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Breastfeeding Interventions for Women with a History of Substance Use

A dissertation submitted in partial satisfaction of the requirements for the degree Doctor of Nursing Practice

by

Kate Mitchell

2023

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ABSTRACT OF THE DISSERTATION

Breastfeeding Interventions for Women with a History of Substance Use

by

Kate Mitchell

Doctor of Nursing Practice

University of California, Los Angeles, 2023

Professor Wei-Ti Chen, Chair

Pregnancy serves as a significant motivating factor for many pregnant people to reduce or abstain from substance use. However, many women relapse during the postpartum period. Additionally, in the United States, substance-use related deaths are a leading cause of maternal mortality.

One potential targeted intervention is development of a lactation support program designed for patients with a history of substance use. Providing supported lactation services to this higher risk population may extend abstinence motivation from pregnancy to the postpartum period, reducing postpartum relapse rates and improving lactation rates. In addition to increasing contact during the postpartum period, targeted breastfeeding support may deter against substance use during an emotionally challenging period fraught with relapse triggers.

The quality improvement project aim is to increase support for vulnerable patients through a pilot lactation program. The project lead evaluates the effectiveness of the pilot to impact breastfeeding rates, postpartum substance use, and maternal satisfaction. By pairing patients with a Certified Nurse-Midwife Internationally Board-Certified Lactation Consultant who focuses on patients with a history of substance use, obstetric practices may impact rates of breastfeeding and postpartum substance use while also achieving high levels of maternal satisfaction.

Few studies focus on the unique needs of people with a history of substance use. As rates of substance use increase in the United States, focused research is needed to determine how to best support this population.

The dissertation of Kate Mitchell is approved.

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2023

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Breastfeeding Interventions for Women with a History of Substance Use

Substance use (SU) during the perinatal period affects fetal, neonatal, and maternal health outcomes, leading to increased risk of preterm birth, intrauterine growth restriction, postpartum depression, and fatal overdose (Chomchai et al., 2019). Despite the negative impact on maternal and fetal health, approximately 5% of pregnant women consume illicit drugs (National Institute on Drug Abuse, 2020), 10% drink alcohol (Denny et al., 2020), and 10% use tobacco (Hansen et al., 2018). Pregnancy serves as a significant motivating factor for many women to reduce or abstain from substance use (Frazer et al., 2019). While many women successfully decrease substance use or abstain from use during pregnancy, rates of postpartum relapse are high: Forray et al. (2015) estimate that 80% of women relapse on one or more substances in the first three months postpartum. On average, relapse occurs within 110 days of delivery for tobacco, 127 days for alcohol, 138 days for marijuana, and 287 days for cocaine products (Forray et al., 2015).

According to the Centers for Disease Control and Prevention (CDC), substance-use related deaths are a leading cause of maternal mortality from 2007 to 2016 (CDC, 2018). In this subset of women, the risk of death or disability secondary to relapse is highest in the postpartum period. In California between 2010 and 2012, 18% of postpartum deaths were attributed to illicit substance use and suicide (Goldman-Mellor & Margerison, 2019). Beyond personal risks associated with maternal relapse, there is an increased risk of neglect, abuse, and/or chemical exposure to the infant and older children in the home when caregivers relapse (Goldberg & Blaauw, 2019). In addition, this population has an increased risk of postpartum depression (Pentecost et al., 2021), further impacting physical health and mother-child bonding. According to Alexander (2013), dual diagnosis increases relapse risk, especially for women with low

socioeconomic status (SES), further highlighting the importance of targeted, interprofessional interventions to improve postpartum care. One potential targeted intervention is development of a breastfeeding support program designed for women with a history of SU. In addition to increasing medical surveillance during the vulnerable postpartum period, Cook and Larson (2019) suggest that breastfeeding may serve as a deterrent against substance use during a period fraught with relapse triggers.

Patients with a history of SU in pregnancy have complex medical and social needs during the postpartum period. One controversial aspect of postpartum care in this population is whether or not they should breastfeed their infant. Current national guidelines from American Pediatric Association (APA) suggest women who use substances can safely breastfeed in certain circumstances; additionally, APA offers nuanced recommendations for shared decision-making with patients after reviewing risks and benefits of lactation (Eidelman et al., 2019). Research suggests lactation is most successful when breastfeeding mothers receive approval from their families, antepartum education from their obstetric provider, practical support from postpartum nurses while inpatient, and ongoing professional lactation support after discharge (Bartick et al., 2017; Blixt et al., 2019; Brown, 2017; Chiang et al., 2021; McGuiness et al., 2020; Rollins et al., 2016; Walters et al., 2019). As multiple studies suggest, evidence-based lactation care requires long-term, professional support. For women with a history of SU, ensuring access to competent and compassionate team-based lactation support is essential for increasing historically low breastfeeding rates (Bartholomew & Lee, 2019).

Supported breastfeeding may be an underutilized intervention in this medically and socially high-risk population. By providing individualized breastfeeding support, providers may increase rates of safe breastfeeding and extend sobriety motivation from pregnancy to the

postpartum period, ultimately decreasing relapse rates in postpartum women. The project provides the education and support needed for successful breastfeeding in a high-risk population through one-to-one counseling with a Certified Nurse-Midwife (CNM)/Internationally Board-Certified Lactation Consultant (IBCLC).

Problem statement

Women with a history of substance use are at elevated risk of relapse in the postpartum period (Forray et al., 2015; Wu et al., 2020). Additionally, they are less likely to initiate breastfeeding (Bartholomew & Lee, 2019). At this urban, safety net hospital, CNMs serve many socially high-risk patients with a history of SU prior to pregnancy or during pregnancy. Owing to the midwife-led prenatal care program, midwives are often the primary care providers for substance-using women during their pregnancies. This model of midwifery care for substance-using women is unique as many practices consider SU an indicator of a high-risk pregnancy and a factor that may preclude patients from midwifery care (Ranchoff & Declercq, 2020). However, CNMs are well equipped to provide care to this vulnerable population as midwives improve obstetric health outcomes through therapeutic, relationship-based care that decreases stigma (Shogren, 2020) and increases maternal self-sufficiency (Reid & McStay, 2018). Furthermore, patients with a history of substance use benefit from the midwifery model of continuity care during the antepartum, intrapartum, and postpartum periods (Whitehead et al., 2019). This project harnesses the power of the established midwife-patient relationship to promote postpartum sobriety/substance harm reduction and lactation.

Current practice

The current standard-of-care for postpartum patients at this safety net hospital includes one phone call at postpartum day twenty-one to postpartum day fifty-six. The CNM initiates the

phone call and typically focuses on the adult patient's physical recovery from birth and her current mental wellbeing. CNMs routinely ask the patient what her chosen feeding method is for the baby and if she is experiencing issues with feeding; if patients report feeding difficulty, CNMs refer the patient to community Women Infants and Children (WIC) centers. If the CNM determines a physical examination is indicated, the CNM will schedule the patient for an in-person evaluation. If the CNM determines there is an acute breastfeeding issue such as mastitis, she will refer the patient to obstetric triage immediately. Prior to the postpartum phone call, many breastfeeding patients seek assistance with breastfeeding issues in the community at non-affiliated centers.

Population, Intervention, Comparison, Outcome, and Time (PICOT)

In women with a history of substance use (P), how does enrollment in a midwife-led breastfeeding program (I) compared to standard care [one postpartum telehealth visit at six weeks postpartum] (C) affect patient breastfeeding rates (O1), self-reported substance use (O2), or maternal satisfaction (03) in the immediate postpartum period [day one until week six] (T)?

Theoretical framework

The therapeutic patient-midwife relationship is central to effective intervention. Engaging substance-using patients in care involves significant relationship building and demonstration of genuine empathy (Page, 2016). Mary Koloroutis developed the Relationship-Based Care (RBC) Model to guide health care practitioners in compassionate relationships that ultimately improve health outcomes. Koloroutis (2004) identifies the foundation of RBC as the recognition that relationships with patients and their families are "a sacred, privileged trust" (p. 134). The first component of the RBC framework, the patient-provider relationship, complements the midwifery model because it centers patients and emphasizes the importance of connection (Butts & Rich,

2018; Koloroutis, 2004). According to Koloroutis, the RBC framework maintains the patient and family as the central focus and demonstrates “unwavering respect and personal concern for the patient” (p. 15). In addition, RBC emphasizes the importance of engaging patients in their self-care, an aspect that the breastfeeding intervention achieves by providing mothers with practical skills for self-sufficiency. The positive relationships formed by RBC may diminish the chronic psychosocial stress experienced by women with a history of SU (Gavin et al., 2012). Utilizing the RBC framework may impact measurable outcomes, such as breastfeeding frequency or self-reported substance use rates, because it lays the foundation for therapeutic recovery beyond the postpartum period.

Literature Search

The benefits of breastfeeding to maternal and neonatal health are well documented in medical literature (Bernardo et al., 2013; Brown, 2017; Chowdhury et al., 2015); however, literature on practical interventions to increase breastfeeding initiation and continuation rates is less robust. Furthermore, interventions to increase breastfeeding rates among special populations, including women with a history of SU, are rarer still. Multiple searches were performed using two electronic article databases, Cumulative Index to Nursing and Allied Health Literature (CINAHL) Complete and PubMed via the University of Los Angeles, California (UCLA) library. Limiting findings to peer-reviewed articles published in English between 2018 to 2022, a search was conducted on PubMed using the search terms ("breast feed*" OR “breastfed” OR "lactation") AND (“substance abuse” OR “drug use”) AND (“support” OR “intervention”), yielding 180,456 results. Inclusion of Boolean terms like OR and AND improved article relevance. Using the same search refinement criteria, the terms (“substance abuse or substance use or drug abuse or drug addiction or drug use”) AND (“breastfeed or breast feed or

breastfeeding" OR "lactation") AND ("support") were entered in CINAHL, yielding 1,933 results. Articles were further refined by relevance and ultimately 200+ articles were reviewed in the development of this DNP QI proposal. Of those articles, ten articles were selected for literature review (Appendix A).

Titles and abstracts were reviewed for relevance to the population and applicability to the primary care setting. The ten articles included in the literature review inspired the development of this DNP proposal and the structure of the pilot intervention. Ultimately seven key studies were selected for appraisal based on their subject relevance, reliability, and applicability to the intended population. The seven key articles are included in the Table of Evidence (see Table 1).

Literature Review

Louis-Jacques et al. (2020) explored the impact of a quality improvement (QI) project focused on maternal knowledge of substance use during lactation. In the QI project, study organizers conducted pre-tests of maternal knowledge, provided one hour of education about the effects of substances during breastfeeding, and then collected post-tests of knowledge; additionally, organizers collected information about participants breastfeeding behavior during the postpartum period. The QI project included 121 pregnant women recruited from prenatal clinics in Hillsborough County, Florida. Louis-Jacques et al. (2020) determined that although maternal knowledge about substance use during lactation increased following the education intervention, overall women using medications postpartum were less likely to exclusively breastfeed than those not taking medications (adjusted OR at 2–4 weeks = 3.150 (95% CI: 1.292–7.684) and adjusted OR at 6–8 weeks = 4.305 (95% CI: 1.076–17.225) regardless of medication type. While this study suggests educational sessions may increase baseline knowledge, it also reveals many patients are incorrectly instructed to discontinue breastfeeding

regardless of the pharmacologic safety profile of their prescriptions. While this QI project did not enroll a large number of women with illicit substance use, it reveals the need for increased provider education regarding lactation, substance use, and harm reduction for providers serving target population.

Harris et al. (2020) examined the correlation between substance use identified by urine toxicology screening in the antepartum period with ongoing substance use identified by urine toxicology in the postpartum period. The study enrolled 503 women receiving care at Boston Medical Center (BMC). The purpose of this retrospective cohort study was to determine best practices for lactation support; the established practice at the investigation site was to discourage women from breastfeeding if they have a positive urine toxicology screening during the third trimester of pregnancy. Harris et al. (2020) utilized student's t-test for continuous variables and Pearson's Chi-squared test for categorical variables; researchers then used 2×2 tables to calculate sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of non-prescribed use prenatally at: 90-31 days prior to delivery, 30 days prior to delivery, at the time of delivery hospitalization, and by trimester. Researchers determined that positive urine toxicology at delivery was associated with the highest odds of postpartum substance use (odds ratio (OR) 4.51 [95% confidence interval (CI) 2.57-7.91]). However, Harris et al. (2020) also determined the positive predictive value of a urine toxicology screening is lower than negative predictive value, resulting in women at little risk of postpartum substance use being discouraged by their health care team from breastfeeding. Findings from Harris et al. (2020) suggest widespread use of urine toxicology screening should not be used as a guiding metric for determining safety of lactation in the target population. This study highlights the complexity of

lactation counseling for women with a history of substance use and suggests recommendations should not be based on a single data point.

Yonke et al. (2019) investigated the difference between breastfeeding intention in women enrolled in medication-assisted therapy (MAT) compared with rates of breastfeeding at the time of hospital discharge and at two months postpartum. This longitudinal retrospective cohort study enrolled six women from the Milagro Prenatal Program at the University of New Mexico (UNM). Researchers conducted chart reviews to determine the participants' infant feeding plan as stated during their prenatal care; researchers then compared breastfeeding intention with documented breastfeeding during the hospital admission and at various time intervals following hospital discharge. Yonke et al. (2019) examined these differences using Pearson chi-square tests. Researchers determined 84% of participants intended to breastfeed; of those 84%, 76% of participants on methadone therapy breastfed at discharge compared to 100% on buprenorphine therapy. However, at two months postpartum, only 12% on methadone therapy and 11% on buprenorphine therapy breastfed exclusively. This study recognizes the high desire of patients to breastfeed and documents the high breastfeeding success rate achieved with intensive, inpatient lactation support. These findings suggest that intensive, longer-term breastfeeding support may build off the success of short-term, inpatient lactation support to increase breastfeeding duration in the target population.

Cook and Larson (2019) designed a qualitative descriptive study exploring how substance use disorder influences maternal breastfeeding practices. The researchers enrolled six Caucasian women receiving treatment at a North Carolina drug rehabilitation therapy program and conducted interviews focused on the participants' breastfeeding experiences. The researchers employed a two-reviewer content analysis with identification of patterns and code words to

identify key themes. Cook and Larson (2019) categorized the discussions into three themes: The Battle (i.e., relapse), The Lockdown (i.e., consequences), and The Best Shot (i.e., bonding with their baby). The research, while limited by the small, racially homogenous sample size, reveals breastfeeding as an opportunity to reduce Neonatal Opioid Withdrawal Syndrome (NOWS) severity, increase mother-child bonding, and promote maternal self-confidence. Cook and Larson's (2019) suggest women in recovery desire breastfeeding and successful breastfeeding may positively impact their self-image, making specialized lactation support in this population a worthwhile intervention.

Young-Wolff et al. (2020) examined the rates of completed SU screening and patient demographic data. This study was a retrospective descriptive study involving 70,031 women at Kaiser Permanente Northern California prenatal clinics. Of the 70,031 women screened, 11,926 women screened positive via substance use questionaries and/or urine screening tests for ethanol, cannabis, and illicit substances, such as cocaine, amphetamine, and opioids (Young-Wolff et al., 2020). Young-Wolff et al. (2020) determined that 83% of women who screened positive accepted and participated in a 1-hour counseling intervention session. After correlating demographic data, Young-Wolff et al. (2020) found women who participated in the counseling intervention session were younger, more likely to be African American or Hispanic, from neighborhoods with lower income, and had lower education levels. Of note, women who screened positive for alcohol use in pregnancy were less likely to participate compared to women who screened positive for drug use in pregnancy. This study suggests that most women who use substances in pregnancy accepted the counseling intervention. It also suggests that screening and counseling interventions are acceptable to the most medically vulnerable demographic groups. While participation was high for patients using drugs, this study highlights the need for a more

tailored approach to women using alcohol in pregnancy. Young-Wolff et al. (2020) contributes to this QI project as it suggests the perinatal period is an impressionable period in which patients may be more likely to accept substance use interventions.

MacVicar et al. (2018) conducted a mixed methods research study examining the feasibility and impact of a breastfeeding support intervention tailored for substance-exposed mothers and babies. The study examined how 1:1 inpatient education covering practical breastfeeding and neonatal self-consolation techniques, along with frequent encouragement, impacted breastfeeding rates and neonatal health outcomes. The target population included adult patients who intended to breastfeed, were enrolled in medical assisted therapy (MAT) during pregnancy, and delivered at term. The study enrolled 14 women and randomly assigned them to either the intervention group or the standard-care group (i.e. received general lactation education and support). While the study was quite small and focused only on inpatient interventions, the authors found a significant improvement in breastfeeding rates at hospital discharge: 100% (7 of 7) of the intervention group breastfed at discharge compared with 57% of control participants. MacVicar et al. (2018) suggests targeted, 1:1 lactation support is an effective intervention in the target population.

Dagla et al. (2020) implemented a retrospective cohort study to determine how a 12-month long midwife-led program providing antepartum education, breastfeeding care, and psychosocial support impacted initiation, exclusivity, and duration of breastfeeding. The study was conducted in Greece and included 1080 women. While the study excluded women with significant mental health issues and/or substance use, the study suggests long-term, interprofessional education and psychosocial support positively impacts breastfeeding rates: intervention participants who completed the full program initiated breastfeeding at higher rates

(96.3% vs. 94%) and continued breastfeeding longer (44.3% at 6 months postpartum vs. 0.78%). The study, while not focused solely on socially high-risk women, presents interesting future research questions examining breastfeeding not as a single decision but within the psychosocial context of women's lives. Dagla et al. (2020) presents interesting questions on whether or not CNMs can expand the success of long-term lactation support from the general population to the target population.

McGuinness et al. (2020) studied the impact of a Midwife/Internationally Board-Certified Lactation Consultant (IBCLC) led, hospital-based breastfeeding clinic on breastfeeding duration and patient satisfaction. The study, conducted in Ireland, enrolled ninety-nine women who delivered at an urban, obstetric hospital and attended the breastfeeding clinic via self-referral. The breastfeeding clinic intervention involved group education, 1:1 assessment by the clinical Midwife/IBCLC, development of a care plan, and weekly follow up. While 76% of the hospital's patients initiated breastfeeding, the target intervention group boasted high initiation rates and impressive breastfeeding duration: 99% breastfeeding at six weeks, 92% at three months, and 77% at six months. Although these rates are significantly higher than national averages in the United States and in Ireland, the study authors did not differentiate between rates of exclusive breastfeeding and any breastfeeding, which may exaggerate impact. Additionally, study authors did not document breastfeeding rates at six weeks, three months, and six months for non-attendees so true comparisons between participants and a control group are not possible. While this study lacks quantitative rigor, the qualitative data demonstrates attendees were highly satisfied with the intervention: interviews revealed participants felt empowered and attributed breastfeeding success to the support of their Midwife/IBCLCs. This study contributes to the extensive existing research on the need for professional lactation support for increasing

breastfeeding initiation and duration. Additionally, the article is valuable to this DNP QI proposal as it focuses specifically on the role of Midwife/IBCLCs to lead breastfeeding interventions within an obstetric hospital clinic.

Pezley et al. (2022) conducted a randomized pilot trial investigating how two web-based educational series affect perinatal depression rates and/or breastfeeding rates in the postpartum period. One educational series focused on strategies for mood management in the perinatal period while the other series included perinatal mood content with additional lactation content. The study recruited nationally and included 22 participants who identified as Black or African American, intended to breastfeed, and self-reported mild to moderate depressive symptoms based on a Patient Health Questionnaire (PHQ 8) score. The study enrolled participants at 20 to 28 weeks of pregnancy and followed participants until they were 12 weeks postpartum. The results of the interventions were compared by computing means and standard deviations for continuous variables and frequencies for categorical variables. While breastfeeding rates were high overall, higher rates of breastfeeding were observed in the lactation intervention group: 100% of lactation participants breastfed in any amount (i.e. breastfed and supplemented with infant formula) and 91% exclusively breastfed at six weeks compared to the mood management group in which 86% breastfed in any amount and 57% exclusively breastfed at six weeks postpartum. Pezley et al. (2022) informs this QI proposal because it shows that breastfeeding educational interventions offered during the antepartum period and continued during the postpartum period impact breastfeeding rates even in populations that historically have lower rates of breastfeeding. However, due to the small sample size and the exclusion of participants with a diagnosis of a mental health disorder, including substance use disorder, the applicability of this intervention to the target population of substance using women is unknown.

Samawi et al. (2021) synthesized published research on interventions to decrease alcohol consumption in the antepartum and postpartum periods in a systematic review of eleven articles. The systematic review included randomized controlled trials and quasi-experimental studies that compared specific interventions to control groups. These studies focused on pregnant and postpartum women who consumed alcohol in pregnancy or during the postpartum period. While each study differed on how it defined alcohol use (i.e. any alcohol consumption versus diagnosed alcohol use disorder), all studies sought to affect rates of alcohol use through 1:1 verbal interventions, such as Motivational Interviewing or Cognitive-Behavioral Therapy, within health care settings such as clinics or hospitals. Of the eleven studies, six studies found decreased alcohol consumption in all participants without a statistically significant difference in consumption for the intervention group compared to the control group. Of the five studies finding significant decreases in alcohol consumption in the intervention group compared to the control group, three were structured to provide an initial intervention with frequent, scheduled follow up interventions. This systematic review is limited by the small number of studies reviewed but suggests continuity and ongoing evaluation may be key to amplifying intervention impact for pregnant and postpartum women who use substances. Such findings influence the QI proposal by structuring the intervention to include provider-participant continuity and weekly follow up with participants.

Literature Synthesis

The literature search revealed consensus on best practice guidelines for lactation support and postpartum care (Dagla et al., 2020; McGuinness et al., 2020; Pezley et al., 2022). While the literature search demonstrates high desire for breastfeeding amongst women with a history of SU (Cook & Larson, 2019; MacVicar et al., 2018; Yonke et al., 2019), it also reveals the need for

additional research exploring best practice postpartum and lactation interventions for women with a history of SU (Harris et al., 2020; Samawi et al., 2021; Young-Wolff et al., 2020). The literature suggests professional lactation support improves breastfeeding initiation, exclusivity, and continuation rates in the general population (Dagla et al., 2020; McGuinness et al., 2020) but does not reveal if these results can be replicated in populations with a history of SU in the long term. These gaps in knowledge highlight the need for the proposed intervention and the need for additional, multidisciplinary research investigating other strategies for perinatal health improvement in substance-using populations.

Methodology

Ethical Considerations

As a quality improvement project implementing best practices for lactation support, this pilot received an Internal Review Board (IRB) waiver from the University of California, Los Angeles and a waiver from the institutional setting.

Guidelines set by the Health Insurance Portability and Accountability Act of 1996 (HIPAA) protecting participants' private health information will be followed. Anonymizing patient information and maintaining patients' information within secure Electronic Medical Record networks will ensure compliance with HIPPA privacy and security rules.

As the target population faces many complex social issues, including poverty, substance dependency, new motherhood, and possible social welfare involvement, that make them uniquely vulnerable, their participation in this pilot must be without coercion. As the pilot occurs within a safety-net hospital setting, most patients will classify as low-income and have publicly funded health insurance plans, such as Medi-Cal or LA Care, or presumptive Medi-Cal. Research shows that socioeconomic status (SES), specifically personally experiencing poverty and living in an

impoverished area, may affect maternal health outcomes more than genetic predisposition (Graham, 2016). This pilot project recognizes the ethical obligation of medical providers to acknowledge these social determinants of health and develop targeted interventions to counteract the negative impact of poverty.

Project Design

This intervention is a quasi-experimental quality improvement (QI) project that utilizes the Plan Do Study Act (PDSA) methodology to determine the impact of enrolling pregnant women with a history of substance use (broadly defined to include tobacco, alcohol use, marijuana, and illicit drugs) in a pilot breastfeeding support program. The aim of this evidence-based QI project was to improve the standard of care that women with a history of substance use receive during the postpartum period.

Setting

The intervention setting was in a large, urban hospital. The intervention occurred within the women's health clinic, the inpatient postpartum unit, and via telehealth visits.

Sampling

The intervention sample included pregnant women with a history of substance use who desire to breastfeed and who receive their antepartum/postpartum care with the midwifery practice. Inclusion criteria were as follows: pregnant patients who are 18 years old+, who have a history of substance use or current substance use in pregnancy, who desire to breastfeed, and who are English-speaking. For the purposes of this QI project, substance use is broadly defined to include tobacco, alcohol use, marijuana, and/or other illicit drugs. Exclusion criteria included patients who decline breastfeeding or who have a medical contraindication to breastfeeding, such as human immunodeficiency virus (HIV) with a detectable viral load or infant galactosemia

(Davanzo, 2018). The comparison group consisted of women who met criteria for inclusion in the intervention group but who were recruited after delivery.

Recruitment

CNM IBCLCs, staff CNMS, the perinatal social worker (SW), and public health nurse (PHN) referred potential participants to the project lead based on the pilot's established eligibility criteria. Recruiters explained the pilot breastfeeding support program and referred interested parties to the project lead for additional counseling. The project lead conducted informed consent prior to enrollment in the QI project.

Plan for Implementation

The project committee implemented the pilot intervention in Summer 2023 (see Appendix B). As the proposal was a pilot conducted by existing CNM IBCLC staff, no additional hiring was necessary. In May 2023, the project committee met to discuss project structure, the intervention bundle, and implementation. The project committee consisted of current employees, including the project lead, staff CNMs, the perinatal SW, and PHN. The project lead's main responsibilities were to coordinate the pilot, ensure adequate recruitment, communicate with implementers, collect pilot data, and analyze results. The project lead provided direct patient care, including antepartum education, in-person postpartum evaluation, and telehealth follow-up.

Data Collection

The Project Lead collected demographic information about participants using the Demographic Survey (Appendix C). Assisted by the CNM IBCLC, the participant completed the Breastfeeding Attrition Prediction Tool (BAPT) prior to delivery (Appendix D). During the in-person evaluation, the CNM IBCLC provided standard breastfeeding support, including

completion of a LATCH assessment (Appendix E). Pilot questionnaires measured rates of participant breastfeeding at hospital discharge, weekly rates of any breastfeeding at one to six weeks, weekly rates of exclusive breastfeeding at one to six weeks, weekly rates of any self-reported substance use, and the number of participants completing the program (Appendix F). Data regarding rates of breastfeeding at hospital discharge were collected from chart review correlated with participants' reports of feeding mode. Data regarding rates of breastfeeding and substance use were collected from participant reports during the telehealth appointment. Qualitative measurements included post-intervention interviews to evaluate participants' satisfaction with the program, self-reported challenges with breastfeeding, and self-reported motivating factors for breastfeeding (Appendix F). Additionally, enrollees answered questions about postpartum substance use (PPSU), including questions about postpartum substance use behavior, relapse triggers, and sobriety/substance use reduction motivators. The qualitative interviews occurred after completion of the program or after withdrawal from the program. Lastly, patients completed General Anxiety Disorder-7 (GAD-7) and Patient Health Questionnaire-9 (PHQ-9) surveys to assess anxiety and depression levels (Appendix G). CNMs referred patients with elevated GAD-7 (score >/= 5) and PHQ-9 (score >/= 5) to the clinic perinatal social worker, as is standard practice for any patient with abnormal mental health screening results.

Intervention Bundle

The program paired the woman with the CNM IBCLC who provided interventions in three stages: 1) Antepartum, 2) Immediately Postpartum, and 3) Postpartum (Appendix H).

Stage One: Antepartum

In stage one, the CNM met with the participant after enrollment and while the participant was still pregnant. During stage one, the CNM built rapport with the participant while providing in-person, 1:1 breastfeeding education, including information about substances in breast milk and harm reduction techniques for safe breastfeeding after potential relapse (i.e. the option of pumping breast milk and discarding milk until substance sobriety is re-established). Stage one data collection included 1) demographic survey, 2) BAPT survey, and 3) chart review of PHQ-9 and GAD-7.

Stage Two: Immediately Postpartum

In stage two, the CNM met with the participant at the hospital within the first 24-48 hours of delivery. During this visit, the CNM provided social support, reviewed breastfeeding education, and assessed the breastfeeding dyad using the LATCH score. During this visit, the CNM continued rapport building using the RBC model. Stage two data collection included: 1) the LATCH score.

Stage Three: Weekly Postpartum

In stage three, the CNM met with the participant via telephone call weekly for six weeks. During stage three, the CNM continued providing social support while also evaluating breastfeeding using questionnaire #1. If the CNM determined in-person evaluation was warranted, the CNM scheduled an in-person lactation visit. At the final six-week telehealth visit, the CNM collected questionnaire #2. Data collection during stage three included: 1) weekly questionnaire #1, 2) one-time questionnaire #2 at final visit, and 3) chart review of PHQ-9 and GAD-7.

Analysis

Quantitative data regarding breastfeeding rates and substance use rates were analyzed using independent samples T-test to determine possible relationships between breastfeeding rates and postpartum substance use rates. Demographic data was analyzed with frequency distributions. Survey responses were also analyzed with frequency distributions.

Demographics

Six women enrolled in the pilot and four women served as the comparison group. In total, five (50%) identified as Hispanic, one (10%) as Asian, one (10%) as African American, and three (30%) as "Other"; none identified as Caucasian (Table 1). Participant and control group ages ranged from 22-39 years old (Table 2). All participants enrolled in the third trimester of their pregnancy, with a range of 33 weeks to 36 weeks of gestation. One participant in the pilot group reported a previous birth; no one in the control group reported a previous birth. In both groups, the reported substances used included five women endorsing (50%) marijuana, seven (70%) endorsing alcohol, two (20%) endorsing methamphetamine, and one (10%) endorsing tobacco use (Table 3). No one endorsed active substance use at the time of enrollment. In total, five (50%) had a known mental health diagnosis; of those, 3 were diagnosed with anxiety, 3 were diagnosed with depression, 1 was diagnosed with schizophrenia, and 2 were diagnosed with bipolar disorder (Table 4).

Outcomes

Of the six women who participated in the pilot, five women continued the pilot after delivery. Of those five women, 100% (N=5) reported breastfeeding or feeding expressed breastmilk at six weeks postpartum, compared to 50% (N=4) of the comparison group at six weeks postpartum (Table 5). At six weeks, 100% (N=5) of the participants and 100% (N=4) of

the comparison group denied substance use (Table 6). Of the five women who completed the pilot, 100% (N=5) reported the breastfeeding program was “very helpful” or “helpful”; none reported the program as “not helpful” (Table 7).

An independent samples T-test with an alpha level of .05 was conducted on group responses related to breastfeeding behavior (“In the past 7 days, have you breastfed the baby or fed the baby breast milk?”). “Yes” responses were coded as “1” and “No” responses were coded as “0”. This analysis revealed no statistically significant difference between the breastfeeding behaviors of the participant group and the comparison group (p-value = 0.31) (Appendix M).

Discussion

The purpose of this pilot was to improve breastfeeding support for socially high-risk patients who may not initiate breastfeeding and/or may be at risk of substance use during the postpartum period. Organizers anticipated an increased rate of breastfeeding in the intervention group and projected possible decreased rates of postpartum substance use; however, no difference was noted in breastfeeding behavior or postpartum substance use behavior between the participants and the control group. While MacVicar et al. (2018) found greater likelihood of breastfeeding amongst substance using women who received tailored breastfeeding support compared to routine care, their study focused on women enrolled in substance abuse programs. Like Yonke et al. (2019) and Cooke & Larson (2019), this pilot revealed high intention to breastfeed in patients with a history of substance use in pregnancy. While Dagla et al. (2020) showed that midwife-led lactation support can lead to increased breastfeeding rates, the duration of this pilot (six weeks) was brief compared to the twelve-month intervention initiated by Dagla et al.. Similar to the population studied by Harris et al. (2020), postpartum substance use rates

were low overall; however, it is unclear how the pilot impacted postpartum substance use behavior compared to routine care.

This pilot did not demonstrate a statistically significant difference in breastfeeding behavior or postpartum substance use between the intervention and comparison groups. The impact of the pilot may be modest due to the small sample size and lack of population diversity. Additionally, the pilot did not control for dual diagnosis of substance use and mental health disorders in the cohorts, which may have affected results. Although general increases in breastfeeding rates and general decreases in PPSU rates were expected, the degree of impact may also be limited by competing health priorities during the postpartum period. Overall, the pilot presented low instances of PPSU in the target population, regardless of participating status on in the assigned group. The overall low rate of substance use may not be representative of general postpartum substance use rates as the pilot concluded data collection at six weeks postpartum verus twelve weeks postpartum. As suggested by Forray et al. (2015), most substance use resumes by twelve weeks postpartum. Had the pilot extended the timeframe beyond six weeks, pilot coordinators may have observed a difference in substance use rates between the intervention group and comparison group. Additionally, the pilot did not control for patients who self-identified recreational use versus self-identified problematic use or addiction. This expansive inclusion criteria allowed greater enrollment in the pilot but may have resulted in inclusion of patients at low risk of relapse. Finally, the impact on substance use rates also may have been obscured as the pilot relied on subjective patient report versus objective toxicology reports, unlike the study by Young-Wolff et al. (2020).

In future study, researchers should consider surveying women at twelve weeks postpartum to determine if breastfeeding behavior and sobriety are sustained at similar rates.

Researchers should develop additional qualitative surveys to understand reasons why this population may wean and/or reasons why they resume substance use.

While organizers anticipated high patient interest in intervention participation, recruitment proved difficult due to a couple of factors. Potential recruits expressed concern that the time commitment of participation was excessive. Additionally, some patients expressed confidentiality concerns and were hesitant to answer detailed questions about substance use in pregnancy. Other potential recruits declined participation because they felt they received adequate breastfeeding education already. In future recruitment, researchers should consider offering enrollment incentives, such as breastfeeding-themed literature, stickers, charms, or water bottles. Additionally, organizers will consider additional survey questions to reveal satisfaction rates for routine breastfeeding education and support in the comparison group.

Limitations

Numerous possible confounders may affect data reliability. The generalizability of this QI project is limited by the small intervention group and comparison group. Another significant confound may be that women who are intrinsically motivated to breastfeed may be more likely to enroll in this time-intensive intervention. Higher breastfeeding rates among enrollees may be related to intrinsic motivation versus the intervention. Additionally, self-reported SU may not be a reliable indicator of the intervention's success at decreasing PPSU as patients may be inclined to under-report PPSU if they fear judgement or other possible ramifications. Furthermore, decreased PPSU rates may be due to increased interpersonal support received during antepartum care and not due to breastfeeding behavior.

Implications for Clinical Practice & Research

While numerous studies investigate best practices for lactation support in the general population, fewer studies focus on the unique needs of women with a history of SU in pregnancy (Haase et al., 2019; van Dellen et al., 2019). As substance use rates increase among pregnant women in the United States (Denny et al., 2020; Haight et al., 2018), focused research is needed to determine how to best support postpartum women in recovery from SU.

In line with research conducted by Cook & Larson (2019), MacVicar et al. (2018), Yonke et al., (2019), this pilot revealed high maternal desire for breastfeeding amongst women with histories of substance use. While this small pilot did not demonstrate differences in breastfeeding behavior or postpartum substance use between the participant group and the comparison group, patients found the intervention helpful (Table 8). The high levels of maternal satisfaction support continuation of the pilot and further evaluation of the intervention bundle.

One potential implication for future research is how such an intervention impacts adherence to the postpartum care schedule. Patients with low socioeconomic status (SES) and/or a history of SU have lower rates of appointment adherence (Arpey et al., 2017; Simmons & Austin, 2022). Overall, research demonstrates attendance for postpartum care is lower compared to prenatal care attendance across patient demographics (de Bocanegra et al., 2017) but rates are improved when postpartum care follows a more holistic model that includes lactation services (Sacks et al., 2022).

Another potential implication for clinical practice and further research is the impact of breastfeeding on long-term health outcomes for people exposed to substances in-utero. Beyond the potential relapse protection, the project may also positively impact child health by increasing safe breastfeeding rates within a population at elevated risk of childhood illness.

Furthermore, additional research could explore the option for breast milk testing of relative substance dose; such an inquiry would fall within the harm reduction framework to improve individual risk/benefit counseling and informed consent. While such testing is not widely available for illicit substances, alcohol test strips for breast milk are available over the counter in the United States. In a future study, testing for commonly used substances such as marijuana could determine if such tests influence patient breastfeeding behavior.

Lastly, additional potential models of care could be examined, such as integrating IBCLCs or lactation counselors within women's recovery programs. In the field of perinatal health, Doctorate of Nursing Practice (DNP) CNMs hold a unique space as expert clinicians and quality improvement (QI) champions, allowing them to develop important research questions and implement QI projects. This QI initiative addresses multiple American Association of Colleges of Nursing (AACN) DNP Essentials, including Essential II: Organizational and Systems Leadership for Quality Improvement and Systems Thinking; Essential VII: Clinical Prevention and Population Health for Improving the Nation's Health; and Essential VIII: Advanced Nursing Practice (AACN, 2006). The proposal meets the DNP Essential of leadership by addressing health disparities in a target population (i.e. women using substances during the perinatal period) through development of a new care model based on contemporary scientific literature. Additionally, the proposal addresses the DNP Essential of population health by promoting human milk feeding, an intervention proven to positively impact public health outcomes, and while also decreasing illicit substance exposure. Lastly, the proposal utilizes the expertise of CNMs within their specialization to impact health outcomes, thereby meeting the DNP Essential of advanced practice nursing. DNPs are well equipped to lead such

interprofessional investigations because they possess the medical and population health knowledge needed for answering complex questions.

Conclusion

Evidence suggests that timely access to professional lactation support increases breastfeeding success over time (Bartick et al., 2017; Chiang et al., 2021; Jiang, 2021; Rollins et al., 2016; Walters et al., 2019), may reduce maternal distress (Chrzan-Dętkoś et al., 2021; Dagla et al., 2021; McGuinness et al., 2020), and may reduce postpartum substance use rates (Cook & Larson, 2020; Orton et al., 2018). Considering the public health benefit and significant future cost avoidance, inquiries into breastfeeding interventions focused on women with a history of SU are needed. Beyond individual-level interventions such as this QI project, robust policy analysis is needed to determine how social policies such as universal paid family leave and/or universal basic income could also impact breastfeeding rates, perinatal mental illness, and postpartum substance use.

Funding

The project lead did not acquire funding from any public or private entities.

Table 1: *Table of Evidence*

Author, Year	Purpose	Sample & Setting	Methods Design Interventions Measures	Results	Discussion, Interpretation, Limitation of Findings
Louis-Jacques, A., Wilson, R., Dean, K., Hernandez, I., Spatz, D., & Običan, S. (2020). Improving drug exposure knowledge during lactation: Quality improvement initiative in low-income women. *Breastfeeding Medicine*, *15*(3), 14–146. https://doi.org/10.1089/bfm.2019.0222	Improve maternal knowledge of substance use during breastfeeding; assess breastfeeding rates at 2–4 and 6–8 weeks postpartum	Setting: Prenatal clinics in n Hillsborough County, Florida Sample: 121 women Inclusion criteria: pregnant women without a medical contraindication to breastfeeding enrolled in prenatal care	Design: quality improvement initiative Intervention: Provide 1H of basic breastfeeding education and information about medication/SU during lactation; conduct pre- and post-education knowledge testing Measurement/instruments: Regression analysis evaluated the influence of medication usage on breastfeeding rates at 2–4 and 6–8 weeks postpartum	Post-educational session test (about effect of medications/SU on human milk) scores increased Women using medications at 2–4W and 6–8W PP were less likely to exclusively breastfeed than those not taking medications (adjusted OR at 2–4 weeks = 3.150 (95% CI: 1.292–7.684) and adjusted OR at 6–8 weeks = 4.305 (95% CI: 1.076–17.225)	Summarize: Educational session on BFing and medication/SU increases baseline knowledge of patients but they still discontinue BFing due to concerns about pharmacological safety Limitations: Population did not have high percentage of SUD Implications for Practice: Patients often instructed by prescribers to discontinue breastfeeding > consider intervention to target prescribers as well as patients

Author, Year	Purpose	Sample & Setting	Methods Design Interventions Measures	Results	Discussion, Interpretation, Limitation of Findings
Harris, M. Joseph, K., Hoeppner, B., Wachman, E. M., Gray, J. R., Saia, K., Wakeman, S., Bair-Merritt, M., & Schiff, D. (2020). A retrospective cohort study examining the utility of perinatal urine toxicology testing to guide breastfeeding initiation. *Journal of Addiction Medicine*, *15*(4), 311–317. https://doi.org/10.1097/ADM.0000000000000761	Examine correlation between SU identified by urine toxicology screening in the antepartum and postpartum periods	Setting: Boston Medical Center Sample: 503 women Inclusion criteria: Women enrolled in RESPECT program at BMC with DSM-IV or V diagnosis of OUD who completed 1+ UTOX in antepartum period and 1+ in postpartum period	Design: Retrospective cohort study Intervention: chart review comparing UTOX result in antepartum period and to UTOX result in PP period Measurement/instruments: Student's t-test for continuous variables and Pearson's Chi-squared test for categorical variables 2×2 tables to calculate sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of non-prescribed use prenatally at: 90-31 days prior to delivery, 30 days prior to delivery, at the time of delivery hospitalization, and by trimester Chi-square tests assess statistical significance of independence	+UTOX at delivery was associated with the highest odds of PP SU (odds ratio (OR) 4.51 [95% confidence interval (CI) 2.57-7.91]) methadone therapy vs. buprenorphine was associated with PP SU (OR 1.96, 95% CI 1.20, 3.22)	+UTOX at time of delivery predicts PP SU but positive predictive value is lower than negative predictive value > women discouraged from breastfeeding may have little risk of PP SU Limitations: Focuses on opioid use only; does not distinguish between multiple +UTOX and single +UTOX Implications for Practice: Consider shared decision-making for breastfeeding recommendations in setting of +UTOX or recent SU

Author, Year	Purpose	Sample & Setting	Methods Design Interventions Measures	Results	Discussion, Interpretation, Limitation of Findings
Yonke, N., Maston, R., Weitzen, S., & Leeman, L. (2019). Breastfeeding intention compared with breastfeeding postpartum among women receiving medication-assisted treatment. *Journal of Human Lactation*, *35*(1), 71–79. https://doi.org/10.1177/0890334418769637	Determine the difference between breastfeeding intention in women enrolled in MAT compared with breastfeeding at discharge and 2 months postpartum	Setting: University of New Mexico (UNM) Milagro prenatal Program Sample: Six women Inclusion criteria: women who started MAT prior to 36W, had 3+ prenatal visits with Milagro Program, and delivered full term	Design: longitudinal retrospective cohort study Intervention: Chart review of feeding plan stated in prenatal care compared with breastfeeding initiation at various time intervals PP Measures/Instruments used: Pearson chi-square tests determined differences between groups for breastfeeding initiation, intention, continuation at discharge, and continuation at 2 months postpartum	84% of participants intended to breastfeed 76% on methadone therapy breastfed at discharge compared to 100% on buprenorphine therapy at 2 months, 12% on methadone therapy breastfed exclusively vs 11% on buprenorphine therapy	Intention to breastfed in SU populations is high Limitations: One hospital setting with rigid hospital policy dictating breastfeeding recommendations Implications for Practice: Address longer term breastfeeding support for SU women vs. inpatient support

Author, Year	Purpose	Sample & Setting	Methods Design Interventions Measures	Results	Discussion, Interpretation, Limitation of Findings
Cook, K. & Larson, K. (2019). Breastworks: Breastfeeding practices among women with substance use disorder. *Applied Nursing Research*, *47*, 41–45. https://doi.org/10.1016/j.apnr.2019.04.006	Examine how SUD influence maternal breastfeeding practices	Setting: North Carolina drug rehabilitation therapy program Sample: Six women Inclusion criteria: Women experiencing SUD who breastfed their infant	Design: Qualitative descriptive Intervention: Interviews focused on breastfeeding experience Measures/Instruments used: Two reviewer content analysis with identification of patterns, code words	Three categories of breastfeeding in recovery: The Battle (ie. relapse), The Lockdown (ie. consequences), and The Best Shot (ie. bonding with their baby)	Breastfeeding allowed participants to "atone" for past substance use Limitations: Small sample size, primarily white participants Implications for Practice: identify effective breastfeeding counseling techniques for women with SUD (ie. promotes bonding, reduces NAS risks, etc.)

Author, Year	Purpose	Sample & Setting	Methods Design Interventions Measures	Results	Discussion, Interpretation, Limitation of Findings
Young-Wolff, K., Tucker, L., Armstrong, M., Conway, A., Weisner, C., & Goler, N. (2020). Correlates of pregnant women's participation in a substance use assessment and counseling intervention integrated into prenatal care. *Maternal and Child Health Journal*, *24* (4), 423–431. https://doi.org/10.1007/s10995-020-02897-4	Examine demographic and clinical correlates of participation in substance use screening	Setting: HMO Northern California Obstetric clinics Sample: 70,031 women screened; 11,926 women screened positive Inclusion criteria: Pregnant & screened positive for SU (by self-report or urine screening)	Design: descriptive Interventions: universal prenatal substance use screening by self-report and urine toxicology testing; hour-long substance use assessment and counseling intervention Measures: self-reported use, urine screening results, substances used, and patient demographics Instruments: Chi-squared tests were used to examine categorical variables; multivariable logistic regression models that included demographic and clinical characteristics in one model were conducted to identify factors related to participation	83% of patients participated in the initial SU screening assessment and counseling intervention Women who participated were younger, more likely to be AA or Hispanic, had lower neighborhood income	Interpretation: screening and counseling is an acceptable intervention to most patients; underserved patients are reached by this intervention Limitation: lacks control group; study conducted in single HMO

Author, Year	Purpose	Sample & Setting	Methods Design Interventions Measures	Results	Discussion, Interpretation, Limitation of Findings
MacVicar, S., Humphrey, T., & Forbes-McKay, K. (2018). Breastfeeding and the substance-exposed mother and baby. *Birth,* 45(4), 450–458. https://doi.org/10.1111/birt.12338	Explore effectiveness and feasibility of tailored breastfeeding support for the substance exposed mother and baby	Setting: Scotland Sample: 14 women Inclusion criteria: opioid substitution medication therapy during pregnancy, intention to breastfeed, >36 weeks' gestation, and over 16 years of age	Design: mixed-methods pilot study, randomized controlled trial, and qualitative maternal questionnaire Intervention: provide practical breastfeeding advice, promotion of maternal self-efficacy through encouragement and persuasion, and provision of neonatal self-consolation techniques Measurement/instruments: descriptive statistics, percentages, epidemiological range, means, and standard deviation; maternal perspective of breastfeeding support was solicited in a questionnaire with 5 Likert-scale	100% (7 of 7) of the intervention group breastfed at discharge compared with 57% (4 of 7) of control participants 28% of the intervention group neonates (2 of 7) required pharmacotherapy for severe withdrawal compared with 57% (4 of 7) in the control group	Targeted, inpatient interventions may increase breastfeeding rates at time of hospital discharge Limitations: Focuses on inpatient outcomes, short-term intervention lacks follow up, small sample size Implications for Practice: Extend intervention to the outpatient setting to determine if effect is lasting

Author, Year	Purpose	Sample & Setting	Methods Design Interventions Measures	Results	Discussion, Interpretation, Limitation of Findings
Dagla, M., Mrvoljak-Theodoropoulou, I., Vogiatzoglou, M., Giamalidou, A., Tsolaridou, E., Mavrou, M., Dagla, C., & Antoniou, E. (2021). Association between breastfeeding duration and long-term midwifery-led support and psychosocial support: Outcomes from a Greek non-randomized controlled perinatal health intervention. *International Journal of Environmental Research and Public Health*, *18*(4), 1-17. https://doi.org/10.3390/ijerph18041988	Examine if long-term midwife-led breastfeeding support and psychosocial support impacts initiation, exclusivity and duration of breastfeeding	Setting: Greece Sample: 1080 women Inclusion criteria: pregnant, 18+ years old, not use drugs, and not hospitalized for mental health condition	Design: retrospective cohort study Interventions: midwife-led antenatal education, antepartum/postpartum mental health screening, antenatal physical health course, antepartum/postpartum midwife-led counseling via telehealth, and parental support classes at 3, 6, and 12 months postpartum Measures: Absolute (n) and relative (%) frequencies were used for the description of qualitative variables; mean values and SD for the description of quantitative variables; multiple analyses of variance; logistic regression analyses	96.3% of participants initiated exclusive breastfeeding 44.3% breastfed exclusively at 6M	Interpretation: participants initiate breastfeeding at higher rates and continued breastfeeding longer than non-participants Limitation: substance-using women were excluded from research; midwife-led counseling is not well defined

TOE Abbreviation Key:
BFing: breastfeeding
MAT: medication assisted therapy
NAS: neonatal abstinence syndrome
PP: postpartum
SU: substance use
SUD: substance use disorder
UTOX: urine toxicology test

Data Summary

Figure 1: *Frequency Distribution – Stated Ethnicity*

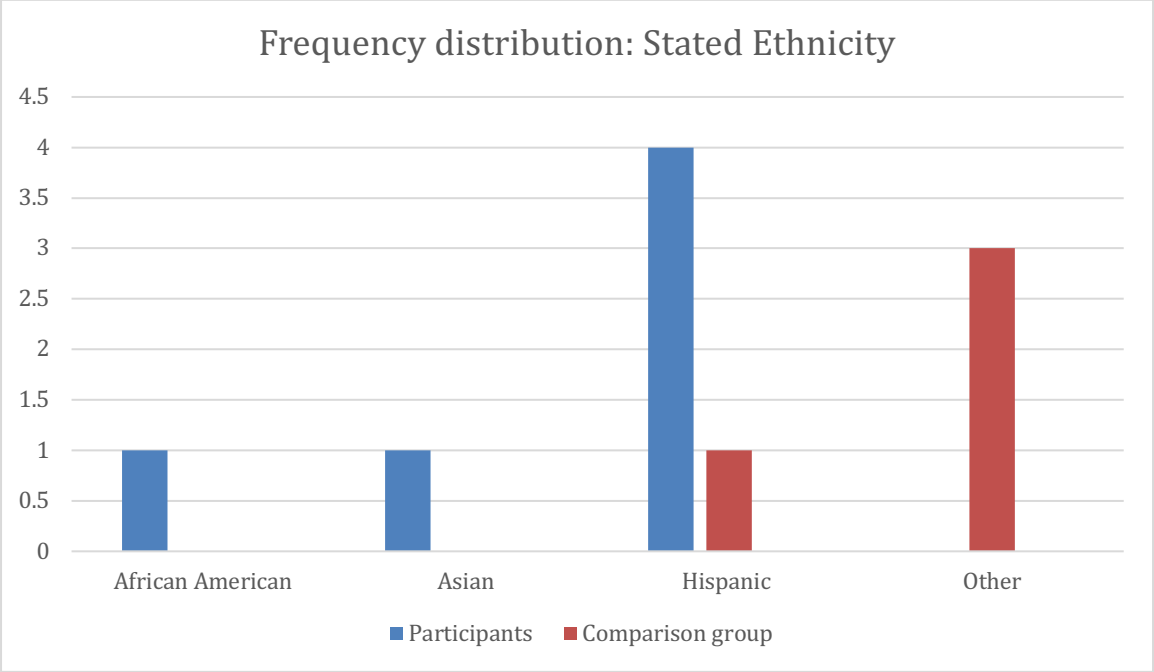


Figure 2: *Frequency Distribution – Age*

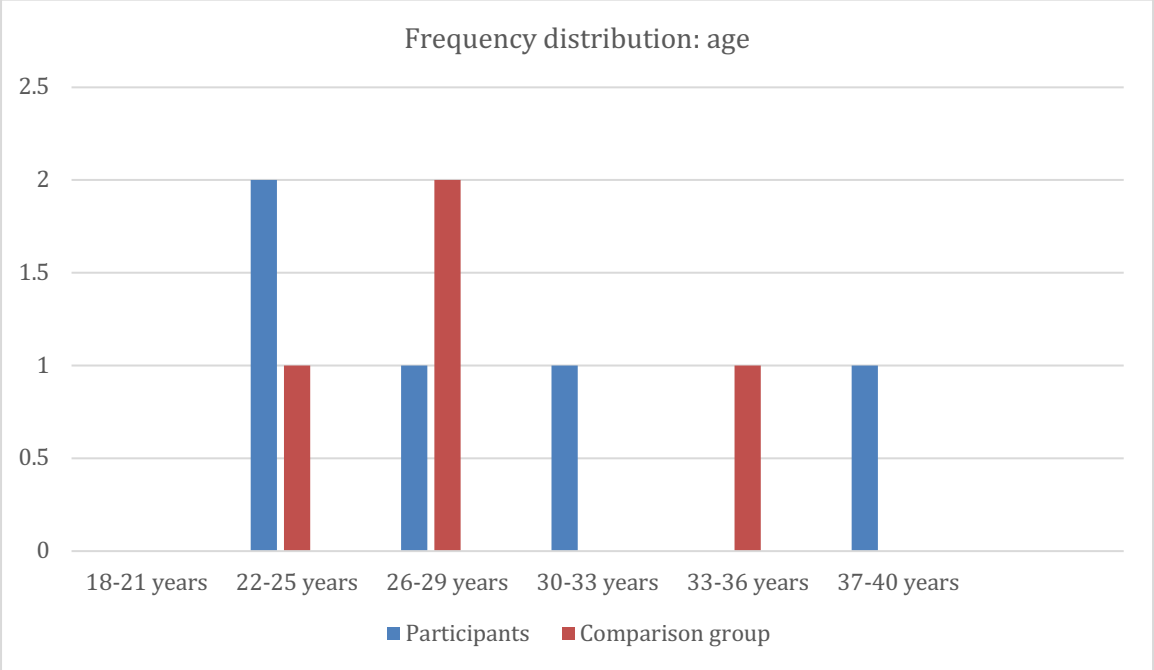


Figure 3: *Frequency Distribution – Substance Used*

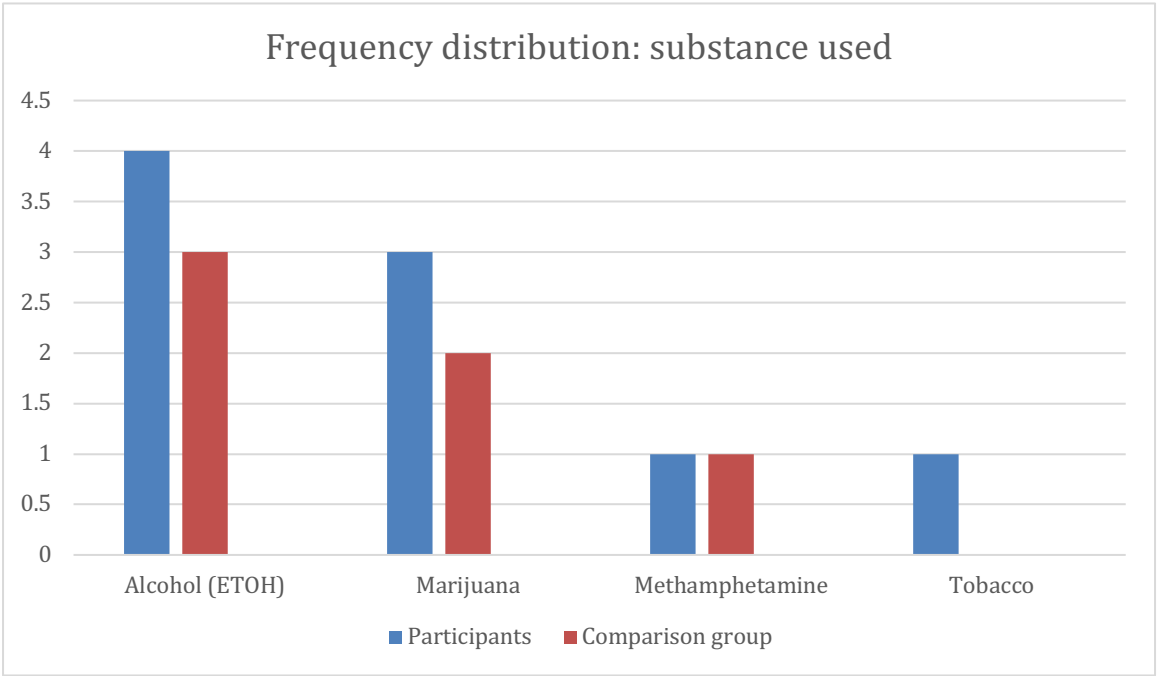


Figure 4: *Frequency Distribution – Psychiatric Diagnoses*

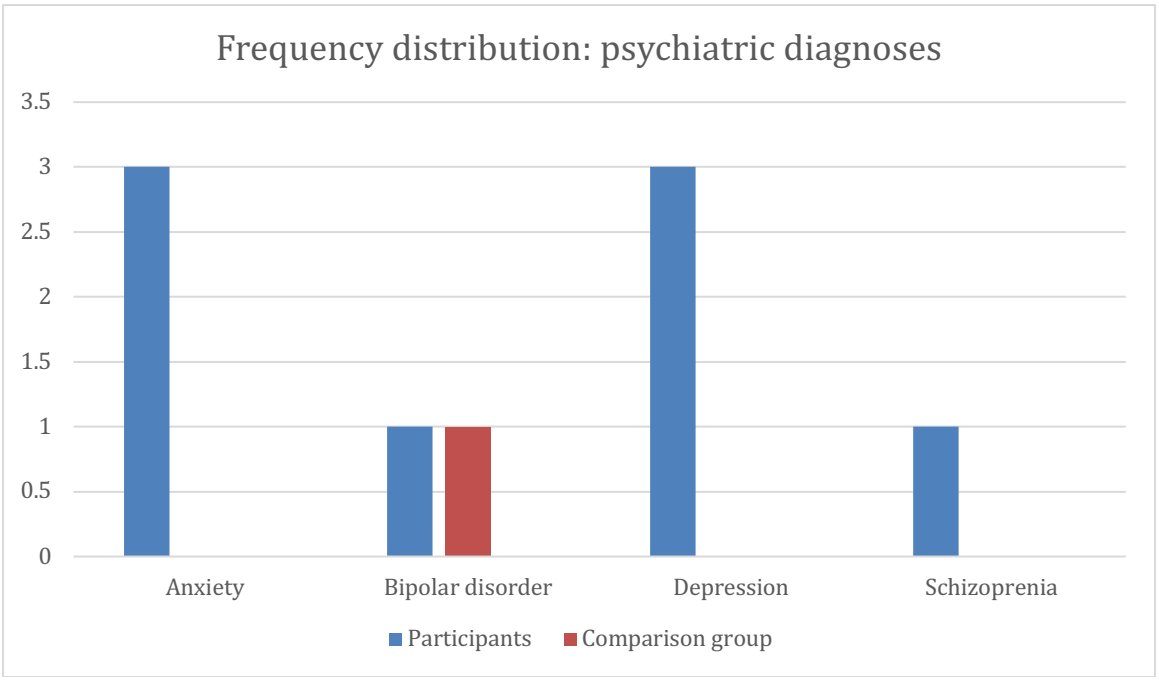


Figure 5: *Responses – In the past 7 days, have you breastfed the baby or fed the baby breast milk?*

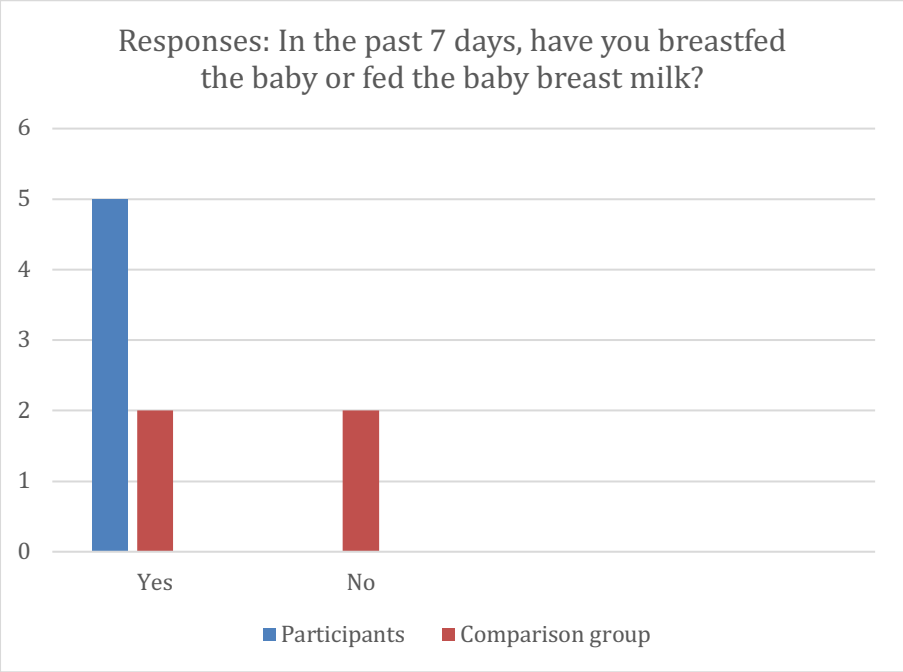


Figure 6: *Responses – In the past 7 days, have you used any substances, including tobacco, alcohol, drugs, or prescription drugs that were not prescribed?*

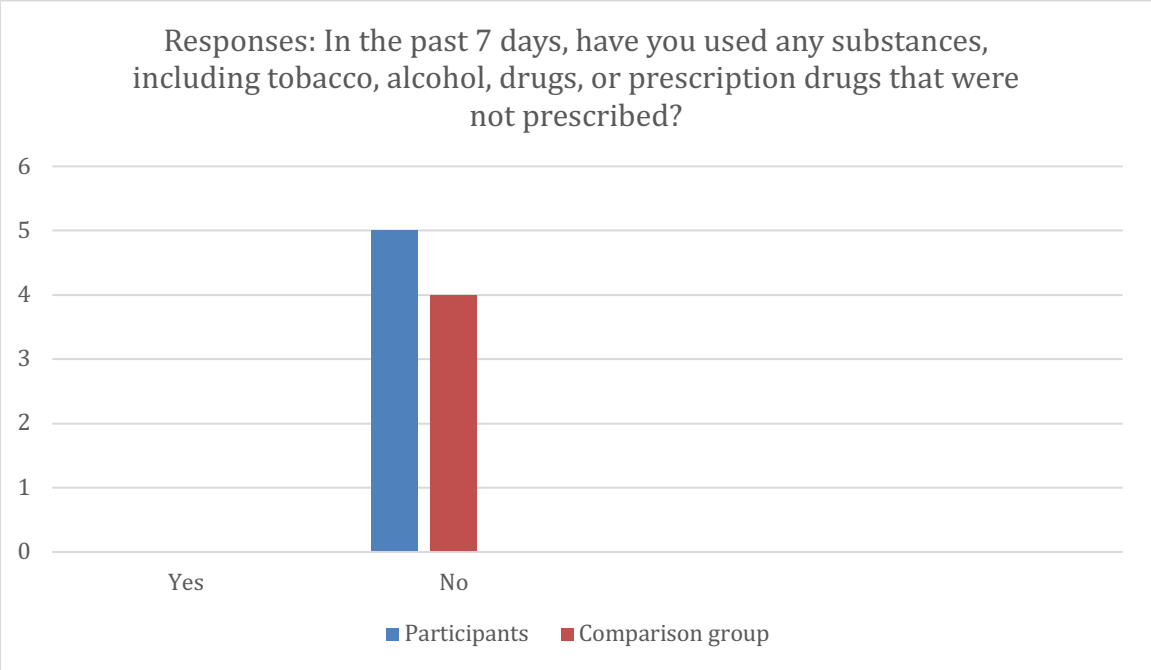


Figure 7: *Reponses – Did you find the breastfeeding program helpful?*

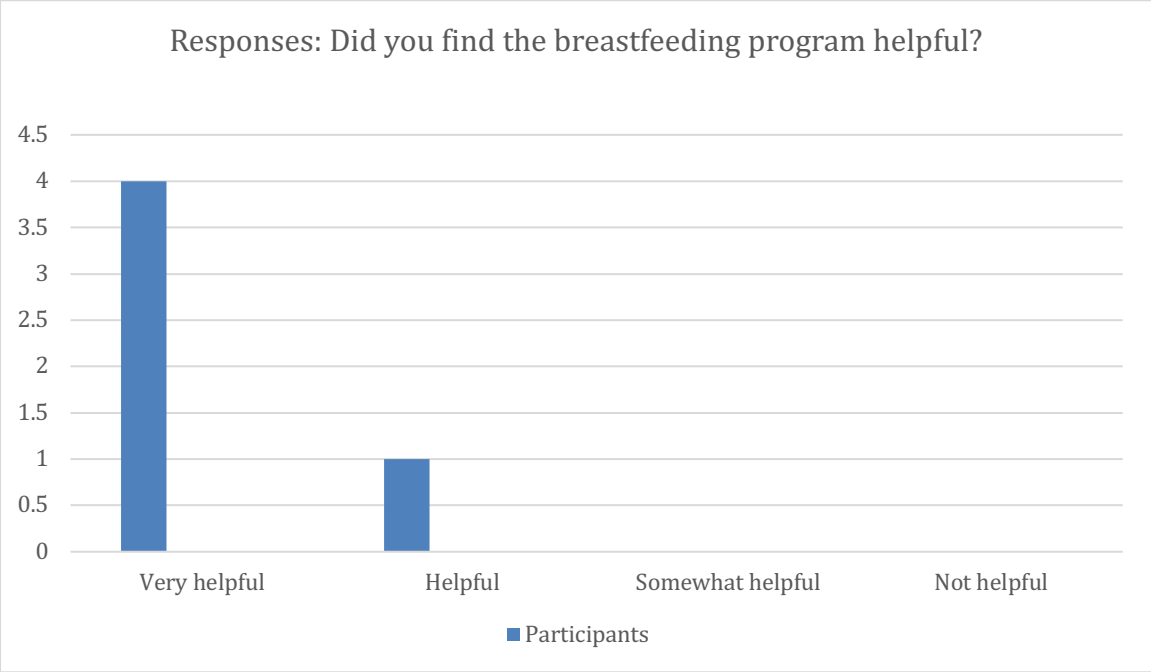


Table 2: *Independent samples t-test – Breastfeeding behavior*

Independent samples t-test
Breastfeeding behavior

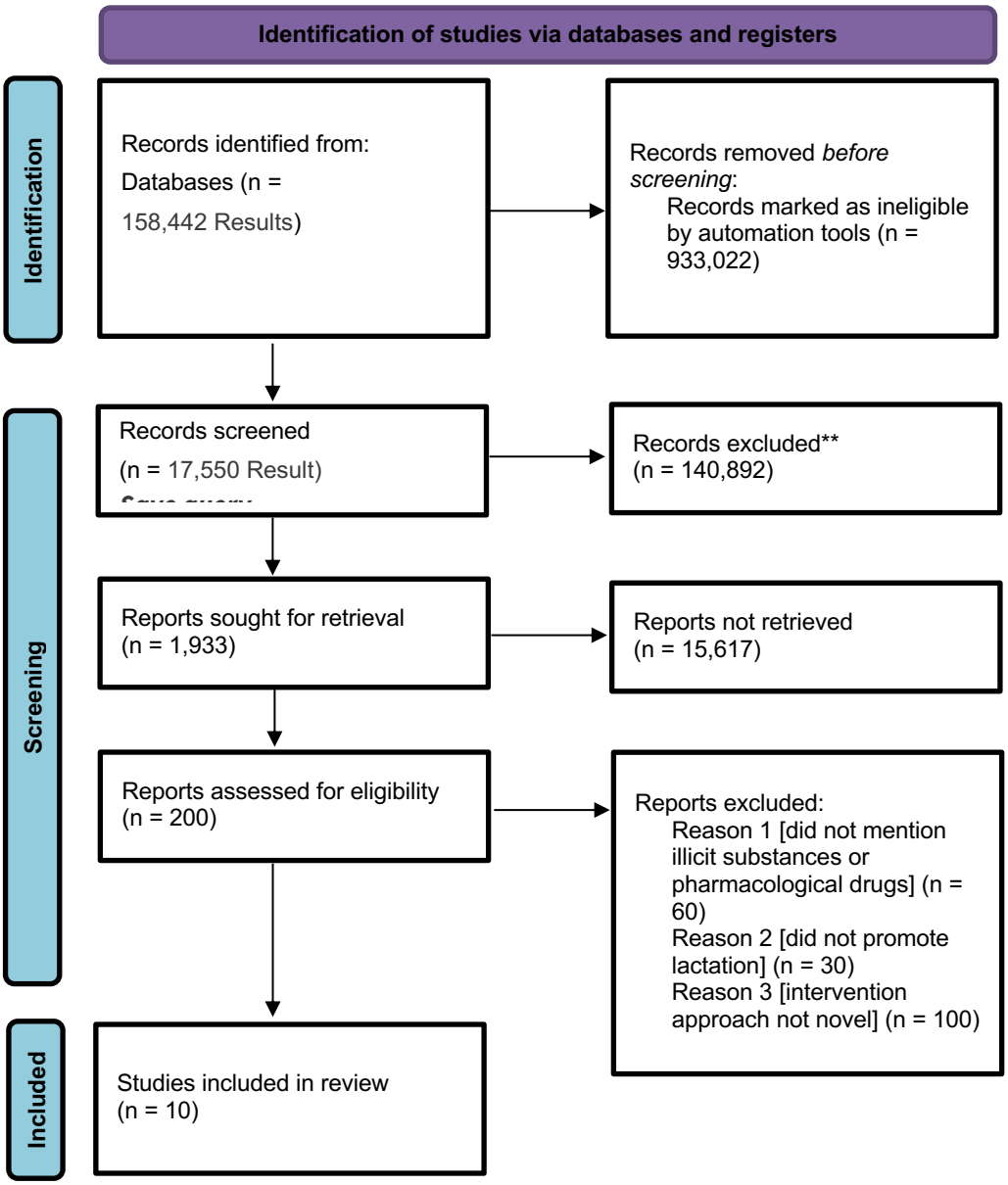
In the past 7 days, have you breastfed the baby or fed the baby breast milk?

Participants	Comparison group
1	0
0	1
1	1
1	0
1	
1	

t-Test: Two-Sample Assuming Equal Variances		
	Group 1	*Group 2*
Mean	0.833333333	0.5
Variance	0.166666667	0.33333333
Observations	6	4
Pooled Variance	0.229166667	
Hypothesized Mean	0	
df	8	
t Stat	1.07871978	
P(T<=t) one-tail	0.156079973	
t Critical one-tail	1.859548038	
P(T<=t) two-tail	0.312159946	
t Critical two-tail	2.306004135	

Appendix A

PRISMA



Appendix B

Timeline: GANNT Chart

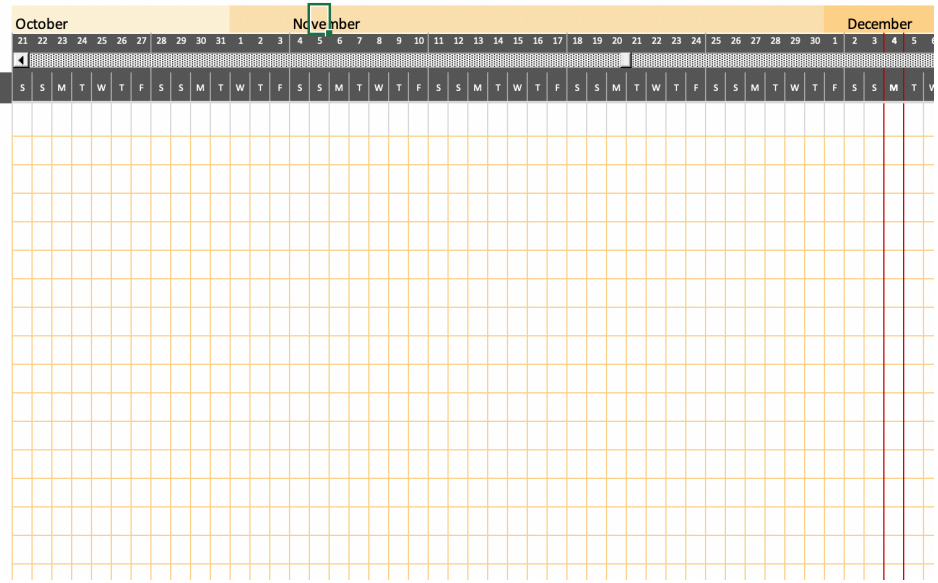
Breastfeeding Interventions for Women with a History of Substance Use GANTT CHART

Legend: On Track | Low Risk | Med Risk | High Risk | Unassigned

Company Name: Safety net hospital
Project Lead: Kate Mitchell, CNM, WHNP-BC, IBCLC

Project Start Date:	4/1/23
Scrolling Increment:	203
Project progress	500%

Activity	Class/Practical/Zo	Categor	Assigned T	Progress	Start	No. Da
Establish project committee	Pratical	On Track	Project lead	1000%	4/1/23	5
Establish clinic financial proposal	Pratical	On Track	Project lead	100%	4/6/23	14
Finalize intervention bundle	Goal	On Track	Committee	100%	4/30/23	14
Recruit participants	Pratical	High Risk	Project lead	100%	6/1/23	60
Administer initial screening	Pratical	On Track	Project lead	100%	6/1/23	7
Implement Intervention	Practical	High Risk	IBCLC CNM	100%	6/10/23	90
Collect data	Pratical	On Track	Project lead	100%	6/1/23	90
Evaluate Results	Goal	Milestone	Project lead	100%	10/1/23	7



Appendix C

Demographic Survey

SU Breastfeeding Clinic QI Project
Demographic Survey

Participant ID
Age
Ethnicity
Gestational age (GA)
Parity
Substances used before pregnancy
Substances used during pregnancy
Current use (y/n)
GA of last use
Frequency of use
Hx of breastfeeding
Partner support (y/n)
Family support (y/n)
Known diagnosis of mental illness (y/n; list ICD-10 Code)
Homeless or unstable housing (y/n)

Appendix D

BAPT

Prenatal Breastfeeding Survey (BAPT)	
Date:	
Name:	LA#:
WIC ID#:	Site #:

Please fill in the oval that most closely describes how you feel about each statement. Would YOU...	Agree	Neither	Disagree
1. Breastfeeding is more convenient than formula feeding.	◯	◯	◯
2. Breast milk is healthy for the baby.	◯	◯	◯
3. Breast milk is more nutritious than infant formula.	◯	◯	◯
4. Breastfeeding makes your breasts sag.	◯	◯	◯
5. Breastfeeding makes you closer to your baby.	◯	◯	◯
6. Breastfeeding makes returning to work more difficult.	◯	◯	◯
7. Breastfeeding is more economical than formula feeding.	◯	◯	◯
8. When you breastfeed you never know if the baby is getting enough milk.	◯	◯	◯
9. Mothers who formula feed get more rest than breastfeeding mothers.	◯	◯	◯
10. Breastfeeding is more time consuming than formula feeding.	◯	◯	◯
11. Breastfeeding is messy.	◯	◯	◯
12. Breastfeeding ties you down.	◯	◯	◯
13. Breastfeeding helps you bond with your baby.	◯	◯	◯
14. Breastfeeding is better than formula.	◯	◯	◯

For each of the following individuals, indicate how they think you should feed your infant.	Feed Formula	No Opinion	Feed Breast Milk	N/A
15. The baby's father thinks I should:	◯	◯	◯	◯
16. My mother thinks I should:	◯	◯	◯	◯
17. My mother-in-law thinks I should:	◯	◯	◯	◯
18. My sister thinks I should:	◯	◯	◯	◯
19. My doctor thinks I should:	◯	◯	◯	◯

Please indicate whether you agree or disagree with the following statements. Would YOU...	Agree	Neither	Disagree
20. I have the necessary skills to breastfeed.	◯	◯	◯
21. I am physically able to breastfeed.	◯	◯	◯
22. I know how to breastfeed.	◯	◯	◯
23. I am determined to breastfeed.	◯	◯	◯
24. I won't need help to breastfeed.	◯	◯	◯
25. Breastfeeding is easy.	◯	◯	◯
26. I am confident I can breastfeed.	◯	◯	◯

Appendix E

LATCH Assessment Tool

LATCH Assessment Tool

- The LATCH system assigns a numerical score of 0, 1, or 2 to five key components of breastfeeding for a possible total score of 10 points.
- Ideally, the quality of the infant's latch should be assessed twice over a 24 hour period by two different healthcare providers and documented. (For example, the nurse can review the LATCH scores from the previous shift and see that there has been improvement related to the "hold" attribute, with the mother able to position without help. However, the nurse may see that the "comfort" characteristic has worsened over time and therefore needs follow-up. This collaborative approach provides a consistent measure of the progress of breastfeeding.)
- Make copies of this tool to use in your practice.

	0	1	2	Score
L Latch	Too sleepy No sustained latch or suck	Repeated attempts for latch or suck Hold nipple in mouth	Grasps breast Tongue down Lips flanged Rhythmical sucking	
A Audible swallowing	None	A few with stimulation	Spontaneous and intermittent (<24 hrs)	
T Type of nipple	Inverted	Flat	Everted (after stimulation)	
C Comfort	Engorged Cracked, bleeding, large blisters, or bruises	Filling Reddened, small blisters or bruises	Soft Non-tender	
H Hold	Full assist (staff holds infant at breast)	Minimal assist (staff holds, then mother takes over)	No assist from staff Mother able to position and hold infant	
				TOTAL:

Jenson, Wallace & Kelsay (1994). LATCH: A breastfeeding charting system and documentation tool. JOGNN, 23(1):29.

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Appendix F

Pilot Questionnaires [Assessment]

Breastfeeding Interventions for Women with a History of Substance Use

Pilot Questionnaire 1

Before leaving the hospital, were you breastfeeding the baby?

yes	no

In the past 7 days, have you breastfed the baby or fed the baby breast milk?

yes	no

In the past 7 days, have you fed the baby breast milk only?

yes	no

In the past 7 days, have you used any substances, including tobacco, alcohol, drugs, or prescription drugs that were not prescribed?

yes	no

If yes, what substances did you use? *Formal or street name is fine*

Pilot Questionnaire 2

1. On the following scale, note your experience of breastfeeding.

    1. Very easy
    2. Easy
    3. Somewhat difficult
    4. Very difficult
    5. Extremely difficult

2. What makes you want to breastfeed?

3. Have you felt like using substances since you delivered?

yes	no

    a. If yes, what triggered the feeling?

    b. What makes you not want to use substances?

4. Did you find the breastfeeding program helpful?

    1. Very helpful
    2. Helpful
    3. Somewhat helpful
    4. Not helpful

Appendix G

GAD-7 and PHQ-9

Patient Health Questionnaire and General Anxiety Disorder
(PHQ-9 and GAD-7)

Date_____ Patient Name:_____ Date of Birth: _____

Over the last 2 weeks, how often have you been bothered by any of the following problems?
Please circle your answers.

PHQ-9	**Not at all**	**Several days**	**More than half the days**	**Nearly every day**
1. Little interest or pleasure in doing things.	0	1	2	3
2. Feeling down, depressed, or hopeless.	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much.	0	1	2	3
4. Feeling tired or having little energy.	0	1	2	3
5. Poor appetite or overeating.	0	1	2	3
6. Feeling bad about yourself – or that you are a failure or have let yourself or your family down.	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television.	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed. Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual.	0	1	2	3
9. Thoughts that you would be better off dead, or of hurting yourself in some way.	0	1	2	3
Add the score for each column				

Total Score (add your column scores): _____

If you checked off any problems, how difficult have these made it for you to do your work, take care of things at home, or get along with other people? (Circle one)

Not difficult at all **Somewhat difficult** **Very Difficult** **Extremely Difficult**

Over the last 2 weeks, how often have you been bothered by any of the following problems?
Please circle your answers.

GAD-7	**Not at all sure**	**Several days**	**Over half the days**	**Nearly every day**
1. Feeling nervous, anxious, or on edge.	0	1	2	3
2. Not being able to stop or control worrying.	0	1	2	3
3. Worrying too much about different things.	0	1	2	3
4. Trouble relaxing.	0	1	2	3
5. Being so restless that it's hard to sit still.	0	1	2	3
6. Becoming easily annoyed or irritable.	0	1	2	3
7. Feeling afraid as if something awful might happen.	0	1	2	3
Add the score for each column				

Total Score (add your column scores): _____

If you checked off any problems, how difficult have these made it for you to do your work, take care of things at home, or get along with other people? (Circle one)

Not difficult at all **Somewhat difficult** **Very Difficult** **Extremely Difficult**

UHS Rev 4/2020

Developed by Drs. Robert L. Spitzer, Janet B.W. Williams, Kurt Kroenke and colleagues, with an educational grant from Pfizer Inc.
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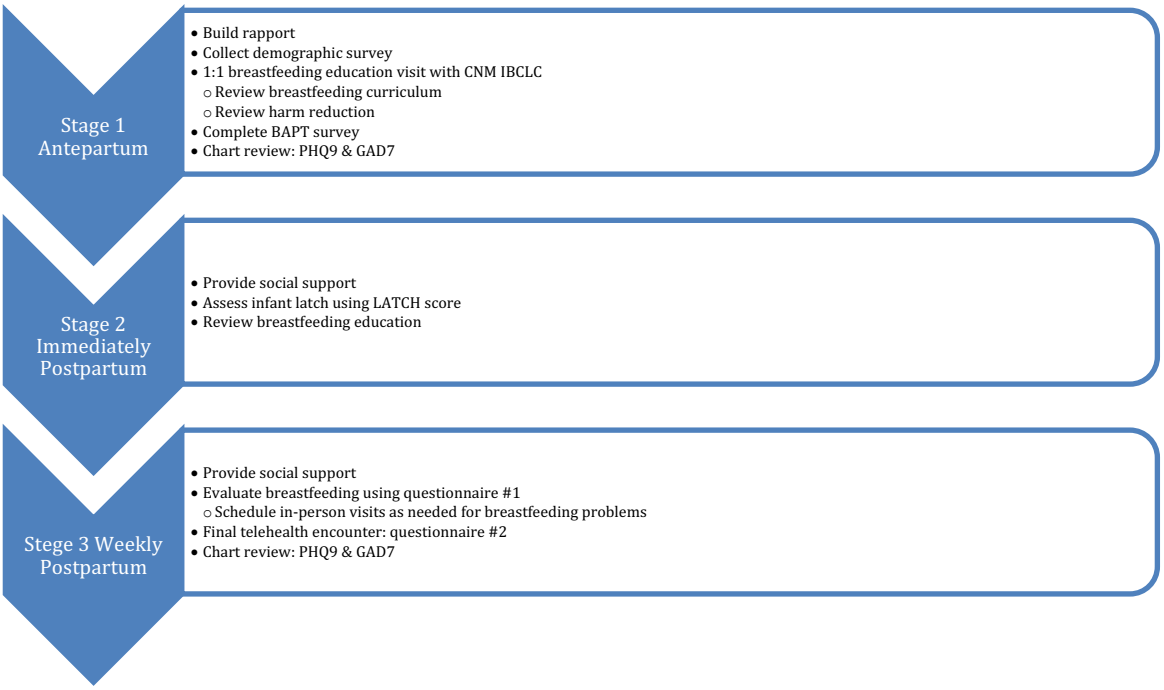
Appendix H

Intervention Bundle



References

Abrams, S. & Duggan, C. (2022). Infant and child formula shortages: Now is the time to prevent recurrences. *The American Journal of Clinical Nutrition, 116 (1)*. https://doi.org/10.1093/ajcn/nqac149

American Association of College of Nursing (AACN) (2006). *Essentials of doctoral education for advanced nursing education*. Retrieved from https://www.aacnnursing.org/Portals/42/Publications/DNPEssentials.pdf

Arpey, N., Gaglioti, A., & Rosenbaum, M. (2017). How socioeconomic status affects patient perceptions of health care: A qualitative study. *Journal of Primary Care & Community Health*, *8*(3), 169–175. https://doi.org/10.1177/2150131917697439

Bartholomew, M. & Lee, M. (2019). Substance use in the breastfeeding woman. *Contemporary Obstetrics and Gynecology*, *64*(9), 22–42. https://www.contemporaryobgyn.net/view/substance-use-breastfeeding-woman

Bartick, M., Schwarz, E., Green, B., Jegier, B., Reinhold, A., Colaizy, T., Bogen, D., Schaefer, A., & Stuebe, A. (2017). Suboptimal breastfeeding in the United States: Maternal and pediatric health outcomes and costs. *Maternal & Child Nutrition*, 13(1), e12366. https://doi.org/10.1111/mcn.12366

Bernardo, H., Cesar, V. (2013). *Long-term effects of breastfeeding: A systematic review*. World Health Organization. https://apps.who.int/iris/bitstream/handle/10665/79198/9789241505307_eng.pdf?sequence=1&isAllowed=y

Blixt, I., Johansson, M., Hildingsson, I., Papoutsi, Z., & Rubertsson, C. (2019). Women's advice to healthcare professionals regarding breastfeeding: "Offer sensitive individualized breastfeeding support"- An interview study. *International Breastfeeding Journal*, *14*(1), 51–51. https://doi.org/10.1186/s13006-019-0247-4

Brown, A. (2017). Breastfeeding as a public health responsibility: A review of the evidence. *Journal of Human Nutrition and Dietetics*, *30*(6), 759–770. https://doi.org/10.1111/jhn.12496

Butts, J., & Rich, K. (2018). *Philosophies and theories for advanced nursing practice* (3rd ed.). Jones and Bartlett Learning.

Centers for Disease Control and Prevention [CDC] (2018). Building U.S. capacity to review and prevent maternal deaths: Report from nine maternal mortality review committees. Retrieved from http://reviewtoaction.org/Report_from_Nine_MMRCs

Chiang, Li, R., Anstey, E. H., & Perrine, C. G. (2021). Racial and ethnic disparities in breastfeeding initiation ─ United States, 2019. *Morbidity and Mortality Weekly Report*, 70(21), 769–774. https://doi.org/10.15585/mmwr.mm7021a1

Chomchai, S., Phuditshinnapatra, J., Mekavuthikul, P., & Chomchai, C. (2019). Effects of unconventional recreational drug use in pregnancy. *Seminars in Fetal & Neonatal Medicine*, *24*(2), 142–148. https://doi.org/10.1016/j.siny.2019.01.010

Chowdhury, R., Sinha, B., Sankar, M. J., Taneja, S., Bhandari, N., Rollins, N., Bahl, R., & Martines, J. (2015). Breastfeeding and maternal health outcomes: A systematic review and meta-analysis. *ACTA PAEDIATRICA*, *104* (S467), 96–113. https://doi.org/10.1111/apa.13102

Chrzan-Dętkoś, M., Walczak-Kozłowska, T., Pietkiewicz, A., & Żołnowska, J. (2021). Improvement of the breastfeeding self-efficacy and postpartum mental health after lactation consultations – Observational study. *Midwifery,* 94, 102905–102905. https://doi.org/10.1016/j.midw.2020.102905

Comprehensive Perinatal Services Program [CPSP] (2017). *Billing code handout Los Angeles County SPSP Rev. 8/24/2017.* http://publichealth.lacounty.gov/mch/cpsp/forms/2022/Billing%20Codes%20Handout.pdf

Cook, K. & Larson, K. (2019). Breastworks: Breastfeeding practices among women with substance use disorder. *Applied Nursing Research*, *47*, 41–45. https://doi.org/10.1016/j.apnr.2019.04.006

Dagla, M., Mrvoljak-Theodoropoulou, I., Vogiatzoglou, M., Giamalidou, A., Tsolaridou, E., Mavrou, M., Dagla, C., & Antoniou, E. (2021). Association between breastfeeding duration and long-term midwifery-led support and psychosocial support: Outcomes from a Greek non-randomized controlled perinatal health intervention. *International Journal of Environmental Research and Public Health*, *18*(4), 1-17. https://doi.org/10.3390/ijerph18041988

Daoud, N. & O'Campo, P., Minh, A. et al. *(2014).* Patterns of social inequalities across pregnancy and birth outcomes: A comparison of individual and neighborhood socioeconomic measures. *BMC Pregnancy Childbirth, 14***,** 393. https://doi.org/10.1186/s12884-014-0393-z

Davanzo, R. (2018). Controversies in Breastfeeding. *Frontiers in Pediatrics*, *6*, 278–278. https://doi.org/10.3389/fped.2018.00278

Denny, C., Acero, C., Terplan, M., & Kim, S. (2020). Trends in alcohol use among pregnant women in the U.S., 2011-2018. *American Journal of Preventive Medicine*, *59*(5), 768–769. https://doi.org/10.1016/j.amepre.2020.05.017

de Bocanegra, H., Braughton, M., Bradsberry, M., Howell, M., Logan, J., & Schwarz, E. (2017). Racial and ethnic disparities in postpartum care and contraception in California's Medicaid program. *American Journal of Obstetrics and Gynecology*, *217*(1), 47.e1–47.e7. https://doi.org/10.1016/j.ajog.2017.02.040

Eidelman, A. Schanler, R.., Johnston, M., Landers, S., Noble, L., Szucs, K., Viehmann, L., Feldman-Winter, L., Lawrence, R., Kim, S., & Onyema, N. (2012). Breastfeeding and the use of human milk. *Pediatrics*, *129*(3), 827–841. https://doi.org/10.1542/peds.2011-3552

Forray, A., Merry, B., Lin, H., Ruger, J., & Yonkers, K. (2015). Perinatal substance use: A prospective evaluation of abstinence and relapse. *Drug and Alcohol Dependence*, *150*, 147–155. https://doi.org/10.1016/j.drugalcdep.2015.02.027

Flora, K. & Blandthorn, J. (2018). A midwifery case management model for women with complex substance use in pregnancy. *Women and Birth: Journal of the Australian College of Midwives,* 31, S8–S9. https://doi.org/10.1016/j.wombi.2018.08.034

Frazer, Z., McConnell, K., & Jansson, L. (2019). Treatment for substance use disorders in pregnant women: Motivators and barriers. *Drug and Alcohol Dependence*, *205*, 107652–107652. https://doi.org/10.1016/j.drugalcdep.2019.107652

Gavin, A., Nurius, P., & Logan-Greene, P. (2012). Mediators of adverse birth outcomes among socially disadvantaged women. *Journal of Women's Health, 21*(6), 634–642. https://doi.org/10.1089/jwh.2011.2766

Glassman, M., Blanchet, K., Andresen, J., Lewis, R., & Rosenthal, S. (2022). Impact of breastfeeding support services on mothers' breastfeeding experiences when provided by an MD/IBCLC in the pediatric medical home. *Clinical Pediatrics*, 61(5-6), 418–427. https://doi.org/10.1177/00099228221086375

Glei, D., Preston, S., Silva, J. (2020). Estimating the impact of drug use on US mortality, 1999-2016. *Public Library of Science ONE*, 15(1), e0226732–e0226732. https://doi.org/10.1371/journal.pone.0226732

Goldberg, A. & Blaauw, E. (2019). Parental substance use disorder and child abuse: Risk factors for child maltreatment? *Psychiatry, Psychology, and Law*, *26*(6): 959–69. https://doi.org/10.1080/13218719.2019.1664277.

Goldman-Mellor, S. & Margerison, C. (2019). Maternal drug-related death and suicide are leading causes of postpartum death in California. *American Journal of Obstetrics and Gynecology*, *221*(5), 489.e1–489.e9. https://doi.org/10.1016/j.ajog.2019.05.045

Graham, G. (2016). Why your ZIP code matters more than your genetic code: Promoting healthy outcomes from mother to child. *Breastfeeding Medicine*, *11*, 396–397. https://doi.org/10.1089/bfm.2016.0113

Haase, B., Brennan, E., & Wagner, C. (2019). Effectiveness of the IBCLC: Have we made an impact on the care of breastfeeding families over the past decade? *Journal of Human Lactation*, 35(3), 441–452. https://doi.org/10.1177/0890334419851805

Haddaway, N., Page, M. J., Pritchard, C. C., & McGuinness, L. A. (2022). PRISMA2020: An R package and Shiny app for producing PRISMA 2020-compliant flow diagrams, with interactivity for optimised digital transparency and Open Synthesis. *Campbell Systematic Review*, *18*(2). https://doi.org/10.1002/cl2.1230

Hansen, A., Akomolafe, T., McGalliard, Z., Belle-Isle, L., & Zhang, J. (2018). Striving to meet Healthy People 2020 Objectives: Trend analysis of maternal smoking. *Public Health Reports (1974)*, *133*(6), 644–649. https://doi.org/10.1177/0033354918793120

Harris, M. Joseph, K., Hoeppner, B., Wachman, E. M., Gray, J. R., Saia, K., Wakeman, S., Bair-Merritt, M., & Schiff, D. (2020). A retrospective cohort study examining the utility of perinatal urine toxicology testing to guide breastfeeding initiation. *Journal of Addiction Medicine*, *15*(4), 311–317. https://doi.org/10.1097/ADM.0000000000000761

Holla-Bhar, R., Iellamo, A., Gupta, A., Smith, J., & Dadhich, J. (2015). Investing in breastfeeding: The World Breastfeeding Costing Initiative. *International Breastfeeding Journal*, 10(1), 8–8. https://doi.org/10.1186/s13006-015-0032-y

Jiang, J. (2021). Racial and ethnic disparities in breastfeeding practices and the impact of interventions in a low-income population in Los Angeles County. University of California, Los Angeles.

Kane, C. & Topmiller, M. (2022). Expanding opioid use disorder treatment in priority areas: The role of Certified Nurse-Midwives. *Journal of Midwifery & Women's Health*, 67(3), 314–320. https://doi.org/10.1111/jmwh.13364

Koloroutis, M. (2004). *Relationship-based care: a model for transforming practice*. Springer Publishing Company.

Louis-Jacques, A., Wilson, R., Dean, K., Hernandez, I., Spatz, D., & Običan, S. (2020). Improving drug exposure knowledge during lactation: Quality improvement initiative in low-income women. *Breastfeeding Medicine*, *15*(3), 14–146. https://doi.org/10.1089/bfm.2019.0222

MacVicar, S., Humphrey, T., & Forbes-McKay, K. (2018). Breastfeeding and the substance-exposed mother and baby. *Birth,* 45(4), 450–458. https://doi.org/10.1111/birt.12338

McGuinness, D., Paul, G., Murtagh, R., & O'Hagan, L. (2020). A service evaluation of a hospital-based specialist postnatal breastfeeding clinic. *British Journal of Midwifery*, *28*(11), 762–767. https://doi.org/10.12968/bjom.2020.28.11.762

National Institute on Drug Abuse (NIDA) (2022). Substance use while pregnant and breastfeeding. Retrieved from https://nida.nih.gov/publications/research-reports/substance-use-in-women/substance-use-while-pregnant-breastfeeding

Orton, S., Coleman, T., Coleman-Haynes, T., & Ussher, M. (2018). Predictors of postpartum return to smoking: A systematic review. *Nicotine & Tobacco Research*, *20*(6), 665–673. https://doi.org/10.1093/ntr/ntx163

Page, M., McKenzie, J., Bossuyt, P., Boutron, I., Hoffmann, T., Mulrow, C., et al. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. BMJ; 372:n71. doi: 10.1136/bmj.n71.

Peltier, M., Roberts, W., Verplaetse, T. L., Burke, C., Zakiniaeiz, Y., Moore, K., & McKee, S. (2022). Licit and illicit drug use across trimesters in pregnant women endorsing past-year substance use: Results from National Survey on Drug Use and Health (2009–2019). *Archives of Women's Mental Health*, *25*(4), 819–827. https://doi.org/10.1007/s00737-022-01244-6

Pentecost, R., Latendresse, G., & Smid, M. (2021). Scoping review of the associations between perinatal substance use and perinatal depression and anxiety. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *50*(4), 382–391. https://doi.org/10.1016/j.jogn.2021.02.008

Pezley, L., Tussing-Humphreys, L., Koenig, M. D., Maki, P., Odoms-Young, A., Freels, S., DiPiazza, B., Cann, F., Cares, K., Depa, C., Klejka, G., Lima Oliveira, M., Prough, J., Roe, T., Buscemi, J., & Duffecy, J. (2022). Feasibility of a web-based intervention to prevent perinatal depression and promote human milk feeding: Randomized pilot trial. *JMIR Formative Research*, *6*(5), e32226–e32226. https://doi.org/10.2196/32226

Polk, S., Edwardson, J., Lawson, S., Valenzuela, D., Hobbins, E., Prichett, L., & Bennett, W. (2021). Bridging the postpartum gap: A randomized controlled trial to improve postpartum visit attendance among low-income women with limited English proficiency. *Women's Health Reports, 2*(1), 381–388. https://doi.org/10.1089/whr.2020.0123

Ranchoff, B., & Declercq, E. (2020). The scope of midwifery practice regulations and the availability of the Certified Nurse-Midwifery and Certified Midwifery Workforce, 2012-2016. *Journal of Midwifery & Women's Health*, *65*(1), 119–130. https://doi.org/10.1111/jmwh.13007

Reid, E. & McStay, P. (2018). Development of an alcohol liaison midwifery service in a health Trust in Northern Ireland. *British Journal of Midwifery,* 26(3), 158–163. https://doi.org/10.12968/bjom.2018.26.3.158

Rollins, N., Bhandari, N., Hajeebhoy, N., Horton, S., Lutter, C., Martines, J., Piwoz, E., Richter, L., & Victora, C. (2016). Why invest, and what it will take to improve breastfeeding practices? *The Lancet,* 387(10017), 491–504. https://doi.org/10.1016/S0140-6736(15)01044-2

Sacks, E., Finlayson, K., Brizuela, V., Crossland, N., Ziegler, D., Sauvé, C., Langlois, É. V., Javadi, D., Downe, S., & Bonet, M. (2022). Factors that influence uptake of routine

postnatal care: Findings on women's perspectives from a qualitative evidence synthesis. *Public Library of Science One*, *17*(8), e0270264. https://doi.org/10.1371/journal.pone.0270264

Samawi, L., Williams, P., Myers, B., & Fuhr, D. (2021). Effectiveness of psychological interventions to reduce alcohol consumption among pregnant and postpartum women: A systematic review. *Archives of Women's Mental Health*, *24*(4), 557–568. https://doi.org/10.1007/s00737-020-01100-5

Shogren, M. (2020). Midwives uniquely suited to deliver woman-centered care and decrease stigma for women with substance use disorders. *Canadian Journal of Nursing Research*, 52(3), 194–198. https://doi.org/10.1177/0844562120931663

Simmons, E. & Austin, A. (2022). Association of prenatal substance use with prenatal and postpartum care: Evidence from the Pregnancy Risk Assessment Monitoring System, 2016–2019. *Preventive Medicine*, *159*, 107065–107065. https://doi.org/10.1016/j.ypmed.2022.107065

van Dellen, S., Wisse, B., Mobach, M., Dijkstra, A. (2019). The effect of a breastfeeding support programme on breastfeeding duration and exclusivity: A quasi-experiment. *BMC Public Health*, 19, 993. https://doi.org/10.1186/s12889-019-7331-y

Walters, D., Phan, L., & Mathisen, R. (2019). The cost of not breastfeeding: Global results from a new tool. *Health Policy and Planning*, *34*(6), 407–417. https://doi.org/10.1093/heapol/czz050

Wendell, A. (2013). Overview and epidemiology of substance abuse in pregnancy. *Clinical Obstetrics and Gynecology*, *56*(1), 91–96. https://doi.org/10.1097/GRF.0b013e31827feeb9

Whitehead, R., O'Callaghan, F., Gamble, J., & Reid, N. (2019). Contextual influences experienced by Queensland midwives: A qualitative study focusing on alcohol and other substance use during pregnancy. *International Journal of Childbirth*, *9*(2), 80–91. https://doi.org/10.1891/2156-5287.9.2.80

Witt, R., Vatti, T., Lasko, L., & Witt, A. (2021). Team-based breastfeeding support at a Federally Qualified Health Center: Efficacy, utilization, and patient satisfaction. *Breastfeeding Medicine*, 16(9), 741–749. https://doi.org/10.1089/bfm.2021.0009

Wong, Ordean, A., Kahan, M., Gagnon, R., Hudon, L., Basso, M., Bos, H., Crane, J., Davies, G., Delisle, M., Farine, D., Menticoglou, S., Mundle, W., Murphy-Kaulbeck, L., Ouellet, A., Pressey, T., Roggensack, A., Sanderson, F., Ehman, W., … de la Ronde, S. (2011). Substance use in pregnancy. *Journal of Obstetrics and Gynaecology Canada*, *33*(4), 367–384. https://doi.org/10.1016/S1701-2163(16)34855-1

Wouk, K., Chetwynd, E., Vitaglione, T., & Sullivan, C. (2016). Improving access to medical lactation support and counseling: Building the case for Medicaid reimbursement. *Maternal and Child Health Journal*, 21(4), 836–844. https://doi.org/10.1007/s10995-016-2175-x

Wu, H., Wu, R., Brownell, E., Oncken, C., & Grady, J. (2020). Stress and Drug Use from Prepregnancy, during pregnancy, to postpartum. *Journal of Racial and Ethnic Health Disparities*, *8*(2), 454–462. https://doi.org/10.1007/s40615-020-00802-x

Yonke, N., Maston, R., Weitzen, S., & Leeman, L. (2019). Breastfeeding intention compared with breastfeeding postpartum among women receiving medication-assisted treatment. *Journal of Human Lactation*, *35*(1), 71–79. https://doi.org/10.1177/0890334418769637

Young-Wolff, K., Tucker, L., Armstrong, M., Conway, A., Weisner, C., & Goler, N. (2020). Correlates of pregnant women's participation in a substance use assessment and counseling intervention integrated into prenatal care. *Maternal and Child Health Journal*, *24* (4), 423–431. https://doi.org/10.1007/s10995-020-02897-4