

Primary Care Behavioral Health (PCBH) Model Research: Current State of the Science and a Call to Action

Christopher L. Hunter¹ · Jennifer S. Funderburk^{2,3,4} · Jodi Polaha⁵ · David Bauman⁶ · Jeffrey L. Goodie⁷ · Christine M. Hunter⁸

© Springer Science+Business Media, LLC (outside the USA) 2017

Abstract The Primary Care Behavioral Health (PCBH) model of service delivery is being used increasingly as an effective way to integrate behavioral health services into primary care. Despite its growing popularity, scientifically robust research on the model is lacking. In this article, we provide a qualitative review of published PCBH model research on patient and implementation outcomes. We review common barriers and potential solutions for improving the quantity and quality of PCBH model research, the vital data that need to be collected over the next 10 years, and how to collect those data.

Keywords Integrated mental health · Integrated behavioral health · Integrated primary care · Primary care behavioral health · Primary care mental health · Collaborative primary care

Introduction

The Primary Care Behavioral Health (PCBH) model of service delivery was developed as a clinician-driven effort to fill a need for effective behavioral health¹ services in primary care (Strosahl, 1994, 1998; Strosahl & Robinson, 2008). Reiter, Dobmeyer, and Hunter (2017) describe the PCBH model as:

... a team-based primary care approach to managing behavioral health problems and biopsychosocially influenced health conditions. The model's main goal is to enhance the primary care team's ability to manage and treat such problems/conditions, with resulting improvements in primary care services for the entire clinic population. The model incorporates into the primary care team a behavioral health consultant (BHC), sometimes referred to as a behavioral health clinician, to extend and support the primary care provider (PCP) and team. The BHC works as a generalist and an educator who provides high volume services that are accessible, team-based, and a routine part of primary care. Specifically, the BHC assists in the care of patients of any age and with any health condition

✉ Christopher L. Hunter
christopher.l.hunter16.mil@mail.mil

¹ Clinical Support Division, Patient-Centered Medical Home, Defense Health Agency, 7700 Arlington Boulevard, Suite 5101, Falls Church, VA 22042, USA

² VA Center for Integrated Healthcare, Syracuse VA Medical Center, Syracuse, NY, USA

³ Department of Psychology, Syracuse University, Syracuse, NY, USA

⁴ Department of Psychiatry, University of Rochester, Rochester, NY, USA

⁵ Department of Family Medicine, East Tennessee State University, Johnson City, TN, USA

⁶ Department of Family Medicine, Central Washington Family Medicine Residency, Yakima, WA, USA

⁷ Department of Medical and Clinical Psychology, Uniformed Services University of the Health Sciences, Bethesda, MD, USA

⁸ Division of Diabetes, Endocrinology, and Metabolic Diseases, National Institute of Diabetes and Digestive and Kidney Diseases, Bethesda, MD, USA

¹ Behavioral health is being used as a generic term to include services for health behavior change like weight loss, substance misuse, behavioral medicine interventions such as chronic pain management, and general mental health services for patient problem presentations such as depression or anxiety.

(generalist); strives to intervene with all patients on the day they are referred (accessible); shares clinic space and resources and assists the team in various ways (team-based); engages with a large percentage of the clinic population (high volume); helps improve the team's biopsychosocial assessment and intervention skills and processes (educator); and is a routine part of biopsychosocial care (routine). To accomplish these goals, BHCs use focused (15–30 min) visits to assist with specific symptoms or functional improvement. Follow-up is based in a consultant approach in which patients are followed by the BHC and PCP until functioning or symptoms begin improving; at that point, the PCP resumes sole oversight of care but re-engages the BHC at any time, as needed. Patients not improving are referred to a higher intensity of care, though if that is not possible the BHC may continue to assist until improvements are noted. This consultant approach also aims to improve the PCP's biopsychosocial management of health conditions in general (this issue).

In other words, the PCBH model focuses on improving primary care services for everyone receiving care. This includes patients seen and not seen by the BHC and for those who have or do not have significant biopsychosocial issues. As a PCP extender, effective BHCs can enable PCPs to complete appointments more efficiently, leaving time for PCPs to attend to the needs of other patients or spend more appointment time on other concerns.

As the importance of integrated behavioral health services in primary care has increasingly been recognized (Baird et al., 2014), the PCBH model has been identified as

a viable option for effective and efficient delivery of integrated care. It is the primary model implemented, alone or blended with other types of behavioral health services delivered in primary care, in several noteworthy healthcare system efforts including the Veterans Health Administration (serving 8.9 million patients), the Department of Defense Medical Health System (3.3 million), Cherokee Health System (66,000+), and Presbyterian Medical Group in New Mexico (190,000+).

Primary care practices are under increasing pressure to integrate behavioral health services into standard care delivery. In spite of the growing use of the PCBH service delivery model, research systematically evaluating the model has been limited in quality and scope. Much of the work on this model has focused on how to implement it successfully, with attention to processes of care and less emphasis on evaluating the model's effectiveness. A robust PCBH model evidence base is needed to provide primary care practices with the information necessary to determine whether it is best for their system and how to effectively implement the model.

PCBH Model Literature Review

In this review, we examined peer-reviewed research related to the PCBH model. Using the taxonomy delineated by Proctor et al. (2009, 2011), we organize this literature by patient versus implementation outcomes. Proctor et al. categorize patient outcomes, as patient satisfaction, changes in patient functioning, and changes in symptomatology. They define implementation outcomes as “the effects of deliberated and purposive actions to implement new treatments, practice, and services.” (Proctor et al., 2011, p. 65). They state “implementation” outcomes (acceptability, adoption,

Table 1 Implementation Outcome variables

Implementation outcomes	Definition ^a
Acceptability	The perception among implementation stakeholders that a given treatment, service, practice, or innovation is agreeable, palatable, or satisfactory. Acceptability is specifically referencing a particular treatment or set of treatments while satisfaction typically references the general service experience
Adoption	The intention, initial decision, or action to try or employ an innovation or evidence-based practice
Appropriateness	The perceived fit, relevance, or compatibility of the innovation or evidence-based practice for a given practice setting, provider, or consumer; and/or perceived fit of the innovation to address a particular issue or problem
Cost (incremental or implementation cost)	The cost impact of an implementation effort. The true cost of implementing a treatment depends upon the costs of the intervention, the implementation strategy used, and the location of service delivery
Feasibility	The extent to which a new treatment, or an innovation, can be successfully used or carried out within a given agency or setting
Fidelity	The degree to which an intervention was implemented as it was prescribed in the original protocol or as it was intended by the program developers
Penetration	The integration of a practice within a service setting and its subsystems
Sustainability	The extent to which a newly implemented treatment is maintained or institutionalized with a service setting's ongoing, stable operations

^aDefinitions taken from Proctor et al. (2011)

appropriateness, cost, feasibility, fidelity, penetration, sustainability; see Table 1 for definitions) are important and distinct from patient outcomes. We believe the Proctor et al. taxonomy is a useful way to separate and categorize two distinctly separate, but equally important PCBH model research domains. We then delineate gaps in the existing research, propose strategies to address those gaps, and attempt to develop a research agenda for the next decade. Given the state of the current literature with few randomized controlled trials and our interest in primarily identifying gaps, we conducted a descriptive review rather than applying systematic review methodology.

Literature Search Methods

The literature search was conducted using Medline and PsycINFO databases from Jan 1, 1996 through May 1, 2016 using the terms: *integrated mental health, integrated behavioral health, integrated primary care, primary care behavioral health, primary care mental health, and collaborative primary care*. Since the PCBH model was just starting to be written about in the mid-1990s (e.g., Strosahl & Sobel, 1996), we included two decades of research and started the literature search from 1996. Search result abstracts were reviewed to identify those that included information on behavioral health services in primary care that included patient outcomes (i.e., changes on a function, symptom measure, or satisfaction) and implementation outcomes (i.e., acceptability, adoption, appropriateness, feasibility, fidelity, implementation cost, penetration, and sustainability). Complete articles were obtained for abstracts that included patient outcome and implementation data when it appeared to involve PCBH model service delivery or where service delivery model was unclear. Articles were reviewed to determine whether PCBH model services were being delivered based on the content provided in the article or additional information was obtained from one of the article's authors if no description was provided within the text. All articles had to meet at least three criteria: (1) behavioral health services were delivered in primary care, (2) behavioral health services were available to all patients (even if the particular study reported on a subset of those patients), and (3) patients were typically seen in appointments for 30 min or less. We believed these to be the minimally necessary (or core) components for PCBH model services and are consistent with the generalist, accessible, team-based, high volume, routine components listed in the Reiter et al. (2017) PCBH model definition.

The reference lists of articles identified for inclusion were reviewed for additional articles that might have been missed in the literature search. In addition, the authors were made aware of articles that were in press that might meet inclusion

criteria. We obtained abstracts for these articles and applied the same review procedures that were used for the original articles. Thirty-two manuscripts describing 29 studies with unique samples that met inclusion criteria are included in the review. Some manuscripts had patient outcome and implementation data. Those manuscripts are included in the patient outcome and implementation outcome sections. The strategies (e.g., search terms) used to find studies likely captured most, if not all, of the peer-reviewed literature related to the PCBH model implementation and patient outcome studies.

Patient Outcomes

As shown in the Appendix Table 3, 20 published articles describing 18 studies were identified that examined the impact of PCBH model service delivery on patient outcomes, with a majority evaluating changes in either symptoms or general functioning. A pre/post design, without comparison data, was used in a majority of the studies. The populations studied included a range of ages, settings, and countries. In addition, a majority of studies included patients presenting with a range of problems, rather than one specific presenting problem (e.g., PTSD).

Satisfaction

Patient satisfaction is a vital component of examining quality of care. Studies have linked it with increased utilization and attendance of healthcare services as well as the intent to comply with treatment recommendations. However, "satisfaction" is difficult to define (see reviews by Gill & White, 2009; Pascoe, 1983 for more information). As shown in the Appendix Table 3, studies in our review assessed patient satisfaction with self-report questionnaires developed locally with varying satisfaction definitions and no psychometric data (Funderburk, Fielder, DeMartini, & Flynn, 2012; Funderburk et al., 2010; Gomez et al., 2014; Goodie, Isler, Hunter, & Peterson, 2009; Katon et al., 1996; Runyan, Fonseca, Meyer, Oordt, & Talcott, 2003). Patients reported high levels of satisfaction with the PCBH model services (Angantyr, Rimner, & Norden, 2015; Gomez et al., 2014; Katon et al., 1996; Runyan et al., 2003), and they would seek this type of care again in the future (Funderburk et al., 2012), and would recommend it to others (Runyan et al., 2003).

Functioning

Within PCBH model service delivery, there is a significant emphasis on delivering interventions that improve the patient's every day functioning with school, work, household chores, interpersonal relationships, or quality of life (Reiter et al., 2017). Studies reviewed used a range of validated

measures [e.g., Duke Health Profile (Parkerson, Broadhead, & Tse, 1990) and the Behavioral Health Measure BHM-20; (Kopta & Lowry, 2002)] to assess specific (e.g. depression) or global behavioral health change. These measures include questions that assess functioning (e.g., functioning at work or school) and are part of the Global Behavioral Health scale score. As summarized in the Appendix Table 3, all of the studies found that patients improved from pre- to post-intervention on Global Behavioral Health scores. However, only Bryan, Morrow, and Appolonio (2009) specifically reported changes in the Life Functioning subscale of the BHM-20.

Symptomatology

Another important patient outcome is the change in patient symptoms across time. As shown in Appendix Table 3, six studies (Angantyr et al., 2015; Cigrang et al., 2011; Goodie et al., 2009; Katon et al., 1996; McFeature & Pierce, 2012; Sadock, Auerbach, Rybarczyk, & Aggarwal, 2014) included validated outcome measures assessing specific symptoms or behaviors (e.g., anxiety, depression, PTSD, sleep, tobacco use). From pre- to post-treatment, these studies found improvements in anxiety and depressive symptoms (Angantyr et al., 2015; Katon et al., 1996; McFeature & Pierce, 2012; Sadock et al., 2014), PTSD symptoms (Cigrang et al., 2011), sleep symptoms (Goodie et al., 2009), tobacco use (Sadock et al., 2014), and weight (Sadock et al., 2014). In small samples, Sadock et al. (2014) found no changes in sleep ($n=4$ patients) and pain ($n=9$ patients). Of note, Cigrang et al. (2015) demonstrated that PTSD symptom improvements observed in a prior study (Cigrang et al., 2011) were maintained after 6 and 12 months.

Implementation Outcomes

Implementation outcomes indicate the extent to which the model is feasible or functional within the primary care setting. As shown in the Appendix Table 4, 14 studies examined implementation outcomes associated with PCBH model service delivery across a range of different healthcare systems representing pediatric, university, general internal medicine, and other primary care clinics. Only three studies included comparison data (Katon et al., 1996; Lanoye et al., 2016; Serrano & Monden, 2011).

Acceptability

“Acceptability” refers to the stakeholders’ report of whether the PCBH model is agreeable, palatable, or satisfactory based on their direct experience with it. Based on our review, acceptability is the implementation outcome for which the PCBH model has the most evidence. As shown in Appendix Table 4, several studies have evaluated acceptability from

the provider’s perspective, demonstrating high satisfaction across various dimensions and provider types (Aguirre & Carrion, 2012; Funderburk et al., 2012; Hill, 2015; Runyan et al., 2003; Serrano & Monden, 2011; Torrence et al., 2014). Importantly, many of these studies evaluated dimensions of satisfaction specific to the key ingredients of the PCBH model, a methodological strength when measuring implementation outcomes (Proctor et al., 2011). These dimensions included BHC availability for urgent cases and high-risk patients (Aguirre & Carrion, 2012); BHC accessibility (Funderburk et al., 2012); improving the PCPs efficiency (Torrence et al., 2014); improving PCP recognition of behavioral health problems (Runyan et al., 2003); and the PCP perceived helpfulness of various components of PCBH model service delivery (Hill, 2015; Runyan et al., 2003).

Two studies evaluated patient acceptability of the PCBH model. Again, this implementation outcome is distinguished from general ratings of satisfaction (described above as patient outcomes) in that it evaluates perceptions of specific aspects of the service or treatment (Proctor et al., 2011). Corso et al. (2012) conducted a study of 541 patients receiving care via the PCBH model at a military primary care clinic, which served active duty, family members, and retirees. Patients’ self-report on the Therapeutic Bond Scale showed they perceived strong rapport development with the BHC in the context of the model’s brief and limited visits. Moreover, a comparison of these results to those of a prior study using the same method showed that patients had higher provider satisfaction after a 30-min BHC appointment in the PCBH model compared to a 60-min visit in specialty mental health. Runyan et al. (2003) asked 76 patients seen by a BHC whether behavioral healthcare options were discussed sufficiently and whether the patients were involved sufficiently in making decisions about their healthcare plan. Ninety-five percent of respondents indicated that healthcare options were “sufficiently,” “very much,” or “completely” discussed. Similarly, 95% of patients were “sufficiently,” “very much,” or “completely” involved in healthcare decision making.

Adoption

“Adoption” refers to the PCPs intent to engage the PCBH model services as prescribed or, their “uptake” of the new service delivery model (Proctor et al., 2011). Although no studies have assessed adoption directly, two studies have provided data *suggesting* PCP adoption of PCBH model services by showing that after the PCBH model was in place, fewer referrals to specialty behavioral health were made (Brawer, Martielli, Pye, Manwarning, & Tierney, 2010; Felker et al., 2004, see Appendix Table 4). In the study by Brawer et al., referral rates to specialty mental health dropped by 50%. They also found that PCPs who were

least likely to prescribe antidepressant medications prior to PCBH model services increased their prescription rate by 323% and those who were most likely to prescribe antidepressants decreased by 29%. They hypothesized that lower frequency prescribing PCPs, appeared to be more willing to prescribe antidepressants when part of a team with PCBH model services. At the same time high frequency prescribing PCPs appeared to have learned more about behavioral health issues and became more discriminate in their use of antidepressants for those who may or may not have had significant behavioral health issues. Likewise, in the study by Felker et al., referral rates dropped from 38 to 14% post-implementation. A third study (Serrano & Monden, 2011) also *suggests* adoption by demonstrating that chart reviews showed a significant increase in behavioral goals documented—from 5.7% pre- to 82.5% post-implementation. This study also showed that PCPs' antidepressant prescription practices decreased from pre- to post-implementation of the PCBH model service suggesting that their adoption of the BHC as a team member provided an important viable alternative to medications.

Cost

“Cost” refers to the costs of delivering a particular intervention, the implementation strategy used, and the location of service delivery. As shown in Appendix Table 4, one study by Lanoye et al. (2016) showed that patients who received integrated behavioral health in the PCBH model had fewer preventable inpatient hospitalizations compared to those who received medical treatment only, a well-known cost efficiency. Taking another tack, Gouge, Polaha, Rogers, and Harden (2016) showed that a rural, stand-alone pediatric practice generated an extra \$1142 on days when the BHC was on site as compared to days when she was not. The increased revenue is attributed to providers' time savings using warm hand-offs, allowing them to see more patients by double-booking and treating more walk-ins.

Fidelity

“Fidelity” refers to the degree to which an intervention was implemented as it was prescribed (Proctor et al., 2011). In the PCBH model, this definition refers to the delivery of an evidence-based/informed intervention for a given problem presentation (e.g., depression, anxiety, or chronic pain). However, an additional measure of fidelity is the extent to which other PCBH model service delivery behaviors occur (e.g., 30-min appointments, same day appointments, curbside consultations, mutually developed and reinforced care plans). These service delivery behaviors may be important for population health management and/or patient outcomes (Reiter et al., 2017). As shown in Appendix Table 4, the

majority of studies in this review included a specific description of an evidence-based/informed intervention for a given problem (e.g., depression, insomnia, or PTSD), or a more general description of the interventions that were delivered in studies that focused on more than one problem presentation. The majority of studies also had specific reference to some PCBH model service behaviors such as services completed in an integrated setting with a multi-disciplinary team, BHC visits lasting less than 30 min, and limited follow-ups (i.e., less than 6 appointments); however, only one study (Katon et al., 1996) objectively evaluated treatment delivery.

Penetration

“Penetration” refers to the extent to which the PCBH model “reaches” the people that it intends to reach (see Appendix Table 4). Brawer et al. (2010) showed that access to the BHC increased 391% compared to the year prior when only specialty services were available. In addition, this study showed that patients who had an appointment with a primary care psychologist prior to a referral to a specialty behavioral health appointment, compared to patients that did not see a primary care psychologist, were more likely to attend (66 vs. 47%) the appointment. In another study, Kessler (2012) found strong follow-up rates for behavioral health referrals for integrated primary care practices.

Research Gaps: What Do We Need to Know?

As described, the evidence supporting the PCBH model has significant limitations; more scientifically robust data across multiple outcomes are needed. Below, we discuss those gaps as they apply to *both* patient and implementation outcomes.

Gaps Across Patient and Implementation Outcomes

Lack of Comparative Data

Only three studies included a comparison group (e.g., usual care, waitlist control) or comparative data of any type (Katon et al., 1996; Lanoye et al., 2016; Serrano & Monden, 2011). This limitation highlights the feasibility challenges of conducting more rigorous research, such as randomized controlled trials, in the context of real-world service delivery. To some extent, feasibility issues can be overcome by seeking more traditional academic/research grant funding to support the personnel and infrastructure resources required to fully implement a randomized clinical trial. More commonly, and perhaps more feasible, comparative data can be obtained through the use of quasi-experimental or multiple baseline designs as described below. Elements to consider

if identifying a different primary care clinic to serve as a comparison might be (1) number of primary care providers; (2) additional resources given to the providers to help address behavioral health issues; (3) availability of specialty behavioral health services in the area; (4) access to medical care at the clinic; (5) provider/staff factors that may influence primary care appointments (e.g., comfort with behavioral health topics), and (6) matching on patient characteristics such as age, percent of racial and ethnic minority groups served, socioeconomic status, insurance status, and various disease indicators. Once a comparator clinic/condition/group is chosen, it is important to monitor it for changes (e.g., staff changes, loss of resources in the system) to ensure that it remains an appropriate comparator. Incorporating comparative data, which could include benchmark data from the literature (e.g., depression) or examining existing literature for how the outcomes may change naturally over time without any intervention should be a primary focus of future PCBH model research to help establish evidence supporting PCBH model service delivery within the context of what naturally occurs in primary care.

Fidelity

The articles included in this review obtained data relevant to the impact of PCBH model service delivery on patient and implementation outcomes. Some of the articles were specifically focused on the impact of PCBH model service delivery behaviors (e.g., 30-min appointments, documentation in the medical record, same day appointments, etc.) for multiple patient problem presentations and others focused on specific treatments offered within the context of PCBH model services (e.g., cognitive behavioral treatment for insomnia). Regardless of the foci, it is vital that studies include a measurement of adherence, otherwise referred to as fidelity, to PCBH model service delivery behaviors and the evidence-based treatment being examined. Were PCBH model service delivery behaviors or the intervention (e.g., cognitive behavioral treatment for insomnia) delivered as intended? What percentage of the intended content was delivered? Without a measure of treatment fidelity, we do not know if PCBH model service delivery behaviors occurred, or if the patient received the active treatment in the sufficient dose to get the change in the health or function outcome of interest.

A majority of studies in the review included some information on PCBH model fidelity primarily relying on data obtained from the electronic medical record (e.g., average number of visits being less than 4 or average length of time of visits being less than 30 min; e.g., Brawer et al., 2010). However, none of the studies had a formal measure or specific observational method to assess the frequency or

appropriate engagement of these behaviors. Theoretically, core components of the PCBH model service behaviors are believed to be important for effective patient outcomes and population health management (see Reiter et al., 2017 for a description of PCBH model core components). Without a validated or standardized measure of the fidelity of PCBH model service behaviors, it is difficult to determine what effect these behaviors (e.g., feedback to the PCP) might have on patient or implementation outcomes. One way to close this gap is to use the Primary Care Behavioral Health Provider Acceptance Questionnaire (PPAQ; Beehler, Funderburk, Possemato, & Vair, 2013), a psychometrically sound assessment measure that is completed by the BHC to assess the level of fidelity to PCBH model behaviors. This measure was developed using the Delphi method using experts in field and additional research found it to demonstrate strong convergent and divergent validity to essential and prohibited PCBH model clinical behaviors and high reliability (Beehler, Funderburk, Possemato, & Dollar, 2013; contact Gregory Beehler at gregory.geehler@va.gov for a copy of the PPAQ). Another option is to create an objective evaluation of PCBH model service behaviors through observation of the BHC and other primary care staff. This would help reduce concerns about biased responses and obtain information from a greater range of experiences than only the BHC, but the feasibility of this type of task may be too difficult depending on the available resources.

Gaps Specific to Patient Outcomes

Functional Outcomes

One core tenant of PCBH model service delivery is a focus on improving patients' day-to-day functioning and quality of life. PCBH model interventions often focus on behavioral changes (e.g., increasing enjoyable activities, social activities, and/or the number of daily activities completed) that are consistent with what patients' value. However, only half of the studies examining patient outcomes included a measure of patient functioning (see Table 2 for a list of common functional measures). The most popular measure used in these studies was the Behavioral Health Measure-20 (BHM-20, Kopta & Lowry, 2002), which assesses changes in symptoms, functioning, and well-being. Although this measure provides a broad assessment of a patient's functional outcomes using the global mental health score, future work should report the subscale changes (e.g., Life Functioning) and also consider more specific assessment of any changes in functioning as identified by the behavioral goals set by the patient, as often times those are patient-specific and can easily be evaluated within brief periods of time.

Table 2 Psychometrically validated measures of functioning, satisfaction, and symptoms that can be used in PCBH research

Type of assessment Purpose	Name of measure Brief description	Reference How to obtain the measure
Functioning Indicator of general mental health	Outcome Questionnaire Short Form (OQ-10) This 10-item self-administered questionnaire assesses general psychological functioning which includes positive and negative affect over the past week	Seclert et al. (1999) http://www.oqmeasures.com/ (copyrighted)
Functioning Evaluates the impact of chronic pain on enjoyment and activity	PEG This 3-item measure assesses the average level of pain and its impact on enjoyment of life and general activity in the past week	Krebs et al. (2009) http://www.health.state.mn.us/topics/cannabis/intractable/PEG_pain_scale.pdf (free to use)
Functioning Measure general physical and mental health functioning	Short-Form 12 (SF-12) This shorter (12-item) version of the SF-36 Health Survey provides a summary of both physical and mental components of functioning	Ware et al. (1996) https://www.hss.edu/physician-files/huang/SF12-RCH.pdf (copyrighted)
Functioning Assess the impact of chronic health problems on work functioning	Work Limitations Questionnaire (WLQ) This 25-item self-report measure reliably assesses the impact of chronic health problems on 4 areas of work demands (i.e., time, physical, mental–interpersonal, and output demands)	Lerner et al. (2001) Debra Lerner, The Health Institute, Tufts–New England Medical Center, Boston MA, USA. WLQ@tufts-nemc.org; 617-636-8636 (copyrighted)
Satisfaction Assess subjective sense of well-being or quality of life	Quality of Life Inventory (QOLI) This 32-item self-report questionnaire assesses life satisfaction across 16 domains (i.e., health, self-esteem, goals and values, money, work, play, learning, creativity, helping, love, friends, children, relatives, home, neighborhood, community)	Frisch (1994) http://www.pearsonclinical.com/psychology/products/100000635/quality-of-life-inventory-qoli.html?origsearchtext=100000635 (copyrighted)
Symptoms Screening tool for hazardous drinking or alcohol dependence	Alcohol Use Disorders Identification Test–Consumption (AUDIT-C) This brief 3-item measure helps screen for hazardous drinking patterns or alcohol misuse by assessing quantity and frequency of alcohol use	Bradley et al. (2007) http://www.integration.samhsa.gov/images/res/tool_audict.pdf (free to use)
Symptoms Assess severity of anxiety on a dimensional scale	Beck Anxiety Inventory (BAI) This 21-item self-report assessment tool measures anxiety symptom severity	Beck et al. (1988) http://www.pearsonclinical.com/psychology/products/100000251/beck-anxiety-inventory-bai.html (copyrighted)
Symptoms Indicator of nicotine dependence	Fagerstrom Test for Nicotine Dependence (FTND) This 6-item measure assess for quantity of cigarette use, compulsion of use, and dependence	Heatherton et al. (1991) http://ndri.curtin.edu.au/bitip/documents/Fagerstrom_test.pdf (free to use)
Symptoms Screening tool for severity of anxiety	Generalized Anxiety Disorder-7 (GAD-7) This 7-item measure functions as a screener for anxiety and also as an index of anxiety severity. It offers reliable cut scores for mild, moderate, and severe anxiety	Spitzer et al. (2006) http://www.phqscreeners.com/ (free to use)
Symptoms Screening tool for PTSD	Primary Care PTSD Screen (PC-PTSD) Developed for primary care and other medical settings, this 4-item screen is used to indicate whether further assessment of PTSD is needed	Prins et al. (2003) http://www.ptsd.va.gov/professional/assessment/screens/pc-ptsd.asp ; http://www.mirecc.va.gov/docs/vsn6/2_primary_care_ptsd_screen.pdf (free to use)

Table 2 (continued)

Type of assessment Purpose	Name of measure Brief description	Reference How to obtain the measure
Functioning and symptoms Indicator of mental health	Behavioral Health Measure-20 (BHM-20) This measure assesses global mental health, as well as well-being, psychological symptoms, and life functioning more specifically	Kopta and Lowry (2002) http://www.celesthealth.com/index.asp ; 443-798-5797 (copyrighted)
Functioning and symptoms Quantify health and dysfunction across physical, mental, and social domains	Duke Health Profile (Duke) This 17-item self-report questionnaire assesses domains of health (i.e., physical, mental, social, general, perceived health, and self-esteem), and dysfunction (i.e., anxiety, depression, pain, and disability)	Parkerson et al. (1990) https://cfm.duke.edu/sites/cfm.duke.edu/files/cfm/Research/HealthMeasures/Duke%20Health%20Profile%20%28Duke%29.pdf ; https://cfm.duke.edu/research/duke-health-measures (free to use)
Functioning and symptoms Screening tool for mild cognitive dysfunction	Montreal Cognitive Assessment (MoCA) This screener assesses a range of cognitive domains with a cutoff score indicating normal or subnormal functioning	Nasreddine et al. (2005) http://echo.unm.edu/wp-content/uploads/2014/07/clinic-dementia-MOCA-English.pdf (copyrighted)
Functioning and symptoms Diagnostic and severity measurement tool of depression	Patient Health Questionnaire (PHQ-9) This brief 9-item measure assesses depressive symptoms severity and can also be used for diagnostic purposes	Kroenke et al. (2001) http://www.phqscreeners.com/ (free to use)
Symptoms, functioning, and satisfaction Assess severity of insomnia symptoms	Insomnia Severity Index (ISI) This 7-item self-administered questionnaire assesses severity of insomnia problems, satisfaction with sleep, distress about sleep, and how much it interferes with functioning	Bastien et al. (2001) http://deploymentpsych.org/system/files/member_resource/Insomnia%20Severity%20Index%20-ISI.pdf (free to use)
Symptoms, functioning, and satisfaction Evaluate global health	Patient-Reported Outcomes Measurement Information System 29-item Health Profile (PROMIS-29) This 29-item multidimensional scale assesses health functioning across 7 domains of physical, mental, and social health. This measure may be particularly useful to assess global health of individuals suffering from pain or illness	<i>PROMIS-29 Profile v2.0</i> © 2008–2016 PROMIS Health Organization and PROMIS Cooperative Group. May, 27, 2016. http://www.nihpromis.org http://www.chiroindex.org/wp-content/uploads/2014/02/PROMIS-29.pdf ; http://www.healthmeasures.net/explore-measurement-systems/promis (free to use)

Comorbidity

The typical primary care patient often has more than one health and/or behavioral health condition affecting their lives (Funderburk, Kenneson, & Maisto, 2014; Vogeli et al., 2007). None of the reviewed studies considers the impact of comorbidity on the success of PCBH model intervention delivery. While this gap is not unique to the PCBH model literature, it remains an important consideration in moving the research in this area forward. In fact, a majority of the studies either group all primary care patients together regardless of presenting problem or focus on a sample presenting with one specific problem (e.g., insomnia). It is important to assess patient comorbidities and evaluate what, if any impact those comorbidities have on the problem of focus. For example, a patient wants assistance with weight loss, but also has moderate depressed mood. Should the focus be primarily on the weight loss, should the depressed mood be the primary focus, should they be addressed equally at the same time or does it make any difference in the long term on outcome? Is there a positive or negative domino effect related to the primary intervention? Interventions can be designed systematically to determine what might be the best focus for initial treatment, what initial treatment might produce the best results or if multiple problems would benefit from concurrent treatment. Also, what impact does PCBH model service delivery have indirectly on other aspects of health that may be relevant to capture (e.g., medication adherence, engagement in medical care)?

Standardized Measures

To draw valid conclusions about interventions that can be replicated across settings and populations, most of the measures used must be standardized, psychometrically sound instruments. In addition to the functional measures listed in Table 2, the symptom measures listed in Table 2 can be used to assess symptom change alone, or a combination of symptom and functional change. Satisfaction measures are of particular concern. Most of the time PCBH model research assesses patient or provider satisfaction with services using measures that have no psychometric validation. So even if there is a positive patient and provider satisfaction outcome, one cannot be sure if that outcome is reliable, that it is in fact measuring what it purports to measure, or that the positive outcome has any reliable relationship to other patient outcomes. Validated provider and patient satisfaction measures specific to the PCBH model of service delivery need to be developed. Until those measures are available the use of validated questionnaires, for global satisfaction with services such as the Patient Satisfaction Questionnaire-18 (PSQ-18; Marshall & Hays, 1994) or the Client Satisfaction Questionnaire (CSQ; Larsen, Attkisson, Hargreaves, &

Nguyen, 1979) would increase the confidence in the drawn conclusions.

Assessment of Potentially Confounding Variables

To draw the conclusion that PCBH model service delivery is resulting in improved patient outcomes, a thorough assessment of other factors that may be contributing to improved symptomatology and functional ability is necessary across the PCBH model services and comparison condition if included. This includes assessment of the delivery of any medical treatment or follow-up by the other members of the primary care team (e.g., prescription of a new antidepressant, any interventions delivered by the nurses or primary care team).

Patient Characteristic

More research is needed to understand how the PCBH model works in different groups. For example, research focused on outcomes in racial and ethnic minority populations and various age groups. There is a particular need for more research with pediatric (under 18 years old) and senior patients (65+ years old). See below for ways to partner with others to coordinate and merge efforts to address these gaps.

Gaps Specific to Implementation Outcomes

Sustainability/Feasibility/Appropriateness

The review above showed three implementation outcomes for which there are no data: sustainability, feasibility, and appropriateness. As described by Proctor et al. (2011), sustainability focuses on how well the PCBH service delivery model is maintained over time, which includes how well the policies, clinical practices of the teams/providers, and subsequent development of PCBH model services across other systems of care are practiced. Feasibility and appropriateness are outcomes that can individualize implementation efforts across varying healthcare systems. For example, the feasibility or appropriateness of PCBH model services within small rural primary care settings may be lower than in a large urban hospital. Alternatively, these outcomes may vary depending on the clinic's current budget, provider values, patient characteristics, or clinic space.

Adoption

An obvious gap in the area of adoption is the lack of clarity regarding what measurable factors constitute "uptake" of the PCBH model or providers' intention to engage the model. No studies have overtly targeted adoption of the

model. In the review above, decreased referrals to specialty behavioral health were regarded as proxies for provider adoption of the PCBH model. Although this appears to represent the spirit of that outcome, a more robust measurement of adoption would be the appropriate use of warm hand-offs. For example, provider adoption could be documented as the percentage of patients with significant PHQ-9 scores who received a warm hand-off to the BHC. The challenge in documenting broad adoption of PCBH model services for “all comers” is knowing the size of the targeted population so that the percent of providers adopting the model when appropriate can be calculated. Nevertheless, researchers are discouraged from studying adoption by the use of only conceptually distal or weak proxies such as decreased use of specialty mental health or decreased use of antidepressant medications. Although conceptually interesting these targets are not overt elements of the PCBH model and leave a wide margin for interpretation.

Acceptability

Although the acceptability of various components of PCBH model service delivery has been evaluated from the patient and provider perspective, a number of components remain unaddressed. For instance, what do patients think about their BHC sharing information and impressions with other members of their primary care team? What do primary care providers think about BHCs sharing their exam rooms? Moreover, according to Proctor et al. (2011), acceptability should reflect the perspectives of all key stakeholders and viewed as a dynamic factor that changes with the stakeholder’s experience with the intervention over time. Thus, data are needed regarding administrators, payers, clinical staff, and other key stakeholders’ perceptions of acceptability, and for all stakeholders, measures of how that changes as the model becomes more familiar or evolves.

Cost

A key factor in PCBH model initiation and maintenance is cost. Although two studies have examined the potential cost savings incurred once a PCBH model was implemented, none of the studies reviewed included implementation cost. This is surprising given that cost is a frequently cited concern (Scharf et al., 2014) when a clinic or healthcare system is considering the launch of a new service. Although there are recent publications that assist individuals in determining the relative cost of initiating and maintaining a given model of primary care behavioral health service delivery, including the PCBH model (e.g., Corso, Hunter, Dahl, Kallenberg, & Manson, 2016), implementation cost analysis for PCBH model service delivery for a given population is not being considered, or at least it is not being written about.

Other Outcome Gaps: BHC as a PCP Extender

Some outcomes related to the BHC as a PCP extender discussed earlier in this article, do not fit neatly into Proctor et al. (2009, 2011) patient and research outcome taxonomy. The following, although not exhaustive, highlights some of the BHC as PCP extender research gaps that need investigation: improved patient access to the PCP, increased PCP preventive care delivery (e.g., increased tobacco cessation discussions, increased anticipatory guidance topics covered during a visit when the BHC is involved in well-child checks); increased PCP completion of chronic disease management activities and/or improved outcomes for patients with chronic disease (including patients not seen by the BHC); better PCP adherence to treatment guidelines (e.g., increased urine drug screen and medication agreements completion for patients using opioids); and improved PCP assessment and intervention for psychosocial concerns.

Pathways to Closing the Research Gaps

The studies in this review suggest that the PCBH model of service delivery may be a promising approach as an effective population health model of behavioral health service delivery. At the same time, this emerging evidence base has multiple scientific limitations that future research will need to address. Also, at times, when behavioral health practice has been ahead of the science there have been negative outcomes, such as in the treatment of autism (Mostert, 2001), alcohol and drug prevention (Werch & Owen, 2002), and critical incident stress debriefings (Litz, Gray, Bryant, & Adler, 2002; McNally, Bryant, & Ehlers, 2003). With these caveats in mind, the PCBH model community should proceed cautiously regarding the status of PCBH model service impact on patient and implementation outcomes and when possible strive to fill the existing research gaps.

Having specific pathways, stakeholders can take to accelerate the next wave of research will more rapidly build the evidence base. Patients, practitioners, and systems need to understand what works well (feasibly implemented and achieves meaningful health outcomes), for whom, delivered under what conditions, and for what cost to be able to more effectively inform decision makers about whether to include PCBH model services as a part of routine care.

Closing the research gaps will require multiple levels of research participation; including patients, practitioners, healthcare systems, and academic researchers. Answering the most important research questions will also require a variety of research designs, methods, and measurement tools. It is imperative to match the research question with the design and measures that are as rigorous as possible but also generalizable and practical to account for the realities

of routine care. Katon et al. (1996) is a study exemplifying elements associated with high levels of methodological rigor using a randomized controlled trial design; a problem-focused (i.e., depression) and large sample size; empirically validated self-report measures; and assessment measures to track adherence to the intervention. However, a randomized controlled trial may not be possible for practicing clinicians or clinics, so it is important to identify questions that match the setting/provider capabilities and evaluate the data on those questions using the most rigorous design given the circumstance. As such, the “right” design to answer the various questions might include large-scale randomized trials, observational methods, quasi-experimental designs (e.g., nonequivalent/non-randomized comparison groups, regression discontinuity, or case-control designs such as time series or propensity score matching), and/or qualitative methods. Selecting the appropriate outcomes and methods of data collection will also vary based on the question and the feasibility of measurement collection. Sources of meaningful data might include everything from observable or self-reported individual level health data from patients and the healthcare team to linkages to large healthcare datasets such as the EHR, pharmacy, or claims data. If possible, a mixture of self-report and objective measures rather than the use of predominantly self-report measures found in this review, will improve the validity of any findings. In addition, greater attention and consideration to controlling or assessing potential confounding variables (e.g. attrition, other changes in the healthcare system that may impact outcomes), increasing the generalizability by increasing the size of samples, and consideration for the potential threats to internal validity associated with pre/post tests would improve any design.

Increased Engagement in Accruing Evidence

Research Sites

In our review, it appeared that the majority of studies conducted took place in Academic Medical Centers (AMCs) or government-sponsored identities (GSIs; e.g., Department of Defense, Veterans Administration Centers, etc.). Specifically, of the 32 research articles included in this review, 21 were conducted in AMCs or GSIs. Although this is not surprising due to these agencies typically having the staff, bandwidth, and financial support to conduct research projects, it does cast concern regarding the generalizability of this research to everyday primary care practices, such as community health centers (CHCs). With 25 million Americans receiving treatment from systems like CHCs (NACHC, n.d.) and a great number of these organizations beginning to use models of integration such as the PCBH model, it is imperative that research projects are developed in these settings.

Providers and Administrators

Behavioral health and medical providers and administrators employed in these settings have a unique opportunity to support and participate in research designed to fill some of the evidence gaps. For instance, providers and administrators are often asked to collect program evaluation data on their local PCBH model service delivery program (e.g., demonstrate financial sustainability, improved healthcare outcomes, etc.). Designing these program evaluation efforts using more rigorous designs and measures would not only serve the local institution’s interests, but also provide data to move the field forward. Although beyond the scope of this article, readers interested in gaining a better understanding on how to improve the rigor of a program evaluation may benefit from reviewing Kozica, Lombard, Hider, Harrison, and Teede (2015). Attending the research and evaluation presentations offered at organizations with a significant PCBH model focus such as the Collaborative Family Healthcare Association (<http://www.cfha.net/>) annual conference can also help individuals develop their skills to conduct this type of research and allow the formation of key transdisciplinary partnerships often needed for these efforts.

Quasi-Experimental Designs

When a randomized controlled trial is not feasible or acceptable to the delivery organization or staff or is not optimal to capture real-world practice, researchers may want to consider how to employ the most rigorous quasi-experimental designs possible as a means to balance feasibility and maximizing research quality. For example, a multiple baseline design would provide valuable information and would likely be appealing to a larger organization implementing PCBH model services for the first time. It allows one to collect data prior to implementation, then stagger implementation at clinics while continuing to collect data to understand the process, cost, and health outcomes as a result of the PCBH model service implementation (see Hawkins, Sanson-Fisher, Shakeshaft, D’Este, & Green, 2007 for more description on multiple baseline designs). Multiple baseline or other single-subject designs may also be valuable for behavioral health providers who may not have support for a larger research effort, but are interested in examining specific clinical interventions/programs they are developing and implementing as a part of their PCBH model care delivery (see Smith, 2012 for more information on single-subject designs). Similarly, pragmatic trials (see Ford & Norrie, 2016 for additional information) compared to traditional randomized controlled trials, allow for greater flexibility for implementation and less disruption to clinical care while systematically evaluating interventions. For instance, Scharf et al. (2014) describes

the use of a scientifically robust quasi-experimental design to assess the impact of integrating primary care services into behavioral health clinics serving individuals with a serious mental illness. The Pragmatic Explanatory Continuum Indicator Summary (PRECIS-2) is one example of a tool designed to help researchers evaluate where their study falls on the pragmatic/explanatory continuum by assessing nine design and implementation factors such as eligibility recruitment methods, characteristics of the setting, flexibility in treatment delivery, and outcomes assessed. For more information about PRECIS-2 and how to use the tool see: <https://www.precis-2.org/>. Additional assistance can be attained through consultation with special interest groups (SIGs) in organizations like the Collaborative Family Healthcare Association (Research and Evaluation Committee (<http://www.cfha.net/?page=ResearchCommittee>)) and the Society of Behavioral Medicine (Integrated Primary Care SIG <http://www.sbm.org/about/special-interest-groups/integrated-primary-care>). Also, federal entities such as the Agency for Healthcare Research and Quality (AHRQ; The Academy for Integrating Behavioral Health and Primary Care <http://integrationacademy.ahrq.gov/>) and the Substance Abuse and Mental Health Services Administration (SAMHSA; <https://www.samhsa.gov/>) offer a range of support and guidance that can be beneficial. Regardless of the research design selected, careful consideration should be given to using the strongest research design, methods and measures that are possible given the resources available; including appropriate comparison/control conditions where possible, valid and reliable outcome measures, and consideration of where the research question falls on the explanatory and pragmatic continuum (Loudon et al., 2015).

Partnerships

Answering the most important PCBH model research questions is unlikely to happen without establishing a partnership between various stakeholders in the healthcare arena and maintaining their involvement from inception (formation of primary aims and research design), to data collection and analysis, and through the dissemination of findings and discussion of next steps. This could mean involving patients and the healthcare team to be sure the questions asked and outcomes collected are not only practical but also meaningful and that the findings are disseminated in a way that is both understandable and actionable. Other partnerships might be within health systems or across clinics and care networks to allow for adequate power, diverse research participation, and generalizable outcomes. Partnerships might also need to be at the healthcare policy maker level to assure access to data systems and inclusion of outcomes will inform future coverage and reimbursement decisions. Clearly not all research questions will require all levels of partnerships and

stakeholder involvement but consideration of the partnership needs and opportunities should be a first step in developing a plan for research.

A common reality of primary care centers (PCCs) is the lack of infrastructure and resources to conduct methodologically sound research projects. From obtaining IRB approval, to receiving funding for projects, to systematically collecting data, the demands of conducting research often exceed the resources available at many PCCs. Practice-Based Research Networks (PBRN) are a potential solution to this reality. As defined by Davis, Keller, DeVoe, and Cohen (2012), “A (PBRN) is a collection of medical practices that affiliate for the purpose of conducting research focused on delivering care to the patients they serve” (p. 107). Often paired with an academic institution, a PBRN allows primary care agencies to share resources, have access to IRB processes, complete longitudinal research across multiple agencies in a specified region, and publish manuscripts regarding relevant research findings (Davis et al., 2012). As of 2015, there were 173 registered PBRNs throughout the U.S. and with the AHRQ (AHRQ, n.d.). The AHRQ provides a registry of these PBRNs, as well as information on how to become involved in the networks. To receive more information regarding PBRNs and to identify a PBRN in your area, visit AHRQ’s PBRN website (<https://pbrn.ahrq.gov/>).

Potential Funding Sources

Much like research designs and partnerships, one funding agency is not likely to be appropriate to fill most PCBH model research gaps. As summarized in the Appendix, the literature review reveals that a majority of the research was not funded through grant support. Of those obtaining funding, a majority were not funded by the typical federal government agencies, such as National Institutes of Health (NIH) or the AHRQ.

Multiple federal funders, including the NIH and AHRQ, have research missions that align with filling PBCH model research gaps. For example, NIH might be the best home for research focused on testing the PCBH model for improving disease or behavioral health outcomes. AHRQ’s research mission is to produce evidence to make healthcare safer, higher quality, more accessible, equitable, and affordable. As such, they might fund research focused on evaluating the cost effectiveness, scale-up, and implementation of existing evidence-based PCBH model practices in diverse care settings and with patients with multiple chronic conditions. However, many of the major funders have related research missions so there are few hard lines differentiating the research solicited at many of the agencies. As such, it is important to stay abreast of current priorities and funding opportunities by regularly checking their websites and

subscribing to various listservs such as the NIH grant listserv (<https://grants.nih.gov/grants/guide/listserv.htm>).

Matching the research question, planned outcomes, and the scope of the research with the mission and mechanisms supported by various funding agencies is a crucial first step in pursuing funding for the next generation of research. For example, at the NIH it is important to understand the mission of, not just NIH as a whole, but the focus, priorities, and policies of the specific Institute leading or signed onto a funding opportunity announcement (FOAs). Often there are misconceptions/myths about what gets funded at NIH (e.g., only basic biomedical research or only large randomized controlled trials) when, in fact, just to name a few, NIH also funds robust portfolios evaluating behavioral interventions on behavioral and health outcomes, dissemination and implementation research, pragmatic trials evaluating models of healthcare delivery, and research evaluating natural experiments in policy and large-scale practices. It is vital that research aims, design, and planned outcomes are of interest to the agency and aligned with the particular details of any given FOA. As such, it is particularly important to contact a scientific program officer at the agency as early as possible to get feedback on your specific aims and advice about the grant process and locus of review. All FOAs have a section titled “Agency Contact” and the scientific contacts listed should be your first point of contact weeks, if not months before the submission date. Interested investigators can search for funding opportunities at multiple federal agencies at this link (<http://grants.nih.gov/funding/index.htm>).

For those individuals interested in conducting comparative clinical effectiveness research that also involve patients as stakeholders, the non-governmental Patient-Centered Outcomes Research Institute (PCORI) is an appropriate funding venue (see <http://www.pcori.org/funding-opportunities>). For those researchers involved in or partnered with a PBRN (as described above), PCORI can be an important funder as it often takes many locations to be able to effectively implement a comparative effectiveness trial. For example, PCORI might be interested in an evaluation of the effectiveness of PCBH model services delivered for an anxiety condition versus co-located behavioral healthcare. An important element necessary for PCORI applications is the inclusion of key stakeholders, including patients within the research process. This can occur with the assistance of a patient/stakeholder advisory board, which can facilitate having key stakeholders play a larger role on the investigative team.

For those working within the Veterans Health Administration (VHA) or interested in collecting data on Veterans, description of various funding mechanisms and topics of interest are available through the VHA Research and Development office (see <http://www.research.va.gov>). These types of projects can range in size and focus, but collaboration

with someone working within the VHA and a focus on Veterans and/or the Veteran Health Administration’s primary care clinics is required. If not affiliated with the VHA, the best option may be to develop a collaboration with researchers at one of the Centers for Excellence (see <http://www.MIRECC.va.gov>). The VHA Center for Integrated Healthcare houses many researchers, who focus on conducting research on integrated healthcare, such as PCBH model service delivery (see <http://www.mirecc.va.gov/cih-visn2/>).

Finally, foundations can be another source of research funding to consider. Foundations with broad healthcare or behavioral health missions such as the Robert Wood Johnson Foundation or the Hogg Foundation for Mental Health, have a history of supporting research similar to or directly related to the evaluation of the PCBH model of care. Disease-specific organizations such as the American Diabetes Association or the American Heart Association also fund research and can often be a good place to seek funding for pilot and feasibility grants focused on testing interventions or processes with the goal of improving the health outcomes in the disease of interest.

Call to Action

We are in a unique position to address the PCBH model research gaps in a comprehensive way over the next few years. State-wide initiatives surrounding the Centers for Medicare and Medicaid Services (CMS) Innovation funding/delivery system reform incentive payment (DISRP) program will likely drive large-scale integrated behavioral health services across a range of people, problems, and clinics. It is likely that a large number of these efforts will use a PCBH model of service delivery and as such will increase the opportunity for large-scale program evaluation and research. This same opportunity is likely to be available as healthcare organizations, those that are already using a PCBH model as well as those initiating PCBH model services, start to incorporate standardized program evaluation (implementation and patient outcome) to determine the value and effect of these services.

A range of individuals will need to work together to efficiently and effectively take advantage of these pending opportunities. We have listed below what we believe are the questions to address over the next 10 years.

How Can the PCBH Model be Systematically Evaluated in Busy Clinics?

Clinicians and administrators, should consider how to design and implement program evaluation/quality improvement

efforts into the routine practice of the clinic. When these evaluations are expected as part of routine care, the consistency of data collection and the ability to describe the population served by the clinic is enhanced. The expanded use of EHRs, as well as the presence of quality improvement managers within primary care practices, increase the feasibility of consistent data collection and interpretation. When data are collected routinely the impact of PCBH model implementation and other efforts to enhance care can be evaluated.

How Does PCBH Model Implementation Affect Care?

We lack a good understanding of the changes that occur in a clinic when it moves from no or limited behavioral health integration to using the PCBH model. Examining the implementation and patient outcomes using a simple pre/post quasi-experimental design could contribute important data to the existing literature. Collecting outcomes to address the lack of information on cost effectiveness, sustainability, adoption, and effectiveness will help fill the identified knowledge gaps. Collaboration with funded academics may help improve these evaluations as they can be complicated and time consuming to do in a manner that provides quality actionable information while minimizing the impact on daily operations and patient care.

In addition, simple considerations within a program evaluation will improve the scientific strength of the data collected and the applicability of that data to other clinics. For example, assessing and describing the fidelity to the PCBH model of service delivery (e.g., 30 min appointments) and intervention delivery for a given problem (e.g., depression) will significantly impact the value of conclusions that could be drawn. Similarly, using psychometrically validated measures listed in Table 2 rather than or in addition to, measures developed specifically for that site will contribute to more scientifically robust data. Finally, taking the time to report the various subscales on the measures may help delineate the impact of interventions on specific types of functioning (e.g., Life Functioning on the BHM-20).

What Affects the Sustainment of PCBH Model Implementation?

For those working within settings that are already engaged in PCBH model delivery, there are several courses of action they might take to help continue to move the field forward. Similar to those considering PCBH model implementation, creating partnerships with funded academics and other organizations as listed above will help provide the necessary resources and reduce the burden on the clinical staff when implementing the evaluation project. Sustainability of PCBH model services and appropriateness within different settings or populations are questions that might be

easily answered. For instance, could incorporating the PPAQ into regular practice while also monitoring the resources and support provided to clinicians allow evaluation of clinical practice change over time. Using regular measurement to examine patient experience and overall acceptability to various components of the PCBH model might be easily integrated into standard clinical operating procedures. In addition, the use of EHR data to provide information on the cost/benefit of having a BHC could be incorporated into routine data extraction, analysis, and scheduled reports. For instance, examining the increased time available for PCPs to see more patients or increase the care level of their visits as a result of BHC assistance to address behavioral health concerns (e.g., depression) or health-related behaviors like tobacco use, alcohol misuse, eating, and physical activity behaviors that impact obesity and health plan adherence (e.g., diabetes).

What is the Efficacy and Effectiveness of PCBH Model Interventions?

Individuals working in academic settings who obtain grant funding or have significant resources (e.g., research assistants, statistical software, etc.) to devote to research may be best equipped to address efficacy and effectiveness gaps such as:

1. The impact on patient symptoms and functioning for a given intervention for common patient presentations such as depression, anxiety, PTSD, substance misuse, diabetes, chronic pain, asthma, tobacco use, obesity, and sleep problems.
2. The impact of specific problem intervention using a PCBH model of service delivery, compared to standard primary care, viable attention control placebo, another primary care appropriate evidence-based intervention (e.g., Collaborative Care model services for depression; Screening, Brief Intervention and Referral to Treatment (SBIRT) for substance misuse), or specialty behavioral health services.
3. The impact of core PCBH Model components, patient outcomes, and implementation outcomes.

To accomplish these types of studies, researchers will need to partner with clinics and work across professions to develop symbiotic relationships allowing this research to be conducted, without interfering with the traditional flow of the clinic. For example, hiring personnel and allocating their time to research-related activities (e.g., recruiting participants, reviewing, and completing a consent form) that are not typically part of the patient experience, can help increase the likelihood that the research will be completed.

Conclusion

The PCBH model offers a tremendous opportunity for changing the delivery of behavioral healthcare in primary care settings, while also opening new opportunities for behavioral health providers. It is a model that has great face validity, makes sense to patients and providers, and has been disseminated, implemented, and sustained in large healthcare systems. The growth and sustained uptake of the model is encouraging and suggests that the model is liked and perceived by these systems as beneficial. However, the quality of the outcome research needs to be strengthened to fully understand, not only the impact of the PCBH model on patient and implementation outcomes, but to understand important implementation and contextual variables that account for variability in effectiveness. As highlighted in this review, we need to build on the promise of the PCBH model with more rigorous and systematic outcomes research. The increased interest in integrated primary care by policy makers and funders is opening the door for interprofessional researchers, clinicians, and administrators to develop the systems and studies to narrow the existing knowledge gaps and ensure that patients receive the behavioral healthcare that so many need, but cannot access.

Disclaimer The opinions and statements in this article are the responsibility of the authors, and such opinions and statements do not necessarily represent the policies of the Department of Health and Human Services, Department of Defense, the Veterans Health Administration, or their agencies.

Compliance with Ethical Standards

Conflict of interest Christopher L. Hunter, Jennifer S. Funderburk, Jodi Polaha, David Bauman, Jeffrey L. Goodie, and Christine M. Hunter declare that they have no conflict of interest.

Human and Animal Rights No animal or human studies were carried out by the authors for this article.

Informed Consent For this type of study, formal consent is not required.

Appendix

See Tables 3 and 4.

Table 3 Patient outcomes

Author/year and funding source	Sample ^a	Study design and outcome assessment	Summary of findings
1. Angantyr et al. (2015) Funding source: none reported	54 adults (age $M = 48.96$, $SD = 17.17$, 40.7% male) Primary Care Centers	Design One group pre/post Outcome assessment Anxiety and depression on the Hospital Anxiety and Depression Scale (HAD) Duke Health Profile (DUKE) Patient Perception of Psychological Consultation Survey	HAD: Significantly reduced anxiety and depression from pre-assessment to last consultation appointment Significantly reduced anxiety from last consultation appointment to three month follow-up assessment DUKE: Significantly improved Functioning Score from pre-assessment to last consultation appointment Significantly improved DUKE total score from pre-assessment to last consultation appointment Patients reported an average rating ($M = 3.54$) of significant confidence with the psychological consultant and an average rating of significant increased understanding ($M = 3.23$) of the problems for which they sought help Outcome findings are a subset of findings from the study of a larger group of 793 consecutive adult and adolescent/pediatric patients, that focused on differential referral, diagnosis, therapeutic alliance, and follow-up behaviors based on ethnicity Seventy patients had at least two appointments with ACORN outcome data. Patients demonstrated clinically meaningful improvement, with Cohen's d values exceeding 0.50 Descriptive statistics examining baseline and final appointment GAF scores for all patients with 1–7 appointments Those with only one appointment had an average GAF score of 61.1 (the mild symptom range) Those that had 2–7 appointments all had improved GAF scores from baseline to last appointment
2. Bridges et al. (2014) Funding source: U.S. Department of Health and Human Services (USDHHS) Health Resources and Service Administration (HRSA) Grant	70 adults and pediatric patients (age $M = 28.72$, $SD = 18.13$, 35.6% male) Government-sponsored entity	Design One group pre/post Outcome assessment A Collaborative Outcomes Resource Network (ACORNS)-assesses patient symptoms and functional impairment	
3. Bridges et al. (2015) Funding source: DHHS HRSA Grant	1035 patients age 1–76 years (age $M = 30.10$, $SD = 18.03$, 33.4% male) Government-sponsored entity	Design One group pre/post Outcome assessment Global Assessment of Functioning Scale (GAF)	

Table 3 (continued)

Author/year and funding source	Sample ^a	Study design and outcome assessment	Summary of findings
4. Bryan et al. (2009) Funding source: none reported	A subset of 113 ranging in age from 11 to 83 years old with two or more appointments were selected from a larger sample of 338 patients Government-sponsored entity	Design One group pre/post Outcome assessment BHM 20. Includes Global Mental Health (GMH) score, subscales of Well-Being (WB) (e.g., subjective distress and life satisfaction), Symptoms (SYM) (e.g., depression and anxiety), and Life Functioning (LF) (e.g., functional problems in several areas of life) and suicidal ideation frequency	Patients with 2 appointments showed statistically significant improvements in scores with medium effect sizes for GMH, WB, LF, and a small effect size for SYM. The changes showed clinically significant improvement in GMH from distressed to healthy, WB from at risk to healthy, and LF from distressed to healthy Patients with 3 appointments showed statistically significant improvements in scores with for GMH, WB, LF, and a small effect size for SYM. The changes showed clinically significant linear improvement from distressed to healthy for GMH, WB, LF, and improvement from at risk to health for SYM Patients with 4 appointments ($n = 8$) showed no statistically significant improvements in scores, but total number of appointments demonstrated a large effect size on GMH, WB and SYM
5. Bryan, Corso, Corso et al. (2012) Funding source: none reported	A subset of 497 patients (age $M = 37.14$, $SD = 12.21$, 42.3% male) selected from a larger sample of 1477 patients Government-sponsored entity	Design One group pre/post Outcome assessment Behavioral Health Measure (BHM) 20. Includes Global Mental Health (GMH) score, subscales of Well-Being (WB) (e.g., Subjective distress and life satisfaction), Symptoms (SYM) (e.g., depression and anxiety), and Life Functioning (LF) (e.g., functional problems in several areas of life) and suicidal ideation frequency	One-third (33%) 164 patients endorsed some level of suicidal ideation Analysis showed a statistically significant remittance of suicidal ideation over the course of BH consultant appointments Rate of improvement was initially faster and tended to slower over time
6. Bryan, Corso, Kanzler et al. (2012) Funding source: none reported	A subset of 495 patients (age $M = 37.14$, $SD = 12.21$, 38.9% male) selected from a larger sample of 1477 adult patients Government-sponsored entity	Design One group pre/post Outcome assessment BHM 20. Global Mental Health (GMH) score	Patients met with BH consultant an average of 2.51 times The majority of patients (71.5%) demonstrated some form of improvement, with 40.5% demonstrating reliable improvement, defined as clinically meaningful and reliable increase in GMH score, as indicated by sufficiently large improvement in the patient's overall severity level to a healthier level (e.g., score increased from severe to moderate or mild)

Table 3 (continued)

Author/year and funding source	Sample ^a	Study design and outcome assessment	Summary of findings
7. Cigrang, Dorneyer, Becknell, Roa-Navarrete, and Yerian (2006) Funding source: none reported	Participants were 234 patients (age $M=49.9$, $SD=16.4$, 18–87, 33% male) Government-sponsored entity A subset of 114 with two or more appointments were selected for outcome evaluation	Design One group pre/post Outcome assessment Outcomes Questionnaire-45 (OQ-45)	Patients showed statistically significant reductions in psychological distress from first to last appointment
8. Cigrang et al. (2011) Funding source: none reported	Fifteen (15) active duty military service members (age $M=39$, $SD=9$, 21–55, 80% male) Government-sponsored entity	Design One group pre/post Outcome assessment PTSD Symptom Scale, Interview Version (PSS-I) PTSD Checklist-Military (PCL-M) Patient Health Questionnaire-9 (PHQ-9) BHM-20, Global Mental Health (GMH) score Beck Scale for Suicidal Ideation Deployment Risk and Resilience Inventory (DDRI) Combat Experience and Aftermath-of-Battle subscales	Five participants discontinued treatment after first or second appointment Treatment completers attended 4.5, 30-minute appointments. At the end of the fourth appointment patients and BHCs reviewed treatment progress and could conclude treatment, schedule one or two additional primary care appointments using the same treatment format, or get referred to specialty mental health Using the last observation carried forward for intent-to-treat analysis, showed that PTSD severity, depression, and GMH functioning significantly improved with the intervention Fifty percent of treatment completers no longer met criteria for PTSD
9. Cigrang et al. (2015) Funding source: none reported	An extension of Cigrang et al. (2011), $N=24$, age $M=38$, $SD=8.1$, 21–55, 62.5% male Government-sponsored entity	Design One group pre/post Outcome assessment See Cigrang et al. (2011)	Seventeen of the 24 patients (71%) completed treatment PCL-M and PSS-I measure of PTSD symptom severity showed statistically significant and clinically significant reductions from baseline to post-treatment that were maintained at the 6-month and 1-year follow-up Treatment effect size for PTSD symptom severity from baseline to 1-month follow-up was large (Cohen's $d \geq 1.08$) At baseline 88% of treatment completers met DSM-IV diagnostic criteria for PTSD; at post-treatment the percentage who met diagnostic criteria was 47% Statistically and clinically significant reduction in depressive symptoms and increases in ratings of GMH were found from baseline to post-treatment and maintained at 6-month and 1-year follow-up

Table 3 (continued)

Author/year and funding source	Sample ^a	Study design and outcome assessment	Summary of findings
10. Corso et al. (2009) Funding source: none reported	19 active duty service members (age $M = 32.26$, $SD = 7.65$, 84.2% male) attending 2–5 appointments Government-sponsored entity	Design Three group comparison; however, the focus of comparison was the intervention provided by BHC. Treatment as usual, combat writing, impact statement Outcome assessment PCL-M BHM-20. Global Mental Health (GMH) score	The impact statement intervention group demonstrated a significant time effect in reduction in PTSD symptoms with a large effect size as measured by the PCL-M. PCL-M change was not significant for treatment as usual and combat writing groups The impact statement intervention group demonstrated a significant time effect for improved GMH score for distressed to healthy range. GMH score change was not significant for treatment as usual and combat writing groups
11. Corso et al. (2012) Funding source: none reported	541 patients (age $M = 36.41$, $SD = 12.25$, 14–73, 42.7% male) A subset of 218 patients that had 2 or more appointments were selected for outcome evaluation Government-sponsored entity	Design One group pre/post Outcome assessment BHM-20. Global Mental Health (GMH) score	Overall patients demonstrated a significant improvement on the GMH scores from initial to final appointment
12. Funderburk et al. (2012) Funding source: none reported	276 patients eligible for survey completion 79 participants completed survey (age $M = 30$, $SD = 3.8$, 25.3% male), 29% response rate Academic medical center	Design One group post-implementation Outcome assessment Patient satisfaction survey	Of the 53 patients who remembered the appointment with a BHC, the majority ($n = 38$), felt the BHC helped them with the topic they discussed Were satisfied with services Would be willing to seek help in the future
13. Funderburk et al. (2010) Funding source: none reported	140 patients (no demos collected) Government-sponsored entity	Design One group post-implementation Outcome assessment Anonymous patient satisfaction survey	Felt good about amount of time and help received from BHC Felt good about care meeting their needs and overall quality of care Would probably recommend services to family or friends and were very satisfied with services received
14. Gomez et al. (2014) Funding source: Grant from the USDHHS/HRSA	56 caregiver/child dyads seen for at least 2 appointments Analysis based on 21 caregivers and their children (age $M = 7.76$, 1–17, 61.9% male) Academic medical center	Design One group pre/post Outcome assessment GAF, ACORNS Satisfaction survey	Significant improvement in child global distress from first to last appointment. 38.1% of patients experienced reliable change despite a 2.38 average number of appointments for overall group Overall high satisfaction ratings by adults and children and adolescents with BH services

Table 3 (continued)

Author/year and funding source	Sample ^a	Study design and outcome assessment	Summary of findings
15. Goodie et al. (2009) Funding source: none reported	29 participants (62% who agreed to participate completed treatment (age $M = 40.5$, $SD = 15.6$, 34% male) Government-sponsored entity	Design One group pre/post Outcome assessment Sleep Diary (self-entry report of sleep related variables like bedtime, arising time, sleep onset latency, time awake following sleep onset) Sleep Impairment Index (SII) (a 7-item questionnaire yielding a quantitative index of sleep impairment) Insomnia Treatment Evaluation Measure (ITEM) (9-item questionnaire developed for the study to assess patient perceptions of credibility and effectiveness of treatment received)	Significant improvement in sleep efficiency Significant improvement in sleep onset latency Significant improvement in wake after sleep onset Significant increased sense of restedness Significant improvement (score decrease) on SII Significant reduction in number of patients that used sleep medication Treatment rated as highly "logical" and effective in reducing sleep problems

Table 3 (continued)

Author/year and funding source	Sample ^a	Study design and outcome assessment	Summary of findings
16. Katon et al. (1996) Funding source: NIMH, Health Services Division	153 patients Major Depression group: Intervention ($M=43.1$, $SD=9.3$, $22-58$, 22.6% male); Control ($M=44.8$, $SD=15.9$, $23-74$, 26.5% male) Minor Depression group: Intervention ($M=49.2$, $SD=13.9$, $22-82$, 28.3% male); Control ($M=47.2$, $SD=13.8$, $21-76$, 26.2% male) Primary care clinic	Design Randomized Controlled Trial Outcome assessment Depression Diagnosis DSM-III 20 depression items from Symptom Check List-90 (SCL-90) Inventory for Depressive Symptomatology (IDS) Adherence to antidepressant medication Satisfaction with management of depression	Intervention and control groups reported substantial improvement from baseline to 1-, 4-, and 7-month follow-up Among control patients with major depression 23.1% met criteria for major depression, and 30.8% met criteria for minor depression, respectively at 4-month follow-ups vs. 7.4 and 33.8% of intervention patients Among control patients with minor depression, 33.3% met criteria for minor depression at 4 month follow-ups vs. 25.6% of intervention patients Significantly more patients with major depression showed 50% or more improvement on the SCL-20 depression items compared to control patients No significant differences between intervention patients with minor depression and control patients who improved 50% or more on the SCL-20 On the IDS 74.1% of intervention patients showed 50% or more improvement compared with 42.3% of control patients No significant differences between in intervention patients and control patients, with minor depression on the IDS Patients with major depression were significantly more likely to adhere to medication recommendation for 25 or more days in the last 1-month period and 4-month follow-up compared to controls Patients with minor depression were significantly more likely to adhere to medication recommendation for 25 of the last 30 days, at 4 and 7-month follow-up At 4-month follow-up significantly more intervention patients with major and minor depression rated the quality of care they received for depression as good to excellent compared to control patients

Table 3 (continued)

Author/year and funding source	Sample ^a	Study design and outcome assessment	Summary of findings
17. McFeature et al. 2012 Funding source: none reported	300 patients referred for a BH consultation, of which 251 were mood-disordered ($M = 41.2$, $SD = 14.02$, 37% male) Community health center	Design One group pre/post Outcome assessment PHQ-9	PHQ-9 Scores were significantly lower from pre- to post-intervention 49.8% of patients demonstrated improvements of at least 50% in PHQ-9 scores from pre- to post-intervention 80.5% of patients demonstrated at least a 5 point improvement in PHQ-9 scores from pre- to post-intervention Patients that returned the BHM-20 had significant improvements from pre- to post-intervention for the GMH score and maintained those gains an average of 2 years after intervention
18. Ray-Sannerud et al. (2012) Funding source: none reported	70 patients (10.5%) of 644, average age 43, completed and returned the BHM-20 (age $M = 43.10$, $SD = 12.69$, 37.1% male) Government-sponsored entity	Design One group pre/post Outcome assessment BHM-20. Global Mental Health (GMH) score	Patients that returned the BHM-20 had significant improvements from pre- to post-intervention for the GMH score and maintained those gains an average of 2 years after intervention
19. Runyan et al. (2003) Funding source: none reported	76 participants Government-sponsored entity	Design One group post-implementation Outcome assessment Patient satisfaction self-report survey	97% of patients reported that they were satisfied or very satisfied with BHC care 69% of patients reported that they would recommend the services to others
20. Sadock et al. (2014) Funding source: Grant from the Virginia Health Care Foundation and a HRSA Graduate Psychology Education program grant	452 adult patients (age $M = 52.29$, $SD = 13.4$, 36.3% male) Academic Medical center	Design One group pre/post Outcome assessment PHQ-9 GAD-7 Number of cigarettes Weight Insomnia Severity Index (ISI) Short-Form McGill Pain Questionnaire (SF-GPQ)	Patients being treated for depression ($n = 51$) showed significant decreases in PHQ-9 scores from initial to final assessment Patients being treated for anxiety ($n = 32$) showed significant decreases in GAD-7 scores from initial to final assessment Patients ($n = 15$) getting smoking cessation interventions (average number of appointments 3.13) significantly decreased cigarette use from pre- to post-intervention (106.2 vs. 68.2), 1 patient stopped smoking Patients ($n = 9$) getting weight loss interventions (average number of appointments 2.89) significantly reduced average weight from 278.78 to 271.10 pounds Only 4 patients filled out the ISI on multiple occasions and some patients who initially sought insomnia services chose to focus on another area and did not complete follow-up ISI questionnaires. ISI scores showed a non-significant decline 19.57–16.4 both scores in the moderate clinically significant insomnia range Patients ($n = 9$) on the SF-MPQ showed no significant change

^aDescriptions of the study sample (including N , M , or SD) are omitted in this table for articles in which they were not reported

Table 4 Implementation outcomes

Author/year and funding source	Sample ^a	Study design and outcome	Summary of findings
1. Aguirre et al. (2012) Funding source: American Academy of Child and Adolescent Psychiatry's Campaign for America's Kids and the National Institute of Mental Health Grant	Pediatric physicians Academic medical center	Design One group post-implementation Outcome Satisfaction	Reported high satisfaction with availability and quality of services. Ability to handle urgent cases and assess risk were identified as important
2. Brawer et al. (2010) Funding source: none reported	System serving 36,000 with 40+ PCPs	Design One group pre/post Outcomes Access to BH PCP prescription practice	Total access to BH increased 391% (primary care BH + specialty BH) compared to year prior to program implementation when only specialty BH was available Top quartile of PCPs responsible for half of all specialty BH referrals prior to program implementation decreased their number of referrals to specialty BH by over 50% post-implementation Number of specialty BH consults written by PCPs declined 37% over all Greater likely hood of completed consult with specialty BH (66%) for those seen by a primary care psychologist prior to referral, compared to 47% completion rate from medical centers at large both pre and post-implementation PCPs who were LEAST likely to prescribe antidepressant medication prior to implementation increased this practice by 323% PCPs who were MOST likely to prescribe psychotropic medications prior to implementation decrease this practice by 29% Authors suggest that prescribing providers appear to be more willing to prescribe when part of an integrated primary care team, and PCPs who were high frequency prescribers, may have gained improved knowledge of BH issues and became more discriminate in their pharmacological treatments of those who may or may not have had significant BH concerns
3. Felker et al. (2004) Funding source: none reported	General internal medicine clinic serving 9656 patients Average age: 53 years 90% male	Design One group pre/post Outcome Referral rate to specialty mental health	Referral rate to specialty mental health dropped from 38% prior to program implementation to 14% post-implementation Mean number of primary care BH appointments for evaluation and stabilization was 2.5

Table 4 (continued)

Author/year and funding source	Sample ^a	Study design and outcome	Summary of findings
4. Funderburk, Dobbmeyer, Hunter, and Walsh (2013) Funding source: none reported	75 BHC in the Veteran Health Administration 23 BHCs in the United States Air Force	Design One group post-implementation Outcomes 23-item background questionnaire 31-question appointment information survey	Large majority of BHCs in both settings used same waiting room as PCPs Offices were located in primary care 25 feet or less from PCP offices Had regular open same day appointment slots Over 2/3 of BHCs regularly attended primary care staff meetings Over 1/2 of BHCs reported they were regularly present at staff meetings Over 30% reported being regularly invited into patient appointments by PCPs PCPs and nurses considered BHCs a part of the team and felt the program helped patients receive treatment more quickly PCPs perceived that patients benefited from seeing a BHC PCPs and nurses would recommend this service to other colleagues
5. Funderburk et al. (2012) Funding source: based upon work supported by the American College Health Association United Healthcare Student Recourse Initiatives in College Mental and Behavioral Health grant	Nine PCPs and 10 nurses eligible for survey completion 9 PCPs (100%) and 6 nurses (60%) responded	Design One group post-implementation Outcome PCP and nurse satisfaction survey	On days where a BHC was present PCPs spent 2 fewer minutes with patients PCPs saw 42% more patients PCPs collected \$1142 more revenue
6. Gouge et al. (2016) Funding source: none reported	5 pediatric PCPs, 2 BHCs (only 1 in the clinic on a given day), 668 pediatric patients and their parents seen on 10 days with BHCs present and 10 days BHCs were not in clinic	Design One group pre/post Outcomes Time PCPs spent with patients Number of patients seen Income generated	BH provider (BHC) in clinic services and training was highly valued BHC behaviors endorsed as helpful Doing warm hand-offs (100% of respondents) Doing curbside consultations (96.97% of respondents) Helping with out-of-clinic mental health referrals (87.88%) Helping with patient crises (84.85%) Having BHC notes in electronic medical record (72.73%)
7. Hill (2015) Funding source: this research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors	33 providers (13 medical faculty, 4 clinician mentors/full-time providers, 4 advanced practice clinicians/physician assistants, 12 residents in all 3 years of training)	Design One group post-implementation Outcome Satisfaction with services Survey	

Table 4 (continued)

Author/year and funding source	Sample ^a	Study design and outcome	Summary of findings
8. Horevitz, Organista, and Areal (2015) Funding source: none reported; the authors report no financial relationships with commercial interests	1537 Latino patients with 9 or higher scores on PHQ-9, ages 18–65 years A subset of 470 patients were referred for primary care BH services for depression tr39 patients were missing data, resulting in a final sample of 431 (age $M = 43.5$, $SD = 14.8$, 27% male)	Design One group post-implementation Outcome Predictors of follow-through on primary care BH appointment	Significant interaction effect between referral type and primary language Odds of follow-through with appointment were 75% lower among English-speaking Latinos in comparison to Spanish-speaking Latinos who received a warm hand-off (in-person referral to a BH provider) versus a prescribed referral In other words, for every four English-speaker patients with a cold hand-off (prescribed appointment without an introduction to the BH provider) who attended an appointment, only 1 English-speaker with a warm hand-off attended an appointment Qualitative findings Patients were more likely to attend an appointment if the prescribed treatment was in concern with their beliefs about the causes of depression Addressing instrumental barriers to care, illness acuity and subsequent readiness for treatment, and family engagement may also enhance the referral process English-speaking patients seemed more skeptical of brief treatment models and expressed more distrust in the clinic Most patients experienced the warm hand-off as rushed and confusing, particularly if the referral was made by a medical assistant Audio recordings of 9% of the total psychologist visits were reviewed for adherence to the 125-page treatment manual Treatment integrity was assessed on a 1 (low adherence) to 3 (high adherence) on 12 or 13 appointment specific items Possible score range for appointment 1 was 13–39, and 12–36 for all other appointments Mean score for both treatment providers for appointment 1 was 39. Mean scores for follow-up appointments ranged from 34 to 36; scores suggest high adherence to treatment protocol
9. Katon et al. (1996) Funding source: NIMH, Health Services Division	153 patients Major depression group: intervention ($M = 43.1$, $SD = 9.3$, 22–58, 22.6% male); Control ($M = 44.8$, $SD = 15.9$, 23–74, 26.5% male) Minor Depression group: Intervention ($M = 49.2$, $SD = 13.9$, 22–82, 28.3% male); Control ($M = 47.2$, $SD = 13.8$, 21–76, 26.2% male) Primary care clinic	Design Randomized controlled trial Outcome Provider adherence to treatment protocol	

Table 4 (continued)

Author/year and funding source	Sample ^a	Study design and outcome	Summary of findings
10. Kessler (2012) Funding Source: None reported	93 patients from a family medicine clinic site A (median age=50.4, 42% male) referred for common BH problems like depression and anxiety. 1/3 referred for specific medical issues such as insomnia, headache and chronic pain 256 from an internal medicine clinic site B (median age=48, 22% male) referred for common BH problems like depression. 60% of referrals were treated for a specific medical issue in addition to a BH problem Academic Medical Center	Design Convenience sample one-time referral analysis Outcomes Site A: Number of scheduled and kept primary care BH appointments Site B: Number of patients referred for a primary care BH appointment, number that made an appointment, number that kept first appointment (new electronic health record allowed for more detailed information gathering in site B)	Site A: 95.5% of patients who scheduled an initial appointment, attended Site B: 82% of patients referred by their PCP, scheduled an initial appointment, of those who were referred; 68.8% attended an initial appointment Author argues that rate of primary care behavioral attendance is substantially higher than published data on out-of-primary care specialty BH attendance
11. Lanoye et al. (2016) Funding source: HRSA/Graduate Psychology Education (GPE) grant and HRSA/GPE grant; Virginia Health Care Foundation; and Clinical and Translational Science Award from the National Center for Advancing Translational Sciences	720 adults receiving one or more primary care BH appointments seen for depression, chronic pain, anxiety, smoking cessation, insomnia, weight loss, diabetes adherence and substance misuse Average age 52.6, seen for an average of 2.15 appointments 720 adult propensity score matched comparison group; average age 54.5	Design Two group pre/post (treatment vs. matched control) Outcome Medical utilization data [emergency department (ED), inpatient hospital, outpatient medical] 1 year before and 1 year after intervention	Significant time by group interaction where those receiving treatment had higher utilization in comparison to controls prior to treatment and lower utilization in comparison to controls after treatment Mean number of preventable hospitalizations was significantly lower for the treatment group after treatment in comparison to the control group
12. Runyan et al. (2003) Funding source: none reported	23 providers completed a self-report survey (68% response rate) Government-sponsored entity 868 patients were seen during 6 months of data collection	Design One group post-implementation Outcomes Provider self-report satisfaction survey Medical Record Data	100% of providers said they would recommend the service to other providers 91% of providers felt the consultant helped them improve recognition and treatment of BH problems 100% of providers were satisfied overall with the service Mean number of visits was 1.6; BHCs managed over 90% of patients identified for BH services in PC

Table 4 (continued)

Author/year and funding source	Sample ^a	Study design and outcome	Summary of findings
<p>13. Serrano et al. (2011) Funding source: none reported</p>	<p>Prior to implementation: $N=282$ (age $M=39.7$, $SD=13.3$, 11–72, 32.6% male) 3 years post-implementation: $N=282$ randomly selected from 617 patients with depression diagnosis (age $M=41.0$, $SD=13.0$, 15–86, 32.9% male) Government-sponsored entity</p>	<p>Design Two Group Pre/Post-Implementation Outcomes Documentation of behavioral goals and uses of standard measures Type and rate of medication adjustment Rate of specialty mental health referral BHC involvement on number of patient visits for depression Primary care clinician's attitudes toward treating mental illness</p>	<p>Rate of documentation of a behavioral goal increased significantly in 2009 (82.5%) compared to 2005 (5.7%). Rate of documentation of the use of a standard measure of depression 41.8% in 2009 vs. 2.7% in 2005 In 2009 symptomatic patients were significantly less likely to initiate psychotropic medication 42.9 vs. 51.1% in 2005 In 2009 symptomatic patients were less likely to have 1 or more changes in their medication regimen: 61.2% of symptomatic patients that initiated psychotropic medication had a change of medication or dosage adjustment vs. 71.6% in 2005 Symptomatic patients not already on psychotropic medication were less likely to have 1 or more changes overall in 2009 61.1 vs. 82.3% in 2005 and were less likely to initiate psychotropic medication in 2009 (16%) compared to 2005 (0%) Patients were significantly less likely to be referred to specialty mental health in 2009, 8.95 vs. 48.2% in 2005 In 2009, BHC involvement was associated with a significant 34% increase in the total number of Primary care visits BHC involvement was associated with a 109% increase of total number of combined Primary care/BHC visits Primary care clinicians (PCCs) ($n=14$) rated the behavioral health consultation (BHC) program most highly (average rating of 9 on a scale of 1–10) among choices for sources of impact improving their comfort level with treating mental disorders, with professional experience (8.54) and mentorship from colleagues (8.23) next most highly rated All PCCs rated the BHC program as important 15.4%, or very important 84.6% PCCs rate psychiatric consultation (8.17 on a scale of 1 = low to 10 = high) and BHC components (9.46) as having high importance to their practice</p>

Table 4 (continued)

Author/year and funding source	Sample ^a	Study design and outcome	Summary of findings
14. Torrence et al. (2014) Funding source: this research was supported by a grant from the USDHHS/HRSA; Graduate Psychology Education Program	45 of 73 primary care providers (age $M = 43.3$, $SD = 10.9$, 31% male) completed survey data. 21 of the respondents were physicians Government-sponsored entity	Design One group post-implementation Outcome Six self-report items assessing medical provider attitudes and perceptions of BHCs	Percentage of respondents that agreed or strongly agreed with each statement are listed Using BHCs improves my efficiency as a healthcare provider (91%) Using BHCs improves overall patient care (93%) BHCs effectively help patients address their mental health problems (93%) BHCs effectively help patients address their physical health problems (76%) Working with BHCs has increased my comfort in discussing mental health issues with my patients (73%) BHCs are an important part of my practice (93%)

^aDescriptions of the study sample (including N , M , or SD) are omitted in this table for articles in which they were not reported

References

References marked with an asterisk indicate studies included in the review

- Agency for Healthcare Research and Quality (ARHQ). (n.d.). About PBRNs. *In Practice-based research networks*. Retrieved from <https://pbrn.ahrq.gov/about>.
- *Aguirre, J., & Carrion, V. G. (2012). Integrated behavioral health services: A collaborative care model for pediatric patients in low-income settings. *Clinical Pediatrics*, *52*, 1178–1180.
- *Angantyr, K., Rimmer, A., & Norden, T. (2015). Primary care behavioral health model: Perspectives of outcome, client satisfaction, and gender. *Social Behavior and Personality*, *43*, 287–302.
- Baird, M., Blount, A., Brungardt, S., Dickinson, P., Dietrich, A., Epperly, T., ... deGruy, F. (2014). Joint principles: Integrating behavioral health care into the patient-centered medical home. *Annals of Family Medicine*, *12*, 183–185.
- Bastien, C., Vallieres, A., & Morin, C. M. (2001). Validation of the insomnia severity index as a clinical outcome measure for insomnia research. *Sleep Medicine*, *2*, 297–307.
- Beck, A. T., Epstein, N., Brown, G., & Steer, R. A. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology*, *56*(6), 893.
- Beehler, G. P., Funderburk, J. S., Possemato, K., & Dollar, K. M. (2013). Psychometric assessment of the Primary Care Behavioral Health Provider Adherence Questionnaire (PPAQ). *Translational Behavioral Medicine*, *3*, 379–391.
- Beehler, G. P., Funderburk, J. S., Possemato, K., & Vair, C. L. (2013). Developing a measure of provider adherence to improve the implementation of behavioral health services in primary care: A Delphi study. *Implementation Science*, *8*, 19. [10.1186/1748-5908-8-19](https://doi.org/10.1186/1748-5908-8-19).
- Bradley, K. A., DeBenedetti, A. F., Volk, R. J., Williams, E. C., Frank, D., & Kivlahan, D. R. (2007). AUDIT-C as a brief screen for alcohol misuse in primary care. *Alcoholism: Clinical & Experimental Research*, *31*, 1208–1217.
- *Brawer, P. A., Martielli, R., Pye, P. L., Manwarning, J., & Tierney, A. (2010). St. Louis initiative for integrated care excellence (SLI²CE): Integrated-collaborative care on a large scale model. *Families, Systems, & Health*, *28*, 175–187.
- *Bridges, A. J., Andrews, A. R., Villalobos, B. T., Pastrana, F. A., Cavell, T. A., & Gomez, D. (2014). Does integrated behavioral health care reduce mental health disparities for Latinos? Initial findings. *Journal of Latino Psychology*, *2*, 37–53.
- *Bridges, A. J., Gregus, S. J., Rodriguez, J. H., Andrews, A.R. III, Villalobos, B. T., Pastrana, F. A., & Cavell, T. A. (2015). Diagnoses, intervention strategies, and rates of functional improvement in integrated behavioral health care patients. *Journal of Consulting and Clinical Psychology*, *83*, 590–601.
- *Bryan, C. J., Corso, K. A., Corso, M. L., Kanzler, K. E., Ray-Sannerud, B., & Morrow, C. E. (2012). Therapeutic alliance and change in suicidal ideation during treatment in integrated primary care settings. *Archives of Suicide Research*, *16*, 316–323.
- *Bryan, C. J., Corso, K. A., Kanzler, K. E., Corso, M. L., Morrow, C. E., & Ray-Sannerud, B. (2012). Severity of mental health impairment and trajectories of improvement in and integrated primary care clinic. *Journal of Clinical and Consulting Psychology*, *80*, 396–403.
- *Bryan, C. J., Morrow, C., & Appolonio, K. (2009). Impact of behavioral health consultant interventions on patient symptoms and functioning in an integrated family medicine clinic. *Journal of Clinical Psychology*, *65*, 281–293.

- *Cigrang, J. A., Avila, L. L., Goodie, J. L., Peterson, A. L., Rauch, S. A. M., Bryan, C. J., & Hryshko-Mullen, A. (2011). Treatment of active-duty military with PTSD in primary care: Early findings. *Psychological Services, 8*, 104–113.
- *Cigrang, J. A., Dobbmeyer, A. C., Becknell, M. E., Roa-Navarrete, R. A., & Yerian, S. R. (2006). Evaluation of a collaborative mental health program in primary care: Effects on patient distress and health care utilization. *Primary Care and Community Psychiatry, 11*, P1–P7.
- *Cigrang, J. A., Rauch, S. A. M., Mintz, J., Brundige, A., Avila, L. L., Bryan, C. J., ... Peterson, A. L. (2015). Treatment of active duty military with PTSD in primary care: A follow-up report. *Journal of Anxiety Disorders, 36*, 110–114.
- *Corso, K. A., Bryan, C. J., Corso, M. L., Kanzler, K. E., Houghton, D. C., Ray-Sannerud, B., & Morrow, C. E. (2012). Therapeutic alliance and treatment outcome in the primary care behavioral health model. *Families, Systems & Health, 30*, 87–100.
- *Corso, K. A., Bryan, C. J., Morrow, C. E., Appolonio, K. K., Dondorf, D. M., & Baker, M. T. (2009). Managing posttraumatic stress disorder symptoms in active-duty military personnel in primary care settings. *Journal of Mental Health Counseling, 31*, 119–137.
- Corso, K. A., Hunter, C. L., Dahl, O., Kallenberg, G., & Manson, L. (2016). *Integrating behavioral health in the medical home: A rapid implementation guide*. Phoenix: Greenbranch Publishing.
- Davis, M. M., Keller, S., DeVoe, J. E., & Cohen, D. J. (2012). Characteristics and lessons learned from practice-based research networks (PBRNs) in the United States. *Journal of Healthcare Leadership*. doi:10.2147/jhl.s16441.
- *Felker, B. L., Barnes, R. F., Greenberg, D. M., Chaney, E. F., Shores, M. M., Gillespie-Gateley, L., ... Morton, C. E. (2004). Preliminary outcomes from an integrated mental health primary care team. *Psychiatric Services, 55*, 442–444.
- Ford, I., & Norrie, J. (2016). Pragmatic trials. *New England Journal of Medicine, 375*, 454–463.
- Frisch, M. B. (1994). *Test manual and treatment guide for the QOLI (Quality of Life Inventory)*. Minneapolis, MN: Pearson Assessments (formerly NCS Assessments).
- *Funderburk, J. S., Dobbmeyer, A. C., Hunter, C. L., & Walsh, C. O. (2013). Provider practices in the primary care behavioral health (PCBH) model: An initial examination in the Veterans Health Administration and United States Air Force. *Families, Systems & Health, 31*, 341–353.
- *Funderburk, J. S., Fielder, R. L., DeMartini, K. S., & Flynn, C. A. (2012). Integrating behavioral health services into a university health centers: Patient and provider satisfaction. *Families, Systems & Health, 30*, 130–140.
- Funderburk, J. S., Kenneson, A., & Maisto, S. A. (2014). Identifying classes of veterans with multiple risk factors. *Military Medicine, 179*(10), 1119–11267. doi: 10.7205/MILMED-D-14-00119.
- *Funderburk, J. S., Sugarman, D. E., Maisto, S. A., Ouimette, P., Schohn, M., Lantinga, L., ... Strutynski, K. (2010). The description and evaluation of the implementation of an integrated healthcare model. *Families, Systems & Health, 28*, 146–160.
- Gill, L., & White, L. (2009). A critical review of patient satisfaction. *Leadership in Health Services, 22*(1), 8–19.
- *Gomez, D., Bridges, A. J., Andrews, A. R., Cavell, T. A., Pas-trana, F. A., Gregus, S. J., & Ojeda, C. A. (2014). Delivering parent management training in an integrated primary care setting: Description and preliminary outcome data. *Cognitive and Behavioral Practice, 21*, 296–309.
- *Goodie, J. L., Isler, W. C., Hunter, C., & Peterson, A. L. (2009). Using behavioral health consultants to treat insomnia in primary care: A clinical case series. *Journal of Clinical Psychology, 65*, 294–304.
- *Gouge, N., Polaha, J., Rogers, R., & Harden, A. (2016). Integrating behavioral health into pediatric primary care: Implications for provider time and cost. *Southern Medical Journal, 109*, 774–778.
- Hawkins, N. G., Sanson-Fisher, R. W., Shakeshaft, A., D'Este, C., & Green, L. W. (2007). The multiple baseline design for evaluating population-based research. *American Journal of Preventive Medicine, 33*(2), 162–168.
- Heatherston, T. F., Kozlowski, L. T., Frecker, R. C., & Fagerstrom, K. O. (1991). The Fagerstrom test for nicotine dependence: A revision of the Fagerstrom Tolerance Questionnaire. *British Journal of Addiction, 86*, 1119–1127.
- *Hill, J. (2015). Behavioral health integrations: Transforming patient care, medical resident education, and physician effectiveness. *The International Journal of Psychiatry in Medicine, 50*, 36–49.
- *Horevitz, E., Organista, K. C., & Arian, P. A. (2015). Depression treatment uptake in integrated primary care: How a “warm hand-off” and other factors affect decision making by Latinos. *Psychiatric Services, 66*, 824–830.
- *Katon, W., Robinson, P., Von Korff, M., Lin, E., Bush, T., Ludman, E., ... Walker, E. (1996). A multifaceted intervention to improve treatment of depression in primary care. *Archives of General Psychiatry, 53*, 924–932.
- *Kessler, R. (2012). Mental health care treatment initiation when mental health services are incorporated into primary care practice. *Journal of the American Board of Family Medicine, 25*, 255–259.
- Kopta, S. M., & Lowry, J. L. (2002). Psychometric evaluation of the Behavioral Health Questionnaire-20: A brief instrument for assessing global mental health and the three phases of psychotherapy outcome. *Psychotherapy Research, 12*, 413–426.
- Kozica, S. L., Lombard, C. B., Hider, K., Harrison, C. L., & Teede, H. J. (2015). Developing comprehensive health promotion evaluations: A methodological review. *MedCrave Online Journal of Public Health, 2*, 1–9. doi: 10.15406/mojph.2015.02.00007.
- Krebs, E. E., Lorenz, K. A., Bair, M. J., Damush, T. M., Jingwei, W., Sutherland, J. M., ... Kroenke, K. (2009). Development and initial validation of the PEG, a three-item scale assessing pain intensity and interference. *Journal of General Internal Medicine, 24*(6), 733–738.
- Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The Phq-9. *Journal of General Internal Medicine, 16*(9), 606–613.
- *Lanoye, A., Stewart, K. E., Rybarczyk, B. D., Auerbach, S. M., Saddock, E., Aggarwal, A., ... Austin, K. (2016). The impact of integrated psychological services in a safety net primary care clinic on medical utilization. *Journal of Clinical Psychology*. doi:10.1002/jclp.22367.
- Larsen, D. L., Attkisson, C. C., Hargreaves, W. A., & Nguyen, T. D. (1979). Assessment of client/patient satisfaction: Development of a general scale. *Evaluation and Program Planning, 2*(3), 197–207.
- Lerner, D., Amick, I. I. L., Rogers, B. C., Malspeis, W. H., Bungay, S., K., & Cynn, D. (2001). The work limitations questionnaire. *Medical Care, 39*(1), 72–85.
- Litz, B., Gray, M., Bryant, R., & Adler, A. (2002). Early intervention for trauma: Current status and future directions. *Clinical Psychology: Science and Practice, 9*, 112–134.
- Loudon, K., Treweek, S., Sullivan, F., Donnan, P., Thorpe, K. E., & Zwarenstein, M. (2015). The PRECIS-2 tool: Designing trials that are fit for purpose. *British Medical Journal, 350*, h2147. doi: 10.1136/bmj.h2147.
- Marshall, G. N., & Hays, R. D. (1994). The patient satisfaction questionnaire short-form (PSQ-18). *RAND*. Retrieved from <https://www.rand.org/pubs/papers/p7865.html>.
- *McFeature, B., & Pierce, T. W. (2012). Primary care behavioral health consultation reduces depression levels among mood-disordered patients. *Journal of Health Disparities Research and Practice, 5*, 36–44.

- McNally, R. J., Bryant, R. A., & Ehlers, A. (2003). Does early psychological intervention promote recovery from posttraumatic stress? *Psychological Science in the Public Interest*, 4, 45–79.
- Mostert, M. P. (2001). Facilitated communication since 1995: A review of published studies. *Journal of autism and Developmental Disorders*, 31, 287–313.
- Nasreddine, Z. S., Phillips, N. A., Bédirian, V., Charbonneau, S., Whitehead, V., Collin, I., ... Chertkow, H. (2005). The Montreal Cognitive Assessment, MoCA: A brief screening tool for mild cognitive impairment. *Journal of the American Geriatrics Society*, 53(4), 695–699.
- National Association of Community Health Centers (NACHC). (n.d.). About our health centers. In *NACHC*. Retrieved from <http://nachc.org/about-our-health-centers/>.
- Parkerson, G. R., & Broadhead, W. E. (1990). The Duke Health Profile. A 17-item measure of health and dysfunction. *Medical Care*, 28(11), 1056–1072.
- Pascoe, G. C. (1983). Patient satisfaction in primary health care: A literature review and analysis. *Evaluation and Program Planning*, 6, 185–210.
- Prins, A., Ouimette, P., Kimerling, R., Cameron, R. P., Hugelshofer, D. S., Shaw-Hegwer, J., Thrailkill, A., Gusman, F. D., & Sheikh, J. I. (2003). The Primary Care PTSD Screen (PC-PTSD): Development and operating characteristics. *Primary Care Psychiatry*, 9(1), 9–14.
- Proctor, E., Landsverk, J., Aarons, G., Chambers, D., Glisson, C., & Mittman, B. (2009). Implementation research in mental health services: An emerging science with conceptual, methodological, and training challenges. *Administrative Policies in Mental Health*, 36, 24–34.
- Proctor, E., Silmere, H., Raghavan, R., Hovmand, P., Aarons, G., Bunger, A., ... Hensley, M. (2011). Outcomes for implementation research: Conceptual distinctions, measurement challenges, and research agenda. *Administration and Policy in Mental Health and Mental Health Services Research*, 38, 65–76.
- PROMIS-29 Profile v2.0 © 2008–2016 PROMIS Health Organization and PROMIS Cooperative Group, May, 27, 2016. <http://www.nihpromis.org>.
- *Ray-Sannerud, B. N., Dolan, D. C., Morrow, C. E., Corso, K. A., Kanzler, K. E., Corso, M. L., & Bryan, C. J. (2012). Longitudinal outcomes after brief behavioral health intervention in an integrated primary care clinic. *Families, Systems & Health*, 30, 60–71.
- Reiter, J. T., Dobbmeyer, A. C., & Hunter, C. L. (2017). The primary care behavioral health (PCBH) model: An overview and operational definition. *Journal of Clinical Psychology in Medical Settings*, 24(4).
- *Runyan, C., Fonseca, V. P., Meyer, J. G., Oordt, M. S., & Talcott, G. W. (2003). A novel approach for mental health disease management: The Air Force Medical Service's interdisciplinary model. *Disease Management*, 6, 179–187.
- *Sadock, E., Auerbach, S. M., Rybarczyk, B., & Aggarwal, A. (2014). Evaluation of integrated psychological services in a university-based primary care clinic. *Journal of Clinical Psychology in Medical Settings*, 21, 19–32.
- Scharf, D. M., Eberhart, N. K., Hackbarth, N. S., Horvitz-Lennon, M., Beckman, R., Han, B., ... Burnam, M. A. (2014). Evaluation of the SAMHSA primary and behavioral health care integration (PBHCI) grant program: Final report (task 13). Retrieved from http://www.rand.org/content/dam/rand/pubs/research_reports/RR500/RR546/RAND_RR546.pdf.
- Seelert, K. R., Hill, R. D., Rigdon, M. A., & Schwenzfeier, E. (1999). Measuring patient distress in primary care. *Family Medicine*, 31, 483–487.
- *Serrano, N., & Monden, K. (2011). The effect of behavioral health consultation on the care of depression by primary care clinicians. *WMJ*, 110, 113–113.
- Smith, J., D. (2012). Single-case experimental designs: A systematic review of published research and current standards. *Psychological Methods*. doi:10.1037/a0029312.
- Spitzer, R. L., Kroenke, K., Williams, J. B., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: The GAD-7. *Archives of Internal Medicine*, 166(10), 1092–1097.
- Strosahl, K. (1994). New dimensions in behavioral health/primary care integration. *HMO Practice*, 8, 176–179.
- Strosahl, K. (1998). Integrating behavioral health and primary care services: The primary mental health care model. In A. Blount (Ed.), *Integrated primary care: The future of medical and mental health collaboration*. New York: W.W. Norton.
- Strosahl, K., & Robinson, P. (2008). The primary care behavioral health model: Applications to prevention, acute care and chronic condition management. In R. Keesler & D. Stafford (Eds.), *Collaborative medicine case studies: Evidence in practice* (pp. 85–95). New York: Springer.
- Strosahl, K., & Sobel, D. (1996). Behavioral health and the medical cost offset effect: Current status, key concepts and future applications. *HMO Practice*, 10, 156–162.
- *Torrence, N. D., Mueller, A. E., Ilem, A. A., Renn, B. N., DeSantis, B., & Segal, D. L. (2014). Medical provider attitudes about behavioral health consultants in integrated primary care: A preliminary study. *Families, Systems & Health*, 32, 426–432.
- Vogeli, C., Shields, A., Lee, T. A., Gibson, T. B., Marder, W. D., Weiss, K. B., & Blumenthal, D. (2007). Multiple chronic conditions: Prevalence, health consequences, and implications for quality, care management, and costs. *Journal of General Internal Medicine*, 22, 391–395.
- Ware, J. E. Jr., Kosinski, M., & Keller, S. D. (1996). A 12-Item Short-Form Health Survey: Construction of scales and preliminary tests of reliability and validity. *Medical Care*, 34(3), 220–233.
- Werch, C. E., & Owen, D. M. (2002). Iatrogenic effects of alcohol and drug prevention programs. *Journal of Studies on Alcohol*, 63, 581–590.