

Behavioral health integration in a nurse-led federally qualified health center: Outcomes of care

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ABSTRACT

Background: Over the past 20 years, significant evidence has emerged for collaborative care in the treatment of depression and anxiety disorders in primary care.

Purpose: The purpose of this project was to integrate an interprofessional and collaborative care model of behavioral health services into routine nurse-led primary care delivered to vulnerable and underserved populations across the lifespan. Team members included psychiatric nurse practitioners (PMHNPs), a registered nurse, and a case manager.

Methods: An Access database was developed to track clients seen by the PMHNPs. Three key outcome measures were tracked over time: Posttraumatic Stress Disorder (PTSD) Checklist Civilian Version, Hamilton Depression Rating Scale (HAM-D), and Bipolar Depression Rating Scale (BDRS). A retrospective analysis of client outcome data from January 2017 through December 2019 was conducted.

Results: There were 118 patients included who were mostly female (63.6%), White (90.7%), and not Hispanic (69.5%), with Medicaid as their primary insurance (74.6%). For each outcome, models with linear and quadratic function forms for time were fit. The final model for PTSD Checklist Score had a linear functional form for time and the final models for BDRS and HAM-D had linear and quadratic terms for time. All predictors were significantly associated with the outcome.

Implications for practice: This program demonstrated that a patient-centered, nurse-led team approach to the treatment of depression, bipolar depression, and PTSD can be successful in primary care.

Keywords: Anxiety; depression; nurse practitioner; patient care team.

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Introduction

The purpose of this project was to integrate an interprofessional and collaborative care model of behavioral health services into routine nurse-led primary care delivered to vulnerable and underserved populations across the lifespan. The practice site was Sheridan Health Services (SHS), a federally qualified, nurse-managed

health center (FQHC) and faculty practice of the University of Colorado College of Nursing, which serves a low-income population in an urban metropolitan area in the West. SHS has two sites: a community health clinic where adult services are provided and a school-based health center where patients from birth to 20 years of age receive care. The intent of this project was to improve health care outcomes as a result of a primary care model of care that is fully integrated with behavioral health support.

A framework for six levels of behavioral health integration was created for the Substance Abuse and Mental Health Services Administration (SAMHSA) and Health Resources Services Administration (HRSA) Center for Integrated Health Solutions (Heath et al., 2013). There are three broad classifications: coordinated care, colocated care, and integrated care. The two levels within coordinated care are (1) minimal collaboration and (2) basic collaboration at a distance. Colocated care includes

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(3) basic collaboration onsite and (4) close collaboration with some system integration. Finally, integrated care includes (5) close collaboration approaching an integrated practice and (6) full collaboration in a transformed/merged practice. At the onset of this project, SHS was at level 4, with close collaboration and some system integration. Behavioral health providers were available for “warm transfers” and used the same electronic health record, but there were technical barriers to a collaborative plan of care that impeded further integration.

The activities of this project aligned with the Center for Medicare and Medicaid Services focus on the updated Triple Aim: (1) better care, (2) smarter spending, and (3) healthier people (Conway, 2015). The “ACE” project, funded by the HRSA Bureau of Health Workforce, Division of Nursing and Public Health (Grant Number, UD7HP30261), focused on **A**ccess to an integrated care delivery model for behavioral health issues for underserved patients, enhanced **C**are coordination, and use of **E**vidence-based tools to facilitate diagnosis and treatment of behavioral health problems within primary care. Specific goals of the ACE project were to:

- Increase access to quality behavioral health services, moving from a colocated model of integrated care to a transformed/merged collaborative care practice model in two nurse-led primary care clinics.
- Demonstrate innovation in collaborative care coordination to treat behavioral health problems in two nurse-led primary care clinics.
- Use technology-enabled, evidence-based tools to effectively screen, diagnose, and treat patients in a fully collaborative, integrated model of care in two nurse-led primary care clinics that serve patients across the lifespan.

Background

According to the SAMHSA, individuals with mental health and substance use disorders die prematurely, primarily due to untreated chronic medical conditions such as hypertension, diabetes, and obesity. In addition, primary care settings have become the gateway for mental health treatment, with up to 30% of those seen in primary care have a co-occurring mental health and/or substance issue (SAMHSA-HRSA Center for Integrated Health Solutions, nd). These trends were noted, starting as early as 2002, that primary care settings have become the “de facto mental health care system” in the United States (Unützer et al., 2006, p. 57). In the last decade, SAMHSA has been promoting models of integrating primary care, mental health, and substance treatment. The integration of mental health care into primary care was noted to increase access to care, improve outcomes, and decrease costs (Hoffman et al., 2019). In 2016, the American

Psychiatric Association (APA) and the Academy of Psychosomatic Medicine (APM) published a report, identifying that the Collaborative Care Model has been the most consistent model of integrated care that improves outcomes for those in primary care with co-occurring mental disorders (Vanderlip et al., 2016). Thus, adaptation of the Collaborative Care Model at our site was the focus of this study in integrated care.

Over the past 20 years, significant evidence has emerged for collaborative care in the treatment of depression and anxiety disorders in primary care. Over 80 randomized controlled trials have established that collaborative care, or integrated primary care with mental health and substance treatment, is more effective than conventional care. Numerous meta-analyses of the literature further substantiated this, including a 2012 Cochrane Review that analyzed 79 randomized controlled trials and 24,308 patients worldwide, across the lifespan populations (Archer et al., 2012). Support for the use of collaborative care is emerging in other conditions such as anxiety disorders, posttraumatic stress disorder (PTSD), and comorbid medical conditions like heart disease, diabetes, and cancer (Archer et al., 2012). Leung et al. (2018) concluded that in the Veteran’s Administration integrated primary care clinic, access to mental health services increased without increasing cost. Morgan et al. (2015) reviewed the literature on collaborative care teams in primary care and identified the key elements of this model: frequent shared communication, shared clinical decision making, and a shared physical space. Thus, the current evidence demonstrates the effectiveness of collaborative care for common mental health and substance issues across treatment settings and throughout the patient lifespan.

For the past 3 years of the funded HRSA project, the primary care teams in our nurse-managed FQHC have used the collaborative care model that aligns with the triple aim and the forward movement in FQHCs to provide patient-centered health homes. The collaborative care framework is suitable for addressing a wide spectrum of behavioral health disorders such as depressive and anxiety disorders and substance abuse issues often seen in primary care settings.

In the conventional model of care, treatment is provided solely by the primary care provider. The collaborative care model differs by shifting the paradigm to employ a team approach to treatment. The treatment team is guided by five core principles of integrated behavioral health care and is expanded to include a care manager and a psychiatric consultant. The guiding principles of the collaborative care model include (AIMS Center at the University of Washington, 2011):

- Patient-Centered Team-shared care plans between primary care and behavioral health in a familiar

setting for the patient without duplication of efforts. Psychiatric consultation is used to reserve resources and manage costs while providing top notch care. In this model, the entire team is responsible for the patient outcomes.

- **Population-Based Care:** Patient care is tracked to avoid gaps or failure in treatment. Patients failing to improve receive caseload-focused consultation from mental health specialists.
- **Measurement-Based Treatment:** Clinical outcomes are measured using evidence-based tools such as the Patient Health Questionnaire-9 (PHQ-9) depression tool, PTSD Checklist Civilian Version (PCL-C), and Bipolar Depression Rating Scale (BDRS). Stepped care is provided based on outcomes measures.
- **Evidence-Based Care:** Patients receive evidence-based medication and psychotherapies. Collaborative care is one such evidence-based strategy.
- **Accountable Care:** Reimbursement is based on the quality of care and clinical outcomes and not solely the volume of patients seen.

Data collection instruments

Patient-reported outcome measures and provider administered outcome measures assist in the identification and screening of mental health symptoms and contribute to assessment and the determination of provisional mental health concerns and diagnoses (Bobo et al., 2016). Outcome measures also play a valuable role in monitoring for symptom change and efficacy of treatment (Rohan et al., 2016). Goals of the collaborative care model include treatment to target and remission of symptoms.

During the course of the collaborative care model, three outcome measures were routinely used in symptom assessment:

- The PCL-C was administered every 3 months to identify severity of PTSD symptoms. The PCL-C is a 17-item self-report of symptoms that measures the Diagnostic and Statistical Manual of Mental Disorders—Fifth Edition symptoms of PTSD (Reichenheim et al., 2018). The PCL-C was given to patients at baseline and measured every 3 months screening for PTSD and assisting in making a provisional diagnosis for PTSD. In addition, the consistent screening assisted in monitoring symptom change and efficacy of treatment.
- The second measure, The Hamilton Depression Rating Scale (HAM-D), was completed monthly to evaluate the severity of depression before and during treatment. The HAM-D is considered gold standard for measuring depression symptoms and

is a clinician-rated outcome measure (Bobo et al., 2016).

- The third measure, the BDRS, was completed every 3 months to assess depressive symptoms related to bipolar disorder. Patients with bipolar disorder experience depression throughout about half of their lives, which often places patients with bipolar disorder at risk of misdiagnosis and inappropriate treatment (Chang et al., 2015). The BDRS measures clinical characteristics consistent with bipolar depression. It is clinician administered, semi-structured, and assesses symptomatology and efficacy of therapeutic treatment (Berk et al., 2007).

Implementation

The ACE care team consisted of primary care providers, a registered nurse (RN) care coordinator, patient case manager, behavioral health providers, and a psychiatric mental health nurse practitioner (PMHNP). Care begins during a primary care visit when a patient reports behavioral symptoms. The primary care provider initiates a “Warm Transfer” with a behavioral health provider. A Warm Transfer refers to a process where behavioral health providers are introduced to the patient during the visit to further assess for the behavioral health needs of the patient, assess for risk factors, establish safety, and triage patients in need of therapy from behavior health services or psychiatric services. The behavior health provider then schedules the patient for a psychiatric evaluation. Emergent referrals are assessed and triaged into the appropriate level of care depending on acuity and if their needs can be met in an outpatient setting. The team follows the “Generalist” approach identified as a core principle in integrated primary care models that refers psychiatrically higher acuity patients to specialty care such as a community mental health center, who can better provide wrap around services (Reiter et al., 2018).

A Warm Transfer is automatically triggered if there are safety concerns related to suicidal or homicidal ideation. In addition, if there is an urgent referral for outpatient psychiatric medication management, the behavioral health provider, PMHNP, and RN care coordinator work together to assess acuity and offer the patient an appointment as soon as possible, usually within 1 week of the referral. Patients are also referred to the behavioral health providers for ongoing psychotherapy. The RN care coordinator assists the PMHNP in coordinating services to meet the mental health and physical health needs for the patient and facilitates consults between the PMHNP and the behavioral health providers. There is communication between the RN care coordinator, behavioral health providers, the PMHNP and the primary care provider. If needs arise for mental health or medical concerns, the RN care coordinator assists in the facilitation of care to

address the patient needs and provide holistic patient care. Communication and care are in both directions for continuity of care.

The case manager assesses patient needs, connects patients with resources, schedules appointments for patients, and guides patients through their treatment. Social Determinants of Health (SDOH) are assessed through the use of the Protocol for Responding to and Assessing Patients' Assets, Risks, and Experiences Assessment Tool (Spencer et al., 2016). This tool allows the case manager to establish a protocol for responding to and assessing patients' assets, risks, and experiences as a result of their living environment. As a result of the SDOH findings, the case manager coordinated services such as transportation services, food bank resources, employment and housing resources, and activity programs. The case manager also acted to bridge the gap between patient and providers and facilitate communication between multiple disciplines. The RN care coordinator and Case Manager worked together to facilitate Case Reviews for the PMHNP and schedule patients accordingly.

The role of the PMHNP was to assess, diagnose, and target psychiatric diagnoses while effectively managing treatment plans consistent with the overall health needs of the patient. The PMHNP also provided education to the patient about medical comorbidities to enhance patient outcomes and to reduce risk factors. The patient's medical comorbidities were jointly monitored and managed by the PMHNP and primary care. The PMHNP also provided consultation to our primary care providers regarding mental health medication management and treatment and suggested treatment modifications. Case reviews were scheduled with the PMHNP to review patients seeking psychiatric care with the team.

Methods

An Access database was developed to track patients seen by the PMHNP and monitor outcome measures. The RN care coordinator created huddle sheets prior to each day of patient care to highlight the need for outcomes assessments as well as to report on trends based on earlier visits. Huddle sheets took approximately 10 minutes for the care coordinator to create each day. A 15-minute daily huddle was conducted each morning and outcome assessment scores were reviewed as a part of the patient planning process. A retrospective analysis of patient outcome data from January 2017 through December 2019 was conducted. The study was deemed as not human participants by the Colorado Multiple Institutional Review Board (APP001-1). Data from 118 patients were downloaded to a spreadsheet and de-identified.

All descriptive statistics and statistical analyses were completed in SAS Version 9.4 on the 118 participants included in the study. A new time variable, time, was created by subtracting the date of new visits from the

baseline date. Insurance was recategorized into Medicaid, Medicare, other insurance, and uninsured.

Analysis

Descriptive statistics, located in Supplemental Digital Content 1 (available at <http://links.lww.com/JAANP/A90>), were created for age, gender, race, ethnicity, and insurance to look at the distributions of these variables across the sample. Only patients with baseline information for the HAM-D score were included in the demographics and used for the other outcomes because all patients who have a baseline visit were given the HAM-D. The demographics table includes those with baseline measurements who may have dropped out after one visit. Patients missing baseline measurements were removed from the analyses. Frequencies and percents were calculated for categorical variables, and *p* values were obtained from chi-square goodness of fit tests. The number missing and used along with percent missing were displayed for each variable.

Longitudinal linear mixed models with compound symmetry covariance structures were used to model the effects of covariates on three outcomes over time: BDRS score, PCL score, and the HAM-D score. In each model, the primary explanatory variable was time in days since the baseline visit. Patient age, gender, and the baseline measurements of the outcome were included in the initial models as covariates. Once the covariance structure and functional form of the primary explanatory variable, time, was determined, backward selection methods were used to identify the model of best fit. An alpha level equal to 0.05 was used to determine significance of the *p* values, and 95% confidence intervals (CIs) were calculated.

Results

Overall, there were 75 females (63.56%) and 42 males (35.59%) who participated in this grant-funded project, with 1 person not specifying their gender. The majority of the patients were classified as White (107 participants, 90.68%), but there were also 5 Black or African American (4.24%), 1 multiple races (0.85%), 3 Asian (2.54%), and 1 other Pacific Islander (0.85%) classifications. There was one person who unreported or refused to report their race (0.85%). Eighty-two participants (69.49%) were identified as not Hispanic or Latino and 27 (22.88%) were Hispanic or Latino, with the remaining 9 (7.63%) being unreported or refused to report. The patients' insurance types were broken down into 88 Medicaid users (74.58%), 4 Medicare users (3.39%), 12 other insurance users (10.17%), and 14 uninsured (11.86%) (Supplemental Digital Content 1, available at <http://links.lww.com/JAANP/A90>).

For each outcome, models with linear and quadratic function forms for time were fit. Akaike Information Criterion was used to compare model fit. For each outcome, the model with the best fit was chosen as the final model.

Table 1. Longitudinal linear mixed model results

A: Fit on BDRS		
Predictor	Estimate and Confidence Interval	p-Value
Days since baseline BDRS visit	-0.03790 (-0.04931, -0.02648)	<.0001
Days since baseline BDRS visit 2	0.000044 (0.000028, 0.000061)	<.0001
Baseline BDRS score	0.5808 (0.4554, 0.7063)	<.0001
B: Fit on PCL Score for Subjects With Baseline PTSD Scores >34		
Predictor	Regression Coefficient Estimate and Confidence Interval	p-Value
Days since baseline PCL visit	-0.02015 (-0.02529, -0.01501)	<.0001
Baseline PCL score	0.5725 (0.2990, 0.8461)	.0001
C: Fit on HAM-D		
Predictor	Point Estimate and Confidence Interval	p-Value
Days since baseline HAM-D visit	-0.03021 (-0.03635, -0.02408)	<.0001
Days since baseline HAM-D visit 2	0.000036 (0.000027, 0.000045)	<.0001
Baseline HAM-D score	0.3915 (0.2772, 0.5058)	<.0001

Note: BDRS = Bipolar Depression Rating Scale; HAM-D = Hamilton Depression Rating Scale; PCL = PTSD Checklist; PTSD = posttraumatic stress disorder.

The final model for PTSD Checklist Score had a linear functional form for time, and the final models for bipolar depression rating scale and HAM-D had linear and quadratic terms for time.

The final model examining the bipolar depression score was fit on 67 participants with 246 observations. Participants with only one visit were not included in the analysis. The model of best fit used time in the quadratic functional form, time since baseline as the primary explanatory variable, and baseline bipolar depression score as a covariate. All predictors were significantly associated with the outcome ($p \leq 0.0001$) (Table 1, A). Patients typically returned for their follow-up visits every 3 months, so bipolar depression score estimates were made at baseline and at 3, 6, 9, and 12 months. At the baseline visit, the mean bipolar depression score was 16.3557 (95% CI: 14.8315, 17.8800). At 3 months after the baseline visit, the mean bipolar depression score was 12.9450 (95% CI: 11.7590, 14.1310). At 6 months after the baseline visit, the mean bipolar depression score was 9.5342 (95% CI: 7.9060, 11.1624). At 9 months after the baseline visit, the mean bipolar depression score was 6.1234 (95% CI: 3.6623, 8.5845). At 12 months after the baseline visit, the mean bipolar depression score was 2.7126 (95% CI: -0.6968, 6.1220) (Table 2).

The final model examining the PTSD checklist score was fit on 44 patients with 359 observations. Only those with baseline PTSD scores >34 were included in the

analysis. Patients with only one visit were not included in the analysis. The model of best fit used a linear functional form for time since baseline as the primary explanatory variable and baseline PTSD checklist score as a covariate. On average, PTSD checklist scores for patients with lower baseline PTSD checklist scores increased more quickly over time with the effect of time decreasing by 0.02015 ($p \leq 0.0001$; 95% CI: -0.02529, -0.01501) for every 1 unit increase in baseline score (Table 1, B). Patients typically returned for their follow-up visits every 3 months, so PTSD Checklist score estimates were made at baseline and at 3, 6, 9, and 12 months. At the baseline visit, the mean PTSD checklist score was 43.0975 (95% CI: 38.5871, 47.6080). At 3 months after the baseline visit, the mean PTSD checklist score was 41.2838 (95% CI: 36.9096, 45.6580). At 6 months after the baseline visit, the mean PTSD checklist score was 39.4701 (95% CI: 35.1837, 43.7565). At 9 months after the baseline visit, the mean PTSD checklist score was 37.6564 (95% CI: 33.4063, 41.9065). At 12 months after the baseline visit, the mean PTSD checklist score was 35.8427 (95% CI: 31.5761, 40.1093) (Table 2).

The final model examining the HAM-D score was fit on 94 patients with 620 observations. Those with only one visit were not included in the analysis. The model of best fit used time in the quadratic functional form, time since baseline as the primary explanatory variable, and baseline HAM-D score as a covariate. All predictors were significantly associated with the outcome ($p < 0.0001$) (Table 1, C). Patients

Table 2. Bipolar Depression Rating Scale, Posttraumatic Stress Disorder Checklist Score, and Hamilton Depression Rating Scale estimates at baseline and at 3, 6, 9, and 12 months

Outcome	Time	N ^a	Estimated Mean and Confidence Interval
Bipolar Depression Rating Scale	Baseline	66	16.3557 (14.8315, 17.8800)
	3 months	43	12.9450 (11.7590, 14.1310)
	6 months	27	9.5342 (7.9060, 11.1624)
	9 months	27	6.1234 (3.6623, 8.5845)
	12 months	35	2.7126 (−0.6968, 6.1220)
Posttraumatic Stress Disorder Checklist Score	Baseline	42	43.0975 (38.5871, 47.6080)
	3 months	26	41.2838 (36.9096, 45.6580)
	6 months	21	39.4701 (35.1837, 43.7565)
	9 months	15	37.6564 (33.4063, 41.9065)
	12 months	20	35.8427 (31.5761, 40.1093)
Hamilton Depression Rating Scale	Baseline	94	14.2007 (13.2530, 15.1483)
	3 months	73	11.4814 (10.6539, 12.3088)
	6 months	44	8.7620 (7.7154, 9.8086)
	9 months	37	6.0427 (4.5833, 7.5021)
	12 months	37	3.3234 (1.3770, 5.2697)

^aBaseline: 0–45 days after baseline; 3 months: 45–135 days after baseline; 6 months: 135–225 days after baseline; 9 months: 235–315 days after baseline; 12 months: >315 days after baseline.

typically returned for their follow-up visits every 3 months, so HAM-D score estimates were made at baseline and at 3, 6, 9, and 12 months. At the baseline visit, the mean HAM-D score was 14.2007 (95% CI: 13.2530, 15.1483). Three months after the baseline visit, the mean HAM-D score was 11.4814 (95% CI: 10.6539, 12.3088). At 6 months after the baseline visit, the mean HAM-D score was 8.7620 (95% CI: 7.7154, 9.8086). At 9 months after the baseline visit, the mean HAM-D score was 6.0427 (95% CI: 4.5833, 7.5021). At 12 months after the baseline visit, the mean HAM-D score was 3.3234 (95% CI: 1.3770, 5.2697; **Table 2**).

Discussion

In January 2017, a nurse-led behavioral health integration project was initiated at SHS, a FQHC and faculty practice of the University of Colorado College of Nursing funded by HRSA. A care team consisting of a PMHNP, RN care coordinator, and case manager worked with existing behavioral health and primary care providers to incorporate care of more complex patients. Results of patient screening in primary care with the PHQ-9 and Generalized Anxiety Disorder were recorded within the electronic health record and used to determine whether a warm transfer to behavioral health was indicated. A case review with primary care, behavioral health, and core team members

determined the evidence-based treatment that was needed. An access database was designed to track three specific outcome indicators for patients receiving care from the PMHNP: the HAM-D, BDRS, and PCL. Outcome data were collected at baseline and at 3-month intervals. In review of the data, all outcome measures significantly improved from baseline.

Significant improvements in outcome measures were seen in depression, bipolar depression, and PTSD symptoms among patients seen by our core team. Alson et al. (2016) recommended that primary care practices using the Collaborative Care model implement evidence-based treatments of depression as well as appropriate consultation with a psychiatrist by primary care providers. In our collaborative care model, we were able to demonstrate significant improvements in outcome measures with our core team that included a PMHNP as the psychiatric provider. Our RN and PMHNP provided education and mentorship to our primary care and behavioral health team about evidence-based treatments for depression. The RN and case manager facilitated patients moving to the higher level of care, in this case, being seen by the PMHNP.

The results of this program support the use of specific outcome measures to drive treatment in integrated care settings. Similar to the APA and APM report (2016)

recommendations, the core team used the outcome measures to target treatment. It is important for all practices implementing the Collaborative Care model use outcome measures to monitor progress and determine whether a change in level of care is necessary.

Our HRSA-funded program supports the implementation of the Collaborative care model in primary care. The program also supports the role of the RN and PMHNP in primary care settings and is the first to publish results using these providers in care. We believe that with the Collaborative Care model, all providers can work to the top of their scope of practice, which is the best utilization of resources as well as improving satisfaction among all providers. There are many ways to implement this model and we have demonstrated that nursing can take a leadership role in improving patient outcomes.

Finally, this program demonstrated that a patient-centered team approach to the treatment of depression, bipolar depression, and PTSD can be successful in primary care. With scarce mental health resources across the United States, the Collaborative Care model is a useful way to improve access to mental health and substance treatment. Our ACE program increased access, improved coordinated care, and provided evidence-based treatments for common mental health disorders in a primary care clinic. Future work will focus on the process of implementing this model across settings.

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Authors' contributions: *A. J. Barton and M. Weber collaborated on developing the project. A. J. Barton obtained IRB approval, wrote the introduction section, contributed to methods, and provided critical feedback. M. Weber selected the instruments, trained the Psych NPs, wrote the Discussion section, and provided critical feedback. S. Stalder and A. Techau were the Psych NPs who implemented the project; they wrote the background, implementation, and instrument sections and edited the manuscript. S. Centi conducted the analysis and drafted the methods and results that were reviewed by B. McNair.*

Competing interests: *The authors report no conflicts of interest.*

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