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Improving Outcomes of Mothers With Opioid Use Disorder Using a Community Collaborative Model

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Abstract

Context: Increasing rates of Opioid Use Disorder among pregnant women are a significant public health issue. Care for these women is fragmented, and multiple barriers to care have been identified. Program: The Tides, Inc. is attempting to address these needs by providing comprehensive, coordinated care, beginning in pregnancy and extending beyond the birth of their infant. **Implementation:** Using a collaborative model, care is coordinated between multiple existing agencies in an effort to reduce barriers and improve access to care. Funding for these services is provided through county funding and existing payor sources (eg, insurance, Medicaid). **Evaluation:** Participant and program outcomes were evaluated at the end of each year of the program. In addition, participants who had completed the program at the end of year 1 were asked to complete a survey providing qualitative information about their experience in the program. Of these participants, 73% reported no opiate use and 100% had full custody of their infants. **Discussion:** The Tides, Inc. program utilizes existing resources to provide coordinated and comprehensive care for pregnant women with Opioid Use Disorder. In addition to improving outcomes for women and their infants, this program can reduce cost and burden on community entities such as the justice system and foster care networks. This program can serve as a model for other communities to coordinate care for women and their infants.

Keywords

access to care, behavioral health, community health, cost-effectiveness, health outcomes, impact evaluation, obstetrics, program evaluation, opioid use disorder, community collaborative model, pregnancy

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Introduction

Opioid Use Disorder (OUD) is defined as the use or abuse of opioids such as prescription or synthetic opioids in which individuals are unable to control use of the drug, develop tolerance, and continue to use the drugs even if there are adverse consequences to use.[1] There has been a significant increase in OUD among pregnant and postpartum women over the past decade, with an increased rate from 1.5 cases per 1000 deliveries to 6.5 cases per 1000 deliveries reported.[2] During pregnancy, OUD contributes to disparity factors such as increased maternal mortality and morbidity, low birth weight of infant, adverse fetal outcomes, and neonatal abstinence syndrome (NAS).[3] According to the Substance Abuse and Mental Health Services Administration (SAMHSA), in 2019 4.7% of pregnant women used illicit substances and 21.6% of pregnant women enrolled in Medicaid received a prescription opioid during their pregnancy. This is critical because misuse of substances is a chronic relapsing disease with unique risk factors impacting pregnant and postpartum women specific to socioeconomic, psychosocial, and biologic factors.[1,4]

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Background

Defining the Problem

Treatment of mothers with OUD requires support from multiple sources, including policy and legislative changes. Legislation recently passed at the national level, "Preventing Maternal Deaths Act of 2018" (H.R.1318), supports establishing interdisciplinary teams to inform systems-based transformation surrounding delivery of care to mothers with OUD as this is a public health crisis requiring a layered approach of community partnerships.[5]

The latest data released by the National Institute on Drug Abuse [NIDA] revealed that in 2017, North Carolina ranked ninth in the United States for mothers with OUD with rates of 10.5 cases per 1000 delivery hospitalizations with NAS.[6] The impact of mothers with OUD in Wilmington, North Carolina and surrounding rural counties had manifested itself with a significant increase in child placement in foster care systems, and costly extended maternal/infant hospital stays. Currently, the county's hospital for women and children admits an average of 15 to 20 babies born each month who test positive for opioids.[7]

Care of mothers with OUD including assessment of their social care needs and provision of services has been fragmented and episodic. Eligibility parameters for Medicaid also contribute to the fragmentation of care and services for these women. Currently, in North Carolina, there is an increased focus on mothers with OUD during pregnancy and the postpartum period. However, multiple gaps still exist in care for this vulnerable population related to Medicaid or other third party insurability and access to extended and appropriate care.

Medicaid is a critical source of health coverage for pregnant and parenting women and children. The Centers for Medicare & Medicaid Services is the country's largest payor of pregnancy-related care and covers approximately 42.6 % of US births.[8] The recovery and care for mothers with OUD and newborns is multifocal and often requires care beyond the 60-day coverage limit established by the State of North Carolina Pregnancy Medicaid coverage program. North Carolina is one of 14 states that chose to not expand the Affordable Care Act's Medicaid expansion program or pregnancy Medicaid program.[9] Mothers with OUD are more likely to discontinue treatment during the postpartum period than during pregnancy related to loss of Medicaid or other insurance coverage. These eligibility parameters contribute to reasons women experience elevated opioid overdose rates during the postpartum period.[10]

In New Hanover County, there are no options for inpatient services related to pregnant women with OUD. While community services exist, complexity of systems and lack of coordination of the system present significant barriers to the care needed for recovery. Additionally, following the infant's birth, added pressure of parenting responsibilities cause difficulty in continuing recovery efforts.

Program and Partnership Development

The national spotlight shone on Wilmington (New Hanover County), North Carolina with the release of the 2016 Castlight Health report, which highlighted Wilmington as the #1 city in the United States for opioid use (based on percentage of population with substance use disorder) and #4 for percentage of opioid prescriptions abused.[7] This demonstrated the need in our community, and the development of a program to address this need, later called Tides, began with an advocacy approach. Barriers to care were recognized by a few individuals who then explored possible solutions using existing community resources and agencies. A local physician (OB-GYN) noted the number of pregnant patients with OUD and deaths from overdose was increasing. The physician was affiliated with a residential program and university in another part of the state and wanted to bring a similar program to Southeastern North Carolina using already existing resources. Ultimately, 3 years of pilot funding from the county was secured.

After engaging community stakeholders in a discussion of mothers with OUD, this group identified ways that different agencies could work together to provide a potential comprehensive treatment program. A director was hired who formalized partnerships, developed program infrastructure, and initially served as a case manager for the first program participants. This is the first local community effort seeking to align medical, social, and public health systems to address issues of health and health equity for mothers with OUD and their newborn babies.

Funding

New Hanover County provided initial funding for the program, including it as a line item in the county's budget. Although there have been some donations from private donors, most of the cost for the program is still being provided by the county. In addition, the partners in the program, who are service providers, continue to bill for services from their respective payers. The sustainment strategy for the program was to establish a 501(c)(3) (non-profit organization). A governing board was identified, and bylaws established as a part of this process.

Adaptation of Model

The design of the Tides program was based on a comprehensive in-patient program located in another part of North Carolina. A primary adaptation was to design the Tides

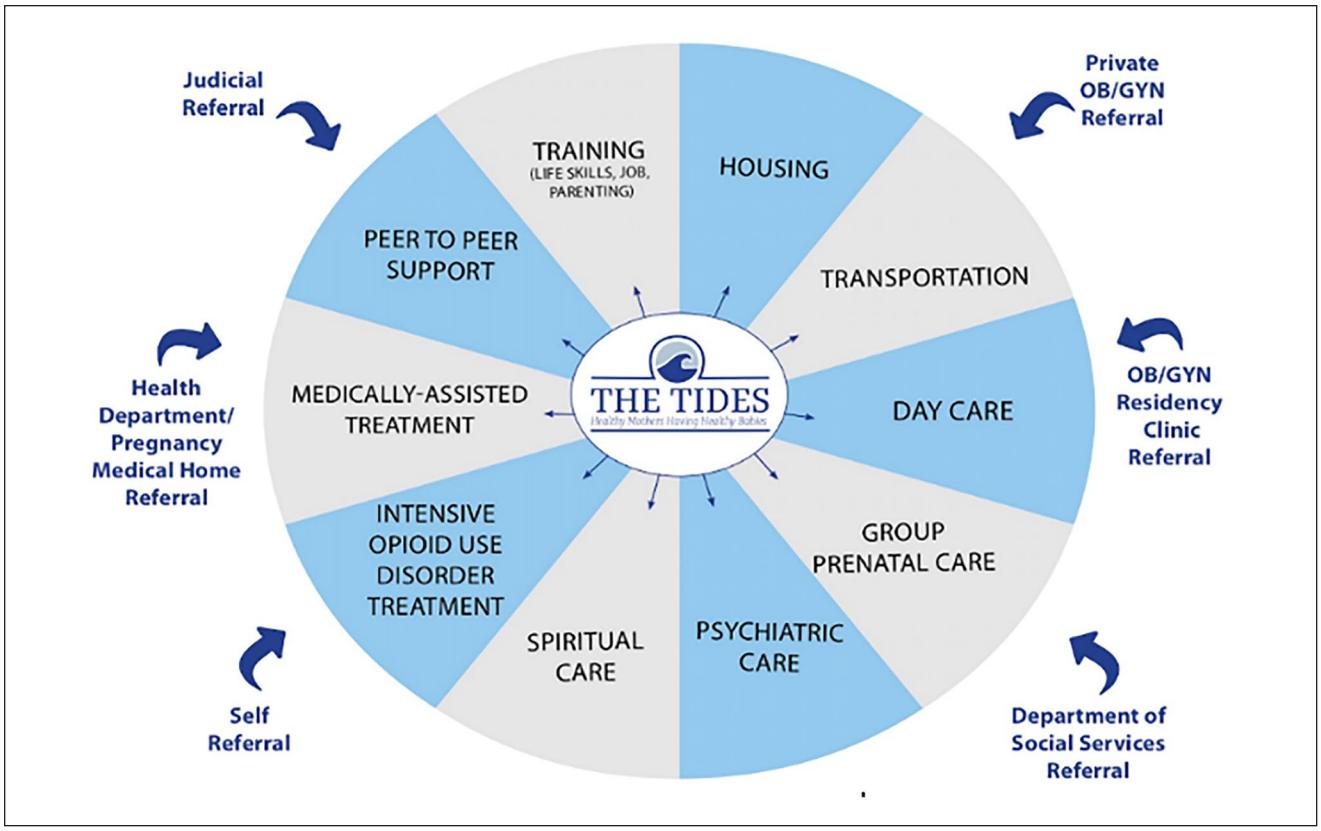

Figure 1. Community consortium model of Tides, Inc.

program as a collaborative community consortium where existing community partners integrate their services to engage women in the recovery process to keep the mother-child dyad intact. This reflected an outside-in approach, based on the needs of the county and available resources, to address gaps in medical care, substance misuse treatment and recovery and social services for mothers with OUD and their newborns (Figure 1). Community partnerships were leveraged to improve coordination of care and services to reduce fragmentation of care.

Description of Services

The Tides program uses a combination of required and optional services so that care can be personalized to meet the needs of each participant. Required services include counseling services through a 12-week intensive outpatient program, Medication Assisted Treatment (MAT) for OUD, prenatal care, peer support specialists, smoking cessation, and parenting training. Optional services include housing in a transitional living facility, transportation to services, childcare, psychiatric care if indicated, spiritual care, job-training, educational assistance, life skills training, and general medical care.[7] Existing community partners (eg, healthcare providers, behavioral health, public health, Social Services department, non-profit agencies) are engaged to meet those needs, and the program facilitates the removal of barriers to accessibility of these services for program participants.

Implementation

Pregnant women with OUD are referred to the Tides program via multiple mechanisms: local medical center, community providers, justice system, mental health providers, Department of Social Services, peer referrals, and faith-based organizations. Candidates should be pregnant or newly postpartum (up to 6 months) and have documented OUD according to the DSM-V. They can have multiple psychiatric diagnoses as long as OUD is their primary diagnosis. There were no limitations regarding ability to pay. If a payment source exists, community partners will apply usual billing practices for their services. If there is not a third party payor, funding for services comes from the Tides program. At intake, participants give a history of their drug use. Based on this history (age of onset, frequency of use, date of last use) the assessor determines if their drug use history is mild, medium, or heavy. The women enter into a contract for the required services and work with a case manager to identify other services that will help them reach their

Table 1. Results and Indicators for Measuring Population Outcomes.

Desired results	Indicators
Previously opioid addicted mothers following a recovery plan	Percent of Tides program graduates who remain free of illicit drug use
Mother–child dyad remaining intact	Percent of Tides program graduates' children who remain outside the foster care system
Healthy and developing babies	(a) Percent of Tides program graduates' children who complete scheduled well-baby checks (b) Percent of Tides program graduates' children not readmitted to the hospital

personal goals. To remain in the program, women must remain drug-free (other than those used in MAT) and adhere to the conditions of their contract – full participation in required and identified services.

Program staff, in coordination with the case manager, work with participants to achieve successful completion of required services and participant-selected opt-in services. Program goals include attending all medical and mental health care appointments, taking part in the MAT program, completing required training related to parenting, life skills, nutrition, relapse prevention, healthy relationships, and obtaining necessary community resources such as food stamps and childcare assistance. As participants progress through the Tides program, they also attend job readiness training and secure at least part-time employment.

There is continued engagement and follow-up with program participants after the delivery of the infant with the goal of independent stable housing, intact mother-infant dyad with avoidance of permanent foster care placement, and appropriate medical and developmental follow-up for infants. Although there isn't a set time frame for successful completion, most graduates are in the program for 12 to 18 months. Ideally a woman will enter the program in the early stages of pregnancy so she can focus on recovery before adding parenting to her list of responsibilities.

Outcomes and Evaluation

Tides provides extensive case management to coordinate all aspects of the program to help women navigate through their recovery plan, communicate with program partners, and meet their program and personal goals. Table 1 highlights the population results and indicators used to measure program outcomes (see Table 1).

Program Performance Outcomes

In the first year of the program, 30 women were admitted to the program. During the second year of program implementation, 30 women were assessed for program admission with 27 (90%) accepted into the program. Adding these 27 women to the 30 who were admitted to the program in Year 1, there were a total of 57 women admitted to the Tides program at the time of this evaluation.

Women admitted to the program in its first 2 years of operation self-reported to be Caucasian (81%), between the ages 20 to 40 (95%), pregnant at intake (93%), and had Medicaid as the primary payer (74%). These demographic data of participants admitted to the program are consistent with national demographics.[11] Additionally, most program participants reported having a heavy drug use history, determined at the time of entry into the program based on age of onset, frequency of use and date of last use (68%), with opiates and heroin being the drugs of choice, and a criminal history (80%). A total of 42% of the women admitted over the 2 years, who had previous children, had lost custody of their children (37%) or had partial custody (5%).

In the program's first 2 years, a total of 36 babies were born to women in the Tides program. Of these births, 75% of babies were born between 36 and 42 weeks gestation and 61% were considered to have normal, healthy birth weights. Additionally, for the babies who needed extra care due to NAS, the average length of stay in the hospital was reduced from 9.6 days in Year 1 to 6.6 days in Year 2.

Assessing the program's quality of effort was viewed as the length of time participants were in the program and their continued success after graduation. Of the women who were currently in the program or had graduated (n = 33), 50% stayed in the program for 12 to 18 months while 44% stayed for 6 to 12 months. The authors believe that remaining in the program for an extended period demonstrates program success, given that 97% of participants entered the program voluntarily. Women, in these cases, increase their chances for long-term change through cultivation of new and healthy relationships and engaging in mentoring, counseling, and long-term reinforcements of positive habitual change.

Population Outcomes

The Tides program had 18 graduates in Year 2 which allowed for collection of post-graduation data using an online survey, for the first time in the program's short history. The survey link was sent to all graduates in August 2020. Survey completion by participants was voluntary and anonymous, and results reflected self-reported information. Nine graduates completed the entire survey, and two graduates partially completed the survey (n = 11). Of

the participants completing the survey, 10 reported continued engagement in their counseling and eight reported not using illicit substances since completing the program. Of the respondents who completed the survey, all indicated they had remained outside of the criminal justice system, foster care system, and had continued with their medication assisted treatment. Eight of these respondents also indicated that their life was better after having completed the Tides program.

The Tides staff and Board of Directors discussed program performance, considering the survey results, and noted the program's benefit to other county agencies/institutions in terms of potential savings (ie, cost avoidance). For example, the cost of foster care in the Tides "home county," in fiscal year 2019 to 2020, was $13,357 per child (foster care maintenance payments and administrative costs). Having this information allowed Tides. staff and Board of Directors to consider potential cost savings of the program to the foster care system, not only related to children born to mothers while in the Tides program, but also associated with mothers' additional children who may exit the foster care system when mothers obtain full custody after completing the program. While local cost of NAS-related hospital readmissions was unknown, the Tides staff and Board of Directors were also able to consider potential cost savings of the program to the local regional medical center.

Implications for Policy & Practice

These early results from the Tides program have several implications for policy, practice, and communities interested in implementing a similar model. A short list of implications follows:

- Structure data collection at the start of the program in order to effectively capture outcomes and opportunities for improvement.
- Identify and collaborate with community entities to meet social needs (eg, job training education and life skill classes).
- Identify and collaborate with referral sources in the community (eg, hospital, Department of Social Services, and judicial system).
- Establish collaborative model of care and secure commitment from service agencies and key stakeholders to provide comprehensive care including agreements on data sharing, billing for services, etc.
- Identify bridging roles to ensure coordinated care with the integration of social needs into health care service delivery.
- Include MAT as a covered benefit by Medicaid and other insurance providers.

Conclusion and Future Directions

The Tides program represents an innovative model of care for opioid addicted pregnant mothers in southeastern North Carolina. The significance of Tides' work is to effectively treat pregnant women's addiction, improve health and developmental outcomes related to NAS births, and increase the placement of newborns with mothers and out of the foster care system.

Limitations

Given the small number of participants who have completed the program, assessment of outcomes is challenging. A survey was distributed to graduates of the program, with 11 out of 18 surveys returned. Of those returned, findings were largely positive, but it is possible the experience of those who didn't reply was less than optimal. It should also be noted that this survey is a self-report by the participants. In order to fully evaluate outcomes, a method for evaluating participant outcomes that is more objective should be developed.

Future Directions

The Tides program staff and governing board remain focused on long-term change in program participants, and the results of the post-graduation survey point to progress being made. Forming relationships during the program, and sustaining them after graduation, have important benefits. Considering that many respondents completed the survey after having graduated from the Tides program for at least 4 to 6 months (64%), with two respondents (18%) having graduated 7 to 12 months prior to completing the survey, demonstrated in part the impact of formed relationships while in the program. While the Tides program has only been operational for going on 3 years, it has demonstrated early successes in achieving both population and program performance outcomes.

The Tides program has begun to improve the outcomes of mothers with OUD and their infants by engaging community agencies in a collaborative effort to provide much needed care and support. The Tides program, since its inception, has needed to make adaptations due to changes in community-based services and programs, as well as the Covid-19 pandemic (eg, telehealth, virtual counseling, etc.). Continued evaluation of the Tides program's outcomes and effectiveness may inform the work of other communities who seek to replicate the program in their counties, to treat mothers with OUD, improve health and developmental outcomes related to NAS births, and increase the placement of newborns with mothers and out of the foster care system.

Further information about the Tides program including yearly reports is available at www.tideswilmington.org/about-us

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Author Contributions

CJ conducted data collection, analysis, and interpretation, drafted the manuscript, and led the writing process. SD was responsible for the conception and design of the work, conducted data analysis and interpretation, contributed substantially to the writing process, and reviewed/revised the manuscript. KG conducted data collection, analysis, and interpretation, contributed substantially to the writing process, and reviewed/revised the manuscript. WJ and DK contributed substantially to the conception and design of the work, provided important intellectual content for the manuscript, and reviewed/revised the manuscript.

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Supplemental Material

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