the time of recruitment and randomization, both groups demonstrated high rates of social marginalization, including

**Table 1. Baseline characteristics of depressed clients in outcomes analysis, by intervention<sup>a</sup>**

	Overall, N=897		Latino, N=409		Black (non-Latino), N=488	
	RS, n=433	CEP, n=464	RS, n=194	CEP, n=215	RS, n=239	CEP, n=249
Age, mean (SD), y	44.4 (12.1)	46.0 (12.7)	43.7 (12.4)	44.8 (14.2)	45.0 (11.8)	47.0 (11.0)
Female, n (%)	258 (57.5)	287 (61.1)	117 (58.7)	145 (66.2)	141 (56.5)	142 (56.2)
Married/living with partner, n (%)	109 (25.0)	109 (24.1)	65 (33.6)	73 (34.1)	44 (17.8)	36 (14.5)
< High school, n (%)	199 (45.8)	213 (46.7)	117 (59.7)	133 (62.2)	83 (34.3)	80 (31.8)
≥ 3 chronic medical conditions of 18, n (%)	223 (52.4)	248 (54.4)	88 (46.1)	99 (47.8)	135 (57.5)	149 (60.8)
No health insurance, n (%)	238 (55.5)	234 (51.1)	113 (58.4)	107 (50.9)	126 (53.2)	127 (51.3)
Income < poverty level, n (%)	319 (74.3)	344 (73.7)	144 (74.9)	158 (73.0)	175 (73.8)	185 (74.5)
Any work for pay now, n (%)	92 (21.1)	93 (20.4)	56 (28.1)	61 (27.9)	36 (15.3)	33 (13.3)
Physically active, n (%) <sup>b</sup>	204 (46.8)	214 (46.2)	101 (52.0)	109 (50.7)	103 (42.5)	105 (41.9)
Chronic homelessness risk, n (%) <sup>c</sup>	241 (57.3)	228 (49.8)	92 (48.3)	92 (43.9)	149 (64.7)	136 (55.5)
Alcohol abuse or use of illicit drugs, 12 months, n (%)	152 (35.6)	194 (41.1)	61 (31.5)	70 (31.8)	92 (39.1)	124 (50.1)
12-month depressive disorder, n (%)	266 (62.2)	284 (60.6)	120 (63.0)	113 (52.2)	146 (61.5)	171 (68.6)
Poor mental health-related quality of life, n (%) <sup>d</sup>	232 (53.6)	252 (53.9)	103 (53.4)	115 (52.8)	129 (53.8)	137 (55.0)
Mental wellness, n (%) <sup>e</sup>	177 (40.3)	190 (41.1)	87 (44.2)	100 (46.2)	90 (37.1)	91 (36.1)
PHQ-8, mean (SD) <sup>f</sup>	15.0 (4.1)	14.8 (4.0)	14.8 (4.1)	14.6 (4.0)	15.1 (4.2)	14.9 (4.0)

a. Data were multiply imputed and weighted for eligible sample for enrollment; Chi-square test was used for a comparison between the two groups accounting for the design effect of the cluster randomization; (P> .10 for all comparisons).

b. 1=Quite/very/extreme active to 'How physically active you are?'

c. Homeless or living in a shelter, or at least two risk factors of four (at least two nights homeless, food insecurity, eviction, financial crisis).

d. Mental Health Composition Score of SF-12 (MCS12) ≤ 40; one standard deviation below population mean.

e. At least good bit of time on any of three items: feeling peaceful or calm, being a happy person, having energy.

f. 8-item Personal Health Questionnaire Depression Scale (0 to 24, higher more distress).

RS, Resources for services or individual program technical assistance; CEP, Community engagement and planning.

**Table 2. Baseline characteristics of depressed clients in outcomes analysis, by race/ethnicity<sup>a</sup>**

	Combined, N=897	Any Latino, N=409	Black (non-Latino), N=488	P
Age, mean ± SD, y	45.2 ± 12.4	44.3 ± 13.4	46.0 ± 11.5	.178
Female, n (%)	545 (59.4)	262 (62.8)	283 (56.3)	.072
Married/living with partner, n (%)	218 (24.5)	138 (33.9)	80 (16.2)	<.001
< High school, n (%)	413 (46.2)	250 (61.1)	163 (33.0)	<.001
≥ 3 chronic medical conditions of 18, n (%)	471 (53.4)	186 (47.0)	284 (59.2)	.002
No health insurance, n (%)	472 (53.2)	220 (54.3)	252 (52.2)	.550
Income < poverty level, n (%)	663 (74.0)	302 (73.9)	361 (74.1)	.916
Any work for pay now, n (%)	186 (20.8)	117 (28.0)	69 (14.3)	<.001
Physically active, n (%) <sup>b</sup>	418 (46.5)	210 (51.3)	208 (42.2)	.055
Chronic homelessness risk, n (%) <sup>c</sup>	469 (53.4)	184 (45.9)	285 (60.0)	<.001
Alcohol abuse or use of illicit drugs, 12 months, n (%)	346 (38.5)	131 (31.7)	215 (44.6)	.005
12-month depressive disorder, n (%)	550 (61.4)	233 (57.2)	317 (65.1)	.043
Poor mental health-related quality of life, n (%) <sup>d</sup>	484 (53.8)	218 (53.1)	266 (54.4)	.685
Mental wellness, n (%) <sup>e</sup>	367 (40.7)	187 (45.3)	180 (36.6)	.008
PHQ-8, mean (SD) <sup>f</sup>	14.9 ± 4.1	14.7 ± 4.0	15.0 ± 4.1	.369

a. Data were multiply imputed and weighted for eligible sample for enrollment; Chi-square test was used for a comparison between the two groups accounting for the design effect of the cluster randomization.

b. 1=Quite/very/extreme active to 'How physically active you are?'

c. Homeless or living in a shelter, or at least two risk factors of four (at least two nights homeless, food insecurity, eviction, financial crisis).

d. Mental Health Composition Score of SF-12 (MCS12) ≤ 40; one standard deviation below population mean.

e. At least good bit of time on any of three items: feeling peaceful or calm, being a happy person, having energy.

f. 8-item Personal Health Questionnaire Depression Scale (0 to 24, higher more distress).

RS, Resources for services or individual program technical assistance; CEP, Community engagement and planning

**Table 3. Comparison of outcomes and service use at 6-month follow-up among minority participants in Community Partners in Care, by intervention group**

	Unadjusted estimates <sup>a</sup>		Adjusted analysis <sup>b</sup>	
	RS	CEP	CEP vs RS test, (95% CI)	P
Overall (Latino or Black (non-Latino))	n/N (%)	n/N (%)	OR	
Poor mental health quality of life	171/330 (51.8)	145/338 (42.9)	.70 (.52, 0.93)	.017
PHQ-9 ≥10	220/329 (66.9)	212/338 (62.7)	.82 (.49, 1.36)	.398
Mental wellness	118/330 (35.8)	153/341 (44.9)	1.59 (1.07, 2.35)	.023
Physically active	132/331 (39.9)	163/341 (47.8)	1.40 (1.03, 1.90)	.031
Chronic homelessness risk	124/330 (37.6)	99/340 (29.1)	.65 (.43, .99)	.044
Any behavioral health hospitalizations	32/331 (9.7)	19/341 (5.6)	.48 (.25, .92)	.028
	mean (SD)	mean (SD)	IRR	
Health care sector visits for depression	13.14 (30.39)	13.32 (27.32)	.98 (.56, 1.74)	.952
Community sector visit for depression	2.77 (15.43)	3.44 (13.44)	1.29 (.67, 2.48)	.432
FBO <sup>c</sup> services for depression	0.45 (1.78)	1.12 (5.15)	2.94 (1.40, 6.20)	.006
Latino	n/N (%)	n/N (%)		
Poor mental health quality of life	73/147 (49.7)	70/156 (44.9)	.81 (.53, 1.23)	.314
PHQ-9 ≥10	89/148 (60.1)	88/155 (56.8)	1.01 (.52, 1.96)	.987
Mental wellness	54/147 (36.7)	81/157 (51.6)	1.81 (1.05, 3.13)	.034
Physically active	64/148 (43.2)	86/157 (54.8)	1.52 (.93, 2.49)	.091
Chronic homelessness risk	47/147 (32.0)	42/156 (26.9)	.69 (.37, 1.28)	.221
Any behavioral health hospitalizations	10/148 (6.8)	4/157 (2.5)	.40 (.09, 1.79)	.212
	mean (SD)	mean (SD)	IRR	
Health care sector visits for depression	12.00 (26.37)	11.44 (24.4)	1.09 (.53, 2.24)	.792
Community sector visit for depression	1.15 (2.97)	2.25 (7.22)	2.19 (.58, 8.29)	.213
FBO services for depression	0.55 (2.16)	1.15 (5.89)	2.90 (.87, 9.66)	.081
Black (non-Latino)	n/N (%)	n/N (%)		
Poor mental health quality of life	98/183 (53.6)	75/182 (41.2)	.62 (.41, .94)	.028
PHQ-9 ≥10	131/181 (72.4)	124/183 (67.8)	.69 (.36, 1.31)	.233
Mental wellness	64/183 (35.0)	72/184 (39.1)	1.39 (.84, 2.30)	.186
Physically active	68/183 (37.2)	77/184 (41.8)	1.28 (.89, 1.84)	.172
Chronic homelessness risk	77/183 (42.1)	57/184 (31.0)	.60 (.35, 1.05)	.069
Any behavioral health hospitalizations	22/183 (12.0)	15/184 (8.2)	.54 (.23, 1.26)	.149
	mean (SD)	mean (SD)	IRR	
Health care sector visits for depression	14.07 (33.34)	14.97 (29.61)	.93 (.46, 1.85)	.812
Community sector visit for depression	4.09 (20.51)	4.45 (17.00)	1.03 (.39, 2.73)	.954
FBO services for depression	0.37 (1.4)	1.09 (4.44)	2.99 (1.40, 6.38)	.005

a Raw data without weighting and imputation.

b Adjusted analysis used multiply imputed data, weighted for eligible sample for enrollment; logistic regression models for binary variables (presented as odds ratio, OR) or Poisson regression models for count variables (presented as incidence rate ratios, IRR), adjusted for baseline status of the dependent variable, age, education, (race/ethnicity for overall sample), 12-month depressive disorder, and community and accounted for the design effect of the cluster randomization.

c Faith-based organizations (FBO) – including both places of worship and social service agencies sponsored by organized religious traditions.

high rates of poverty, lack of health insurance, joblessness, and homelessness risk. Examining across groups, relative to Latino adults, Black participants were less likely to be married/living with partner, more likely to have a high school education, more likely to have ≥3 chronic physical health conditions, less likely to

have paying work, and less likely to report mental wellness (Table 2). Within each group, there were no significant differences in randomization to RS vs CEP interventions.

### Intervention Effects

Table 3 shows 6-month outcomes for the combined group

(both self-identified Latino and Black [non-Latino]) as well as for each group individually and includes outcomes according to both unadjusted raw data as well as adjusted analysis (using imputed data).

In the overall sample, there was a significant benefit in reduced MHRQL, increased mental well-

**Table 4. Comparison of outcomes and service use at 6-month follow-up among minority participants in Community Partners in Care, by intervention group from intervention-by-ethnicity interaction model<sup>a</sup>**

	Any Latino		Black (non-Latino)		Interaction effects
	CEP vs RS		CEP vs RS		
	OR (95% CI)	P	OR (95% CI)	P	P
Poor mental health quality of life	.80 (.53, 1.20)	.266	.62 (.41, .95)	.029	.403
PHQ-9 ≥10	.98 (.51, 1.90)	.955	.68 (.36, 1.29)	.219	.350
Mental wellness	1.82 (1.06, 3.14)	.032	1.40 (.85, 2.31)	.177	.442
Physically active	1.53 (.94, 2.51)	.085	1.29 (.89, 1.87)	.168	.569
Chronic homelessness risk	.70 (.37, 1.33)	.257	.61 (.36, 1.03)	.064	.710
Any behavioral health hospitalizations	.41 (.09, 1.77)	.214	.52 (.23, 1.18)	.115	.788
	IRR (95% CI)		IRR (95% CI)		
# Health care sector visits for depression	1.09 (.55, 2.16)	.799	.91 (.46, 1.79)	.761	.648
# Community sector visit for depression	2.17 (.58, 8.16)	.218	1.04 (.38, 2.86)	.933	.434
# Religious services for depression	2.95 (.85, 10.22)	.086	2.90 (1.40, 6.01)	.005	.981

a. Intervention-by-ethnicity interaction models used multiply imputed data, weighted for eligible sample for enrollment; logistic regression models for binary variables (presented as odds ratio, OR) or Poisson regression models for count variables (presented as incidence rate ratios, IRR), adjusted for baseline status of the dependent variable, age, education, 12-month depressive disorder, and community and accounted for the design effect of the cluster randomization.

ness, increased physical activity, decreased chronic homelessness risk, a decrease in behavioral health hospitalization, and increase in attending FBO services for depression among CEP participants relative to RS.

Among Latino adults, CEP resulted in improved mental wellness (OR: 1.81, 1.05-3.13, P=.034), and trended toward increased physical activity (OR: 1.52, .93-2.49, P=.091). For Black adults, CEP demonstrated a statistically significant benefit in reducing incidence of poor mental health related quality of life (OR: .62, .41-.94, P=.028) and increasing religious services for depression (OR: 2.99, 1.40-6.38, P=.005), and approached significance in decreasing chronic homelessness risk (OR: .60, .35-1.05, P=.069).

While significant in the entire study population, there was no significant decrease in behavioral health hospitalization for either group (nor approaching significant).

There were no significant effects in the interaction analysis (Table 4).

## DISCUSSION

CPIC was specifically designed to evaluate the efficacy of two expanded collaborative care initiatives for depression QI in underserved, minority-majority communities. It examined a technical approach, Resources for Services (RS), which provided assistance to individual programs vs a coalition-based and community-participatory approach known as Community Engagement and Planning (CEP). Although the majority of participants included in CPIC identified as Black (non-Latino) or Latino, the paucity of investigations dedicated specifically to racial/ethnic subgroups and the promotion of equity-based interventions prompted this exploratory sub-analysis of outcomes for Black (non-Latino) and Latino participants.

This exploratory study was focused on 6-month outcomes including mental health outcomes, community-specified measures, and markers of utilization. As hypothesized, we found at least

one significant outcome favoring CEP for both groups. Namely, we found improvements in mental wellness for Latino participants, and improved MHRQL for Black participants. For Latino adults, increased physical activity (approaching significance) is a promising step in identifying culturally tailored interventions capable of improving both physical and mental health outcomes.<sup>26</sup> Similarly, for Black adults, reductions in homelessness risk trending to significance are encouraging evidence of the CEP model to address social determinants of health. Of note, for Black participants, CEP demonstrated or suggested efficacy greater than RS for each outcome domain – clinical (MHRQL), regarding social determinants of mental health (homelessness), and in service utilization (attendance to FBO programming for depression). Exploration of the processes contributing to increased FBO utilization, without change in health care or community sector visits, was beyond the scope of this study, and

may be the result of multiple considerations. Despite concerns regarding the propagation of mental health stigma in faith communities, increased FBO access likely underscores the central role of faith organizations as a social and cultural pillar in the community.<sup>27,28</sup> Given the absence of interaction effect, this study cannot conclude that CEP was favorable for one group relative to another for any specific outcome. Rather, it suggests benefit to both groups and may reflect the unique capacity of CEP to shape interventions to fit local need. This interpretation, that CEP provides added value to

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*As hypothesized, we found at least one significant outcome favoring CEP for both groups.*

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marginalized communities in its capacity to tailor engagement as well as supplement content, is consistent with pre-existing evidence that community-participatory approaches may uniquely address barriers to the access and meaningful use of mental health care for underserved communities of color.

Both the initial CPIC study as well as the present exploratory analysis have important limitations. The initial CPIC study was designed with randomization and participation protocols that are vulnerable to contamination given that participants could seek services independent of randomization, analyses required item- and wave-level imputation to address

missing data, and participants were identified by agencies in the CEP programs (and not RS). These concerns have been previously examined and demonstrated as either of modest and decreasing bias, to have underestimated CEP contribution, or to not significantly impact the efficacy of care delivery.<sup>21,29</sup> With regard to this secondary analysis specifically, CPIC was not powered to detect differences in racial/ethnic subgroups, and may therefore underestimate the potential impact of community participatory interventions. Similarly, this study's limited sample size prevents nuanced examination of outcomes according to the diversity within the two racial/ethnic groups themselves (eg, according to primary language or nation of birth among Latino participants<sup>11</sup>).

This study focuses on two large communities of color in the Los Angeles area, and as such it remains unclear how expanded collaborative care models based in CPPR processes would reduce disparities in mental health access and outcomes for other marginalized racial/ethnic groups and/or in other geographies throughout the United States. A recent review of integrated behavioral health care for Native Americans mirrored the sentiment echoed in this exploratory analysis, that in order for interventions to benefit marginalized communities, they must "be carried out collaboratively and elicit local knowledge."<sup>30</sup>

## CONCLUSIONS

In order to promote health equity, the Institute of Medicine<sup>31</sup> and others recommend community-partici-

patory processes to build capacity in historically marginalized groups.<sup>32</sup> Service interventions and research that prioritize community input and include non-health care agencies can uniquely address real-world barriers influencing care – both in regard to service utilization as well as cultural, historical, and structural factors.<sup>33–35</sup> Yet, there are few studies that focus intentionally on the effects of collaborative care (CC) interventions for specific racial/ethnic groups and fewer that approach CC through the lens of community-based coalitions. Absent this understanding, there remains a paucity of data to guide policy or systems delivery reform capable of generating equity.<sup>36</sup>

This exploratory secondary analysis suggests that, for Black and Latino adults with depressive symptoms, there may have been short-term benefit in clinical and community-prioritized outcomes in a coalition-based intervention for multi-sector depression QI relative to program technical assistance alone. The modest effect sizes associated with each significant outcome, even despite noted limitations in study design and analysis, offers promise for continued investigation of expanded community-participatory collaborative care interventions to address multi-level barriers and improve service delivery of tailored content to marginalized communities.

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#### CONFLICT OF INTEREST

No conflicts of interest to report.

#### AUTHOR CONTRIBUTIONS:

Research concept and design: Barceló, Miranda, Chung, Bonds, Dixon, Wells; Acquisition of data: Miranda, Chung, Bonds, Dixon, Wells; Data analysis and interpretation: Barceló, Lopez, Tang, Aguilera, Jones, Miranda, Chung, Arevian, Izquierdo, Wells; Manuscript draft: Barceló, Lopez, Tang, Aguilera, Jones, Miranda, Chung, Arevian, Izquierdo, Wells; Statistical expertise: Barceló; Acquisition of funding: Miranda, Chung, Wells; Administrative: Barceló, Lopez, Tang, Aguilera, Jones, Miranda, Chung, Arevian, Bonds, Dixon, Wells; Supervision: Miranda, Izquierdo, Dixon, Wells

#### REFERENCES

1. Lagomasino IT, Dwight-Johnson M, Miranda J, et al. Disparities in depression treatment for Latinos and site of care. *Psychiatr Serv.* 2005;56(12):1517-1523. <https://doi.org/10.1176/appi.ps.56.12.1517> PMID:16339612
2. 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. *J Gen Intern Med.* 2013;28(10):1268-1278.

<https://doi.org/10.1007/s11606-013-2484-3> PMID:23649787

3. *Mental Health: Culture, Race, and Ethnicity - A Supplement to Mental Health: A Report of the Surgeon General.* Vol 2. U.S. Department of Health and Human Services; 2001.
4. Olfson M, Marcus SC. National patterns in antidepressant medication treatment. *Arch Gen Psychiatry.* 2009;66(8):848-856. <https://doi.org/10.1001/archgenpsychiatry.2009.81> PMID:19652124
5. Alegría M, Chatterji P, Wells K, et al. Disparity in depression treatment among racial and ethnic minority populations in the United States. *Psychiatr Serv.* 2008;59(11):1264-1272. <https://doi.org/10.1176/ps.2008.59.11.1264> PMID:18971402
6. Cook BL, Zuvekas SH, Chen J, Progovac A, Lincoln AK. Assessing the individual, neighborhood, and policy predictors of disparities in mental health care. *Med Care Res Rev.* 2017;74(4):404-430. <https://doi.org/10.1177/1077558716646898> PMID:27147641
7. Lesser I, Rosales A, Zisook S, et al. Depression outcomes of Spanish- and english-speaking Hispanic outpatients in STAR\*D. *Psychiatr Serv.* 2008;59(11):1273-1284. <https://doi.org/10.1176/ps.2008.59.11.1273> PMID:18971403
8. Davis TD, Deen T, Bryant-Bedell K, Tate V, Fortney J. Does minority racial-ethnic status moderate outcomes of collaborative care for depression? *Psychiatr Serv.* 2011;62(11):1282-1288. [https://doi.org/10.1176/ps.62.11.pss6211\\_1282](https://doi.org/10.1176/ps.62.11.pss6211_1282) PMID:22211206
9. Cooper LA, Ghods Dinoso BK, Ford DE, et al. Comparative effectiveness of standard versus patient-centered collaborative care interventions for depression among African Americans in primary care settings: the BRIDGE Study. *Health Serv Res.* 2013;48(1):150-174. <https://doi.org/10.1111/j.1475-6773.2012.01435.x> PMID:22716199
10. Lagomasino IT, Dwight-Johnson M, Green JM, et al. Effectiveness of collaborative care for depression in public-sector primary care clinics serving Latinos. *Psychiatr Serv.* 2017;68(4):353-359. <https://doi.org/10.1176/appi.ps.201600187> PMID:27842470
11. Garcia ME, Ochoa-Frongia L, Moise N, Aguilera A, Fernandez A. Collaborative care for depression among patients with limited English proficiency: a systematic review. *J Gen Intern Med.* 2018;33(3):347-357. <https://doi.org/10.1007/s11606-017-4242-4> PMID:29256085
12. Angstman KB, Phelan S, Myszkowski MR, et al. Minority primary care patients with depression outcome disparities improve with collaborative care management. *Med Care.* 2015;53(1):32-37. <https://doi.org/10.1097/MLR.000000000000280> PMID:25464162
13. Lee-Tauler SY, Eun J, Corbett D, Collins PY. A systematic review of interventions to improve initiation of mental health care among racial-ethnic minority groups. *Psychiatr Serv.* 2018;69(6):628-647. <https://doi.org/10.1176/appi.ps.201700382> PMID:29716446
14. Springgate B, Tang L, Ong M, et al. Comparative Effectiveness of coalitions versus technical assistance for depression quality improvement in persons with multiple chronic conditions. *Ethn Dis.* 2018;28(2)(suppl 2):325-338. <https://doi.org/10.18865/ed.28.S2.325> PMID:30202185
15. Bao Y, Alexopoulos GS, Casalino LP, et al. Collaborative depression care management and disparities in depression treatment and outcomes. *Arch Gen Psychiatry.* 2011;68(6):627-636. <https://doi.org/10.1001/archgenpsychiatry.2011.55> PMID:21646579
16. Ramanuj P, Ferenchik E, Docherty M, Spaeth-Ruble B, Pincus HA. Evolving models of integrated behavioral health and primary care. *Curr Psychiatry Rep.* 2019;21(1):4. <https://doi.org/10.1007/s11920-019-0985-4> PMID:30661126
17. Jones L, Wells K, Norris K, Meade B, Koegel P. Chapter 1. The vision, valley, and victory of community engagement. *Ethn Dis.* 2009;19(Suppl 6):S6-3-S6-7 PMID:19602693
18. Wells K, Jones L. "Research" in community-partnered, participatory research. *JAMA.* 2009;302(3):320-321. <https://doi.org/10.1001/jama.2009.1033> PMID:19602693
19. Khodyakov D, Sharif MZ, Dixon EL, et al. An implementation evaluation of the community engagement and planning intervention in the CPIC Depression Care Improvement Trial. *Community Ment Health J.* 2014;50(3):312-324. <https://doi.org/10.1007/s10597-012-9586-y> PMID:23625140
20. Jones L, Meade B, Forge N, et al. Chapter 2. Begin your partnership: the process of engagement. *Ethn Dis.* 2009;19(Suppl 6):S6-8-S6-16. PMID: 20088077
21. Ong MK, Jones L, Aoki W, et al. A Community-partnered, participatory, cluster-randomized study of depression care quality improvement: three-year outcomes. *Psychiatr Serv.* 2017;68(12):1262-1270. <https://doi.org/10.1176/appi.ps.201600488> PMID:28712349
22. Korn E, Graubard B. Analysis of health surveys. In: Groves R, Kalton G, Schwarz N, eds. *Probability and Statistics Survey Methodology Section.* New York, NY: Wiley Interscience; 1999.
23. Lavori P, Dawson R, Shera D. A multiple imputation strategy for clinical trials with truncation of patient data. *Stat Med.* 1995; (14):1913-1925. <https://doi.org/10.1002/sim.4780141707>
24. Rubin D. *Multiple Imputation for Nonresponse in Surveys.* Hoboken, NJ: John Wiley & Sons;

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- 2004.
25. Binder D. On the variances of asymptotically normal estimators from complex surveys. *Int Stat Rev Int Stat.* 1983;279-292.
26. Chowdhury PP, Balluz LS, Zhao G, Town M. Health behaviors and obesity among Hispanics with depression, United States 2006. *Ethn Dis.* 2014;24(1):92-96. PMID:24620454
27. Ward EC, Wiltshire JC, Detry MA, Brown RL. African American men and women's attitude toward mental illness, perceptions of stigma, and preferred coping behaviors. *Nurs Res.* 2013;62(3):185-194. <https://doi.org/10.1097/NNR.0b013e31827bf533> PMID:23328705
28. Caplan S. Intersection of cultural and religious beliefs about mental health: Latinos in the faith-based setting. *Hisp Health Care Int.* 2019;17(1):4-10. <https://doi.org/10.1177/1540415319828265> PMID:30799650
29. Gilbody SM, House AO, Sheldon TA. Routinely administered questionnaires for depression and anxiety: systematic review. *BMJ.* 2001;322(7283):406-409. <https://doi.org/10.1136/bmj.322.7283.406> PMID:11179161
30. Lewis ME, Myhra LL. Integrated care with Indigenous populations: considering the role of health care systems in health disparities. *J Health Care Poor Underserved.* 2018;29(3):1083-1107. <https://doi.org/10.1353/hpu.2018.0081> PMID:30122685
31. *The Role and Potential of Communities in Population Health Improvement: Workshop Summary.* Washington, DC: The Institute of Medicine, The National Academies Press; 2015.
32. Thomas SB, Quinn SC, Butler J, Fryer CS, Garza MA. Toward a fourth generation of disparities research to achieve health equity. *Ann Rev Public Health.* 2011; 32:399-419. <https://doi.org/10.1146/annurev-publ-health-031210-101136>
33. Carpenter-Song E, Chu E, Drake RE, Ritsema M, Smith B, Alverson H. Ethno-cultural variations in the experience and meaning of mental illness and treatment: implications for access and utilization. *Transcult Psychiatry.* 2010;47(2):224-251. <https://doi.org/10.1177/1363461510368906> PMID:20603387
34. Santiago CD, Miranda J. Progress in improving mental health services for racial-ethnic minority groups: a ten-year perspective. *Psychiatr Serv.* 2014;65(2):180-185. <https://doi.org/10.1176/appi.ps.201200517> PMID:24178249
35. Wrenn G, Kasiah F, Belton A, et al. Patient and practitioner perspectives on culturally centered integrated care to address health disparities in primary care. *Perm J.* 2017;21:16-018. <https://doi.org/10.7812/TPP/16-018> PMID:28488990
36. Interian A, Lewis-Fernández R, Dixon LB. Improving treatment engagement of underserved U.S. racial-ethnic groups: a review of recent interventions. *Psychiatr Serv.* 2013;64(3):212-222. <https://doi.org/10.1176/appi.ps.201100136> PMID:23203442