Integrating Pediatric Universal Behavioral Health Care at Federally Qualified Health Centers

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abstract

BACKGROUND: Research supports integrated pediatric behavioral health (BH), but evidence gaps remain in ensuring equitable care for children of all ages. In response, an interdisciplinary team codeveloped a stepped care model that expands BH services at 3 federally qualified health centers (FQHCs).

METHODS: FQHCs reported monthly electronic medical record data regarding detection of BH issues, receipt of services, and psychotropic medications. Study staff reviewed charts of children with attention-deficit/hyperactivity disorder (ADHD) before and after implementation.

RESULTS: Across 47 437 well-child visits, >80% included a complete BH screen, significantly higher than the state's long-term average (67.5%; $P < .001$). Primary care providers identified >30% of children as having BH issues. Of these, 11.2% of children <5 years, 53.8% of 5–12 years, and 74.6% >12 years were referred for care. Children seen by BH staff on the day of referral (ie, "warm hand-off") were more likely to complete an additional BH visit than children seen later (hazard ratio = 1.37; $P < .0001$). There was no change in the proportion of children prescribed psychotropic medications, but polypharmacy declined (from 9.5% to 5.7%; $P < .001$). After implementation, diagnostic rates for ADHD more than doubled compared with baseline, follow-up with a clinician within 30 days of diagnosis increased (62.9% before vs 78.3% after; $P = .03$) and prescriptions for psychotropic medication decreased (61.4% before vs 43.9% after; $P = .03$).

CONCLUSIONS: Adding to a growing literature, results demonstrate that integrated BH care can improve services for children of all ages in FQHCs that predominantly serve marginalized populations.

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WHAT'S KNOWN ON THIS SUBJECT: Prior research supports the effectiveness of integrating behavioral health services into pediatric care, yet evidence gaps remain with respect to the spectrum of challenges faced by racially and ethnically diverse children who often experience inequities in access to quality healthcare.

WHAT THIS STUDY ADDS: Results extend a growing literature supporting the effectiveness of pediatric behavioral health integration to federally qualified health centers, which serve patient populations that are diverse with respect to race or ethnicity, culture, language and service needs.

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Over 15% of children in the United States have a behavioral health (BH) condition, with impoverished children bearing disproportionate risk.[1,2] Despite the availability of evidence-based treatments, significant barriers prevent timely recognition, accurate diagnosis, and effective treatment.[3] The stigma of mental illness and lack of culturally responsive, language-concordant care present engagement obstacles. Shortages of mental health professionals make engagement difficult for those motivated to seek it[4] and mental illness itself, which tends to run in families, reduces the self-efficacy, motivation, and organization required to navigate fragmented systems.[5]

Responding to these problems, recent research supports a range of integrated pediatric BH approaches.[5–10] However, a 2020 review of available research noted several evidence gaps.[11] Many integrated care models focus on specific disorders and do not directly address the needs of children with developmental disabilities and/or trauma.[11] Most models focus on older children and adolescents[11]; few have adopted an intergenerational approach that also addresses the needs of infants, preschool-age children, and their caregivers. Finally, most integrated care models have not been studied in low socioeconomic status communities or among racially and ethnically marginalized children,[11] who are among the most likely to experience structural racism and inequities in access to BH care. Moreover, none have been studied within federally qualified health centers (FQHCs), community-based primary care practices that provide care for 1 in 11 Americans, including more than 1 in 7 of Black race, 1 in 6 of Latinx ethnicity, and 1 in 2 living in poverty each year.[12] FQHCs are unique in their funding from the US Health Resources and Services Administration and focus on addressing health-related social needs alongside physical and BH concerns. These evidence gaps raise questions regarding the generalizability of current BH integration models and suggest a need to adapt existing intervention approaches to diverse settings and populations.

With philanthropic support, an interdisciplinary team of researchers and clinicians sought to address these evidence gaps by developing the Transforming and Expanding Access to Mental Health Care in Urban Pediatrics (TEAM UP) model. Prior research documents TEAM UP's impact on health service utilization, finding that implementation was associated with a relative increase in primary care visits driven by children with BH diagnoses but no significant change in cost or emergent health care utilization.[13] Additional publications document that clinicians at participating sites believe that successful BH integration requires supportive clinical and operational infrastructure, and that TEAM UP supports team building and enhances professional fulfillment.[14,15] Here, we first provide a detailed description of the TEAM UP model and the care delivery metrics that were codeveloped with participating FQHCs to examine TEAM UP's reach and impact and to guide practice transformation. Codevelopment ensured that metrics addressed shared goals and were feasible to collect from different electronic medical record (EMR) systems, and that parties were committed to high-quality data collection, analysis, and meaningful use of resulting data. Specifically, we evaluated:

1. detection of BH issues as a foundational element of stepped care that is necessary to ensure access to BH services. We hypothesized that TEAM UP sites would achieve higher screening rates than those published for other Massachusetts primary care practices;
2. provision of BH care, because a primary goal of TEAM UP was to decrease time-to-service, especially through warm handoffs to integrated behavioral health clinicians (BHCs) and community health workers (CHWs) on the same day as well-child visits. Consistent with prior literature that minimally defines warm handoffs as an introduction to a BH provider by a primary care provider (PCP),[16] warm handoffs could include an initial contact to plan further visits, and/or triage, assessment, or direct intervention. We hypothesized that warm handoffs would result in greater access and more timely care compared with routine internal referrals (ie, BH visits with a BHC/CHW who practices within pediatric primary care on a day after the well-child visit);
3. prescription of psychotropic medications, provided that they are often first-line treatments for BH problems and because of concerns regarding polypharmacy in the literature. We hypothesized that rates of polypharmacy would decrease;
4. care for children with attention-deficit/hyperactivity disorder (ADHD), in accordance with the ADHD toolkit,[17] emphasizing appropriate diagnosis given documented disparities and improving follow-up after diagnosis given integration of BHCs and CHWs into the care team. Improving ADHD care aligned with ongoing FQHC priorities and reporting requirements to the accountable care organization.

THE TEAM UP MODEL

TEAM UP was cocreated with 3 FQHCs. FQHCs share a common mission to provide comprehensive high-quality care to medically underserved areas or populations, but each has differing governance structures, resources and strategic priorities, and each works with unique patient populations with respect to race or ethnicity, culture, language, and service needs. Unlike traditional primary care, FQHCs must meet federal requirements that include providing care on a sliding fee scale, operating under a governing board of directors that includes patients, and complying with specific reporting requirements.[18] A number of frameworks informed TEAM UP's development, most notably the National Academy of Medicine (NAM) Prevention Framework and principles of stepped care,[17] guidelines from the American Academy of Pediatrics and American Academy of Child and Adolescent Psychiatry, continuous quality improvement (CQI) models from the Institute for Healthcare Improvement, and concepts of team-based care from the Primary Care Behavioral Health (PCBH) model.[19] To integrate these best practices, we used the science of intervention adaptation, which recognizes the necessity of adapting frameworks and evidence-based interventions to match the capacity of local service systems and the needs of target populations.[20] TEAM UP includes 3 interrelated components (Fig 1):

1. TEAM UP Clinical Model

Consistent with the PCBH model, TEAM UP expands primary care teams to include BHCs, who are masters-prepared (MSW, LMHC, or LMFT) licensed mental health professionals who provide assessment and evidence-informed BH interventions within the medical home. Extending the PCBH model, TEAM UP also includes psychiatric consultations as needed, as well as CHWs, who are lay health workers with cultural and linguistic competence specific to FQHC populations who partner with families to address health-related social needs, provide navigation and parental peer support, serve as cultural brokers, and address the stigma of mental health concerns by providing culturally relevant health education. TEAM UP augmented existing CHW and BHC workforces to achieve a ratio of approximately 1 integrated CHW and 1 integrated BHC for every 2500 children on the patient panel.

Grounded in NAM's Prevention Framework,[21] TEAM UP's stepped care approach aims to enhance the efficiency of BH care by matching the intensity of services to individuals' symptoms and needs. At all well-child visits, children are screened, and PCPs

discuss results with families. Based on family need, PCPs collaborate with: (1) integrated CHWs and BHCs to develop family-centered care plans that promote healthy development and address emerging behavioral issues, and/or (2) consulting psychiatrists who facilitate access to appropriate care. TEAM UP worked with CHCs to ensure multidisciplinary involvement and guideline-consistent care. For example, changes to ADHD care stressed improving the initial diagnostic process by obtaining Vanderbilts from parents and teachers more consistently and facilitating access to nonpharmacological therapeutic care (eg, BH support). For further detail, we include the Template for Intervention Description and Replication (TIDiER)[22] (Supplemental Table 3).

2. Data-Driven Implementation Model

Primary implementation activities include clinical training and practice transformation support. All pediatric staff, including nurses, medical assistants, and front desk staff, receive training in team-based care and participate in case-based discussions to support integration of the training curriculum into practice. Concurrently, training on therapeutic interventions is tailored to each clinical role. CHWs are trained in motivational interviewing,[23] family engagement, and problem-solving techniques[24–26] to support the engagement of culturally- and linguistically-diverse families in BH care, address health-related social needs, and improve linkages to existing community resources. BHCs are trained in motivational interviewing, problem-solving skills, and transdiagnostic approaches[26–29] to intervention. PCPs received education on BH conditions and access to psychiatric consultation,[30] with an emphasis on guideline-concordant prescribing. Across all FQHCs, CHWs, BHCs, and PCPs participated in 40 hours of clinical training delivered over a 2-year period; CHWs and BHCs received an additional 1 to 3 weeks of clinical supervision and training specific to their care team role.

Guided by the Institute for Healthcare Improvement's Model for Improvement[31] and Quality Improvement Essentials Toolkit,[32] practice transformation activities are tailored to support each FQHC individually and to ensure cohesion across sites. FQHCs received technical assistance to develop effective team roles and clinical workflows. This work used specific CQI tools (process mapping, failure modes, and effects analysis) to optimize 2 core clinical workflows that are foundational to the stepped

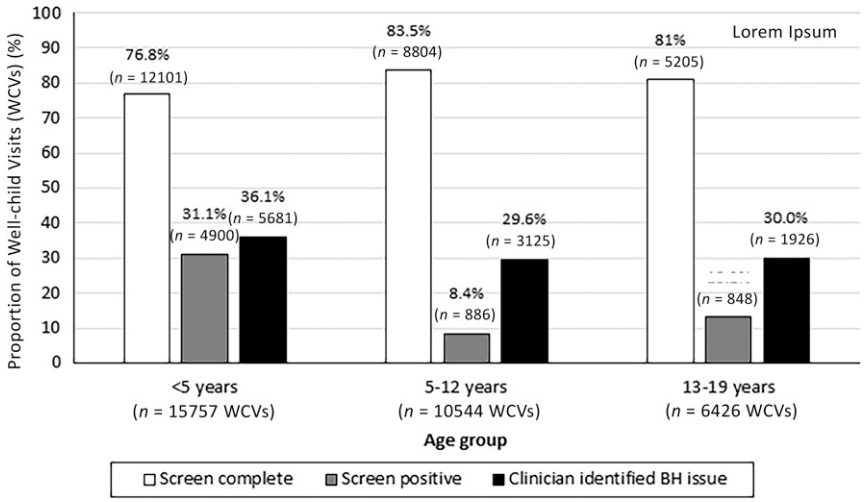


FIGURE 1
Screening and identification of behavioral health (BH) issues.

care model: routine screening during well-child visits and warm hand-offs for BH care.[33,34] Standardized electronic medical record (EMR) metrics were codeveloped with FQHCs; results were reported monthly to support CQI efforts, including maximizing screening rates and improving access to on-site BH services.[35] Consistent with each site's data use agreement, outcomes based on these metrics are reported at the aggregate level.

For further detail on implementation strategies, we include the Expert Recommendation for Implementing Change (ERIC) checklist[36] (Supplemental Table 4).

3. Governance Model

TEAM UP developed a governance structure that emphasizes decision-making based on the best available evidence (both from the published literature and from the FQHCs themselves), expert judgement to apply that evidence (from clinicians, researchers, and practice leaders), and priorities of FQHC medical and BH staff.[37,38] Specifically, a steering committee was formed to oversee the clinical and implementation models. The steering committee included members of the academic medical center-based Implementation and Evaluation Teams, FQHC project managers, and designated clinical champions, for example, PCPs from each FQHC who often shared champion responsibilities with members of the BH team. The steering committee met monthly and invited other members of FQHC teams depending on the meeting agenda.

METHODS

Sample

Between June 2017 and November 2019, 3 FQHCs reported data for 47 437 unique well-child visits for children 30 days through 18.99 years of age. Sites varied in size, each contributing 16%, 32%, and 52% of total visits, respectively. FQHCs' submissions to the federal Uniform Data System[39] indicate that over 80% of patients identified as nonWhite or Hispanic and nearly half were living below the federal poverty level (Table 1). There were no exclusion criteria.

Data Sources and Measures

Data were derived from each FQHC's EMR (OCHIN EPIC [1 site] and eCW [2 sites]). Before implementation, the evaluation team worked with FQHCs to standardize templates for submitted reports of aggregated data. Key measures included:

- Standardized screening questionnaires, including the Survey of Wellbeing of Young Children (SWYC) for younger children,[40–42] the Pediatric Symptom Checklist (PSC)[43,44] for children 5 to 12 years, and the Patient Health Questionnaire (PHQ-9)[45,46] for adolescents.[47,48] On a monthly basis, FQHCs reported the following data stratified across 3 age groups (<5 years, 5–12 years, and >12 years): number of well-child visits, proportion of visits with a completed screening questionnaire, and proportion of screening results that were positive.
- Primary care provider (PCP) BH Plan. Recognizing the need for standardized, extractable information about PCPs' care plans for addressing identified BH issues, TEAM UP sites worked together to create an extractable EMR template reflecting the "PCP BH plan" (Table 2). At each visit,

TABLE 1 Population Characteristics at 3 Participating Community Health Centers (FQHCs)

	2017, *n* (%)	2018, *n* (%)	2019, *n* (%)
Pediatric patients	19 853	19 642	20 073
Uninsured	243 (3.2)	240 (2.9)	148 (2.4)
Total patients (all ages)	68 085	69 166	71 829
Race or ethnicity			
Non-Hispanic white	9593 (16.8)	9977 (17.5)	10 769 (18.6)
Hispanic	17 803 (27.1)	18 381 (28)	19 250 (28.2)
Asian	8018 (13.2)	8213 (13.6)	8226 (13.6)
Native Hawaiian orPacific Islander	973 (2.5)	980 (2.5)	990 (2.4)
Black orAfrican American	28 075 (53.7)	27 267 (51.1)	27 888 (50.4)
American Indian or Alaska Native	110 (0.2)	163 (0.3)	163 (0.3)
>1 Race	1268 (2.7)	1900 (3.6)	1968 (3.6)
Best served in language other than English	20 167 (29.6)	21 332 (30.8)	22 844 (31.8)
Medicaid or CHIP	12 209 (60.4)	11 596 (59.6)	107 01 (58.2)
<100% federalpoverty level	9363 (47.4)	9466 (47.4)	8364 (24)
<200% federalpoverty level	10 676 (56.4)	10 932 (56.7)	10 155 (34.6)

Data derive from the Uniform Data System (UDS), a system administered by the Health Resources and Services Administration to which federally qualified health centers (FQHC) submit annual reports. Note that pediatric-specific estimates are unavailable for race or ethnicity, language, Medicaid, and poverty status; these refer to the entire FQHC population. In addition, Medicaid and poverty status are estimated based on the 58.7% of families for whom data are available in UDS. CHIP, Children's Health Insurance Program.

providers specified whether a BH issue was identified (through screening, or parental or provider concern). They then selected whether a family declined care, was already in care, or whether new services were recommended (noting all applicable services). Three times per year, FQHCs submitted data on all children with an identified BH concern, including the number and timing of BH visits after identification. Counts of completed visits with integrated BHCs were used to assess BH care provision. All visits were in person (precoronavirus disease 2019).

- Psychotropic medication prescriptions. FQHCs used EMR data to produce monthly reports detailing all psychotropic medications prescribed by primary care or specialty providers within the FQHC (medications prescribed outside the system, eg, through school-based or non-FQHC affiliated specialty clinics, were not available). Polypharmacy was defined as 3 or more medications. Whereas most prior studies of pediatric polypharmacy focus on 2 or more medications,[49] we adopted a more conservative threshold to account for the frequency of cooccurring health conditions.

In addition, manual chart review at baseline (January 2015–December 2016) and after implementation (January 2018–February 2019) assessed:

- Care for children with ADHD. At each timepoint, FQHCs generated lists of all 6 to 12 year-old children who were newly diagnosed with ADHD. The evaluation team then abstracted the following EMR data into REDCap: child age and sex, presence and scoring of parent and teacher Vanderbilt questionnaires, indication of ADHD follow-up in-person or by telephone, and psychotropic medication prescription.

TABLE 2 Plans of Primary Care Providers to Respond to Behavioral Health (BH) Needs Using an Extractable "BH Plan"

	Age group		
	<5 y, *n* (%)	5–12 y, *n* (%)	13–19 y, *n* (%)
Well-child visits with BH plan complete	14219	9578	5869
No BH issue identified	8117 (57.1)	6178 (64.5)	3564 (60.7)
Parent declined services	421 (2.9)	275 (2.9)	379 (6.5)
BH issue that requires services	5681 (40.0)	3125 (32.6)	1926 (32.8)
Among visits with identified BH issues that require services (multiple options allowed)			
Already in care for BH issue	1553 (27.3)	1017 (32.5)	557 (28.9)
PCP intends to manage BH issue	1888 (33.2)	614 (19.6)	339 (17.6)
Warm handoff to CHW	645 (11.4)	231 (7.4)	95 (4.9)
Warm handoff to BH clinician	381 (6.7)	723 (23.1)	634 (32.9)
Routine internal referral to BH clinician	257 (4.5)	961 (30.7)	802 (41.7)

BH plans were completed by PCPs subsequent to screening and reflect intentions regarding further need for care. Warm handoff refers to a behavioral health provider seeing a child the same day as the well-child visit; Routine internal referral refers to a behavioral health provider seeing the child in a follow up visit after the well-child visit. Primary care providers could select more than 1 action for management.

Statistical Analyses

For each outcome, we calculated descriptive statistics and conducted regression modeling. Linear models were used for continuous outcomes, logistic models for binary outcomes, and Cox models for time-to-event data. A covariate reflecting month of implementation was included to test for linear effects of time. Unless otherwise specified, dummy variables were included as covariates to test for differences in child age groups (<5 years, 5–12 years, and >12 years), which reflect eligibility for different screening questionnaires.

For detection of BH issues, we compared TEAM UP screening rates to published statewide estimates[35,50–52] by selecting the highest documented estimate of screening completion (74%) and conducting a *t* test to determine whether average completion rates at TEAM UP FQHCs exceeded this proportion. Regression analyses examined differences by age group and linear changes over time for 3 outcomes: the proportion of well-child visits that included screening, the proportion of screens that were positive, and the proportion of well-child visits that resulted in an identified BH concern.

For provision of BH care, descriptive analyses examined the results of primary care BH plans, including the proportion of BH issues managed by the PCP and/or resulting in a referral to a BHC or CHW (note that >1 option was possible). Regression modeling determined whether these variables differed by age group.

Descriptive statistics and conducted confirmatory survival analyses using Cox regressions compared time-to-next-BH appointment between children who received a warm handoff versus a routine internal referral. Interactions with time were tested to evaluate the proportional hazards assumption. By definition, warm handoffs include a visit at the time a BH issue is identified. Some children should be expected to have their issues addressed at that time and to not require further follow-up. Therefore, comparing time-to-next-BH visit offers a conservative assessment of the utility of warm handoffs.

Descriptive analyses examined the percentage of visits (well, sick, and follow-up) in which such a psychotropic medication was prescribed, as well as the proportion of prescribing events characterized by polypharmacy. Regression modeling determined whether the number of psychoactive medication prescriptions changed over the study period, and whether the proportion of those prescriptions involving polypharmacy declined.

We used logistic regression models to conduct confirmatory tests of whether ADHD reflected better quality care when assessed after implementation compared with baseline. Fisher's exact test was used in place of logistic regression if outcomes were reported for fewer than 5 children during either period, and Hosmer-Lemeshow tests were conducted to ensure goodness of fit. Specifically, we tested for improvements in completion of parent and teacher Vanderbilts during the diagnostic process and follow-up with a clinician within 30 days after a diagnosis of ADHD. We also tested for differences in prescriptions of stimulant medication within 30 days of ADHD diagnoses.

RESULTS

Detection of BH Issues

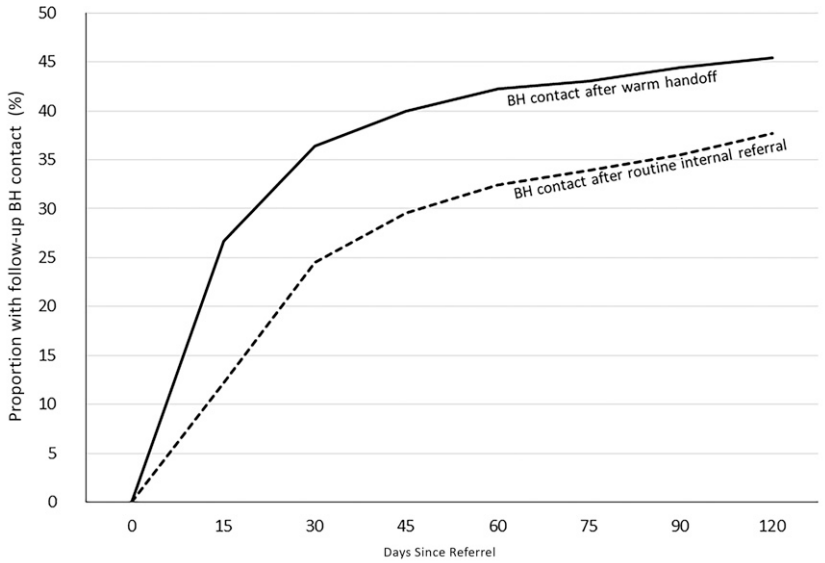
Screening was completed at 81% to 83.5% of well-child visits across age groups, which is significantly greater than the highest reported estimate of the statewide average (74%; $P < .001$)[35] and the long-term average reported by the State's BH initiative (67.5%; $P < .001$).[35] Differences between age groups were not significant, and no linear trend was noted.

Large differences were noted between the proportion of children under 5 years who screened positive on the SWYC Milestones (31.1%) compared with children ages 5 to 12 years who screened positive on the PSC (8.4%; $P = .014$) and children 12+ years who screened positive on the PHQ-9 (13.2%; $P = .007$). Modest differences were noted between the proportion of children under 5 years who were identified by primary care providers with developmental or BH issues (39.9%) compared with children aged 5 to 12 years (32.6%; $P = .048$), whereas the difference with children 12+ years was not statistically significant (32.8%; $P = .07$) (Fig 1). Linear trends were not significant over the study period for positive screens and BH plan concerns.

Provision of BH Care

The proportion of BH issues managed by the PCP was higher among children <5 years (33.2%) compared with children 12+ years (17.6%, $P = .02$), but differences with children 5 to 12 years (19.6%; $P = .056$) were not significant. In contrast, the proportion of BH issues resulting in a referral to a BHC among children <5 years (11.2%) was lower than among children 5 to 12 years (53.8%; $P = .04$), which was lower than children 12+ years (74.6%, $P = .01$) (Table 2).

To evaluate the degree to which warm handoffs resulted in successful referrals for subsequent BH care, days until next BH contact (beginning with the day a BH plan indicated a need for a new service)



Warm handoff (n = 1035)	276 (27)	377 (36)	414 (40)	437 (42)	445 (43)	460 (44)	470 (45)	276 (27)
Routine Internal Referral (n = 860)	105 (12)	211 (25)	254 (30)	279 (32)	292 (34)	305 (35)	324 (38)	105 (12)

FIGURE 2
Completion of next behavioral health (BH) visit after warm handoff versus routine internal referral. BH, behavioral health; warm handoff, in-person BH visits that occur at the time of a well-child visit; routine internal referral, BH visits that occur at a time following a well-child visit.

were compared for children who did and did not have a warm handoff. Children who received warm handoffs were more likely to complete an additional BH visit during the study period as compared with routine internal referral (hazard ratio = 1.37; $P <$ .0001; Fig 2). Because a warm handoff includes an immediate visit, this result indicates that, on average, children with warm handoffs receive two BH visits before children with routine internal referrals receive one.

Prescription of Psychotropic Medications.

Overall, 7.8% of pediatric visits involved prescription of at least one psychotropic medication, and 8.9% involved polypharmacy (ie, ≥3 medications). No change over time was noted in the number of children prescribed psychotropic medications (P = .75), but polypharmacy declined significantly ($P <$ .001) from 9.5% of those who received prescriptions at the beginning of the project to 5.7% by the end.

Care for Children With ADHD

TEAM UP FQHC's diagnosed approximately 2.9 children with ADHD per month preimplementation and approximately 6.6 children per month after implementation. Compared with preimplementation, children who received new ADHD diagnoses after implementation were more likely to have a follow-up contact with a clinician within 30 days of diagnosis (62.9% vs 78.3%; P = .03). Moreover, children with a contact within 30 days were more likely to meet with a clinician face-to-face rather than by telephone (61.4% vs 97.2%; $P <$ .001) (Fig 3). The rate at which children were diagnosed with ADHD and prescribed a psychotropic medication within 30 days rose from 1.8 children per month before implementation to 2.9 per children per month after implementation; however, the probability of a prescription conditional on a new diagnosis declined from 61.4% to 43.9% (P = .03; Fig 3). No differences were noted in the proportion of children with complete parent or teacher Vanderbilt assessments at diagnosis. Fewer children scored positive on parent Vanderbilts after implementation (28 of 31 = 90.3% before implementation vs 29 of 42 = 69.1% after; P = .04); however, no differences were noted on teacher Vanderbilts.

DISCUSSION

Designed specifically for FQHCs, TEAM UP addresses several evidence gaps noted in a recent systematic review.[11] TEAM UP delivers integrated BH care to low socioeconomic status, structurally marginalized communities that disproportionately include racial and ethnic minority children. Moreover, TEAM UP addresses the BH needs of entire patient panels, including young children and those

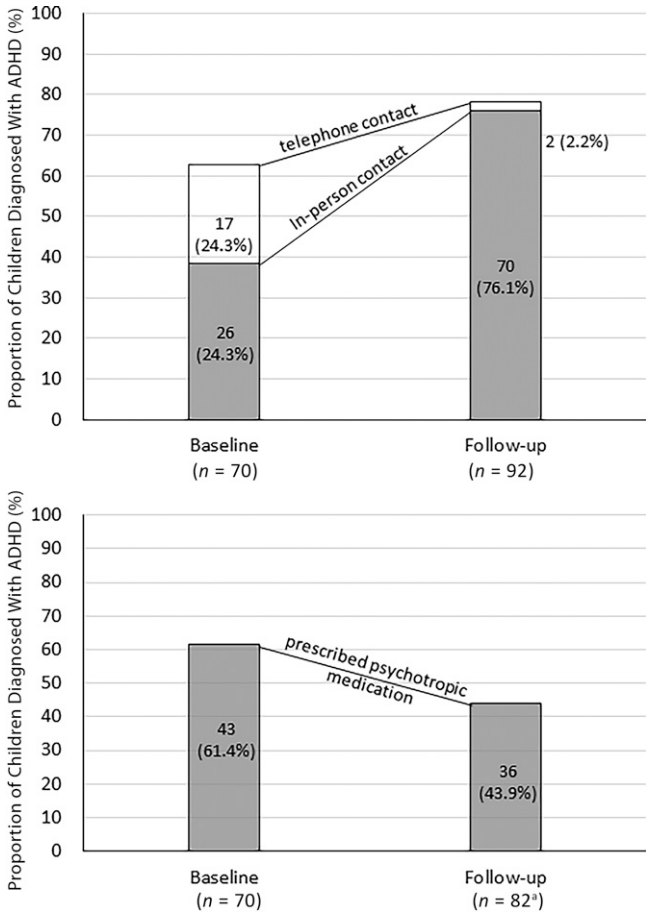


FIGURE 3

Follow-up within 30 days of ADHD diagnosis. [a] Ten children had prescriptions but time from diagnosis to prescription was unknown. Thus, $n = 82$.

with cooccurring disorders, developmental disabilities, and trauma. High rates of screening and identification, reduced wait for other BH services, reduced polypharmacy, and expansion of ADHD services offer preliminary evidence that TEAM UP, which integrated BHCs and CHWs into primary care teams, was successful in improving care.

We note several key findings worth consideration. First, BH screening at TEAM UP sites significantly exceeded state levels as documented in prior literature. [35,49–52] Massachusetts is an interesting location to examine screening because the ruling of a 2001 class action lawsuit (*Rosie D et al versus Jane Swift* et al; judgement implemented in 2007) requires Massachusetts Medicaid providers to screen for behavioral concerns using state-approved measures at all well-child visits. Robust state-based data document a significant increase in screening (from 4% to 74%) before versus after the ruling.[35] FQHCs involved in TEAM UP exceed the post-judgement Massachusetts screening rates for reasons that could include improved screening workflows, enhancements of EMR functionality, or regular use of data for CQI.

The prevalence of BH diagnoses in pediatric populations is approximately 15% to 20%. However, clinicians identified 33% to 40% of children with BH problems, of whom between 8% and 31% scored positive on age-based screeners. Screening thresholds (ie, "cut scores") that differ by age, with SWYC prioritizing sensitivity and the PSC prioritizing specificity, are a likely factor. Uniformly high rates of identification of BH problems by clinicians may reflect higher than expected prevalence of BH problems and/or identification of subclinical problems that nevertheless cause impairment.

Warm handoffs were associated with improved timeliness of BH care. This finding is notable given somewhat mixed evidence. Several prior studies suggest that integration of BH staff in primary care can improve access[53,54] and that warm handoffs can improve follow-up rates.[55,56] However, one prior study among adults found no

association between warm handoffs and access to BH care,[57] and a second study found similar results among Latinx adolescents.[58] In contrast, warm handoffs in the TEAM UP project were associated with greater likelihood of attending BH appointments, and in less time. Future research is needed on the effectiveness of warm handoffs with careful attention to the activities that comprise the warm hand-off, ideally while controlling for differences in staff availability and patient need.

BH integration occurred without increasing the number of children receiving psychotropic medications, and polypharmacy declined. Prior literature documents secular trends toward increased rates of polypharmacy for children[59,60] without clear evidence that benefits outweigh potential risks. While our findings suggest that BH integration may reduce polypharmacy, they require replication and additional investigation about possible mechanisms.

After TEAM UP implementation, more children were diagnosed with ADHD and a significantly higher percentage received in-person follow-up care within 30 days following diagnosis. Although the rate at which children were both diagnosed with ADHD and prescribed a psychotropic medication rose during implementation, the probability of a prescription conditional on a new diagnosis declined. These findings regarding medication could either be negative, representing under-treatment,[61,62] or positive, representing enhanced identification and care for ADHD and/or co-occurring conditions (eg, trauma) that emphasizes nonpharmacological BH treatment.[63] Further research is needed, especially given strong evidence for persistent and robust health disparities in ADHD diagnosis and treatment.[61,62,64,65]

We note several limitations. Because data derive from EMRs, information on care from affiliated specialty clinics was unavailable. Data are observational. Whereas previous TEAM UP analyses used a quasi-experimental design,[13] no comparison group with similar metrics was available. Participating FQHCs varied preintervention and do not likely represent the FQHC population as a whole. While results are consistent with hypotheses, they do not offer proof of effectiveness. Furthermore, TEAM UP represents a complex, multicomponent intervention; further research is needed to ascertain which elements are most effective and why. Finally, analyses primarily focus on one aspect of the quadruple aim, that is improving care. While other manuscripts focus on cost[13] and provider well-being,[14] the metrics do not explicitly assess whether improvements in care also led to improvements in health.

Because replication will likely require continued adaptation to ensure feasibility in new contexts, all TEAM UP materials are available in the public domain. After all, replication is difficult at best[66]; even the early promise of surgical checklists[67] failed to replicate when implementation was mandated at new sites.[68] While results are specific to 3 FQHCs, TEAM UP's stepped care clinical model, data-driven implementation support, and shared governance structure demonstrate an evidence-informed process by which integrated BH care might be implemented at other sites. Indeed, TEAM UP's further research with a second cohort of 4 FQHCs includes important evolutions. Investigators now receive monthly individual, item-level EMR data from every child, the provider BH plans have been further refined, and extractable templates for BHCs and CHWs are being developed. Events highlighting systemic racism caused us to reconsider processes for evaluating health inequities, and we will gather robust race and ethnicity data. In addition, TEAM UP continues revenue optimization with FQHCs and state-level advocacy to support BHCs and CHWs. We believe that these adaptations will increase TEAM UP's effectiveness while enhancing opportunities for further evaluation.

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ABBREVIATIONS

ADHD: attention-deficit/hyperactivity disorder
BH: behavioral health
FQHC: Federally Qualified Community Health Center
CHWs: community health workers
EMR: electronic medical record
PHQ: Patient Health Questionnaire
PSC: Pediatric Symptom Checklist
PCP: primary care provider
SWYC: Survey of Wellbeing of Young Children
TEAM UP: Transforming and Expanding Access to Mental Health Care in Urban Pediatrics

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