

UCLA

UCLA Previously Published Works

Title

Development and Evaluation of Two Integrated Care Models for Children Using a Partnered Formative Evaluation Approach.

Permalink

<https://escholarship.org/uc/item/5j18107v>

Journal

Ethnicity & Disease, 28(Suppl 2)

ISSN

1049-510X

Authors

Zima, Bonnie T
McCreary, Michael
Kenan, Kristen
[et al.](#)

Publication Date

2018

DOI

10.18865/ed.28.s2.445

Peer reviewed

DEVELOPMENT AND EVALUATION OF TWO INTEGRATED CARE MODELS FOR CHILDREN USING A PARTNERED FORMATIVE EVALUATION APPROACH

Bonnie T. Zima, MD, MPH¹; Michael McCreary, MPP²; Kristen Kenan, MD, MPH³; Michelle Churchey-Mims, MSW, LCPC⁴; Hannah Chi, MPH⁵; Madeline Brady, MPH⁴; Jewel Davies, LCPC⁴; Vikki Rompala, MSW, LCSW⁴; Bennett Leventhal, MD⁶

Objective: To describe the development and evaluation of two integrated care models using a partnered formative evaluation approach across a private foundation, clinic leaders, providers and staff, and a university-based research center.

Design: Retrospective cohort study using multiple data sources.

Setting: Two federal qualified health care centers serving low-income children and families in Chicago.

Participants: Private foundation, clinic and academic partners.

Interventions: Development of two integrated care models and partnered evaluation design.

Main Outcome Measures: Accomplishments and early lessons learned.

Results: Together, the foundation-clinic-academic partners worked to include best practices in two integrated care models for children while developing the evaluation design. A shared data collection approach, which empowered the clinic partners to collect data using a web-based tool for a prospective longitudinal cohort study, was also created.

Conclusion: Across three formative evaluation stages, the foundation, clinic, and academic partners continued to reach beyond their respective traditional roles of project oversight, clinical service, and research as adjustments were collectively made to accommodate barriers and unanticipated events. Together, an innovative shared data collection approach was developed that extends partnered research to include data collection being led by the clinic partners and supported by the technical resources

INTRODUCTION

Improving access to and quality of mental health care for children through care integration has been a long-standing national priority,¹⁻⁴ with more recent impetus from the Affordable Care Act to drive improvement by incentivizing the integration of pediatric and behavioral health care.^{5,6} Additionally, national recommendations to improve child mental health care emphasize reducing disparities because children living in poverty and from racial or ethnic minority backgrounds are at greater risk for developmental delays, mental health problems, and poor access to care.⁷ Child poverty is also inextricably linked to greater risk of adverse childhood experiences, such as exposure to violence, established

risk factors for poor school engagement and higher rates of chronic disease.⁸ Thus, strategies to increase access to and quality of behavioral health care for children optimally should address social determinants that may impact child well-being.⁹

Findings from federally funded, randomized clinical trials suggest that integrated care models that include evidence-based practices are effective in improving clinical outcomes for children and youth. A meta-analysis that included five randomized clinical trials of integrated care models for the treatment of select, target disorders found a modest, statistically significant improvement of clinical outcomes when compared with children receiving usual care.¹⁰ Of these five trials, three targeted adolescent depression¹⁰⁻¹² and two tar-

of a university-based research center. *Ethn Dis.* 2018;28(Suppl 2):445-456; doi:10.18865/ed.28.S2.445.

Keywords: Child Mental Health; Integrated Care; Formative Evaluation; Partnered Research

¹ UCLA Semel Institute for Neuroscience and Human Behavior, Geffen School of Medicine at UCLA, Los Angeles, CA

² UCLA Center for Health Services and Society, Los Angeles, CA

³ Department of Pediatrics, University of Illinois at Chicago, IL

⁴ Metropolitan Family Services, Chicago, IL

⁵ Erie West Town Family Health Center, Chicago, IL

⁶ Department of Psychiatry, University of California at San Francisco, CA

Address correspondence to Bonnie T. Zima, MD, MPH, UCLA Center for Health Services & Society, 10920 Wilshire Blvd. #300, Los Angeles, CA 90024, bzima@mednet.ucla.edu.

geted children, aged 5-12 years, with externalizing behavior problems.^{13,14} Nevertheless, only one of the integrated care models for adolescent depression included youth from predominantly racial/ethnic minority backgrounds and purposively sampled to include youth receiving publicly funded health care.¹⁵ Together,

We describe the collective contributions of the partnership across a private foundation, clinic leaders, providers and staff, and a university-based research center to develop two integrated care models and the evaluation.

these findings validate the national call for partnered research and demonstration projects to further refine the development and implementation of integrated care models for children receiving care in “real world” treatment settings.^{10,14,16-21}

To address this knowledge gap, we describe a partnered formative evaluation approach to develop and evaluate two integrated care models that serve predominantly poor, racial/ethnic minority children at high risk for trauma exposure. Given the dynamism of the implementation of mental health care interventions²⁰

and subsequent cycles of adaptation of the evaluation design, the process is organized within the conceptual framework of three partnered formative evaluation stages; namely the developmental, implementation-focused and progress-focused evaluation stages.²² Guided by this framework, we describe the collective contributions of the partnership across a private foundation, clinic leaders, providers and staff, and a university-based research center to develop two integrated care models and the evaluation.

METHODS

Partnership Context

In 2013, the Illinois Children’s Healthcare Foundation (hereafter referred to as the “Foundation”) spearheaded the Healthy Minds, Healthy Children, Healthy Chicago (H3) initiative to integrate primary and mental health care services through a team-based approach to improve the prevention and early intervention for child mental health problems.²³ This project was a natural extension of the Foundation’s long-standing commitment to invest in innovative programs designed to improve access, early detection, treatment, and care coordination of child mental health care in community-based settings across multiple care sectors (ie, schools, community mental health programs, primary care clinics). This project was also one of the Foundation’s first efforts to target children served in federally qualified health care centers (FQHCs) in the Chicago area, while also partnering with

a university-based mental health services research center outside Illinois.

Support for the clinic programs was allocated in two phases: 1) a 6-month planning grant to develop an integrated care model tailored to the unique characteristics of each clinic organization and communities served; and 2) a five-year grant to implement the integrated care models. At the end of the planning phase, the academic partner was invited to submit a proposal for the evaluation. A partnered formative evaluation approach was proposed because the Foundation believed it was important for the clinic providers to be involved in how the program evaluation was to be designed and implemented. In addition, the clinic programs were expected to participate in the program evaluation, including data collection, consistent with the Foundation’s approach for evaluation of an earlier, large scale project to improve community-based systems of care for children.

Origin of the Primary Care Clinic-Specialty Mental Health Program Dyads

Site 1

The lead agency was an FQHC located on the west-side of Chicago that cares for underserved and vulnerable communities. This clinic is part of a network of seven community-based clinics and five school-based clinics serving Chicago’s north- and west-side communities. During the planning phase, Site 1 built upon their existing collaboration with a well-established community mental health agency that included five com-

community-based mental health centers. The team adapted their existing integrated care model for adults to create an integrated care program for children, adolescents, and their families.

Site 2

The lead agency was a large human services agency, with a well-established outcome and data driven care process that has been integrally involved in the National Child Traumatic Stress Network's Integrated Health Behavioral Health Committee.²⁴ This agency engaged in a new partnership with an FQHC serving predominantly African American children and families from the southside of Chicago. This clinic is part of a well-established network of six community-based clinics and five school-based clinics, which are also affiliated with a major univer-

sity health center. Early challenges for Site 2 included building new relationships with an FQHC affiliated with a large health system, adding a pediatric primary care clinic to a site that was originally a family medicine center, and negotiating space for the mental health team within a building leased from the City.

Partnered Formative Evaluation Stages

To describe the transformation of our work together, the project is broadly conceptualized by three formative evaluation stages that are aligned with the project phases (Figure 1). A partnered formative evaluation approach is a highly valued approach to identify problems, develop strategies, and gather input from stakeholders regarding effective remedies for local implementation

barriers.²⁵ The developmental stage (stage 1) corresponds to the planning phase of the care models by the clinic programs. The onset of the implementation stage (stage 2) corresponds to the early implementation of the care models and development of the evaluation design. The progress stage (stage 3) corresponds to the data collection time period, during which early indicators of progress were reviewed using data tracking reports. Because data collection is underway, our work during the final interpretive evaluation phase (stage 4) is not described.

Data Collection Procedures and Sources

Clinic and academic partners met regularly, in person and by conference call, to identify the conceptual framework, brainstorm about challenges

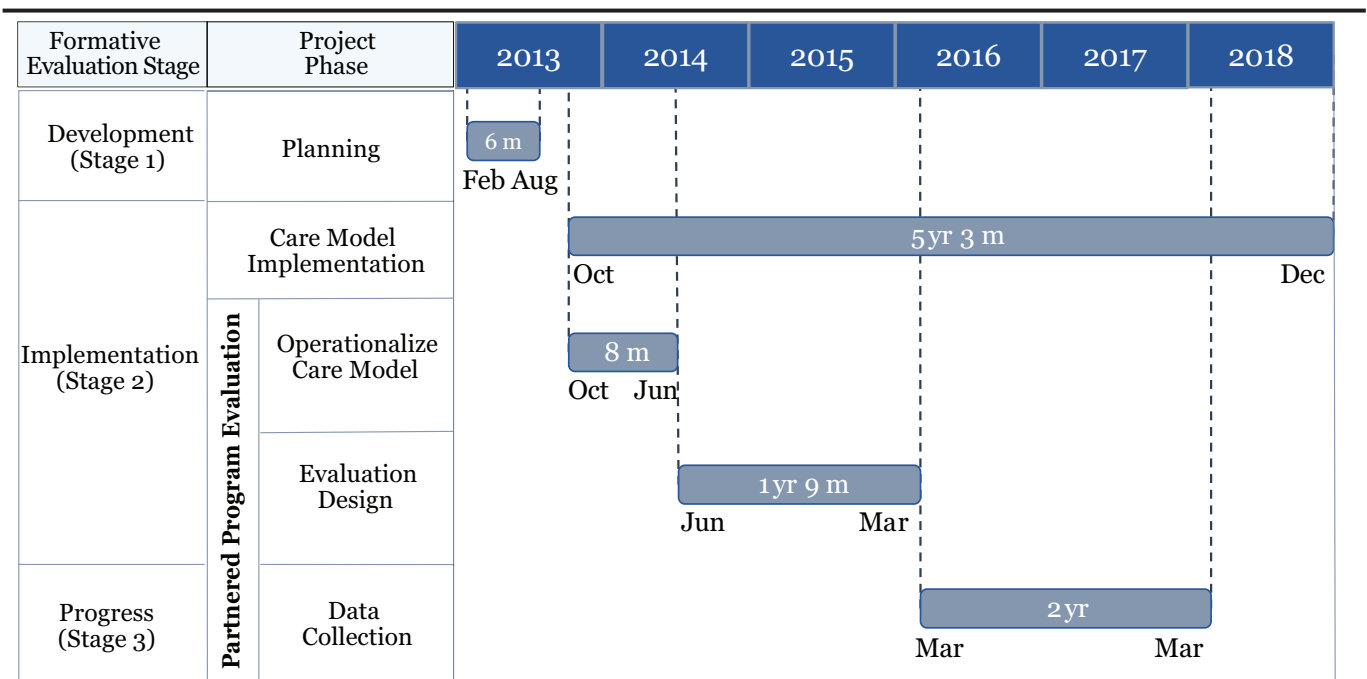


Figure 1. Healthy Minds, Healthy Children, Healthy Chicago (H3) project overview by partnered formative evaluation stage.

faced, trade-offs identified, solutions considered, discrepancies between planned and actual implementation of the care models and evaluation, unanticipated influences, early lessons learned and accomplishments.

Data sources included meeting minutes, quarterly and biannual progress reports, work flow analyses drafts, clinical program proposals, and updated evaluation design reports that documented changes during this

study's time period. In addition, a presentation was made summarizing the working group's early findings during a recent on-site clinic visit. Feedback from the larger group, including clinicians, data coordina-

Table 1. Partnered approach for development of integrated care models and evaluation by best practice

Stage ^a	Partner Contributions	Early Lessons Learned
Operationally Define Integrated Care Models		
1	FOUNDATION: 6-month grants for clinic programs to plan integrated care models. CLINIC: Site-specific meetings of providers and staff across federally qualified health care center and community-based mental health program pairs.	Encouragement for the clinic sites to engage in planning care models together could provide opportunities for more shared learning and identifying common care processes. Early inclusion of the academic partner could: 1) strengthen foundation-clinic-academic partnership; 2) create work flow analyses prior to implementation; 3) consult on the scientific evidence for care processes; 4) advise on measurement-based care; and 5) integrate evaluation planning during care model development.
2	FOUNDATION: Support for additional time for clinic-academic team to create work flow analyses. CLINIC: Provide consultation on care model by care process type (ie, screening, therapy, parent training, case management, specialty mental health care). ACADEMIC: Develop and refine work flow analyses.	The staffing ratio between PCP and embedded MH team should be similar to account for differences in clinic volume. Divide evaluation plan into two phases: 1) operationally define care models; and 2) evaluation design to better align with developmental stage of care models.
Measurement-based Care		
2	FOUNDATION: Supportive of exploring use of adapting stepped care model for children. CLINIC: Provide consultation on how clinical decisions for transitions in care model are made. ACADEMIC: Delete in work flow analyses and evaluation design use of standardized measures to guide decisions at transition points between care processes.	Provider preference is to base decisions about recommended H3 care on clinical judgment. Use of standardized measures to guide decision points in care model perceived as burdensome.
Mental Health Screening		
2	FOUNDATION: History of dedication to increase universal screening for developmental delays and child mental health problems to improve prevention, early detection and treatment. CLINIC: At both sites, during well child visits, pediatricians continue existing procedures for children ages 0-3 years. Site 1 to continue existing procedures for mental health screening for children ≥3 years. At Site 2 the family resource developer engages family and hands out the mental health screener, and counselor scores the mental health screen during assessment. ACADEMIC: Conduct literature review to identify strength of evidence for child mental health screening measures in primary care settings.	The process of the evaluation should be respectful of clinic partner's decision to continue existing clinical practice. Scientific evidence supports use of the PSC to screen for mental health problems and track clinical outcomes for children ages 3-17 years.
Traumatic Events Screening		
2	FOUNDATION: History of dedication to tailor mental health interventions to the needs of the community. CLINIC: Provide consultation on trauma exposure among the children and families served. Share information about existing trauma screening approaches from clinic involvement in the NCTSN. (site 2) ACADEMIC: Scientific literature review of existing trauma exposure screening tools for children and youth. Identify survey items from national surveys to address gaps in TESI (ie, bullying) identified by clinic partners.	Allow for flexibility to include traumatic event screening into the evaluation only (site 1) or as part of the mental health assessment (site 2).

a. Formative evaluation stages: Stage 1=Developmental, Stage 2=Implementation-focused, Stage 3=Progress-focused. M-CHAT, Modified Checklist for Autism in Toddlers; ASQ, The Ages & Stages Questionnaires®; ASQ-SE, The Ages & Stages Questionnaires® Social Emotional; PSC, Pediatric Symptom Checklist; TESI, Trauma Events Screening Inventory; NCTSN, National Child Traumatic Stress Network.

tors, clinic administrative leaders and Foundation leadership, was then integrated into the working table drafts. During the submission and revision process, earlier manuscript drafts were reviewed by the Foundation and clinic partners, and further revisions in response to comments were made. Given the focus on partnership development activities, the project was

deemed not to be research by the UCLA Institutional Review Board.

RESULTS

Partnered Approach: Early Lessons Learned

The partnered approach for the development of the integrated care

models and evaluation by best practice and corresponding formative evaluation stage with early lessons learned is summarized in Tables 1 and 2. Lessons learned included: incorporate the academic partner early in the planning process; adjust staffing of the embedded mental health team to align with clinic volume; and provide additional support to

Table 2. Partnered approach for development of integrated care models and evaluation by best practice

Stage ^a	Partner Contributions	Early Lessons Learned
Evidence-based Therapy		
1,2	FOUNDATION: History of dedication to improving the effectiveness of child mental health care in community-based settings. CLINIC: Provide consultation on clinical approach for psychotherapy provided and provider experience with evidence-based psychotherapies. Provide consultation on the existing parent training class that parents are referred. (site 1) ACADEMIC: Conduct scientific literature review of parent training interventions. Share strength of evidence for these interventions with priority placed on studies using similar target populations. Engage clinic partners in meetings with developers of the Chicago Parent Program and EZ parent (web-based version). (site 2)	Additional training and resources required to implement and monitor fidelity to evidence-based brief psychotherapy in primary care setting. If there is an existing protocol for referral to parent training, clinic preference is to continue referral to the regularly scheduled parent training classes (site 1). Integrate web-based 6-session parent training into care model, but additional on-site counselor needed to support referral follow-up and deliver parent training at times convenient for parent (site 2).
On-site Psychiatrist		
1,3	FOUNDATION: Supportive of on-site child psychiatrist to be integrated into H3 Care model. CLINIC: Approaches to include a child psychiatrist were: 1) provide lectures to primary care providers (site 1); 2) hire a psychiatrist and allocate two days/week at H3 primary care site (site 1); and 3) integrate child psychiatrist into embedded mental health team (site 2). ACADEMIC: Clarify roles for psychiatrist in care models by site. Continue to revise H3 Tracker programming and data entry responses to align with shifts in psychiatrist roles in care model.	Challenges to integrate and sustain on-site child psychiatrist in care model include shortage of child psychiatrists and Medicaid reimbursement policies.
Detection of Need for Primary Care in Affiliated Specialty Mental Health Setting		
1,2	FOUNDATION: Supportive of an integrated care model that is accessible for children served in either primary care or by affiliated specialty mental health care program. CLINIC: Development of an integrated care model that has "no wrong door" was envisioned by both sites. ACADEMIC: Develop 3-item screener that aligns with AAP guidelines for detection of probable need for primary care in affiliated specialty mental health site.	Changes in how referrals to specialty mental health care and expansion of options that included non-affiliated mental health programs made it problematic to screen for need for primary care in the evaluation.
Track Clinical Outcomes		
2,3	FOUNDATION: Supportive of tracking clinical outcomes at 3-, 6-, and 12-months. CLINIC: On-site data coordinator to conduct telephone follow-up interviews for parents and youth enrolled in evaluation. ACADEMIC: Build-in capacity in H3 Tracker to generate reminders for follow-up interviews within 4-week window for follow-up and document 6 contact attempts, 2 at each of 3 different time intervals of the day.	Consider at least two on-site data coordinators/site to provide additional coverage for data collection. Build capacity to conduct follow-up interviews in the early evenings or weekends that may be more convenient for working parents and youth in high school.

a. Formative evaluation stages: Stage 1=Developmental, Stage 2=Implementation-focused, Stage 3=Progress-focused.

on-site counselors for measurement-based care as well as to implement and monitor fidelity to evidence-based therapies. In addition, the evaluation should be respectful of existing clinical practice and build flexibility in the evaluation design to capture data from standardized measures that may be gathered from a clinician, front-line staff or on-site data coordinator. Further, tracking clinical outcomes among predominantly low-income families with

children and youth may require additional resources to expand capacity to conduct follow-up interviews during evenings and weekends.

Across all stages, challenges were identified consistent with “setbacks” described in implementation science.^{21,26} Logistical constraints were identified and some were at best partially addressed. For example, designated space for the mental health providers within the primary care clinic was a challenge for both sites.

With the support of the Foundation, Site 1 built two consultation rooms near the primary care clinic area. Although development of a shared electronic health care record (EHR) system remains a future goal, both sites developed administrative approaches (ie, credentialing, changes in hiring practices) to enable the on-site mental health provider to access and enter progress notes in the primary care clinic’s EHR. Additionally, following financial reor-

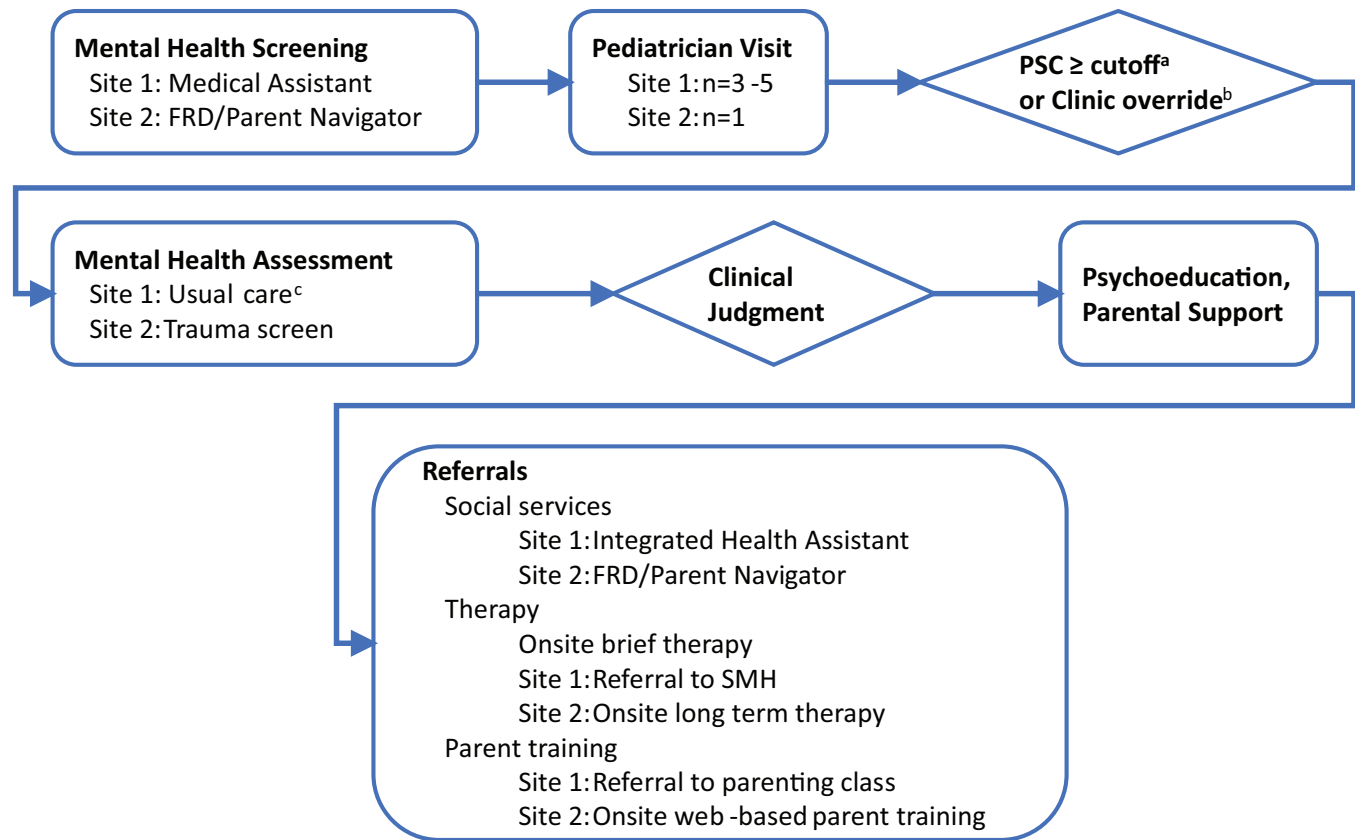


Figure 2. Partnered integrated care model

a. Cutoff scores for the PSC are ≥ 24 for ages 3-5 years, and ≥ 28 for ages 6-18 years.
 b. Clinical judgment if need for mental health services may include children 0-2.
 c. Trauma events screening included in baseline interview for evaluation.
 FRD, Family Resource Developer; PSC, Pediatric Symptom Checklist; SMH, specialty mental health.

Table 3. Partnered approach for shared data collection for evaluation by task

Stage ^a	Partner Contributions	Accomplishments
Institutional Review Board (IRB) Approval		
2	FOUNDATION: Supportive of additional time required to comply with existing clinic policies and procedures for approval of research. CLINIC: Provide guidance on clinic's research committee application content and process. (Site 1) ACADEMIC: Complete submission of Site 1 research committee application.	Site 1 Research Committee approval.
2	FOUNDATION: Supportive of additional time required to ensure protection of human subjects and compliance with related federal regulations. CLINIC: Consultation on clinic description for IRB application. (site 1) Senior H3 Care Pediatrician to serve as Principal Investigator (PI) on IRB application for university-affiliated primary care clinic. (site 2) On-site data coordinator, Director of Outcomes and Evaluation, and site PI complete IRB application and revisions. (site 2) Provide consultation on development of consent forms. ACADEMIC: Explore with IRB leadership at both universities administrative options to streamline and coordinate dual IRB application submissions. Technical consultation to site 2 on IRB application. Complete concurrent IRB application at academic institution. Develop consent forms.	IRB Approval from two major universities. Additional approval from the University Chancellor's Office to include site 1 that was not affiliated with the university but is also a study site.
3	FOUNDATION: Continued support for additional time required for approval of amendments to IRB applications. CLINIC: Completed and submitted IRB amendments to address changes in staff and refinement of study methods. (site 2) ACADEMIC: Technical consultation on IRB amendments. Completion of amendments to IRB at academic institution.	Approval of several IRB amendments from two major universities.

a. Formative evaluation stages: Stage 1=Developmental, Stage 2=Implementation-focused, Stage 3=Progress-focused.

ganization of their affiliated mental health agency at Site 1, the primary care clinic hired on-site behavioral health counselors to continue the embedded H3 care model. To address poor service uptake at nearby offsite Center, Site 2 changed the affiliated specialty mental health provider to an on-site specialty mental health counselor. Further, across the implementation and progress stages, work flow analyses continued to change with subsequent refinements in the evaluation design.

Partnered Integrated Care Models

The basic design of the partnered integrated care models is depicted in Figure 2. Although there were site-specific differences, the general work flow was similar, starting with parent or youth engagement and mental health screening upon arrival,

referral for mental health assessment based on screening positive for a psychosocial problem based using the Pediatric Symptom Checklist²⁷⁻³⁰ or clinical override. A clinical override is defined as clinical judgment of an unmet need for mental health services. For mental health screening, Site 1 preferred to continue their existing clinical practice, which was to include the mental health screen in the pre-visit packet for parents to complete when vital signs were checked and allow for physician discretion to determine when clinically indicated problems existed. Site 2 adopted routine trauma exposure screening using the Trauma Events Screening Inventory³¹ into their mental health assessment while Site 1 preferred that this screening be included only for children enrolled in the evaluation.

At both sites, mental health assessments were conducted by an

on-site counselor who also provided psychoeducation, parental support, and referrals for social services, therapy and parent training. At Site 1, the counselors were licensed clinical social workers, while at Site 2, the counselor was a licensed clinical professional counselor.³² Site 1 counselors provided a trial of brief therapy followed by referral to community-based specialty mental health services, when clinically indicated. For Site 2, there was one counselor assigned to provide mental health assessment, short-term therapy, and on-site web-based parent training. Following the assessment, she could directly refer to the on-site specialty mental health provider who could provide more long-term therapy.

In addition, Site 2 employed a family resource developer who served as a parent navigator to assist in accessing community-based services.

Table 4. Partnered approach for shared data collection for evaluation by task.

Stage ^a	Partner Contributions	Accomplishments
Staffing		
2	FOUNDATION: Carry-forward funding to support on-site data coordinator. (site 1) CLINIC: Recruit and hire on-site data coordinator. (site 1) Share staff person from mental health agency's outcomes and evaluation division to serve as on-site data coordinator. (site 2) ACADEMIC: Interview candidates and provide consultation on extent of research experience and technical skills that would be required for the position.	Full-time on-site data coordinators at each clinic site.
Training		
2	FOUNDATION: Support participation of program officers in data collection training. CLINIC: Participate in 3-day training to prepare for data collection. Provide computer lab space at mental health agency for group training. (site 2) Provide feedback on data collection procedures and H3 Tracker. ACADEMIC: Provide training in survey administration, standardized measures, and H3 Tracker functionalities.	Further refine data collection procedures and H3 Tracker prototype.
3	FOUNDATION: Support for using a half-day of clinic visit time for training. CLINIC: Participate in additional training session for new on-site data coordinator (site 1) during clinic site visit. ACADEMIC: Designate site 2 on-site data coordinator as "H3 Tracker champion" to co-lead second wave of training. Provide additional training session.	Trained new on-site data coordinator for site 1.
2,3	CLINIC: Complete IRB-required research ethics training. ACADEMIC: Provide consultation on how to access and complete on-line CITI training.	
Development of Web-based Data Collection Tool: H3 Tracker		
2	FOUNDATION: Supportive of approach for electronic transfer of data from clinics to research center. CLINIC: Provide consultation on the design and features of the provider interface. ACADEMIC: Program H3 Tracker to align with data summary in evaluation design, with iterative cycles of testing new features and deployment. Create an interface to allow providers to view study data related to their patients. Create training manual.	Web-based data collection tool in both English and Spanish that includes clinic daily census, eligibility criteria checklist, H3 care processes, baseline and follow-up surveys, standardized outcome measures, and capacity for providers to view the care processes delivered and clinical outcomes of their patients. Training manual for H3 Tracker use.
3	FOUNDATION: Continued support to refine web-based data collection tool. CLINIC: Provide consultation on changes in H3 Care processes. ACADEMIC: Revise H3 Tracker and training manual to align with refinements in care model.	Revised H3 Tracker and training manual.
Data Quality Monitoring		
3	FOUNDATION: Participate in data quality monitoring calls. CLINIC: Provide weekly updates on data collection, advise academic partner about any discrepancies in the data tracking report, and inform academic team of any data entry errors for correction. ACADEMIC: Provide technical consultation on implementation of IRB-approved subject recruitment and data collection procedures, clarify and further refine operational definitions for inclusion and exclusion criteria in training manual, correct data entry errors in H3 Tracker database. Provide consultation to on-site data coordinators on real-time decision points by email or phone.	Partnered weekly data quality monitoring with regularly updated data tracking reports.

a. Formative evaluation stages: Stage 1=Developmental, Stage 2=Implementation-focused, Stage 3=Progress-focused.

The family resource developer was not only the point person who initially greeted the family at their visit and introduced them to H3 care, she also handed out the mental health screen and explained the nature and purpose of the integrated care mod-

el. If the parent was interested, the family resource developer provided referrals for social services and special education while also remaining available to help parents access and use additional community-based resources. Site 1 case management

support was offered by an integrated health assistant, who provided similar referrals and remained available to support access to recommended community-based resources. At different time points during the implementation and progress

stages, both primary care programs increased their capacity for referrals to an on-site psychiatrist. Site 1 initially invited the child psychiatrist from the affiliated community mental health agency to provide presentations to the pediatricians about the assessment and treatment of child psychiatric disorders. Midstream during the progress stage, the primary care network at Site 1 hired a general psychiatrist and allocated two days per week to provide psychiatric care to adults and children at the Site 1 clinic. During the implementation stage, Site 2 integrated an on-site child psychiatrist into their care model. Duties included providing weekly one-hour clinical supervision by phone and, once-a-month, providing on-site psychiatric evaluations and follow-up care. However, given staff turn-over, integration of a child psychiatrist into the model for Site 2 could not be consistently sustained during the progress stage.

Partnered Evaluation Design

During the implementation stage, the evaluation design was completed. The main aims of the longitudinal cohort study design were to: 1) describe the care processes received by children and parents in the H3 care models; and 2) to examine the relationship between receipt of H3 care processes and clinical outcomes at 3, 6 and 12 months. The evaluation design integrated input from the Foundation and clinic partners. Flexibility was built in for the clinics to use existing administrative data for select study variables and to conduct baseline interviews with parent and youth by telephone

within the first two weeks after study enrollment. With the support of the Foundation leadership, funding for Site 1 was carried forward to support an on-site data coordinator, and we explored the option of including a usual care site within the Site 2 clinic network in the evaluation design to build capacity for examining the effectiveness of H3 care.

Partnered Approach for Data Collection

Together, the partners developed a shared data collection approach summarized in Tables 3 and 4. The accomplishments included approval from the Institutional Review Boards (IRB) from two major universities, a trained on-site data coordinator/site, a web-based data collection tool, and partnered weekly data quality monitoring calls with updated data tracking reports. During the progress stage, there was staff turnover in the data coordinator position and additional refinements were made in the study design and methods. To accommodate each of these changes, IRB amendments were submitted, additional training was provided, and revisions were made to the training manual, web-based data collection tool, tracking reports, and data programming.

DISCUSSION

Overall, the dynamism persisted in the partnership process as well as the development of the care models and evaluation across three partnered formative evaluation stages. Together, the Foundation, clinic, and aca-

demically partners continued to extend beyond their respective traditional roles of project oversight, clinical service, and research as adjustments were collectively made to accommodate barriers and unanticipated events. In addition to providing funding and oversight of the project, the Foundation partners were involved in activities to promote engagement between the clinic and academic partners throughout the project's timeline. Our clinic partners were dedicated to providing clinical care,

Together, the Foundation, clinic, and academic partners continued to extend beyond their respective traditional roles of project oversight, clinical service, and research as adjustments were collectively made to accommodate barriers and unanticipated events.

but also took on relatively new tasks such as participating in developing work flow analyses, providing input into the evaluation design, exploring use of existing clinic administrative data, obtaining IRB approval, implementing IRB-approved subject recruitment, consent and data col-

lection procedures for a longitudinal cohort study, use of standardized measures, and data quality monitoring. Further, the academic partner also flexed to step back and work with clinic partners to operationally define their care models prior to developing the evaluation design, iteratively changed the evaluation design to accommodate changes in the care model, and shifted resources to support data collection as well as requested changes in the study design and methods during data collection.

In addition, the implementation of the care models and their evaluation were closely intertwined. Both the care models and evaluation design continued to adapt to constraints that were often shared, such as staff turnover, changes in the type of mental health providers, specialty mental health care site and agency reorganization, and changes in the availability of an on-site psychiatrist. Within the care models, there were also differences in the extent changes in existing clinical practice were made, such as family engagement, universal mental health screening for child well visits, and integration of routine trauma exposure screening during a child's mental health assessment. For Site 2, there was greater flexibility in clinical practice, but this may have been due to having fewer pre-existing clinic-based procedures because the pediatric primary care clinic was created with Foundation funding. At Site 1, the clinic volume was higher and thus accommodations were made to safeguard against making referrals to the on-site behavioral health counselor beyond clinic capacity. In addition, both sites were not ready to adopt

some best practices for collaborative care, such as measurement-based or "stepped care".^{11-15,33} Nevertheless, the clinic program's dedication to providing parental support, psychoeducation and on-site supportive therapy will provide an opportunity to describe "practice-based evidence" to better understand usual care processes and its relationship to short-term clinical outcomes.³⁴ Together, these observations are consistent with the findings that partnerships range across a continuum of collaboration and the process of including multiple best practices within an integrated care model is uneven.^{20,35}

Limitations

The major limitation of our work is related to being at the early phase of developing and maintaining our partnerships. Future partnered work to further refine the integrated care models and evaluate their impact on community health should consider extending our partnerships to include parents, youth and community partners in all phases of the decision making and evaluation.³⁶ As this partnership matures, there will likely be more unanticipated events that will offer further challenges to the partnership, implementation of the care model, interpretation of data, and planning for next steps—challenges that may be more successfully negotiated within an infrastructure guided by the principles of community-partnered participatory research.³⁷

CONCLUSIONS

The increasing synergy across the partners of this effort has enabled

us to begin articulating early lessons learned and to develop an innovative shared data collection approach that extends partnered research to include data collection being led by the clinic partners and supported by the technical resources of a university-based research center. Together, we are well-positioned to work in partnership to improve access to and quality of mental health care for children served in two FQHCs serving low-income children at high risk for trauma exposure.

ACKNOWLEDGEMENTS

The authors would like to gratefully acknowledge the support of the Illinois Children's Healthcare Foundation, Lamorris Perry MD for his outstanding clinical leadership, and Natisha Olaseni, Family Resource Developer, Pastor Dr. Willie L. Johnson, Yesenia Garcia, LCSW, Natalie Galarza LCSW, Georgia Hutchins BA, Yesenia Renteria BAS, Elisette Villegas LCSW for their excellent clinical work, and Sylvia Gonzalez MPH and Ana Mosqueda BA for data collection. This study was funded by the Illinois Children's Healthcare Foundation. The views and opinions expressed in this article are those of only the authors.

CONFLICT OF INTEREST

No conflicts of interest to report.

AUTHOR CONTRIBUTIONS

Research concept and design: Zima, McCreary, Kenan, Churchey-Mims, Chi, Davies, Rompala, Leventhal; Acquisition of data: Zima, McCreary, Kenan, Churchey-Mims, Chi, Brady, Davies, Rompala; Data analysis and interpretation: Zima, McCreary, Kenan, Churchey-Mims, Chi, Brady, Davies, Rompala, Leventhal; Manuscript draft: Zima, McCreary, Kenan, Churchey-Mims, Chi, Davies, Rompala, Leventhal; Acquisition of funding: Zima, Leventhal; Administrative: Zima, McCreary, Churchey-Mims, Chi, Brady, Davies, Rompala, Leventhal

REFERENCES

1. Croghan TW, Brown JD. *Integrating Mental Health Treatment into the Patient-centered Medical Home*. Rockville, Md: Agency for

- Healthcare Research and Quality. 2010.
2. Institute of Medicine, Committee on Crossing the Quality Chasm. *Adaptation to Mental Health and Addictive Disorders. Improving the Quality of Health Care for Mental and Substance-use Conditions: Quality Chasm Series*. Washington, DC: National Academies Press; 2006.
 3. US Department of Health and Human Services. *New Freedom Commission on Mental Health: Achieving the Promise: Transforming Mental Health Care in America. Final Report*. Rockville, Md: Department of Health and Human Services. 2003;SMA-03-3832.
 4. U.S. Public Health Service. *Mental Health: A Report of the Surgeon General*. Rockville, MD: Department of Health and Human Services; 1999.
 5. Patient Protection and Affordable Care Act of 2010, PL 111-148, sec. 3021(2010).
 6. Croft B, Parish SL. Care integration in the Patient Protection and Affordable Care Act: implications for behavioral health. *Adm Policy Ment Health*. 2013;40(4):258-263. <https://doi.org/10.1007/s10488-012-0405-0> PMID:22371190
 7. US Department of Health and Human Services. Culture, race, and ethnicity: A supplement to mental health. *A Report of the Surgeon General*. 2001.
 8. Bethell CD, Newacheck P, Hawes E, Halfon N. Adverse childhood experiences: assessing the impact on health and school engagement and the mitigating role of resilience. *Health Aff (Millwood)*. 2014;33(12):2106-2115. <https://doi.org/10.1377/hlthaff.2014.0914> PMID:25489028
 9. Alegria M, Alvarez K, Ishikawa RZ, DiMarzio K, McPeck S. Removing Obstacles To Eliminating Racial And Ethnic Disparities In Behavioral Health Care. *Health Aff (Millwood)*. 2016;35(6):991-999. <https://doi.org/10.1377/hlthaff.2016.0029> PMID:27269014
 10. Asarnow JR, Rozenman M, Wublin J, Zeltzer L. Integrated medical-behavioral care compared with usual primary care for child and adolescent behavioral health: A meta-analysis. *JAMA Pediatr*. 2015;169(10):929-937. <https://doi.org/10.1001/jamapediatrics.2015.1141> PMID:26259143
 11. Clarke G, Debar L, Lynch F, et al. A randomized effectiveness trial of brief cognitive-behavioral therapy for depressed adolescents receiving antidepressant medication. *J Am Acad Child Adolesc Psychiatry*. 2005;44(9):888-898. [https://doi.org/10.1016/S0890-8567\(09\)62194-8](https://doi.org/10.1016/S0890-8567(09)62194-8) PMID:16113617
 12. Richardson LP, Ludman E, McCauley E, et al. Collaborative care for adolescents with depression in primary care: a randomized clinical trial. *JAMA*. 2014;312(8):809-816. <https://doi.org/10.1001/jama.2014.9259> PMID:25157724
 13. Kolko DJ, Campo JV, Kilbourne AM, Kelleher K. Doctor-office collaborative care for pediatric behavioral problems: a preliminary clinical trial. *Arch Pediatr Adolesc Med*. 2012;166(3):224-231. <https://doi.org/10.1001/archpediatrics.2011.201> PMID:22064876
 14. Kolko DJ, Perrin E. The integration of behavioral health interventions in children's health care: services, science, and suggestions. *J Clin Child Adolesc Psychol*. 2014;43(2):216-228. <https://doi.org/10.1080/15374416.2013.862804> PMID:24588366
 15. Asarnow JR, Jaycox LH, Duan N, et al. Effectiveness of a quality improvement intervention for adolescent depression in primary care clinics: a randomized controlled trial. *JAMA*. 2005;293(3):311-319. <https://doi.org/10.1001/jama.293.3.311> PMID:15657324
 16. Ader J, Stille CJ, Keller D, Miller BF, Barr MS, Perrin JM. The medical home and integrated behavioral health: advancing the policy agenda. *Pediatrics*. 2015;135(5):909-917. <https://doi.org/10.1542/peds.2014-3941> PMID:258669375
 17. Asarnow JR, Kolko DJ, Miranda J, Kazak AE. The Pediatric Patient-Centered Medical Home: innovative models for improving behavioral health. *Am Psychol*. 2017;72(1):13-27. <https://doi.org/10.1037/a0040411> PMID:28068135
 18. Campo JV, Bridge JA, Fontanella CA. Access to mental health services: implementing an integrated solution. *JAMA Pediatr*. 2015;169(4):299-300. <https://doi.org/10.1001/jamapediatrics.2014.3558> PMID:25664846
 19. Kolko DJ. The effectiveness of integrated care on pediatric behavioral health: outcomes and opportunities. *JAMA Pediatr*. 2015;169(10):894-896. <https://doi.org/10.1001/jamapediatrics.2015.1428> PMID:26259063
 20. Pringle B, Chambers D, Wang PS. Toward enough of the best for all: research to transform the efficacy, quality, and reach of mental health care for youth. *Adm Policy Ment Health*. 2010;37(1-2):191-196. <https://doi.org/10.1007/s10488-010-0266-3> PMID:20112059
 21. Proctor EK, Landsverk J, Aarons G, Chambers D, Glisson C, Mittman B. Implementation research in mental health services: an emerging science with conceptual, methodological, and training challenges. *Adm Policy Ment Health*. 2009;36(1):24-34. <https://doi.org/10.1007/s10488-008-0197-4> PMID:19104929
 22. Stetler CB, Legro MW, Wallace CM, et al. The role of formative evaluation in implementation research and the QUERI experience. *J Gen Intern Med*. 2006;21(S2)(suppl 2):S1-S8. <https://doi.org/10.1007/s11606-006-0267-9> PMID:16637954
 23. Illinois Children's Healthcare Foundation. Fact Sheet. Last accessed April 24, 2017 from http://www.ilchf.org/images/H3_Partners_Fact_Sht.pdf.
 24. The National Child Traumatic Stress Network. Last accessed May 10, 2017 from www.nctsn.org.
 25. Hagedorn H, Hogan M, Smith JL, et al. Lessons learned about implementing research evidence into clinical practice. Experiences from VA QUERI. *J Gen Intern Med*. 2006;21(S2)(suppl 2):S21-S24. PMID:16637956
 26. Greenhalgh T, Robert G, Macfarlane F, Bate P, Kyriakidou O. Diffusion of innovations in service organizations: systematic review and recommendations. *Milbank Q*. 2004;82(4):581-629. <https://doi.org/10.1111/j.0887-378X.2004.00325.x> PMID:15595944
 27. Borowsky IW, Mozayeny S, Ireland M. Brief psychosocial screening at health supervision and acute care visits. *Pediatrics*. 2003;112(1 Pt 1):129-133. <https://doi.org/10.1542/peds.112.1.129> PMID:12837878
 28. Jellinek MS, Murphy JM, Little M, Pagano ME, Comer DM, Kelleher KJ. Use of the Pediatric Symptom Checklist to screen for psychosocial problems in pediatric primary care: a national feasibility study. *Arch Pediatr Adolesc Med*. 1999;153(3):254-260. <https://doi.org/10.1001/archpedi.153.3.254> PMID:10086402
 29. Murphy JM, Reede J, Jellinek MS, Bishop SJ. Screening for psychosocial dysfunction in inner-city children: further validation of the Pediatric Symptom checklist. *J Am Acad Child Adolesc Psychiatry*. 1992;31(6):1105-1111. <https://doi.org/10.1097/00004583-199211000-00019> PMID:1429413
 30. Navon M, Nelson D, Pagano M, Murphy M. Use of the pediatric symptom checklist in strategies to improve preventive behavioral health care. *Psychiatr Serv*. 2001;52(6):800-804. <https://doi.org/10.1176/appi.ps.52.6.800> PMID:11376228
 31. Dartmouth Child Trauma Research Group. An Interview for Children: Traumatic Events Screening Inventory (TESI-C). 2011. Last accessed June 29, 2017 from <http://www.mindfuleotherapy.org/wp-content/uploads/2017/01/TESI-C-1.pdf>.
 32. Counselor-Education.com. Illinois LPC Requirements. 2017. Last accessed June 6, 2017 from <http://counselor-education.com/illinois-lpc-requirements/>.
 33. Katon W, Von Korff M, Lin E, et al. Stepped collaborative care for primary care patients with persistent symptoms of depression: a randomized trial. *Arch Gen Psychiatry*. 1999;56(12):1109-1115. <https://doi.org/10.1001/archpsyc.56.12.1109> PMID:10591288
 34. Garland A, Bickman L, Chorpita B. Change what? Identifying quality improvement targets by investigating usual mental health care.

Integrated Care Models for Children - Zima et al

- Adm Policy Ment Health*. 2010;37(1-2):15-26.
<https://doi.org/10.1007/s10488-010-0279-y>
35. Chambers DA, Pringle B, Juliano-Bult D. Connecting science and practice in child and adolescent mental health services research. *Adm Policy Ment Health*. 2012;39(4):321-326. <https://doi.org/10.1007/s10488-011-0399-z> PMID:22271355
36. Jones L. Preface: Community-partnered participatory research: how we can work together to improve community health. *Ethn Dis*. 2009;19(4)(suppl 6):S6-S1, 2. PMID:20085119
37. Wells K, Jones L. "Research" in community-partnered, participatory research. *JAMA*. 2009;302(3):320-321. <https://doi.org/10.1001/jama.2009.1033> PMID:19602693