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Feasibility of model adaptations and implementation of a perinatal psychiatric teleconsultation program

Christina L. Wichman[a,*], Audrey Laszewski[a], Jennifer J. Doering[b], Shelby Borchardt[a]

[a] Medical College of Wisconsin, Department of Psychiatry and Behavioral Medicine, 8701 W Watertown Plank Road, Milwaukee, WI 53226, United States of America
[b] University of Wisconsin-Milwaukee, College of Nursing, 1921 E Hartford Ave, Milwaukee, WI 53211, United States of America

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ABSTRACT

Objective: Given the critical shortage of perinatal psychiatrists, combined with the prevalence of psychiatric conditions in the perinatal period, teleconsultation may help to maximize the efficiency of psychiatrists to reach this population. The Periscope Project (TPP) is a Wisconsin-based program offering real-time provider-to-provider teleconsultation, community resource information, and provider education. This paper describes model adaptations and implementation of TPP and the first 18 months of program data.

Method: Enrollment and satisfaction data was collected via self-reported online surveys. Encounter data was entered by TPP team members through communication with providers. All data was housed in REDCap.

Results: Four hundred eight-five providers enrolled and 268 unique providers accessed services at least once. There were 594 encounters with 85% of encounters resulting in a teleconsultation. Mean call-back time from the psychiatrist was 6.8 min. Over half of utilizing providers practiced in obstetrical settings and 23% practiced in mental health settings. Provider satisfaction with the service was 100%.

Conclusions: Utilization and satisfaction with TPP suggest that perinatal psychiatry access program models can vary in structure and process and experience similar utilization rates. Model adaptations are feasible and demonstrate the teleconsultation service is accepted by providers and may improve the population's health over time.

1. Introduction

Perinatal mental health and substance use disorders are a widespread public health issue, with estimates as high as 20–30% of women struggling with mental health or substance use during the perinatal period, which is defined as the period of time during and immediately following pregnancy [1–3]. The effects of untreated disorders are profound and far-reaching to women, fetuses, infants, children, families, and communities [4,5]. Detection and adequate management of clinically significant psychiatric symptoms seeks to reduce intrauterine stress and associated obstetrical and fetal complications including stillbirth, preterm birth, low birthweight, and may be a strategy for reducing infant mortality [5].

Universal screening for depression, anxiety and substance use disorders with appropriate follow-up, including evaluation and treatment, is a recommended standard of practice in perinatal care [6]. In fact, the November 2018 American College of Obstetrics and Gynecology Committee (ACOG) Opinion further recommends that “systems should be in place to ensure follow-up for diagnosis and treatment” and advocates for initiation of treatment in obstetrical and gynecological care settings [6], especially given that without intervention, only 22% of women with depression will obtain mental health care [7].

Barriers to appropriate evaluation and treatment for depression and other psychiatric and substance use conditions are present throughout the health care system and can be categorized into patient, provider, and practice-level barriers [7]. Byatt and colleagues showed that systematically reducing the number of barriers to depression care increased the likelihood that perinatal women would use mental health care [7]. Teleconsultation that enables primary care providers to efficiently consult with psychiatrists specializing in perinatal mental health and substance use is a population-based means of minimizing provider and practice-level barriers to provide women with high quality care [8].

Wisconsin has a critical shortage of access to psychiatric services across 65,556 mi^2 of widely varying urban and rural geography. Of Wisconsin's 72 counties, 55 are designated as shortages areas for psychiatrists, and 20 of those counties have no practicing psychiatrist much less a psychiatrist with sub-specialty expertise in perinatal care management for the state's approximately 66,500 annual births [9,10].

* Corresponding author.
E-mail address: cwichman@mcw.edu (C.L. Wichman).

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The only perinatal psychiatric teleconsultation model in the United States, the Massachusetts Child Psychiatry Access Project for Moms (MCPAP for Moms), was implemented in 2014 [11]. It demonstrated consistent utilization from its enrolled providers and was seen in the field as an innovative model to address the shortage of sub-specialty perinatal psychiatric care by supporting front-line obstetric providers. MCPAP for Moms was examined and adapted in the development phase of The Periscope (**Peri**natal **S**pecialty **Co**nsult **P**sychiatry **E**xtension) Project (TPP) [11]. TPP, a statewide perinatal psychiatric teleconsultation program, was implemented in Wisconsin in 2017. TPP aimed to fill a critical gap between statewide depression screening initiatives and a lack of perinatal psychiatric treatment services across the state. The purpose of this paper is to describe perinatal psychiatric teleconsultation model adaptations, and assess implementation feasibility and acceptability of this care model with 18 months of program utilization.

2. Methods

2.1. Overview of The Periscope Project

TPP was developed in Wisconsin to respond to frontline health care providers and professionals concerns about the assessment, diagnosis and management of perinatal psychiatric and substance use disorders. TPP aims to improve diagnosis, management and treatment of perinatal women struggling with any psychiatric or substance use disorders by increasing the capacity of front-line primary providers. This is accomplished by providing three core services: 1) Real-time provider-to-provider teleconsultation, 2) access to a community resource database detailing available resources specific to perinatal patients with mental health or substance use disorders, and 3) online and in-person provider education on related topics.

2.2. Model adaptations

A teleconsultation model with consistent utilization implemented in Massachusetts, the Massachusetts Child Psychiatry Access Project for Moms (MCPAP for Moms), was examined and adapted in the development phase of TPP [11]. Model adaptions were primarily driven by input from key stakeholders with knowledge and experience in working with the TPP target population of perinatal providers during the planning stage. Table 1 highlights the key features that differentiate TPP from MCPAP for Moms.

2.2.1. Project planning process

TPP engaged in a 12-month planning process led by a contracted consultant and financially supported through a planning grant from State of Wisconsin, Department of Health Services. The process brought together key stakeholders from maternal and child health initiatives, maternal mental health experts and health systems leadership to determine key program design elements and model adaptations. For example, an assessment of Wisconsin's needs suggested that direct care coordination not be included given the vast array of care coordination services already in place and provided by various health entities throughout the state. The planning team recommended addressing any perceived barriers to access by health care providers. This recommendation led to the decision to provide open access without prerequisites for utilization. TPP design does not included direct contact with the patients via face to face consultations or follow-up with patients. The planning process resulted in an implementation plan, budget and evaluation that was then used for grant writing.

2.2.2. Project implementation

TPP provider eligibility includes any health care professional who cares for pregnant and or postpartum women in a professional capacity. Engagement with providers is kept within the scope of the individual provider. For example, a prenatal care coordinator could be given recommendations on how to follow-up an elevated depression screening score with questions about imminent risk and referral resources; however, the psychiatrist would not engage in a conversation about psychiatric medication management of patient symptoms. TPP does not enroll clinics or hospitals, rather individual providers must review and agree to the terms of participation. The basic terms of participation outline the overview of the program, including that TPP is not an emergency referral service, TPP psychiatrists are not available for ongoing treatment, nor provide face-to-face patient consultations, and that patients remain in the care of the primary provider utilizing the service. The decision to enroll providers at an individual level was to ensure that providers agreed of the terms of participation, thereby emphasizing the educational nature of TPP and reducing confusion about the program itself. Additionally, this allows for eligible providers made aware of TPP from any means (internet search, word of mouth, etc.) to enroll and utilize the program.

Prior to utilization of services, providers are not required to complete or attend training, either informational about the program services or educational in nature. The decision to not require participation in informational or educational sessions was deliberate in order to minimize any barriers from providers utilizing TPP services. Providers are encouraged to enroll in TPP prior to utilization of services, but it is not required. If not pre-enrolled, verbal consent to participate is obtained at the start of consultation. Once services are utilized, the provider is automatically sent an enrollment form. When a provider calls a second time without enrolling in TPP, they are verbally encouraged to enroll and sent an email reminder with enrollment information.

Table 1
Model characteristics.

Component	MCPAP for Moms	The Periscope Project
Provider/user eligibility	Obstetric providers, pediatric providers, adult psychiatric providers, adult primary care providers[a]	Any provider serving women of childbearing age with questions regarding the treatment of mental health in pregnant, postpartum or intra-contraception women.[b]
Provider enrollment	Practice level enrollment where practice leader signs enrollment form Obstetric practices must participate in 1-h on-site training conducted by MCPAP for Moms consulting perinatal psychiatrists prior to enrollment [11]	Individual providers enroll via online form and eligibility verified by TPP staff
Care coordination and patient follow-up	Provides option to see patients for one-time face-to-face consultations for treatment recommendation to be managed by obstetrician or referral to psychiatrist; and care coordinators can call patient/family for follow-up [11]	Supports providers in management and follow-up of patient, does not see or contact patients directly; provides information on available resources to providers including perinatal psychiatrists available to see patients
Prerequisites to utilization	None	None

[a] https://www.mcpapformoms.org/Providers/WhoCanCall.aspx. Retrieved electronically on May 13, 2019.
[b] https://the-periscope-project.org/faq/. Retrieved electronically on May 13, 2019.

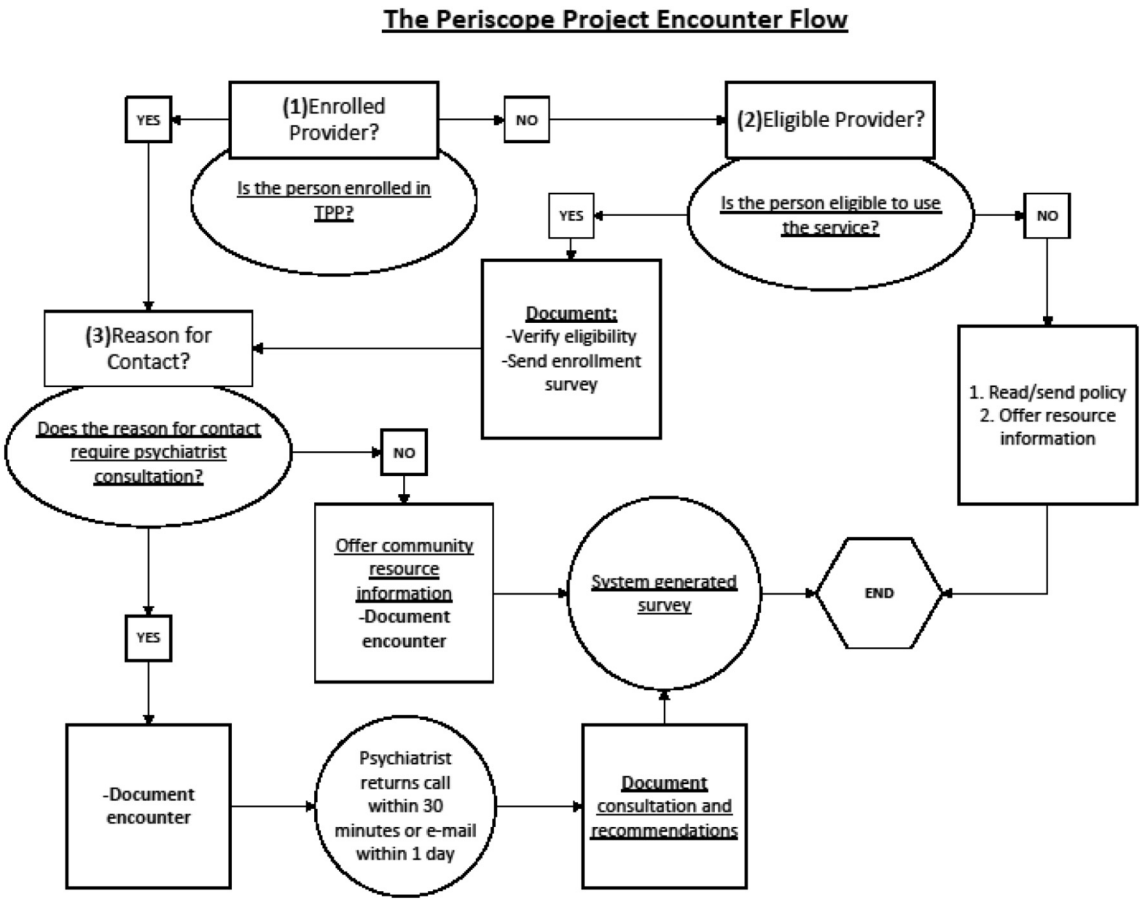

Fig. 1. The Periscope Project encounter flow.

2.3. Funding

A $50,000 planning grant from the Wisconsin Department of Health Services – Division of Public Health, Title V Maternal and Child Health Services Block Grant supported TPP development of a grant proposal that was subsequently awarded by United Health Foundation for $1.275 million dollars over 3 years, beginning in January 2017. The Wisconsin Department of Health Services provided an additional $300,000 for implementation during the 3-year grant period (2017–2019).

2.3.1. Program costs

Program costs were calculated in two ways. 1) Start-up and implementation costs include all costs incurred during the 3 year (2017–2019) funding period and determine the annual cost per birth based on Wisconsin birth data; 2) ongoing annual cost projections exclude the one-time start-up and infrastructure costs and are based on the cost projection to offer services annually per birth.

2.4. Development and operations

Upon notice of funding award, an implementation team formed to lead program operations, including hiring a full-time program coordinator, executing subcontracts for program administration and evaluation services, and psychiatry scheduling changes allowing the program medical director to devote time to overseeing the program and providing consultation services. In the six months leading to full program operation, approximately 80 staff hours per week were devoted to efforts focused on operationalizing the daily implementation of the program. Activities included the development of: 1) A program operations database for enrollment and utilization data, 2) a community resource database of available resources specializing the perinatal population with psychiatric or substance use disorders, and 3) a website that included provider educational materials (toolkit and online video modules). After the launch, the focus shifted to the day-to-day operations, on-going outreach to targeted providers, and further development of the community resource database.

TPP began providing services on July 1, 2017 with teleconsultation available Monday–Friday between 8:00 am and 4:00 pm CST with the goal of consultation services being provided within 30 min from initial contact with TPP.

2.4.1. Staffing

TPP utilizes a 0.5 full-time equivalent (FTE) perinatal psychiatrist, 0.8 FTE triage coordinator, and 0.7 FTE program administration. Providing full-time coverage with only a 0.5 FTE psychiatrist required administrative and clinical buy-in from leadership for an innovative staffing and patient scheduling approach whereby the psychiatrist has the flexibility to answer calls within a 30-minute window of time every day while continuing to have an active clinical practice and administrative role. This was accomplished by changing clinical templates (i.e. scheduling breaks between all in-office patients, changing coverage of hospital services) and scheduling coverage time during non-patient care times (administrative, education, and research times). TPP requests for consultation were prioritized as urgent, necessitating a rapid response from the covering perinatal psychiatrist.

2.4.2. TPP process

All calls are first answered by a triage coordinator; if a provider is pre-enrolled, the coordinator gathers basic information about the nature of the request. If the provider is not pre-enrolled, the triage coordinator is able to verify provider eligibility while on the telephone

and still serve the provider's request. If the request is only for community resource information, the triage coordinator can provide this information directly without involvement of the perinatal psychiatrist. If the request requires involvement of a perinatal psychiatrist, the triage coordinator contacts the psychiatrist via simultaneous text, email, and page generated by the program data system. The perinatal psychiatrist then returns the providers call within 30 min. Telephone calls are promptly returned with the intent that the patient is still within the provider's office after completion of the teleconsultation. A flowchart outlining this process can be seen in Fig. 1.

Teleconsultations are intended to serve as individualized, case-based discussion for providers. The discussion is tailored to the individual provider utilizing the service. If teleconsultation is not sufficient in answering the providers question/concern, or if the provider does not feel comfortable in management of the patient, a face-to-face consultation with a psychiatrist may be suggested. TPP does not offer face to face psychiatric consultations as part of its service; however, providers will be given information on local mental health providers, including psychiatrists, who feel comfortable in the management of perinatal patients.

Email contact is also available; emails to TPP are returned within one business day. If questions involve a specific case or would be better served by a brief discussion, the provider is often asked to set a time to discuss via telephone. TPP encourages utilization of teleconsultation, rather than email consultation, given the richness of the discussion that can occur between two providers.

An encounter is considered as any inquiry to TPP via phone or e-mail. Multiple call backs on the same day relating to the same initial inquiry are recorded as a single encounter.

2.4.3. Provider outreach and engagement

Active outreach, engagement and enrollment was pursued and included didactic educational sessions, presentations at staff meetings and professional organizations, as well as features in health system and association newsletters. Most presentations and all educational sessions were conducted by TPP perinatal psychiatrists. This format allowed potential utilizers to establish a relationship with responding psychiatrists. Initial outreach targeted the greater Milwaukee area during the first 12 months of operations and included a focus on both health system leadership as well as front line providers. This top-down and bottom-up approach was used to garner support for utilization of TPP services among the various levels of decision-makers within area health systems. Additionally, access to mid-level clinic managers offered an opportunity to reach the widest base of providers caring for the target population of perinatal women. Given the priority of locating providers caring for perinatal patients, obstetrical practices were initially targeted; however, recognizing that in rural areas of Wisconsin, obstetrical care is primarily provided by family medicine providers and midwives, these providers have also been targeted with expansion efforts beginning after the first 12 months of operations. All program related materials including website, presentation slides, brochures, newsletter articles predominately display the 800 number and website address. Promotional items such as pens, notepads, water bottles, coffee mugs also included TPP branded information with the 800 number and given to providers at presentations and meetings.

2.5. Data collection

2.5.1. Setting

Data were collected from all providers who either enrolled (enrollment began May 1, 2017) or began utilizing TPP (daily operation began July 1, 2017) through December 31, 2018. An encounter is considered any contact via phone or email by an eligible provider for consultation or community resource information. For providers who called for teleconsultation for more than one patient, an individual encounter was entered for each patient. Encounters were entered into REDCap, a secure, web-based, Health Insurance Portability and Accountability Act-compliant structured-query language database. REDCap was selected for its ability to create a customized user-friendly database with search and data export functionality, automated system for notifying the covering perinatal psychiatrist of a consultation request, sending follow-up satisfaction surveys, and secure access across mobile devices for authorized staff. REDCap also was used to capture education-related service data. Education service data includes online module views and in-person didactic presentations.

2.5.2. Measures

Provider demographics, as well as data regarding provider type, highest degree earned, primary area of practice, prescribing privileges, and state in which licensed to practice, was collected at enrollment. Data was collected for each discrete encounter included the following: date and time, utilizing provider name, primary area of practice, zip code where encounter was originating from, and health system. Further data was collected on reason for contact (medication or diagnostic question, community resource, etc.), individual patient factors (if relevant to consultation question) including patient status (pregnant, postpartum, perinatal loss, etc.), patient's reported symptoms, providers' diagnostic concerns, current psychiatric medications and whether patient was formally screened for depressive symptoms. Note that providers may have provided multiple concerns regarding patient symptoms, diagnostic concerns or reason for contact. Additionally, at end of encounter, provider was asked “What would you have done if you had not reached us today?” Encounter data was analyzed in aggregate. A post-encounter survey included three Likert scale statements with the prompt: Please indicate your level of satisfaction with your recent Periscope Project encounter. The statements were as follows:

1) I am satisfied with my most recent Periscope Project encounter.
2) My most recent Periscope Project encounter helped me to more effectively manage my patients care.
3) I will incorporate the information I learned in my most recent Periscope Project encounter in the future care of patients.

The Medical College of Wisconsin's Human Research Protection Program provided review and approval for all data collection under a minimal risk designation, and providers consented to study participation at the point of enrollment.

3. Results

3.1. Enrollment

In the first 18 months of operation, 485 providers enrolled in The Periscope Project. Thirty percent of encounters originated from a provider who was not pre-enrolled at the time of contact.

3.2. Utilization of services

During the first 18 months of operation, from July 1, 2017 to December 31, 2018, TPP had 594 total encounters. Of those encounters, 85% (502/594) resulted in a provider-to-provider consultation regarding a perinatal patient. 207 of the 594 (35%) total encounters requested or were offered information on additional community resources for their patients including psychotherapy options, peer to peer support, home visiting programs and perinatal psychiatrists. 268 unique providers accessed TPP services, with 111 (41%) utilizing more than once. Educational sessions (n = 115) were provided reaching over 700 health care providers and professionals. 6% of encounters were from providers outside of the state of Wisconsin. TPP online education videos, available on the TPP website free of charge, were viewed 93 times by providers representing eight states including Wisconsin.

Table 2
Reason for contact by provider type and area of practice for service related encounters.

Provider type and area of practice	n (%)	Reason for contacting The Periscope Project*						
		Medication	Community resource	Diagnostic	General consult	Follow up	Screening tool	Other
Physician (MD/DO) OB/GYN	171 (29)	141	28	24	11	2	1	2
Midwife OB/GYN	97 (16)	81	20	14	3	6	0	0
Physician (MD/DO) Psychiatry/Behav. Health	90 (15)	54	35	4	5	0	0	0
Nurse Practitioner (NP) OB/GYN	48 (8)	44	6	11	4	1	0	0
Physician (MD/DO) Family Medicine	43 (7)	38	8	9	3	3	0	1
Nurse Practitioner (NP) Psychiatry/Behav. Health	35 (6)	33	1	1	3	0	0	1
Registered Nurse OB/GYN	18 (3)	6	9	0	4	1	1	0
Physician (MD/DO) Pediatrics	14 (2)	8	5	2	1	1	1	0
Registered Nurse Public Health	8 (1)	2	3	1	3	0	0	0
Physician (MD/DO) Internal Medicine	6 (1)	5	1	1	0	0	0	0
Nurse Practitioner (NP) Family Medicine	6 (1)	5	1	1	0	0	0	0
Other	58 (10)	23	25	6	10	0	4	1
Total	594 (100)	440	142	74	47	14	7	5

* There may be more than one reason for contacting The Periscope Project.

3.2.1. Service-related encounters

The majority (56%) of utilizing providers practice in an obstetrical setting; specifically, physicians (29%), midwives (16%), nurse practitioners (8%) and registered nurses (3%). Psychiatrists made up 15% of the utilizing providers and psychiatric/behavioral health nurse practitioners represented 6% of utilizers. The most common reason providers contacted TPP was due to medication-related questions. Depression (67%) and anxiety (35%) and related symptoms were the most common diagnostic considerations discussed during consultations. Table 2 reports reason for contact by provider type and area of practice.

3.2.2. Utilizing provider demographics

Data collected from providers at the time of encounter included the provider type, practice setting, healthcare affiliation, and clinic zip code. Overall, physicians utilized the service most often (56%) followed by midwives (17%) and nurse practitioners (16%). The remaining utilizing provider types included (in descending order): registered nurse, psychologist, physician assistant, social worker, behavioral health counselor/psychotherapist, and family support worker. The majority (56%) of utilizing providers practice in an obstetrical setting. Providers practicing in psychiatric and behavioral health settings made up 23% of utilization. The remaining notable practice settings which utilized services included family medicine (9%), pediatrics (3%), public health (2%), internal medicine (1%), and psychology (1%). The service was utilized most often by Wisconsin based providers (93%). In total, providers from eight states used the service. Wisconsin providers represented 39 cities and 23 counties. Wisconsin's most populous city, Milwaukee, made up 60% (353/588) of all encounters with a known location.

Utilizers represented > 20 health systems including large health systems, federally qualified health centers, and private practices.

Two hundred sixty-eight unique providers accessed TPP services, with 111 (41%) utilizing more than once. Repeat users ranged from those who used the service twice (16%) to those who used the service 11 or more times (2%).

3.3. Provider satisfaction and encounter effectiveness

There was a 69% (347/502) response rate to the three-question survey administered after each encounter. Survey results reveal 100% of responding utilizers agreed or strongly agreed with the following statements:

1) I am satisfied with my most recent Periscope Project encounter; 2% (6/347) agreed and 98% (341/347) strongly agreed.
2) My most recent Periscope Project encounter helped me to more effectively manage my patients care; 3% (9/345) agreed and 97% (336/345) strongly agreed.
3) I will incorporate the information I learned in my most recent Periscope Project encounter in the future care of patients; 5% (18/346) agreed and 95% (328/346) strongly agreed.

3.4. Method of contact and response time

Most of the providers (63%) accessed TPP via the provider line with the call answered by triage. Thirteen percent of encounters were initiated via email and 18% were direct contact with the perinatal psychiatrist via phone or email. The average time from the end of call triage to callback from the psychiatrist was 6.8 min with 56% of callbacks being < 5 min. Table 3 displays response time in minutes for the triage, call back by the psychiatrist and length of consultation data. Data includes only calls answered by triage that result in a provider to provider consultation requested within 30 min.

3.5. Patient status

Most providers (488/502 encounters) called TPP regarding one specific patient at a time. Patient pregnancy status collected for provider to provider consultations is displayed in Table 4. Sixty-seven percent (326/488) of patient specific provider consultations occurred before the patient became pregnant or while the patient was pregnant.

3.6. Program costs

TPP operating costs for the three-year period, including the development and implementation start-up costs, was $7.88 per birth per pregnant/postpartum woman per year based on 66,593 births per year in Wisconsin. One-time start-up costs included purchasing branding and website design services, printing of outreach materials, professional videography services and assistance to design the program data system in REDCap. Reporting program cost data on a per birth basis was used as the 'cost per teleconsultation or encounter' would not take into account that providers effectively apply knowledge learned in one

Table 3
Response Time for Provider Consultations.

Length of time in minutes	Mean (SD)	Median	Min–max
Length of triage	3.54 (2.31)	3	0–23
Time from end triage to call back from Psychiatrist	6.78 (6.57)	4.5	0–32
Length of consultation	8.82 (4.25)	8	2–30

Table 4
Patient status of patient specific consults July 1, 2017 through December 31, 2018 n = 488.

Pregnancy status	n (%)
Pregnant	293 (60)
1st trimester	124 (25)
2nd trimester	104 (21)
3rd trimester	65 (13)
Postpartum	134 (27)
Lactating	87 (18)
Not lactating	47 (10)
Preconception	28 (6)
Interconception	5 (1)
Post adoption	2 (< 1)
Perinatal loss	16 (3)
Other[a]	3 (< 1)
N/A	7 (1)

[a] Lactation status unknown.

consultation to other patients in their practice with similar case presentations. Projected on-going annual operating costs, post the 3-year start-up period, is $373,000 annually, or $5.60 per birth per year. Approximately, $310,000 (83% of annual on-going costs) is staffing related to provide coverage during program business hours. The remaining $63,000 is for administrative costs for phone service, printing of materials, travel and meeting costs and related program activities.

4. Discussion

TPP has demonstrated model adaptation from the successful MCPAP for Moms program [11] to meet state specific needs. The rationale for the model adaptations were primarily driven by existing care structures in place. For example, the decision to exclude direct patient care coordination as part of program services was made based on the depth and breadth of existing care coordination services already in place in the state. Similarly, expanding provider eligibility was informed by early planning and design input, which recognized that a broad spectrum of health professionals touch the lives of perinatal women and these health professionals expressed interest in using program services. Key stakeholders informed the decision to prioritize ease of access to program services. As such, providers are not required to enroll nor participate in any prerequisite informational or educational training prior to using the service for the first time; this decision was made to minimize any perceived barriers to service and has demonstrated success. For example, this streamlined process accommodates providers schedules by allowing enrollment on any device (i.e. mobile phone, tablet, computer) and taking less than 2 min to complete. TPP "open door and ease of use" approach was designed to reduce barriers to utilization by allowing providers access to perinatal psychiatrists at their time of need, regardless of their enrollment status.

TPP hours of operation are fulfilling the needs of providers and has demonstrated that providers prefer to call the provider line and receive a response from a perinatal psychiatrist within 30 min. Obtaining information in real-time is also intended to meet the aim of improving the patient experience, because real-time teleconsultation can enable a patient to receive a plan of care while still in the provider's office as part of their routine prenatal or postpartum care. Treatment plans for management of psychiatric and substance use conditions that are enacted in a timelier manner also support improving patient outcomes, lowering health care costs, and meets the ACOG recommended standard [6,12]. A psychiatrist's ability to enable a primary care provider to enact a treatment plan sooner than if the psychiatrist needed to see the patient directly has the potential to shift some costs from specialty care to primary care and minimize delays in care caused by long wait times for mental health providers [13].

Additional state specific characteristics that informed program design included the extent and variation in availability of mental health resources throughout the state. For example, parts of Wisconsin, particularly Milwaukee county, have considerable quality and quantity of perinatal mental health resources, however it can be incredibly difficult for an individual provider to get the patient to the appropriate resource at the right time. However, in much of rural Wisconsin, perinatal mental resources are quite scarce and, in some areas, non-existent over larger areas. The goal was to empower health care providers to provide first line management of treatment of psychiatric disorders, as well as provide a "bridge of care" to mental health services if in existence locally, and not replace mental health services.

While TPP can address any mental health or substance use disorder, the most frequently discussed diagnostic considerations were depression and anxiety; these are the most common psychiatric disorders seen in this patient population [7]. Additionally, these are disorders that often be appropriately managed by front-line providers.

One of the most expensive components of any teleconsultation program is that of the psychiatrist's time. Real-time availability is clearly essential to any teleconsultation, however with the number of service encounters occurring on an average day, it can be difficult to justify a full-time FTE psychiatrist to a teleconsultation program. TPP has demonstrated that even with 0.5 FTE psychiatrist time, there can be an incredibly responsive call-back time, with an average of 7 min and with 56% of calls having a call-back time of < 5 min. Administration buy-in to support flexible scheduling for the psychiatrist is warranted for this model to be successful. In terms of scheduling during patient care, breaks need to be built into the schedule template to allow call-back within a designated time. This model could also be accomplished by pairing teleconsultation coverage time with non-patient care activities, such as dedicated administrative, education or research time.

Engagement with a clinical practice required individual tailoring and an understanding of their desire as to how to engage with TPP. It has been most effective to pair a brief educational didactic with an introduction to TPP services. This gives providers the opportunity to vet the TPP psychiatrist with in-person engagement. Presentations at regional and state-wide professional organizations in medical specialties (family practice, obstetrics, psychiatry) and nursing have also been useful. Direct marketing specifically to health care professionals and providers has been challenging as there is not an existing pathway to communicate with groups of health care providers outside of organized professional societies in Wisconsin. Unfortunately, many health care providers are not associated with these organizations and may not be associated with a major health care system, especially in the more rural areas.

Despite lack of marketing outside of Wisconsin, 6% of encounters came from out-of-state and represented seven states. Given the lack of geographic limitation on who could receive services, TPP provided teleconsultation to these providers, however, could not provide community resources options. Education modules were also viewed by out of state providers. The utilization of TPP services from out of state providers supports the need of perinatal psychiatric consultation services across the country.

While TPP adaptations to the MCPAP for Moms model were in response to state specific needs, data from both programs demonstrated similar utilization patterns. For example, teleconsultation services most frequently occurred during pre-conception or during pregnancy for both programs [8] and present an opportunity to address mental health early in pregnancy and positively impact birth outcomes. Evidence for effects of maternal stress, depression, and anxiety in pregnancy on adverse neurodevelopmental outcomes for the child is substantial. TPP data suggests it is engaging with providers during a "window of opportunity" to impact effective care management.

Given the narrow focus of perinatal psychiatry, it is expected that consultation utilizers would be primarily providers working in obstetric settings. Both TPP (56%) and MCPAP for Moms (63%) [8] reported similar consultation rates by this target population. Both programs also

experienced 15–16% of consultations with general psychiatrists [11] suggesting that even among psychiatrists, there may be questions about treatment options and medication safety profiles for the perinatal patient. It is also noteworthy that both programs report similar reasons for contact with a substantial focus on medication related consultations followed by community access/resources information [8]. Diagnostic considerations discussed during consultations also aligned with a substantial volume of consults related to depression and anxiety [8], both conditions where initial management is reasonable in primary care or obstetrical settings.

The TPP model's on-going cost is less than the Massachusetts's MCPAP for Moms program with TPP projected on-going annual operating cost of $5.60 per birth per year or $373,000 annually. This compares to $8.38 per pregnant and postpartum women or $600,000 for Massachusetts' MCPAP for Moms program for 71,618 deliveries annually [8].

There are several limitations to this study. There exists the potential for selection bias by utilizing providers as users self-select to participate. It is possible that TPP utilizers are generally providers who see and accept their role in the management of mental health disorders in the perinatal population. Primary care providers who do not see their role in identifying and treating mental health concerns and/or their subsequent care management, will likely not proactively address mental health concerns (i.e. screening of all perinatal patients in their practice). These providers may not be interested in utilizing TPP services and may simply refer when a mental health concern arises or is disclosed by the patient. This study does not have patient specific outcome data to assess how TPP services impacted the individual patient care trajectory after the teleconsultation. Collecting data on follow-up patient care presents an opportunity for further study to link consultation recommendations to actual patient care delivered and its impact on improved outcomes.

The growing challenge of insufficient psychiatric resources to meet the perinatal population needs, combined with ACOG recommendations [6] suggests the need for innovative programming to increase the capacity of primary care providers to address the mental health of their patients. Perinatal psychiatric teleconsultation models are emerging as a service that increases access to perinatal psychiatry expertise. The utilization and satisfaction with TPP suggest that perinatal psychiatry teleconsultation program models can vary in structure and process and experience similar utilization of services. Model adaptations are feasible and demonstrate that teleconsultation service is acceptable, efficient and has the potential to improve the population's health over time.

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