

Early Screening for Perinatal Depression in Pittsburgh, Pennsylvania

by

Stephanie Renae Hartos

BA in Sociology, Kent State University, 2018

Submitted to the Graduate Faculty of the
Graduate School of Public Health in partial fulfillment
of the requirements for the degree of
Master of Public Health

University of Pittsburgh

2020

UNIVERSITY OF PITTSBURGH

GRADUATE SCHOOL OF PUBLIC HEALTH

This thesis was presented

by

Stephanie Renae Hartos, MPH

It was defended on

December 4, 2020

and approved by

Judy Chang, MD, MPH, Departments of Obstetrics, Gynecology, and Reproductive Sciences and
Internal Medicine

Marian Jarlenski, PhD, MPH, Health Policy and Management

Thesis Advisor/Chair: Martha Ann Terry, PhD, Behavioral and Community Health Sciences

Copyright © by Stephanie Hartos

2020

Early Screening for Perinatal Depression in Pittsburgh, Pennsylvania

Stephanie Renae Hartos, MPH

University of Pittsburgh, 2020

Perinatal depression is a severe mental disorder that is greatly underdiagnosed and rarely treated in the United States. There are five main forms of perinatal depression: baby blues, postpartum depression, postpartum anxiety, postpartum panic disorder, and postpartum psychosis. Tools have been created to help obstetric providers screen for potential depressive symptoms in pregnant and postpartum women, but these are not used as often as recommended by the American College of Obstetrics and Gynecologists. This study, utilizing data collected by University of Pittsburgh Medical Center Magee-Womens Research Hospital in Pittsburgh, Pennsylvania, from 2011-2015, analyzes audio recordings of the first comprehensive visit for pregnant women. The primary goals of this study are to determine if providers are asking women about their mental health history and educating their patients on perinatal and postpartum depression, and if patients are disclosing current or previous mental illness to their providers. This study found that most patients are not being properly screened by providers for depressive symptoms and are rarely being educated on the risks of perinatal and postpartum depression. Universal standards need to be established for all women to receive ample screening, education, and treatment for all forms of maternal depression.

Table of Contents

Preface.....	vii
1.0 Introduction.....	1
2.0 Overview of Perinatal Depression	5
2.1 Health Outcomes for Women who Experience Perinatal Depression	9
2.1.1 Impacts of Perinatal Depression on the Family	11
3.0 Methods.....	16
3.1 Data Selection.....	17
3.1.1 Participants.....	18
3.1.1.1 Data Analysis.....	19
4.0 Results	21
5.0 Discussion.....	28
5.1 Prevalence	29
5.1.1 Recommendations	30
6.0 Conclusions.....	35
6.1 Limitations	36
6.1.1 Implications	37
Appendix A	39
Bibliography	40

List of Tables

Table 1: Patient Information 21

Table 2: Data collected from patients who received PPD information..... 23

Table 3: EPDS Findings and Likelihood of Depression 25

Table 4: Data collected from 80 T2P2 audio recordings and transcripts 39

Preface

This project is supported by the Health Resources and Services Administration (HRSA) of the United States Department of Health and Human Services (HHS) under grant number 1 UB6HP31689-01-00 “Public Health Training Centers” for \$3,699,596. The content and conclusions are those of the author and should not be construed as the official position or policy of, nor should any endorsements be inferred by HRSA, HHS or the U.S. Government. Data for this project’s analysis came from a study funded by that National Institutes of Drug Abuse and the Pennsylvania Department of Health.

I would like to thank my research team, Abisola Olaniyan, PhDc and Anna Patterson, RN, BSN, MPHc, for their hard work and dedication that made this research possible. I would also like to thank Dr. Judy Chang and Dr. Simone Taubenberger for providing me with incredible knowledge and guidance on this project, as well as allowing me to utilize their data.

Finally, I would like to thank my incredible partner, Daniel Arndt, for always believing in me and giving me the strength I need to succeed. My mother, Caroline Hartos, and my two cats, Ella and Zuzu, thank you for all the hugs and support, I could not do this work without you.

1.0 Introduction

Perinatal depression is defined by the National Institute of Mental Health as a mood disorder that can affect women both during and after their pregnancy ("Perinatal Depression," 2020). Depression that occurs after newborn delivery is often referred to as postpartum depression, or PPD. Approximately 12-20% of all mothers suffer from symptoms of perinatal and postpartum depression within the first year of delivery (Avalos et al., 2016). These statistics are not precise as research has found that over half of all women who are afflicted with PPD are never diagnosed, and those who are diagnosed rarely receive any form of treatment (Zauderer, 2009).

This paper presents a review of literature on the various forms of perinatal depression, as well as research conducted on the physiological effects and repercussions of related mental illnesses. Research has found that perinatal and postpartum depression are more likely to occur and have prolonged severity in women with low socioeconomic status, less education, and a history of mental illness. Age, race, and financial resources also play a significant role in whether women are properly diagnosed and treated for their mental illness in the United States (U.S.) (Ghaedrahmati et al., 2017).

Perinatal depression can impact women for years after giving birth. Mothers who experience long-term symptoms are at a higher risk for experiencing mental and physical conditions that can negatively impact their quality of life. These mothers tend to report having fewer social interactions, poor relationships with family members and friends, and are more likely to develop additional mental illnesses and chronic health conditions (Groer & Morgan, 2007; Muzik & Borovska, 2010).

Perinatal and postpartum depression not only impact new mothers, but the partners and children of these mothers as well. When mothers experience depression during their pregnancy, they are more likely to give birth prematurely and have a baby that is born underweight or with other medical complications (Muzik & Borovska, 2010). Children raised by depressed mothers are also at a greater risk for developing their own mental illnesses and behavioral issues, as well as experiencing intellectual difficulties (Groer & Morgan, 2007; "Maternal depression and child development," 2004).

Male partners of women with PPD were found to be 2.5 times more likely to develop paternal depression once their partner begins displaying symptoms (Matthey et al., 2000). Relationships involving two partners who are experiencing depressive symptoms tend to have more difficulties, conflicts, and a perceived increase in burden in regard to caring for the child (Johansson et al., 2020; Roux et al., 2002).

The paper then describes findings from an analysis of data collected through UPMC Magee-Womens Research Hospital from 2011-2015 at the first comprehensive visit a woman had with her obstetric care provider (Chang et al., 2017). This data included audio-recorded first obstetric visit conversations between pregnant patients and their obstetric care providers, as well as medical record abstraction from the pregnancy care records. A mixed-methods approach was taken; we used qualitative coding to describe and categorize mental health conversations and then performed quantitative analyses to explore associations between communication approaches and patient-provider characteristics and pregnancy outcomes. Our team studied these visits by coding the transcripts and organizing our analysis in the program NVIVO.

The participant pool consisted of 80 pregnant women who were visiting their obstetric care provider for the first time. We also studied the providers themselves to understand how

communication methods and rapport building skills impact the conversations surrounding mental health in pregnancy. Our providers were divided up by their clinical specialties: physicians, nurse practitioners, and nurse midwives. All participants were asked comprehensive health history questions by their providers and given a physical exam. Our study explored how often providers asked their patients about their mental health history to determine if certain provider types were more or less likely to initiate this conversation with their patients.

The American College of Obstetricians and Gynecologists (ACOG) strongly recommends that all women be screened for depressive symptoms by their providers at the first obstetric care visit (ACOG, 2018). Contrary to these guidelines, this study found that most participants were not being asked about their mental health history by their providers. Providers at these clinics were supposed to administer the Edinburgh Pre/Postnatal Depression Scale (EPDS) at the first visit to determine depression risk, yet only 55 of the 80 participants had these results recorded in their medical charts.

The EPDS consists of 10 questions designed to detect minor, moderate, or severe levels of depressive symptoms in patients. If a patient scored less than an 8 on the EPDS, depression was deemed to be not likely. The highest score a patient could get was a 30 (Chang et al., 2017). A score between 9 and 11 showed possible depression, 12-13 determined a fairly high probability of depression, and 14 and above demonstrated probable depression. Current standards are that all patients should be educated on perinatal and postpartum depression, regardless of their score, but those who scored higher on the scale are deemed to be more at risk ("ACOG Committee Opinion No. 757: Screening for Perinatal Depression," 2018; Chaudron et al., 2010).

This study found that most patients were not being properly screened for depressive symptoms by their providers. Only nine of the 80 participants were given an opportunity to engage

in a discussion about maternal depression, meaning that women from this study were not being properly educated on mental health in pregnancy.

2.0 Overview of Perinatal Depression

The term “perinatal depression” encompasses depression that is experienced during pregnancy, as well as depression that arises after delivery, referred to as postpartum depression (PPD). PPD can also be broken down into various categories such as “baby blues,” which affects up to 75% of new mothers after the first two weeks of delivery. Baby blues are a mild mood disorder and while it is considered normal after delivery, 25% of women who experience baby blues develop more intense depressive symptoms that follow them well after the first few weeks of motherhood (Thurgood et al., 2009).

PPD and postpartum anxiety are severe mood disorders that can be attributed to drastic hormone changes and can present through feelings of excessive guilt or sadness, lack of interest in the child, changes in appetite, hopelessness, and lack of pleasure in once enjoyable activities. More severe forms of PPD can lead to postpartum obsessive-compulsive disorder, panic disorder, and psychosis. These are less common but can be extremely dangerous for the well-being of the mother, the baby, and the family itself. Postpartum obsessive-compulsive disorder has an incidence rate between 4 and 11%, with the highest number of cases being found two weeks after delivery (House et al., 2016).

Postpartum panic disorder is thought to afflict approximately 10% of all new mothers, yet current data may underrepresent women of all racial, ethnic, and financial backgrounds. This disorder in particular receives little attention because new mothers are often taught that they will naturally be more nervous after they become a parent, and many serious symptoms that can lead to postpartum psychosis are ignored. Postpartum psychosis has a 5% suicide and 4% infanticide rate, and while it occurs after only .002% of deliveries, maternal suicide is now the leading cause

of maternal mortality in the U.S. and screenings for this level of PPD are often inadequate (Zauderer, 2009).

Prior to 2006, most research on perinatal depression focused on the idea that maternal depression developed and was present in the postpartum period, while more recent research has shown that it may not be as simple as once thought. It may be true for a percentage of women that the trauma of delivery, extreme hormone changes, fatigue, and other significant factors cause an onset of depression after delivery, but recent data have shown that the majority of women diagnosed with PPD experienced depressive symptoms while still pregnant (Wilcox et al., 2020).

A study by Wilcox et al. (2020) followed 1179 pregnant women in the U.S. in a longitudinal study analyzing the effects that pregnancy had on the mental health and the overall well-being of women in the healthcare system. This study used the Edinburgh Postnatal Depression Scale (EPDS), an instrument used to recognize depressive symptoms in perinatal and postpartum women, to assess the level of depression experienced by the women both during and after their pregnancy. This study found that 80% of all cases of perinatal depressive symptoms occurred during pregnancy, and 1/3 of those women experienced the symptoms in the first trimester (Wilcox et al., 2020). Twenty seven percent of all women included in this study experienced depression at some point either during or after their pregnancy, while only 11% of these women screened positive at the baseline assessment.

Another longitudinal study (Pop et al., 2019) conducted in the Netherlands over a 25-year period, sought to find if perinatal depression had been increasing, decreasing, or remaining stagnant over time. The participants in this study were also screened with the EPDS and were split into four cohorts. From 1988 to 2014, the percentage of women who completed higher education jumped from 23 to 66%, the percentage of women actively working rose from 75 to 95%, and

smoking and alcohol usage had decreased in a similarly significant fashion. Even with these perceived positive changes in social and economic factors of human health, the number of women who screened positive for perinatal depression doubled from 7 to 14% over the last two decades. Protective factors for pregnancy, such as economic stability and lower rates of substance use, increased significantly over the course of the study, yet diagnoses of PPD were increasing (Pop et al., 2019).

Perinatal depression is the most common complication seen in pregnancy and childbirth, and it is likely that current statistics on this subject are not accurate. More than half of all cases of PPD in the U.S. go undiagnosed due to a variety of factors such as misunderstandings of the disorder itself, inaccurate or untimely screenings completed by medical providers, and the stigma surrounding mental health and motherhood (Zauderer, 2009). Two studies conducted over the past decade (Edge, 2010; Kozhimannil et al., 2013) found that some new mothers are unwilling to disclose depressive symptoms to providers or even family members due to the conventional idea that motherhood is supposed to be joyous, and feelings of disconnectedness, sadness, and the desire to self-harm make you a “bad mother.”

Perinatal depression can affect women of all ages and races, yet there is a difference in the level of diagnosis and treatment for PPD among women of color (Edge, 2010). A 2013 retrospective cohort study conducted in the New Jersey Medicaid program analyzed the disparities in PPD diagnosis and treatment between white women and women of color. This study determined that rates of PPD do not vary between different races; 8% of all women, regardless of race, screened positive for major depressive disorders and 23% for all depressive disorders within the first three months of motherhood (Kozhimannil et al., 2013). The differences, however, are in rates of detection and treatment. Kozhimannil et al. (2013) hypothesized that lower rates of detection

and treatment among women of color are linked to different expectations of motherhood and the acceptability of mental health treatment within the culture and family unit. A difference was also found between white women and women of color in risk factors (Kozhimannil et al., 2013).

Risk factors for perinatal depression are low socioeconomic status, poor access to health care, being single, previous history of depression or mental illness, financial instability, high-risk pregnancy and difficult delivery among others. Age has also been found to be a risk factor for perinatal depression as metabolic rate, serotonin and tryptophan development are all linked to increased cases of PPD and these biological responses decrease as we age (Ghaedrahmati et al., 2017). Due to racial inequality and systemic racism built into healthcare, housing, and economic systems that determine quality of life in the U.S., women of color are already more likely to be predisposed to risk factors, increasing their chances of developing perinatal depression as well as other life-threatening disorders associated with pregnancy and delivery.

While the researchers in the Kozhimannil et al. (2013) study determined that the prevalence of PPD among women of different racial and ethnic backgrounds is the same, they reported significantly different statistics surrounding the initiation and length of care. The vast majority of the women in their study did not receive the services and level of care that they needed, and those numbers were disproportionately higher for the black and Latina women. The black and Latina participants were less likely to initiate conversations around mental health with their providers, and the white participants were twice as likely to start any kind of treatment. For the women of color who did initiate discussions about depression with their providers, the time it took to receive any kind of care or treatment was significantly longer than for their white counterparts. The black and Latina participants who received care were less likely to have follow-up or

prolonged treatment, and the researchers found that there was also a difference in the type of care being given.

White participants were more likely to receive antidepressant medication while black and Latina participants often received only outpatient counseling. Barriers to care for minority women included stigma, lack of proper communication on behalf of the provider, and logistical issues such as transportation availability and access to childcare (Kozhimannil et al., 2013). Racism and provider bias in the healthcare system greatly contribute to the immense disparities seen in all aspects of minority health. Increased risk factors and decreased levels of treatment impact not only the mother, but all members of the family as well.

2.1 Health Outcomes for Women who Experience Perinatal Depression

Women experiencing any form of perinatal depression typically suffer from various detrimental symptoms that can affect their lives for as little as a few weeks up to a year. These symptoms do not always go away once the postpartum period is over. Recent research has shown that adverse effects of perinatal and postpartum depression can continue following the mother years after her pregnancy and birth. A 2018 study published by the World Health Organization sought to determine the effects of PPD on the mental and physical health of women diagnosed with this condition four years after they had given birth. The tool used for depression screening was the EPDS and women were screened three times: during pregnancy, at 12 weeks postpartum, and again four years later. The average age of participants in this study was approximately 30 years old and a total of 671 out of the original 691 participants completed all of the needed information and follow-up (Abdollahi & Zarghami, 2018). The results of this study were that women who

previously screened positive for perinatal depression screened positive for current depression three times more than those who did not. Women who were previously afflicted with perinatal depression experienced psychological distress at a 2.3 times higher rate than those who did not experience depression during or after pregnancy (Abdollahi & Zarghami, 2018).

A systematic review published in the *Women's Health Journal* analyzed the adverse effects of PPD on relationships with the partner and other members of the woman's social network (Slomian et al., 2019). The researchers found that women who experienced perinatal depression had overall more relationship difficulties and fewer social interactions than women who did not experience depression in early motherhood. Depressed mothers also reported lower levels of social support and were less likely to reach out to loved ones if they were in need (Slomian et al., 2019).

There has been a surge of recent research looking at whether PPD can impact women on a physical and chronic health level as well. A study (Groer & Morgan, 2007) sought to determine if there was a connection between PPD and immune system response. The researchers excluded women from the study who were previously diagnosed with depression to limit confounding factors.

The participants with PPD had significantly lower levels of cortisol in their saliva; cortisol is a stress hormone that increases sugar levels in the blood stream and assists in tissue repair (Mayo Clinic, 2019). Depressed participants also reported more than twice as high levels of fatigue, high levels of daytime sleepiness, and more frequent symptoms of infection in the four to six weeks after their baby had been born (Groer & Morgan, 2007). Depressed mothers in this study were less likely to breastfeed (32%) compared to 55% of non-depressed mothers. Participants with depression also had lower serum-prolactin levels, meaning they may have had difficulty producing milk for their child (Groer & Morgan, 2007).

Perinatal and postpartum depression impact the mother in a multitude of ways, and researchers have just begun to scratch the surface of what the long-term effects can be. Mothers with depression are more likely to smoke cigarettes and use illicit substances, which can contribute to a possible increase in risk for developing chronic illnesses later in life (Bezruczyk, 2019). Negative outcomes do not shape just the mother, but the child and the whole family as well. Mothers with PPD are less likely to provide routine and preventative care for their children, and consequences of this, among many other developmental complications, can impact the child throughout the lifespan in drastic ways (Groer & Morgan, 2007, Muzik & Borovska, 2010).

2.1.1 Impacts of Perinatal Depression on the Family

Perinatal and postpartum depression not only impact the mother, but also can lead to adverse outcomes experienced by the child and other family members as well. If the mother is experiencing depression during her pregnancy, the infant is at a higher risk of being born premature and underdeveloped (Muzik & Borovska, 2010).

Infants who are born to mothers with depression tend to have lower birth weights and are at a higher risk for undernutrition and growth limitations (Groer & Morgan, 2007). The first six months of an infant's life are extremely important for proper physical, emotional, and psychological development (Abdollahi et al., 2017). New mothers who have debilitating depressive symptoms are less likely to engage and bond with their newborn adequately; this lack of connection can have lifelong consequences for the child (Muzik & Borovska, 2010). When their child is an infant, mothers with depression typically have one of two forms of interactive patterns with the child, intrusive and withdrawn. While both interaction styles impact the infant's

developing coping mechanisms, infants who experience intrusive interactions tend to develop protective and angry coping styles, while infants who experience withdrawn maternal interaction are often unable to properly cope or self-regulate and tend to display their own withdrawn or passive behaviors ("Maternal depression and child development," 2004).

Mothers with depression tend to be less responsive to and interactive with their children; this can lead to behavioral and cognitive developmental issues and delays as the child ages. These children tend to be less mature than others their age and are passively non-compliant ("Maternal depression and child development," 2004). A longitudinal study (Abdollahi et al., 2017) found that women with PPD and chronic depression were significantly more likely to have a child who developed communication disabilities, as well as cognitive developmental delays and difficulty grasping new concepts. Studies have found that boys are more sensitive to the effects of maternal depression than girls (Abdollahi et al., 2017 & "Maternal Depression and Child Development," 2004).

As toddlers, children with depressed mothers tend to display more aggressive and destructive behaviors. They are less likely to engage in play with their peers and can respond negatively to positive interactions ("Maternal Depression and Child Development," 2004). Women who are experiencing depression in the years after childbirth have higher levels of negative mother-child interactions. This has been shown to lead to non-compliance by the child, as well as difficulties regulating and expressing emotions (Dietz et al., 2009).

As the child continues to age and develop, behavioral and psychological impacts of maternal depression become more apparent. School age children with depressed mothers tend to display difficulties with internalizing and externalizing their problems ("Maternal Depression and Child Development," 2004). These children are also more likely to develop psychological

disorders such as depression, anxiety, and conduct disorders (“Maternal Depression and Child Development,” 2004).

As far as academic development, these children have a higher risk of developing attention deficit and hyperactive disorder (ADHD) and tend to have difficulty retaining and demonstrating information learned in an academic setting (Hay et al., 2001; “Maternal Depression and Child Development,” 2004). A longitudinal study (Hay et al., 2001) conducted in South London found that out of 132 students, the children with depressed mothers had on average lower IQ scores, difficulty paying attention, difficulty with mathematical reasoning, and a higher chance of having or developing special educational needs (Hay et al., 2001).

In the adolescent to young adult years, children of depressed mothers are at an increased risk for developing psychological and social complications. Multiple studies have found these teenagers and young adults are at a significantly increased risk for developing major depression, anxiety disorders, conduct issues, and substance abuse problems (“Maternal Depression and Child Development,” 2004; Hirsch et al., 1985). Major depression is most likely to occur between the ages of 15 and 20 for children of depressed mothers; they also have higher than average rates of developing more than one psychological disorder (Beardslee et al., 1992; “Maternal Depression and Child Development,” 2004).

These trends in psychosocial differences and risks persist and can follow the child throughout the lifespan. Women who are pregnant have a greater likelihood of developing maternal depression themselves if their mothers had it, continuing the cycle of devastating illness that is often not discussed within families or medical facilities (Silverman et al., 2017).

A qualitative study published in January of 2020 (Johansson et al., 2020) sought to better understand the lived experiences of PPD among not only mothers, but fathers as well. Paternal

postpartum depression is thought to affect between 4 to 25% of all new fathers, and men are 2.5 times more likely to develop depression if their partner begins displaying symptoms (Matthey et al., 2000). The study found that while one partner being depressed can greatly impact the other, the symptoms and actions of depression present themselves in vastly different ways between the sexes (Johansson et al., 2020).

While both parents with depressive symptoms found themselves feeling ill equipped to care for their child, fathers were more often stressed about external conditions, such as work and finances, and mothers expressed more internal concerns such as childcare, family relationships, and domestic obligations (Johansson et al., 2020). Depression for both sexes was more likely if the woman had a difficult pregnancy or traumatic birth, and many participants noted the lack of resources or coping mechanisms available to them after the traumatic experience occurred (Johansson et al., 2020).

Maternal and paternal depression can lead to strains on a couple's relationship that often present in numerous ways. Lack of communication and quality time can increase the burden on each individual differently; many women in this study became frustrated and angry with their partner for being unavailable to them and the child, yet the fathers often felt they were causing more harm than good and that it would be better to let the mother handle most of the infant care (Johansson et al., 2020). An increase in workload often leads to a decrease in intimacy, which was a point of frustration for many study participants. The mothers were much more likely than the fathers to disclose that they were feeling symptoms of depression, which aligns with societal gender norms regarding men's displaying of emotions (Johansson et al., 2020; Matthey et al., 2000).

While maternal depression has been studied much more than paternal depression, both can have significant impacts on the child, partner, and family. Women with PPD often experience relationship distress and dissatisfaction; lack of proper communication channels and adequate treatment can often cause depressive symptoms to develop into more severe issues (Roux et al., 2002). Perinatal depression, for either parent, can lead to an increase in substance use, risky behavior, marital friction, and even divorce or separation (Johansson et al., 2020; Roux et al., 2002).

Overall, perinatal and postpartum depression can affect more than just the mother. Symptoms and adverse effects can stem from many different sources and spread in a vast number of ways (Johansson et al., 2020). The best strategy to mitigate the impact of perinatal depression on everyone involved is to screen women for depression both during and after pregnancy, as well provide women who screen positive with adequate and scientifically proven treatment options.

3.0 Methods

As is apparent from the aforementioned research, there are multiple gaps regarding the understanding, diagnosis and treatment of perinatal depression for women in our society; there is more research to be done on how these gaps begin and why they continue to exist. ACOG, the leading source of practice guidelines for obstetric care providers in the U.S., has been educating the public and the medical community on perinatal and postpartum depression for decades. In its most recent practice guidelines given to obstetric providers in 2018, it stated this regarding mental health screening in pregnancy:

The American College of Obstetricians and Gynecologists recommends that obstetrician-gynecologists and other obstetric care providers screen patients at least once during the perinatal period for depression and anxiety symptoms using a standardized, validated tool. It is recommended that all obstetrician-gynecologists and other obstetric care providers complete a full assessment of mood and emotional well-being (including screening for postpartum depression and anxiety with a validated instrument) during the comprehensive postpartum visit for each patient. If a patient is screened for depression and anxiety during pregnancy, additional screening should then occur during the comprehensive postpartum visit (ACOG, 2018, p.1).

To evaluate whether providers were following these guidelines given by ACOG and to determine how they were communicating information to their patients, research was conducted. We performed a post-hoc analysis of a subset of data collected in a larger study, Talking to Pregnant Patients (T2P2), that included audio-recorded conversations between pregnant patients and their obstetric care providers during the first obstetric visit, patient and provider demographic

data, and medical record data from the pregnancy records. The data for this original study was collected from 2011 to 2015. This was an NIH funded observational study that looked to better understand patient-provider communication and health outcomes regarding substance use in pregnancy (Chang et al., 2017). The original study's main goal was to "identify communication styles and processes that encourage pregnant, substance-using women to disclose alcohol or illicit drug use and subsequently result in conversations that promote the adoption of positive behaviors" (Olaniyan, 2020, p. 68).

3.1 Data Selection

This current analysis was conducted under the direction of Abisola Olaniyan, a PhD candidate in the Department of Behavioral and Community Health Sciences at the University of Pittsburgh's Graduate School of Public Health, and Dr. Judy Chang, an OBGYN and Associate Professor at the University of Pittsburgh's Medical School in the Department of Obstetrics, Gynecology and Reproductive Sciences. Our team also included Anna Patterson, an MPH student in the Department of Health Policy and Management who is a Registered Nurse. This research team collected information from audio recordings of the first visit by pregnant patients with an obstetric care provider (Chang et al., 2017). These visits had been transcribed with the names of the patients and providers removed to maintain confidentiality. Participating women and their medical providers agreed to partake in the T2P2 study that allowed an audio recording of their first obstetric visit.

Following the first obstetric visit, the patient completed a post-visit questionnaire and an interview with a member of the research team to talk about how they felt their provider handled

the appointment and the topic of substance use in pregnancy. In addition to providing these qualitative data, the research team also collected urine samples from patient participants to test for illegal drugs and substances. The study team then obtained patient medical records and demographic information, selecting 88 women to interview within four weeks of their first visit who met the following requirements: a positive test for any illegal substance in a drug screen, verbal confirmation to their provider that they used substances, and a disclosure of alcohol consumption on the post-appointment questionnaire (Chang et al., 2017; Olaniyan, 2020).

Out of the 88 women who completed an interview, 80 had the necessary comprehensive data file to be included in this analysis: an audio recording of their first prenatal visit, a written transcript of the first prenatal visit, the type of the provider who completed the visit, and the ability to access medical records to obtain further patient information if necessary. These records were also supposed to include a score from the EPDS, the depression screening tool that all providers are to give their patient during their first prenatal visit. Out of the 80 participants who were selected for this study, 25 did not have an EPDS on file, meaning they were likely not screened for depressive symptoms (J. Chang, personal communication, September 3, 2020).

3.1.1 Participants

To qualify for this study, patients had to be pregnant, 18 years of age or older, English speaking, and having their first obstetric appointment for this pregnancy with a participating provider (Chang et al., 2017; Olaniyan, 2020). Providers were eligible to participate if they were seeing the patient for her first obstetric visit for that pregnancy at their current medical facility

(Olaniyan, 2020). These obstetric visits took place and were recorded at five urban outpatient gynecological clinics located in Pittsburgh, Pennsylvania (Chang et al., 2017).

All participants in this study signed informed consent forms for the data collection process that took place between December 2011 and May 2015 (Chang et al., 2019). They were told the study was focusing on patient-provider communication but were not initially informed of the substance use focus as the researchers did not want that knowledge impacting the responses of the patients or the demeanor of the providers. The participant pool was racially diverse and included women from mostly lower socio-economic backgrounds (Olaniyan, 2020).

3.1.1.1 Data Analysis

Our research team coded 80 transcripts of the first obstetric visit and organized this analysis using a software called NVIVO. This coding software allows researchers to conduct mixed-methods analysis effectively, helping the user organize and analyze the text to find patterns, discrepancies, and various other important factors that helped fuel and defend this research (QSR International, 2020). While coding these recordings, we were looking specifically at three main questions:

- Did the provider ask about the patient's mental health history in any capacity?
- Did the provider communicate the risk of perinatal or postpartum depression to the patient?
- Did the patient disclose any current or previous mental illness?

After we listened for this information in the audio recordings and coded the conversation in NVIVO, we documented our findings in an Excel spreadsheet. These findings included a yes/no answer to the three aforementioned research questions as well as the title of the provider.

Once the data were coded, it was important for us to distinguish not only the communication styles displayed by different providers, but also if racial and demographic differences of the patients may have played a role in whether or not they were given information on perinatal depression.

4.0 Results

Our research team coded and analyzed 80 case files looking for discussions between patients and their providers about mental health and perinatal and postpartum depression. Three types of providers participated in this research project: physicians, nurse midwives, and nurse practitioners. We found it was important to include the provider's title in our research findings to determine if there were any differences in how certain providers addressed the topic of mental health and if some providers were more inclined to discuss mental health in pregnancy than others. Patient information such as race and EPDS score were also analyzed, the table below shows a brief summary of those demographics.

Table 1: Patient Information

Patient Race	White: 21	Black: 50	Multiracial: 8	Unreported: 1	Total: 80
EPDS Scores	0-8: 36	9-11: 3	12-14: 5	15+: 11	Total: 55

For the 80 obstetric visits we listened to and coded, 56 of the providers were physicians, 19 were nurse practitioners, and five were nurse midwives. Our analysis shows that the provider asked about the patient's current or previous mental health history at 33 of the 80 visits, meaning that only 41.2% of these patients were asked about their mental health. When providers are divided by type, these numbers are even more disparate. Out of the 56 cases in which the provider was a physician, only 14 patients were asked about their mental health history; 75% of patients who were seen by a physician were not asked about their mental health in any capacity. The opposite can be

said for the nurse practitioners in the study; 16 of the 19 patients seen by a nurse practitioner were asked about their mental health, meaning that 84.2% of all patients seen by a nurse practitioner had the opportunity for a discussion on mental health. Midwives were the providers for only five out of the 80 patients, but out of the five visits they did have, three of them (60%) asked about mental health. Table 4, located in Appendix A, shows the record of which patients were and were not asked about their mental health history, broken up by the patient's EPDS score if it was provided, provider title, if perinatal or postpartum depression was discussed, and if the patient disclosed any previous or current mental health problems.

The study also looked for whether or not the provider brought up the topics of perinatal or postpartum depression. This was important to measure as previous research showed that 80% of all cases of perinatal depressive symptoms occur during pregnancy, and 1/3 of those women experienced the symptoms in the first trimester (Wilcox et al., 2020). ACOG recommends that screening for depressive symptoms and asking about the patient's mood should occur at the first appointment to better monitor the course of a patient's symptoms and to advise the patient on what is abnormal in pregnancy ("ACOG Committee Opinion No. 757: Screening for Perinatal Depression," 2018).

In our data set, only nine out of the 80 patients had a provider who initiated a conversation about perinatal and postpartum depression. Out of those nine patients, eight had disclosed either past or current mental illness, which is known to be a risk factor for developing perinatal or postpartum depression (Ghaedrahmati et al., 2017). Of the 80 patients we studied, 23 of them disclosed either current or past mental illness, and even though we know they are at higher risk for developing any form of maternal depression, only eight out of 23, or 34.8%, of providers brought this up to their patients to inform them of the risk. Table 2 shows the data related to the nine

patients who were educated about PPD, including their EPDS score, the title of the provider, and what type of mental illness was disclosed.

Table 2: Data collected from patients who received PPD information

EPDS Score	Provider Type	Provider asks a about Mental Health History	Patient Disclosed Current or Previous Mental Illness	If yes, what type?
Not recorded	Nurse Practitioner	Yes	No	N/A
5	Nurse Practitioner	Yes	Yes	Depression
15	Physician	Yes	Yes	Depression, PPD
1	Nurse Practitioner	Yes	Yes	Mood disorders
8	Physician	Yes	Yes	Depression, Anxiety
Not recorded	Physician	No	Yes	Current PPD
17	Physician	Yes	Yes	Depression, PPD
Not recorded	Physician	Yes	Yes	Depression, Anxiety
Not recorded	Physician	Yes	Yes	Depression

The data in the table above show that perinatal and postpartum depression were discussed at nine of the 80 (11.3%) visits. Physicians, who saw 56 of the patients, had this necessary conversation with only six (10.7%) of them. Nurse Practitioners discussed PPD with three out of their 19 patients (15.8%), none of the five midwives initiated this conversation (0%).

As previously mentioned, all patients in this study were to be screened for depressive symptoms with the EPDS at their first visit. Only 55 out of the 80 participants had this assessment on file, meaning that potentially 31.3% of all patients were not screened with this tool (J. Chang, personal communication, September 3, 2020). These findings go against the current standards

created by ACOG, as well as those encouraged by UPMC, that all patients be screened for depressive symptoms at the first obstetric care visit ("ACOG Committee Opinion No. 757: Screening for Perinatal Depression," 2018; Chaudron et al., 2010).

Out of the 55 participants who were administered the EPDS, 36 of them screened not likely for depression, three of them screened possible for depression, five screened to have a fairly high probability for depression, and 11 scored to have probable depression. Of the 19 who scored positive for any depressive symptoms, 12 were asked by their provider about their mental health history. For the seven patients who screened positive for symptoms but were not asked, all the providers were physicians. A more detailed breakdown of the data for the 55 EPDS scores is shown in Table 3. The EPDS scores are broken into four categories dictating the likelihood of depression, as well as the title of the provider and whether provider asked about patient's mental health.

Table 3: EPDS Findings and Likelihood of Depression

<u>0 to 8- Depression not likely</u>	<u>9 to 11- Possible depression</u>	<u>12 to 13- High probability of depression</u>	<u>14 and higher- Probable Depression</u>
Nurse Practitioner- Yes	Nurse Practitioner- Yes	Physician- No	Nurse Practitioner- Yes
Midwife- Yes	Physician- No	Physician- Yes	Nurse Practitioner- Yes
Nurse Practitioner- Yes	Physician- No	Nurse Practitioner- Yes	Physician- Yes
Nurse Practitioner- Yes		Physician- No	Physician- Yes
Nurse Practitioner- Yes		Physician- Yes	Physician- No
Nurse Practitioner- Yes			Physician- Yes
Midwife- Yes			Physician- Yes
Physician- No			Nurse Practitioner- Yes
Nurse Practitioner- Yes			Physician- No
Physician- Yes			Physician- No
Nurse Practitioner- Yes			Physician- No
Physician- No			
Physician- No			
Physician- No			
Physician- No			
Physician- Yes			
Midwife- No			
Physician- No			
Physician- No			
Physician- No			
Physician- No			
Physician- Yes			
Nurse Practitioner- Yes			
Nurse Practitioner- No			
Nurse Practitioner- Yes			
Nurse Practitioner- Yes			
Physician- No			
Physician- No			
Physician- No			
Physician- No			
Physician- No			
Physician- No			

Physician- No
Physician- No
Physician- No
Physician- No

A previous study (Kozhimannil et al., 2013) showed that black women are disproportionately under screened and less likely to be treated for perinatal and postpartum depression. This was an important aspect of our study that warranted further analysis to better understand if the race of the patient impacted the likelihood of these necessary conversations taking place in Pittsburgh, Pennsylvania. Out of the 80 participants in our study, 79 of them had their race documented in their medical charts. The following data analysis is reflective of the 79 patients whose race was disclosed.

Twenty-one out of the 79 patients were white (26.6%), 50 were black (63.3%), and eight identified as bi- or multiracial (10.1%), with at least one of their races being black. For the 21 white participants, 10 (48%) were asked about their mental health history while 11 were not. Physicians asked their white patients 37.5% of the time (six out of 16), nurse practitioners asked 100% of the time (two of two), and nurse midwives asked 66.7% of the time (two out of three).

Out of the 50 patients in our study who identified as black, 19 (40%) of them were asked about their mental health by providers. Thirty-five of the black participants saw a physician as their provider, and only seven of them (20%) were asked about their mental health. Fourteen of all black patients were seen by nurse practitioners, and 11 of them (78.6%), were asked about their mental health history. Only one patient in this racial group saw a midwife, and there was a discussion about mental health (100%).

Of the eight participants who identified as bi or multiracial, four (50%) of them were asked about their mental health in general. Patients who saw a physician were asked 25% of the time (one in four), nurse practitioners asked 100% of the time (three of three) and midwives asked 0% of the time (zero out of one).

While there are only 21 white participants in this study, this begins to suggest possible racial disparities as white women were more likely than any other racial group to be asked about depressive symptoms during their visit.

5.0 Discussion

This research study explored how obstetric providers speak to their patients about mental health. The primary goals were to see how many patients were given the opportunity to discuss their mental health, which providers were initiating these conversations and what those conversations looked like. Screening for and treating perinatal and postpartum depression are extremely important to the overall health of the mother and child, and our study has shown that obstetric providers in the Pittsburgh area are not following the recommended guidelines, contributing to the greater lack of understanding, diagnosis and treatment of PPD.

Recommendations for early and multiple mood screenings for pregnant women have been in place since the early 2000s (Management, 2010). In 2002, the U.S. Preventative Task Force published a report that recommended women be screened early and often for depressive symptoms in pregnancy, finding that screening increased the number of adults who were accurately diagnosed with depression and that subsequent treatment decreased overall clinical morbidity ("Screening for depression: recommendations and rationale," 2002).

Because only 41.2% of the patients in our study were asked about their mental health, we can say that at least for this sample, recommended guidelines are not being followed. To ensure that all women are given the opportunity to discuss their mood and possible concerns with their provider, these guidelines need to be required for all providers who are caring for pregnant patients. It is also important to recognize the differences across provider type in this study. Only 25% of patients who saw a physician had a discussion about mental health, yet 84.2% of nurse practitioners and 60% of nurse midwives initiated this conversation with their patients.

Research shows that up to 51% of women who experience socioeconomic hardships report depressive symptoms during and after pregnancy (Muzik & Borovska, 2010). Women who use illicit substances prior to, during, or after pregnancy are also at an increased risk for developing perinatal depression (Bezruczyk, 2019). When considering the pool selected to participate in this study, the results are even more surprising. The majority of our study participants were at a higher risk for developing perinatal and postpartum depression because of those factors alone, so all providers, regardless of type, should have been actively screening them for symptoms.

Differences in screening rates across provider types can possibly be attributed to differences in education and training. This could also be caused by other factors such as physicians thinking one of the other staff members is responsible for screening. Universal standards need to be established so that every woman, regardless of her provider, has equal access to the necessary screenings. Many women who are experiencing symptoms of depression do not report them, but with proper screening systems put into place that can change (Avalos et al., 2016).

5.1 Prevalence

The study found that only 68.8% of patients were screened for depressive symptoms using the EPDS, which was unexpected. Sixteen out of the 55 screened patients showed a high probability of having depression, yet only 62.5% of them were asked about it by their provider. Of all 80 patients, 19 of them were not screened with the EPDS or asked about their mental health by a provider, meaning that 23.8% of all patient participants received zero opportunity to document or discuss their mental health. The data found in this study show that maternal mental health is not being monitored and cared for the way it desperately needs to be.

5.1.1 Recommendations

To decrease the incidence of perinatal and postpartum depression in the United States, pregnant women need to be screened on a regular basis for potential signs and symptoms and given adequate, equal access to proven treatment. To do this, medical professionals need to be trained on multiple issues:

- Administering the Edinburgh Postnatal Depression Scale (EPDS), Beck's Depression Inventory (BDI), or the Patient Health Questionnaire (PHQ-9).
- Using these diagnostic screening tools, as well as other forms of gathering information, at every obstetric visit throughout the patient's pregnancy.
- Asking every single patient, regardless of screening tool score, if they have a history of depression or mental illness, how their mood has been since the beginning of this pregnancy, and if there is a history of PPD in the maternal side of their family at the first comprehensive visit.
- Developing skills in communication, rapport building, and establishing trust with the patient.

As far as deciding which screening tool to use, three main questionnaires that screen for depressive symptoms are used regularly in the United States: the EPDS, BDI, and PHQ-9. The screening tool used in this study was the EPDS, one of the most commonly used depression screening tool for women during and after pregnancy (Timsit, 2019). A study (Petrozzi & Gagliardi, 2013) found that the EPDS can also be successful in detecting anxiety symptoms because it is one of the only screening tools that includes three questions specifically regarding anxiety (Timsit, 2019).

The EPDS and PHQ-9 are similar in structure as both have 10 straightforward questions that determine if the participant is experiencing depressive symptoms. The EPDS asks if the patient has been experiencing these symptoms in the past seven days, while the PHQ-9 asks if they have occurred in the past two weeks (Timsit, 2019). Some providers think the PHQ-9 is not as accurate as the EPDS, but it is important to note that both of these screening tools have come under scrutiny for not being language-inclusive for people of all race, economic, and educational backgrounds (Timsit, 2019; Di Florio et al., 2016).

A 2016 study (Di Florio et al., 2017) used ordinal regression and measurement invariance to determine if there was a relationship between demographic factors such as race, education, culture, and the effectiveness of the EPDS. The study found that educational background was the largest contributor to inaccurate EPDS scores for new mothers. Obstetric care providers need to be aware of educational and cultural differences that can contribute to flawed reporting on the EPDS and other depression measurement scales (Di Florio et al., 2017). Having this knowledge will allow providers to better screen for depression through other mechanisms such as conversation, body language, and overall health.

The BDI can be used by a trained provider to determine if a patient is experiencing depressive symptoms. This screening questionnaire contains 21 questions that are broader than either the EPDS or PHQ-9. This tool, however, was not designed specifically for identifying depression during or after pregnancy. It is used to gauge the severity of depressive symptoms in patients who already meet the threshold for depression, so it is recommended that obstetric care providers use this screening tool only for patients who already appear depressed or who have screened positive on either the EPDS or PHQ-9 (Edelstein et al., 2004).

Screening for depressive symptoms, both during and after pregnancy, needs to be a mandatory part of every woman's obstetric care routine, regardless of location or provider. Several states have passed legislation mandating depression screening for postpartum women as well as mandating that educational material be provided to women on the risks and symptoms of postpartum depression (Rhodes & Segre, 2013). These mandates, however, do not cover the topic of screening for depression during pregnancy and often are not followed in an effective manner (Rhodes & Segre, 2013).

An issue that has arisen from this legislation is that once women do screen positive for depressive symptoms, not many resources are in place for them to get treatment (Timsit, 2019). A published review of U.S. laws and legislation regarding state mandated screenings found that even when the policies are mandated on a large scale, it does not guarantee that every clinic and hospital system is implementing and following the guidelines (Rhodes & Segre, 2013). For these states, funds have not been distributed adequately and some smaller practices were not receiving the same resources as larger hospital systems, creating a gap in their ability to enforce the mandate. "Best practices" were often not achieved as access was not the same statewide (Rhodes & Segre, 2013).

To mitigate this issue, the best way to implement mandatory screenings would be on a local level, allowing hospitals and clinics to create their own procedures through financial resources provided by the state government. The main goal is to get every patient screened, every time they are seen. If funds are not being distributed equitably, this will likely continue to affect lower income communities more severely. By creating a mandatory state allocated budget rather than just a mandated guideline, every woman attending obstetric care visits will have

access to the same resources, regardless of location or health care system (Rhodes & Segre, 2013; Timsit, 2019).

Even after a woman is diagnosed, current barriers in our health care and social service systems prevent most of them from seeking or completing any form of treatment (Kozhimannil et al., 2013). We can alter the course of this issue by implementing procedures that must be followed once a patient receives a certain score on the EPDS or other screening tool. First steps would include a mandatory evaluation from a mental health professional within one week of receiving this result. Depending on the results of the evaluation, the provider will either recommend continual monitoring of symptoms or the patient will discuss other options with the designated medical provider.

Regardless of the result of the evaluation, patients should continue to be screened on a regular basis to monitor for adverse symptoms. A 2019 study based in Hong Kong, China (Chan et al., 2019), consisted of 660 women at 24 weeks gestation who were all receiving regular prenatal care. Three hundred thirty of these women were also given an intervention of a psychoeducational mobile app for their smartphone to monitor and educate them on mental health during pregnancy. The women in the study who received the intervention had significantly reduced postnatal depression at four weeks postpartum compared to the control group. These women also recorded lower stress levels and were more likely to attend all necessary medical visits (Chan et al., 2019).

While the research and technology are rather new, a mobile app that women could use to monitor their symptoms from home appears to be extremely beneficial. Some women do not want to disclose depressive symptoms to their provider even if they are asked, and a potential issue with the EPDS and other screening tests is that people can lie about their symptoms to avoid

unwanted opinions or treatment (Management, 2010). If women have the ability to access screening tools and educational information from the privacy of their own home, they may be more likely to answer questions honestly and read the educational material that corresponds to their answers.

Overall, the issues of underdiagnosing and not treating maternal depression do not stem from one obstacle in particular. Various barriers exist that prevent women from obtaining the information and education needed to protect their mental health both during and after pregnancy. Increasing obstetric provider education and training is a necessary step so that all providers are asking the proper questions and evaluating their patients for depression. Funding needs to be allocated to all obstetric care facilities to allow these screenings and evaluations to take place. Once women are being properly diagnosed and treatments are initiated, we will greatly improve the health of the mother, child, and the family unit.

6.0 Conclusions

The terms perinatal and postpartum depression encompass multiple mental illnesses that can be extremely dangerous to women who are affected. Perinatal depressive symptoms can begin as early as the first trimester of pregnancy and can continue for months or years after delivery. There are five main forms of PPD: baby blues, postpartum depression, postpartum anxiety, postpartum panic disorder, and postpartum psychosis (Thurgood et al., 2009; House et al., 2016).

While minor emotional changes are to be expected during pregnancy and after delivery, women who experience the aforementioned illnesses may be subjected to long-term impacts that negatively affect the health and well-being of the entire family. Women with PPD are at an increased risk of developing long-term depression, additional mental illnesses, and chronic health problems (Groer & Morgan, 2007, Muzik & Borovska, 2010).

Children of depressed mothers are at increased risk for developing mental illnesses, behavioral issues and intellectual difficulties (Groer & Morgan, 2007; "Maternal depression and child development," 2004). Babies born to depressed mothers are at a higher risk of being low birth weight; these children are also less likely to receive the routine care needed for proper emotional and intellectual development which often continues the cycle of mental illness in the family (Abdollahi et al., 2017; "Maternal depression and child development," 2004).

Male partners of women with PPD were found to be 2.5 times more likely to develop depression themselves (Matthey et al., 2000). This can add to the mental and emotional strains of parenthood and potentially cause irreparable damage to the relationship of the couple (Johansson et al., 2020).

In most of the visits studied for this research, obstetric care providers did not ask their patients about mental health in any capacity. This is contributing to much larger issues such as perinatal and postpartum depression, maternal and infant health, and even maternal mortality. Perinatal and postpartum depression affects between 12-20% of new mothers within the first year of delivery and often goes undiagnosed (Avalos et al., 2016). To effectively diagnose and treat women who experience this form of mental illness, universal standards need to be put in place and be mandated for every obstetric care provider. A screening tool needs to be used at every obstetric care visit for the duration of a woman's pregnancy. All obstetric care providers, regardless of title, need to be properly trained on how to administer these screening tools, how to approach the conversation of mental health, and how to recognize the non-verbal signs and symptoms that their patient may be struggling with perinatal depression.

6.1 Limitations

Our study, completed with the T2P2 data, strove to understand the relationship between provider communication and patient discussion of mental health in pregnancy. While we had a substantial amount of data to analyze, this study had limitations.

As we look at our results in comparison to one another, there is already a noticeable distinction, specifically for physicians, regarding patient race and the discussion of mental health history. While the previous overall analysis showed that physicians asked their patients about mental health only 25% of the time, race could possibly be a contributing factor as to when these discussions occur. Physicians asked their white patients 37.5% of the time, their black patients 20% of the time, and bi or multiracial patients 25% of the time.

While this data set may not be large enough to draw conclusions on the contrast between patient race and perinatal depression screening accessibility, it supports previous research that has found that women of color have less access to necessary tools needed to have a healthy pregnancy and postpartum period (Kozhimannil et al., 2011).

Additional limitations are that the providers selected for this study worked only for the UPMC hospital system. It is possible that other obstetric providers, either locally, statewide, or nationally, operate under different screening requirements and do require discussions on mental health. Also, only five of the 80 providers were midwives, meaning the quantity of data collected was not substantial enough to show whether midwives asked about maternal mental health at a higher or lower rate than their coworkers. The data provided through the T2P2 study were also purposefully selected from patients who had either disclosed or tested positive for substance use, making them a high-risk population that is more likely to have a history of mental illness. Replication with other clinics and hospital networks, specifically with women who are not deemed to be high-risk, is warranted (Chaudron et al., 2010).

6.1.1 Implications

Overall, perinatal and postpartum depression are the most common complications in pregnancy and childbirth with more than half of all cases remaining undiagnosed (Zauderer, 2009). Whether a patient has PPD or anxiety, postpartum panic disorder, psychosis, or even just the baby blues, all cases need to be taken seriously and treated properly if necessary. For all cases of perinatal depressive symptoms, 80% of those occur during pregnancy and 1/3 of those women experienced the symptoms in the first trimester (Wilcox et al., 2020). Our study has shown that

the highly recommended screening procedures from ACOG were not being followed by all of providers in the five UPMC outpatient clinics where patients were seen. All providers, regardless of type, need to be trained on how to appropriately implement the chosen screening tool as well as how to properly initiate and monitor a conversation about mental health with their patients. Funding must be allocated for these resources through the state and federal government, allowing all obstetric care offices and providers equal access to the screenings that can prevent disease progression and save lives. Mandatory protocols and guidelines need to be established and followed so all women who screen positive have the ability to receive further evaluation and treatment if necessary.

Once screenings are required and all providers are equally trained and successful at discussing and diagnosing perinatal and postpartum depression, maternal health outcomes for women in the United States will improve. This will result in a higher quality of life for all families, decreasing mental illness incidence and increasing opportunities for a successful future (O’Conner et al., 2019; Georgiopoulos et al., 2001).

Appendix A

Table 4: Data collected from 80 T2P2 audio recordings and transcripts

EPDS Score	Type of Provider	Asks about Mental Health History	Mention Perinatal Depression or	Did patient disclose History of Mental Ill
12	Physician	No	No	No
	Physician	No	No	No
	Physician	No	No	No
	Nurse Practitioner	Yes	Yes	No
5	Nurse Practitioner	Yes	Yes	Yes-Depression
7	Midwife	Yes	No	Yes- Depression
8	Nurse Practitioner	Yes	No	Yes- Bipolar, depression
6	Nurse Practitioner	Yes	No	No
21	Nurse Practitioner	Yes	No	No
0	Nurse Practitioner	Yes	No	No
12	Nurse Practitioner	Yes	No	No
12	Physician	Yes	No	No
3	Nurse Practitioner	Yes	No	No
9	Nurse Practitioner	Yes	No	No
7	Midwife	Yes	No	Yes- Anxiety
2	Physician	No	No	No
14	Nurse Practitioner	Yes	No	No
	Nurse Practitioner	No	No	Yes- Anxiety
5	Nurse Practitioner	Yes	No	Yes- Depression
	Midwife	No	No	Yes- Anxiety
15	Physician	Yes	Yes	Yes- Depression, PPD
21	Physician	Yes	No	No
	Physician	No	No	No
0	Physician	Yes	No	Yes- Depression
	Physician	No	No	No
	Physician	No	No	No
1	Nurse Practitioner	Yes	Yes	Yes- Mood disorders
2	Physician	No	No	No
2	Physician	No	No	Yes- Depression
3	Physician	No	No	No
16	Physician	No	No	No
	Physician	Yes	No	Yes- Anxiety, panic attacks
4	Physician	No	No	No
	Physician	No	No	No
8	Physician	Yes	Yes	Yes- Anxiety, Depression
13	Physician	No	No	No
	Physician	No	No	No
14	Physician	Yes	No	Yes- Bipolar, depression, manic, schizophre
4	Midwife	No	No	No
	Physician	No	No	No
	Midwife	Yes	No	Yes- Depression
3	Physician	No	No	No
	Physician	No	No	No
9	Physician	No	No	No
8	Physician	No	No	No
5	Physician	No	No	No
	Physician	No	No	No
	Physician	No	Yes	Yes- Depression in pregnancy only
2	Physician	No	No	No
2	Physician	Yes	No	No
17	Physician	Yes	Yes	Yes- Depression, PPD
8	Nurse Practitioner	Yes	No	No
5	Nurse Practitioner	No	No	Yes- Anxiety
2	Nurse Practitioner	Yes	No	No
0	Nurse Practitioner	Yes	No	No
	Physician	Yes	Yes	Yes- Depression, Anxiety
6	Physician	No	No	No
20	Nurse Practitioner	Yes	No	No
1	Physician	No	No	No
1	Physician	No	No	No
4	Physician	No	No	No
2	Physician	No	No	No
2	Physician	No	No	Yes: Anxiety
	Physician	No	No	No
	Physician	No	No	No
14	Physician	No	No	No
14	Physician	No	No	No
1	Physician	No	No	No
2	Physician	No	No	No
9	Physician	Yes	No	No
	Nurse Practitioner	No	No	No
12	Physician	Yes	No	Yes: Depression, Night terrors
17	Physician	No	No	No
3	Physician	No	No	No
6	Physician	No	No	No
	Physician	Yes	No	Yes: Depression
	Physician	Yes	Yes	Yes: Depression
	Physician	No	No	No
	Physician	No	No	No
	Physician	No	No	No

Bibliography

- ACOG Committee Opinion No. 757: Screening for Perinatal Depression. (2018). *Obstet Gynecol*, 132(5), e208-e212. doi:10.1097/aog.0000000000002927
- Abdollahi, F., Rezai Abhari, F., & Zarghami, M. (2017). Post-Partum Depression Effect on Child Health and Development. *Acta Med Iran*, 55(2), 109-114.
- Abdollahi, F., & Zarghami, M. (2018). Effect of postpartum depression on women's mental and physical health four years after childbirth. *East Mediterr Health J*, 24(10), 1002-1009. doi:10.26719/2018.24.10.1002
- Avalos, L. A., Raine-Bennett, T., Chen, H., Adams, A. S., & Flanagan, T. (2016). Improved Perinatal Depression Screening, Treatment, and Outcomes With a Universal Obstetric Program. *Obstet Gynecol*, 127(5), 917-925. doi:10.1097/aog.0000000000001403
- Barry A. Edelstein, A. S.-N., Stephanie A. Scheck. (2004). *Encyclopedia of Applied Psychology*. Morgantown, West Virginia West Virginia University
- Beardslee, W. R., Keller, M. B., Lavori, P. W., Staley, J., & Sacks, N. (1993). The impact of parental affective disorder on depression in offspring: a longitudinal follow-up in a nonreferred sample. *J Am Acad Child Adolesc Psychiatry*, 32(4), 723-730. doi:10.1097/00004583-199307000-00004
- Bezruczyk, D. (2019). Who Is at Risk for Postpartum Depression and Addiction? *Postpartum Depression and Addiction* Retrieved from <https://www.addictioncenter.com/addiction/postpartum-depression-addiction/>
- Chan, K. L., Leung, W. C., Tiwari, A., Or, K. L., & Ip, P. (2019). Using Smartphone-Based Psychoeducation to Reduce Postnatal Depression Among First-Time Mothers: Randomized Controlled Trial. *JMIR Mhealth Uhealth*, 7(5), e12794. doi:10.2196/12794
- Chang, J. (2020). [Question about T2P2 Data].
- Chang, J. C., Holland, C. L., Tarr, J. A., Rubio, D., Rodriguez, K. L., Kraemer, K. L., . . . Arnold, R. M. (2017). Perinatal Illicit Drug and Marijuana Use. *Am J Health Promot*, 31(1), 35-42. doi:10.4278/ajhp.141215-QUAL-625
- Chang, J. C., Tarr, J. A., Holland, C. L., De Genna, N. M., Richardson, G. A., Rodriguez, K. L., . . . Arnold, R. M. (2019). Beliefs and attitudes regarding prenatal marijuana use: Perspectives of pregnant women who report use. *Drug Alcohol Depend*, 196, 14-20. doi:10.1016/j.drugalcdep.2018.11.028

- Chaudron, L. H., Szilagyi, P. G., Tang, W., Anson, E., Talbot, N. L., Wadkins, H. I., . . . Wisner, K. L. (2010). Accuracy of depression screening tools for identifying postpartum depression among urban mothers. *Pediatrics*, *125*(3), e609-617. doi:10.1542/peds.2008-3261
- Cogill, S. R., Caplan, H. L., Alexandra, H., Robson, K. M., & Kumar, R. (1986). Impact of maternal postnatal depression on cognitive development of young children. *Br Med J (Clin Res Ed)*, *292*(6529), 1165-1167. doi:10.1136/bmj.292.6529.1165
- Di Florio, A., Putnam, K., Altemus, M., Apter, G., Bergink, V., Bilszta, J., . . . Meltzer-Brody, S. (2017). The impact of education, country, race and ethnicity on the self-report of postpartum depression using the Edinburgh Postnatal Depression Scale. *Psychol Med*, *47*(5), 787-799. doi:10.1017/s0033291716002087
- Dietz, L. J., Jennings, K. D., Kelley, S. A., & Marshal, M. (2009). Maternal depression, paternal psychopathology, and toddlers' behavior problems. *J Clin Child Adolesc Psychol*, *38*(1), 48-61. doi:10.1080/15374410802575362
- Edge, D. (2010). Falling through the net - black and minority ethnic women and perinatal mental healthcare: health professionals' views. *Gen Hosp Psychiatry*, *32*(1), 17-25. doi:10.1016/j.genhosppsy.2009.07.007
- Falana, S. D., & Carrington, J. M. (2019). Postpartum Depression: Are You Listening? *Nurs Clin North Am*, *54*(4), 561-567. doi:10.1016/j.cnur.2019.07.006
- Forman, D. R., O'Hara, M. W., Stuart, S., Gorman, L. L., Larsen, K. E., & Coy, K. C. (2007). Effective treatment for postpartum depression is not sufficient to improve the developing mother-child relationship. *Dev Psychopathol*, *19*(2), 585-602. doi:10.1017/s0954579407070289
- Georgiopoulos, A. M., Bryan, T. L., Wollan, P., & Yawn, B. P. (2001). Routine screening for postpartum depression. *J Fam Pract*, *50*(2), 117-122.
- Ghaedrahmati, M., Kazemi, A., Kheirabadi, G., Ebrahimi, A., & Bahrami, M. (2017). Postpartum depression risk factors: A narrative review. *J Educ Health Promot*, *6*, 60. doi:10.4103/jehp.jehp_9_16
- Groer, M. W., & Morgan, K. (2007). Immune, health and endocrine characteristics of depressed postpartum mothers. *Psychoneuroendocrinology*, *32*(2), 133-139. doi:10.1016/j.psyneuen.2006.11.007
- Hay, D. F., Pawlby, S., Sharp, D., Asten, P., Mills, A., & Kumar, R. (2001). Intellectual problems shown by 11-year-old children whose mothers had postnatal depression. *J Child Psychol Psychiatry*, *42*(7), 871-889. doi:10.1111/1469-7610.00784
- Hirsch, B. J., Moos, R. H., & Reischl, T. M. (1985). Psychosocial adjustment of adolescent children of a depressed, arthritic, or normal parent. *J Abnorm Psychol*, *94*(2), 154-164. doi:10.1037//0021-843x.94.2.154

- Horowitz, J. A., & Cousins, A. (2006). Postpartum depression treatment rates for at-risk women. *Nurs Res*, 55(2 Suppl), S23-27. doi:10.1097/00006199-200603001-00005
- House, S. J., Tripathi, S. P., Knight, B. T., Morris, N., Newport, D. J., & Stowe, Z. N. (2016). Obsessive-compulsive disorder in pregnancy and the postpartum period: course of illness and obstetrical outcome. *Arch Womens Ment Health*, 19(1), 3-10. doi:10.1007/s00737-015-0542-z
- International, Q. (2020, 2020). Fueling Academic Research. Retrieved from <https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/about/nvivo/who-its-for/academia>
- Johansson, M., Benderix, Y., & Svensson, I. (2020). Mothers' and fathers' lived experiences of postpartum depression and parental stress after childbirth: a qualitative study. *Int J Qual Stud Health Well-being*, 15(1), 1722564. doi:10.1080/17482631.2020.1722564
- Kozhimannil, K. B., Trinacty, C. M., Busch, A. B., Huskamp, H. A., & Adams, A. S. (2011). Racial and ethnic disparities in postpartum depression care among low-income women. *Psychiatr Serv*, 62(6), 619-625. doi:10.1176/ps.62.6.pss6206_0619
- Lilja, G., Edhborg, M., & Nissen, E. (2012). Depressive mood in women at childbirth predicts their mood and relationship with infant and partner during the first year postpartum. *Scand J Caring Sci*, 26(2), 245-253. doi:10.1111/j.1471-6712.2011.00925.x
- Management, N. I. f. H. C. (2010, June 2010). Identifying and Treating Maternal Depression: Strategies & Considerations for Health Plans *NIHCM Foundation Issue Brief*. Retrieved from https://fhop.ucsf.edu/sites/fhop.ucsf.edu/files/wysiwyg/NIHCM_IssueBrief_MaternalDepression_June2010.pdf
- Maternal depression and child development. (2004). *Paediatr Child Health*, 9(8), 575-598. doi:10.1093/pch/9.8.575
- Matthey, S., Barnett, B., Ungerer, J., & Waters, B. (2000). Paternal and maternal depressed mood during the transition to parenthood. *J Affect Disord*, 60(2), 75-85. doi:10.1016/s0165-0327(99)00159-7
- Moore Simas, T. A., Brenckle, L., Sankaran, P., Masters, G. A., Person, S., Weinreb, L., . . . Byatt, N. (2019). The PRogram In Support of Moms (PRISM): study protocol for a cluster randomized controlled trial of two active interventions addressing perinatal depression in obstetric settings. *BMC Pregnancy Childbirth*, 19(1), 256. doi:10.1186/s12884-019-2387-3
- Muzik, M., & Borovska, S. (2010). Perinatal depression: implications for child mental health. *Ment Health Fam Med*, 7(4), 239-247.

- O'Connor, E., Senger, C. A., Henninger, M. L., Coppola, E., & Gaynes, B. N. (2019). Interventions to Prevent Perinatal Depression: Evidence Report and Systematic Review for the US Preventive Services Task Force. *Jama*, *321*(6), 588-601. doi:10.1001/jama.2018.20865
- Olaniyan, A. (2020). Comprehensive and Dissertation Overview Examination: Implicit Racial Bias in Prenatal Visit Patient-Provider Communication, Prenatal Screening, and Interventions. 68.
- Pearlstein, T. (2008). Perinatal depression: treatment options and dilemmas. *J Psychiatry Neurosci*, *33*(4), 302-318.
- Pérez, C. F., & Brahm, M. P. (2017). [Paternal postpartum depression: Why is it also important?]. *Rev Chil Pediatr*, *88*(5), 582-585. doi:10.4067/s0370-41062017000500002
- Perinatal Depression. (2020). Retrieved from <https://www.nimh.nih.gov/health/publications/perinatal-depression/index.shtml>
- Petrozzi, A., & Gagliardi, L. (2013). Anxious and depressive components of Edinburgh Postnatal Depression Scale in maternal postpartum psychological problems. *J Perinat Med*, *41*(4), 343-348. doi:10.1515/jpm-2012-0258
- Pop, V., van Son, M., Wijnen, H., Spek, V., Denollet, J., & Bergink, V. (2019). Increase of depressive symptomatology during pregnancy over 25 years' time in four population based cohorts. *J Affect Disord*, *259*, 175-179. doi:10.1016/j.jad.2019.08.062
- Rhodes, A. M., & Segre, L. S. (2013). Perinatal depression: a review of US legislation and law. *Arch Womens Ment Health*, *16*(4), 259-270. doi:10.1007/s00737-013-0359-6
- Roux, G., Anderson, C., & Roan, C. (2002). Postpartum depression, marital dysfunction, and infant outcome: a longitudinal study. *J Perinat Educ*, *11*(4), 25-36. doi:10.1624/105812402x88939
- Ruta Nonacs, J. E. M.-B., Lisa S. Segre, Yelena Perkhounkova, Scott Stuart, Michael W. O'Hara. (2015). Using the EPDS to Measure Postpartum Depression Severity. Retrieved from <https://womensmentalhealth.org/posts/using-epds-measure-postpartum-depression-severity/>
- Sara Thurgood, B., Daniel M. Avery, M., & Lloyd Williamson, M. (2009). Postpartum Depression (PPD). *American Journal of Clinical Medicine*, *6*(2), 6.
- Screening for depression: recommendations and rationale. (2002). *Ann Intern Med*, *136*(10), 760-764. doi:10.7326/0003-4819-136-10-200205210-00012
- Silverman, M. E., Reichenberg, A., Savitz, D. A., Cnattingius, S., Lichtenstein, P., Hultman, C. M., . . . Sandin, S. (2017). The risk factors for postpartum depression: A population-based study. *Depress Anxiety*, *34*(2), 178-187. doi:10.1002/da.22597

- Slomian, J., Honvo, G., Emonts, P., Reginster, J. Y., & Bruyère, O. (2019). Consequences of maternal postpartum depression: A systematic review of maternal and infant outcomes. *Womens Health (Lond)*, *15*, 1745506519844044. doi:10.1177/1745506519844044
- Staff, M. C. (2019). Chronic stress puts your health at risk. *Chronic stress can wreak havoc on your mind and body. Take steps to control your stress.* Retrieved from <https://www.mayoclinic.org/healthy-lifestyle/stress-management/in-depth/stress/art-20046037#:~:text=Cortisol%2C%20the%20primary%20stress%20hormone,flight%2Dor%2Dflight%20situation.>
- Timsit, A. (2019). Ten questions about mothers' mental health could promote resilient pregnancies. Retrieved from qz.com website: <https://qz.com/1752679/prenatal-mental-healthcare-can-build-more-resilient-pregnancies/>
- Webster-Stratton, C., & Hammond, M. (1988). Maternal depression and its relationship to life stress, perceptions of child behavior problems, parenting behaviors, and child conduct problems. *J Abnorm Child Psychol*, *16*(3), 299-315. doi:10.1007/bf00913802
- Wilcox, M., McGee, B. A., Ionescu, D. F., Leonte, M., LaCross, L., Reys, J., & Wildenhaus, K. (2020). Perinatal depressive symptoms often start in the prenatal rather than postpartum period: results from a longitudinal study. *Arch Womens Ment Health*. doi:10.1007/s00737-020-01017-z
- Zauderer, C. (2009). Postpartum depression: how childbirth educators can help break the silence. *J Perinat Educ*, *18*(2), 23-31. doi:10.1624/105812409x426305