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Detecting Postpartum Depression in Women: Effects of Breastfeeding, Weight Gain, and Abuse

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This is to certify that the doctoral dissertation by

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has been found to be complete and satisfactory in all respects,
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Walden University
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Abstract

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MPH, Purdue University Global, 2015

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Proposal Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Postpartum depression is a significant health issue that has affected over 10% of women worldwide. However, it has not received the attention it deserves, and many women continue to suffer in silence. Certain risk factors are indicative of postpartum depression. Some include a history of depression and a lack of a support system. Others include weight gain, breastfeeding, and physical/emotional abuse. However, research on these is limited. Thus, this research aimed to investigate the effect of breastfeeding, weight gain, and abuse on postpartum depression in women between 18 and 40+. This cross-sectional study used secondary data from the Pregnancy Risk Assessment Monitoring Systems Phase 8 of the Centers for Disease Control and Prevention. The theoretical framework for this study was Bronfenbrenner's social-ecological model, and the data analysis was done using logistic regression analysis. The results indicated that weight gain in women 18-29 years old affected postpartum depression ($p<0.05$), while in women 30-40 years old, there was no effect ($p>0.05$). For breastfeeding, the results showed that exclusive breastfeeding for 6 months or less did not affect postpartum depression ($p>0.05$), but for 9 months, there was an effect ($p<0.05$), while during pregnancy, physical/emotional abuse in women 18-40+ by a partner, postpartum depression may result ($p<0.05$). The results obtained from this study may help develop intervention measures targeted at these risk factors, thus assisting in the early detection of postpartum depression in women. Also, this research contributes to the existing body of scholarly knowledge of postpartum depression. This study hopes to contribute to positive social change by providing possible evidence for public health intervention to reduce postpartum depression in women.

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Dedication

To my parents, Isaac and Peninnah Onu, for your love and prayers, which have covered me, and your wisdom from which I have constantly drawn.

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"Thanks be to God for His indescribable gift" – 2 Corinthians 9:15. I am so thankful to be at the end of this long journey at Walden University. It was filled with highs and lows and multiple turns. However, I have grown and increased in knowledge with every turn, so I am thankful to God.

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Every one of you is a part of my success on this journey. You are all the thread that completes and beautifies the weave of my fabric. Thank you!

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Chapter 1: Introduction to the Study

Pregnancy and childbirth are natural phenomena experienced by women. Multiple transformations occur and mark the periods of pregnancy, childbirth, and postpartum in women. These include biological, physiological, social, mental, and spiritual changes (Hancioglu Aytac & Yazici, 2020). Some women adapt well to these changes without complications and adverse effects. In contrast, others may find the changes challenging or complex, and to varying degrees. One adverse condition some women may experience after childbirth is postpartum depression. Postpartum depression is a mood disorder that affects approximately 10–15% of postpartum women annually (Anokye et al., 2018). Postpartum depression can be misunderstood as baby blues, also called postpartum blues. It is a brief feeling of chronic sadness after childbirth and usually remits within 10 days after delivery (Pope & Mazmanian, 2016). Postpartum depression, however, is experienced for a more extended period and is far more severe than a brief period of sadness.

Postpartum depression differs from baby blues. According to Pope and Mazmanian (2016), baby blues is experienced by four in five women. It is characterized by anxiety, trouble sleeping, tearfulness, dysphoria, mood lability, and irritability. Postpartum depression, on the other hand, lasts for much longer and is characterized by a persistent low mood, often accompanied by feelings of sadness, worthlessness, or hopelessness (Pope & Mazmanian, 2016). Additionally, postpartum depression often manifests as sleep disorders, mood swings, changes in appetite, fear of injury, serious concerns about the baby, much sadness and crying, sense of doubt, difficulty in

concentrating, lack of interest in daily activities, and thoughts of death and suicide (Ghaedrahmati et al., 2017).

The research on postpartum depression is limited. This is partly because, as Sherman and Ali (2018) reported, postpartum depression is largely underdiagnosed and undertreated. Furthermore, it is difficult to identify patients who have postpartum depression. For example, a few extensive population-based studies of postpartum depression (Bauman et al., 2020; Silverman et al., 2018; Yu et al., 2021) have assessed the clinical diagnosis of depression. In their study, they discussed the clinical diagnosis of postpartum depression based on a structured clinical interview by screening with the Edinburgh Postpartum Depression Scale, which is reliable and well-validated (Yu et al., 2021). This is problematic because some women have been screened negatively yet present feelings of depression (Corrigan et al., 2015).

Furthermore, as of 2017, no study had examined how a maternal depression history interacts with known risk factors of postpartum depression, like young age or lack of social support (Silverman et al., 2017). Unlike other medical conditions, clinical diagnosis of postpartum depression does not involve a blood test or body scan but involves screening by the Edinburgh Postnatal Depression Scale. Thus, there exists a need to explore various methods for detecting postpartum depression, which will aid in the early detection and possible treatment of postpartum depression. Hence, this study attempted to bridge that gap by examining risk factors associated with postpartum depression by evaluating pre-existing data from the Pregnancy Risk Assessment Monitoring System (PRAMS) of the Centers for Disease Control and Prevention (CDC).

I attempted to achieve this by analyzing possible individual and interpersonal related factors (i.e., body weight gain, breastfeeding practices, and physical/emotional abuse) and the prevalence of postpartum depression. I sought to add to the research that aids in detecting postpartum depression, leading to a possible positive social change for mothers, their children, and their families.

Chapter 1 presents the background of the study, problem statement, purpose, research questions, and hypotheses. Additionally, there is a brief discussion of the theoretical framework, nature of the study, scope, delimitations, definitions of terms, assumptions, limitations, and significance. The chapter ends with a summary and transitions into Chapter 2.

Background

Postpartum depression has been identified as a mental health disorder and a significant public health concern. In developed and developing countries, women suffer from postpartum depression. Globally, there is a rising trend in mental health disorders, yet postpartum depression is receiving inadequate attention (Russel & Patrick, 2018). Corrigan et al. (2015) reported that postpartum depression has not received the attention it deserves despite affecting about 10% to 20% of women. This lack of attention is reflected in the limited number of studies conducted to understand postpartum depression and possible ways to address it (Farr et al., 2016). These limited studies reduce the information available about this aspect of mental health. Consequently, this study will attempt to bridge that gap and contribute to existing research and literature.

Several researchers have employed a multifaceted approach to understanding postpartum depression and its risk factors. Postpartum depression has been attributed to insomnia, stress, anxiety, inadequacy, lack of a robust support system, over-planning for the baby's arrival, and other life issues, such as mode of delivery and employment status (Torres et al., 2017). Among these numerous risk factors are individual and interpersonal factors that can influence postpartum women, creating many unanswered questions regarding the entire process of pregnancy, childbirth, and postpartum, leading to anxiety (Corrigan et al., 2016). Hartley et al. (2018) reported that among these questions are some regarding the individual and interpersonal factors of body image, weight status, and psychological distress and the nature of their relationship with depressive and anxiety symptoms.

Women are highly affected by stress during pregnancy and after delivery (Ayers et al., 2020; Qobadi, 2016). According to Qobadi (2016), various forms of stress during pregnancy, such as financial, relational, emotional, and trauma, influence women's health and quality of life. Some stress could be identified as maternal abuse, which may arise from someone close to the mother, e.g., the husband, partner, or ex-partner. Abuse could occur at various times before or during pregnancy or after delivery. These multiple forms of stress, e.g., abuse, may create heightened anxiety in the mother, translating into the postpartum period, complicating issues, and lead to postpartum depression (Desta et al., 2021; Guintivano et al., 2018). The relationship between these stressors and postpartum depression requires further research (Qobadi, 2016).

Additionally, breastfeeding and weight gain are often associated with the period after childbirth and are possible stressors for the new mother. However, reactions differ among women. While some women naturally tend to breastfeed, others associate breastfeeding with stress. Early breastfeeding has been identified as highly beneficial to the baby, but the association between early breastfeeding and postpartum depression is yet to be fully explored (Chiu et al., 2020). However, Ayers et al. (2020) noted that some women become stressed while breastfeeding due to pressure or a lack of breastfeeding self-efficacy. Also, Yamaguchi et al. (2021) discussed that women tend to gain some weight with pregnancy, and there are mixed reactions to the ease of weight loss, sometimes becoming a stressor (Johar, 2020). Yamaguchi et al. noted a controversy surrounding body weight gain and maternal mental health, especially postpartum depression. The findings from this study assisted and offered support for the possible detection of postpartum depression by evaluating these factors.

Due to some significant barriers, postpartum depression frequently goes unrecognized, undiagnosed, and untreated. Some of these include a lack of knowledge of postpartum depression, societal stigma, and an unwillingness for women to speak out about their symptoms (Kendig et al., 2017). Also, some women may not report their real feelings accurately to their healthcare providers or support groups (Pope & Mazmanian, 2016), thus creating significant obstacles to the diagnosis and treatment of postpartum depression. Some of these barriers include the mother's lack of knowledge about the signs and symptoms of postpartum depression (Farr et al., 2016). Therefore, this research attempted to address these obstacles to diagnosis and treatment by contributing to

existing literature, thereby improving the existing knowledge of some of the factors responsible for postpartum depression.

In clinical settings, the detection of postpartum depression occurs via screening for symptoms. Screening for postpartum depression is by a self-screening test conducted approximately 6 weeks after childbirth, using the 10-item Edinburgh Postpartum Depression Scale, a collection of 10 screening questions. It assesses the mother's feelings and mood in the past 7 days (Bauman et al., 2020) and has a possible maximum score of 30, with a cutoff value of 13 or more (Pope & Mazmanian, 2016). The cutoff value of 13 or more indicates that the mother may be suffering from a depressive illness of varying severity, but the final diagnosis is based on clinical judgment (Pope & Mazmanian, 2016). This self-report may lead to some cases of postpartum depression escaping detection and diagnosis (Pope & Mazmanian, 2016). However, a score of 10 or greater indicates depressive symptoms and calls for a need for additional follow-up, and in doubtful cases, the questionnaire may be repeated after 2 weeks (Levis et al., 2020). Also, symptoms may develop after 6 weeks, leading to a loophole in which some cases of postpartum depression escape diagnosis. Fatality may result in both mother and infant if not addressed immediately (Pirec, 2018). Self-reported screening for postpartum depression often occurs during the 6-week postpartum visit using the Edinburgh Postnatal Depression Scale.

The diagnosis and treatment of postpartum depression are of utmost importance. An undetected and untreated case of postpartum depression can adversely affect the health of both mother and infant, causing sleeping, eating, and behavioral problems

(Bauman et al., 2020). Prevention, detection, management, as well as diagnosis and treatment of postpartum depression, have multiple benefits for both mother and infant (Bauman et al., 2020). A lack of detection and proper management may lead to fatality in both mother and/or infant (Pirec, 2018), thus creating a renewed need for other follow-up methods to identify factors that will aid the detection of postpartum depression. Hence, this study also attempted to bridge the gap in determining possible risk factors by identifying individual and interpersonal factors to detect postpartum depression.

Consequently, the limitation in research and studies on postpartum depression, as well as the burden of the disease, presented a need for this study. The limitations discussed emphasized the gap this study attempted to fill. This research attempted to address the barrier to diagnosis and treatment due to a lack of knowledge of the signs and symptoms of postpartum depression. Also, I sought to address the lack of proper understanding of the individual-level and interpersonal level factors of body weight gain, breastfeeding practices, and physical/emotional abuse. Additionally, this study aimed to determine how the individual and interpersonal level factors of body weight gain, breastfeeding practices, and physical/emotional abuse) are related to the early detection of postpartum depression in women between 18 and 40+ years old.

The gap in the literature and the burden of postpartum depression in women provided the rationale for this study. The research contributed to positive social change by better understanding the relationship between breastfeeding, weight gain, abuse, and postpartum depression. The study's findings will possibly assist in designing intervention programs targeted at preventing and managing postpartum depression. This study may be

significant to women in the United States and worldwide as an undetected and untreated case of postpartum depression can adversely affect the health of both mother and infant, causing sleeping, eating, and behavioral problems (Bauman et al., 2020).

Problem Statement

The postpartum period in new mothers is often associated with multiple physical and emotional changes. These changes are related to several individual and interpersonal level factors that may result in postpartum depression. Still, limited research identifies some of these factors, which may be vital to detect postpartum depression. Currently, in the United States, there has been an attempt to increase the attention administered to mental health (Lake & Turner, 2017). However, postpartum depression, an aspect of mental health, has not received sufficient attention (Corrigan et al., 2015).

Various studies have been conducted on postpartum depression (Bauman et al., 2020, Hartley et al., 2017; Kang et al., 2019; Russel & Patrick, 2020). However, minimal studies have been conducted to determine how body weight gain affects the development of postpartum depression among women and how physical/emotional abuse affects the onset of postpartum depression in women of childbearing age (Hartley et al., 2018). Women are very sensitive in the period surrounding pregnancy and delivery. Consequently, the stress associated with emotional or physical abuse increases anxiety; this may linger and adversely affect the mother's mental health, leading to postpartum depression (Desta et al., 2021). Qobadi (2016) reported a need to examine this relationship further. Therefore, this study was designed to bridge these existing gaps and contribute to the available body of knowledge on postpartum depression by determining

the relationship between the individual-level factors of body weight gain and breastfeeding practices on postpartum depression. Also, this study assessed the interpersonal level factor of physical/emotional abuse on postpartum depression while analyzing the relationship between the individual and interpersonal level factors of breastfeeding and physical/emotional abuse in postpartum depression.

Purpose

The purpose of this study was to determine how the individual and interpersonal level factors of body weight gain, breastfeeding practices, and physical/emotional abuse are related to the early detection of postpartum depression in women between the ages of 18 and 40+ years old. I employed a cross-sectional quantitative approach using the social-ecological model to address these issues to analyze secondary data from CDC, PRAMS. In this study, I attempted to contribute to the existing body of knowledge and scholarly research on postpartum depression by determining the relationship between individual-level factors, such as body weight gain and breastfeeding practices, on the occurrence of postpartum depression in women between the ages of 18 and 50 years old, as well as the relationship between interpersonal level factors of life stress (e.g., abuse) and the outcome of postpartum depression.

More research studies on postpartum depression are required (Farr et al., 2016). This would aid in a better understanding of the condition, thereby facilitating prevention and control. Also, there are limited studies on the effect of body weight gain and life stress on postpartum depression and its largely unknown effect (Hartley et al., 2018). Desta et al. (2021) conducted a study on the abuse of women, reporting its association

with postpartum depression, but emphasized the need for further research and studies. Consequently, this research built upon these described studies by analyzing these individual and interpersonal factors to determine the relationship between them and postpartum depression. The possible findings will aid healthcare providers in conducting a follow-up study if there is a relationship between individual and interpersonal level factors of body weight gain and unavoidable life stress.

Furthermore, the results of this study would aid in designing interventions for women between the ages of 18 and 40+ years old. These interventions would target postpartum depression as it is affected by body weight gain, breastfeeding practices, and life stress (e.g., abuse). This study is unique as it focuses on an area of mental health (postpartum depression) that is gradually receiving some attention since there is a renewed urgency to address mental health disorders that are currently increasing (Hartley et al., 2018). The primary independent variables will include the individual and interpersonal levels of the social-ecological model, including the covariates such as body weight gain, breastfeeding, and life stress (e.g., abuse), as described earlier, while the dependent variable will be postpartum depression.

Research Questions and Hypotheses

The study's research questions, and corresponding null and alternative hypotheses are listed below.

RQ1: What effect do the individual-level factors of body weight gain affecting postpartum women have on the development of postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race?

$H_0$1: There is no effect between the individual-level factors of body weight gain affecting postpartum women on the development of postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race.

H_A1: There is an effect between the individual-level factors of body weight gain affecting postpartum women on the development of postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race.

RQ2: What effect does the individual level factor of breastfeeding (e.g., duration) affecting postpartum women have on the development of postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race?

$H_0$2: There is no effect between the individual level factor of breastfeeding (e.g., duration) affecting postpartum women on the development of postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race.

H_A2: There is an effect between the individual level factor of breastfeeding (e.g., duration) affecting postpartum women on the development of postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race.

RQ3: What effect does the interpersonal level factor of physical/emotional abuse affecting postpartum women have on the development of postpartum depression in childbearing women ages 18 to 40+ years old, while controlling for age and race?

$H_0$3: There is no effect between the interpersonal level factor of physical/emotional abuse affecting postpartum women on the development of

postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race.

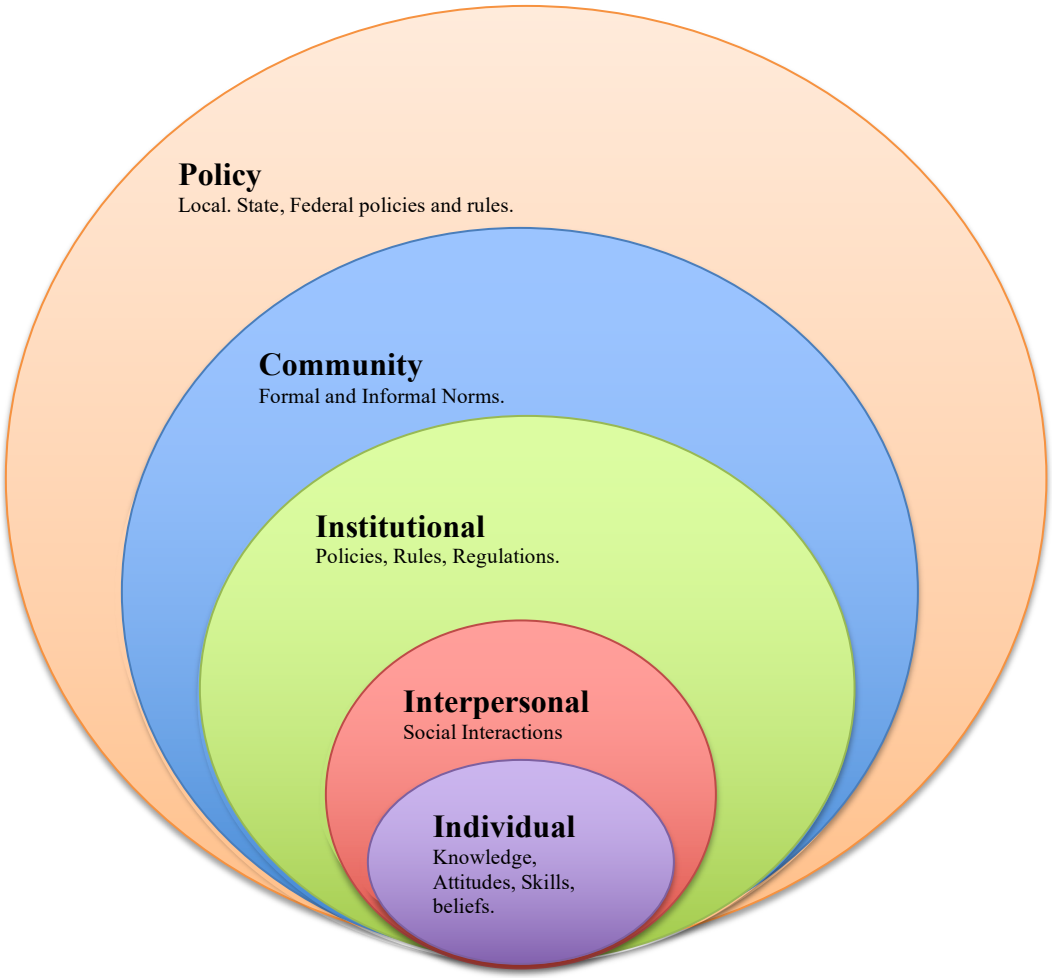
H_A3: There is an effect between the interpersonal level factor of physical/emotional abuse affecting postpartum women on the development of postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race.

Theoretical Framework

The social-ecological model was the theoretical framework used for this study. Bronfenbrenner (1979) first introduced the social-ecological model as a conceptual model for understanding human development. It was later formalized as a theory in the 1980s (Kilanowski, 2017). According to Glanz et al. (2015), the social-ecological model has five levels of influence: individual, interpersonal, community, organizational, and societal. These levels of influence, directly and indirectly, affect lifestyle, behavior choices, and health. Thus, they are essential to intervention planning and mark the core concept of the social-ecological model (Glanz et al., 2015). Saquib (2018) stated that the levels of influence could be independently applied to the study's outcome.

Figure 1

The Social Ecological Model



According to Glanz et al. (2015), the social-ecological model, along with other ecological models, is based on four core principles, which are summarized below:

1. Specific health behaviors are influenced across the five levels of influence of the social-ecological model.
2. Behavioral influences interact across these different levels.
3. Ecological models allow identifying the relevant potential influences at each level, which is behavior specific.

4. An intervention based on more than one level of influence is more effective.

Furthermore, Glanz et al. (2015) stated that when all the factors surrounding the behavior change are aligned, such as norms and social support, and environment and policies support healthful choices, behavior change can occur without challenges. The two levels of influence used for this study include the individual and interpersonal level factors. I sought to determine if the individual-level factors of body weight gain and breastfeeding practices, with the interpersonal level factors of life stress, are critical factors for the early detection of postpartum depression. Thus, I analyzed data from women across the United States in this study. The data were obtained from the CDC, PRAMS. The social-ecological model assesses the individual and their relationship to people, organizations, and communities (Glanz et al., 2015), thereby offering a multifaced approach to managing postpartum depression, which is the focus of this study. Therefore, this multifaceted approach informed the choice of this model for the research. More details will be offered in Chapter 2.

Nature of Study

A cross-sectional, quantitative approach was used for this study. Quantitative analysis was conducted, as it examined the relationship between the variables. In this study, I sought to analyze extensive quantitative data, precisely a secondary data set, the Phase 8 (2016 to 2020) data set of postpartum women from the CDC, PRAMS. CDC (2021) reports that PRAMS is the only surveillance system that offers ongoing, state-specific, population-based data about pregnancy and the first few months after birth. The CDC collected the data, covering about 83% of U.S. births from postpartum women

shortly after childbirth, obtaining data on maternal attitudes and experiences before, during, and shortly after pregnancy to evaluate emerging reproductive health issues (CDC, 2021). Hence, the study was based on the social-ecological model, examining individual and interpersonal level covariates of body weight gain, breastfeeding practices, physical/emotional abuse, and postpartum depression as the dependent variable.

The statistical analysis that I used for this study was logistic regression analysis. This was completed to answer the research questions and validate or reject the hypothesis. According to Schober and Vetter (2021), logistic regression generally explains the relationship between categorical variables and estimates the relationship between one or more independent variables and a binary (dichotomous) outcome variable. Hence, in this study, I attempted to analyze the relationship between postpartum depression (dependent variable) and multiple independent variables (body weight gain, breastfeeding practices, and physical/emotional abuse). The Statistical Product and Service Solutions (SPSS) software by the International Business Machines Corporation (IBM) was utilized for this study.

Definitions

The following terms used in this proposal are defined:

Baby blues or postpartum blues: A brief period of emotional disturbance following childbirth, characterized by irritability, tearfulness, dysphoria, mood lability, trouble sleeping, and anxiety (Pope & Mazmanian, 2016). Baby blues occur in as many as 80% of postpartum women within the first few days after childbirth and usually

resolve within 10 days (Pope & Mazmanian, 2016). Baby blues is also called postpartum dysphoria (Balaram & Marwaha, 2022).

Body weight gain: An increase in body weight, measured in pounds (lbs.), between a specific period. For this study, it will be the difference in body weight between the period before and after pregnancy.

Breastfeeding practices: This is described in this study as the practices related to nursing the baby. For this study, the duration of breastfeeding, which will be measured in weeks and months, will be the practice of focus.

Dysphoria: The opposite of euphoria. It is an intense feeling of dissatisfaction and unease (Trifu et al., 2019).

Feeding with other liquids: This involves feeding the infant with other meals/ liquids besides breastmilk, e.g., infant formula.

Life stress: For this study, life stress is a condition that produces strain in the postpartum mother. It will be measured by emotional/physical abuse by the husband or other family member before and during pregnancy, as defined by the CDC, PRAMS.

Mood lability: An intense or rapidly changing emotional response disproportionate to the situation (Høegh et al., 2020). It is sometimes referred to as affective lability, mood or emotional instability, and mood swings (Høegh et al., 2020).

Postpartum depression: A debilitating mental disorder that affects women after childbirth (Ghaedrahmati et al., 2017). Also, postpartum depression is a persistent low mood in new mothers, often accompanied by feelings of sadness, worthlessness, and hopelessness, and differs from baby blues (Pope & Mazmanian, 2016). Although it may

be somewhat similar to other depressive symptoms experienced by women, it is remarkably different due to the profound physiological changes occurring during pregnancy and postpartum (Pope & Mazmanian, 2016).

Postpartum psychosis: A rare psychiatric emergency that results from unmanaged postpartum depression (Pirec, 2017). It is characterized by anxiety, extreme confusion marked by delirium, loss of touch with reality (disorientation and confusion), paranoia, delusions, disorganized thought process, and hallucinations (Davies, 2017). It affects about one to two per one thousand females of childbearing age annually and usually commences within the first 6 weeks after childbirth. Although rare, it is considered a psychiatric emergency that warrants immediate medical and psychiatric attention and hospitalization if the risk of suicide or infanticide exists (Davies, 2017).

Assumptions

This study had four significant assumptions. These are ontological, epistemological, methodological, and axiological assumptions. I assumed that the secondary data I used for this study and obtained from the CDC, PRAMS, is objective, truthful, correct, and credible. According to CDC (2021), PRAMS is a state-specific population-based surveillance data developed in 1987. It involved two core parts: state-specific questions and core questions developed by CDC. It offered standardized data only obtainable from the CDC about maternal attitudes and experiences before, during, and after pregnancy. The methodology involved collecting surveillance data through a standardized data collection system. Thus, it is assumed that all participants who filled the data were not coerced to give any answers based on the existing standardization.

They answered truthfully, so the data can be trusted to accurately represent the population under study. Also, I assumed that the data were accurate, valid, and free from bias. These assumptions were critical to the study, as they assisted in obtaining meaningful results in the proposed research.

Scope and Delimitations

The scope of this study was limited to analyzing body weight gain, breastfeeding practices, and physical and emotional abuse as factors for detecting postpartum depression. The pregnancy and postpartum period are associated with several physiological and emotional changes (Pope & Mazmanian, 2016). Some women adapt to these changes without any challenge, while in others, postpartum depression results (Pirec, 2017). Self-reported screening for postpartum depression occurs at 6 weeks postpartum using the Edinburgh Postnatal Depression Scale survey in clinical settings. Based on self-reporting, some reports may not be truthful (Ghaedrahmati et al., 2017). Thus, identifying certain factors will aid in detecting postpartum depression and the possible design of interventions targeted at postpartum women.

This study was limited to postpartum women. Women who had not given birth and pregnant women were excluded from the study because they did not meet the study criteria. Also, the study was limited to postpartum women between the ages of 18 and 40+ years old. Postpartum women younger than 18 years old were also excluded from the study. This was because they did not qualify for the study. Although this study was based on data from postpartum women in the United States, the results and findings of the study

will contribute to the existing literature on postpartum depression. Also, it may be beneficial to postpartum women all over the world.

Limitations

There are a few limitations identified in this study. A possible limitation is that the secondary dataset for the research was not collected with considerations for the social-ecological model as the theoretical framework. Therefore, this affected the reliability and applicability of the obtained results. Another limitation of the study is that the secondary data included self-reported data. Self-reported data may unintentionally create a self-reported bias, like social desirability and acceptance or recall/remembrance bias, which might have also affected the reliability and applicability of the results (Althubaiti, 2016). Additionally, the generalizability of the results may be affected as the results might not apply to women globally due to cultural differences and other personal beliefs that may be peculiar to the different women worldwide.

Significance

Postpartum depression is an aspect of mental health currently lacking in peer-reviewed research (Corrigan et al., 2015). This study was based on the individual and interpersonal levels of the social-ecological model. Therefore, this study attempted to contribute to the existing research and body of knowledge with an original study focused on whether a relationship existed between the individual, interpersonal level factors, and postpartum depression in childbearing women, ages 18 to 40+ years old. This research is significant, as the findings may assist in the early detection of postpartum depression by shedding light on the possible risk factors that affect postpartum women. A cross-

sectional quantitative analysis was conducted on secondary data to determine the relationship between individual-level variables of body weight gain, breastfeeding practices, and the interpersonal level variable of physical/emotional abuse) on postpartum depression. Also, determining if these factors were significant indicators of postpartum depression to assist in the possible early detection of postpartum depression.

Therefore, in this study, I aimed to create a better understanding of the factors that contributed to postpartum depression in postpartum women ages 18 to 40 + years old. Thus, the study is essential as it may aid in designing targeted intervention programs to address these likely factors. More specifically, this study attempted to contribute to the existing literature by offering providers a better understanding of vital factors that may or may not determine if postpartum women are more or less likely to develop postpartum depression if they have bodyweight gain and/or life stress. Furthermore, the study is essential, as the results may guide the women in seeking help when they identify risk factors, hence preventing fatality. Additionally, this may enable the tailoring of possible interventions based on the results obtained from the study from the possible recognition of factors responsible for postpartum depression, thus increasing awareness and, in the long-term, reducing the highly alarming current statistics of postpartum depression among women.

In this study, there are several components of public health significance, thereby contributing to social change. A possible contribution to social change is that the results of this study may be recommended to various fields that relate to and improve women's quality of life. Some are public health, social services, medical, and healthcare

professionals, like obstetricians, gynecologists, lactation consultants, and Women, Infants, and Children (WIC) counselors, thus creating opportunities for active conversations about postpartum depression during prenatal visits, particularly among women with a certain range of body weight gain, breastfeeding practices, and/or life stress. Also, the results obtained from this study will be used to begin the conversation about the importance of health education and awareness for pregnant women and nursing mothers. The discussions will be about the significance of recognizing postpartum depression and factors that may contribute to the mental state of postpartum women, thus promoting positive social change. The findings of this study increased knowledge about postpartum depression, reduced anxiety about the unknown, improved women's overall health, and reduced the stigma associated with postpartum depression.

Summary

Postpartum depression is a significant issue affecting 10-20% of women worldwide (Anokye et al., 2018). It is a pregnancy complication that can result in adverse outcomes for the mother and/or infant (Shrivastata et al., 2015). Multiple factors contribute to postpartum depression. Some of them are classified under the individual and interpersonal level factors of the social-ecological model. Understanding the effect of breastfeeding, weight gain, and abuse on postpartum depression may inform appropriate intervention measures targeted at detecting postpartum depression. In this study, I used secondary data obtained from the PRAMS, CDC to contribute to the existing body of knowledge and scholarly research on postpartum depression using the social-ecological model. This was done by determining the relationship between individual-level factors

(e.g., body weight gain and breastfeeding practices on the occurrence of postpartum depression in women between the ages of 18 and 40+ years old), interpersonal level factors of life stress (e.g., abuse), and the outcome of postpartum depression.

This concludes Chapter 1, which discussed the introduction of the study, background, problem statement, purpose, research questions, and hypothesis, as well as the theoretical framework, nature of the study, definitions, assumptions, scope and delimitations, limitations, significance, and conclusion of chapter 1. Chapter 2 follows this chapter and will focus on the literature review, examining various research conducted on postpartum depression and the theoretical framework used for the study, which is the social-ecological model, offering more details.

Chapter 2: Literature Review

Postpartum depression is a significant public health challenge affecting approximately 10-20% of women in the United States (Anokye et al., 2018; CDC, 2021). This is due to various changes women experience before, during, or after delivery. The postpartum period in mothers is often associated with physical and emotional changes (Mughal et al., 2021). These changes are related to several individual and interpersonal level factors that may result in postpartum depression; however, there is limited research in identifying factors that may be important for detecting postpartum depression and the nature of the relationship between these factors and postpartum depression. Consequently, the purpose of this study was to determine how individual and interpersonal level factors of body weight gain, breastfeeding practices, and physical/emotional abuse are related to the early detection of postpartum depression in women between the ages of 18 and 40+ years old.

Chapter 2 focuses on current relevant peer-reviewed literature that highlights postpartum depression and its relationship with the individual (i.e., breastfeeding practices and weight gain) and interpersonal level factors (i.e., physical/emotional abuse) that may be responsible for some of the symptoms experienced by postpartum women between the ages of 18 and 40+ years old. Additionally, this chapter focuses on the theoretical framework used for this study. Finally, the chapter concludes with a summary and a transition into Chapter 3, which discusses the method used for the research.

Literature Search Strategy

The literature search was conducted using the Walden University Library. The search engines and databases used include MEDLINE, CINAHL Plus, APA PsycInfo, and APA PsycArticles. The investigation limited the search to current peer-reviewed studies conducted between 2016 and 2022 in English. A general search using the terms "postpartum depression OR postnatal depression OR ppd OR pnd OR post-partum depression OR post-natal depression" AND "factors associated with OR responsible for" resulted in 348 MEDLINE, 175 CINAHL Plus, 427 APA PsycInfo, and 20 APA PsycArticle articles. I divided the search into the study's four significant variables to become more specific. The key terms used included "breastfeeding OR breast-feeding OR infant feeding OR lactation OR lactating" AND "postpartum depression OR postnatal depression OR ppd OR pnd OR post-partum depression OR post-natal depression." This search revealed 365 articles from MEDLINE, 226 from CINAHL Plus, 186 from APA PsycInfo, and one from APA PsycArticles. Also, "postpartum depression OR postnatal depression OR ppd OR pnd OR post-partum depression OR post-natal depression" AND "weight change OR weight gain OR weight loss" was searched in the Walden University Library, resulting in 103 peer-reviewed articles from MEDLINE, 47 articles from CINAHL Plus, 40 from APA PsycInfo, and five from APA PsycArticle.

In addition, I conducted a third search using "postpartum depression OR postnatal depression OR ppd OR pnd OR post-partum depression OR post-natal depression" AND "physical abuse OR emotional abuse OR psychological abuse OR neglect OR sexual abuse." This search yielded 55 MEDLINE, 35 CINAHL Plus, and 78 APA PsycArticles

articles. I combined the variables to take the investigation further. A search using the keywords “postpartum depression OR postnatal depression OR ppd OR pnd OR post-partum depression OR post-natal depression” AND “weight change OR weight gain OR weight loss” AND “breastfeeding OR breast-feeding OR infant feeding OR lactation OR lactating” resulted in 19 MEDLINE peer-reviewed articles, 12 CINAHL articles, and three APA PsycArticles articles. Additionally, a search using the keywords “postpartum depression OR postnatal depression OR ppd OR pnd OR post-partum depression OR post-natal depression AND life stress AND abuse resulted in 73 peer-reviewed journal articles between 2016 and 2022.

The literature search revealed very few results from studies conducted in the United States. Many of the results were from studies conducted in Asia, South America, and Africa. To further expand the search due to the low number of articles obtained from the Walden University Library, PubMed was searched using the exact keywords mentioned earlier, resulting in 11,531 English articles from MEDLINE, published from 2016 through 2021. The limiters were applied as used earlier in the Walden Library, and some papers were selected by scanning through the abstracts to determine their relevance to the study. Additionally, the references of selected articles were searched and screened to determine the relevant papers that will be included in the literature review. Thus, this study will contribute to the number of studies conducted on women in the United States.

Postpartum Depression

Postpartum depression affects about 10 to 20% of women worldwide (Shrivastata et al., 2015). However, insufficient attention is given to postpartum depression, as women

are sometimes unwilling to speak about their symptoms and experiences (Kendig et al., 2017). Hence, it is often unrecognized, undiagnosed, and untreated for several reasons, including a lack of knowledge of postpartum depression, societal stigma, and the silence of the women (Kendig et al., 2017). Consequently, it sometimes progresses to postpartum psychosis, which could lead to suicidal ideation and sometimes to suicide or infanticide if unchecked (Pirec, 2018; VanderKruik et al., 2017). Although postpartum psychosis has a relatively low incidence rate in many countries, 0.89 and 2.6 in 1,000 births, the gravity of its consequences (suicide or infanticide) makes it a major global health challenge (VanderKruik et al., 2017). The relationship between the mother and infant is also affected, and affective disorders can be traced to a history of postpartum psychosis or depression (Ramsauer & Achtergarde, 2018; VanderKruik et al., 2017).

The consequences and burdens of postpartum depression require a concerted approach to address it. Hence, a thorough assessment of all aspects of postpartum depression could reduce the incidence and prevalence of postpartum depression and its adverse effect on the mother, the infant, her immediate family, and the immediate community. Postpartum depression may cause the mother to withdraw and feel inadequate. This may strain her relationship with the new baby, her other children (if any), and her spouse, further aggravating her feelings of guilt or inadequacy, which could complicate the existing postpartum depression if unchecked. Furthermore, the family unit may be affected. In this study, I assessed certain factors that may be responsible for postpartum depression, thus contributing to the existing body of knowledge. Postpartum depression has been attributed to feelings of inadequacy, overplanning for the baby's

arrival, insomnia, anxiety, stress, lack of a strong support system, and other life issues, such as employment status and mode of delivery (Torres et al., 2017). However, a need exists to conduct more studies to determine the nature of the relationship between the individual and interpersonal factors of breastfeeding, body weight gain, stress (i.e., abuse), and postpartum depression (Hartley et al., 2018; Vieira et al., 2018). Consequently, I addressed these literature gaps in this study and identified the relationship between these individual and interpersonal level factors with postpartum depression.

Theoretical Foundation

I used the social-ecological model for this study as it offered a basis for understanding the factors that result in certain behaviors or conditions (Glanz et al., 2015). Bronfenbrenner (1979) first introduced the social-ecological model as a conceptual model for understanding human development, then known as the ecosystem theory. According to Panopoulos and Drossinou-Korea (2020), the ecosystem theory, which evolved into the social-ecological model, was anchored on interactions between humans and the social environment surrounding them and how they are directly and indirectly influenced by it. In the original model, there were four hierarchical systems: the microsystem, mesosystem, exosystem, and macrosystem, with humans at the center (Moran et al., 2016). However, in the 1980s, there was a transition. The conceptual model was formalized as a theory and referred to as the social-ecological model (Kilanowski, 2017). McLeroy (1988) developed upon Bronfenbrenner's theory to introduce the five levels of influence.

Glanz et al. (2015) reported that the social-ecological model has five levels of influence: the individual, interpersonal, community, organizational, and societal factors. These levels of influence can be applied independently and in concert with each other (Saquib, 2018). Also, they directly and indirectly influence behavioral choices and health, thus affecting lifestyle and quality of life. This underlines the core concept of the social-ecological model, thus making the model crucial to planning interventions (Glanz et al., 2015).

The social-ecological model is a theory with multiple levels of influence. The various factors that influence humans are placed at these levels. It is assumed that in the social-ecological model, factors across and within each level of influence are interrelated and mutually influential (Moran et al., 2016). To obtain a holistic picture, there should be a close examination of these environments as they influence humans, considering that ecology is the study of organisms in their environment. Thus, for this study, breastfeeding, weight gain, and abuse were examined as possible factors for postpartum depression.

According to Glanz et al. (2015), the social-ecological model is based on four core principles, like other ecological models. These are summarized below:

1. Specific health behaviors are influenced across the five levels of influence of the social-ecological model.
2. Behavioral influences interact across these different levels.
3. Ecological models allow identifying relevant influences at each level, which is behavior specific.

4. When an intervention is based on more than one level of influence, it is more effective.

Previous Application of the Social-Ecological Model

According to Panopoulos and Drossinou-Korea (2020), the social-ecological model framework emphasizes the multiple contexts that influence behavior and assumes interdependencies among the various levels, consisting of immediate and distant environments, as well as the dynamic relations between people and their environment. The social-ecological model can be applied to several interventions and health communication programs (Moran et al., 2016). The social-ecological model has been employed widely in several studies worldwide. This broad application is due to its strength as an ecological model with multiple levels of influence, among others.

Additionally, several studies have applied the social-ecological model in similar ways as I did in this study. For instance, Nicholson et al. (2019) conducted a cross-sectional study examining the total and domain-specific sedentary behavior in a cross-sectional study using secondary data. The researchers used the two levels of influence, the individual and interpersonal levels of the social-ecological model, in their research, as I did in this study. Similarly, in another study, Nicholson et al. (2019) aimed to investigate the factors associated with sedentary behavior, while this proposed study seeks to examine factors related to postpartum depression. Also, Wall et al. (2018) conducted a cross-sectional study applying the social-ecological model to detect the factors responsible for pregnancy-related anxiety in Tanzanian women. Similarly, the authors used secondary data in their study, just as I did, using the social-ecological model

to identify predictive factors. In this study, I determined the relationship between individual and interpersonal factors and postpartum depression.

Rationale for Choice of Model

The social-ecological model is an excellent model. My choice for using the social-ecological model was based on multiple reasons, which are discussed. Humans are influenced by a myriad of factors across the five levels of influence. Consequently, the ecological perspective offered by the social-ecological model creates an essential framework for insight into the range of factors that influence human health and well-being (Nicholson et al., 2019). In this study, I focused on postpartum depression, which has affected about 10 to 20% of women worldwide. Postpartum depression has been attributed to multiple factors, some of which are confirmed, and others are being evaluated. Thus, the classification into various levels of influence will enable a close examination of the factors that may be responsible for postpartum depression. Therefore, this informs the choice of the social-ecological model for this study, examining factors that may be responsible for postpartum depression among women between the ages of 18 and 50 years old. Thus, my selection of this model is because it offered the structure that provided a holistic perspective of some factors that affect specific health behaviors, that may result in postpartum depression, ensuring the possible design of a comprehensive prevention or health promotion program.

Relationship Between Model and Present Study

The social-ecological model relates to the present study in a tangible way. In this research, I examined the relationship between the individual-level factors of

breastfeeding and weight gain, as well as the interpersonal level factors of stress, as depicted by abuse and postpartum depression. The social-ecological model, a multiple-level ecological model, offered a robust framework for examining this relationship across these levels. This theory enabled the research questions to be answered through the study that was conducted, thus building upon it. The social-ecological model assesses the individual and their relationship to people, organizations, and their community, thereby offering a multifaced approach to managing postpartum depression, which was the focus of this study.

The research questions were based on the two levels of the social-ecological model (individual and interpersonal), building upon them to ensure that the study has the appropriate theoretical structure. Also, Glanz et al. (2015) reported that the core principle of the social-ecological model offers the opportunity for identifying the relevant potential influences at each level, which is behavior specific. Thus, the research question relates to the existing theory, as it attempted to determine the effect of breastfeeding, weight gain, and abuse on postpartum depression. Furthermore, the individual level of the social-ecological model consists of factors such as knowledge, skills, personality traits, attitude, and beliefs. The interpersonal level consists of the interactions with people, which may create barriers or facilitate interpersonal growth to encourage healthy behaviors. For this study, breastfeeding and weight gain were the individual-level factors. At the same time, abuse was the interpersonal factor since it involved interactions with other people, which may give rise to postpartum depression, hence building upon the social-ecological model.

Literature Review Related to Study Variables

Postpartum Depression in Women

Postpartum depression is not baby blues, although it is sometimes confused. Baby blues resolves fast (often within 2 weeks), while postpartum depression lingers for longer. Women with postpartum blues are 4 to 11 times more likely to get postpartum depression (Balaram & Marwaha, 2022). The feelings associated with postpartum depression are similar to baby blues (Balaram & Marwaha, 2022). Some predictors of postpartum depression include a family history of mental illness, life stress, a lack of emotional support, baby blues, mood swings during menstrual period, oral contraceptives, and being diagnosed with depression (Nayak et al., 2021). Mood lability is one of the notable symptoms of postpartum depression. It occurs as rapid, often exaggerated mood changes or emotions associated with uncontrollable laughing, crying, heightened irritability, or temper (Hoegh et al., 2020).

Generally, postpartum depression creates a considerable disease burden in women Worldwide. According to Ghaedrahmati et al. (2017), postpartum depression is a debilitating mental disorder with a high prevalence. It is very difficult to assess the overall effect of untreated postpartum depression in mothers (Slomian et al., 2019). However, some of the consequences include alcohol and illicit drug use, weight problems, breastfeeding problems, social relationship problems, or persistent depression (Slomian et al., 2019; Yadav et al., 2020). The current global pandemic (coronavirus) has further exacerbated the prevalence of postpartum depression among women globally (Safi-Keykaleh et al., 2022). Additionally, the economic burden of postpartum depression

increased in households with postpartum depression by about 22% compared to homes without (Epperson et al., 2020). Hence, addressing this issue among women is essential.

Postpartum Depression and Weight Change

In women worldwide, pregnancy is associated with changes in weight or BMI, often a weight gain (Kominiarek & Peaceman, 2017). While obesity has been associated with adverse physical health outcomes during pregnancy and after childbirth (Cunningham et al., 2018), the relationship between weight gain and maternal mental health, especially postpartum depression symptoms, is controversial (Yamaguchi et al., 2021). For some women, losing weight after childbirth may be difficult, while it may be effortless for others, and reactions vary to this weight change (Johar, 2020). The CDC's Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion (2021) recommends that women with a healthy BMI and single baby pregnancy gain between 25 to 35 lbs. as the gestational weight gain. It is the difference between the weight at the first and last prenatal visit just before delivery (Kominiarek & Peaceman, 2017). Hence, insufficient weight gain is regarded as less than recommended.

Insufficient gestational weight gain (less than 25 to 35 lbs.) is one of the clinical challenges women encounter in pregnancy, not only postpartum depression. Yamaguchi et al. (2021) conducted a longitudinal study between 2011 to 2014 and reported that insufficient gestational weight gain resulted in postpartum depression symptoms among the 80,927 Japanese women studied. Multiple regression analysis was used for statistical analysis to determine the potential risk factors of weight gain on postpartum depression symptoms in these women. It was a successful study, but one limitation was that the

confounding factors for postpartum depression symptoms like psychotic disorders were not examined by Yamaguchi et al. (2021). Also, another shortcoming reported by Yamaguchi et al. (2021) was that a high score on the Edinburgh Postpartum Depression Scale was not indicative of a clinical diagnosis for postpartum depression, even if it was the most frequently used screening tool for postpartum depression (Yamaguchi et al., 2021).

Physical activity has a significant impact on women's health. Diepetro et al. (2018) conducted research to assess the effects of physical activity on maternal health during pregnancy and after childbirth. They analyzed 76 systematic reviews and meta-analyses published between 2006 and 2016 and 2017–2018. They concluded that moderate-intensity physical activity reduced the risk of excessive gestational weight gain and the symptoms of postpartum depression. Still, there was insufficient evidence to determine the impact of physical activity on postpartum weight loss. However, Johar et al. (2020) conducted a study on 1583 participants in Germany. They reported that while there was an association between prepregnancy obesity and postpartum depression, there was a limited study on excessive gestational weight gain and postpartum depression.

Many women reduce physical activity in late pregnancy, contributing to postpartum weight retention. This is one of the observations of the narrative review by Makama et al. (2021) of various literature from PubMed and Google Scholar in November 2020. Lower diet quality, sedentary lifestyle, irregular sleep, and mealtimes also contributed to postpartum weight retention (Makama et al., 2021). Postpartum weight retention plays a crucial role in overweight and obesity challenges in the long

term. This is due to the extra body weight the body retains postpartum, which some women may find difficult to lose. In a study by Salehi-pourmehr et al. (2018), postpartum weight retention was identified as a critical pathway for long-term overweight and obesity, resulting in postpartum depression and other chronic diseases like cardiovascular diseases, osteoarthritis, diabetes, and some cancers (Makama et al., 2021).

According to Koleilat et al. (2020), several factors are responsible for postpartum weight retention. These include: lack of knowledge, self-efficacy, time, having a cesarean section, childcare and support, postpartum depression, and the 40-day rule. The 40-day rule is allotted time for the mother to relax and allow her body to recover immediately after childbirth. Makama et al. (2021) reported that a suboptimal lifestyle behavior contributed to postpartum weight retention. The nature of the diet and physical activity are some of the suboptimal behaviors that influence postpartum weight retention (Makama et al., 2021). Saligheh et al. (2017) conducted a systemic review and reported that although physical activity was generally effective on depression and weight management, its effectiveness on postpartum depression remains uncertain. While these authors, through their research, suggest an association between postpartum depression and weight gain, they recommend further studies to identify the nature of the relationship between weight gain and postpartum depression. In line with this recommendation, in this research, I bridged this gap and contributed to existing literature.

Postpartum Depression and Breastfeeding

In women worldwide, the question of which feeding method to adopt for the child is crucial. Some women opt to breastfeed, and others choose to use other forms of baby

food, like infant formula, while others prefer to combine both feeding methods (Kotowski et al., 2020). Several studies have explored the relationship between breastfeeding and postpartum depression. The relationship between breastfeeding and postpartum depression has been determined to be bidirectional, with postpartum depression affecting breastfeeding and breastfeeding affecting postpartum depression (Pope & Mazmanian, 2016). The CDC (2021) reported insufficient evidence to declare a relationship between breastfeeding and postpartum depression. This was based on a systematic review conducted in 2018 by the Agency for Healthcare Research and Quality, which noted that women with depression might have difficulty initiating and sustaining breastfeeding, which may translate to depression (CDC, 2021).

Early breastfeeding was discovered to have resulted in a low risk of postpartum depression (Chiu et al., 2019; Vieira et al., 2018). Vieira et al. (2018) conducted a prospective cohort study on 83 Brazilian women, reporting that postpartum depression is a risk factor for breastfeeding. Chiu et al. (2019), in a cohort study involving 333 Taiwanese pregnant women, reported that breastfeeding during the first week after childbirth, although essential, significantly affected the mother's mental health. However, the question remains of the specific nature of the relationship (Chiu et al., 2019; Pope & Mazmanian, 2016). Thus, a gap exists in the literature to identify the nature of the relationship. Hence in this study, I bridged that gap and identified and evaluated the nature of the relationship between postpartum depression and breastfeeding. Ghaedamarti et al. (2017) conducted a narrative review of 74 articles between 2000 and 2015. They reported that breastfeeding showed a reduction in the rate of postpartum depression as the

women reported lower values on the Edinburgh Postnatal Depression Scale. However, they recommended further evaluation of the relationship between breastfeeding and postpartum depression. Also, Avilla et al. (2020) reported that women with increased breastfeeding satisfaction have a reduced rate of postpartum depression. After conducting a cross-sectional nested in a cohort study involving 287 women in the first month of childbirth. The findings showed that maternal satisfaction with breastfeeding and not the duration was integral to reducing postpartum depression. The researchers recommended further studies on the subject, as they noted a limitation on the number of available research.

Furthermore, women with robust support have better breastfeeding results. Gila-Diaz et al. (2020) noted that breastfeeding pattern is associated with maternal psychological aspects, and women with better support have increased adherence to breastfeeding. This was after a cross-sectional study design involving 711 women. The findings indicated that breastfeeding adherence correlated positively with perceived maternal stress and postpartum depression and negatively with maternal dispositional optimism. In another study conducted in Japan, Shimao et al. (2021) reported that women who breastfed their children exclusively for 6 months had a reduced risk of postpartum depression compared to women who had mixed feeding. However, other factors, such as eye contact with the baby and talking to the baby while feeding, played an enormous role in the results obtained (Shimao et al., 2021). While the results are significant, this sort of study does not abound in the United States; thus, in this current study, I addressed this gap, contributing to the existing literature after examining the nature of the relationship

and identifying the effect of breastfeeding on postpartum depression in postpartum women in the United States.

Postpartum Depression and Physical/Emotional Abuse

The period following childbirth may be very stressful for mothers. Life stress may be due to multiple reasons and may increase anxiety in the mother (Qobadi et al., 2016). Various researchers have examined this relationship, and a few are discussed. Qobadi et al. (2016) conducted a study in Mississippi using CDC's PRAMS from 2009-2011, involving 3,836 participants. The aim of the study was to evaluate the association of different stressful life events with postpartum depression. The authors reported that the study's findings indicated increased postpartum depression among women with high relational stress. In the study by Qobadi et al. (2016), the use of a population-based sample that reflected the total birth population in Mississippi was remarkable and a major strength of the study. Another strength identified was using a comprehensive approach for calculating life events stressors while analyzing the interaction between stressors and the degree of stress. The limitations noted in this study are that the data used was from self-reported secondary data; thus, they may be subject to recall or bias. Also, the generalizability of the results may be limited to states with similar demographic characteristics as Mississippi (Qobadi et al., 2016). Postpartum depression is associated with multiple factors. Hutchens and Kearney (2020) conducted another study involving an umbrella review in which they summarized and synthesized previously published systematic reviews and meta-analyses. The study involved 21 articles after reviewing eight databases between 1996 and 2016. The results from the research by Hutchens and

Kearney (2020) showed that the factors responsible for postpartum depression are high life stress, lack of social support, prenatal depression, current or past abuse, and marital or partner dissatisfaction. Prenatal depression and current abuse were identified as the most substantial risk factors for postpartum depression (Hutchens & Kearney, 2016). Leite et al. (2020) also conducted another study on secondary data involving 23,378 participants using the three-stage cluster sampling method. The authors found that the study indicated that disrespect and abuse of women during childbirth might be responsible for postpartum depression in private and public hospitals, irrespective of the nature of delivery. Although the study was not a diverse sample, the study was a large sample and therefore was generalizable (Liete et al., 2020).

Physical, sexual, and emotional abuse of postpartum women have profound implications. In a longitudinal study in Vietnam involving 1337 participants, Tho Nhi et al. (2019) identified physical and sexual abuse as strong contributors to postpartum depression after conducting a multivariate analysis. They noted, however, that being a very sensitive subject, eliciting information about abuse proved to be somewhat difficult since there was a level of "silence" associated with the topic, which may have created under-reporting. Additionally, Kothari et al. (2016) reported that intimate partner violence was considerably related to postpartum depression despite socio-economic status. Similarly, intimate partner violence in Bangladesh was associated with postpartum depression (Esie et al., 2019).

In a longitudinal study involving 3902 recently married women between the ages of 16 and 37 in rural Bangladesh, five in six women among the participants experienced

intimate partner violence. The strengths of the study by Esie et al. (2019) include the use of validated, standardized instruments to ascertain the variables measured in the study, a large sample size affording precise estimates, the use of a population-based non-pregnant sample enhancing generalizability, as well as the ability to account for vital potential confounders at baseline. The limitation noted in the study was the cross-sectional ascertainment of the variables measured at follow-up (Esie et al., 2019). Surprisingly, in the United States, few studies were identified from the databases examined among the peer-reviewed journal articles in the Walden University Library. Tebeka et al. (2016) conducted epidemiological research on secondary data involving two waves of data: 2001-2002 and 2004-2005, including 43,093 and 34,653 participants respectively. Tebeka et al. (2016) reported that stressful life events during childhood or adulthood were associated with peripartum depression and complications in childbirth, which may result in postpartum depression. Based on the longitudinal analysis, Tebeka et al. (2016) reported that the study's main strengths include the large sample size, the sample representativeness, the validity of the psychiatric assessment, and the prospective design. The study's limitations include the inability to distinguish between depressed women during pregnancy from postpartum depressed women since the sample was from secondary data from two waves National Epidemiologic Study of Alcohol and Related Conditions (NESARC).

Summary and Conclusion

In this chapter, I focused on describing the literature review as well as the theoretical framework that will be used for the study. Specifically, there were highlights

of various research conducted on the relationship between breastfeeding and postpartum depression, weight gain, and postpartum depression, as well as life stress depicted by physical abuse and postpartum depression. The next chapter, Chapter 3, focuses on the study's methodology, including research design and rationalization, operationalization of variables, data analysis, threats to validity, and ethical procedure.

Chapter 3: Research Methods

The purpose of this study was to determine how the individual and interpersonal level factors of body weight gain, breastfeeding practices, and physical/emotional abuse affect the early detection of postpartum depression in women between the ages of 18 and 40+ years old. In this study, I used secondary data from the CDC's PRAMS in a cross-sectional quantitative analysis with the social-ecological model as the theoretical framework to determine the effect of breastfeeding, weight gain, and physical/emotional abuse on postpartum depression.

Consequently, this chapter focuses on the study's methodology and includes a discussion of the research design, study population, setting and sampling procedures, instrumentation, study variables, data collection methods, statistical analysis used to address the research questions and ethical considerations. This study was approved by the Walden University Institutional Review Board (IRB), approval number #09-16-22-0746245. In this chapter, I also included the data analysis plan and the threats to study validity. This chapter concludes with a summary of the main points contained in the chapter and a transition into Chapter 4.

Research Design and Rationale

The nature of this study is quantitative. I used the population-based cross-sectional research design and focused on analyzing various variables, including both dependent and independent variables, in this research. The independent variables consisted of the individual and interpersonal levels of the social-ecological model, including the covariates such as body weight gain, breastfeeding practices, and

physical/emotional abuse, while the dependent variable was postpartum depression. In this cross-sectional study, I answered the research questions concerning breastfeeding, weight gain, physical/emotional abuse, and postpartum depression in postpartum women between the ages of 18 and 40+ years old.

My choice of the cross-sectional quantitative research design was based on its advantage of being relatively fast and inexpensive to conduct (Setia, 2016). Additionally, the cross-sectional research design was well-suited to the study as it was essential to advance health education and promotion knowledge. Specifically, this research design offers the avenue for addressing the research questions, facilitating the investigation to bring about an outcome that may benefit women in the United States and worldwide. Furthermore, using PRAMS, a collection of data from multiple postpartum women across the United States at a particular period, indicates the ease of using the cross-sectional research design in examining the variables of this study.

Additionally, since the variables are from secondary data (PRAMS), no time or resource constraints were associated with the cross-sectional study design choice. The resources were available upon request from CDC, and logistic regression statistical analysis was used to analyze the data. Furthermore, the cross-sectional research design aligned with other health education and promotion studies (Ausserhofer et al., 2022; Srivastava et al., 2020) and suggested the ease of accessibility, offering numerous data from one source. The cross-sectional design provided specific and collective access to the variables of this study (weight gain, breastfeeding, physical/emotional abuse, and

postpartum depression) in one place and gave the options for comparison with data from past or future studies (Setia, 2016).

Methodology

As earlier stated, I used secondary data from the CDC's PRAMS Phase 8, which was collected between 2016 and 2019. For PRAMS, the CDC used a two-mode data collection method, collecting data from women across the United States. This method was based on the research of Dillman (2000) and colleagues' tailored design method (CDC, 2021). This involved a mailed survey questionnaire, which began 2 to 4 months after childbirth, with several follow-up attempts and a telephone survey. The data collection cycle is between 60 and 95 days (CDC, 2021).

Population

The priority population of this study was postpartum women between the ages of 18 and 40+ years old, who were sampled between 2 and 6 months after childbirth (CDC, 2021). This study was conducted using secondary data from CDC's PRAMS. The CDC's PRAMS covers approximately 83% of all births in the United States. Hence, the population size was approximately 51,000–153,000 women (Shulman et al., 2018). This was based on the report by the CDC that data was drawn from 1,000 to 3,000 women from 47 participating states and four areas (the District of Columbia, New York City, Puerto Rico, and the Great Plains Tribal Chairman's Health Board). Additionally, Shulman et al. (2018) reported that women who resided in the participating states with recent live births during the surveillance year (2016 and 2019 for this study) would be

enrolled. For this study, data analysis was computed based on the population size, which was predetermined, considering the use of secondary data.

Setting and Sampling Procedures

The sampling method for this study (based on the PRAMS data) was the probabilistic method. The data were stratified by various characteristics of public health interest, such as race/ethnicity, maternal age, infant birth weight, and geographic area of residence (Shulman et al., 2018). A stratified sampling procedure involves a strategy whereby researchers divide subjects into subgroups known as strata based on specific characteristics (Elfil & Negida, 2017). Thus, this stratified sampling procedure is a probabilistic method, and it is a random sampling method.

The strength of the stratified sampling method involved accurately representing the target population as it offered the opportunity for a comparative assessment of the sample under study and offered a better representation of the target population due to its precision (Elfil & Negida, 2017). On the other hand, the weakness of this procedure was that it was more complex than the simple random sampling method, and the analysis was more complicated as it involved more data from the different strata (Elfil & Negida, 2017).

The stratified sampling strategy was employed in this data. The variables to be analyzed included postpartum depression, breastfeeding, weight gain, and physical/emotional abuse. The dependent variable, postpartum depression, was a dichotomous categorical variable with two major categories (1 = *yes*, 2 = *no*). The independent variables: weight gain, breastfeeding ever, and physical/emotional abuse

were categorical, while the duration of breastfeeding is a continuous variable. The inclusion criteria were that the participants must be within the United States, postpartum women, and be between 18 and 40+ years old, with recent live births, sampled within 2 to 6 months after childbirth. Women who did not meet the criteria listed were excluded from the study.

Power Analysis and Sample Size

The power analysis was computed to determine the sample size required to make an appropriate decision for this study. Thus, G*Power 3.1.9.7 software was used to compute the sample size a priori. The G*Power software was used because it is logical, ethical, easy to use, and free (Kang, 2021). Additionally, an a priori analysis was ideal for sample size and power calculation because it offered a strategy for controlling Type I and II errors to prove the hypothesis. Furthermore, the incorrect sample size may have led to unsatisfactory results, loss of time, cost, and ethical problems. Determining the optimal sample size for a study assures adequate power to detect statistical significance (Kang, 2021). This prevented the use of a statistically incorrect sample size. This justified the use of G*Power for this study. After conducting the power analysis, the estimated sample size was 71 for the three research questions. The sample size was calculated using a two-tailed test, $\alpha = 0.05$, and the power of the test $(1-\beta)$–0.8. This indicated that the CDC's PRAMS was appropriate to conduct the study and answer the research questions as it had more than the calculated sample size. Also, this sample size, 71, was sufficient to ensure a confidence interval of over 95%. This can be compared to similar studies such as Manso-Cordoba (2020), which had a sample size of 618 participants; Omar (2019),

which had a sample size of 1426; and Qobadi (2016), which had a sample size of 3695. The sample size calculated using power analysis was 962. The effect size was 0.05, and the power was 0.90.

Since the dependent variable was categorical, logistic regression was used for the statistical analysis. Additionally, the effect size indicates the strength or difference of relationships, and it is large if r varies over 0.5. The significance level (α) shows the maximum allowable limit of type 1 error: for this study, $\alpha = 0.05$. The power shows the minimum allowed limit of accepting the alternate hypothesis when it is true, and for this study, the power of the test ($1-\beta$) is –0.8. This justifies the choice of the effect size, alpha, and power levels. Determining the optimal sample size for a study assures adequate power to detect statistical significance (Kang, 2021).

According to Serber et al. (2021), calculating the sample size in scientific studies was one of the critical issues regarding the study's scientific contribution. The sample size critically affected the hypothesis and the study design. There was no straightforward way of calculating the effective sample size for reaching an accurate conclusion, hence the use of G*Power to obtain the sample size for this study. This prevented the use of a statistically incorrect sample size, as a wrong sample size may lead to unsatisfactory results in both clinical and laboratory studies and result in loss of time, cost, and ethical problems. Also, the calculation of the sample size determined if the available data met the sample size required for the study.

This research is in line with two other studies using PRAMS. Manso-Cordoba et al. (2020) conducted an investigation using PRAMS (2016-2017) to assess the influence

of different sociodemographic and health factors associated with symptoms of postpartum depression. However, the study was restricted to New York alone instead of across the United States, as I did in this study. In another study by Omar (2019), the sample size obtained was 1,426 with a power of 99%, a small effect size of .05, and a significant alpha of .01.

Data Collection, Sampling Strategy, and Procedure

The data set for this study was archival data from the PRAMS, a surveillance project of the CDC and health departments, offering population-based data unavailable from other sources (CDC, 2021). In this section, I summarize the data collection, sampling strategy, and procedure of the CDC for PRAMS and the sampling strategy I employed for this study. PRAMS covers data on maternal attitudes and experiences before, during, and shortly after pregnancy, and data collection is by a standardized surveillance system (CDC, 2021).

According to Shulman et al. (2018), the PRAMS data collection method is a mixed-mode mail and telephone surveillance system. This was based on Dillman (2000) and colleagues' tailored design, which incorporated many techniques developed to enhance response, such as personalized mailing packages and response incentives and rewards (Shulman et al., 2018). According to CDC (2022), PRAMS combined two modes of data collection: a survey conducted by mailed questionnaire with multiple follow-up attempts and a survey by telephone. The telephone survey was a follow-up attempt for mail nonrespondents, while mail respondents did not get a follow-up phone call. The

mailed questionnaire contained several questions to obtain the required data. Also, informed consent was included in every survey.

The data collection method permitted states to be flexible in their techniques by allowing states to obtain phone numbers from birth certificates and other health department programs, like immunization records. The data collection process involved a 6-step process highlighted: pre-letter, initial mail questionnaire packet, tickler, second mail questionnaire packet, third mail questionnaire packet, and telephone follow-up. Data were collated and reviewed by the health departments and the local institutional review board.

Additionally, the CDC IRB approved the methodology and protocol used in data collection. Before implementation, the local and CDC IRB approved any deviation from the approved protocol. A web-based customized tracking system, the PRAMS Integrated Data System (PIDS), assisted in data collection and collation. The CDC developed and installed this on CDC servers (CDC, 2021).

The PRAMS data set is publicly available to researchers; however, permission and approval must be obtained from the CDC to collect and use the PRAMS dataset. According to the CDC (2021), when a proposed study involves multiple areas of jurisdiction, researchers may request data by submitting a proposal to the CDC via email to PRAMProposals@cdc.gov. The application must include an application form, the abstract, and a signed data-sharing agreement. Submissions are reviewed on the first day of every month, decisions are made within 2 to 3 weeks, approvals will be forwarded to the PRAMS site for review, and data sets will be sent out about 6 weeks after the initial

review date. Consequently, after I had obtained the Walden University IRB approval, I adhered to these guidelines and requested permission to use this dataset.

Operationalization of Variables

The instrument used in the data collection was the PRAMS Phase 8 Core Questionnaire, served via email and telephone, which was based on Dillman (2000) and colleagues' strategy. There was no special requirement for administering the questionnaire, but the respondents had to fill it out as truthfully as possible. The questionnaire was about 14 pages long on an 8.5" by 11" sheet (CDC, 2021). The data collection procedures and instruments were standardized to allow comparisons between jurisdictions (CDC, 2021). Permission to use the dataset was obtained from the CDC after approval of this study proposal. Also, this instrument had been previously examined and used in a few studies involving postpartum women, like Ghandour (2018), Manso-Cordoba et al. (2020), and Qobadi et al. (2016).

The variables for this study contained in the PRAMS data set included the dependent variable (postpartum depression), the independent variables (weight gain, breastfeeding, physical/emotional abuse), and the covariate variables (race and age). These variables were appropriate to answer the research questions of this study.

Dependent Variable

The dependent variable (postpartum depression) was analytic, and the (Statistical Analysis System) SAS label used by the CDC is PP_DEPRESS. Postpartum depression is a kind of depression suffered in some women after childbirth. It was an ordinal and a categorical variable with five categories, represented as A (Not Applicable), B

(DK/Blank), N (Not recorded), U (Unknown), 1 (No), 2 (Yes). Postpartum depression was recoded as 0 (*no)* and 1 (*yes)*. The other categories were discarded as they were irrelevant to the study.

Independent Variables and Covariates

The independent variables analyzed in this study were within two levels of the social-ecological model (individual and interpersonal). The individual level variables include weight gain and breastfeeding, while the interpersonal level was physical/emotional abuse. The covariates were age and race. Weight gain was the amount of weight the mother added after childbirth compared to her pre-pregnancy weight. It was a categorical variable with seven categories, which include B (DK/Blank), M (Not Printed on QX), N (Not recorded), S (Skip), T (Teen Mom, Not asked), 1 (No), 2 (Yes). Weight gain was recoded as 0 (*no)* and 1 (*yes)*. The other independent variable (breastfeeding ever) was also a categorical variable, which was coded similarly to weight gain. It was also recoded as 0 (*no)* and 1 (*yes)*. The covariate, Age was coded from Mother's birth year.

Physical/Emotional abuse was a categorical variable with three categories, abuse by husband, abuse by family member, and abuse by other. Each one was recorded before and during pregnancy. The outcome was categorized as B (DK/Blank), M (Not Printed on QX), N (Not recorded), S (Skip), T (Teen Mom, Not asked), 1 (No), 2 (Yes). Physical/Emotional abuse was recoded as 0 (*no)* and 1 (*yes)*.

Data Analysis Plan

The IBM SPSS was the statistical software used for data analysis for this study. The data analysis was thorough, analyzing the data while answering the research questions. Considering that the data for this study was secondary data from CDC, the CDC conducted a careful weighting process. According to the CDC (2021), the first-order Taylor series approximations, software that considers (mathematically determining a formula to fit multiple data points in the complex sampling designs) that organizations like the CDC employ, were used to calculate an appropriate standard error for the produced estimates.

Data Cleaning and Screening Procedures

According to Shulman (2018), the CDC makes the dataset available to all participating states after 8 to 12 months of the given year. This is after thoroughly cleaning the data to ensure the aggregate dataset meets the slated standard. However, for further cleaning, I used the SPSS software. All missing data identified during the study were properly documented and reported. These missing data were omitted, and the remaining data were analyzed.

Research Questions and Hypotheses

The research questions and corresponding null and alternative hypotheses for this study are listed below:

RQ1: What effect do the individual-level factors of body weight gain affecting postpartum women have on the development of postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race?

$H_0$1: There is no effect between the individual-level factors of body weight gain affecting postpartum women on the development of postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race.

H_A1: There is an effect between the individual-level factors of body weight gain affecting postpartum women on the development of postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race.

RQ2: What effect does the individual level factor of breastfeeding (e.g., duration) affecting postpartum women have on the development of postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race?

$H_0$2: There is no effect between the individual level factor of breastfeeding (e.g., duration) affecting postpartum women on the development of postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race.

H_A2: There is an effect between the individual level factor of breastfeeding (e.g., duration) affecting postpartum women on the development of postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race.

RQ3: What effect does the interpersonal level factor of physical/emotional abuse affecting postpartum women have on the development of postpartum depression in childbearing women ages 18 to 40+ years old, while controlling for age and race?

$H_0$3: There is no effect between the interpersonal level factor of physical/emotional abuse affecting postpartum women on the development of

postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race.

H_A3: There is an effect between the interpersonal level factor of physical/emotional abuse affecting postpartum women on the development of postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race.

Data Analysis and the Statistical Tests

In this study, I used logistic regression for statistical analysis. This was to evaluate the relationship between the variables involved in the research. According to Boateng and Abaye (2019), logistic regression is used in studies involving a categorical dependent variable and multiple independent variables. The dependent variable, postpartum depression, is categorical, while the independent variable includes weight gain, breastfeeding, and physical/emotional abuse. Thus, for this study and the research questions upon which it was dependent, logistic regression offered an excellent method to provide possible answers to the various research questions. This was because it offered a possible explanation of the relationship between weight gain and postpartum depression, as well as the effect of breastfeeding on postpartum depression and the physical/emotional abuse on postpartum depression.

Schober and Vetter (2021) discussed the importance of logistic regression. They stated that the advantage of logistic regression over other regression models is its ease of interpretation. Also, its exponential coefficient slope can be easily interpreted as an odds ratio. Additionally, logistic regression can be used to evaluate the relationship between

the independent and dependent variables separately. For this study, the effect of breastfeeding, weight gain, and physical/emotional abuse on postpartum depression was determined using logistic regression. This may inform the possible early diagnosis of postpartum depression and offer likely findings to prevent postpartum depression.

The logistic regression assumed that the outcome variable is binary. In this study, postpartum depression was recoded into two outcomes 0 (*no)* and 1 (*yes)*. Also, another assumption was that the variables to be analyzed were independent of one another. All the variables of this dissertation were independent of one another. To check this assumption, I observed if there was a random pattern. If there was no random pattern, this assumption might be violated, meaning that the measurements may be repeated, affecting the results. In addition, logistic regression assumed that there were no extreme outliers, which are extreme values that abnormally lie outside the overall pattern of distribution of variables (Kwak & Kim, 2017). To check this assumption, I used the option offered by SPSS.

The statistical analysis included a determination of the p-value, the odds ratio, R^2, and the goodness-of-fit tests. To interpret the results after data analysis, I determined if the relationship between the variables was statistically significant and analyzed the effect of the independent variables on the dependent variable, postpartum depression, using $\alpha = 0.05$. I determined that if the p-value was less than α, the association was statistically significant, and the null hypothesis would be rejected. On the other hand, if the p-value was greater than α, the relationship was not statistically significant, and the null hypothesis would not be rejected.

Threats to Validity

Validity in the study design is described as the accuracy of the research, trustworthiness of instruments used, and the data or findings collected are highly ordered and obtained with reduced systemic error (Chander, 2018). Additionally, the validity of a research study is described as how well the results among the study participants represent accurate findings among similar individuals outside the study (Patino & Ferreira, 2018). There are two types of validity: internal and external. Internal validity is defined as the extent to which the observed results represent the truth in the population under study and, thus, are not due to methodological errors (Patino & Ferreira, 2018). External validity refers to the extent to which results from a study can be applied to other situations, groups, or events. (Patino & Ferreira, 2018).

Based on the large secondary data utilized for this research, there was a possibility of some internal validity. Although, these possible threats were addressed by the CDC, as they use a standardized sampling method across all participating states. PRAMS samples were stratified so that sub-populations of minority races and ethnic groups and those living in high-risk geographical areas were over-sampled. The statistical weighting schemes utilized by PRAMS accounted for the different sampling rates in different strata, allowing estimates from these groups to be combined to obtain state-level estimates that ultimately reflect the actual proportions of births attributed to these subpopulations (Shulman et al., 2018). This strategy ensured that the data represented the United States population (Shulman et al., 2018). This strategy indicates that the results can be applied, thus, reducing the threat to validity.

Some of the needed data were missing or unavailable from the CDC PRAMS data. For instance, 6,007 participants' data were missing from the data collected for race, while 5,068 participants' data were missing from the data obtained for postpartum depression. However, these threats were minor and did not significantly threaten the study or affect the results. When the validity is within acceptable limits, it aids wider acceptance and leads to progressive research (Chander, 2018).

Ethical Procedures

I followed the procedure in this research and maintained all ethical guidelines, such as not sharing the dataset. The Walden University IRB approval was obtained before obtaining data from CDC. The Walden University IRB approval number for this study is 09-16-22-0746245. Through the participating states, the CDC obtained data from their states' participants. The right and privacy of the participants were completely respected, following all the ethical procedures of the CDC. The data was collected from the participants with full informed consent and other ethical approvals. The data used for this research was completely de-identified (Shulman et al., 2018).

Furthermore, the CDC IRB also reviewed and approved the PRAMS methodology and protocol. Every survey packet contained the informed consent document explaining the participants' rights. However, no written consent was required for the survey. A completed document implied that consent was given. However, the consent was read for phone interviews, and the participants verbally offered their consent before proceeding with the survey (Shulman et al., 2018). The responses are filed electronically in the PRAMS database. To facilitate the research process, the CDC

implemented the PIDS in 2012 to support data collection activities. PIDS is a secure, Web-based system housed at and maintained by the CDC that assists in tracking all aspects of data collection (Shulman et al., 2018). The data are confidential and are not openly available, but they are readily available to researchers who apply for them after a thorough screening process. The PRAMS data is available through each state system or nationally from the CDC.

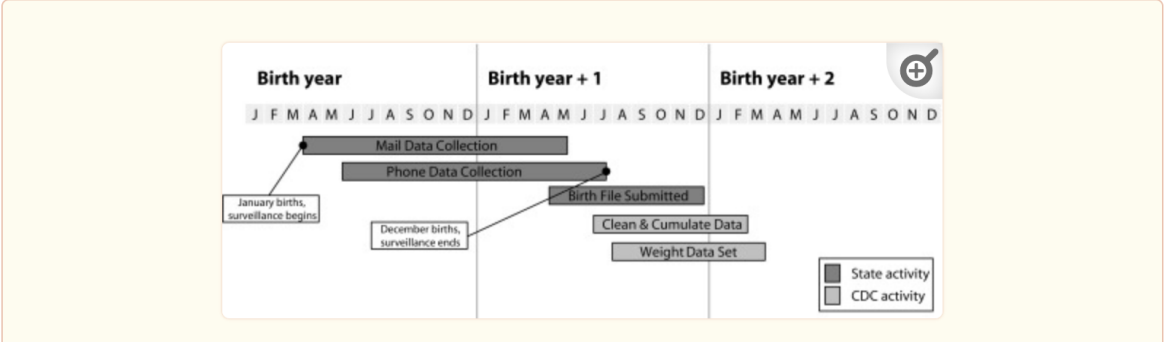
According to Shulman et al. (2018), the dataset is reviewed every 3 to 5 years. The dataset used for this study is the eighth version, implemented in 2016. The questions were unique to each state and consisted of three types of questions. These were core questions common to all PRAMS states, standard questions developed by the CDC and made available for selection to all states, and state-developed questions (based on state needs). (Appendix A). The CDC conducts a central weighting process for all data obtained. The files from the states are provided 5 to 12 months after the end of the birth year, and most states receive their weighted data 3 to 6 months after the conclusion of the data collection (Shulman et al., 2018).

There were no concerns about confidentiality, although there were concerns about recall bias and non-responses. To encourage participation, the states gave various incentives or rewards to participants, e.g., baby items, thermometers, prepaid gift cards, or cash. The CDC imposed and ensured a strict data collection protocol for all the states to ensure further high-quality data is released to researchers. For states whose data did not meet the threshold, their obtained data was not included in the data nor made available for that dataset but was kept for internal use. PRAMS data was available to all

states about 8 to 12 months after data collection of the given year (Shulman et al., 2018). The data collection and processing timeline is shown in Figure 2.

Figure 2

PRAMS Data Collection and Data Processing Timeline



Summary

This chapter focused on the research method of the study. In this study, I used secondary data from PRAMS to determine the effect of body weight gain, breastfeeding, and life stress depicted by abuse on postpartum depression. In this chapter, I described the cross-sectional research design employed in the study, focusing on the population from PRAMS (postpartum women between the ages of 18 and 40+ years old) using a stratified sampling strategy. Also, in this chapter, I discussed the operationalization of the variable, the data analysis plan with logistics regression for statistical analysis, the threats to validity, and the ethical procedure that will be followed. This chapter concludes with the summary and transitions into the next chapter, Chapter 4, which describes the study results.

Chapter 4: Results

In this study, I analyzed the effects of breastfeeding, weight, and physical/emotional abuse on postpartum depression, using secondary data (PRAMS from the CDC). The purpose of this study was to determine how the individual and interpersonal level factors of body weight gain, breastfeeding practices, and physical/emotional abuse are related to the early detection of postpartum depression in women between the ages of 18 and 40+ years old. The research question and hypotheses given below guided this research.

RQ1: What effect do the individual-level factors of body weight gain affecting postpartum women have on the development of postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race?

$H_0$1: There is no effect between the individual-level factors of body weight gain affecting postpartum women on the development of postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race.

H_A1: There is an effect between the individual-level factors of body weight gain affecting postpartum women on the development of postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race.

RQ2: What effect does the individual level factor of breastfeeding (e.g., duration) affecting postpartum women have on the development of postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race?

$H_0$2: There is no effect between the individual level factor of breastfeeding (e.g., duration) affecting postpartum women on the development of postpartum

depression in childbearing women ages 18 to 40+ years old while controlling for age and race.

H_A2: There is an effect between the individual level factor of breastfeeding (e.g., duration) affecting postpartum women on the development of postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race.

RQ3: What effect does the interpersonal level factor of physical/emotional abuse affecting postpartum women have on the development of postpartum depression in childbearing women ages 18 to 40+ years old, while controlling for age and race?

H_03: There is no effect between the interpersonal level factor of physical/emotional abuse affecting postpartum women on the development of postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race.

H_A3: There is an effect between the interpersonal level factor of physical/emotional abuse affecting postpartum women on the development of postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race.

This chapter contains the results obtained from the analysis, a discussion of the secondary data used in this study, the variables, the data management, and the deviations from the data analysis plan presented in Chapter 3, as well as the descriptive statistics and results from the logistics regression analysis conducted on the variables. The results are

organized and given according to each research question and hypothesis. The chapter ends with a summary of the overall findings.

Data Collection and Data Management

The data for this study was obtained from the CDC following approval from the Walden University IRB. The data was collected within a period of 60 to 95 days from the participants (CDC, 2023). The response rate is shown in Table 1 and Table 2 for 2019 and 2020, respectively.

Table 1

2019 PRAMS Response Rate Table

State	Sample size	Respondents	Unweighted percent responding	Weighted percent responding
Alabama	1412	798	56.5	56.4
Alaska	1922	1077	56	57.7
Arizona	1551	711	45.8	45.7
Arkansas	1794	974	54.3	55.6
Colorado	1824	1101	60.4	59.4
Connecticut	2303	1203	52.2	55.7
Delaware	1655	930	56.2	57.4
District of Columbia	1060	515	48.6	51.9
Florida	2132	1050	49.2	51.1
Georgia	1293	789	61	61
Hawaii	1219	629	51.6	55.5
Illinois	2099	1235	58.8	59.3
Indiana	1960	835	42.6	48.8
Iowa	1974	850	43.1	49.6
Kansas	1623	1009	62.2	63.3
Kentucky	1579	910	57.6	60.4
Louisiana	1858	1079	58.1	57.1
Maine	1411	826	58.5	61.4
Maryland	2198	952	43.3	50.5
Massachusetts	2947	1697	57.6	61.2
Michigan	2636	1392	52.8	55.6

State	Sample size	Respondents	Unweighted percent responding	Weighted percent responding
Minnesota	2467	1060	43.0	54.7
Mississippi	1993	1266	63.5	65
Missouri	2813	1603	57	56.9
Montana	1566	726	46.4	51.3
Nebraska	2769	1626	58.7	63.8
Nevada	1466	657	44.8	41.8
New Hampshire	1257	660	52.5	51.4
New Jersey	1773	1131	63.8	65.3
New Mexico	1696	1151	67.9	66.6
New York	1518	762	50.2	52.8
New York City	2200	1269	57.7	60.8
North Dakota	1528	761	49.8	59.1
North Carolina	1833	871	47.5	50.1
Oklahoma	2865	1328	46.4	48.1
Oregon	3643	2459	67.5	69.3
Pennsylvania	2079	1153	55.5	58.2
Rhode Island	1858	988	53.2	54.5
South Carolina	1272	483	38	39.8
South Dakota	1718	1014	59	68.1
Tennessee	1193	668	56	54.4
Texas	3102	1288	41.5	41.4
Utah	2464	1713	69.5	72.8
Vermont	1266	783	61.8	62.4
Virginia	1868	989	52.9	55.5
Washington	2030	1185	58.4	64.1
West Virginia	2294	1028	44.8	49.2
Wisconsin	1830	852	46.6	59.7
Wyoming	1008	493	48.9	55
Puerto Rico	1269	1027	80.9	81

** Does not meet 50% response rate criteria

Table 2

2020 Site Specific Response Rate Table

Site	Sample size	Respondents	Unweighted percent responding	Weighted percent responding
Alabama	1171	647	55.3	55.2
Alaska	1944	1028	52.9	54.4
Arizona	1494	794	53.1	53.0
Arkansas	1724	925	53.7	58.3
Colorado	1666	1051	63.1	63.3
Connecticut	2250	1365	60.7	63.2
Delaware	1608	854	53.1	53.7
District of Columbia	991	556	56.1	58.6
Florida	2030	1101	54.2	55.6
Georgia	1272	692	54.4	53.1
Hawaii	2151	1227	57.0	62.3
Illinois	1994	1205	60.4	61.1
Indiana	1870	973	42.4	49.2
Iowa	1731	720	41.6	50.5
Kansas	1772	1174	66.3	65.8
Kentucky	1579	910	57.6	60.4
Louisiana	1237	698	56.4	57.3
Maine	1625	894	55.0	55.2
Maryland	2128	1004	47.2	49.5
Massachusetts	2492	1400	56.2	59.6
Michigan	2538	1394	54.9	59.2
Minnesota	1674	627	37.5	54.2
Mississippi	1643	1012	61.6	60.4
Missouri	1690	962	56.9	57.1
Montana	1587	711	44.8	53.1
Nebraska	2523	1489	59.0	66.0
Nevada	1399	651	46.5	43.2
New Hampshire	1283	647	50.4	51.9
New Jersey	1715	1110	64.7	64.8
New Mexico	1656	1041	62.9	61.7
New York	1482	703	47.4	49.5
New York City	2065	1214	58.8	61.3
North Dakota	1491	779	52.2	60.5

Site	Sample size	Respondents	Unweighted percent responding	Weighted percent responding
North Carolina	1809	785	43.4	44.7
Oklahoma	2769	996	36.0	40.1
Oregon	2653	1677	63.2	64.2
Pennsylvania	2118	1219	57.6	60.3
Rhode Island	2042	982	48.1	47.4
South Carolina	1244	512	41.2	43.2
South Dakota	1678	976	58.2	66.8
Tennessee	1152	628	54.5	55.5
Texas	2385	944	39.6	39.1
Utah	2328	1418	60.9	66.9
Vermont	1274	815	64.0	66.1
Virginia	1778	944	53.1	57.6
Washington	2068	1239	59.9	64.4
West Virginia	1175	598	50.9	50.4
Wisconsin	3339	1692	50.7	64.1
Wyoming	956	465	48.6	51.4
Puerto Rico	1075	874	81.3	81.3

**
Does not meet 50% response rate criteria.
Maryland's weighted response rate is 49.53% and rounds to 50%.
New York's weighted response rate is 49.45% and rounds to 49%.

Following the application and approval, the CDC sent the PRAMS data set in a zip file containing the data as a SAS7bdat file, the questionnaire analytic codebook (Appendix A), the research dataset codebook, and the set-up guide after a period of thorough vetting of the study. I imported the data into SPSS and extracted the variables I needed to analyze for the study. There was no discrepancy in data collection. However, the mothers' age indicated 40+ years; thus, the study was conducted on this age group instead of limiting it to 50 years old. The dataset contained 480 variables, and the variables of interest were present in the data as described in Chapter 3 and coded. Using

the PRAMS Research Dataset Codebook made interpretation of the dataset easy. After which, I proceeded with the analysis. According to the CDC (2022), the data were drawn by a complex sampling method. Therefore, for the data analysis, I conducted complex samples logistics regression, which includes the Cox and Snell, McFadden, and Nagelkerke R squared, to evaluate the goodness of fit of the logistics regression model, which is the power of explanation of the model.

Descriptive Statistics

I completed the final analysis based on the responses from 203,542 women between 18 and 40+ years in the dataset. The sample of the population of the data set (by race) clearly represents the United States population, as seen in Table 3, while Table 4 shows the population of the descriptive statistics of the PRAMS data set.

Table 3

United States Population by Race

Race and Hispanic origin	**%**
White alone, percent	75.8
Black or African American alone, percent	13.6
American Indian and Alaska Native alone, percent	1.3
Asian alone, percent	6.1
Native Hawaiian and Other Pacific Islander alone, percent	0.3
Two or More Races, percent	2.9
Hispanic or Latino, percent	18.9
White alone, not Hispanic or Latino, percent	59.3

Source: United States Census Bureau

Table 4

PRAMS Descriptive Statistics, Race

	Count	Relative frequency	Valid frequency	Weighted frequency	95% Confidence interval	
					Lower	Higher
White	114570	56.29%	58.00%	68.77%	68.47%	69.07%
Black	37871	18.61%	19.17%	15.94%	15.71%	16.17%
Other non-white	10788	5.30%	5.46%	5.92%	5.74%	6.10%
Other Asian	9595	4.71%	4.86%	3.77%	3.65%	3.89%
Mixed race	11316	5.56%	5.73%	2.92%	2.82%	3.02%
Chinese	2451	1.20%	1.24%	1.11%	1.05%	1.18%
AM Indian	7103	3.49%	3.60%	0.79%	0.76%	0.83%
Filipino	1705	0.84%	0.86%	0.54%	0.50%	0.59%
Japanese	453	0.22%	0.23%	0.12%	0.10%	0.14%
AK Native	1581	0.78%	0.80%	0.09%	0.09%	0.09%
Hawaiian	102	0.05%	0.05%	0.02%	0.01%	0.03%
Missing	6007	2.95%				

Thus, comparing both Tables 3 and 4 shows the similarity in the numbers and percentages obtained; thus, the results obtained from the study can be applied to the United States population. Table 4 shows that the highest representation in the weighted sample has white women (68.77%), followed by Black women (15.94%) and other non-White women (5.92%). No other race was represented by more than 5%. From the overall sample, 28,396 women representing 13.03% of the weighted population, suffered from postpartum depression. I conducted all analyses using the weighted data. According to Haddad et al. (2022), weighting is a technique for adjusting statistical survey data to improve the accuracy of the survey estimates.

Comparing the data for Race as shown in the United States Population Data (U.S Census Bureau, 2023) in Table 3 and the frequency Table 4 of the PRAMS data set, there

is an approximate representation of the United States population by the data set, as the deviation is not much. Thus, the data set is a true representation of the United States population. Additionally, Table 5 shows the descriptive statistics of the occurrence of postpartum depression. This offers a picture of the data I analyzed for this study and shows a total of 203,542 participants with a relative frequency of 13.95%, stating yes to postpartum depression.

Table 5

Descriptive Statistics, Occurrence of Postpartum Depression

	Count	Relative frequency	Valid frequency	Weighted frequency	95% Confidence interval	
					Lower	Higher
No	170078	83.56%	85.69%	86.97%	86.73%	87.20%
Yes	28396	13.95%	14.31%	13.03%	12.80%	13.27%
Missing	5068	2.49%				

Table 6 offers the descriptive statistics by age. The age is grouped into various groups: 18-19; 20-24; 25-29; 30-34; 34-40, and 40+, as shown. There were no missing data, and the age group of 30-34 years had the highest number of women, with 60,584, and the 18–19-year-old age group had the least number, with 7,008 women.

Table 6

Descriptive Statistics, Age

	Count	Relative frequency	Valid frequency	Weighted frequency	95% Confidence interval	
					Lower	Higher
18-19	7008	3.44%	3.44%	3.20%	3.08%	3.33%
20-24	37661	18.50%	18.50%	18.68%	18.40 %	18.96%
25-29	59474	29.22%	29.22%	29.30%	28.98 %	29.62%
30-34	60584	29.76%	29.76%	29.95%	29.64 %	30.27%
34-40	31544	15.50%	15.50%	15.40%	15.16 %	15.65%
40+	7271	3.57%	3.57%	3.47%	3.35%	3.60%
Missing	0	0%				

Data Analysis

RQ 1: The Effect of Weight Gain

RQ1: What effect do the individual-level factors of body weight gain affecting postpartum women have on the development of postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race?

$H_0$1: There is no effect between the individual-level factors of body weight gain affecting postpartum women on the development of postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race.

H_A1: There is an effect between the individual-level factors of body weight gain affecting postpartum women on the development of postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race.

To determine the effect of weight gain on the probability of developing postpartum depression, I used the complex samples logistics regression. Following preliminary analysis, as seen in Table 7, the average weight the women gained was 28.5 lbs. (SD = 15.33), with the median being 28 lbs. Using the weighted data, the average weight gain was 29.4 lbs. Table 7 shows the Descriptive Statistics of Weight Gain.

Table 7

Descriptive Statistics, Weight Gain

	Mean	Std. deviation	Median	Weighted mean	95% Confidence interval	
					Lower	Higher
Weight Gain	28.50	15.33	28.00	29.43	29.33	29.54

The results from the research, as shown in Table 8, indicate that the women gained some weight after giving birth. Additionally, since the p-value is less than 0.05, it indicates statistical significance for the age groups 18 through 29 years; thus, the hypothesis is rejected. This indicates that weight gain, for this group, has an effect on the development of postpartum depression. Additionally, the p-value for the age groups 30-34 years shows that the p-value is 0.054, which is slightly higher than 0.05, indicating a 50% probability of no effect on postpartum depression. This indicates that weight gain for this age group has a mild effect on the development of postpartum depression. Also, for 34-40 years, the p-value is 0.425, which is significantly greater than 0.05. Thus, the null hypothesis is accepted for this age group, which indicates that weight gain for this age group has no effect on the development of postpartum depression.

Furthermore, looking at the Results of Weight Gain, Logistics Regression (Table 8) for the various races: Whites, Asians, Mixed Race, Blacks, Chinese, and Japanese, weight gain affects the development of postpartum depression since the p-value is less than 0.05. For Filipinos, Hawaiians, and Other Non-White, the p-value is significantly higher than 0.05. Thus, there is no effect of weight gain on the development of postpartum depression for this age group.

Table 8

Logistics Regression, Weight Gain

	B	T	Df	p-value	OR	95% Confidence interval	
						Lower	Higher
Intercept	-2.315	-34.060	186719	<.001	.099	.086	.113
Weight Gain	-.002	-3.243	186719	.001	.998	.996	.999
Age Group (ref. 40+)							
18-19	.989	12.089	186719	<.001	2.687	2.289	3.154
20-24	.742	10.994	186719	<.001	2.100	1.840	2.397
25-29	.375	5.652	186719	<.001	1.454	1.277	1.656
30-34	.129	1.931	186719	.054	1.137	.998	1.296
34-40	.056	.797		.425	1.057	.922	1.213
Race (ref. White)							
Other Asian	.795	17.479	186719	<.001	2.214	2.025	2.421
Mixed Race	.308	5.783	186719	<.001	1.361	1.226	1.510
Black	.448	15.674	186719	<.001	1.565	1.480	1.655
AM Indian	.368	5.165	186719	<.001	1.445	1.257	1.662
Chinese	.203	2.109	186719	.035	1.225	1.014	1.479
Japanese	1.083	5.178	186719	<.001	2.954	1.960	4.451
Filipino	.176	1.338	186719	.181	1.192	.922	1.542
Hawaiian	.367	.680	186719	.496	1.444	.501	4.159
Other Non-white	-.031	-.571	186719	.568	.969	.870	1.079
AK Native	.304	4.209	186719	<.001	1.355	1.176	1.561

***Pseudo R^2**: Cox and Snell = 0.015; Nagelkerke = 0.028; McFadden = 0.020*

In a further analysis, as shown in Pseudo R-Squared of Weight Gain (Table 9), using the Nagelkerke R^2 (the power of explanation), the model explained 2.8% of the variance in the probability of depression and classified 87.0% of cases correctly.

Table 9

Pseudo R^2 of Weight Gain

Pseudo R^2	
Cox and Snell	.015
Nagelkerke	.028
McFadden	.020

Dependent Variable: VAR: POST-PARTUM DEPRESSION INDICATOR (reference category = Yes)
Model: (Intercept), MOMLBS, MAT_AGE_NAPHSIS, MAT_RACE

In conclusion, as shown in the Test of Model Effects for Weight in Table 10, weight ($F = 10.5$, $df = (1, 186719)$, $p = 0.01$), race ($F = 53.5$, $df = (10, 186710)$, $p < 0.01$), and age ($F = 128.8$, $df = (5, 186715)$, $p < 0.01$) were all significant predictors of postpartum depression.

Table 10

Tests of Model Effects for Weight

Source	df1	df2	Wald F	Sig.
(Corrected Model)	16.000	186704.000	79.731	<0.001
(Intercept)	1.000	186719.000	670.184	<0.001
MAT_AGE_NAPHSIS (Maternal Age Grouped)	5.000	186715.000	128.805 (128.8)	<0.001
MAT_RACE	10.000	186710.000	53.459 (53.5)	<0.001
MOMLBS	1.000	186719.000	10.514 (10.5)	0.001

Model: (Intercept), MAT_AGE_NAPHSIS, MAT_RACE, MOMLBS

In summary, while controlling for age and race, based on this analysis, it can be concluded that in women between 18-29, weight gain affects postpartum depression, whereas among mothers 34-40, weight gain has no effect on postpartum depression. Furthermore, for White, Asian, Mixed race, Black, Chinese, and Japanese women, weight gain influenced postpartum depression.

RQ 2: Effect of Breastfeeding

RQ2: What effect does the individual level factor of breastfeeding (e.g., duration) affecting postpartum women have on the development of postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race?

$H_0$2: There is no effect between the individual level factor of breastfeeding (e.g., duration) affecting postpartum women on the development of postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race.

H_A2: There is an effect between the individual level factor of breastfeeding (e.g., duration) affecting postpartum women on the development of postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race.

To determine the effect of breastfeeding on the probability of developing postpartum depression, I used the complex samples logistics regression. The results are shown in the tables below. The initial analysis, as shown in Table 11 below, reflects that when weighted, 12.09% of the women do not breastfeed their babies, 3.89% breastfeed till just after birth, 4.14% breastfeed for up to 2 weeks, and 8.57% for up to 1 month.

Additionally, 6.48% of the women breastfeed for up to 2 months, and 4.92% for up to 3 months. The data showed that the surveyed women rarely breastfeed for longer than that. Additionally, the data shows that 54.48% of the women are still breastfeeding. This implied that when data was collected, these women were still breastfeeding and had not stopped breastfeeding their infants, unlike those who had stopped breastfeeding at 2 weeks, 1 month, 2 months, or 3 months.

Table 11

Descriptive Statistics, Breastfeeding

	Count	Relative frequency	Valid frequency	Weighted frequency	95% Confidence interval	
					Lower	Higher
None	23019	11.31%	11.80%	12.09%	11.86%	12.32 %
After Birth	7313	3.59%	3.75%	3.89%	3.76%	4.03%
2 Weeks	7819	3.84%	4.01%	4.14%	4.00%	4.29%
1 Month	16624	8.17%	8.52%	8.57%	8.37%	8.78%
6 Weeks	5598	2.75%	2.87%	2.76%	2.65%	2.88%
2 Months	13795	6.78%	7.07%	6.66%	6.48%	6.84%
3 Months	10477	5.15%	5.37%	5.07%	4.92%	5.23%
4 Months	3512	1.73%	1.80%	1.59%	1.50%	1.68%
5 Months	1045	0.51%	0.54%	0.48%	0.44%	0.53%
6 Months	460	0.23%	0.24%	0.21%	0.18%	0.24%
9 Months	133	0.07%	0.07%	0.06%	0.04%	0.08%
Still	105361	51.76%	53.99%	54.48%	54.13%	54.83 %
Missing	8386	4.12%				
Total	203542	100.0%				

Similar to the weight gain analysis, the results are displayed in the tables shown. From the Results of Breastfeeding, Logistics regression (Table 12), mothers that still breastfeed their children have about 30% lower odds (OR=0.715, 95% CI [0.668, 0.764])

of suffering from postpartum depression than women that have never done it, which is OR = 0.108, 95% CI [0.94, 0.124]. Similarly, mothers that breastfed for up to 9 months had a significantly lower probability of depression (OR=0. 476, 95%CI [0.236, 0.962]) than those women who were still breastfeeding. In contrast, women who breastfed for 6 months showed a p-value greater than 0.05; thus, the null hypothesis is not rejected. The p-value for mothers who never breastfed and still breastfeed is <0.001. This is less than 0.05; thus, we reject the null hypothesis. This indicates that breastfeeding has an effect on postpartum depression.

Table 12

Logistics Regression, Breastfeeding

	B	T	df	p-value	OR	95% Confidence interval	
						Lower	Higher
Intercept	-2.224	-31.384	185987	<.001	.108	.094	.124
Breast feeding (ref. never)							
After Birth	.064	1.063	185987	.288	1.066	.948	1.199
2 Weeks	.089	1.521	185987	.128	1.093	.975	1.225
1 Month	.045	.976	185987	.329	1.046	.955	1.146
6 Weeks	-.065	-.961	185987	.336	.937	.820	1.070
2 Months	.010	.199	185987	.843	1.010	.915	1.114
3 Months	-.053	-.929	185987	.353	.949	.849	1.060
4 Months	-.094	-1.099	185987	.272	.910	.769	1.077
5 Months	-.234	-1.359	185987	.174	.791	.564	1.109
6 Months	-.090	-.388	185987	.698	.914	.578	1.443
9 Months	-.743	-2.069	185987	.039	.476	.236	.962
Still	-.336	-9.797	185987	<.001	.715	.668	.764
Age Group (ref. 40+)							
18-19	.869	10.428	185987	<.001	2.384	2.025	2.807
20-24	.670	9.732	185987	<.001	1.954	1.708	2.237
25-29	.360	5.332	185987	<.001	1.434	1.256	1.637
30-34	.133	1.961	185987	.050	1.142	1.000	1.305
34-40	.076	1.069	185987	.285	1.079	.939	1.241
Race (ref. White)			185987				

Other Asian	.845	185987	85987	<.001	2.329	2.129	2.548
Mixed Race	.293	185987	85987	<.001	1.341	1.207	1.489
Black	.386	185987	85987	<.001	1.471	1.388	1.558
AM Indian	.304	185987	85987	<.001	1.355	1.177	1.561
Chinese	.271	185987	85987	.005	1.311	1.084	1.586
Japanese	1.251	185987	85987	<.001	3.492	2.329	5.238
Filipino	.213	185987	85987	.111	1.238	.952	1.609
Hawaiian	.374	185987	85987	.495	1.453	.497	4.254
Other Non-white	-.010	185987	85987	.860	.990	.887	1.105
AK Native	.296	185987	85987	<.001	1.344	1.159	1.558

Pseudo R^2: Cox and Snell = 0.018; Nagelkerke = 0.033; McFadden = 0.024

In an interesting observation, as shown in Table 12, for women who are still breastfeeding or breastfed for 6 months or less, the p-values are greater than 0.05. Thereby indicating no statistical significance for this group. This means that the null hypothesis is accepted. The results for mothers who breastfed their children less than 6 months do not offer sufficient evidence to show an impact, as the data and analysis showed no statistically significant difference between them and non-breast feeders. Only the women who breastfed for up to 9 months had a p-value less than 0.05, which indicates statistical significance; thus, we reject the null hypothesis.

In further analysis, Table 13 shows the Pseudo R Squared, Nagelkerke R^2 (the model explained 3.3%. Cox and Snell, 0.018, and McFadden, 0.024), and all these factors, Cox and Snell, Nagelkerke, and McFadden were less than 0.05, this indicates that they are statistically significant.

Table 13

Pseudo R^2 of Breastfeeding

Pseudo R Squared	
Cox and Snell	.018
Nagelkerke	.033
McFadden	.024

Dependent Variable: VAR: POST-PARTUM DEPRESSION INDICATOR (reference category = No)
Model: (Intercept), BREASTWEEK, MAT_AGE_NAPHSIS, MAT_RACE

Table 14 shows the Test of Model Effect for breastfeeding, race ($F = 50.927$, df = (10, 185978), $p < 0.001$), and age ($F = 92.176$, df = (5, 185983), $p < 0.001$) show similar results as before, and are all less than 0.05, which implies a statistically significant result. More importantly, the variable of breastfeeding ($F = 21.246$, df = (11, 185977), $p < 0.001$) is statistically significant and affects the development of postpartum depression in childbearing women while controlling for age and race.

Table 14

Test of Model Effects for Breastfeeding

Source	df1	df2	Wald F	Sig.
(Corrected Model)	26.000	185962.000	56.145	<0.001
(Intercept)	1.000	185987.000	537.364	<0.001
MAT_AGE_NAPHSIS (Maternal Age Grouped)	5.000	185983.000	92.176	<0.001
MAT_RACE (Maternal Race)	10.000	185978.000	50.927	<0.001
BREASTWEEK	11.000	185977.000	21.246	<0.001

Dependent Variable: VAR: POST-PARTUM DEPRESSION INDICATOR (reference category = No)
Model: (Intercept), MAT_AGE_NAPHSIS, MAT_RACE, BREASTWEEK

RQ 3: Effect of Physical/Emotional Abuse

RQ3: What effect does the interpersonal level factor of physical/emotional abuse affecting postpartum women have on the development of postpartum depression in childbearing women ages 18 to 40+ years old, while controlling for age and race?

$H_0$3: There is no effect between the interpersonal level factor of physical/emotional abuse affecting postpartum women on the development of postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race.

H_A3: There is an effect between the interpersonal level factor of physical/emotional abuse affecting postpartum women on the development of postpartum depression in childbearing women ages 18 to 40+ years old while controlling for age and race.

Based on the data available, I used the complex samples logistics regression to conduct the data analysis on a sub-sample of 90,998 women to determine the effect of physical/emotional abuse on the probability of developing postpartum depression. Table 15 shows that from the weighted sample (n = 95,341), 95.53% of surveyed women were never abused. This indicates that about 4.5% experienced abuse during or prior to pregnancy. The abuse appeared more often prior to the pregnancy when 1.48% of the women were abused by their partners and 1.61% by their ex-partners. Another 0.62% and 0.87% of the women were abused by other family members or someone else, respectively. Additionally, during pregnancy, 1.22% of the women experienced abuse from a partner, 0.83% from an ex-partner, 0.66% from someone else, and 0.53% from

family members. These numbers are not exclusive, meaning a woman could simultaneously be abused by her partner, ex-partner, family member and/or someone else.

In further observation, the abuse by family members appeared to have a lower and statistically insignificant effect (OR = 1.432, 95% CI [0.932, 2198], compared to the abuse by a partner , which raises the odds of having postpartum depression by 80% (OR=1.790, 95% CI [1.356, 2.363]), the abuse by an ex-partner by 65% (OR=1.652, 95% CI [1.258, 2.170]), and the abuse by someone else almost doubles them (OR=1.964, 95% CI [1.402, 2.751]).

Table 15

Descriptive Statistics, Abuse

	Count	Relative frequency	Valid frequency	Weighted frequency	95% Confidence interval	
					Lower	Higher
12 Month Prior Pregnancy						
Family	586	0.29%	0.64%	0.62%	0.54%	0.72%
Someone Else	840	0.41%	0.91%	0.87%	0.78%	0.98%
Ex-Partner	1627	0.80%	1.77%	1.61%	1.48%	1.76%
Partner	1625	0.80%	1.77%	1.48%	1.36%	1.61%
During Pregnancy						
Family	495	0.24%	0.54%	0.53%	0.46%	0.62%
Someone Else	691	0.34%	0.75%	0.66%	0.58%	0.75%
Ex-Partner	871	0.43%	0.95%	0.83%	0.74%	0.93%
Partner	1302	0.64%	1.42%	1.22%	1.12%	1.34%
Never	87304	42.91%	95.00%	95.53%	95.30 %	95.74%
Missing	112544	55.27%				

After conducting the logistic regression, the results revealed, as shown in the tables below, that physical/emotional abuse (while controlling for age and race) has a significant effect on the development of postpartum depression in childbearing women ages 18 to 40+ years old. Table 16, The Test of Model Effects for physical/emotional abuse, showed that the abuse before pregnancy by partner ($F = 16.875$, $df = [1, 89658]$, $p < 0.001$), by ex-partner ($F = 13.021$, $df = [1, 89658]$, $p < 0.001$), and by someone else ($F = 15.4$, $df = [1, 89658]$, $p<0.001$) are all significant predictors of postpartum depression.

Table 16

Test of Model Effect for Abuse

Source	df1	df2	Adjusted Wald F	Sig.
(Corrected Model)	21.861	1960029.168	35.601	<0.001
(Intercept)	1.000	89658.000	0.221	0.638
MAT_AGE_NAPHSIS (Maternal Age Grouped)	5.976	535797.512	45.591	<0.001
MAT_RACE (Maternal Race)	8.023	719296.845	22.003	<0.001
PAB_FAM (Pre-Pregnancy Abuse by Family)	1.000	89658.000	2.689	0.101
PAB_OTH (Pre-Pregnancy Abuse by Others)	1.000	89658.000	15.409	<0.001
PAB_XHUS (Pre-Pregnancy Abuse by Ex-Husband)	1.000	89658.000	13.021	<0.001
PAB6HUS (Pre-pregnancy Abuse by Husband)	1.000	89658.000	16.875	<0.001

PAD_FAM (Abuse During Pregnancy by Family)	1.000	89658.000	0.052	0.819
PAD_OTH (Abuse During Pregnancy by Others)	1.000	89658.000	0.005	0.943
PAD_XHUS (Abuse During Pregnancy by Ex-Husband)	1.000	89658.000	1.052	0.305
PAD6HUS (Abuse During Pregnancy by Husband)	1.000	89658.000	25.246	<0.001

Dependent Variable: VAR: POST-PARTUM DEPRESSION INDICATOR (reference category = No)
Model: (Intercept), MAT_AGE_NAPHSIS, MAT_RACE, PAB_FAM, PAB_OTH, PAB_XHUS, PAB6HUS, PAD_FAM, PAD_OTH, PAD_XHUS, PAD6HUS

Table 17, the results of the logistics regression, shows that the effect of abuse during pregnancy seems to be lower and statistically insignificant for abuse by everyone except the partner. Also, the abuse by a partner during pregnancy has a strong statistically significant effect on the probability of developing postpartum depression ($F = 25.25$, $df = (1, 89658)$, $p < 0.01$). The odds of having postpartum depression more than doubled (OR=2.155, 95%CI [1.597, 2.907]) for women abused during pregnancy by their partners.

Table 17

Logistics Regression, Abuse

	B	t	df	p-value	OR	95% Confidence Interval	
						Lower	Higher
Intercept	-2.380	-23.846	89658	<.001	.093	.076	.113
12 Month Prior	-2.380	-23.846	89658	<.001	.093	.076	.113
Pregnancy (ref. never)							
Family	.359	1.640	89658	.101	1.432	.932	2.198
Someone Else	.675	3.925	89658	<.001	1.964	1.402	2.751
Ex-Partner	.502	3.609	89658	<.001	1.652	1.258	2.170
Partner	.582	4.108	89658	<.001	1.790	1.356	2.363
During pregnancy (ref. never)							
Family	-.058	-.229	89658	.819	.944	.574	1.551
Someone Else	-.015	-.071	89658	.943	.985	.659	1.475
Ex-Partner	.199	1.026	89658	.305	1.220	.834	1.786
Partner	.768	5.025	89658	<.001	2.155	1.597	2.907
Age Group (ref. 40+)				89658			
18-19	.778	4.294	89658	<.001	2.178	1.527	3.107
20-24	.940	7.543	89658	<.001	2.560	2.005	3.268
25-29	.617	5.859	89658	<.001	1.853	1.507	2.277
30-34	.295	2.858	89658	.004	1.343	1.097	1.645
34-40	.036	.346	89658	.729	1.037	.845	1.271
Race (ref. White)			185987	89658			
Other Asian	.767	9.504	89658	<.001	2.153	1.838	2.521
Mixed Race	.178	1.986	89658	.047	1.195	1.002	1.424
Black	.411	9.636	89658	<.001	1.509	1.388	1.640
AM Indian	.266	2.486	89658	.013	1.304	1.058	1.609
Chinese	.428	2.373	89658	.018	1.534	1.077	2.183
Japanese	1.035	2.944	89658	.003	2.815	1.413	5.608
Filipino	.244	1.113	89658	.266	1.277	.830	1.963
Hawaiian	.669	.863	89658	.388	1.953	.427	8.920
Other Non-white	.164	1.733	89658	.083	1.178	.979	1.419
AK Native	.767	9.504	89658	<.001	2.153	1.838	2.521

Pseudo R^2: Cox and Snell = 0.022; Nagelkerke = 0.042; McFadden = 0.030

Table 18 shows the result of the Pseudo R Squared for maternal abuse. The results indicate a similar result for all three R's, which shows consistency and confirmation of the results obtained.

Table 18

Pseudo R^2 for Abuse

Pseudo R Squared	
Cox and Snell	0.022
Nagelkerke	0.042
McFadden	0.030

Dependent Variable: VAR: POST-PARTUM DEPRESSION INDICATOR (reference category = No)
Model: (Intercept), MAT_AGE_NAPHSIS, MAT_RACE, PAB_FAM, PAB_OTH, PAB_XHUS, PAB6HUS, PAD_FAM, PAD_OTH, PAD_XHUS, PAD6HUS

Summary

In this chapter, I discussed the results of the complex samples logistics regression to determine the effect of weight gain, breastfeeding, and physical/emotional abuse on postpartum depression in women between 18 and 40+ years old. I presented the results obtained from the data analysis using SPSS in this chapter in Tables 1–18. I conducted the same tests for all three research questions and interpreted the results based on the null and alternate hypotheses. Additionally, I reported the results of the frequency, description, logistics regression, Pseudo R squared and test of model effects of the data analysis.

This chapter is followed by chapter 5 in which I will interpret the findings of the study. Furthermore, the discussion of the strengths and limitations of the study, as well as the conclusion and recommendations for further study will be provided. Lastly, the

chapter will conclude with an explanation of the implications of the findings and the potential impact of this study on positive social change.

Chapter 5: Discussion, Conclusion, and Recommendation

In this study, I attempted to address the effect of weight gain, breastfeeding, and physical/emotional abuse on postpartum depression in women between 18 and 40+ years old using secondary data obtained from the CDC. I used complex samples logistics regression to analyze the PRAMS data in this cross-sectional study. I sought to determine the relationship between the individual-level factors of body weight gain and breastfeeding practices on postpartum depression and the relationship between the interpersonal level factor of physical/emotional abuse on postpartum depression.

In this study, I analyzed how the individual and interpersonal level factors of body weight gain, breastfeeding practices, and physical/emotional abuse are related to the early detection of postpartum depression in women between 18 and 40+ years old. Specifically, I sought to contribute to the existing literature as I addressed the research gap concerning the effect of breastfeeding, weight gain, and physical and emotional abuse on postpartum depression in women aged 18–40+ years. The dependent variable in this study was postpartum depression, while the independent variables were breastfeeding, weight gain, and physical/emotional abuse.

The results of this study showed that the individual level factor of weight gain, breastfeeding, and the interpersonal level factor of physical/emotional abuse had some effects on the development of postpartum depression. For women younger than 30 years old who gained weight, there was an increased probability of being affected by postpartum depression ($p<0.05$). In comparison, women greater than 30 years old had no probability of postpartum depression with weight gain ($p>0.05$). Also, there was no

statistically significant effect for women still breastfeeding or breastfed for up to 6 months ($p>0.05$), while women who breastfed for up to 9 months showed statistical significance ($p<0.05$). Additionally, abuse before and during pregnancy by partner significantly affected the development of postpartum depression ($p<0.05$).

Interpretations of the Study

The premise of this study was that weight gain, breastfeeding, and physical/emotional abuse impacted postpartum depression. The study findings indicated some relationship between these variables and postpartum depression.

Association Between Weight Gain and Postpartum Depression.

The study findings confirmed a relationship between weight gain and postpartum depression for specific age groups. The results showed that postpartum depression is mildly affected by weight gain based on the results shown in Table 8, the weight gain logistics regression analysis result. The findings indicated mixed results for the age groups, while the younger age groups (18-29 years old) had a p-value less than 0.05. This is further explained here. The women in the three age groups, 18-19 years, 20-24 years, and 25-29 years, had p-values of < 0.001, which is less than 0.05. The older age groups, 30–40 years old, had a p-value greater than 0.05; 30-34 years had a p-value of 0.54, while 34-40 years had a p-value of 0.425. Notably, these p-values were significantly higher than 0.05. This indicates that women younger than 30 who gained weight had an increased probability of being affected by postpartum depression. In contrast, women older than 30 years old had no likelihood of postpartum depression with weight gain, especially in the 35-40 years old age group.

These findings extend the existing knowledge on the subject. For instance, Bazzazian et al. (2021) systematically reviewed 24 articles from PubMed, Embase, Scopus, and others to analyze the relationship between postpartum weight retention and depression, stress, and anxiety. They found an association between these factors, but time played a notable role. For instance, the postpartum period, e.g., 6 months or 1 year postpartum, affected anxiety levels about weight retention. Thus, this present study examined the factors of weight gain and its effect on postpartum depression, contributing to the existing knowledge by determining the age and race of the women most affected by this relationship. The study shows that weight gain increased the risk of postpartum depression in White, Asian, Black, Chinese, Japanese, and Mixed Race women, although the duration postpartum was not measured for weight gain. Among Filipinos and Hawaiians, weight gain had no effect on the development of postpartum depression. Knowledge of this result will equip women at risk to better manage their health and make informed decisions to ensure their overall health and wellness. This information also implies that interventions can be tailored to suit women of these various races, with the result of this study becoming a guide toward informed decision-making. This is by making healthier choices with the approval of their healthcare providers in terms of diet and exercise to achieve a healthier weight postpartum if required.

Additionally, multiple researchers have found the relationship between weight gain and postpartum depression to be controversial (Gomes et al., 2023, Qiu et al., 2022; Yamaguchi et al., 2021). For instance, Gomes et al. (2023) conducted a cross-sectional analysis on a prospective cohort study in Sao Paolo, Brazil, on 466 pregnant women.

They reported that excessive weight gain does not impact postpartum depression, while insufficient weight gain affected postpartum depression. The results of the crude analysis by Gomes et al. (2023) showed that there was no association between the presence of depressive symptoms and excessive weight gain (OR: 1.13; 95% CI, 0.60–2.13). At the same time, the crude analysis of depression and insufficient weight gain identified an association between them (OR: 2.41; 95% CI, 1.13–5.12).

In another study, Qiu et al. (2022) conducted a meta-analysis of 16 studies involving 100,438 participants. They reported that excessive gestational weight gain significantly affected the development of postpartum depression (OR=1.09, 95% CI: 1.03–1.15; $P = 0.001$) although considerable heterogeneity existed ($P<0.0001$; $I^2=70.0\%$). Further analysis by Oiu et al. discovered that overall, pregnant women with excessive gestational weight gain (OR=1.31, 95%CI: 1.06–1.61; $P = 0.01$) and inadequate gestational weight gain (OR=1.14, 95% CI: 1.08–1.20; $P<0.00001$) had a significantly higher risk of developing postpartum depression compared with those with adequate gestational weight gain.

Thus, the findings of this present study extend this existing knowledge and further clarify the relationship between weight gain and postpartum depression, enhancing the need for tailored interventions. In this study, I examined the effect of weight gain on postpartum depression while considering the age and race of the participants to determine the results based on the age and race of the women. The results obtained for the women 18-29 years indicated that weight gain affected postpartum depression, which corroborated the findings of Oiu et al (2023). These results will benefit not only the

women but also their families and healthcare professionals. This indicates that healthcare practitioners or health education professionals can better assist pregnant women between the ages of 18-29 years old in gaining access to resources that will help them better manage their pregnancy weight. They may also help by offering periodic screening so that their gestational weight gain is within the CDC's recommended 25-35 lbs. for a single pregnancy.

Based on the findings of this study, intervention programs should be tailored to suit the various age groups and women of these races. However, there should be more focus on women between the ages of 18-29 years old, as this group showed that weight gain affected postpartum depression. Thus, in pre-natal visits, as well as postpartum visits, healthcare providers should take note of this risk factor among this age group. Additionally, stakeholders like family members, lactation consultants, and WIC can also be educated on this relationship in this age group to target intervention programs, thus mitigating postpartum depression among this group.

Association Between Breastfeeding and Postpartum Depression

The findings from this study indicated that breastfeeding also had an effect on postpartum depression. The results were mixed based on the duration of breastfeeding. For mothers who were still breastfeeding (54.48%), the p-value was <0.001, while for those that breastfed for 6 months (0.21%), there was no significant effect (p=0.698). However, for mothers that breastfed up to 9 months (0.06%), there was a display of statistical significance, as there was a probability of developing postpartum depression while controlling for age and race (p=0.039).

The results obtained from the study corroborate the findings of several researchers on the subject. Xia et al. (2022) conducted a meta-analysis on eight studies, including 18,570 participants, and reported that breastfeeding was associated with a 14% lower risk of postpartum depression (OR 0.86, 95% CI 0.77–0.94, I2 = 51.78%). Also, Alimi et al. (2022) conducted a systematic review and meta-analysis on the possible association between the type and degree of breastfeeding and postpartum depression. After their study, they reported that non-exclusive breastfeeding was associated with a risk of postpartum depression with 89% higher odds of postpartum depression (OR = 1.89, 95% confidence interval [CI]: 1.50-2.39). Shimao et al. (2021) also reported that exclusive breastfeeding reduced postpartum depression, especially in mothers who breastfed for 6 months and maintained eye contact or talked to their babies during feeding. They had an odds ratio of 0.69 for postpartum depression (95% confidence interval: 0.61–0.79). Thus, women who breastfeed for as long as 9 months should be observed closely, as they are at an increased risk of developing postpartum depression, based on the findings of this study (p=0.039).

Based on these results, exclusive breastfeeding should be limited to 6 months postpartum, as going higher than that showed an increased risk of developing postpartum depression, which is detrimental to the mother's health. Thus, stakeholders like family members, lactation consultants, health care providers, and organizations like WIC should know these results and tailor interventions to suit these women. This would protect the mental health of the mother and reduce the risk of the development of the symptoms of postpartum depression.

Association Between Physical/Emotional Abuse and Postpartum Depression

The findings from this study showed that physical/emotional abuse had an effect on postpartum depression. The outcome differed across the various categories as shown in the months before pregnancy; the abuse from family members showed a p-value of 0.101, while abuse by someone else, partner, and ex-partner showed <0.001, which indicates that the null hypothesis can be rejected, meaning that physical/emotional abuse has as effect on postpartum depression for this category. During pregnancy, however, abuse by a family member, someone else, or an ex-partner showed a p-value greater than 0.05, which indicates that the null hypothesis can be accepted, suggesting that physical/emotional abuse has no effect on postpartum depression for this category. However, abuse by a partner during pregnancy showed a p-value of <0.001, thus indicating that physical/emotional abuse by a partner resulted in postpartum depression in the mother.

The findings of this study corroborate studies by Esie et al. (2019) and Tho Nhi et al. (2019), which reported that intimate partner violence had a profound effect on postpartum depression. Esie et al. conducted a cross-sectional analysis of secondary data drawn on women in rural Bangladesh. The results showed that women faced various forms of abuse, with the highest levels being psychological (RR=2.27, 95% CI: 1.62, 3.17), physical (RR=2.44, 95% CI: 1.94, 3.08), and sexual (RR=1.65, 95% CI: 1.08, 2.52). Intimate partner violence was found to be significantly associated with major depressive episodes, with psychological (77.2%) being the most common, followed by sexual (58.8%) and physical (44.4%). Additionally, the study by Tho Nhi et al. revealed

that partner violence was strongly associated with postpartum depression. Tho Nhi et al. conducted a longitudinal study on women in Hanoi, Vietnam. They conducted a multivariate analysis, showing that physical and sexual violence were statistically significantly associated with postpartum depression (AOR=2.75, 95%CI: 1.19-6.35 and AOR=1.93, 95%CI: 1.01-3.73, respectively). Thus, these results indicate that women should be screened for abuse when they come for their prenatal and postpartum visits with their healthcare provider, as this would enable early detection and limit the incidence of postpartum depression.

Furthermore, screening and detecting abuse by an ex-partner or another individual close to them is essential as the risk from this form of abuse was discovered to be twice more likely to cause postpartum depression. Thus, interventions should be tailored to suit these various groups, and the women should be educated on these risk factors and their effect on postpartum depression.

The Study Findings in the Concept of the Social-Ecological Model

I used the social-ecological model as the theoretical framework for this study, using two levels of influence of the social-ecological model: the individual and the interpersonal levels. The individual level was represented by weight gain and breastfeeding, while the interpersonal level was represented by physical and emotional abuse. The findings from this study were based on a close examination of these three factors based on these two levels of influence, which is like the study conducted by Nicolson et al. (2019). Nicolson et al. conducted a cross-sectional study across the three levels of influence: individual, interpersonal, and environmental—the data comprised

secondary data from 7328 adults of the nationally-representative Healthy Ireland Survey. The purpose of the study was to identify the individual, social and environmental correlates of total sedentary behavior and the contexts in which sitting time accumulated in an Irish adult cohort. Nicolson et al. discovered that the interpersonal level factor, which examines interactions with people, was a strong level of influence and should be addressed, showing that lower socioeconomic classification and education levels were associated with increased screen time sitting ($p < 0.001$).

Similarly, Sharma et al. (2022) conducted a systematic review of articles from 6 databases (Medline, CINAHL, PsychInfo, Web of Science, Nepal Journals Online and Kathmandu University Medical Journal). The focus of the study was to review the state of knowledge on menstrual health and hygiene in Nepal through a socio-ecological perspective. The factors contributing to menstrual health and hygiene were categorized based on the level of the socio-ecological model. The results showed that there were factors affecting menstrual health across the five levels of influence of the social ecological model. In another study to understand the determinants of COVID-19 vaccine trust, Latkin et al. (2021) conducted a mixed methods study using the social-ecological framework. Latkin et al. used the individual, social, and societal-level factors associated with COVID-19 trust and identified that vaccine trust was significantly associated with individual sociodemographic and behavioral factors. The results from the bivariate analysis showed that men had increased vaccine trust compared with women (OR = 1.46, CI:1.05–2.04), while participants who reported non-Hispanic Black race had decreased odds of vaccine trust compared with White race (OR = 0.42, CI:0.21–0.82).

Individual Level Factors

Weight

The results of this study reflected that weight gain had a mixed effect based on the mother's age, with women between the ages of 18 and 29 showing a p-value of less than 0.01 ($p<0.01$), which indicates that they have an effect on postpartum depression. For women older than 30, the p-value is greater than 0.05 ($p>0.05$), which suggests that for women in this age group, their weight gain does not have an effect on postpartum depression. Additionally, considering that the results showed that the women who belonged to these races: White, Asian, Black, Indian, Chinese, Mixed race, and Japanese presented a p-value of less than 0.05 ($p<0.05$), it showed that weight gain was a notable factor for postpartum depression among these group of women. This indicates that for mothers of these races, weight gain played a significant role in their developing symptoms of postpartum depression. Thus, various intervention measures should be tailored to suit them. While for Filipino, Hawaiian, and other Non-white mothers, whose p-value was significantly higher than 0.05 ($p>0.05$), weight gain has no effect on the development of postpartum depression.

This study corroborates the findings of Incollingo Rodriguez et al. (2019) that the stress and stigma associated with weight gain postpartum created mental health threats among women ($p<0.001$). Also, the 76 systematic reviews and meta-analysis assessments by Dipietro et al. (2019) indicated that increased physical activity might reduce weight gain and the possibility of developing postpartum depression (aaverage RR=1.20; 95%CI: 1.00 to 1.43). Based on the findings of the individual level factor of weight gain

($p<0.05$), it is, therefore, imperative that postpartum women be educated on the importance of taking charge of their health at this level. Adequate physical activity and a healthy diet are some activities they can engage in to help with postpartum weight management (Makama et al., 2021). This involves lifestyle efficacy so the women can manage their weight postpartum, thereby limiting the risk of postpartum depression at this level.

Breastfeeding

The results from the study showed mixed results of breastfeeding for the women. For the mothers who breastfeed immediately after childbirth to up to 6 months, it showed a p-value greater than 0.05 ($p>0.05$), indicating no effect on the development of postpartum depression by breastfeeding. For women who are still breastfeeding or breastfed for up to 9 months, the analysis showed a p-value of less than 0.05 ($p<0.05$); this indicates that this duration of breastfeeding was a notable factor in the development of postpartum depression. Similarly, for the age group of 18-29, with $p< 0.05$, which indicates an effect of breastfeeding on the development of postpartum depression. Conversely, for the age group of 30–34-year-old women, the p-value is at 0.05 ($p=0.05$), indicating a 50% probability of developing postpartum depression in this age group. While for 34–40 years old, the $p = 0.285$ was greater than 0.05. Thus, breastfeeding has no probability of leading to postpartum depression among this age group.

This result does not quite agree with a study conducted by Toledo et al. (2021), in which the authors reported that breastfeeding reduces the probability of postpartum depression after conducting a cross-sectional study using a correlational study design

using the PRAMS secondary dataset (n=29,682). The results showed that women currently breastfeeding (AOR = 0.87 CI: 0.79-0.95, p = .001) and women who breastfed for longer periods (p = < .002) had a statistically significantly lower postpartum depression risk compared to those who stopped breastfeeding. Thus, at this level of the social-ecological model, which is individual, lifestyle efficacy must be improved upon. All stakeholders should consider these findings as they develop interventions to suit women of these various age groups, as they assist them in developing lifestyle efficacy to limit the rise of postpartum depression.

Interpersonal Level

Physical/Emotional Abuse

I used the interpersonal level of the social-ecological model, represented by physical/emotional abuse, for this study to assess the effect of physical/emotional abuse by the people around the mother (18-40+ years) on the development of symptoms of postpartum depression. These people include family members, partners, ex-partners, and someone else. The results showed that abuse during pregnancy by family, someone else, and ex-partner had no effect on the development of symptoms of postpartum depression. The p-values were p=0.819, 0.943, and 0.305, respectively. This indicates a p-value > 0.05 for these three groups. Conversely, abuse by a partner was shown to have an effect on the development of postpartum depression in the mother (p<0.001).

Additionally, abuse of women 18-19, 20-24, 25-29, and 30-34 years old showed p-values of <0.05 for each of them. This indicates that these groups were adversely affected by abuse, indicating that physical/emotional abuse led to the development of

symptoms of postpartum depression in women of these age groups, for women who were between the ages of 34 to 40 years old, physical/emotional abuse had no effect on the development of symptoms of postpartum depression ($p = 0.729$). The results obtained from this study extend the knowledge from the results obtained from research by Kah et al. (2022). Kah et al. conducted a cross-sectional study using the PRAMS data from Utah State in the United States on 4,101 women. The results from Kah et al. (2022) indicated that women who were abused pre-pregnancy and prenatal had a 3.06 higher probability for postpartum depression (95% CI, 2.43, 3.85) than those who were not.

Limitations of the Study

There are a few limitations identified in this study. One of them is the use of self-reported secondary PRAMS data. The self-reporting by the mothers creates room for bias from the mothers (Boyle et al., 2022). Also, the outcome of interest in this study, postpartum depression, lacks an official medical diagnosis and is dependent on the participant's responses to survey data (Shulman et al., 2018). Additionally, some missing data limits the data analysis to the number of available data (Salgado et al. (2016). Furthermore, the proposal of this study stated that the age of the women to be analyzed was 18-50. However, after the data was obtained, the age was grouped into 40+, thus creating a vagueness to the limit of the mothers' ages. Hence, this study was conducted with this age group and was not limited to 50-year-old women. Also, this study did not examine feeding with other liquids, as it only examined the feeding duration. Likewise, the use of only two levels of influence of the social-ecological model (individual and interpersonal) for this study may be a limitation to the generalizability of the results of

the study (Saquib, 2018). The social-ecological model involves five levels of influence; thus, intervention programs that may be designed based on this study's results may not comprise the other three levels of influence.

Recommendations for Future Research

This study contributed to the limited number of studies and literature on postpartum depression in the United States. Thus, to improve the number of research available on the subject, particularly in the United States, I recommend further research on postpartum depression. This research can be on the variables examined in this study or other variables that may be possible risk factors for postpartum depression, such as the availability of medical or health insurance covering mental health challenges and state policies that encourage women with mental challenges to speak up. Additionally, conducting a mixed methods study with both qualitative and quantitative data may provide a more comprehensive result, in which the results may be more generalizable to women in the United States and worldwide. This would assist in designing intervention programs and policy changes to reduce the increasing rate of postpartum depression.

Additionally, recommendations on lifestyle modifications based on the three variables examined are given. For weight gain, intervention programs tailored to suit postpartum women between the ages of 18 and 29 should be given preference, as this age group had a higher likelihood of developing postpartum depression with weight gain. Also, exclusive breastfeeding after 9 months should be limited as this may result in postpartum depression, as shown in the result of the studies. Finally, women whom their ex-partner abuses, or someone else who is at 2 times the risk of developing postpartum

depression compared to other abusers (p= 0.943), should not be neglected but should be given the care and mental health support that they need. This is by designing interventions to address this group.

Implications

The findings of this study have great potential for positive social change at the individual, family, organizational, and policy (societal) levels. Considering the number of women globally affected by postpartum depression annually, the potential for the impact of the findings of this study abounds. The results of this study offer the tools for a comprehensive and strategic approach to address these risk factors associated with postpartum depression. This is because the findings will benefit the mothers and their babies, as well as family members, the community, and healthcare providers. According to Anokye et al. (2018), postpartum depression affects as much as 10-15% of women annually. Thus, knowledge of the results obtained from the effect of breastfeeding, weight gain, and physical/emotional abuse will benefit this group and all those to whom they are connected. Thus, interventions can be designed with the findings of this study as a guiding framework to a more sustainable intervention targeted at preventing postpartum depression.

Possible interventions that may be designed based on the results of this study are highlighted below. Interventions targeting postpartum weight gain or postpartum weight retention may be intended to aid the mothers in achieving a healthy weight, giving them body satisfaction, thereby not exposing them to depression and possibly postpartum depression or causing those with postpartum depression to progress into complications

that may arise. Additionally, postpartum depression, a mental health disorder that affects mothers, can also be addressed by the possible interventions and policy changes that may occur based on the results of this study. This would mitigate complications of unaddressed postpartum depression, for instance, the progression of postpartum depression into postpartum psychosis and its attendant suicidal ideation, suicide, or infanticide (Nayak et al., 2021). Thus, this knowledge will equip the women, giving them a good quality of life that will benefit them, their babies, their husbands, and the community in which they exist. Furthermore, the women would not have to go through the stigma associated with postpartum depression, making them comfortable to live in their community and not live in shame for the rest of their lives.

Conclusion

This study on postpartum depression contributes to the literature on a fundamental mental health aspect. Its importance cannot be over-emphasized. Thus, interventions like health education programs targeting excessive weight gain, exclusive breastfeeding beyond 9 months, and the effect of physical/emotional abuse, based on the variables addressed in this study, which may be possible risk factors of postpartum depression, should be developed. These interventions will increase health awareness among pregnant and postpartum women and all stakeholders involved, such as family, friends, loved ones, health care providers, and mental health providers. This would limit complications (like postpartum psychosis) that may arise from postpartum depression, thereby avoiding life-threatening situations like suicide or infanticide. Women with increased health awareness would possess more lifestyle efficacy and be better equipped to take charge of their

health and make beneficial decisions. Therefore, reducing the likelihood of developing postpartum depression and prevent possible complications and fatalities that may arise if it develops.

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Appendix: Pregnancy Risk Assessment Monitoring System (PRAMS) Questionnaire

Pregnancy Risk Assessment Monitoring System (PRAMS)

Phase 8 Core Questionnaire 06/03/16

Please check the box next to your answer or follow the directions included with the question. You may be asked to skip some questions that do not apply to you.

The first questions are about *you*.
1. How tall are *you* without shoes?

[BOX] Feet **[BOX]** Inches **OR [BOX]** Centimeters

BEFORE PREGNANCY

2. ***Just before*** **you got pregnant with your *new* baby, how much did you weigh? [BOX] Pounds OR [BOX] Kilos**
3. **What is *your* date of birth?**

[BOX] /[BOX] /[BOX]

Month Day Year

The next questions are about the time *before* you got pregnant with your *new* baby.

Insertion point for Previous Pregnancy Outcomes Series: FF5-FF7 [former Core 4-6], FF4, K1
Insertion point for Standard question L26 [former Core 7]
Insertion point for Standard question L10

4. During the *3 months before* you got pregnant with your *new* baby, did you have any of the following health conditions? For each one, check **No** if you did not have the condition or **Yes** if you did.

1. Type 1 or Type 2 diabetes (**not** gestational diabetes or diabetes that starts during pregnancy)
2. High blood pressure or hypertension
3. Depression
4. *State-added options from Standard question L11*

Insertion point for Standard question L11 (add as options to Core 4)

No Yes

5. During the *month before* you got pregnant with your new baby, how many times a week did you take a multivitamin, a prenatal vitamin, or a folic acid vitamin?

2

Phase 8 Core Mail Questionnaire June 2016

I didn't take a multivitamin, prenatal vitamin, or folic acid vitamin in the *month before* I got pregnant 1 to 3 times a week
4 to 6 times a week
Every day of the week

Insertion point for Standard question G8

6. In the *12 months before* you got pregnant with your new baby, did you have any health care visits with a doctor, nurse, or other health care worker, including a dental or mental health worker?

No **Go to Question [Core 9]** Yes

Insertion point for Standard question J5

7. **What type of health care visit did you have in the *12 months before* you got pregnant with your new baby? Check ALL that apply**

   Regular checkup at my family doctor's office Regular checkup at my OB/GYN's office
   Visit for an illness or chronic condition
   Visit for an injury

   Visit for family planning or birth control
   Visit for depression or anxiety
   Visit to have my teeth cleaned by a dentist or dental hygienist Other Please tell us:
   _____

8. **During any of your health care visits in the *12 months before* you got pregnant, did a doctor, nurse, or other health care worker do any of the following things? For each item, check No if they did not or Yes if**

they did.

No Yes

1. Tell me to take a vitamin with folic acid * *
2. Talk to me about maintaining a healthy weight * *
3. Talk to me about controlling any medical conditions such as diabetes

or high blood pressure * *

4. Talk to me about my desire to have or not have children * *
5. Talk to me about using birth control to prevent pregnancy * *
6. Talk to me about how I could improve my health before a pregnancy * *
7. Talk to me about sexually transmitted infections such as chlamydia,

   gonorrhea, or syphilis * *

8. Ask me if I was smoking cigarettes * *
9. Ask me if someone was hurting me emotionally or physically * *
10. Ask me if I was feeling down or depressed * *
11. Ask me about the kind of work I do * *

3

Phase 8 Core Mail Questionnaire June 2016

l. Test me for HIV (the virus that causes AIDS) * * **Insertion point for Standard questions L27, L18**

The next questions are about your *health insurance coverage* before, during, and after your pregnancy with your *new* baby.

9. During the *month before* you got pregnant with your new baby, what kind of health insurance did you have? Check ALL that apply

Private health insurance from my job or the job of my husband or partner
Private health insurance from my parents
Private health insurance from the <*State*> Health Insurance Marketplace or <*state website*> or

HealthCare.gov
Medicaid (required: *state Medicaid name*)

State-specific option (Other government plan or program such as SCHIP/CHIP)
State-specific option (Other government plan or program not listed above such as MCH program, indigent

program or family planning program)
State-specific option (TRICARE or other military health care)
State-specific option (IHS or tribal)
Other health insurance\Please tell us: _____ I did not have any health insurance during the *month before* I got pregnant

Insertion point for Standard questions DD4, DD5, DD6, DD7

10. During your *most recent pregnancy*, what kind of health insurance did you have for your *prenatal care*? Check ALL that apply

I did not go for prenatal care**Go to Question [Core 11]**
Private health insurance from my job or the job of my husband or partner
Private health insurance from my parents
Private health insurance from the <*State*> Health Insurance Marketplace or <*state website*> or

HealthCare.gov
Medicaid (required: *state Medicaid name*)
State-specific option (Other government plan or program such as SCHIP/CHIP)
State-specific option (Other government plan or program not listed above such as MCH program, indigent

program or family planning program)
State-specific option (TRICARE or other military health care)
State-specific option (IHS or tribal)
Other health insurance\Please tell us: _____ I did not have any health insurance for my *prenatal care*

Insertion point for Standard questions DD8, DD9, DD10, DD11 Insertion point for Standard questions DD12, DD13, DD14, DD15, DD16

11. What kind of health insurance do you have *now*? Check ALL that apply

Private health insurance from my job or the job of my husband or partner
Private health insurance from my parents
Private health insurance from the <*State*> Health Insurance Marketplace or <*state website*> or

HealthCare.gov
Medicaid (required: *state Medicaid name*)
State-specific option (Other government plan or program such as SCHIP/CHIP)
State-specific option (Other government plan or program not listed above such as MCH program, indigent

program or family planning program)
State-specific option (TRICARE or other military health care)
State-specific option (IHS or tribal)
Other health insurance\Please tell us: _____

I do not have health insurance *now*

Insertion point for Standard questions DD17, DD18, DD19, DD20, DD21

12. Thinking back to *just before* you got pregnant with your new baby, how did you feel about becoming pregnant? Check ONE answer

I wanted to be pregnant later
I wanted to be pregnant sooner
I wanted to be pregnant then
I didn't want to be pregnant then or at any time in the future I wasn't sure what I wanted

Insertion point for Standard question Q4 [former Core 13]
Insertion point for Preconception Contraception Series E5, E6, E7 [former Core 14-16] & E3
Insertion point for Fertility & Fertility Treatment Series E5, Q7, A1–A2, A4, A5

DURING PREGNANCY

The next questions are about the prenatal care you received during your most recent pregnancy. Prenatal care includes visits to a doctor, nurse, or other health care worker before your baby was born to get checkups and advice about pregnancy. (It may help to look at the calendar when you answer these questions.)

Insertion point for Standard question R19
13. How many weeks *or* months pregnant were you when you had your first visit for prenatal care?

[BOX] Weeks **OR [BOX]** Months
I didn't go for prenatal care**Go to Question [Core 15]**

Insertion point for Standard questions R20, R21
Insertion point for Standard question R15
Insertion point for Standard questions R22 [former Core 19], R6, R7, R8, R9, R10, R11, R12, R14, R16

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14. *During any of your prenatal care visits*, did a doctor, nurse, or other health care worker ask you any of the things listed below? For each item, check **No** if they did not ask you about it or **Yes** if they did.

1. If I knew how much weight I should gain during pregnancy
2. If I was taking any prescription medication
3. If I was smoking cigarettes
4. If I was drinking alcohol

No Yes

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e. If someone was hurting me emotionally or physically **

6. If I was feeling down or depressed
7. If I was using drugs such as marijuana, cocaine, crack, or meth
8. If I wanted to be tested for HIV (the virus that causes AIDS)
9. If I planned to breastfeed my new baby
10. If I planned to use birth control after my baby was born

Insertion point for Standard questions R17, R18, R13, K4 Insertion point for Standard question R1
Insertion point for HIV Testing Series: I8 [former Core 20], I9, I3 Insertion point for Standard questions G5, G1-G4

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15. During the 12 months *before the delivery* of your new baby, did a doctor, nurse, or other health care worker *offer* you a flu shot or *tell* you to get one?

No Yes

16. During the 12 months *before the delivery* of your new baby, did you *get* a flu shot? Check ONE answer

No
Yes, before my pregnancy Yes, during my pregnancy

Insertion point for Standard questions L19, L14, L15, L24
17. During *your most recent* pregnancy, did you have your teeth cleaned by a dentist or dental hygienist?

No Yes

Insertion point for Oral Health Series: , Y7 [former Core 24], Y5, Y8, Y6
Insertion point for Childbirth Class & Home Visitation Series: R23 [former Core 25], V21 [former Core 26], V13, V14, V15, V20
Insertion point for Standard questions B12 [former Core 27], B8, B7, B4

18. During *your most recent* pregnancy, did you have any of the following health conditions?
For each one, check **No** if you did not have the condition or **Yes** if you did.

a. Gestational diabetes (diabetes that **started** during *this* pregnancy)

No Yes

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b. High blood pressure (that **started** during *this* pregnancy), pre-eclampsia or eclampsia c. Depression
d. *State added options*

Insertion point for Standard questions N6, N7, M4, M9, M8 Insertion point for Standard questions N9, N8b, N8c, N1-N4 Insertion point for Standard questions N5, EE3

The next questions are about smoking cigarettes around the time of pregnancy (before, during, and after).

19. **Have you smoked any cigarettes in the *past 2 years*?**

    No → Go to Question [Core 23] Yes

20. **In the *3 months before* you got pregnant, how many cigarettes did you smoke on an average day? A pack has 20 cigarettes.**

    41 cigarettes or more 21 to 40 cigarettes 11 to 20 cigarettes
    6 to 10 cigarettes

    1 to 5 cigarettes Less than 1 cigarette I didn't smoke then

21. **In the *last 3 months* of your pregnancy, how many cigarettes did you smoke on an average day? A pack has 20 cigarettes.**

    41 cigarettes or more 21 to 40 cigarettes 11 to 20 cigarettes
    6 to 10 cigarettes

    1 to 5 cigarettes Less than 1 cigarette I didn't smoke then

Insertion point for Standard questions AA1, AA3
Insertion point for Standard questions AA2, AA12, AA6, AA10

22. How many cigarettes do you smoke on an average day *now*? A pack has 20 cigarettes.

41 cigarettes or more 21 to 40 cigarettes 11 to 20 cigarettes
6 to 10 cigarettes

1 to 5 cigarettes Less than 1 cigarette

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I don't smoke now

Insertion point for Standard questions AA8, AA5 Insertion point for Standard questions AA9, AA7, U1, U2

The next questions are about using other tobacco products around the time of pregnancy.

E-cigarettes (electronic cigarettes) and other electronic nicotine products (such as vape pens, e-hookahs, hookah pens, e-cigars, e-pipes) are battery-powered devices that use nicotine liquid rather than tobacco leaves and produce vapor instead of smoke.

A **hookah** is a water pipe used to smoke tobacco. It is not the same as an e-hookah or hookah pen. **23. Have you used any of the following products in the *past 2 years*?** For each item, check **No** if you did not use it or **Yes** if you did.

a. E-cigarettes or other electronic nicotine products ∗
b. Hookah
c. *State added option (Chewing tobacco, snuff, snus, or dip)*
d. *State added option (Cigars, cigarillos, or little filtered cigars)*

No Yes

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If you used e-cigarettes or other electronic nicotine products in the *past 2 years*, go to Question [Core 24]. Otherwise, go to Question [Core 26].

24. **During the *3 months before* you got pregnant, on average, how often did you use e-cigarettes or other electronic nicotine products?**

    More than once a day Once a day
    2-6 days a week
    1 day a week or less

    I did not use e-cigarettes or other electronic nicotine products then

25. **During the *last 3 months* of your pregnancy, on average, how often did you use e-cigarettes or other electronic nicotine products?**

    More than once a day Once a day
    2-6 days a week
    1 day a week or less

    I did not use e-cigarettes or other electronic nicotine products then

Insertion point for Standard questions AA13, AA14

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The next questions are about drinking alcohol around the time of pregnancy.
26. Have you had any alcoholic drinks in the *past 2 years*? A drink is 1 glass of wine, wine cooler, can or bottle

of beer, shot of liquor, or mixed drink.

No **Go to Question [Core 28]** Yes

27. During the *3 months before* you got pregnant, how many alcoholic drinks did you have in an average week?

14 drinks or more a week 8 to 13 drinks a week
4 to 7 drinks a week
1 to 3 drinks a week

Less than 1 drink a week I didn't drink then

Insertion point for Standard questions JJ1, JJ3 [former Core 35], JJ2
Pregnancy can be a difficult time.. The next questions are about things that may have happened *before* and

***during* your most recent pregnancy.**
Insertion point for Standard questions P19 [former Core 36], P14, P17, P15, P16

Insertion point for Standard questions BB1, Z7

28. In the *12 months before you got pregnant* with your new baby, did any of the following people push, hit, slap, kick, choke, or physically hurt you in any other way? For each person, check **No** if they did not hurt you during this time or **Yes** if they did.

1. My husband or partner
2. My ex-husband or ex-partner
3. *State option (Another family member)*
4. *State option (Someone else)*

Insertion point for Standard question Z14

No Yes

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* *

29. During *your most recent pregnancy*, did any of the following people push, hit, slap, kick, choke, or physically hurt you in any other way? For each person, check **No** if they did not hurt you during this time or **Yes** if they did.

1. My husband or partner
2. My ex-husband or ex-partner
3. *State option (Another family member)*
4. *State option (Someone else)*

Insertion point for Standard question Z1

No Yes

* * * * * *

* *

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AFTER PREGNANCY
The next questions are about the time since your new baby was born.

Insertion point for Standard questions K13, K14, K5 30. When was your new baby born?

[BOX] /[BOX] /20___[BOX]

Month Day Year

Insertion point for Labor Interventions Series: K9, K10, K8, K3, K7, K6 Insertion point for Standard questions K15, II1 [former Core 40] Insertion point for Standard question K16 [former Core 41]

31. After your baby was delivered, how long did he or she stay in the hospital?

Less than 24 hours (less than 1 day) 24 to 48 hours (1 to 2 days)
3 to 5 days
6 to 14 days

More than 14 days
My baby was not born in a hospital
My baby is still in the hospital **Go to Question [Core 34]**

Insertion point for Standard questions K11, K12

32. Is your baby alive now?

No ***We are very sorry for your loss.*** **Go to Question [Core 43] Yes**

33. Is your baby living with you now? No Go to Question [Core 43]

Yes

Insertion point for Standard question B9

34. *Before or after your new baby was born*, did you receive information about breastfeeding from any of the following sources? For each one, check **No** if you did not receive information from this source or **Yes** if you did.

a. b. c.

My doctor
A nurse, midwife, or doula
A breastfeeding or lactation specialist

No Yes

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4. My baby's doctor or health care provider
5. A breastfeeding support group
6. A breastfeeding hotline or toll-free number
7. Family or friends
8. Other\Please tell us: _____

35. Did you ever breastfeed or pump breast milk to feed your new baby, even for a short period of time? No\ **Go to Question [Core 38]**

Yes

Insertion point for Standard question B1 Insertion point for Standard question B13

36. Are you currently breastfeeding or feeding pumped milk to your new baby?

No
Yes\ Go to Question [Core 38]

37. How many weeks or months did you breastfeed or feed pumped milk to your baby?

Less than 1 week
[BOX] Weeks OR [BOX] Months

Insertion point for Standard questions B2, B14-B16
Insertion point for Standard questions B3, B10, B11, B5, B6 Insertion point for Standard questions H2, H6, H7, H5, H1, H3, H4 Insertion point for Standard question S13

If your baby is still in the hospital, go to Question [Core 43].

38. In which *one* position do you *most often* lay your baby down to sleep now? Check ONE answer

On his or her side
On his or her back
On his or her stomach

39. In the *past 2 weeks*, how often has your new baby slept alone in his or her own crib or bed?

Always
Often
Sometimes
Rarely
Never\Go to Question [Core 41]

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Insertion point for Standard question F4
40. When your new baby sleeps alone, is his or her crib or bed in the same room where *you* sleep?

No Yes

41.
Listed below are some more things about how babies sleep. How did your new baby *usually* sleep in the *past 2 weeks*? For each item, check **No** if your baby did not *usually* sleep like this or **Yes** if he or she did.

42.

a. b. c. d.

1. In a crib, bassinet, or pack and play
2. On a twin or larger mattress or bed
3. On a couch, sofa, or armchair
4. In an infant car seat or swing
5. In a sleeping sack or wearable blanket
6. With a blanket
7. With toys, cushions, or pillows, including nursing pillows
8. With crib bumper pads (mesh or non-mesh)

0 0 0 0

0 0

0 0

No Yes

0 0 0 0 0 0 0 0

Did a doctor, nurse, or other health care worker tell you any of the following things? For each thing, check **No** if they did not tell you or **Yes** if they did.

No Yes

Place my baby on his or her back to sleep
Place my baby to sleep in a crib, bassinet, or pack and play Place my baby's crib or bed in my room
What things should and should not go in bed with my baby

Insertion point for Infant Well Care Visit Series: X10, X6, X9, X7, X8, X1, X4, X2, X3, X5, X11, X12 Insertion point for Infant Sick Care Series: T4, T5, T1, T2, T3, T8, T6, T7
Insertion point for Postpartum Home Visitation Series: V22 [former Core 49], V16, V17, V18, V19

43. **Are you or your husband or partner doing anything *now* to keep from getting pregnant? Some things people do to keep from getting pregnant include having their tubes tied, using birth control pills, condoms, withdrawal, or natural family planning.**

    No
    Yes ⌊ **Go to Question [Core 45]**

44. **What are your reasons or your husband's or partner's reasons for not doing anything to keep from getting pregnant *now*? Check ALL that apply**

    I want to get pregnant I am pregnant now

I had my tubes tied or blocked
I don't want to use birth control
I am worried about side effects from birth control
I am not having sex

My husband or partner doesn't want to use anything I have problems paying for birth control
Other ⟨ Please tell us: _____

If you or your husband or partner is not doing anything to keep from getting pregnant *now*, go to Question [Core 46].

45. What kind of birth control are you or your husband or partner using *now* to keep from getting pregnant? Check ALL that apply

Tubes tied or blocked (female sterilization or Essure®) Vasectomy (male sterilization)
Birth control pills
Condoms

Shots or injections (Depo-Provera®)
Contraceptive patch (OrthoEvra®) or vaginal ring (NuvaRing®) IUD (including Mirena®, ParaGard®, Liletta®, or Skyla®) Contraceptive implant in the arm (Nexplanon® or Implanon®) Natural family planning (including rhythm method) Withdrawal (pulling out)
Not having sex (abstinence)
Other ⟨ Please tell us: _____

46. *Since your new baby was born,* have you had a postpartum checkup for yourself? A postpartum checkup is the regular checkup a woman has about 4-6 weeks after she gives birth.

No ⟨ **Go to Question [Core 48]** Yes

Insertion point for Standard questions J3, J2
47. *During your postpartum checkup,* did a doctor, nurse, or other health care worker do any of the following things? For each item, check **No** if they did not do it or **Yes** if they did.

1. Tell me to take a vitamin with folic acid
2. Talk to me about healthy eating, exercise, and losing weight gained

   during pregnancy

3. Talk to me about how long to wait before getting pregnant again
4. Talk to me about birth control methods I can use after giving birth
5. Give or prescribe me a contraceptive method such as the pill, patch,

No Yes

* *

* * * * * *

shot (Depo-Provera®), NuvaRing®, or condoms

6. Insert an IUD (Mirena®, ParaGard®, Liletta®, or Skyla®) or a contraceptive implant (Nexplanon® or Implanon®)
7. Ask me if I was smoking cigarettes
8. Ask me if someone was hurting me emotionally or physically
9. Ask me if I was feeling down or depressed
10. Test me for diabetes

Insertion point for Standard question J4
Insertion point for Standard questions O4-O6, O1-O3, L28, L29

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48. *Since your new baby was born*, how often have you felt down, depressed, or hopeless?

Always Often Sometimes Rarely Never

49. *Since your new baby was born*, how often have you had little interest or little pleasure in doing things you usually enjoyed?

Always Often Sometimes Rarely Never

Insertion point for Standard questions M6, M5, M11, M10
Insertion point for Standard questions M12, M21, M15, M16, M20, M19 Insertion point for Standard questions Z13, Z2

OTHER EXPERIENCES The next questions are on a variety of topics.

[STATE-SPECIFIC SECTION]
The last questions are about the time during the *12 months before* your new baby was born.
Insertion point for Standard Question: P18

50. During the *12 months before* your new baby was born, what was your yearly total household income before taxes? Include your income, your husband's or partner's income, and any other income you may have received. *All information will be kept private* and will not affect any services you are now getting.

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$0 to $16,000 $16,001 to $20,000 $20,001 to $24,000 $24,001 to $28,000 $28,001 to $32,000 $32,001 to $40,000 $40,001 to $48,000 $48,001 to $57,000 $57,001 to $60,000 $60,001 to $73,000 $73,001 to $85,000 $85,001 or more

(Note: *States can add additional categories as long as the categories are collapsible back to the existing core categories*.)

51. During the *12 months before* your new baby was born, how many people, *including yourself*, depended on this income?

[BOX] People

52. What is today's date?

[BOX] /[BOX] /20___[BOX]

Month Day Year

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