



A Systematic Review of the Methods Used to Evaluate Child Psychiatry Access Programs

Amie F. Bettencourt, PhD; Corinne M. Plesko, RN, BSN

From the Johns Hopkins School of Medicine (AF Bettencourt), Baltimore, Md; and Johns Hopkins School of Nursing (CM Plesko), Baltimore, Md

The authors have no conflicts of interest to declare.

Address correspondence to Amie F. Bettencourt, PhD, Johns Hopkins School of Medicine, 550 N. Broadway, Rm 907, Baltimore, MD 21205 (e-mail: abetten3@jhu.edu).

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ABSTRACT

BACKGROUND: There is a well-documented gap between the need for and availability of mental health services for children nationwide. To address this gap, over 30 regional Child Psychiatry Access Programs (CPAPs) provide psychiatric consultation and other services to primary care providers.

OBJECTIVE: Summarize the methods used to evaluate CPAPs in the United States.

DATA SOURCES: PubMed, PsychInfo, CINAHL, and reference checking.

STUDY APPRAISAL METHODS: A systematic literature review was conducted searching 3 databases. The search produced 307 unique articles, 278 were excluded for irrelevance, leaving 29 for data extraction. Data extracted included author(s), publication year, provider types, CPAP formats, study sample, design, outcomes examined, results, and limitations. Articles were also appraised for quality using the Johns Hopkins Nursing Evidence-Based Practice Evidence Level and Quality Guide.

RESULTS: The 29 articles evaluated 13 unique CPAPs. Most evaluations used nonexperimental observational designs (68.9%), 6.9% used quasi-experimental designs, and none

used true experimental designs. Evaluations examined the following outcomes: usage of program services (82.8%), provider satisfaction (48.3%), provider comfort/confidence with managing mental health concerns (31.0%), provider practice change (24.1%), patient outcomes (13.7%), and family satisfaction (6.9%). Outcomes were measured using surveys, qualitative interviews, or insurance claims data.

LIMITATIONS: Review was limited to articles published in English in 3 databases or identified by reference checking.

CONCLUSIONS: Evaluations of CPAPs have largely been descriptive in nature, focusing primarily on program usage and provider satisfaction. Few studies have examined the impact of CPAPs on patients, families, or health systems. Future studies should evaluate the broader impacts of CPAPs.

KEYWORDS: child psychiatry; consultation and referral; integrated care; pediatrics; primary care providers

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ONE IN 6 children nationwide has a diagnosable mental health problem, yet almost half are not receiving treatment.¹ Untreated pediatric mental health conditions are a significant problem,² costing approximately \$247 billion annually.³ A range of factors contribute to the gap between the need for and availability of mental health services.^{4,5} One major barrier is the nation's shortage and inadequate distribution of mental health providers.^{6–8} For example, a recent study found child psychiatrists were more likely to practice in higher income and metropolitan areas, contributing to gaps in service access in lower income and less densely populated areas.⁸ As a result, primary care providers (PCPs) often are left to manage pediatric mental health problems within their own practices.^{9,10} PCPs offer a practical alternative to specialty psychiatric care as they are often well known to families and offer the opportunity to discuss sensitive concerns in a nonstigmatizing setting.^{11,12} However, pediatric PCPs

often lack the time and appropriate training to manage mental health concerns.^{11,13}

Integrating mental health care with pediatric primary care is a promising solution to address the mental health service gap.^{12,14–16} There are 4 models of pediatric integrated care^{15–17}: 1) co-location of mental health professionals at primary care sites, 2) team-based collaborative care where a PCP, mental health professional, and care manager co-manage patients, 3) collaboration between PCPs and off-site mental health professionals, and 4) consultation liaison models where PCPs receive training and support in treating mental health problems via in-person, phone, or web-based consultation from off-site mental health professionals. The latter serves as the basis for Child Psychiatry Access Programs (CPAPs) and the focus of this review.

The primary goal of CPAPs is to increase access to pediatric mental health services through providing training and consultation to PCPs to increase their comfort and skills in

managing mild to moderate mental health problems.¹⁸ Currently, the United States has more than 30 regional CPAPs, which vary in structure, services,¹⁹ and funding sources, with many using both federal and state dollars for operational costs.²⁰ Decisions about program structure and services are guided by many factors including the distribution of psychiatrists and medical centers across the state, population density, and funding.²¹ What remains standard across CPAPs is the availability of child psychiatrists by phone to provide consultation to PCPs regarding diagnosis and management of mental health problems. Many programs also provide referral assistance, continuing education trainings, and in-person or virtual psychiatric evaluations.¹⁸ For example, the Massachusetts Child Psychiatry Access Project (MCPAP) includes 6 teams housed in medical centers throughout the state that provide telephone consultation and continuing education to PCPs in addition to care coordination and outpatient consultation services.²²

Recognizing their potential to increase access to pediatric mental health services, government agencies are increasing investments in CPAP implementation. Over the past 2 years, the Health Resources and Services Administration's Maternal and Child Health Bureau granted approximately 20 million dollars to 21 states to expand pediatric telehealth integrated care models including CPAPs.^{23,24} With this expansion, it is critical to identify best practices for evaluating 1) how well CPAPs are being implemented and 2) whether such programs are achieving intended goals. Having reliable and valid evaluations of CPAPs will inform continuous program improvements and support optimization of outcomes for providers, patients, and families.

Recent reviews have summarized existing research on the implementation^{16,17,25} and efficacy¹⁵ of pediatric integrated care models. However, evaluations of CPAPs have been excluded from these reviews with one exception: Spencer et al (2019) summarized research on implementation outcomes related to off-site integrated care models, including CPAPs, and found off-site models are feasible and acceptable, but there remains a need for more rigorous evaluations of implementation quality, costs, spread, and sustainability of these models.¹⁷ These conclusions are informative for future evaluations, but the review focused solely on implementation outcomes. Building on that review and growing interest in expanding CPAPs, the goal of this systematic review is to summarize the full range of methods and tools used to evaluate CPAPs in the existing literature. This review describes the research designs employed, specific outcomes evaluated, and tools/data sources used to assess CPAP outcomes while also seeking to identify gaps in the literature to inform the expansion of CPAP evaluation methods.

METHODS

We worked with an informationist to develop a search strategy. The search terms (Table 1) focused on primary care, child psychiatry access, and pediatric mental health. PubMed, PsycInfo, and CINAHL databases were searched

using a combination of Medical Subject Headings and free-text. Additional articles were identified via reference-checking. Articles were screened using Covidence,²⁶ a web-based software that organizes literature for reviews.

Inclusion and exclusion criteria were determined prior to the search. Included articles presented an evaluation of a CPAP published in English in a peer-reviewed journal. Articles were excluded if psychiatric consultation was not provided by a CPAP, psychiatric care was given directly to patients without PCP involvement, it did not pertain to children/adolescents, or was published as an abstract or book chapter only. No articles were excluded due to publication date.

We evaluated study quality (Table 3) using the Johns Hopkins Nursing Evidence-Based Practice (JHNEBP) Evidence Level and Quality Guide, which includes criteria for evaluating experimental and nonexperimental designs.²⁷ All studies were rated on evidence level, with Level I indicating the highest level (ie, experimental/randomized studies) and Level V indicating the lowest level (eg, case reports). Study quality was rated from A to C with A indicating high quality studies (eg, sufficient sample size, generalizable results); B indicating good quality (eg, sufficient sample size, reasonably consistent results/recommendations); and C indicating low quality (eg, insufficient sample size, little evidence/inconsistent results).²⁷

Each article was independently evaluated for eligibility and quality. We met biweekly to discuss findings and ensure consistency with review criteria. If we disagreed, the article was re-read and inclusion, exclusion, and quality criteria were reviewed to achieve consensus. Prior to data extraction, we defined outcome evaluation categories (Table 2). Data regarding study design and specific outcomes evaluated were then extracted from each study.

RESULTS

The search resulted in 307 unique articles, 246 were removed during title and abstract screening for irrelevance, leaving 61 articles for further review. After full-text review, an additional 32 articles were excluded: 18 for wrong intervention (ie, not about a CPAP) and 14 for insufficient details about evaluation methods (eg, conference abstracts). Twenty-nine articles remained for data extraction and synthesis. Figure displays the PRISMA for the search.²⁸ Articles selected for extraction were of recent publication, with the oldest published in 2006 and the majority published within the last 5 years ($n = 22, 75.9\%$).^{18,29–48}

Results are summarized in Table 3. The 29 articles represented 13 CPAPs from 11 states, with some discussing multiple state programs.^{29,36,39,47} The following states were represented: Arkansas ($n = 2, 6.9\%$),⁴⁹ Illinois ($n = 1, 3.4\%$),²⁹ Maine ($n = 1, 3.4\%$),²⁹ Maryland ($n = 3, 10.3\%$),^{40,42,43} Massachusetts ($n = 14, 48.3\%$),^{29–31, 44–48,50–54} Michigan ($n = 3, 10.3\%$),^{32–34} Minnesota ($n = 1, 3.4\%$),³⁵ New York ($n = 3, 10.3\%$),^{37,38,55} Texas ($n = 1, 3.4\%$),²⁹ Washington ($n = 3, 10.3\%$),^{21,39} and Wyoming ($n = 2, 6.9\%$).^{39,41} One article used a nationwide approach (3.4%).³⁶ Details of services provided by

Table 1. Search Strategy

Database	Search Terms and Format
PubMed	((("Primary Health Care"[Mesh] OR "Physicians, Primary Care"[Mesh] OR "primary care" OR "primary health care")) AND ("Child Psychiatry"[Mesh] OR "child psychiatry" OR "child psychiatric")) AND ("Referral and Consultation"[Mesh] OR refer* [tw] OR consult* [tw])) AND (child [mh] OR child* OR adolescent [mh] OR adolescen* OR teen* OR youth* OR "school-age" OR "school age" OR "school aged" OR "school-aged")
Psych Info	((MH "Primary Health Care") OR (MH "Physicians, Family")) OR primary N3 care AND ((MH "Referral and Consultation+") OR (refer* OR consult*)) AND ((MH "Child+") OR (MH "Adolescence+")) OR (child* OR adolescen* OR teen* OR youth* OR "school-age" OR "school age" OR "school aged" OR "school-aged") AND (MH "Child Psychiatry") OR child N3 psychiatr* Limit age to birth-12 and 13-17
CINAHL	((MH "Primary Health Care") OR (MH "Physicians, Family")) OR primary N3 care AND (MH "Child Psychiatry") OR child N3 psychiatr* AND ((MH "Referral and Consultation+") OR (refer* OR consult*)) AND ((MH "Child+") OR (MH "Adolescence+")) OR (child* OR adolescen* OR teen* OR youth* OR "school-age" OR "school age" OR "school aged" OR "school-aged")

MH indicates major heading.

Table 2. Definitions of Evaluation Categories

Outcomes	Definition/Inclusion
Usage of CPAP services	Usage data reported: examples include number of calls and reason for calls, diagnosis of patient, medication management, severity of patient, need for referrals for patient, and number of encounters/sessions/evaluations, referral data and follow-up data. Characteristics of who is using CPAP or patient being called about (eg, race, gender, diagnosis, provider specialty, type of insurance, number of medications)
Provider satisfaction	Included survey response on attitude toward CPAP, or perception of use (eg, user friendliness, efficiency, helpfulness), and satisfaction
Provider comfort/confidence	Includes articles referencing changes in comfort, confidence, self-efficacy of the PCP
Provider practice change	Perceived change in PCP actions (eg, screenings, referrals, prescribing, educating families about MH concerns) or actual change measured since using the CPAP service
Patient outcomes	Outcomes reported related to patients. Include reported symptom change, diagnosis change, medication change, or need for additional services or referrals following the CPAP intervention
Family satisfaction	Patient and/or family satisfaction reports regarding the CPAP
Other outcomes	Any other outcome measured and reported in the literature

CPAP indicates Child Psychiatry Access Program; PCP, primary care provider.

these CPAPs are summarized in [Supplemental Table S1](#). Approximately 83% (n = 24)^{18,21,22,29,31–36,39–48,51–54} of the studies focused primarily on findings from CPAP consultation/evaluation and referral services, 10.3% (n = 3)^{30,37,49} focused equally on education/training and consultation/evaluation and referral services, and 6.9% (n = 2)^{38,55} focused primarily on education/training.

STUDY DESIGNS

Several study designs have been used to evaluate CPAPs, with the most common being nonexperimental observational designs (eg, examination of trends in consultation services; n = 20; 69.0%).^{21,29–32,37,39–41,43–47,49–54} Four studies used qualitative (n = 3, 10.3%)^{38,42,48} or mixed-methods designs (n = 1, 3.4%).¹⁸ Three studies

presented program reports detailing CPAP evaluation outcomes without including study design information (n = 3, 10.3%).^{32,34,35} Two studies used quasi-experimental designs (6.9%),^{36,55} and none used a randomized controlled trial (RCT) design.

USAGE OF CPAP SERVICES

The most common outcome evaluated was usage of CPAP services (n = 24; 82.8%). CPAP usage was evaluated in a range of ways including quantitative data on: number of calls or patients served (n = 21),^{18,21,29,30,33–35,37–39,41–45,48–50,53,54} PCP and patient characteristics (eg, demographics, diagnoses; n = 20),^{18,21,30,33–35,37–39,41–46,48,50,52–54} and reasons for calling (eg, medication management; n = 14).^{18,21,30,33–35,37,43–46,49,50,52} Three

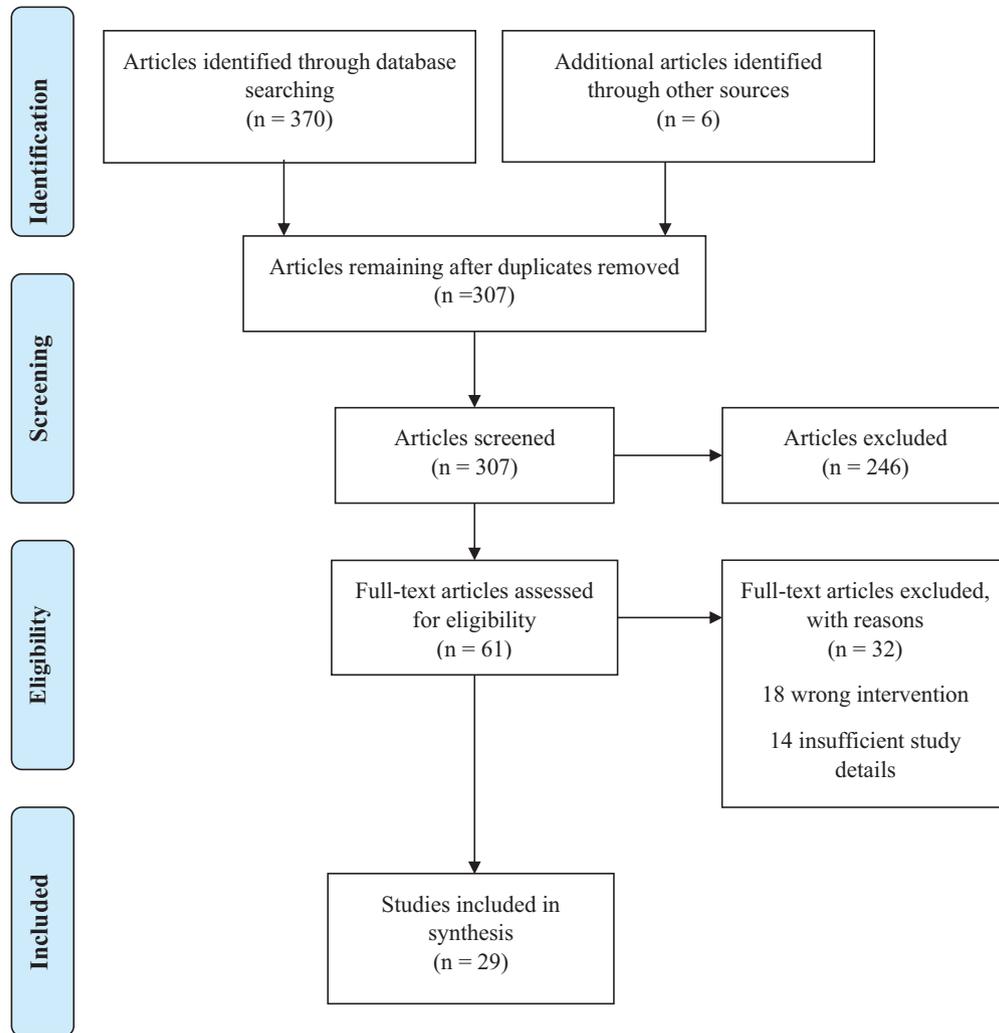


Figure. PRISMA diagram.²⁸

studies evaluated usage with case studies of consultation calls or qualitative interviews regarding barriers and facilitators of service use (n = 3).^{40,42,54}

PCP SATISFACTION

Fourteen (48.3%) studies evaluated PCP satisfaction with CPAP services. Most (n = 10) used surveys with a combination of Likert-type scales and free-text responses to evaluate provider satisfaction (eg, ease of use, timeliness).^{21,30,32,35,37,45,47,48,50} While some information on survey content was reported, only 3 articles described survey development, all of which were developed by the article authors.^{21,32,47} Only one described the survey's psychometric properties.²¹ Of the 10 studies using Likert-type scales, 4 distributed surveys electronically,^{30,32,37,52} 4 by mail,^{45,47,48,50} 1 used both methods,²¹ and 1 did not disclose administration methods.³⁵ Two studies utilized qualitative interviews to evaluate PCP satisfaction,^{18,38} while 1 obtained written feedback from participating providers but did not report how feedback was collected.⁴¹

PROVIDER COMFORT/CONFIDENCE

Provider comfort and confidence changes following receipt of CPAP telephone consultation or education/training were evaluated in 9 studies (31.0%). A majority evaluated provider comfort and confidence via Likert-type surveys^{30,32,33,35,37,38,47} with questions like "I felt more confident in my ability to manage psychiatric conditions after talking to an expert."³⁵ Only 3 articles described survey development, with 1 using a survey adapted from validated measures³⁰ and 2 including surveys developed by the articles' authors^{32,47} with only 1 providing details on the survey's psychometric properties.³² Of the 7 studies using Likert-type surveys, 3 distributed them electronically,^{30,32,37} 1 by mail,⁴⁷ 1 administered the survey through an interview,³⁸ and 2 did not disclose administration methods.^{33,35} The 2 other studies used qualitative interviews or free-text responses,^{18,41} and asked broad questions such as "how and why the PCP decided to use or not use" the CPAP.¹⁸

PROVIDER PRACTICE CHANGE

Provider practice change, defined as perceived or actual change in PCP practices (eg, screenings, prescribing)

Table 3. Summary of Outcomes Evaluated in Child Psychiatry Access Programs

State and CPAP Name	Year of Publication and Lead Author	Study Design	Evaluation Metrics of CPAP						Quality Appraisal		Key Findings	Critique	
			Usage of CPAP Services (n = 24)	PCP Satisfaction (n = 14)	Provider Comfort/Confidence (n = 9)	Provider Practice Change (n = 6)	Patient Outcomes (n = 4)	Family Satisfaction (n = 2)	Evidence Level	Quality Rating			
Arkansas Psych TLC (Psychiatric Telehealth, Liaison, and Consult)	2011 Castro	Observational: cross-sectional	X							III	C	Most common referral diagnoses were Autism, Mood disorders, or ADHD. Most common reason for service use was medication consult. Service use prevented 4 cases going to ER.	Few details presented in the article relating to the program design and implementation of consultations.
Arkansas, Illinois, Maine, Massachusetts, Texas, & Washington CPAPs	2014A Hobbs Knutson	Observational: cross-sectional	X							III	A	Over a 6-year period in which 6 CPAP programs were active, there were no medical malpractice lawsuits against CPAP clinicians.	Although data were included from 6 states, majority of data are from 1 program (MCPAP) due to early implementation of other programs at time of study.
Maryland BHIPP (Behavioral Health Integration in Pediatric Primary Care)	2016 Harrison	Observational: case report	X							V	A	Five S's tool can be used in clinical consultation to promote communication.	Focused only on utility of Five S tool but unclear in regards to frequency of use of tool in context of BHIPP consultation service.
Maryland BHIPP	2017 Arora	Qualitative	X							III	B	Barriers to BHIPP use included limited time, lack of afterhours access, and current access to mental health referrals. Supports included personal relationships with BHIPP and easy access to program. Recommended outreach to increase program use.	Extremely low response rate for recruitment to participate in interviews (14%).
Maryland BHIPP	2018 Platt	Observational: cross-sectional	X							III	A	More than 25% of cases rated severe. Majority of severe cases were managed alone by PCP; odds of patient co-management increased with increase in number of prescription medication.	Measure of co-management solely based on PCP report of other services the patient is receiving.
Massachusetts TCPS (Targeted Child Psychiatric Services- Now MCPAP)	2006 Connor	Observational: cross-sectional	X					X		III	B	About half of calls were about follow-up patient evaluation. After evaluation, about half received brief intervention through TCPS, a third needed more intensive services.	Concerns about representativeness of sample. Study only sampled from 1 region of the state.
Massachusetts Child Psychiatry Access Project (MCPAP)	2010 Sarvet	Observational: cross-sectional	X	X						III	A	Service use increased over time. Majority of calls were for diagnostic help, referrals, or medication questions. PCPs reported improved ability to meet needs of psychiatric patients (8% increased to 63%).	Low response rate to surveys (38%).
Massachusetts MCPAP	2011 Sarvet	Observational: case report	X							V	A	Examples given in case reports highlight PCPs' experience with CPAP.	Case reports only show selected experiences with MCPAP. Unclear if reports are representative of majority of calls to MCPAP.
Massachusetts MCPAP	2012 Dvir	Observational: cross-sectional							X	III	A	Majority of parents agreed that CPAP services were high quality and met family needs; 50% felt situation improved following contact with MCPAP. Parents least satisfied with follow-up treatment.	Mailed surveys may create bias and led to low survey response rate (44%). Survey respondents were most often white and of higher socioeconomic status.

(Continued)

Table 3. (Continued)

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			Usage of CPAP Services (n = 24)	PCP Satisfaction (n = 14)	Provider Comfort/Confidence (n = 9)	Provider Practice Change (n = 6)	Patient Outcomes (n = 4)	Family Satisfaction (n = 2)	Evidence Level	Quality Rating			
Massachusetts MCPAP	2012 Sheldrick	Observational: cross-sectional	X	X						III	A	Majority of survey respondents used MCPAP services. Most sought MCPAP consultation for older children and consulted with community mental health or schools for evaluation and treatment of younger children.	Low response rate on survey and no information on the survey psychometric properties. Survey sample excludes family practitioners who may have also used MCPAP services.
Massachusetts MCPAP	2014B Hobbs Knuston	Observational: cross-sectional	X							III	A	Most calls to MCPAP were for diagnostic clarity or mental health resources. Utilization higher among PCPs who first called about medication management and children prescribed multiple medications.	Data on key factors potentially associated with MCPAP utilization unavailable (eg, PCP characteristics, patient socioeconomic factors).
Massachusetts MCPAP	2014 Straus	Observational: cross-sectional	X	X						III	A	Almost all PCPs enrolled in MCPAP. Diagnostic clarity and mental health resources were most common reasons for MCPAP contact. Sophistication of PCP questions has increased over time. PCPs using MCPAP report more confidence in meeting mental health needs, and are managing majority of mental health concerns.	Changes in sophistication of PCP questions based on anecdotal data. Number of participants included in survey data not reported.
Massachusetts MCPAP	2015 Van Cleave	Observational: cross-sectional	X							III	A	Most practices called MCPAP less than 1 year after they were enrolled. Majority of calls were about medications.	Focused on the practice-level characteristics with 25% of practices excluded from analysis due to missing data.
Massachusetts MCPAP Also evaluated Indiana- No CPAP	2016 Pidano	Observational: cross-sectional	X	X	X	X				III	A	Massachusetts PCPs more likely to screen for mental health issues compared to Indiana PCPs. Massachusetts PCPs more likely to contact MCPAP if they were less confident in a patient diagnosis and had less comfort with treating mental health issues.	Low response rate of surveys from both of the states' providers with 20% response rate in Massachusetts and 25% response rate for Indiana.
Massachusetts MCPAP	2017 Sarvet	Qualitative with reported state data	X	X						III	B	MCPAP enrolled almost all practices within state. PCPs seeking referrals have increased over time. PCPs report satisfaction with MCPAP. More support needed to ensure patients connect with external referrals.	No information provided on how stakeholders were selected to interview or on the response rate of interview requests. No information on survey questions administered to MCPAP team members.
Massachusetts MCPAP	2018 Van Cleave	Mixed methods	X	X	X	X				III	A	Most PCPs called <5 times. Calls from infrequent callers were mostly for diagnostic clarity or referral. Majority of frequent callers called regarding medication consults. Frequent callers reported more confidence delivering mental health care.	Failed to interview PCPs who have never called or utilized MCPAP. This would have helped understand barriers to using the service.
Massachusetts BHLIC (Behavioral Health Learning Community)	2018 Walter	Observational: cross-sectional	X	X	X					III	A	85% of practices participated in phone consultation service. Majority of PCPs were highly satisfied with education program and consultation. Reports of greater self-efficacy in managing mental health concerns following CPAP use.	Pilot study had limitations in geographical area and sample. Participation was voluntary and not generalizable. There is no baseline survey to gauge self-efficacy change as a result of service use.

(Continued)

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Massachusetts MCPAP	2019 Cama	Observational: cross-sectional							X	III	A	86% of parents surveyed reported satisfaction with PCP's management of their child's health problems after consultation with MCPAP.	Low survey response rate of 44%.
Michigan MC3 (Michigan Child Collaborative Care Program)	2018 Malas	Observational: Cross-sectional		X	X	X				III	A	PCPs reported more knowledge, comfort and confidence in providing mental health care following MC3 consultation.	Low survey response rate (44%); Use of multiple survey responses from the same PCPs but were not longitudinal in nature.
Michigan MC3	2017 Marcus	Program evaluation	X		X					V	A	Program has enrolled 894 PCPs from 40 Michigan counties. PCPs report more confidence after consultation.	Confidence data based off of only 33 PCP reports. Unclear if they are unique reports. Limited information provided about data collection.
Michigan MC3	2019 Marcus	Program evaluation	X	X						V	C	Program enrolled over 2000 PCPs in 519 practices across state, 97% of PCPs were satisfied or very satisfied with services.	Not a study, but gives critical usage data and information on the current trends and direction of the program.
Minnesota Psychiatric Assistance Line (PAL)	2015 Archbold	Program evaluation	X	X	X					V	B	Majority of calls were seeking medication consultation. PCPs reported satisfaction with consultation and more confidence managing mental health concerns.	No details of measures provided. Unclear how many PCPs responded to the survey. Survey given after each consultation, data may represent multiple calls by same PCP.
Nationwide	2019 Stein	Quasi-experimental design						X		II	A	Children residing in states with a statewide CPAP were more likely to receive mental health services than children in states without a CPAP.	Information on mental health services access relies entirely on parent report, with no measure of dosage, quality, or effectiveness.
New York Project TEACH (Training and Education for the Advancement of Children's Health)	2015 Kerker	Quasi-experimental design					X			II	A	Percent of children prescribed psychotropic medication increased more with providers who participated in training.	Only included providers who were reimbursed by Medicaid and in the Medicaid database. Intervention sample not randomly selected.
New York CAP PC (a component of Project TEACH)	2017 Kaye	Observational: cross-sectional	X	X	X					III	A	Consultation call volume increased over time. Most common calls were for medication consult and referrals. Most calls were from PCPs who haven't had REACH training. PCPs highly satisfied and report increased knowledge and skills.	Low response rate to surveys (24%). Only looked at current perception of PCPs knowledge and mental health skills. Unclear if surveys connected PCPs to their responses over time to assess change in knowledge and skills.
New York Project TEACH	2014 Gadomski	Qualitative	X	X	X	X	X	X		III	A	Perceived increase in patient mental health problems led to PCP enrollment in Project TEACH. PCPs satisfied with program and reported more openness and confidence in treating mental health concerns.	Only assesses PCP's perception of impact on patients as opposed to actual impact on patient outcomes.
Washington PAL (Partnership Access Line)	2013 Hilt	Observational	X	X				X		III	A	Majority of calls about medication consultation, children with serious emotional disturbance, and children already prescribed medication. PCPs satisfied with PAL. PAL calls associated with changes in medication use.	Claims data only available for fee for service Medicaid children. Less than 50% response rate to satisfaction survey.

(Continued)

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Washington /Wyoming PAL	2015 Barlay	Observational: cross-sectional	X						III	A	Key Findings Only 10% of calls were about patients with trauma-related concern. Trauma cases were more often recommended to see a CAP and receive psychosocial intervention. Trauma cases were on more medications and taking anti-psychotics at higher rates at first PAL contact.	No standardized questioning about trauma by consultant.
Wyoming (Via Washington State - PAL)	2015 Hilt	Observational: cross-sectional	X	X	X	X			III	A	Psychotherapy recommended in majority of PAL calls, medication change recommended in <50% of calls. Decrease in psychotropic use in young Medicaid kids following start of service. Program well received and claimed reduction in unnecessary hospitalization.	Cost saving calculations assumed that all children referred to hospitalization would have been admitted if not for consultation. Only focused on Medicaid patients, potentially preventing generalizability.

CPAP indicates Child Psychiatry Access Program; PCP, primary care provider; ADHD, attention-deficit/hyperactivity disorder; and ER, emergency room.

since using CPAP services, was examined in 6 studies (20.7%).^{18,32,38,41,47,55} Three utilized qualitative methods or surveys with free-text responses to assess practice change.^{18,32,38} For example, Gadowski et al (2014) interviewed providers that had and had not received Project TEACH training to examine whether they made changes to their management of pediatric mental health conditions (eg, “Have your mental health medication prescribing practices changed over the past 3 years?”) and factors influencing implementation of such changes.³⁸ Two studies used Medicaid claims data to assess practice change.^{41,55} For example, Hilt et al (2015) examined Wyoming Medicaid claims related to prescription of psychotropic medication before and after Washington/Wyoming Partnership Access Line implementation.⁴¹ One study used a survey to compare the likelihood of conducting routine mental health screenings and other mental health practices among providers in Massachusetts, a state with a well-established CPAP and a policy mandating mental health screening at well-child visits⁵⁶ and Indiana, a state with neither a CPAP nor such a policy.⁴⁷ The survey, which was developed by the authors and mailed to PCPs, included patient vignettes followed by Likert-type, Yes/No, and free-text questions assessing how the PCP would address the patient’s mental health concerns. No information was provided on the survey’s psychometric properties.⁴⁷

PATIENT OUTCOMES

Four studies examined patient outcomes using a variety of methods (13.8%).^{21,36,38,53} Using qualitative interviews, Gadowski et al (2014) asked PCPs to report what impact their participation in Project TEACH training had on patients’ clinical outcomes.³⁸ Using chart reviews, Connor et al (2006) gathered information about patient dispositions (eg, returned to PCP, triaged to Targeted Child Psychiatric Services) following evaluation by Targeted Child Psychiatric Services. Hilt et al (2013) examined insurance claims for fee-for-service Medicaid-insured children prior to calling Washington’s Partnership Access Line and up to 12 months following the final call to determine whether CPAP consultation influenced inpatient/emergency department visits and outpatient mental health service use.²¹ Stein et al (2019) used data on CPAP location and parent reports of their children’s mental health service use from the National Survey of Children’s Health to examine whether children from states with CPAPs were more likely to receive mental health services.³⁶

FAMILY SATISFACTION

Two studies examined family satisfaction with CPAPs (6.9%).^{31,51} Dvir et al (2012) mailed a survey to parents, developed and validated by the study’s authors, with Likert-type and free-text questions to assess satisfaction with MCPAP (eg, “quality of services was satisfying”).⁵¹ Using telephone surveys, Cama et al (2019) examined parents’ overall satisfaction with the PCP’s management

of their child's mental health problems following MCPAP consultation and whether satisfaction varied as a function of the PCP's recommendations using Likert-type and yes/no items. No information was provided about the survey's development or psychometric properties.³¹

SURVEY RESPONSE RATES

Forty-eight percent ($n = 14$) of the studies used surveys to assess CPAP outcomes. Survey response rates ranged from 20% to 81%, with the majority falling below 50%. A comparison by administration method indicated wider variation in electronic survey response rates (ie, 24%–81%) compared to mailed survey response rates (20%–46%). Overall, studies provided evidence of positive ratings from most respondents for satisfaction, comfort/confidence, and PCP practice change. For example, Kaye et al (2017) reported 95.1% of respondents found Project TEACH training increased their confidence to provide mental health services, yet only 24% of training participants returned the survey.³⁷

STUDY QUALITY APPRAISAL

The JHNEBP guide was used to rate each study's evidence level and quality. Most articles (86%) were rated as level III, indicating nonexperimental or qualitative designs. Two articles (7%) displayed level II evidence or quasi-experimental designs, while 2 (7%) presenting case study reports were rated at Level V. Article quality was consistently rated high with 23 articles (79.3%) rated as an A and 4 (13.8%) rated as a B. Only 2 articles (6.9%) received a C.

DISCUSSION

The purpose of this systematic review was to summarize methods used to evaluate CPAPs. Twenty-nine peer-reviewed manuscripts evaluating 13 CPAPs in 11 states were identified. These studies used a variety of research designs, measurement tools, and approaches to examine a range of outcomes related to providers, patients, and families.

Sixty-nine percent of reviewed studies employed observational designs and the vast majority were cross-sectional. Most studies focused on enumerating the reasons PCPs sought consultation with CPAPs, characteristics of patients for whom PCPs sought consultation, or PCP/family satisfaction with services. Several studies examined trends in program usage over time, but failed to focus on changes for specific individuals or practices, thus falling short of a prospective design. Another gap in this prospective research has been the lack of pre-post intervention data collection. The majority of published studies have only collected data following interactions with a CPAP. The absence of baseline data may be due to a combination of factors, including expedited CPAP initiation leaving limited time for baseline data collection and difficulties engaging a sufficient number of PCPs to complete surveys as evidenced by low response rates. A major goal of

CPAPs is to increase PCP capacity to manage mental health problems,¹⁸ but without baseline measurements, it is difficult to attribute changes in PCP comfort/confidence or practices to CPAP usage.

Appraisal of evidence level and quality indicated that most articles employed nonexperimental study designs. No articles were rated at evidence Level I, indicating a lack of experimental studies and RCTs. Despite the low level of evidence of the included articles due to design limitations, the overall quality of the evidence presented was high with most articles receiving "A" quality ratings.

The best practice for establishing an intervention's evidence base is to move from small pilots to efficacy studies to effectiveness trials to practical implementation studies.⁵⁷ However, this research-to-practice pipeline is long and conflicts with an urgent need to implement potentially viable solutions, like CPAPs, to close the pediatric mental health services gap. Common concerns about RCTs pertinent to CPAP evaluation include that such designs would necessitate denying some part of the population access to this solution, even if for a short time (eg, stepped-wedge design),⁵⁷ potentially disrupting existing patient-provider relationships, or asking providers to only use the new knowledge gained via consultation or provide access to the additional services provided by the CPAP to a portion of their caseload when doing so would not only be impractical but possibly unethical.⁵⁸ Some of these concerns could be combated by randomizing at the practice level to avoid patient care disruptions, but this would require a significantly larger sample for the study to be adequately powered.⁵⁸ However, there is precedent from studies of adult integrated care^{59,60} and onsite pediatric integrated care¹⁵ to suggest that RCTs are viable and informative to integrated care policies and practices. Thus, it is worth considering how such designs could be implemented, particularly in states still planning future CPAPs or with planned expansions to existing CPAPs. Quasi-experimental designs, like those employed by Stein (2019), Kerker (2015), and their colleagues^{36,55} provide reasonably rigorous alternatives when RCTs are not possible. For example, states with CPAPs could be matched to similar states (eg, similar demographics/policies) without CPAPs and compared on outcomes that CPAPs are theorized to impact, such as PCP mental health practices (eg, prescription of psychotropic medications) and patient outcomes (eg, referrals to mental health services) to more rigorously evaluate CPAPs.

Almost half of reviewed articles used surveys to evaluate CPAPs. However, most reported low response rates. While there is no consensus on a reasonable response rate, higher is better with many publications encouraging over 50%.⁶¹ Additionally, some articles reported that surveys were given after every consultation, potentially leading to multiple responses from the same provider being treated as independent responses.^{21,32,35,37} Further, most surveys reported positive responses regarding CPAPs. Low response rates, nonindependence of responses, and overall positive satisfaction scores are potential sources of bias.⁶² Of particular concern is nonresponse bias, where PCPs

who do not respond to surveys may have different opinions/experiences than PCPs who do respond.⁶³ Thus, survey results should be interpreted cautiously. These limitations further underscore the need for CPAPs to be evaluated using more rigorous research designs and objective measures (eg, medical records) to increase the validity and generalizability of findings.

Most articles in this review focused on evaluating CPAP consultation/evaluation and referral services, with only 2 studies focusing primarily on evaluating the education/training component. Because these distinct components (eg, 1-time phone consultation, longitudinal education/training) may have differing impacts, an important next step is to examine the relative impacts of each CPAP component on provider and patient outcomes. Relatedly, there is a need to examine factors that contribute to providers' continued usage or cessation of CPAP services and to further examine the underlying mechanisms contributing to changes in provider and patient outcomes following CPAP interaction. Knowledge gleaned from this research would further inform program structure, services, and sustainability.

Another important gap in the CPAP literature has been the limited focus on patient outcomes. Only 4 of the 29 studies examined impacts on patients with a primary focus on psychotropic medication and mental health service use or provider perceptions of CPAP impacts on patients.^{21,36,38,53} More needs to be done to evaluate how PCP engagement with CPAPs impacts patients, including referrals to and use of mental health services and changes in patient's mental health (eg, symptom severity or inpatient admission reductions). Connecting provider's CPAP service use with patient medical records has great potential to improve our understanding of CPAP impacts and provides a useful alternative to PCP perceptions provided via surveys.

This review has several limitations. The use of 3 databases for identifying eligible studies means that relevant literature not available in these databases may have been excluded. Also, the search was limited to publications in English, potentially excluding relevant articles in other languages. However, due to the focus on CPAP programs in the United States, we believe the risk of relevant literature published in other languages is small. Further, due to the vast majority of included studies using nonexperimental study designs, we were unable to use many of the common study appraisal tools to assess risk of bias. However, we believe the JHNEBP guide provides an easy to interpret, comprehensive assessment of the reviewed studies and further demonstrates the significant lack of experimental studies evaluating CPAPs. Finally, only the authors were involved in screening articles, thus findings may be biased by our perspectives.

To date, more than 30 CPAPs have been established in the United States and government agencies are continuing to invest in their expansion.¹⁹ However, the research base evaluating CPAP impacts on providers, patients, and families continues to lag behind these investments. Future research is needed that employs more rigorous research

designs and innovative strategies to increase provider participation in data collection efforts. In addition, evaluations of a broader range of CPAP outcomes including more in-depth assessment of provider practice changes and patient outcomes and a deeper understanding of the mechanisms through which CPAP services contribute to provider and patient outcomes are critical.⁵⁸ A focus on expanding CPAP evaluation methods is particularly timely given Health Resources and Services Administration's increased investment in CPAPs.^{23,24} Furthermore, given the majority of articles reviewed were published within the last 5 years, we recommend this review be replicated once the CPAP literature has sufficiently matured and move beyond summarizing the methods used to evaluate CPAPs to include a review of program impacts on providers, patients, and families.

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SUPPLEMENTARY DATA

Supplementary data related to this article can be found online at <https://doi.org/10.1016/j.acap.2020.07.015>.

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