Elements of Integrated Behavioral Health Associated with Primary Care Provider Confidence in Managing Depression at Community Health Centers

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BACKGROUND: Depression is most often treated by primary care providers (PCPs), but low self-efficacy in caring for depression may impede adequate management. We aimed to identify which elements of integrated behavioral health (BH) were associated with greater confidence among PCPs in identifying and managing depression.

DESIGN: Mailed cross-sectional surveys in 2016.

PARTICIPANTS: BH leaders and PCPs caring for adult patients at community health centers (CHCs) in 10 midwestern states.

MAIN MEASURES: Survey items asked about depression screening, systems to support care, availability and integration of BH, and PCP attitudes and experiences. PCPs rated their confidence in diagnosing, assessing severity, providing counseling, and prescribing medication for depression on a 5-point scale. An overall confidence score was calculated (range 4 (low) to 20 (high)). Multilevel linear mixed models were used to identify factors associated with confidence.

KEY RESULTS: Response rates were 60% (N=77/128) and 52% (N=538/1039) for BH leaders and PCPs, respectively. Mean overall confidence score was 15.25±2.36. Confidence was higher among PCPs who were satisfied with the accuracy of depression screening (0.38, p=0.01), worked at CHCs with depression tracking systems (0.48, p=0.045), had access to patients' BH treatment plans (1.59, p=0.002), and cared for more patients with depression (0.29, p=0.003). PCPs who reported their CHC had a sufficient number of psychiatrists were more confident diagnosing depression (0.20, p=0.02) and assessing severity (0.24, p=0.03). Confidence in prescribing was lower at CHCs with more patients living below poverty (−0.66, p<0.001). Confidence in diagnosing was lower at CHCs with more Black/African American patients (−0.20, p=0.03).

CONCLUSIONS: PCPs who had access to BH treatment plans, a system for tracking patients with depression, screening protocols, and a sufficient number of psychiatrists were more confident identifying and managing depression. Efforts are needed to address disparities and support PCPs caring for vulnerable patients with depression.

KEY WORDS: depression; behavioral health integration; primary care providers; screening; health centers.

INTRODUCTION

About 7% of adults in the USA experience major depression each year and lifetime risk is nearly 30%.[1,2] Depression is associated with lower quality of life, worse health outcomes, and higher mortality,[3–11] yet more than a third of people with depression do not receive treatment.[2] Since depression is most often treated in primary care, it is important to have primary care providers (PCPs) who are prepared to diagnose and manage depression.[12–14] Systematic screening can improve detection,[15,16] but screening alone does not improve care or outcomes.[17] Many PCPs lack confidence in their abilities to assess depression severity, offer counseling or behavioral interventions, and provide ongoing management.[18–22]

Integration of behavioral health (BH) and primary care is one key to improving depression care. The goal of integration is not only to facilitate access to behavioral health providers (BHPs) such as therapists, social workers, and psychiatrists, but also to increase the primary care team's capacity to identify, assess, and treat BH conditions.[23] Several studies have found that collaborating with BHPs increases PCPs' own knowledge and confidence in managing depression and other BH conditions.[24–30] However, one study found that PCPs' perceived competence did not differ at integrated and non-integrated clinics, with integration defined as having BHPs onsite at least once per week.[31]

One major challenge to understanding the impact of BH integration is that it is a broad term encompassing multiple approaches to care and varying degrees of interaction between

PCPs and BHPs.[32,33] Prior studies have not explored how different components of integration impact the care PCPs provide for patients with depression. Community health centers (CHCs) are an important setting to study this question because they serve a large number of patients with depression—about one in 11 people in the USA receive care at CHCs—and the majority of CHCs have implemented some level of integrated BH.[34–36] The aim of this study was to examine provider- and organization-level factors, including specific elements of integrated BH (e.g., screening, treatment protocols, access to BHPs, collaboration), associated with higher PCP confidence in identifying and managing depression at CHCs.

METHODS

Design

We partnered with Midwest Clinicians' Network (MWCN), a nonprofit corporation that provides education, research, and networking opportunities, because of its wide reach (>120 CHCs in 10 states) and our history of successful collaborative research.[37–40] In summer 2016, we sent a survey to BH directors at MWCN-affiliated CHCs. If a CHC did not have a BH director, the survey was sent to the medical director or another leader knowledgeable about the CHC's BH services. In fall 2016, we contacted the CHC leaders who had completed the survey ("CHC survey") and requested names and mailing addresses of PCPs who cared for adult patients to send a second survey ("PCP survey"). The study was determined to be exempt by the University of Chicago Institutional Review Board.

Measures

BH leaders and PCPs answered questions about the CHC environment, including depression screening practices, systems and support for depression care, availability of BH services, and integration between primary care and BH. PCPs also answered questions about their attitudes and experiences related to depression and BH. The conceptual model for the study was informed by social cognitive theory, which posits a reciprocal relationship between person, behavior, and environment and emphasizes the role of self-efficacy or confidence in determining performance (see Fig. 1).[41,42]

To measure PCP confidence in diagnosing, assessing severity, providing counseling, and prescribing medication for depression, PCPs rated their agreement with statements (e.g., I am confident in my ability to assess depression severity; 1 = strongly disagree to 5 = strongly agree), adapted from the Perceived Self-Efficacy in Diagnosing and Treating Depression Scale.[20,43] An overall confidence score was calculated as the sum of PCPs' responses to the four items (range 4–20; Cronbach's alpha=0.79).

Publicly available data on CHCs' patient populations were downloaded from the Bureau of Primary Health Care Uniform Data System.[44]

Analysis

This cross-sectional study had a hierarchical multilevel structure: PCP (level 1), CHC (level 2), and state (level 3). We used basic descriptive statistics to summarize the CHC- and PCP-level data. We used a multilevel model via a linear mixed model (LMM) to model PCP confidence and test associations with predictors. State and CHC nested within state were considered random intercepts. We first conducted unadjusted univariate analyses by adding one predictor at a time into an LMM. We then conducted adjusted multivariate analyses of those covariates with p-value <0.10 in unadjusted analyses. We applied the backward model selection procedure to eliminate non-significant predictors in the multivariate LMM until all p-values were <0.10.

We also conducted missing data analyses. The primary analysis was based on the complete dataset, due to only 1.9% missing in PCP confidence and 0–11.9% missing in one of the covariates. There were 30.9% missing across PCP confidence and covariates. We imputed all missing data, using the multiple imputation method, via the Markov chain Monte Carlo algorithm. We used all covariates for the multiple imputations and generated 10 imputed datasets, which were used to calculate a mean dataset, where all missing values were filled with mean values. SAS version 9.4 software was used for analyses.

RESULTS

Four of the 132 MWCN-affiliated CHCs were deemed ineligible: three offered limited primary care services and mail for one was undeliverable. Of the remaining CHCs (N=128), 77 returned completed surveys (60% response rate, see Supplemental Figure 1) and 73 provided contact information for PCPs. Of 1039 eligible PCPs, 538 from 71 CHCs returned surveys (55% adjusted response rate, see Supplemental Figure 2). States with the most responding CHCs were Illinois (N=15), Michigan (N=14), and Ohio (N=13). On average, 26% of patients at CHCs were Black/African American, 16% were Hispanic/Latino, and 68% had an income below the federal poverty level. Most PCP respondents were female (71%), were White (73%), and had been working at their CHC an average of 5.8 years (Table 1).

The overall mean confidence score was 15.25±2.36. Most PCPs reported they were confident in diagnosing depression (93% agree or strongly agree (N=497), mean 4.17±0.59), assessing severity (74% (N=394), 3.90±0.78), and prescribing medication (87% (N=463), 4.03±0.68). Less than half were confident in their ability to provide counseling for depression (37% (N=199), 3.15±0.98). Among all PCPs, 39% (N=200) were interested in more training on medication management of
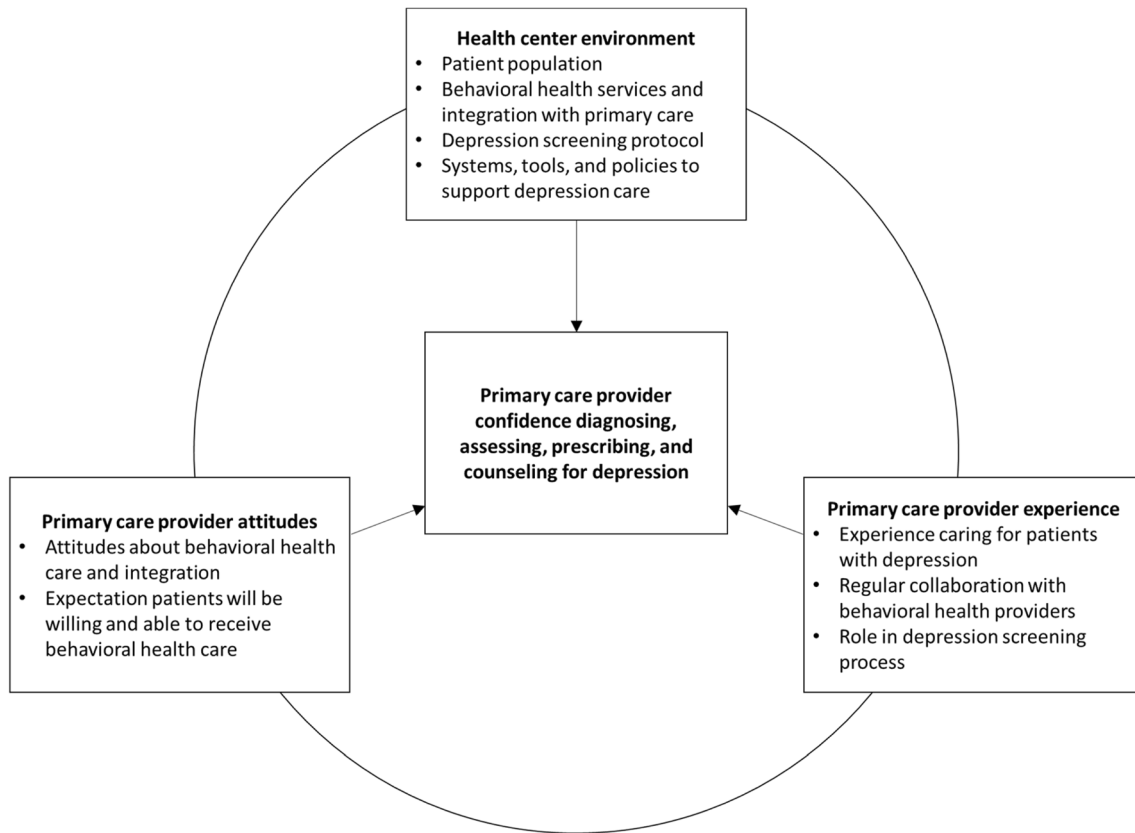
Health center environment
- Patient population
- Behavioral health services and integration with primary care
- Depression screening protocol
- Systems, tools, and policies to support depression care

Primary care provider confidence diagnosing, assessing, prescribing, and counseling for depression

Primary care provider attitudes
- Attitudes about behavioral health care and integration
- Expectation patients will be willing and able to receive behavioral health care

Primary care provider experience
- Experience caring for patients with depression
- Regular collaboration with behavioral health providers
- Role in depression screening process

Figure 1 Conceptual model

depression and 29% (*N*=151) were interested in more training on counseling; among those who did not express confidence in these areas, 64% (*N*=43) desired training in medication management but only 33% (*N*=107) desired training in counseling. Notably, unlike depression counseling, the majority of PCPs were confident providing health behavior counseling (68% (*N*=362)).

Descriptive statistics for CHC- and PCP-level factors are summarized in Table 2. Nearly all PCPs (98%, *N*=526) reported that their CHCs had a depression screening protocol, with all CHCs using the PHQ-2 and/or PHQ-9.[36,45,46] Other systems, tools, and policies to support depression care were less common. While more than half of PCPs (58%, *N*=306) indicated their CHCs had a sufficient number of non-psychiatrist BHPs, few (13%, *N*=70) thought they had a sufficient number of psychiatrists. The majority of PCPs always had access to BH treatment plans (71%, *N*=367), sometimes made joint decisions with BHPs (68%, *N*=350), but never co-signed treatment plans (65%, *N*=335). PCPs agreed that BH care was important but only half (53%, *N*=281) thought their patients would be willing to see BHPs.

Modeling results for overall confidence are shown in Table 3. Results for confidence in diagnosing, assessing, prescribing, and counseling are shown in Supplemental Table 1.

PCP Characteristics

Compared to physicians, physician assistants and advanced practice nurses had lower confidence overall (−0.72, *p*=0.047 and −0.69, *p*=0.01, respectively). Overall confidence decreased with age (−0.02 per year, *p*=0.03), as did confidence providing counseling (−0.01, *p*=0.03). PCPs who cared for more patients with depression were more confident overall (0.29 per 1-level category increase, *p*=0.003) and in diagnosing (0.05, *p*=0.02), assessing severity (0.10, *p*=0.001), and prescribing medication (0.06, *p*=0.01).

Depression Screening

PCPs' satisfaction with the accuracy of depression screening was associated with greater confidence overall (0.38 per 1-point higher rating of accuracy, *p*=0.01) and in diagnosing (0.12, *p*=0.002), assessing severity (0.13, *p*=0.01), and prescribing medication (0.08, *p*=0.04). Satisfaction with the efficiency of screening was associated with confidence in providing counseling (0.12 per 1-point higher rating of efficiency, *p*=0.046). At CHCs where PCPs performed depression screening, PCPs were more confident in their ability to provide counseling (0.25, *p*=0.03), compared to CHCs where PCPs were not responsible for screening.

Table 1 Characteristics of Community Health Center (*N*=71) and Primary Care Provider (*N*=538) Survey Respondents

	Mean (SD)/*N* (%)
CHC characteristics	
Patient population, mean (SD)	
% Black/African American	26 (26)
% Hispanic/Latino	16 (19)
% < 100% Federal poverty level	68 (17)
Location, *N* (%)	
Rural	24 (34)
Urban	30 (42)
Both rural and urban	17 (24)
State, *N* (%)	
Illinois	15 (21)
Indiana	7 (10)
Iowa	3 (4)
Kansas	3 (4)
Michigan	14 (20)
Minnesota	3 (4)
Missouri	8 (11)
Nebraska	0 (0)
Ohio	13 (18)
Wisconsin	4 (6)
PCP characteristics	
Age, mean (SD)	46.7 (11.6)
Female, *N* (%)	376 (71)
Race/ethnicity, *N* (%)	
American Indian/Alaskan Native	4 (1)
Asian/Pacific Islander	38 (7)
Black/African American	47 (9)
Hispanic/Latino	29 (6)
White	395 (73)
Clinician type, *N* (%)	
Advanced practice nurse	197 (39)
Physician	243 (48)
Physician assistant	69 (14)
Years at current CHC, mean (SD)	5.8 (6.7)
Patients with depression in panel, *N* (%)	
0–10%	40 (8)
11–20%	153 (30)
21–30%	143 (28)
31–40%	97 (19)
41–50%	45 (9)
> 50%	27 (5)

Systems, Tools, and Policies for Depression Care

At CHCs with depression tracking systems, PCPs were more confident overall (0.48, *p*=0.045) and prescribing medication (0.14, *p*=0.03), compared to CHCs without tracking systems. Having stepped care protocols was associated with greater confidence assessing severity (0.18, *p*=0.01) and providing counseling (0.27, *p*=0.01). In final models, confidence was not associated with automated reminders to screen or assess severity, algorithms for antidepressant initiation or titration, depression treatment order sets, or required BH training.

Availability of BHPs

PCPs who agreed that their CHC had a sufficient number of psychiatrists were more confident diagnosing depression (0.20, *p*=0.02) and assessing severity (0.24, *p*=0.03), compared to PCPs who did not agree. PCPs who had an easier time doing warm hand-offs were more confident diagnosing depression (0.08 per 1-level increase in rating of ease, *p*=0.01). Confidence was not significantly higher among PCPs who

reported their CHC had a sufficient number of non-psychiatrist BHPs.

Regular Collaboration with BHPs

PCPs who always had access to patients' BH treatment plans were more confident overall in managing depression (1.59, *p*=0.002), compared to those who did not have access. PCPs who sometimes or always made joint decisions on treatment plans with BHPs were more confident prescribing medication for depression (0.47, *p*<0.001 and 0.38, *p*=0.01, respectively), compared to those who did not make joint decisions. Sharing offices and co-signing treatment plans with BHPs were not significantly associated with confidence in the final model.

Attitudes and Expectations About BH Care

PCPs' attitudes and expectations about BH care were not significantly associated with confidence in managing depression.

Patient Population

PCPs working at CHCs with a higher percentage of patients living below poverty were less confident overall, 1.53 points lower per 100% increase in patients below poverty (*p*=0.03). In particular, those working at CHCs with higher poverty were less confident prescribing medication (−0.66, *p*<0.001). PCPs working at CHCs with a higher percentage of Black/African American patients were less confident diagnosing depression, 0.20 points lower per 100% increase in Black/African American patients (*p*=0.03).

Missing Data Analysis

No missing patterns were found in the data. Modeling results for overall confidence using imputed data are shown in Supplemental Table 2. Results using complete and imputed data were consistent although models with imputed data had more significant covariates.

DISCUSSION

We surveyed >500 PCPs and found that most were confident in diagnosing, assessing, and prescribing medication for depression, but less than half were confident in providing depression counseling. PCPs' confidence was positively associated with having access to BH treatment plans, a system for tracking patients with depression, an accurate and efficient screening protocol that involved the PCP, stepped care protocols, and a sufficient number of psychiatrists on staff. PCPs' confidence was lower at CHCs with a greater proportion of patients living below poverty, and PCPs' confidence diagnosing depression was lower at CHCs with a greater proportion of Black/African American patients.

Table 2 Community Health Center Environment, Primary Care Provider Experiences, and Primary Care Provider Attitudes Related to Depression and Behavioral Health Care

	Survey	Mean (SD)/*N* (%)
Depression screening		
Screening protocol in place, *N* (%)	PCP	526 (98)
Frequency of screening, *N* (%)	CHC	
Every visit		15 (22)
Every 3–6 months		9 (13)
Annual		43 (63)
Responsible for screening, *N* (%)	CHC	
PCP		18 (25)
Social worker or case manager		11 (15)
Other staff (e.g., LPN, MA, front desk)		53 (75)
Screening protocol followed consistently, mean (SD)*	PCP	4.25 (0.76)
Satisfied with efficiency of depression screening, mean (SD)*	PCP	4.05 (0.80)
Satisfied with accuracy of depression screening, mean (SD)*	PCP	3.95 (0.79)
Systems, tools, and policies for depression care		
Stepped care protocols for depression, *N* (%)	PCP	220 (41)
Tracking system for depression, *N* (%)	PCP	210 (41)
Automated reminders to screen, *N* (%)	PCP	293 (56)
Automated reminders to assess severity, *N* (%)	PCP	105 (20)
Algorithm for antidepressant initiation, *N* (%)	PCP	24 (5)
Algorithm for antidepressant titration, *N* (%)	PCP	18 (3)
Depression treatment order sets, *N* (%)	PCP	21 (4)
BH training required for PCPs, *N* (%)	CHC	27 (38)
Satisfied with tracking system, mean (SD)*	PCP	3.62 (0.81)
Tracking system helps me monitor if patients are reaching treatment goals, mean (SD)*	PCP	3.43 (0.90)
Tracking system helps me provide better patient care, mean (SD)*	PCP	3.61 (0.87)
Availability of BHPs		
CHC has a sufficient number of psychiatrists, *N* (%)	PCP	70 (13)
CHC has a sufficient number of non-psychiatrist BHPs, *N* (%)	PCP	306 (58)
Ease of doing warm hand-offs to BHPs, mean (SD)†	PCP	4.0 (1.0)
Regular collaboration with BHPs		
Share same offices with BHPs, *N* (%)	PCP	283 (53)
Have access to BH treatment plans, *N* (%)	PCP	
Always		367 (71)
Sometimes		117 (23)
Never		34 (7)
Make joint decisions on treatment plans with BHPs, *N* (%)	PCP	
Always		126 (24)
Sometimes		350 (68)
Never		42 (8)
Co-sign treatment plans with BHPs, *N* (%)	PCP	
Always		66 (13)
Sometimes		116 (22)
Never		335 (65)
Attitudes and expectations about BH care		
Care that integrates BH and physical health ensures that patients receive appropriate care, *N* (%)	PCP	507 (95)
BHPs can significantly improve my patients' mental health, *N* (%)	PCP	515 (96)
BHPs can significantly improve my patients' health behaviors, *N* (%)	PCP	483 (90)
BHPs can significantly improve my patients' physical health, *N* (%)	PCP	408 (76)
Most of my patients are willing to see BHPs, *N* (%)	PCP	281 (53)
Confident that patients who agree to a referral for mental health counseling will be scheduled, *N* (%)	PCP	438 (83)
Confident that patients who agree to a referral for medication management by a psychiatrist will be scheduled, *N* (%)	PCP	271 (52)

*1–5 scale, strongly disagree to strongly agree
†1–5 scale, not possible to very easy
CHC health center, PCP primary care provider, BH behavioral health, BHP behavioral health provider

These findings suggest that system-level efforts to integrate primary care and BH can bolster PCPs' self-efficacy in caring for patients with depression. In integrated practices, BHPs often provide formal and informal training to PCPs and staff.[23] PCPs gain knowledge and confidence from the experience of regularly collaborating with BHPs and seeing patients' BH treatment plans. Conversely, we found that simply requiring PCPs to have training in BH was not associated with confidence. This is consistent with prior research showing that training alone does not improve depression detection, treatment, or outcomes; it must be combined with organizational changes.[17,47–49]

Our findings also align with previous research emphasizing the importance of a systematic approach to screening. Studies have shown that, although PCPs express confidence in their ability to diagnose depression and prefer to rely on clinical intuition over standardized tools, in real-world practice, they do not accurately identify cases.[22,48,50–53] In our study, an accurate and efficient protocol was associated with greater PCP confidence in identifying and treating depression. In

Table 3 Community Health Center and Primary Care Provider Factors Associated with Provider's Self-Rated Confidence in Managing Depression

	Unadjusted		Adjusted	
	β (95% CI)	*p*-value	β (95% CI)	*p*-value
PCP characteristics				
Age (per year)	−0.02 (−0.04, 0.00)	0.06	−0.02 (−0.04, 0.00)	0.03
Clinician type		0.02		0.02
Physician	Ref		Ref	
Physician assistant	−0.62 (−1.26, 0.02)		−0.72 (−1.43, −0.01)	
Advanced practice nurse	−0.59 (−1.04, −0.14)		−0.69 (−1.21, −0.16)	
Patients with depression*	0.30 (0.14, 0.47)	<0.001	0.29 (0.10, 0.47)	0.003
Depression screening				
Screening protocol in place	0.91 (−0.64, 2.46)	0.25	-	-
Screen more than once per year (vs. annual)	0.44 (−0.09, 0.97)	0.10	-	-
Responsible for screening				
PCP	0.53 (−0.02, 1.08)	0.06	0.54 (−0.01, 1.09)	0.05
Social worker or case manager	0.34 (−0.31, 1.00)	0.30	-	-
Other staff (e.g., LPN, MA, front desk)	−0.31 (−0.85, 0.23)	0.26	-	-
Screening protocol followed consistently†	0.44 (0.15, 0.73)	0.003	-	-
Satisfied with efficiency of screening†	0.49 (0.22, 0.76)	<0.001	-	-
Satisfied with accuracy of screening†	0.63 (0.36, 0.90)	<0.001	0.38 (0.10, 0.67)	0.01
Systems, tools, and policies for depression care				
Stepped care protocols for depression	0.86 (0.45, 1.27)	<0.001	0.40 (−0.07, 0.87)	0.10
Tracking system for depression	0.84 (0.42, 1.25)	<0.001	0.48 (0.01, 0.96)	0.045
Automated reminders to screen	0.40 (−0.01, 0.82)	0.05	-	-
Automated reminders to assess severity	0.28 (−0.23, 0.78)	0.28	-	-
Algorithm for antidepressant initiation	1.03 (0.05, 2.00)	0.04	-	-
Algorithm for antidepressant titration	1.17 (0.08, 2.25)	0.04	-	-
Depression treatment order sets	0.49 (−0.54, 1.53)	0.35	-	-
BH training required for PCPs	−0.08 (−0.58, 0.42)	0.74	-	-
Availability of BHPs				
CHC has a sufficient number of psychiatrists	0.92 (0.32, 1.51)	0.003	-	-
CHC has a sufficient number of non-psychiatrist BH	0.22 (−0.19, 0.64)	0.30	-	-
Ease of doing warm hand-offs to BHPs‡	0.35 (0.15, 0.56)	0.001	-	-
Regular collaboration with BHPs				
Share same offices with BHPs	0.47 (0.06, 0.88)	0.02	-	-
Have access to BH treatment plans		<0.001		0.003
Always	2.01 (1.16, 2.85)		1.59 (0.60, 2.59)	
Sometimes	1.20 (0.29, 2.11)		1.05 (−0.01, 2.11)	
Never	Ref		Ref	
Make joint decisions on treatment plans with BHPs		0.001		
Always	1.57 (0.74, 2.39)		-	-
Sometimes	0.90 (0.15, 1.65)		-	-
Never	Ref		-	-
Co-sign treatment plans with BHPs		0.01		
Always	0.92 (0.27, 1.57)		-	-
Sometimes	0.53 (0.02, 1.04)		-	-
Never	Ref		-	-
Attitudes and expectations about BH care				
BHPs can significantly improve my patients' mental health	0.10 (−0.95, 1.15)	0.85	-	-
Care that integrates BH and physical health ensures that patients receive appropriate care	0.57 (−0.37, 1.52)	0.23	-	-
Most of my patients are willing to see BHPs	0.29 (−0.12, 0.70)	0.16	-	-
Confident that patients who agree to a referral for mental health counseling will be scheduled	0.49 (−0.05, 1.03)	0.08	-	-
Confident that patients who agree to a referral for medication management will be scheduled	0.37 (−0.05, 0.79)	0.09	-	-
Patient population				
Black/African American§	−0.75 (−1.73, 0.24)	0.13	-	-
Hispanic/Latino§	−0.02 (−1.36, 1.32)	0.97	-	-
< 100% FPL§	−2.26 (−3.60, −0.92)	0.001	−1.53 (−2.92, −0.14)	0.03

Unless otherwise noted, β is difference in PCP confidence score associated with having/not having a characteristic or agreeing/not agreeing with a statement (e.g., β=1 indicates 1 point higher on overall confidence scale, which has a possible range of 4–20). "-" indicates the variable was not retained in the final model

*β is difference in PCP confidence per 1-level category increase in patients with depression on panel (0–10%, 11–20%, 21–30%, 31–40%, 41–50%, >50%)

†β is difference in PCP confidence per 1-point increase on 1–5 scale, strongly disagree to strongly agree

‡β is difference in PCP confidence per 1-point increase on 1–5 scale, not possible to very easy

§β is difference in PCP confidence score per 100% increase in patient population

addition, at CHCs where PCPs were responsible for screening, PCPs were more confident providing

counseling for depression. Given that studies have found higher screening rates when screening is conducted by

staff rather than PCPs, a protocol that relies on other team members and involves the PCP may be most helpful.[54–56]

Interestingly, we found that confidence was higher when PCPs felt their CHC had a sufficient number of psychiatrists, but was not related to their perception of the number of other BHPs. This distinction might be due to psychiatrists' status as physicians, their expertise in psychotropic medication, the relative rarity of psychiatrists, or some other factors. Difficulty recruiting and retaining psychiatrists has been one of the most commonly cited barriers to BH integration in CHCs.[36,57] CHCs are often located in areas without psychiatrists, and resource-limited CHCs may favor hiring other BHPs with lower salaries.[58,59] However, psychiatric consultation is a key component of the collaborative care model, which is the integrated BH model with the most robust research support.[60]

Similar to earlier studies, we found that PCPs' confidence in providing counseling for depression was lower than their confidence in diagnosing and prescribing medication.[22,52,61] Brief evidence-based behavioral and psychosocial interventions for depression can be delivered by PCPs.[62–64] The skills and strategies involved have considerable overlap with health behavior counseling, which PCPs expressed greater confidence doing. Younger PCPs were more confident in providing counseling for depression, which may reflect changes over time in health professionals' attitudes toward mental illness, public acceptance of mental health treatment, and efforts to integrate BH into primary care training.[65–67]

We found that PCPs were less confident overall, and in particular less confident prescribing medication, at CHCs with more patients living below poverty. PCPs may feel that treatment will have limited effect on outcomes if patients have substantial unmet social needs, or that socioeconomic or insurance barriers will prevent patients from engaging in treatment. Additionally, we found that PCPs were less confident diagnosing depression at CHCs with more Black/African American patients. This aligns with prior research showing disproportionate under- and misdiagnosis of depression among Black/African American patients.[68–71]

An important caveat is that we measured PCP confidence, which may not reflect actual knowledge, skill, or behavior—though prior research has found that greater confidence is associated with more guideline-adherent care for depression.[72] While we did not assess quality of care or patient outcomes, previous studies have found that screening, stepped care, and patient tracking improve depression outcomes,[73–79] and the number of BHPs in a clinic is associated with degree of integration.[35] Effects of access to BH treatment plans are under investigation.[80] Factors that we did not find to be associated with PCP confidence could still affect quality of care and patient outcomes. For example, studies have shown that reminders increase screening and treatment rates[81–83] and that use of treatment algorithms is associated with greater likelihood of receiving adequate care for depression.[84,85] A

combination of components and effective implementation are likely key.[86]

There are a few additional limitations to this study. Findings may not be generalizable to all primary care settings given our focus on midwestern CHCs and the predominantly White female respondents. It is possible that CHCs and PCPs with a greater interest in BH may have been more likely to respond to the survey. The cross-sectional design precludes causal inferences, and results reflect PCPs' comfort managing depression when the survey was conducted in 2016. We likely did not consider all factors related to confidence. In particular, we did not assess PCPs' beliefs in regard to what their role in depression care should be or mental health stigma.

The results of this study may be helpful for CHCs and other health care organizations interested in improving depression care. Having clinic-level systems in place for depression screening, treatment, and follow-up may be instrumental to increasing PCPs' confidence in managing depression. Tools like registries and treatment protocols support the PCP in proactively managing patients and ensuring they receive adequate treatment.[87,88] Shared access to BH treatment plans is also helpful for PCPs and could be made the default in a clinic's EHR; only psychotherapy notes need to be kept private according to HIPAA rules.[89] In regard to personnel, organizations may want to consider the value of access to psychiatrists for both patients and PCPs. Psychiatric nurse practitioners could also play a role in integrated BH.[90] When on-site psychiatry is not feasible, telemedicine-based collaborative care for depression has been shown to be effective in the CHC setting.[91] Moreover, collaborative care has been shown to improve treatment engagement among underserved racial/ethnic populations.[92]

Policy changes could also support depression care. Current depression quality measures focus on screening and remission 1 year after a positive screen.[44] Evaluating intermediary processes and outcomes (e.g., follow-up assessments, dose and duration of medication and/or therapy, significant symptom reduction) could be useful. Increasing reimbursement rates, establishing CHCs as training sites, and offering financial incentives and mentorship for those employed in underserved areas could encourage more psychiatrists to work in CHCs.[93–95] These changes are important for promoting health equity, given the shortage of BHPs is more severe in areas with higher concentrations of racial/ethnic minorities.[96] Additional efforts are needed within and beyond the health care system to address economic and racial/ethnic disparities in depression prevalence, care, and outcomes.[93,97,98] Future research should examine why confidence was lower among advanced practice nurses and physician assistants, and assess PCPs' confidence in managing other BH conditions.

In conclusion, low PCP self-efficacy is a barrier to effective depression care. Primary care clinics should be encouraged and incentivized to implement systems and tools that support PCPs and facilitate depression care. Integrated BH may be an important strategy to increase PCPs' confidence in caring for

patients with depression. Additional efforts to address socio-economic barriers and structural racism are needed to improve depression care and reduce disparities among vulnerable populations.

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REFERENCES

1. Kessler RC, Petukhova M, Sampson NA, Zaslavsky AM, Wittchen HU. Twelve-month and lifetime prevalence and lifetime morbid risk of anxiety and mood disorders in the United States. *International journal of methods in psychiatric research.* 2012;21(3):169-184.
2. National Institute of Mental Health. Major Depression. 2019; https://www.nimh.nih.gov/health/statistics/major-depression.shtml. Accessed October 15, 2020.
3. GBD 2015 Disease and Injury Incidence and Prevalence Collaborators. Global, regional, and national incidence, prevalence, and years lived with disability for 310 diseases and injuries, 1990-2015: a systematic analysis for the Global Burden of Disease Study 2015. *Lancet (London, England)* 2016;388(10053):1545-1602.
4. Walker ER, McGee RE, Druss BG. Mortality in mental disorders and global disease burden implications: a systematic review and meta-analysis. *JAMA psychiatry.* 2015;72(4):334-341.
5. Jantaratnotai N, Mosikanon K, Lee Y, McIntyre RS. The interface of depression and obesity. *Obesity research & clinical practice.* 2017;11(1):1-10.
6. Jha MK, Qamar A, Vaduganathan M, Charney DS, Murrough JW. Screening and Management of Depression in Patients With Cardiovascular Disease: JACC State-of-the-Art Review. *Journal of the American College of Cardiology.* 2019;73(14):1827-1845.
7. Yu M, Zhang X, Lu F, Fang L. Depression and Risk for Diabetes: A Meta-Analysis. *Canadian journal of diabetes.* 2015;39(4):266-272.
8. Cademartori MG, Gastal MT, Nascimento GG, Demarco FF, Corrêa MB. Is depression associated with oral health outcomes in adults and elders? A systematic review and meta-analysis. *Clinical oral investigations.* 2018;22(8):2685-2702.
9. Mathew AR, Hogarth L, Leventhal AM, Cook JW, Hitsman B. Cigarette smoking and depression comorbidity: systematic review and proposed theoretical model. *Addiction (Abingdon, England).* 2017;112(3):401-412.
10. IsHak WW, Wen RY, Naghdechi L, et al. Pain and Depression: A Systematic Review. *Harv Rev Psychiatry.* 2018;26(6):352-363.
11. Zareifopoulos N, Bellou A, Spiropoulou A, Spiropoulos K. Prevalence, Contribution to Disease Burden and Management of Comorbid Depression and Anxiety in Chronic Obstructive Pulmonary Disease: A Narrative Review. *Copd.* 2019;16(5-6):406-417.
12. Unützer J, Park M. Strategies to improve the management of depression in primary care. *Primary care.* 2012;39(2):415-431.
13. Harman JS, Veazie PJ, Lyness JM. Primary care physician office visits for depression by older Americans. *Journal of general internal medicine.* 2006;21(9):926-930.
14. Alson AR, Robinson DM, Ivanova D, et al. Depression in primary care: Strategies for a psychiatry-scarce environment. *International journal of psychiatry in medicine.* 2016;51(2):182-200.
15. Yano EM, Chaney EF, Campbell DG, et al. Yield of practice-based depression screening in VA primary care settings. *Journal of general internal medicine.* 2012;27(3):331-338.
16. Pfoh ER, Janmey I, Anand A, Martinez KA, Katzan I, Rothberg MB. The Impact of Systematic Depression Screening in Primary Care on Depression Identification and Treatment in a Large Health Care System: A Cohort Study. *Journal of general internal medicine.* 2020.
17. Mitchell AJ, Vahabzadeh A, Magruder K. Screening for distress and depression in cancer settings: 10 lessons from 40 years of primary-care research. *Psycho-oncology.* 2011;20(6):572-584.
18. Hart AM, Macnee CL. How well are nurse practitioners prepared for practice: Results of a 2004 questionnaire study. *Journal of the American Academy of Nurse Practitioners.* 2007;19(1):35-42.
19. Hart AM, Bowen A. New nurse practitioners' perceptions of preparedness for and transition into practice. *The Journal for Nurse Practitioners.* 2016;12(8):545-552.
20. Gerrity MS, Williams JW, Dietrich AJ, Olson AL. Identifying physicians likely to benefit from depression education: a challenge for health care organizations. *Medical care.* 2001;39(8):856-866.
21. Browne MO, Lee A, Prabhu R. Self-reported confidence and skills of general practitioners in management of mental health disorders. *Australian Journal of Rural Health.* 2007;15(5):321-326.
22. Alexander C, Fraser J. General practitioners' management of patients with mental health conditions: the views of general practitioners working in rural north-western New South Wales. *The Australian journal of rural health.* 2008;16(6):363-369.
23. Blasi PR, Cromp D, McDonald S, et al. Approaches to Behavioral Health Integration at High Performing Primary Care Practices. *Journal of the American Board of Family Medicine : JABFM.* 2018;31(5):691-701.
24. Rodríguez EM, Gulbas LE, George-Jones J, Leija A, Burrows D, Neavel C. Interdisciplinary Perspectives on an Integrated Behavioral Health Model of Psychiatry in Pediatric Primary Care: A Community-Based Participatory Research Study. *Community mental health journal.* 2019;55(4):569-577.
25. Garfunkel LC, Pisani AR, leRoux P, Siegel DM. Educating residents in behavioral health care and collaboration: comparison of conventional and integrated training models. *Academic medicine : journal of the Association of American Medical Colleges.* 2011;86(2):174-179.
26. Hemming P, Hewitt A, Gallo JJ, Kessler R, Levine RB. Residents' Confidence Providing Primary Care With Behavioral Health Integration. *Family medicine.* 2017;49(5):361-368.
27. Zallman L, Joseph R, O'Brien C, et al. Does behavioral health integration improve primary care providers' perceptions of health-care system functioning and their own knowledge? *General hospital psychiatry.* 2017;46:88-93.
28. Kisely S, Duerden D, Shaddick S, Jayabarathan A. Collaboration between primary care and psychiatric services: does it help family physicians? *Canadian family physician Medecin de famille canadien.* 2006;52(7):876-877.
29. Torrence ND, Mueller AE, Ilem AA, Renn BN, DeSantis B, Segal DL. Medical provider attitudes about behavioral health consultants in integrated primary care: A preliminary study. *Families, Systems, & Health.* 2014;32(4):426-432.
30. Serrano N, Monden K. The effect of behavioral health consultation on the care of depression by primary care clinicians. *WMJ : official publication of the State Medical Society of Wisconsin.* 2011;110(3):113-118.
31. Beacham AO, Herbst A, Streitwieser T, Scheu E, Sieber WJ. Primary care medical provider attitudes regarding mental health and behavioral medicine in integrated and non-integrated primary care practice settings. *Journal of clinical psychology in medical settings.* 2012;19(4):364-375.

32. Vogel ME, Kanzler KE, Aikens JE, Goodie JL. Integration of behavioral health and primary care: current knowledge and future directions. *Journal of behavioral medicine.* 2016.

33. Heath B, Wise Romero P, Reynolds K. A standard framework for levels of integrated healthcare. Washington, DC: SAMHSA-HRSA Center for Integrated Health Solutions. 2013.

34. Health Resources & Services Administration. Health Center Program: Impact and Growth. *HRSA Health Center Program* 2020; https://bphc.hrsa.gov/about/healthcenterprogram/index.html. .

35. Jones EB, Ku L. Sharing a playbook: Integrated care in community health centers in the United States. *American journal of public health.* 2015;105(10):2028-2034.

36. Staab EM, Wan W, Li M, et al. Integration of Primary Care and Behavioral Health Services in Midwestern Community Health Centers: A Mixed Methods Study. *Families, Systems & Health.* Accepted September 6, 2021.

37. Baig AA, Locklin CA, Campbell A, et al. Community health center access to resources for their patients with diabetes. *Journal of immigrant and minority health.* 2014;16(3):553-558.

38. Chin MH, Drum ML, Guillen M, et al. Improving and sustaining diabetes care in community health centers with the health disparities collaboratives. *Medical care.* 2007;45(12):1135-1143.

39. Chin MH, Kirchhoff AC, Schlotthauer AE, et al. Sustaining quality improvement in community health centers: perceptions of leaders and staff. *J Ambul Care Manage.* 2008;31(4):319-329.

40. Wilkes AE, John PM, Vable AM, et al. Combating Obesity at Community Health Centers (COACH): a quality improvement collaborative for weight management programs. *Journal of health care for the poor and underserved.* 2013;24(2 Suppl):47-60.

41. Bandura A. Social cognitive theory: An agentic perspective. *Asian journal of social psychology.* 1999;2(1):21-41.

42. Harrison AW, Rainer Jr RK, Hochwarter WA, Thompson KR. Testing the self-efficacy—performance linkage of social—cognitive theory. *The Journal of social psychology.* 1997;137(1):79-87.

43. Main DS, Lutz LJ, Barrett JE, Matthew J, Miller RS. The role of primary care clinician attitudes, beliefs, and training in the diagnosis and treatment of depression. A report from the Ambulatory Sentinel Practice Network Inc. *Archives of family medicine.* 1993;2(10):1061-1066.

44. Health Resources & Services Administration. Health Center Data & Reporting. https://bphc.hrsa.gov/datareporting/index.html. .

45. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. *Journal of general internal medicine.* 2001;16(9):606-613.

46. Kroenke K, Spitzer RL, Williams JB. The Patient Health Questionnaire-2: validity of a two-item depression screener. *Medical care.* 2003;41(11):1284-1292.

47. Ramanuj P, Ferenchick EK, Pincus HA. Depression in primary care: part 2-management. *BMJ (Clinical research ed).* 2019;365:l835.

48. Gask L. Educating family physicians to recognize and manage depression: where are we now? *Canadian journal of psychiatry Revue canadienne de psychiatrie.* 2013;58(8):449-455.

49. Christensen H, Griffiths KM, Gulliver A, Clack D, Kljakovic M, Wells L. Models in the delivery of depression care: a systematic review of randomised and controlled intervention trials. *BMC family practice.* 2008;9:25.

50. Schwartz A, Peskin S, Spiro A, Weiner SJ. Direct observation of depression screening: identifying diagnostic error and improving accuracy through unannounced standardized patients. *Diagnosis (Berlin, Germany).* 2020;7(3):251-256.

51. Mitchell AJ, Vaze A, Rao S. Clinical diagnosis of depression in primary care: a meta-analysis. *Lancet (London, England).* 2009;374(9690):609-619.

52. Adamek ME, Kaplan MS. Caring for depressed and suicidal older patients: a survey of physicians and nurse practitioners. *International journal of psychiatry in medicine.* 2000;30(2):111-125.

53. Dowrick C, Leydon GM, McBride A, et al. Patients' and doctors' views on depression severity questionnaires incentivised in UK quality and outcomes framework: qualitative study. *BMJ (Clinical research ed).* 2009;338:b663.

54. Stoeckle JJ, Cunningham A, Al-Hawarri D, Silverio A, Valko G. The Effect of Primary Care Team Realignment on Point-of-Care Screening. *Popul Health Manag.* 2019;22(2):108-112.

55. Gorman DC, Ham SA, Staab EM, Vinci LM, Laiteerapong N. Medical Assistant Protocol Improves Disparities in Depression Screening Rates. *American Journal of Preventive Medicine.* 2021;61(5):692-700.

56. Mertens JR, Chi FW, Weisner CM, et al. Physician versus non-physician delivery of alcohol screening, brief intervention and referral to treatment in adult primary care: the ADVISe cluster randomized controlled implementation trial. *Addiction science & clinical practice.* 2015;10:26.

57. NORC. *National Association of Community Health Centers Assessment of FQHCs' Integrated Behavioral Health Services.* 2011.

58. Andrilla CHA, Patterson DG, Garberson LA, Coulthard C, Larson EH. Geographic Variation in the Supply of Selected Behavioral Health Providers. *American journal of preventive medicine.* 2018;54(6 Suppl 3):S199-s207.

59. Kaliebe KE. The Future of Psychiatric Collaboration in Federally Qualified Health Centers. *Psychiatric services (Washington, DC).* 2016;67(8):827-829.

60. Archer J, Bower P, Gilbody S, et al. Collaborative care for depression and anxiety problems. *The Cochrane database of systematic reviews.* 2012;10:Cd006525.

61. Casini F, Sighinolfi C, Tedesco P, et al. Primary care physicians' perspective on the management of anxiety and depressive disorders: a cross-sectional survey in Emilia Romagna Region. *BMC family practice.* 2013;14:75.

62. Searight HR. Counseling Patients in Primary Care: Evidence-Based Strategies. *American family physician.* 2018;98(12):719-728.

63. Richards DA, Ekers D, McMillan D, et al. Cost and Outcome of Behavioural Activation versus Cognitive Behavioural Therapy for Depression (COBRA): a randomised, controlled, non-inferiority trial. *Lancet (London, England).* 2016;388(10047):871-880.

64. Keeley R, Engel M, Reed A, Brody D, Burke BL. Toward an Emerging Role for Motivational Interviewing in Primary Care. *Current psychiatry reports.* 2018;20(6):41.

65. Lien YY, Lin HS, Tsai CH, Lien YJ, Wu TT. Changes in Attitudes toward Mental Illness in Healthcare Professionals and Students. *International journal of environmental research and public health.* 2019;16(23):4655.

66. Schomerus G, Schwahn C, Holzinger A, et al. Evolution of public attitudes about mental illness: a systematic review and meta-analysis. *Acta psychiatrica Scandinavica.* 2012;125(6):440-452.

67. Cronholm PF, Wolk CB. Guidance for Integrated Behavioral Health in Primary Care: Responding to a Proposed Curriculum. *Family medicine.* 2019;51(8):700-701.

68. Lagomasino IT, Stockdale SE, Miranda J. Racial-ethnic composition of provider practices and disparities in treatment of depression and anxiety, 2003-2007. *Psychiatric services (Washington, DC).* 2011;62(9):1019-1025.

69. Borowsky SJ, Rubenstein LV, Meredith LS, Camp P, Jackson-Triche M, Wells KB. Who is at risk of nondetection of mental health problems in primary care? *Journal of general internal medicine.* 2000;15(6):381-388.

70. Stockdale SE, Lagomasino IT, Siddique J, McGuire T, Miranda J. Racial and ethnic disparities in detection and treatment of depression and anxiety among psychiatric and primary health care visits, 1995-2005. *Medical care.* 2008;46(7):668-677.

71. Carrington CH. Clinical depression in African American women: diagnoses, treatment, and research. *Journal of clinical psychology.* 2006;62(7):779-791.

72. Smolders M, Laurant M, Verhaak P, et al. Which physician and practice characteristics are associated with adherence to evidence-based guidelines for depressive and anxiety disorders? *Medical care.* 2010;48(3):240-248.

73. Siu AL, Bibbins-Domingo K, Grossman DC, et al. Screening for Depression in Adults: US Preventive Services Task Force Recommendation Statement. *Jama.* 2016;315(4):380-387.

74. Meyers MA, Groh CJ, Binienda J. Depression screening and treatment in uninsured urban patients. *Journal of the American Board of Family Medicine : JABFM.* 2014;27(4):520-529.

75. Siniscalchi KA, Broome ME, Fish J, et al. Depression Screening and Measurement-Based Care in Primary Care. *Journal of primary care & community health.* 2020;11:2150132720931261.

76. Burdick TE, Kessler RS. Development and use of a clinical decision support tool for behavioral health screening in primary care clinics. *Applied clinical informatics.* 2017;8(2):412-429.

77. Rivero-Santana A, Perestelo-Perez L, Alvarez-Perez Y, et al. Stepped care for the treatment of depression: a systematic review and meta-analysis. *Journal of affective disorders.* 2021;294:391-409.

78. Hu J, Wu T, Damodaran S, Tabb KM, Bauer A, Huang H. The Effectiveness of Collaborative Care on Depression Outcomes for Racial/Ethnic Minority Populations in Primary Care: A Systematic Review. *Psychosomatics.* 2020;61(6):632-644.

79. Yang M, Loeb DF, Sprowell AJ, Trinkley KE. Design and Implementation of a Depression Registry for Primary Care. *American journal of medical*

quality : the official journal of the American College of Medical Quality. 2019;34(1):59-66.

80. Kessler R, Hitt JR. Re: Electronic Health Record Challenges, Workarounds, and Solutions Observed in Practices Integrating Behavioral Health and Primary Care. *Journal of the American Board of Family Medicine : JABFM.* 2016;29(2):289-290.

81. Schaeffer AM, Jolles D. Not Missing the Opportunity: Improving Depression Screening and Follow-Up in a Multicultural Community. *Joint Commission journal on quality and patient safety.* 2019;45(1):31-39.

82. Williams LS, Ofner S, Yu Z, Beyth RJ, Plue L, Damush T. Pre-post evaluation of automated reminders may improve detection and management of post-stroke depression. *Journal of general internal medicine.* 2011;26(8):852-857.

83. Sudhanthar S, Thakur K, Sigal Y, Turner J. Improving validated depression screen among adolescent population in primary care practice using electronic health records (EHR). *BMJ quality improvement reports.* 2015;4(1):u209517.w3913.

84. Duhoux A, Fournier L, Gauvin L, Roberge P. Quality of care for major depression and its determinants: a multilevel analysis. *BMC psychiatry.* 2012;12:142.

85. Menear M, Duhoux A, Roberge P, Fournier L. Primary care practice characteristics associated with the quality of care received by patients with depression and comorbid chronic conditions. *General hospital psychiatry.* 2014;36(3):302-309.

86. Van Voorhees BW, Walters AE, Prochaska M, Quinn MT. Reducing health disparities in depressive disorders outcomes between non-Hispanic Whites and ethnic minorities: a call for pragmatic strategies over the life course. *Medical care research and review : MCRR.* 2007;64(5 Suppl):157s-194s.

87. Kates N, Mach M. Chronic disease management for depression in primary care: a summary of the current literature and implications for practice. *Canadian journal of psychiatry Revue canadienne de psychiatrie.* 2007;52(2):77-85.

88. Thota AB, Sipe TA, Byard GJ, et al. Collaborative care to improve the management of depressive disorders: a community guide systematic review and meta-analysis. *American journal of preventive medicine.* 2012;42(5):525-538.

89. Department of Health and Human Services Office for Civil Rights. HIPAA Privacy Rule and Sharing Information Related to Mental Health. https:// www.hhs.gov/sites/default/files/hipaa-privacy-rule-and-sharing-info-related-to-mental-health.pdf. Accessed October 15 2021.

90. Reising V, Diegel-Vacek L, Dadabo L, Corbridge S. Collaborative Care: Integrating Behavioral Health Into the Primary Care Setting. Journal of the American Psychiatric Nurses Association. 2021 Aug 25:10783903211041653. https://doi.org/10.1177/10783903211041653.

91. Fortney JC, Pyne JM, Mouden SB, et al. Practice-based versus telemedicine-based collaborative care for depression in rural federally qualified health centers: a pragmatic randomized comparative effectiveness trial. *The American journal of psychiatry.* 2013;170(4):414-425.

92. Interian A, Lewis-Fernández R, Dixon LB. Improving treatment engagement of underserved U.S. racial-ethnic groups: a review of recent interventions. *Psychiatric services (Washington, DC).* 2013;64(3):212-222.

93. Alves-Bradford JM, Trinh NH, Bath E, Coombs A, Mangurian C. Mental Health Equity in the Twenty-First Century: Setting the Stage. *The Psychiatric clinics of North America.* 2020;43(3):415-428.

94. Behavioral Health + Economics Network. Addressing the Behavioral Health Workforce Shortage. 2018. https://www.bhecon.org/wp-content/uploads/2016/09/BHECON-Behavioral-Health-Workforce-Fact-Sheet-2018.pdf. Accessed October 15, 2020.

95. Kepley HO, Streeter RA. Closing Behavioral Health Workforce Gaps: A HRSA Program Expanding Direct Mental Health Service Access in Underserved Areas. *American journal of preventive medicine.* 2018;54(6 Suppl 3):S190-s191.

96. Cook BL, Doksum T, Chen CN, Carle A, Alegria M. The role of provider supply and organization in reducing racial/ethnic disparities in mental health care in the U.S. *Social science & medicine (1982).* 2013;84:102-109.

97. Brody DJ, Pratt LA, Hughes JP. Prevalence of Depression Among Adults Aged 20 and Over: United States, 2013-2016. *NCHS data brief.* 2018(303):1-8.

98. Weinberger AH, Gbedemah M, Martinez AM, Nash D, Galea S, Goodwin RD. Trends in depression prevalence in the USA from 2005 to 2015: widening disparities in vulnerable groups. *Psychological medicine.* 2018;48(8):1308-1315.

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