

ABSTRACT

Addressing Postpartum Depression in the Primary Care Setting: Current Screening Practices and Quality Improvement

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As the family's primary point of interaction with the healthcare system in the postpartum period, the pediatric primary care setting offers an invaluable opportunity to identify parents suffering from postpartum depression and refer them for treatment. However, research from the American Academy of Pediatrics indicates that physicians frequently underutilize opportunities to screen parents for the condition, and even those who do screen positive for depressive symptoms may never receive help. This failure to diagnose and treat postpartum depression on a consistent basis ultimately harms both parental and infant health. This thesis examines the current state of the problem, beginning with a brief history of the medicalization of postpartum depression. After giving some general background on the condition, this thesis offers a multivariate analysis of the incidence of postpartum depression in a private pediatric clinic in Northern Virginia. Finally, the referral practices of this clinic are examined, and suggestions are made for quality improvement.

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ADDRESSING POSTPARTUM DEPRESSION IN THE PRIMARY CARE SETTING:
CURRENT SCREENING PRACTICES AND QUALITY IMPROVEMENT

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PREFACE

This thesis began as a simple question over lunch with a pediatrician back in 2018: were fussy babies with reflux more likely to have depressed parents? It quickly became apparent that answering this question would require a deep dive into both PubMed and patient records, and a more comprehensive plan for a study on postpartum depression detection and management in the clinic's population of families was soon developed. The final study design moved far beyond these initial questions about the relationship between GERD and postpartum depression, ultimately investigating a variety of factors in conjunction with maternal and paternal depression screenings: these variables included gestational age, maternal age, parity, frequency of office visits, and presence of the father at the child's appointments.

Unfortunately, the onset of the COVID-19 pandemic dramatically reduced the data collection timeline, limiting the sample size and therefore decreasing the power of the study. While this hindered researchers' ability to uncover statistically significant associations among variables, the study nevertheless yielded important findings. The research as a whole demonstrated that although unmanaged postpartum depression is known to affect children and families negatively, clinics often fail to comply with the American Academy of Pediatrics' recommendations for best screening and referral practices.

Before turning to the details of the study itself, however, this thesis begins with an investigation of postpartum depression itself. In the first chapter, historical records of postpartum mental disturbances are traced from the days of Hippocrates to the most

recent edition of the DSM. In the second, postpartum depression is examined in greater depth as a medical condition. The third chapter deals with the study itself, including methodology and results. Finally, the fourth chapter examines the ways in which the COVID-19 pandemic affected the progress of this study and offers suggestions for quality improvement in the management of postpartum depression screenings in the pediatric primary care setting. As a whole, this thesis sets out to help readers understand postpartum depression and its detection and treatment in order to offer suggestions for more effective screening practices to promote management of the condition for the wellbeing of children of depressed parents.

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CHAPTER ONE

Introduction

Background

These initial chapters will lay a foundation for the original research found in Chapter Three by providing a brief explanation of postpartum depression as a medical diagnosis. In order to contextualize this discussion, it will be helpful to explore the various historical records pertaining to mental disturbances in women after childbirth, drawn from both medical texts and personal accounts. From there, one can turn to the formal acknowledgment of postpartum depression by the medical community; this work will focus specifically on its classification by the American Psychological Association.

Although postpartum depression ranks among the most common complications of childbirth in developed countries—more common, even, than well-known conditions such as gestational diabetes and preterm birth—it nevertheless remains seriously underdiagnosed and undertreated in the United States (Earls et al., 2019; CDC, 2019). Also referred to as postnatal depression, this condition is defined by *Pediatrics in Review* as “a heterogeneous group of depressive symptoms and syndromes that occurs during the first year following birth” (Chaudron, 2003, p. 154). The DSM-V, which is the current edition of the American Psychiatric Association’s *Diagnostic and Statistical Manual of Mental Disorders*, does not list postpartum depression as a separate disorder, instead categorizing it under the diagnosis of Major Depressive Disorder with Peripartum Onset, which includes depressive episodes beginning during pregnancy or the first four weeks after delivery (2013). Notably, this onset period is much shorter than those given by most

authorities on the topic of postpartum depression; according to other sources, postpartum depression is at its highest during the first three months after childbirth, although it does typically first present within four to six weeks (Kokkinaki, 2015). In either case, it is important to note that postpartum depression is a clinical diagnosis that should be considered distinct from what is commonly referred to as a mother's "baby blues," a more common but shorter and less severe experience of mood swings, crying spells, and anxiety that should resolve on its own within the first few weeks after childbirth (Mayo Clinic Staff, n.d.).

Although postpartum depression has historically been understood only in the context of maternal mental health, more recent studies indicate that it can affect both parents. A meta-analysis of data from the last decade suggests that mothers do suffer from depression with postpartum onset at a higher rate, but fathers' experience with the condition remains significant (Shorey et al., 2018; Cameron et al., 2016). These findings are consistent with the basic etiology of postpartum depression: rather than being a simple product of neuroendocrine biology, it is also closely tied to the major psychosocial adjustments that all new parents face (Mayo Clinic Staff, n.d.).

In addition to causing problems for the affected parent, untreated depression adds stress to the family unit as a whole, which has the potential to harm the mother-child dyad and interfere with child development (Mayo Clinic Staff, n.d.). Because of this, timely diagnosis and treatment are critical for the sake of both parent and child.

History

Because the modern understanding of postpartum depression—or really any form of clinical depression, per se—is relatively new, its history can be difficult to trace. The

term itself was not used until the 1940s, and the condition was not officially acknowledged and classified by the APA until 1968 (Day, 1985). Despite this tenuous history, the correlation between childbirth and mental disturbances has long been noted in various forms. Hippocrates himself noted in the fifth century BCE that women may suffer from “agitation, delirium and attacks of mania” in the aftermath of childbirth (Penn Medicine, 2016, para. 5). This passage seems to be referencing puerperal fever, a post-delivery septic infection of the mother, accompanied by significant psychological disturbances. While this would make the diagnosis more consistent with modern understandings of psychosis than depression, this text is nonetheless commonly identified as the earliest existing record of postpartum mental illness.

Hippocrates’ reference to this kind of mania is far from the only ambiguous reference to postpartum mental disturbances in the historical record, however; the 2500 years between his life and the formal classification of postpartum depression are replete with such cases. Frequently, these records rely heavily on the pervasive concept of hysteria, the idea that erratic activity of the uterus causes women to be excessively emotional. This understanding is reflected in the writings of Trotula, a 13th century female physician who wrote that “because the womb is tied to the brain by nerves, it is necessary that the brain suffer with the womb. Whence, if the womb has within itself excessive humidity, from this the brain is filled, which [humidity], flowing to the eyes, forces them involuntarily to emit tears” (Green, 2002, p. 86). This medically questionable explanation, although not an explicit reference to postpartum depression, remains historically significant in that it connects physiological changes in a woman’s body with the potential for mental disturbances.

A few centuries later, an English mystic named Margery Kempe wrote the first extant autobiography in the English language. The book begins with the story of her traumatic labor, which was followed by a bout of puerperal fever and six months of psychosis; from that point on, the focus of the work turns to more mystical experiences. While scholars have debated the respective roles of physical and spiritual factors in Margery's postpartum experience, her account does draw a clear connection between childbirth and the onset of psychological symptoms. Furthermore, she notes that she went on to meet other women with similar experiences of difficulty after childbirth in her travels later in life (Jefferies and Horsfall, 2014). For this reason, Margery Kempe's autobiography is now widely considered among the most important early records of postpartum mental illness.

Moving away from these medieval accounts and into the beginnings of the modern era, medical records become both more scientific and accessible, and a more familiar picture of postpartum depression begins to emerge. The first clear account of the condition appears in the writings of Portuguese physician João Rodrigues de Castelo Branco, better known as Amato Lusitano. In a case study dating back to 1551, the physician records his treatment of a merchant's wife who, though she had "always enjoyed the best of health, was many times attacked by melancholia after childbirth" (Kokkinaki, 2015, section 3). Lusitano notes that the young woman "remained insane for a month, but recovered with treatment" (Kokkinaki, 2015, section 3). Four hundred years before it was formally defined by the APA, an unequivocal case of postpartum depression appears in the historical record, potentially accompanied by some form of postpartum psychosis.

For the next several hundred years, it was this psychosis that commonly defined postpartum mental illness, both in the popular understanding and in medical circles. From the seventeenth century through the nineteenth, the public was fascinated by a rash of sensational newborn murders. While this phenomenon was largely associated with mothers attempting to hide the birth of illegitimate children, some unexplained cases were attributed instead to a “disturbance of the maternal instinct” (Riecher-Rössler and Steiner, 2005). This explanation, while not overtly medical in nature, highlights the public’s morbid fascination with the macabre extremes of postpartum mental disturbances. These extreme cases of psychosis would retain a prominent place in the thinking of the Victorian doctors who would once again medicalize these postpartum disorders.

The nineteenth century offers a much more complete picture of maternal mental health, since the existing records comprise not only medical treatises, but also personal letters and literary accounts. As for the former, several landmark texts on mental health were published in the middle of the century. In 1845, French psychiatrist Jean-Étienne Dominique Esquirol published a text entitled *Mental Maladies: A Treatise on Insanity*, which contains a chapter entirely dedicated to “Mental Alienation of Those Recently Confined, and of Nursing Women” (Esquirol, 1845). Specifically, Esquirol notes that “insanity takes place more frequently after confinement and during lactation, than during pregnancy” (Esquirol, 1845, p. 52). While the treatise deals primarily with the subject of insanity in all its forms, the chapter deals also with “mental alienation” as well as “sadness and disquietudes, exaggerated or without foundation” (Esquirol, 1845, p. 127). These symptoms—referred to by the author as lypemania or melancholy—while little

more than a footnote to Esquirol himself, provide a classic clinical description of postpartum depression (Esquirol, 1845).

Thirteen years after the publication of this text, a Parisian doctor named Louis-Victor Marcé released an even more specialized work on the same subject. His *Treatise on Insanity in Pregnant, Puerperal and Lactating Women*, published in 1858, consists of the physician's case descriptions, treatment methods, and theories relating to the etiology of the various disorders he identified in his own practice. With this strikingly modern approach to observational research, Marcé determined that women are especially prone to depression and other mental disturbances during and immediately after pregnancy. Like Esquirol, Marcé helped to describe postpartum depression for a medical community that was becoming increasingly concerned with science and objectivity (Trede, et al., 2009).

However, the records from this era are not purely objective and scientific. Instead, one can actually read firsthand accounts from women suffering from what would now be acknowledged as postpartum depression. According to her personal diaries and letters, it seems that Queen Victoria herself was among their numbers. In the months surrounding her many pregnancies, the queen showed little interest in her infant children, and was often “troubled with lowness” (Benson & Esher, 1841, p. 463). Her condition could more accurately be presumed to be peripartum depression, rather than true postpartum, as symptoms began during pregnancy and continued into the postpartum period. During one of her pregnancies, one of her courtiers noted that “at times she was very low indeed though she strove to bear up” (Benson & Esher, 1841, p. 391). Even after she gave birth, it was evident that she “interest[ed] herself less and less about politics” (Benson & Esher,

1841, p. 461). While the term itself would not have carried overtly medical connotations, the word ‘depression’ was used to describe her mental state during this period, with Lord Melbourne expressing “great concern that your Majesty has been suffering under depression and lowness of spirits” in one of his many letters to the queen (Benson & Esher, 1841, p. 457). Victoria herself acknowledged this ongoing struggle in her personal correspondence. In a letter to her uncle, for example, she wrote “I have likewise been suffering so from lowness that it made me quite miserable, and I know how difficult it is to fight against it” (Benson & Esher, 1841, p. 460). While all of these quotations date back to the months surrounding the birth of Victoria’s second child, similar observations appear in records written throughout her childbearing years.

Perhaps the best-known reference to postpartum depression from this time, however, is Charlotte Perkins Gilman’s short story, “The Yellow Wallpaper.” In six thousand chilling words, Gilman tells the story of a young woman suffering from a “temporary nervous depression—a slight hysterical tendency,” following the birth of her child (Gilman, 1892, para. 10). This condition is exacerbated by counterproductive treatments administered by a fashionable physician and a well-meaning but rather unsympathetic husband, and the protagonist ends the story in a psychotic state (Gilman, 1892). While the story itself is fictional, it does represent the contemporary attitude towards women who struggled to make a complete psychological recovery after childbirth. Furthermore, Gilman later revealed that the story was semi-autobiographical: she herself had “suffered from a severe and continuous nervous breakdown tending to melancholia—and beyond” earlier in life (Gilman, 1913, para. 4). “The Yellow Wallpaper,” she explained, was written “to save people from being driven crazy” in a

time when the prevailing medical treatments were wont to have the opposite effect (Gilman, 1913, para. 10). This story highlights, then, both the growing awareness of postpartum mental illness and the lack of meaningful support available to many postpartum mothers.

Formal Classification

With this basic knowledge of historical understandings of postpartum depression, one can look to the twentieth century, in which it was finally acknowledged and codified as a mental illness. This was also the period in which the term postpartum depression itself came into use. Use of the phrase “postpartum depression” in published works dates back at least to the 1940s, and usage has been increasing since then (American Journal of Psychotherapy, 1947). Some sources instead refer to the condition as postnatal depression or use the hyphenated forms post-partum or post-natal, although these variations are less common and will be avoided in this thesis. Usage trends for all four terms are depicted below in Figure 1, with the first small peak appearing around 1947 and then trending up throughout the latter half of the century.

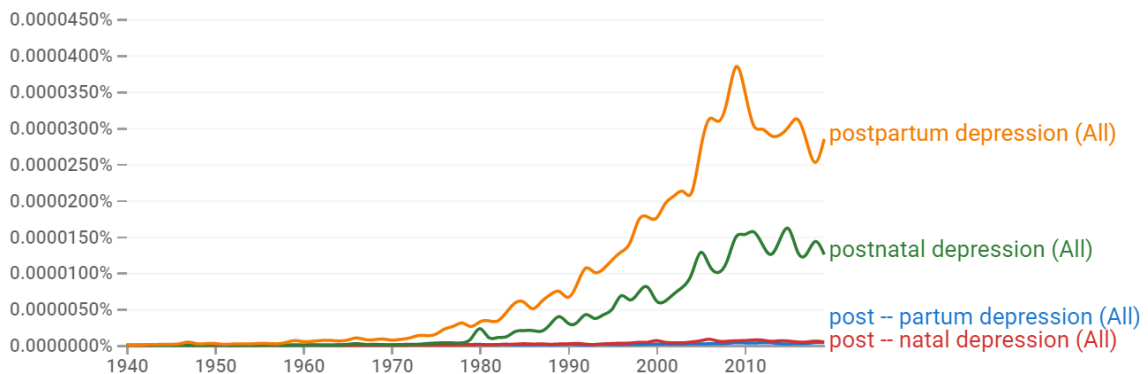


Figure 1. Google Ngram Viewer is used to visualize usage of various terms relating to postpartum depression from 1940–2019. The vertical axis represents the frequency with which the terms appeared in English-language texts from each year.

With this emerging awareness of increased incidence of depressive disorders in the period after childbirth, the American Psychiatric Association (APA) included postpartum depression in the second edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-II), published in 1968. Because the DSM is widely regarded as the defining standard for psychiatric conditions, this was a significant step forward in the recognition of postpartum depression as a legitimate medical condition.

However, progress was not linear. In 1980, the DSM-III was published, and postpartum depression was conspicuously absent from its 450 pages, despite an appearance from its significantly less common—but far more sensational—cousin, postpartum psychosis. Interestingly, this edition of the DSM also removed “female hysteria” as a medical diagnosis, whereas the previous edition had recognized it as a genuine condition (DSM III, 1980; DSM II, 1968). While the omission of postpartum depression was questionable, this does at least seem to mark a willingness on behalf of the psychiatric establishment to eschew classic diagnoses that were found to have a less-than-scientific basis. Accordingly, the publication of the DSM-III can be viewed as a step backwards for the recognition of postpartum depression per se, but a significant step forward in the legitimization of women’s mental health issues.

Postpartum depression was reintroduced as a recognized condition in the DSM-IV, which was published in 1994. This edition allows for “postpartum onset” as a specifier for a series of mood disorders, including Major Depressive Disorder and Bipolar I or II. A range of possible symptoms is then discussed, mentioning “suicidal ideation, obsessional thoughts regarding violence to the child, lack of concentration and psychomotor agitation,” as well as “severe anxiety, Panic Attacks, spontaneous crying...

disinterest in their new infant, and insomnia” (DSM-IV, 1994, p. 386). The DSM goes on to explain that the depressive feelings are often compounded by a mother’s feelings of guilt surrounding her inability to be happy after the birth of her child, and then explains how this complicated dynamic may affect the development of the infant (1980). While this entry technically deals with any mood disorders beginning within the first four weeks after childbirth, it provides an excellent clinical description of postpartum depression.

The current edition of the DSM recognizes “peripartum onset” as a specifier for depressive disorders. Interestingly, though, more than half of the peripartum depression entry deals instead with psychotic mood disorders rather than strictly depressive ones.

The relevant portion is reproduced in its entirety below:

[Depressive Disorders] with peripartum onset: This specifier can be applied to the current or, if full criteria are not currently met for a major depressive episode, most recent episode of major depression if onset of mood symptoms occurs during pregnancy or in the 4 weeks following delivery.

Note: Mood episodes can have their onset either during pregnancy or postpartum. Although the estimates differ according to the period of follow-up after delivery, between 3% and 6% of women will experience the onset of a major depressive episode during pregnancy or in the weeks or months following delivery (Gaynes et al. 2005). Fifty percent of “postpartum” major depressive episodes actually begin prior to delivery (Yonkers et al. 2001). Thus, these episodes are referred to collectively as peripartum episodes. Women with peripartum major depressive episodes often have severe anxiety and even panic attacks (Miller et al. 2006). Prospective studies have demonstrated that mood and anxiety symptoms during pregnancy, as well as the “baby blues,” increase the risk for a postpartum major depressive episode (O’Hara et al. 1991). (DSM-V, 2013, p. 186)

By referring to the condition as perinatal depression, the DSM combines prenatal and postpartum depression into a single category. Given their similar etiologies, this makes sense. However, Chapter Two of this thesis will demonstrate areas in which other authorities diverge from the DSM definition of perinatal depression; many experts extend the onset period beyond four weeks postpartum, and explicitly add that biological

mothers are not the only parents at risk for the condition. Even so, the DSM-5 entry can be viewed as something of an endpoint of a historical analysis of postpartum depression categorization to date.

CHAPTER TWO:

Postpartum Depression: An Overview

Outline

With this brief history of the medicalization of postpartum depression in mind, one can turn to the present day with a more complete contextual understanding. This chapter will begin with a discussion of the etiology of postpartum depression, before touching on its presentation and potential effects. This overview will be followed by an explanation of various models of screening, diagnosis, and treatment, with particular attention given to the current recommendations published by medical authorities in the United States. Special emphasis will be given to the gatekeeping role of the pediatric primary care provider.

Causes

According to the American Academy of Pediatrics, perinatal depression—of which postpartum depression is a subset—is now “the most common obstetric complication in the United States” (Earls et al., 2019, p. 1). Unlike the milder and more transient feelings of sadness, commonly known as the “baby blues,” that the majority (50–80%) of new mothers report feeling in the days or weeks after delivery, true postpartum depression meets the diagnostic criteria of major depressive disorder. Furthermore, the baby blues naturally resolve within a few days to weeks, whereas postpartum depression peaks between six to twelve weeks postpartum, with a secondary peak at six months (Earls et al., 2019). Postpartum psychosis, mentioned above in the

historical analysis of mental disturbances after childbirth, is a serious but rare medical condition that lies beyond the scope of this study.

The etiology of postpartum depression is complex and incompletely understood, but experts agree that it is rooted in both physiological and social changes. Although Trotula's hypothesis of the "humid womb" has long fallen out of favor, she was correct to look to physical functions of the reproductive system as a potential cause of psychological distress (Green, 2002). While they are no longer considered to be the sole cause of postpartum mental disturbances, the physical changes that occur after childbirth do play a role in the onset of depression for many women. Specifically, the rapidly falling levels of estrogen and progesterone after pregnancy can cause significant changes in a woman's mood, contributing to depression; a similar drop in thyroid hormones has the potential to compound this hormonal depression with feelings of fatigue (Mayo, 2018).

However, the emotional and social changes that accompany the birth of a new baby can also have a significant effect on the new parents' mental health. These frequently include the stress and lack of sleep associated with having a newborn, although other factors such as changing body image may be involved as well (Mayo, 2018). Major life changes not directly related to the birth of the child may likewise contribute to the onset of depression; this facet of the condition's etiology will be discussed in greater detail in the conclusion of this thesis, which deals with the effect of the COVID-19 pandemic on postpartum depression research.

Because the causes of postpartum depression are not associated solely with the physical effects of pregnancy and its aftermath, the population at risk extends beyond biological mothers. In recent decades, researchers have begun to explore the connection

between the birth of a child and the onset of depression in fathers, with the number of existing studies nearly doubling from 2009 to 2016 (Cameron et al., 2016). This condition may be referred to as paternal postpartum depression, in order to emphasize that postpartum depression is not limited to the population of new mothers. While mothers are at a higher risk than fathers, the incidence of depression is clinically significant in both populations, and fathers with an affected partner are at an increased risk for developing postpartum depression (Earls et al., 2019). Like fathers, adoptive parents may also experience depressive symptoms during the early months with a new baby, although post-adoptive depression is less likely to be categorized as postpartum (Nonacs, 2016).

According to a 2017 meta-analysis of 58 of nearly 16,000 available studies on maternal mental health, the prevalence of postpartum depression is approximately 17%. While research into paternal postpartum depression is less abundant, the number of existing studies nearly doubled between 2009 and 2016, when a meta-analysis of 73 independent studies estimated that 8% of new fathers met the criteria for this condition (Cameron et al., 2016). Together, these studies demonstrate that parents may struggle with postpartum depression regardless of gender, although the condition does affect mothers more frequently than fathers.

Symptoms

Diagnosis of postpartum depression is complicated by the fact that its symptoms are often protean in nature, and may be difficult to distinguish from a more typical reaction to a major life change. Classic cases may be characterized by depressed mood, hopelessness, excessive crying, or suicidal ideation, but these symptoms are not

ubiquitous. New parents may instead struggle with insomnia and fatigue, severe anxiety, irritability, feelings of guilt and inadequacy, or changes in appetite. Further maladaptive responses to the birth of a child include impaired concentration and decision-making, thoughts of self-harm, and a tendency to withdraw from one's support system (Mayo, 2018).

Other symptoms may have a more direct impact on the parents' interactions with the infant, since depression may manifest as difficulty bonding with the baby or occasionally in thoughts of harming the child (Mayo, 2018). These symptoms may occur regardless of the parent's gender, but studies focusing on fathers indicate that they are more likely to develop maladaptive coping mechanisms such as substance abuse and domestic violence, potentially because their depression is less likely to receive proper treatment (Earls et al., 2019). While this is not a comprehensive list of the symptoms of postpartum depression, it does demonstrate the condition's wide range of possible presentations.

Effects

Given the severity of its potential symptoms, then, it should not be surprising that postpartum depression has the potential to impact the family unit as a whole in significant and potentially devastating ways. Many of these symptoms negatively impact the parent's ability to care for the child. While postpartum depression (unlike postpartum psychosis) rarely leads to consequences as drastic as outright abuse or neglect of the newborn, it may nevertheless hinder normal infant development. Parental depression—especially when left untreated—contributes to general family dysfunction, reduces the likelihood that a baby will receive proper medical care, and decreases breastfeeding time, all of which act

as stressors for the infant during the early weeks of life, which are critical for proper brain development. Because of this, postpartum depression is considered “an adverse childhood experience that has potential long-term adverse health complications for the mother, her partner, the infant, and the mother-infant dyad” (Earls et al., 2019, p. 1). If only one parent is depressed, the child is more likely to be protected from these adverse effects (Earls et al., 2019).

In conjunction with these deleterious effects on the family unit, postpartum depression (referred to in the following quotations as PPD) significantly increases healthcare costs. Because parents suffering from depression are more likely to utilize both the emergency department and mental health services, “maternal health care costs associated with PPD are 90% higher than those for comparison groups of women who are postpartum and do not have PPD” (Earls et al., 2019, p. 2). However, these direct healthcare costs are not the only negative economic effects of postpartum depression: “Overall, costs to employers for US workers with PPD, including worker absence and lost productivity, are \$44 billion per year and \$12.4 billion in health care costs” (Earls et al., 2019, p. 2). While these economic statistics certainly do not provide a comprehensive picture of postpartum depression’s negative effects, they do help to demonstrate how widespread those effects can be on the national scale.

Risk Factors

Of course, some of these estimates are complicated by the fact that postpartum depression does not always occur alone; its etiology is complex and the condition may be accompanied by various comorbidities. For instance, parents are at an increased risk for developing depression after a complicated delivery, a multiple birth, or when a child is

born with significant health issues. Other stressful situations such as a difficult or unplanned pregnancy, financial stress, and a weak support system may also contribute to depression risk, as can significant difficulties with breastfeeding. Finally, a history of anxiety, depression, or other mental illness—either personal or familial—can significantly increase one’s risk of developing postpartum depression, especially if those previous depressive episodes occurred during or after pregnancy (Mayo Clinic Staff, n.d.; Rafferty et al., 2019).

Screening and Diagnosis

While all of these factors predispose parents to postpartum depression, it is entirely possible for individuals without any of these risk factors to develop the condition. Because of this, the population at risk comprises all parents throughout the postpartum period. In the 1980s, a team of British researchers discovered that the standard screenings for depression and anxiety proved neither sensitive nor specific for postpartum women, and attributed this failure of validity to normal physiological changes following childbirth. Consequently, they set out to create a new screening tool, with the following requirements in mind:

To be useful as a screening test for depression following childbirth, therefore, a self-report scale must be fully acceptable to women who may not regard themselves as unwell, or as in need of medical help. The scale needs also to be simple to complete, and not require the health worker to have any specialist knowledge of psychiatry. It must have satisfactory reliability and validity. (Cox et al., 1987, p. 783)

In accordance with these criteria, the team developed the Edinburgh Postnatal Depression Scale, or EPDS. This ten-question screening tool was widely adopted due to its sensitivity and specificity, as well as the ease with which it can be administered, completed, and scored (Cox et al., 1987). Thirty-four years later, the EPDS has been

widely translated, validated with different threshold scores in multiple languages, and remains the most common screening tool for postpartum depression (Gibson et al., 2009). Various other postpartum depression screens are available as well, but they lie beyond the scope of this thesis.

The Edinburgh Postnatal Depression Scale consists of a single page with ten questions asking parents how they have felt over the course of the last week (attached as Appendix A). The instructions are simple, and ask only that the mother be allowed to answer the questions privately unless she needs assistance reading the questions. Each of the ten questions is answered on a four-point sliding scale, with zero points assigned to the healthiest response, and three for the response considered most maladaptive. Originally, the researchers used thirteen as the threshold for a positive screening, although they indicated that ten might be a more appropriate cutoff if the EPDS were to be used for routine screening in the primary care setting. Both scoring systems are in use today. Furthermore, parents automatically screen positive for depression risk if they indicate on the final question that they have considered self-harm, regardless of their total scores. Generally speaking, the screening process as a whole takes only five minutes to complete, and scoring is simple (Cox et al., 1987).

While various other screenings and diagnostic methods for postpartum depression do exist, the ten-question EPDS remains the most common. While screening for postpartum depression may seem clearly to fall within the jurisdiction of obstetricians, the EPDS may also be administered in other healthcare settings. Because the mental health of the parents has a profound effect on the wellbeing of the child, screening for postpartum depression in the pediatric primary care setting is generally accepted as well.

Importantly, it can also be billed as a part of a well-child check (Earls et al., 2019). The practice of screening for postpartum depression in the pediatric primary care setting, while still not universal, is the subject of the observational study detailed in Chapter Three of this work.

When the EPDS was first developed, it was intended primarily for mothers already suspected of having depression, rather than general use. However, even the original 1987 publication mentioned the possibility of administering the screening to other populations (Cox et al., 1987). Since that time, the EPDS has been validated not only for all postpartum mothers, but also for fathers. Clinical evidence indicates that the screening is sufficiently sensitive and specific when used in either population, meaning that neither false positives and false negatives are unreasonably common (Earls et al., 2019).

One should note, however, that screening alone cannot and does not provide a definitive diagnosis; instead, “a positive screen result indicates a risk that depression is present” (Earls et al., 2019, p. 5). From there, the patient with a positive EPDS can be referred to a specialist who is able to “clarify the diagnosis and offer the indicated treatment” (Earls et al., 2019, p. 5). This is consistent with the recommendations of the team that first developed the screening; their original article emphasized that “The EPDS is not a substitute for this clinical assessment” (Cox et al., 1987, p. 785). Accordingly, they did not preclude the possibility of their screening producing false negatives, even though it had been clinically validated for sensitivity. On the contrary, the researchers suggested that “a score just below the cut-off should not be taken to indicate the absence

of depression, especially if the health professional has other reasons to consider this diagnosis” (Cox et al., 1987, p. 785).

Referral and Treatment

While the EPDS is a meaningful first step towards a diagnosis, then, it is essential that parents who screen positive for depression symptoms receive follow-up care.

Typically, this entails a referral to a mental health professional for definitive diagnosis and treatment. After a diagnosis of postpartum depression is made, parents may choose from a wide variety of treatment options, which may include therapy or antidepressant drugs, depending on the patient’s preferences. However, many diagnoses of postpartum depression do not require medical treatment, and parents may do well with improved social support. Even when medical treatment is not pursued, a definitive diagnosis may be helpful, since basic education on postpartum depression may help demystify parents’ experience and help them to understand that they are not alone. Understanding postpartum depression as a medical condition benefits parents by reducing their sense of guilt and shame (Earls et al., 2019). Any of these options has the potential to benefit parents, even if the treatment is not strictly medical in nature.

Current Recommendations

The research is clear, however: screening alone is insufficient to address postpartum depression. Instead, “Meta-analysis of depression screening programs generally conclude that depression screening must be combined with systemic paths for referral of cases and well defined and implemented care plans to achieve outcome benefits” (Stewart et al., 2003, p. 4). One would hope, then, that use of the EPDS would be accompanied by an emphasis on referral and treatment of parents who screen positive.

Unfortunately, this seems not to be the case. Instead, the data suggest that “even when screening results are positive, mothers often do not receive further evaluation, and even when [postpartum depression] is diagnosed, mothers do not receive evidence-based treatments” (Earls et al., 2019, p. 1). It appears, then, that any program focused on improving outcomes for families affected by postpartum depression should aim not only to promote universal screening for the condition, but also to ensure that parents with depressive symptoms actually receive the resources they need in order to cope.

With these goals in mind, the American Academy of Pediatrics (AAP) officially recommends “integrating postpartum depression surveillance and screening at the 1-, 2-, 4-, and 6-month visits,” for a total of four longitudinal screenings (AAP, n.d.). This prescribed timeline accounts for normal variation in the course of depression, as evidence indicates that the condition tends to peak at 6 weeks, 2–3 months, and 6 months postpartum. Furthermore, this allows multiple opportunities for parents to disclose depressive symptoms even if they are not initially comfortable doing so (Earls et al., 2019).

Despite the AAP recommendations, this screening schedule has yet to become standard practice among pediatricians. As of 2008, 71% of pediatricians indicated that they rarely or never screened for postpartum depression, and 93% said that they rarely or never made referrals for parental mental health care. Although these numbers do seem to be improving, a 2013 survey of AAP members revealed that less than 50% of US pediatricians screened new mothers for depression in their practices (Earls et al., 2019). Unfortunately, the fact that a clinic does have EPDS questionnaires available to parents in the postpartum period does not guarantee that this screening is part of the routine exam;

some practices only investigate parental mental health when nurses or doctors see clear signs of depression. Even those who did regularly utilize the EPDS at the time of the 2013 study did not necessarily repeat the screening more than once, and screening rates were almost certainly lower for fathers than for mothers. One major step in improving outcomes for parents with postpartum depression, then, would be for pediatricians to follow AAP recommendations and incorporate the EPDS into regularly scheduled well-child checks.

If a clinic does routinely administer these screenings, it is imperative that there be a system in place for referral and treatment. The AAP guidelines on this front are not as obvious. While their “Perinatal Depression” page outlines the organization’s recommendations with respect to screening timelines, one must then search through a series of 22 linked articles, webinars, and posters in order to access “information on effective screening, referral, and support for perinatal/postpartum depression” (AAP, n.d.). While no official recommendation for best referral practices seems immediately evident, further perusal of these linked articles reveals that “recent AAP recommendations are for universal screening of infant behavior and development and partnering with mental health care providers to implement evidence-based treatments during early childhood” (Rafferty et al., 2019, section 10). However, it is worth noting that the AAP recommendations cited here do not deal specifically with postpartum depression. In this particular case, the AAP does not seem to specify whether a referral ought to be made to an adult mental health professional, or another party such as the mother’s obstetrician or primary care provider. While referral of some sort is clearly

indicated in the case of positive depression screenings, the standard of care remains ambiguous and unclear.

One thing, at least, does seem to be clear: the pediatrician's patient is the infant, not the parent. The pediatrician, then, is not directly responsible for diagnosis and treatment of the parent's depression (Earls et al., 2019). Instead, general pediatricians can help combat postpartum depression by routinely screening parents and consistently making referrals when the EPDS indicates the presence of depressive symptoms. In these cases, pediatricians should be sure to follow up with parents at subsequent well-child checks.

CHAPTER THREE

The Study

Origins

This study began as an attempt to investigate the association between gastroesophageal reflux disease of the infant (GERD) with maternal postpartum depression, based on the supervising physician's suspicion that there existed a positive correlation between the two diagnoses. In order to investigate this hypothesis, a comprehensive chart review was initiated, drawing from the electronic health records (EHR) of all 304 patients in the clinic who met the criteria enumerated below in the "Population" section of this chapter. Once this list of patients was compiled, researchers decided to collect data on a wider variety of factors in order to produce a more detailed description of postpartum depression and its etiology within the clinic's population. The overall objective, then, was to identify risk factors for postpartum depression and to assess whether there were differences in the incidence of depression risk and the management of positive EPDS screenings in mothers versus fathers.

Ultimately, the variables of interest comprised gestational age, maternal age, parity, diagnosis of GERD, number of office visits within the first six months of the child's life, and number of routine well visits attended by both parents, as well as the EPDS scores for both parents, as measured at four predetermined well-child checks throughout the first six months of the infant's life. When there was information available, notes were also made on relevant social factors, as well as any discussion of possible

treatment or support for postpartum depression that was recorded in the physicians' appointment notes.

Researchers submitted an abstract for this study, with the working title of "Risk Factors, Prevalence, and Management of Positive Maternal and Paternal Postpartum Screening in a Primary Care Clinic," to the Institutional Review Board of the hospital where the supervising physician was employed. As the study comprised only a retrospective chart review with the potential for addition of quality improvement measures, it was ultimately ruled exempt from IRB review (Appendix B).

Population

This retrospective descriptive study took place in the context of a single private primary-care clinic in the D.C. suburb of Vienna, Virginia. While demographic information for individual subjects was not consistently available, the clinic's patient population can be reasonably approximated by looking at data for the town of Vienna as a whole. According to the U.S. Census Bureau, 67% of the town's population is White (non-Hispanic), 15% is Asian, 10% is Hispanic or Latino, and 3% is Black, with another 6% of the population reporting as mixed-race. 77% of Vienna residents were born in the United States, and 74% report that English is their primary language used within the home. The median household income in 2019 was just over \$161,000, and 95% of residents under 65 had some form of health insurance (U.S. Census Bureau, 2019). While none of these statistics should be considered directly applicable to the population of this study, they may nevertheless be helpful for understanding the context in which it was conducted. The study itself did, however, reveal some demographic information, including a mean maternal age of 34 years.

Because the demographic makeup of Vienna is not representative of the American population as a whole, one must be careful not to make inappropriate or unwarranted generalizations from the results of this project. This is a descriptive study of the clinic's unique population, and the 304 families in the study population included should not be considered a random sample of parents in the United States.

Although this clinic had administered the EPDS for some time, parents initially completed the questionnaire only once during the postpartum period. During the summer of 2018, the clinic's protocols changed, and parents were asked to complete the survey on four separate occasions: two weeks, two months, four months, and six months after the birth of their child. Mothers and fathers were both encouraged to complete the screening if they were present at the appointment. This practice is consistent with the current AAP recommendations for the detection of postpartum depression, and it was instituted independently of this study (AAP, n.d.). The date of implementation for this longitudinal repeat screening led to the selection of June 1, 2018 as the start date for the chart review, since babies born on or after this date would have the appropriate EPDS records that were needed for the study. Ultimately, October 1, 2019 was chosen as the final date of birth for potential subjects. While the study was originally slated to extend for another year in order to increase the potential pool of subjects for a higher-powered study, the advent of the COVID-19 pandemic was determined to be too great a confounding variable, and data collection ended a year earlier than anticipated. With this in mind, screenings were only evaluated through the end of February, 2020.

In order to be eligible for the study, then, babies had to be born between June of 2018 and October of 2019. Because some patients born within this window transferred in

or out of the practice within their first six months of life, and others did not complete all of the standard well-child checks within this period, the threshold for inclusion in the study was set at the completion of three of the four pertinent appointments. Because the primary outcome of this study comprised the parental EPDS scores, the parents of twins were counted only once, although a note was made in the case of multiple births. According to these selection criteria, 304 unique patient families qualified for inclusion in the study.

Methods

The electronic health record system PCC was used to compile a list of every new Patient Identification Number issued by the clinic between June 2018 and January 2020. These charts were then manually reviewed to identify those infants who met the aforementioned criteria. From there, a thorough chart review was performed, and data was collected from the PCC pages labeled “Medical Summary,” “Demographics,” and “History,” giving information on gestational age, maternal age, parity, diagnosis of GERD, number of office visits within the first six months of life, and number of EPDS screening visits attended by both parents. If any of this information was not recorded in the PCC interface itself, it was extracted from the hospital discharge records attached to the patient’s file.

Information on both parents’ EPDS scores was taken from the PCC “Documents” page. Often nurses would indicate the scores in their upload notes, but these notes proved to be unreliable in that they were not always present and not always accurate. With positive postpartum depression screenings resulting from any score greater than or equal to ten, any score of seven or greater was corroborated with the scanned page itself in

order to reduce the likelihood of false negatives or false positives entering the data set unnoticed. Any scoring errors detected in this corroboration process were noted beside the primary outcome. If one or both parents did receive a positive EPDS screening, a more thorough reading of the appointment notes would follow, and a note was made detailing any discussion of referral or treatment for postpartum depression.

Patient privacy remained an utmost concern throughout the study. From start to finish, no patient names were ever connected to the data being collected. Initially, researchers hoped to use birth dates to investigate the possibility of seasonal effects on rates of postpartum depression; however, date of birth is considered to be identifying information, so this variable was abandoned in the course of project development in order to avoid compromising patient privacy. While initial chart access depended on PCC's Patient Identification Numbers, these too can be linked to specific individuals, so the only copy of the data that includes these PINs is stored on the clinic's secure server. In order to fully anonymize the data so that it can be accessed by researchers outside of the clinic, each subject was issued a separate Study Identification Number, which cannot be traced back to the individual.

Results and Analysis

Once all of the data were collected and organized, the results were analyzed. In addition to calculating basic summary statistics, the researchers performed tests including two proportion Z-tests and χ^2 tests of independence. Typically, the threshold for statistical significance was set at .05, although this was lowered to a more strict .01 to account for multiple comparisons when applicable.

All in all, the study involved 304 separate families, for a total of 2641 office visits over the course of 21 months, although screenings were only administered at four routine well-child checks, which accounted for about half of these appointments. During these selected visits, the ten-item EPDS questionnaire was administered and completed 1759 times by 547 different parents.

Consistent with the original recommendations for physicians using the EPDS as a routine screening tool in primary care, the clinic considers a score greater than or equal to ten as positive, therefore indicating the presence of possible depression (Cox et al., 1987). Likewise, any parent who indicated on the final question that he or she had continued self-harm would screen positive for depression risk as well, even if the composite score was below the typical threshold of ten. According to these criteria, the study yielded a total of 68 positive screenings, for an overall per-screening positivity rate of 3.87%.

Women's EPDS scores ranged from 0 to 22 out of 30 points, with a mean score of 3.35, a median of 3, and a standard deviation of 3.21 points. Scores for men were overall somewhat lower, ranging from 0 to 17, with a mean score of 2.32, a median of 1, and a standard deviation of 2.86. A two proportion z-test confirms that the difference between these two data sets is statistically significant at an alpha level of 0.05, suggesting that women on average really do report more depressive symptoms than men ($z = 3.18$, $p = .00148$).

Researchers were also able to use the data to calculate EPDS positivity rates within the clinic, although it is worth noting that these are only approximations of the true rates of depression, since the Edinburgh Postnatal Depression Scale can only point to the likelihood that an individual is suffering from depression, rather than providing a

definitive diagnosis. Out of the 304 mothers who were screened for depression, 39 women, or 12.8% screened positive at least once. Positivity rates for the 243 fathers who completed the EPDS were lower, amounting to 5.35%. While these rates do suggest significant rates of depression among both parents, the numbers indicate that mothers coming into the clinic were more likely to screen positive at some point.

However, one should avoid drawing too direct of a direct comparison between these two rates, since fathers attended significantly fewer appointments overall and therefore completed the EPDS less frequently. Mothers attended an average of 3.74 out of the 4 screening visits, as opposed to fathers' 2.04, for a total of 1138 EPDS questionnaires completed by women, and only 621 filled out by men. Accounting for these differences, EPDS scores for women were positive 4.31% of the time, while men's screenings were positive 2.58% of the time. These data do not show a statistically significant per-screen positivity rate based on the gender of the parent ($z = 2.96$, $p = .066$). This indicates that mothers were more likely to screen positive for depression at least in part because they had more frequent opportunities to do so, and not necessarily just because they make up a more depressed population overall.

A review of the timing of these positive screens revealed that each new screening appointment (two weeks, two months, four months, and six months) detected new cases of postpartum depression in parents who had not previously screened positive; in fact, only 40.1% of positive EPDS scores were recorded at the two-week appointment. This was true for both mothers and fathers, emphasizing the importance of these longitudinal screenings in both populations. The total set of positive screenings is broken out by gender and time of screening in Figure 2, below. This graph helps to illustrate the fact

that many cases of postpartum depression would likely have gone undetected if the EPDS had only been administered to women at one single appointment, to the detriment of both the parent and the child.

Time of Positive Screening

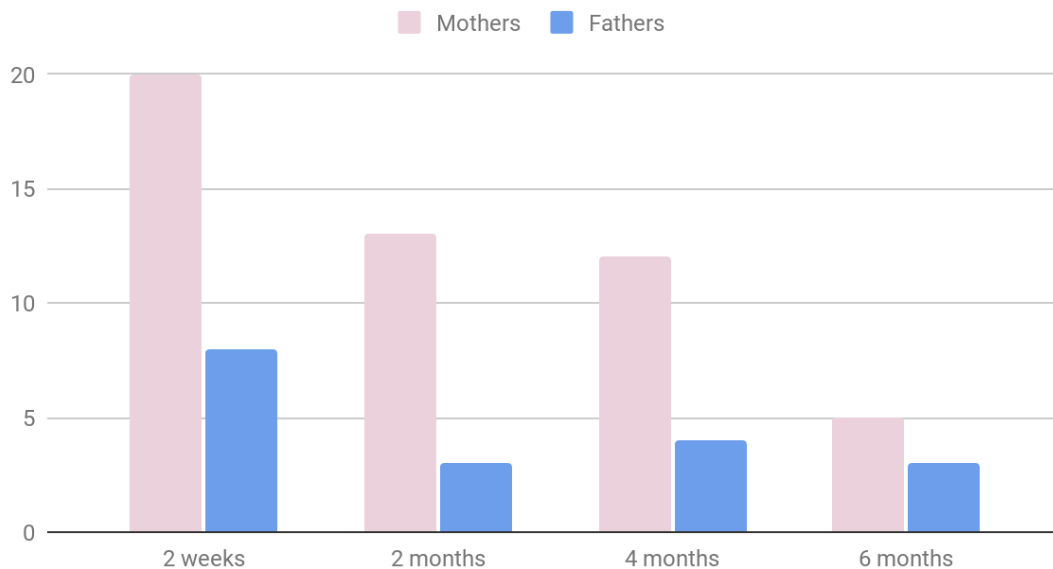


Figure 2. Each screening appointment revealed previously undetected symptoms of postpartum depression. The vertical bars demonstrate the number of positive screenings at a given appointment.

Following this basic analysis of EPDS positivity rates, researchers began to look for associations between postpartum depression and the other variables of interest. However, this analysis did not yield any statistically significant results, although this may be tied to the decreased power of the truncated study. Furthermore, the alpha level for the independence tests had to be lowered from 0.05 to 0.01 to account for the increased likelihood of Type I errors due to multiple comparisons. While some of the variables of interest initially seemed to show a positive association with positive EPDS screenings, a series of χ^2 tests of independence revealed that the proportion of parents with a positive EPDS screening did not significantly differ by maternal age, infant gestational age, or

infant diagnosis of GERD, regardless of gender. In other words, analysis of the study results revealed that the variables of interest seemed to vary independently.

If any of these associations truly were present in the clinic's parent population, the study was insufficiently powered to positively determine them. For instance, initial analysis of the data seemed to reveal that the partners of depressed parents were themselves at an increased risk of depression; this association is well-documented in the existing literature (Earls et al., 2019). However, this apparent association was not statistically significant in this study at a sufficiently conservative alpha level of .01, $\chi^2(1, n = 253) = 6.24, p = .013$. Without a larger study sample size, it is difficult to determine the relationships among the different variables of interest in the clinic's unique patient population.

Incidental Findings

While the study was initially intended to consist only of a descriptive study investigating the relationship between postpartum depression and various other factors in the clinic's patient population, some significant incidental findings became evident in the course of data collection, and the researchers chose to pursue these as avenues for further study. Although patient records indicated that the EPDS questionnaire was appropriately administered to parents on a relatively consistent basis, the research process revealed several weaknesses in the way the clinic handled these screenings for postpartum depression.

As data collection progressed, researchers unearthed a number of errors in the recording process for depression screenings. First, it was not uncommon for the completed questionnaires to be scored incorrectly. As is mentioned in Chapter Two, each

of the ten items on the EPDS is scored on a scale of 0–3, such that the range of possible total scores is 0–30 (the EPDS is included as Appendix A). However, these associated numerical scores are not listed by the corresponding answers—this omission may increase honest and unbiased responses, but it does make scoring more difficult. Furthermore, not all questions are scored the same. Some items dealing with adaptive responses to one’s situation are scored from 0–3, respectively; others dealing with maladaptive responses are reverse scored, such that the answers are ordered from 3–0 instead. If nurses only briefly look over the page, they may be liable not to use the correct scale for each question, leading to an incorrect composite score. If this occurs, there is a possibility that the total score will move above or below 10 points, the clinic’s threshold for depression risk. If this occurs, the clerical error causes either a false positive or a false negative result for the EPDS. Surveys were determined to have been misscored by up to 3 points on multiple occasions, so researchers manually reviewed any that were within a few points of the positivity threshold.

Even questionnaires that were correctly scored by the nurses were at times charted incorrectly. After scoring, each completed EPDS was scanned into the clinic’s EHR so that the documents are accessible for retrieval and review at any time. However, nurses would often make a note of the total score directly into the patient’s chart, and these notes were also prone to errors. If a provider were then to reference the summary note alone rather than personally reviewing the scanned screening sheet, these errors might never be corrected. If the clerical error adjusted a positive score down below the threshold, it would likely prevent depressed parents from receiving appropriate guidance. This is not a theoretical concern, either; there were parents within the study who were incorrectly

marked as “passing” the EPDS with a negative screening in the medical records, although a further review of the scanned questionnaire documents revealed otherwise. For some parents, such as one mother who was charted as having “passed” the screening despite scoring a 13 and indicating thoughts of self-harm, this error could have dangerous implications.

However, the greatest concern uncovered by researchers relates not to the way nurses scored and recorded depression screenings, but instead to the providers’ handling of those results. Not every positive screening for postpartum depression was followed by appropriate recommendations by the provider. On the contrary, over 30% of the charts for parents with evidence of depression contain no indication of any mention of options for referral and treatment.

In order to assess how the clinic handled these positive screenings, researchers read through the entirety of the provider’s notes from each appointment that yielded a positive EPDS score, making a record of any discussion of the parents’ mental health, or the lack thereof. These notes were then divided into four distinct categories, representing the possible responses to a parent with indications of depression. The first category was “no record;” if the topic of postpartum depression was ever raised in these appointments, the provider never made note of it. Second was the offer of “general support.” These appointment notes revealed that postpartum depression had been addressed in some capacity, but no specific help was offered beyond encouragement or the assurance that the parents were welcome to contact the clinic with any concerns. The third category was “referral.” Most of these parents were advised to contact their obstetricians to discuss postpartum depression, although a few were directed to their primary care physicians or

given information on local mental health care providers. Finally, some of the charts indicated that parents were already being seen by a mental health care provider; these cases were designated “already in mental health care”. If an appointment note indicated more than one of these responses, it was sorted into the category of the higher-level response. For example, if general support was offered to a parent who was also referred to her obstetrician for follow-up, the visit as a whole was sorted into the “referral” category.

Each of these response categories was further broken down by gender to determine whether providers are likely to treat postpartum depression differently in mothers than in fathers. Among parents with evidence of depression, there was no statistically significant difference between the proportions of mothers and fathers whose risk of depression was not addressed (31.6% versus 50.0%, $z = -1.2236$, $p = .222$). Likewise, there was no significant difference in mothers versus fathers who received only general support (21.1% versus 28.6%, $z = -0.5708$, $p = .569$), specific referrals (34.2% versus 14.3%, $z = 1.4067$, $p = .159$), or reported that they were already receiving mental health care (13.2% versus 7.1%, $z = 0.602$, $p = .549$). While it was appropriate that providers handled positive depression screenings the same regardless of the gender of the parent in question, these data are nevertheless concerning in that they reveal just how often parents with significant depressive symptoms seem not to have received referrals for appropriate care. The charted responses to positive EPDS scores are depicted below in Figure 3.

Management of Positive EPDS

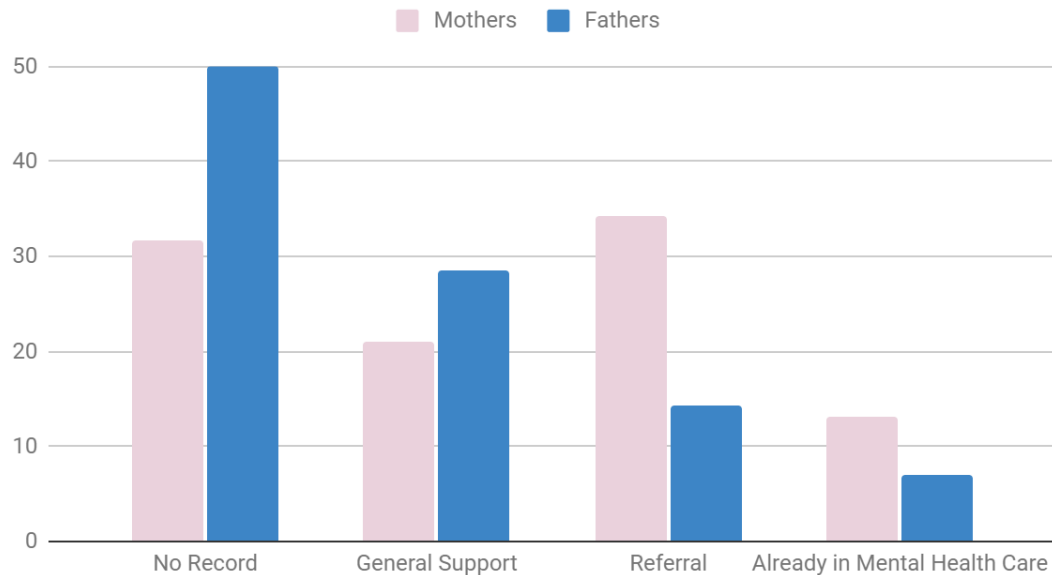


Figure 3. Responses to positive EPDS scores varied widely. While there was no statistically significant gender-based discrepancy between responses, the appointment notes in the electronic health records showed that providers had not consistently offered appropriate referrals to parents whose screenings showed an increased risk of depression.

In conclusion, the clinic seems to have excellent screening protocols, administering the EPDS to both mothers and fathers at four separate well-child checks. This is consistent with AAP recommendations and corroborated by the fact that each of the four screening opportunities revealed previously undetected indications of postpartum depression for parents of both genders. Data analysis also failed to detect any strong associations between potential risk factors and positive depression screenings, emphasizing that surveillance based on these factors alone is insufficient to detect depression in parents; on the contrary, all parents should be screened, regardless of presentation. With the one caveat that not all parents consistently attend appointments and therefore do not complete the EPDS as often as would be ideal, the clinic's screening practices on the whole are excellent. The study did, however, reveal several weaknesses

in the handling procedures for positive depression screens, as discussed above. Potential solutions to some of these issues will be discussed in the concluding chapter of this thesis.

CHAPTER FOUR

Conclusion

COVID-19

While the onset of the COVID-19 pandemic had a significant effect on the progress of this study, it did not lessen the importance of this research. On the contrary, data from other sources indicate that rates of postpartum depression (along with other mental illnesses) have dramatically increased over the course of the last year. According to a large observational study conducted at Brigham and Women's Hospital in Boston during the summer of 2020, rates of depression were significantly higher among pregnant and postpartum women than would have been expected apart from the pandemic; prevalence was measured at 36.4%, or more than double the approximate rate of 17% which is otherwise considered typical. (Liu et al., 2021; Cameron et al., 2016). Although studies like this cannot demonstrate causation, the researchers did find a significant positive association between COVID-related health worries and grief and positive screenings for depression, anxiety, and PTSD in the perinatal period (Liu et al., 2021). The researchers suggested that the dramatic increase in perinatal depression rates may therefore have been related to the increased stress and decreased social support that characterized new parents' experience during the pandemic. This corroborates the causative role of social factors in postpartum depression that was described in Chapter Two.

While the dramatic increase of mental illness among new parents is not necessarily surprising given the significant role of environmental factors in the etiology

of postpartum depression, it is concerning, given the dramatic effects that parental depression can have on the infant and the family as a whole. The pandemic may make identification of these cases more difficult, but it nevertheless remains imperative that these parents receive proper diagnoses and treatment.

Study Modifications

Originally, data collection for this project was to have continued through January of 2021 at the earliest, as opposed to ending at the beginning of March, 2020. However, the onset of the COVID-19 pandemic dramatically shortened the timeline of the study, since the increased use of telehealth and the social stressors of the pandemic introduced too many confounding variables that had the potential to contaminate the data. This truncated timeline reduced the anticipated subject pool by roughly 36%. As a result, the total number of families included in the study was 304, rather than approximately 475 as would otherwise have been projected. Regrettably, this smaller sample decreased the power of the study significantly, making it more difficult to detect statistically significant relationships among the different variables of interest.

The premature end of the study due to the COVID-19 pandemic also impacted the researchers' ability to implement quality improvement measures in the clinic as was originally intended. While certain suggested changes will be included below, the quality improvement portion of the study has not been completed, and no data are available at this time to indicate the effectiveness of these measures.

Further Recommendations

This study indicated that while protocols down the line may sometimes fail, the clinic does do a good job of consistently administering the EPDS questionnaire to parents

who are present at the four designated well-child checks in the first six months of the baby's life. However, this does allow some parents to fall through the cracks if only one parent consistently attends these check-ups. The AAP has recommended sending copies of the EPDS home with parents in order to screen their partners and mail in the results. Perhaps in this setting a similar thing could be accomplished by making the screening available on the patient portal; this would give parents convenient access to the EPDS in their own homes (Earls et al., 2019).

However, the same AAP article notes that the utility of these remote screenings is especially dependent on the existence of a previously assembled list of available resources for parents struggling with postpartum depression (Earls et al., 2019). While there is a link to "postpartum mental health services" on the referral page of the clinic's website, this may not be easily accessible to parents who do not know to look for it.

Given this fact, in conjunction with the frequency with which positive depression screenings administered within the clinic appeared go unaddressed, the researchers developed an informational handout for parents whose EPDS scores indicate a likely diagnosis of depression. This page is available in both English and Spanish (included as Appendices C and D, respectively). In addition to basic information on postpartum depression, the information sheet also directs parents to the online list of local mental health care providers to whom they may reach out for definitive diagnosis and treatment. While providers should still discuss these matters directly with parents, the information sheet was developed in order to bridge any gaps in communication that might remain.

However, the best way to ensure that every parent receives adequate follow-up and treatment in the case of a positive screen is to promote discussion of EPDS results

during the initial appointment. One simple yet effective way to do this would be to introduce an automatic alert to the clinic's EHR system, reminding providers to check parents' EPDS scores and discuss referral and treatment with them, if indicated. To further ensure compliance, the EPDS alert could even be introduced as a forcing function, requiring users to respond to the prompt appropriately before they could continue to navigate the chart. This kind of systems design has been demonstrated to successfully improve workflow and decrease the frequency of errors in similar situations (Manca, 2015). By making this one simple change to the EHR software settings, the clinic could achieve better compliance with the AAP's recommendation that parents who screen positive for postpartum depression symptoms receive proper referrals, diagnosis, and treatment.

Final Thoughts

Postpartum depression remains a common, if underdiagnosed, condition that affects a large percentage of parents in the early months after childbirth. Although records of postpartum mental disturbances date back at least 2500 years, the official diagnosis of medical depression with postpartum onset is far more recent. Even in the decades since its acknowledgment by the APA, definitions of postpartum depression have been significantly revised and expanded, with the addition of peripartum onset and the legitimization of paternal postpartum depression being more recent developments.

These changes in definition, however, can do little in and of themselves to address postpartum depression and ameliorate its negative effects on the family unit. Instead, it is imperative that new parents be screened for the condition so that those with significant depressive symptoms can receive proper diagnosis and treatment. Analysis of risk factors

for depression has limited predictive value, so all parents should be considered at risk and be screened accordingly. In order to promote this universal screening, then, the AAP recommends that primary care pediatricians take an active role in screening both mothers and fathers regularly throughout the first six months of their infant's life. For this to be effective, positive screenings must be followed by appropriate discussion of postpartum depression and referrals to providers who will be able to address it properly.

Unfortunately, many providers fail to comply fully with these AAP guidelines, either neglecting to screen parents on a consistent basis or overlooking positive screenings after the fact. A culture of quality improvement is necessary to rectify these common omissions: if clinics recognize this habitual lack of compliance with AAP guidelines, a simple change in protocols may be sufficient to address the problem. By advocating for prompt treatment of postpartum depression, pediatricians can help to mitigate a major adverse childhood experience and promote the child's health, beginning in the first weeks and months of life.

APPENDICES

APPENDIX A

Edinburgh Postnatal Depression Scale

Edinburgh Postnatal Depression Scale¹ (EPDS)

Name: _____ Address: _____

Your Date of Birth: _____

Baby's Date of Birth: _____ Phone: _____

As you are pregnant or have recently had a baby, we would like to know how you are feeling. Please check the answer that comes closest to how you have felt **IN THE PAST 7 DAYS**, not just how you feel today.

Here is an example, already completed.

I have felt happy:

- ☐ Yes, all the time
☒ Yes, most of the time This would mean: "I have felt happy most of the time" during the past week.
☐ No, not very often Please complete the other questions in the same way.
☐ No, not at all

In the past 7 days:

- | | |
|---|--|
| 1. I have been able to laugh and see the funny side of things
<input type="checkbox"/> As much as I always could
<input type="checkbox"/> Not quite so much now
<input type="checkbox"/> Definitely not so much now
<input type="checkbox"/> Not at all | *8. Things have been getting on top of me
<input type="checkbox"/> Yes, most of the time I haven't been able to cope at all
<input type="checkbox"/> Yes, sometimes I haven't been coping as well as usual
<input type="checkbox"/> No, most of the time I have coped quite well
<input type="checkbox"/> No, I have been coping as well as ever |
| 2. I have looked forward with enjoyment to things
<input type="checkbox"/> As much as I ever did
<input type="checkbox"/> Rather less than I used to
<input type="checkbox"/> Definitely less than I used to
<input type="checkbox"/> Hardly at all | *7. I have been so unhappy that I have had difficulty sleeping
<input type="checkbox"/> Yes, most of the time
<input type="checkbox"/> Yes, sometimes
<input type="checkbox"/> Not very often
<input type="checkbox"/> No, not at all |
| *3. I have blamed myself unnecessarily when things went wrong
<input type="checkbox"/> Yes, most of the time
<input type="checkbox"/> Yes, some of the time
<input type="checkbox"/> Not very often
<input type="checkbox"/> No, never | *8. I have felt sad or miserable
<input type="checkbox"/> Yes, most of the time
<input type="checkbox"/> Yes, quite often
<input type="checkbox"/> Not very often
<input type="checkbox"/> No, not at all |
| 4. I have been anxious or worried for no good reason
<input type="checkbox"/> No, not at all
<input type="checkbox"/> Hardly ever
<input type="checkbox"/> Yes, sometimes
<input type="checkbox"/> Yes, very often | *9. I have been so unhappy that I have been crying
<input type="checkbox"/> Yes, most of the time
<input type="checkbox"/> Yes, quite often
<input type="checkbox"/> Only occasionally
<input type="checkbox"/> No, never |
| *5. I have felt scared or panicky for no very good reason
<input type="checkbox"/> Yes, quite a lot
<input type="checkbox"/> Yes, sometimes
<input type="checkbox"/> No, not much
<input type="checkbox"/> No, not at all | *10. The thought of harming myself has occurred to me
<input type="checkbox"/> Yes, quite often
<input type="checkbox"/> Sometimes
<input type="checkbox"/> Hardly ever
<input type="checkbox"/> Never |

Administered/Reviewed by _____ Date _____

¹Source: Cox, J.L., Holden, J.M., and Sagovsky, R. 1987. Detection of postnatal depression: Development of the 10-item Edinburgh Postnatal Depression Scale. *British Journal of Psychiatry* 150:782-786.

²Source: K. L. Wisner, B. L. Parry, C. M. Piontek, Postpartum Depression *N Engl J Med* vol. 347, No 3, July 18, 2002, 194-199

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Appendix B

IRB Abstract (Exempted)

Submitted by Dr. Kristen Johnson to the Institutional Review Board at Children's National Hospital. Approved 7/17/2020.

Full Study Title:

Risk factors, prevalence, and management of positive maternal and paternal postpartum screening in a primary care clinic

Abstract:

Studies estimate that 1 in 9 mothers and 1 in 10 fathers experience postpartum depression (PPD) within a year of an offspring's birth. Postpartum depression may have profound negative impacts on child growth and development. Mental health interventions exist that may improve symptoms and outcomes of PPD, but accurate identification of cases is necessary to initiate interventions. At our primary care clinic, we have recently expanded use of the Edinburgh Postnatal Depression Scale (EPDS) by administering this questionnaire to both mothers and fathers at well child checks. Drawing from this expanded screening protocol, this study proposes to identify risk factors for maternal and paternal PPD and to assess whether there are differences in the prevalence and management of positive PPD screening in mothers versus fathers.

Data will be collected from the medical record of patients at a single, private primary care clinic. Investigators will abstract data from the medical records for infants born between June 2018 and December 2019. Data on gestational age, maternal age, parity, frequency of physician visits, diagnosis of GERD, maternal and paternal EPDS score, and method in which positive scores were addressed by clinicians will be recorded from all eligible charts during the study period. The primary outcome is an EPDS score > 10 , which constitutes a positive screen for PPD.

The statistical significance of differences in categorical variables will be tested using the chi-square test and in continuous variables using the two-sample t-test. All tests will be two-tailed with a significance level of $p < 0.05$.

APPENDIX C

Parent Information Sheet (English)

Postpartum depression

Many women experience a period of sadness and fatigue after delivery, but sometimes these “baby blues” are stronger than usual or fail to resolve after two weeks. If this occurs, she may be suffering from postpartum depression. This common condition, sometimes referred to as perinatal depression since it may begin during pregnancy, can affect fathers as well as mothers. It is caused by a combination of hormonal changes after pregnancy and various social factors such as sleep deprivation and the increase of stress that many new parents experience.

Every parent with postpartum depression has a different experience. Sometimes the condition presents with classic symptoms such as sadness, excessive crying, hopelessness, or thoughts of suicide. Other parents have different symptoms, which may include anxiety, anger, irritability, or feelings of guilt or confusion. Sometimes, parents with postpartum depression struggle to connect with loved ones including the baby, and they may at times want to hurt the child. Depression can also affect one’s ability to eat or sleep, and many patients suffer from fatigue. These symptoms can be difficult to cope with, especially with an infant in the house.

Fortunately, it is possible to treat postpartum depression. Various forms of treatment are available, including social support, therapy, and antidepressant drugs. Talk to your doctor to determine which options might be best for you.

Resources for Parents with Postpartum Depression

If you believe that you have postpartum depression, there is support available for you. Try contacting one of these agencies for more information and to receive help.

- Advanced Pediatrics offers free virtual classes on newborn care and CPR for children and infants. These classes may help give parents peace of mind about their ability to care for young children, reducing feelings of anxiety
- The Substance Abuse and Mental Health Services Administration (SAMHSA) has a toll free helpline at 1-800-662-4357
- You can find a more complete list of recommended mental health care providers in the community online at <https://www.advancedpediatrics.com/mt-content/uploads/2020/06/postpartum-provider-list-updated-3.25.20.pdf>

For more information, visit www.cdc.gov/reproductivehealth/features/maternal-depression

APPENDIX D

Parent Information Sheet (Spanish)

La Depresión Postparto

Muchas mujeres experimentan un período breve de tristeza (el “baby blues”) después de dar a luz, pero a veces estos sentimientos son bastante severos y no mejoran después de dos semanas. Si esto ocurre, es posible que esté sufriendo de depresión postparto. Esta condición común (a veces llamada depresión perinatal porque puede empezar durante el embarazo) no puede afectar solamente a las madres, sino también a los padres. Es causado por una combinación de cambios hormonales femeninas después del parto y factores sociales, como la falta de descanso y el aumento de estrés que muchos padres nuevos experimentan.

Cada madre o padre con depresión postparto tiene una experiencia distinta. A veces, la condición tiene una presentación muy clásica con síntomas de gran tristeza, llanto excesivo, desesperanza o pensamientos suicidas. Otras padres tienen síntomas diferentes, como ansiedad, enojo, irritabilidad o sentimientos de culpa o de confusión. A veces, los padres con depresión postparto se sienten distancia entre ellos mismos y los seres queridos (que incluyen el bebé) o quieren lastimarlos. La depresión también puede afectar la habilidad de alguien para comer o dormir, y muchos pacientes sufren de cansancio. Todos estos síntomas pueden ser muy difíciles, especialmente con un bebé en casa.

Lo bueno es que se puede tratar depresión postparto. Hay varias formas de tratamiento, que incluyen apoyo social, psicoterapia, y antidepresivos. Hable con su médico para determinar qué tratamiento es mejor para Ud.

Recursos para padres con depresión postparto

Si cree que Ud. tiene depresión postparto, hay apoyo disponible. Se recomienda que contacte a una de estas agencias para más información y a obtener ayuda.

- La clínica está ofreciendo clases virtuales sin pagar sobre el cuidado de los recién nacidos y otras sobre la resucitación de niños y bebés
- La Administración de Salud Mental y Abuso de Sustancias tiene una línea gratuita de ayuda al 1-800-662-4357
- Hay una lista más completa de proveedores de atención de salud mental en la comunidad en línea al <https://www.advancedpediatrics.com/mt-content/uploads/2020/06/postpartum-provider-list-updated-3.25.20.p>

Para más información, visite
www.cdc.gov/reproductivehealth/features/spanish/maternal-depression

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