UNIVERSITY FOR DEVELOPMENT STUDIES

PREVALENCE OF DEPRESSION AND ITS ASSOCIATED RISK FACTORS AMONG POSTPARTUM MOTHERS ATTENDING POSTNATAL CLINIC AT THE NORTHERN REGIONAL HOSPITAL IN THE NORTHERN REGION OF GHANA.

PROSPER MBAWUNI

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PROSPER MBAWUNI

(MASTER OF PUBLIC HEALTH)

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A THESIS SUBMITTED TO THE DEPARTMENT OF GLOBAL AND INTERNATIONAL HEALTH, UNIVERSITY FOR DEVELOPMENT STUDIES, SCHOOL OF PUBLIC HEALTH, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF A MASTER PUBLIC HEALTH DEGREE

JULY 2024

DECLARATION

DECLARATION

Student

I hereby declare that this thesis is the result of my own original research and has not been submitted for credit toward a degree at another university or location. Every work that was referenced in this research has been properly acknowledged.

Signature: ..... Date: 8/08/2024

Name: Mbawuni Prosper

Supervisor

I hereby certify that the thesis was prepared and presented under supervision, in accordance with the thesis supervision requirements established by the University for Development Studies.

Signature .... Date: 19/08/2024

Name: Dr. Hamdan Adam Yussif

i

ABSTRACT

Background: The purpose of this study was to ascertain the prevalence and related risk factors of postpartum depression (PPD) among mothers attending postnatal clinic (PNC) at the Northern Regional Hospital. Postpartum depression is a mood disorder that affects approximately 10–43% of mothers globally. Using the biopsychosocial theoretical model for postpartum depression.

Methods: The research employed an analytic cross-sectional design with a quantitative approach, sampled 321 mothers attending PNC at the Northern regional hospital. The Edinburgh Postnatal Depression Scale (EPDS) tool was used to screen for depression, while a structured questionnaire was used to collect primary data on associated risk factors of PPD. The data was analysed using Statistical Package for the Social Sciences (SPSS) software version 20, using a logistic regression model, at 95% confidence interval (CI).

Results/Findings: The prevalence of PPD among mothers was (10.9%), with varying degrees of severity, ranging from; mild (9.0%), moderate (1.6%) and severe (0.3%) in table 3. Risk factors significantly associated with PPD were found to include experiencing significant life stressors in the past year (adjusted odds ratio [AOR]=8.544, 95%CI: 3.277,22.277), complications during pregnancy (AOR=2.814, 95%CI: 1.120,7.072), and ongoing conflicts in relationships (AOR=4.402, 95%CI: 1.888,10.266). Consequences of PPD were found to include impaired daily functioning, emotional distress, with physical symptoms such as poor sleep, headache and suicidal ideations.

Conclusion and recommendation: The study provides crucial insights into the prevalence and risk factors of PPD among mothers in the Northern Regional Hospital. The findings underscore or recommend the need for targeted interventions, including routine screening for PPD, particularly for mothers with identified risk factors, and comprehensive support systems to address the emotional, physical, and social consequences of PPD.

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Finally, my sincere thanks are extended to the Northern Regional Hospital's workers, administration, and the Regional Health Directorate for their assistance, and friends and family for their encouragement.

DEDICATION

This study is dedicated to my beloved wife, Afulimi Evelyn Awonteyme, whose support cannot be measured.

TABLE OF CONTENTS

ITEM **PAGE**

LIST OF TABLES

LIST OF FIGURES

ACRONYMS / ABBREVIATIONS

ANC: Antenatal Care

APA: American Psychological Association

CDC: Centres for Disease Control and Prevention,

CHAG: Christian Health Associations of Ghana

CMHU: Community Mental Health Unit

DSM IV-TR: Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision

EPDS: Edinburgh Postnatal Depression Scale

GHS: Ghana Health Service

GSS: Ghana Statistical Service

ICD - 10: International Statistical Classification of Diseases and Related Health Problems, 10th Revision

PNC: Post Natal Care

PPD: Postpartum Depression

TCH: Tamale Central Hospital

TRH: Tamale Regional Hospital

UAE: United Arab Emirates

UNICEF: United Nations International Children's Emergency Fund

WHO: World Health Organization

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the Study

Depression is a common and serious medical illness that negatively affects how a person feels, the way they think, and how they act. It is characterized by persistent feelings of sadness and loss of interest in activities enjoyed. It can lead to a variety of emotional and physical problems and can decrease a person's ability to function at work and at home (WHO, 2016).

Postpartum depression is a type of depression that occurs after childbirth. It is a mental health condition that affects a woman's mood, thoughts, and behaviour (WHO, 2016). Baby blues is a term used to describe a brief period of mild mood swings, anxiety, and tearfulness that many new mothers experience shortly after childbirth (Fan et al., 2020). This condition is very common and typically begins within the first few days of postpartum, peaking around the fourth or fifth day, and generally subsiding within two weeks (Bhakta et al., 2024). Unlike the baby blues, which are mild and short-term mood swings that affect many new mothers, postpartum depression is more intense and lasts longer, requiring treatment (Anokye et al., 2018). This feeling of sadness dominated by pessimism in which normal behaviour pattern(s) are disturbed, and where the individual experiences for at least two (2) weeks is termed postpartum depression (Agrawal et al., 2022).

Globally, postpartum depression, affects around (10–43%) of mothers, with low and middle income countries (LMICs) having a higher prevalence rate, than the high income countries with a prevalence of 10 – 15 % ((Segre & Davis, 2013); WHO, 2016). Moreover, according to Mathisen et al., (2013), globally the prevalence rates of PPD (11-42%) have been attributed to various factors including cultural differences, screening techniques, stigma associated with mental health, or socioeconomic status.

Furthermore, PPD, a multifaceted disorder can remain undiagnosed and untreated for long periods of time. Over the last two decades, globally, there has been a great interest in psychiatric illnesses associated with childbirth, with depression been an issue of public health importance (Breese McCoy et al., 2006; WHO, 2016). Baby blues and postpartum depression are the most common mental health conditions mothers experience after delivery, with symptoms ranging from mild to severe psychotic syndromes which usually occur most often during pregnancy or the postpartum period (Meltzer-Brody et al., 2018).

However, the prevalence rate of PPD in Africa varies from country to country, due to different cultural values, access to care, lifestyles and policies by governments (WHO, 2016). In a study conducted in a tertiary hospital in Nigeria, the prevalence of PPD was 27.2 percent among mothers attending Postnatal Clinic (PNC) at the hospital. The study used the EPDS to determine prevalence (Ebeigbe & Akhigbe, 2018).

Furthermore, in a study conducted in Ghana, at the Komfo Anokye Teaching Hospital, on the prevalence of PPD among mothers attending PNC at the hospital, the study revealed that 11.6 percent of the mothers screened were depressed with varying forms of depression. The study referenced another study conducted in Bongo in the Upper East region, with a prevalence of (23.7%) and suggested that the prevalence of PPD would be high within the northern sector (Anokye et al., 2018)

However, with regards to risk factors associated with PPD, various studies have shown multifaceted factors that can predispose a mother to be depressed. In a study conducted in China, it was found that dissatisfaction from family members toward the birth of female babies had a heavy burden on mothers psychologically. In that community, it is usual for boys to be preferred over girls, especially in areas heavily impacted by the culture of the south of the Five Ridges, mothers who gave birth to females were neglected and were not given the needed attention as compared to those who gave birth to males. This they found had great impact on the mother's

mental health state and development. This connotes the fact that, the sex of the baby had some significant impact on the mother, creating and predisposing her to worry or feel sad leading to depression (Fan et al., 2020). This tendency according to the study may be partially explained by the outdated belief that only males could continue the family lineage, the community studied in Southern China was one with the greatest population density with devise culture (Fan et al., 2020). In a recent study conducted in Nigeria, it was found that 1 in 7 women could anticipate experiencing depression in the year after giving birth. It's critical to realise that these statistics only include live births, with some common risk factors identified among mothers which includes those who miscarry or gave birth to stillborn children ((Ebeigbe & Akhigbe, (2018); WHO, ((2016).

Additionally, according to Anokye et al., (2018), the incidence of PPD can develop from a pre-existing case of the baby blues, or can become apparent after the first weeks of giving birth if care is not given to the mother as expected, and can last as long as 14 months (Anokye et al., 2018). While the exact causes of PPD remain unknown, several risk factors have been found to be associated with the disorder, these include a history of depression, smoking, unintended pregnancies, low socioeconomic status, marital status, maternity blues, a poor marital relationship, life stress, low social support, childcare stress, low self-esteem, and prenatal anxiety (Becker et al., 2016).

To conclude with some risk factors, the fact that PPD affects people of all racial and ethnic backgrounds, as well as those with and without higher education, it is crucial aspect of its prevalence in Africa. It does not only affect new mothers but also fathers and adoptive parents as well, there is no one known cause of this disease. The risk of PPD is said to increase by 30 to 35 percent in women having a history of major mood disorders like bipolar disorder, anxiety disorders, or depression. A woman's chances of experiencing PPD with her subsequent pregnancies are between 10 and 50 percent higher if she has previously experienced it. It's

estimated that symptoms of PPD first appeared in 50 percent of women who experience it after giving birth (Abdul Rahman et a., 2018).

Consequently, there are some negative long-term repercussions that arises from untreated postpartum depression, causing emotional, behavioural, cognitive, and interpersonal issues for mothers, their children and family, hence emphasis should be placed on identifying the risk factors, and intervening through clinical or public health interventions (Gress-Smith et al., 2012; Letourneau et al., 2017).

Moreover, because of the social and health effects of PPD, depressive disorders are ranked among the leading causes of disability worldwide. According to WHO/UNICEF JMP, (2010), postpartum depression is one of the world's fastest-growing diseases, with significant public health concern for childbearing women, which includes difficulty in sleeping, suicidal ideation, poor appetite, and infanticide (the tendency to cause harm to your child) (Gress-Smith et al., 2012).

Additionally, over time, several studies conducted worldwide have demonstrated the effects of PPD on the mother-child bond and on the development of healthy children (WHO, 2010). In line with some research, PPD has a negative clinical impact on mother-infant attachments, affecting the growth of the child as well as the mother's health. The mother may exhibit withdrawn and disengaged behaviour or engage in hostile and invasive communication with her child (Montazeri et al., 2007).

In addition, approximately 10 percent of expectant mothers and 13 percent of recent mothers worldwide suffer from a mental illness, most often depression. When PPD is left untreated or misdiagnosed, mothers suffer to a great extent that they are unable to function normally with some daily housework, or even consider suicide, while the child's development and growth might suffer as a result. Mental illnesses in mothers can be treated, good interventions can be provided even by non-specialist healthcare practitioners with training (Bhusal et al., 2016; Gjerdingen & Yawn, 2007).

Also, the mother's ability to manage her marriage, adjust socially after giving birth, and maintain the mother-infant attachment may all be negatively impacted by PPD. Early-life depression in a mother can have a profound effect on the child's psychosocial growth and possibly lead to severe intellectual deficiencies. The mother's experienced sleep difficulty, poor appetite, contemplating suicide, poor hygiene practices and sometimes recurrent headaches (Afolayan et al., 2016).

Furthermore, in a study conducted in Kumasi it was revealed that mothers who experienced PPD were anaemic due to poor nutrition or feeding, poor breastfeeding practices, difficulty sleeping, and a few mothers contemplating suicide (Gold et al., 2013). In another study done among rural mothers in Ghana, it was revealed that mothers who were depressed experienced poor communication, poor sleeping pattern and quality, loss weigh, easily angry and they also neglected their infants (Weobong et al., 2015).

Additionally, in a study carried out in Ghana investigating the mechanisms that underlie the links between maternal depression and unfavourable child outcomes (such as behaviour, socio-emotional adjustment, and emotion regulation) suggested that maternal depression during pregnancy had an impact on the outcomes of the child through modified placental function, changes in the child's epigenetic makeup, and stress reactivity. Social support, environmental or sociodemographic factors, and changed mother-child interactions all have an impact on the postnatal relationships between maternal depression and child outcomes (Gold et al., 2013).

In conclusion, postpartum depression is rarely given priority and routine screening is not carried out as a result, regrettably maternal mental health is frequently ignored throughout pregnancy and the postpartum period in most LMICs, including Ghana (Weobong et al., 2015).

1.2 Problem Statement

Postpartum depression is termed "the silent killer" because, unlike persons with physical symptoms which are immediately felt and diagnosed, it can remain asymptomatic for many weeks

causing very significant disorder(s) to mother. Across the globe, depression is a primary cause of disease and death. Approximately 10–20 percent of mothers worldwide have been found to suffer from PPD, with LMICs, recording prevalence rates - ranging from 10 to 42 percent (Fan et al., 2020).

In Ghana, two community-based studies undertaken in 2016 and 2018 suggested that the prevalence of depression in Northern Ghana was 27.8 and 33.5 percent, respectively, while studies in the Southern part on mothers found lower rates (11.6%), attributable to availability of social services, healthcare and health professional among others (Alshikh Ahmad et al., 2021).

With the shame of not experiencing the joy that our culture expects from giving birth, mothers in the Tamale Metropolis have been quietly suffering for years, with less awareness and treatment for PPD among mothers and community at large (*Review meeting, 2021*). In Ghana, apart from the fact that obstetric care fails to deal with mother's mental health needs throughout pregnancy or the postpartum period, mental healthcare services remain highly inaccessible to mothers (Anokye et al., 2018).

Consequently, in an Annual Performance Review Meeting, in 2021, the Metropolitan Director of Health Services in his remarks expressed concerns about the increasing incidence of depression, especially among pregnant and postpartum mothers. During this meeting it was reported that 49 and 92 cases were recorded in 2019 and 2020 respectively, at the psychiatric unit of the Northern Regional Hospital (*Review meeting, 2021*). There has been a significant increase in PPD cases since then and during the first half of the year 2021, out of a total of 176 mothers who were screened, 73 (41.5%) were found to have various forms of depression. This alarming trend thus constituted a significant factor for choosing the Northern Regional hospital as the setting for this research.

Thus, this study sought to determine the prevalence of PPD and its associated risk factors among mothers to generate evidence that will contribute to designing appropriate interventions to alleviate the suffering of mothers, children, and their families.

1.3 Research objectives

1.3.1 Main Research Questions

The main research question for the study was "What is the prevalence of depression and its associated risk factors among postpartum mothers attending the postnatal clinic at the Northern Regional Hospital in the Northern Region of Ghana?"

1.3.2 Specific Research Questions

The specific research questions for the study were:

1. What is the prevalence of PPD among mothers attending the Northern Regional Hospital's postnatal clinic?
2. What are the risk factors associated with PPD among mothers attending the postnatal clinic at the Northern Regional Hospital?
3. What are the health and social effects of PPD on the mother, child, and family?

1.4 Main Research Objective

The main research objective for the study was “to determine the prevalence of depression and identify its associated risk factors among postpartum mothers attending the postnatal clinic at the Northern Regional Hospital in the Northern Region of Ghana.

1.4.1 Specific Research Objectives

The specific research objectives of the study were:

1. To determine the prevalence of PPD among mothers visiting the Northern Regional Hospital's postnatal clinic.

2. To identify the risk variables associated with PPD among mothers who visit the Northern Regional Hospital postnatal clinic.

3. To find out the health and social consequences of PPD on the mother, child, and family.

1.5 Expected study outcomes

The study is envisaged to generate data on PPD among mothers within the health care system. The findings would inform management of the hospitals of the condition, leverage on it to raise awareness and reduce stigma, improve screening at the ANC and PNC services for prompt identification and management of depressive episodes experienced before they become difficult for the mother.

1.6 Significance of the study

Postpartum depression (PPD) is a significant public health issue affecting maternal mental health and overall family well-being. It is associated with adverse outcomes for mothers, infants and families, including impaired mother-child bonding, developmental delays in children and a heightened risk of chronic mental health condition in mothers. In Ghana, the prevalence and associated risk factors of PPD remain understudied, particularly in the Northern Region, where cultural, socioeconomic, and healthcare access dynamics may influence maternal mental health.

This study holds significant value for several reasons:

a Improved Maternal Health Outcomes: By identifying the prevalence of PPD among postnatal mothers attending the Northern Regional Hospital, this study will highlight the extent of the problem in the region. It will contribute to efforts to improve maternal mental health services, ensuring that postnatal mothers receive timely and effective support.

b Understanding Risk Factors: Investigating the associated risk factors for PPD, including socioeconomic, cultural and psychological determinants will provide critical insights for healthcare providers and policymakers to design targeted interventions.

c Enhance Child Health and Development: Addressing PPD is essential for promoting optimal child health and development. Early detection and management of maternal depression can mitigate risk to the mother-child relationship and improve outcomes for infants and young children.

d Evidence-Based Policy and Programming: the findings to this study will provide valuable data for health authorities, including the Ghana health Service, to incorporate mental health screening and support into postnatal care services. This will ensure a more comprehensive approach to maternal and child health in the Northern Region and beyond.

e Advancing Public Health Research: the study will fill a critical knowledge gap in the existing literature on maternal mental health in Ghana, contributing to the global discourse on postpartum depression in low-and middle-income countries.

f Community Awareness and Advocacy: The study's findings can be used to raise awareness among healthcare workers, families and communities about the importance of maternal mental health reducing stigma and encouraging postpartum mothers to seek help

1.7 Organization of the study

This study is organized into six chapters. The chapter one presents the introduction and background to the study. It outlines the problem statement, research objectives, general objectives, specific objectives, and the significance of the study.

Chapter two looked at some literature reviews that support the study, on the prevalence, risk factors associated and the health and social consequences of postpartum depression.

The methodology for this study is outlined in chapter three. This includes the study design, sampling procedure, and ethical considerations through to dissemination plan for the study.

Chapter four of the study presents the results that answer each of the objectives of the study in tables.

The discussion of the results from the study is presented in chapter five. In this chapter an in-depth discussion of the results is made with the use of relevant literature.

Finally, chapter six concludes the study by providing the summary, conclusion and recommendations generated from the study as well as the limitation of the study.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction to the Literature Review

This chapter presents a review of relevant literature which guided the study. The reviewed literature considered the global perspectives of prevalence, the risk factors linked with it and the social and health consequences of postpartum depression. The literature was reviewed to back the choice of study design and methodology and concluded with a summary justifying the pursuit of the current study.

2.2 Prevalence of depression among postnatal mothers

Depression is described as a feeling of sadness dominated by pessimism in which normal behaviour pattern(s) are disturbed, which the individual experiences for at least two (2) weeks (WHO, 2016).

Postpartum depression (PPD) is a mood disorder that can occur after childbirth, significantly affecting a mother's emotional, mental, and physical well-being. It goes beyond the temporary "baby blues" and may last for months or even longer if not addressed (Atuhaire et al., 2021). The Diagnostic and Statistical Manual (DSM-V) defines postpartum depression (PPD) as a recurrent or new onset of major depressive disorder (MDD) in mothers, with the episodes transpiring during pregnancy or within 4 weeks post-delivery (Segre & Davis, 2013; Shelke & Chakole, 2022).

The birth of a baby can trigger a jumble of powerful emotions, from excitement and joy to fear and anxiety, however, it can also lead to an unanticipated outcomes like depression. Many new mothers experience baby blues after childbirth, which commonly include mood swings, crying spells, anxiety, and difficulty sleeping. Postpartum blues, often referred to as "baby blues," are a common and temporary mood disturbance that many new mothers experience shortly after

childbirth (Froeliger et al., 2024). Baby blues typically begin within the first two to three days after delivery and may last for up to two weeks, with no therapy required. But when not carefully managed predisposes mothers to be depressed, a risk factor for PPD (Fantahun et al., 2018; Wilkinson et al., 2017). The most prevalent puerperal mood disorder that has been identified is postpartum blues, with prevalence estimates ranging from 30 to 75 percent (Peltzer, Rodriguez, Lee, & Jones, 2018). The symptoms of baby blues abate within days and are moderate, time-limited, and do not require medical intervention (Rai et al., 2015). Postpartum psychosis is a rare but severe mental health condition that typically develops within the first two weeks after childbirth. It is considered a psychiatric emergency due to the potential risks to both the mother and the infant (Atuhaire et al., 2021).

Globally, Postpartum depression is a significant public health concern that affects women greatly across different cultures and regions. And it remains one of the leading causes of maternal disease and death, with a prevalence rate of 10-43 percent (Anokye et al., 2018; WHO, 2016).

Additionally, according to the World Health Organization (WHO), in high-income countries, the prevalence of PPD ranges from 10 to 20 percent, with approximately 1 in 7 women experiencing PPD, though there are variations within and between countries. In Low and Middle-Income Countries, the prevalence of PPD is higher ranging from 10 percent to as high as 43 percent in some regions (WHO, 2016).

Maternal mental health has been considered a global health issue by many health partners. Studies have shown that about 10% of pregnant women and 13% of post-partum mothers experience one form of mental health disorders, especially depression. In developing countries, almost 16% of pregnant women and 19.8% women experience depression after childbirth. The prevalence rate of Post-Partum Depression (PPD) in the northern part of Ghana was estimated as 33.5% in 2018 and 16.8% in 2019. PPD has been linked to poor health seeking habits during and after pregnancy, leading to poor birth outcomes. The study aimed to identify the prevalence rate of PPD and its

adverse effects on pregnancy and birth outcomes in Tano North Municipality. The Edinburgh Postpartum Depression Scale [EPDS] was used to screen mothers who utilized the postnatal services at the Municipal Hospital (St. John of God Hospital, Duayaw Nkwanta) for the study. Three-hundred and eighty-six respondents were selected using purposive and systematic sampling technique. Results from the study depicted that, 69.4% of the postpartum women were mildly depressed, 8.6% moderately depressed and 1.3% severely depressed (Amponsah et al., 2023).

Postpartum depression is a common public problem which occurs during the postpartum period. If unrecognized and undiagnosed it may affect the health of the mother. In a study to find out the prevalence of postpartum depression and identify the influence of selected demographic, personal and child factors on postpartum depression, 164 postpartum mothers were selected randomly in the Viajayanagar district of Karnataka state. Using the Edinburgh Postnatal Depression Scale (EPDS) by Cox et al. and Socio-Economic Status (SES) by Aggarwal et al. (2005). The results of the study revealed that overall prevalence rate postpartum depression was 42.70 per cent (70 out of 164) (Sunitha et al., 2023).

In addition, depending on the criteria used, PPD is regarded as a crippling mental illness with prevalence rates ranging from 0.5 to 60.8 per cent worldwide (Bhusal et al., 2016). The tenth edition of the International Classification of Diseases (ICD) and the fourth edition of the DSM Manual of Mental Disorders (APA, 2000) are the two diagnostic systems that currently define PPD (Bhusal, Bhandari, Chapagai, & Gavidia, 2016).

Consequently, PPD affects 10-15 per cent of mothers in affluent countries and is a significant public health concern, irrespective of cultural identity and beliefs (WHO, 2016). In a study conducted by Fan et al., (2020) it was found that PPD could impact up to 30% of all postpartum women, with symptoms typically ranging from mild to moderate, affecting 50–80 per cent of

women, to severe psychosis, affecting less than 1% of mothers, especially in LMICs (Fan et al., 2020).

That notwithstanding, for many women, the postpartum period can be a time of vulnerability to distress. Postpartum mental health issues are often difficult for parents of the newborn to deal with and can have substantial short and long-term consequences for newborns. Suicide, as well as infanticide occur, though rarely. The cost implications for healthcare systems are enormous. The prevalence of this condition has been found to differ in different communities within Africa. For example, in Ethiopia, prevalence was found to be 15.6% in the Debre, Berhan district and 23.7% in the Ankesha district. A systematic review of the condition in Africa found prevalence ranging from 6.9% to 50.1% depending on which instrument was used for screening. In Ghana, the country-specific prevalence was 7%. Several studies within the country have reported higher prevalence rates than the national average (16-18%). A typical case is noted by Saeed et al., whose assessment of depression among mothers of children under five months in the Bole district revealed a 16.8% prevalence rate. In a similar study conducted to assess the prevalence and associated factors of PPD among postnatal women in the Bawku municipality in the Upper East Region of Ghana. The prevalence of PPD among women in this study was 50.4%. Bawku has been experiencing tribal conflicts with occasional spikes (Daliri et al., 2023).

However, PPD often remains undiagnosed and untreated, in many facilities especially within LMICs leading to long-term consequences for families. It was on this basis that a study was conducted by Kassa and colleagues to examine the prevalence and determinants of PPD among adolescent and adult mothers in northwest Ethiopia. Data were collected from 374 adolescent (10–19 years) and 760 adult (20–34 years) mothers 6 weeks after childbirth. Data were analysed using binary and multiple logistic regression. Adolescent mothers had a significantly higher proportion of PPD (37.4%) than adult mothers (20.1) (Kassa et al., 2024).

Moreover, in a study carried out in Canada, the findings revealed the prevalence of PPD as 10.5 per cent and 14.2 per cent in other areas of Canada. The study attributed the low prevalence to access to care, information, and social support systems available to mothers. It also revealed that some mothers contemplated suicide, although they were referred for further management. The study concluded that effective awareness creation, improved social support systems and improved national insurance were necessary for mothers during the pregnancy periods to delivery (Goweda & Metwally, 2020)

In addition, Postpartum depression is a mood disorder produced by changes in brain chemistry among women beginning 4-6 weeks postpartum and lasting up to a year. This maternal mental health problem affects 11-42% of postpartum women globally with a reported prevalence of 60.8%, causing severe health implications to both the mother and the baby. In Ghana, maternal mental health during the postpartum period receives little attention. A study was carried out to estimate the prevalence of postpartum depression and the associated socio-demographic and social support variables. A total of 274 mothers participated in the study. Prevalence of Postpartum Depression was estimated at 31.39%. The study concluded that postpartum depression remains high in prevalence (Peters et al., 2024).

Furthermore, in a study conducted by Bhakta, M., et al (2024) on Assessing the prevalence and risk factors of postpartum depression, using the Edinburgh Postnatal Depression Scale (EPDS). The study encompassed 121 mothers, with 8.26% scoring above the depression cutoff of 12 and 6.61% falling within the borderline range. Notably, all mothers surpassing the cutoff were from joint families, contrasting with those from nuclear families. A predominant portion of the depressive group was in their 20s, while the borderline group primarily consisted of mothers in their 30s. Urban residency and government hospital care were universal among the samples (Bhakta et al., 2024).

Postpartum depression affects many women and remains the fourth-leading cause of disability and premature death. A systematic study was conducted which examined PubMed, Scopus, Up-to-date, Science Direct, Google Scholar, and ProQuest to estimate postpartum depression prevalence. Between 2009 and 2022, published papers on the prevalence of postpartum depression in English were analysed. According to the research, Community-based research in Northern Ghana found prevalence rates between 16.8 and 33.5 percent, whereas estimates from the rest of the nation were between 3.8 and 11.3 percent (Keku et al., 2024).

Additionally, a study was carried out to screen for postnatal depression (PND) symptoms among women attending primary health care (PHC) facilities within Maseru City Council in Lesotho. The Edinburg Postnatal Depression Scale (EPNDS) was used to screen PND symptoms in a sample of 393 postnatal mothers. The prevalence of PND symptoms was 43%. The high prevalence of PND highlighted the need to integrate routine screening of mothers for PND, which will enable early diagnosis and treatment and thus contribute to the improvement of maternal and child well-being in the country (Mokwena et al., 2024).

Moreover, a study was carried out to assess the prevalence of PPD and its related factors in a tertiary care hospital in Riyadh, Saudi Arabia, specifically King Khalid University Hospital (KKUH). A cross-sectional study was conducted of 187 females aged 18 to 50 years old who gave birth at KKUH. Using the Edinburgh Postnatal Depression Scale (EPDS) and demographic questions. The prevalence of PPD found in the study was 50.3%, demonstrating a high prevalence of PPD in women who delivered at KKUH (Aljaffer et al., 2023).

In a prospective cohort study women from postpartum wards in hospitals across four emirates in the UAE were recruited. Women completed questionnaires immediately after childbirth and at 3 and 6 months postpartum. Depressive symptomatology was measured using the Edinburgh Postnatal Depression Scale (EPDS > 12). Among the 457 women recruited, 35% exhibited depressive symptomatology within the first 6 months postpartum. The prevalence of maternal

depressive symptomatology is considerable in the UAE. Risk factors change over the 6-month postpartum period suggesting the need for an innovative multidisciplinary approach to the management of postpartum depression, including follow-up screening (Froeliger et al., 2024)

Postpartum depression (PPD) is the most common psychological condition following childbirth and may have a detrimental effect on the social and cognitive health of spouses, infants, and children. A total of 565 studies from 80 different countries or regions were included in the final analysis. Postpartum depression was found in 17.22% (95% CI 16.00–18.51) of the world's population. Meta-regression analysis showed that study size, country or region development, and country or region income were the causes of heterogeneity. Multivariable meta-regression analysis found that study size and country or area development were the most important predictors. Varied prevalence rates were noted in geographic regions with the highest rate found in Southern Africa (39.96%). Of interest was a significantly lower rate of PPD in developed countries or high-income countries or areas. Furthermore, the findings showed that there was a substantial difference in rates of PPD when marital status, educational level, social support, spouse care, violence, gestational age, breast feeding, child mortality, pregnancy plan, financial difficulties, partnership, life stress, smoking, alcohol intake, and living conditions were considered in the pooled estimates. The results indicated that one out of every five women experiences PPD which is linked to income and geographic development. It is triggered by a variety of causes that necessitate the attention and committed intervention of primary care providers, clinicians, health authorities, and the general population (Wang et al., 2021)

In addition, there is no one recognized cause of PPD; however, it can affect both biological parents and adoptive parents. Postpartum depression risk is increased by 30 to 35 per cent in women having a history of mood illnesses like bipolar disorder, anxiety disorders, and depression. They could have a high chance of experiencing PPD with her subsequent pregnancies (Hopkins, 2017).

Furthermore, Spada et al., (2022) conducted a study to determine the prevalence of PPD among mothers living in urban areas, using a sample size of five hundred married women who were pregnant. The study followed them up to delivery and after delivery, the findings of the study indicated that most mothers had mild depression (54.3%) compared to mothers in the rural areas (45.7%). The study found that mild depression was due to marital and family issues, poor social support systems, the nuclear family system and financial complications, predisposing the mothers to be depressed (Spada et al., 2022).

Also, in a cohort study conducted by Young and Jeong in 2013 in Korea reported the prevalence of PPD 2 weeks and 6 weeks after delivery was 36.3 and 36.7 percent respectively. In the study conducted among pregnant women attending clinic services at the government hospital, the findings revealed that rural women (14.2%) were less depressed than urban women (22.5%), and that rural people prefer to rely on themselves, family, and friends for help. The study concludes that rural people are varied and their experiences are just as diverse as urban people are (Weobong et al., 2015).

In addition, according to Abdollahi & Zarghami, (2018) depression affects 4.7 percent of people globally, making it a serious public health problem. Furthermore, in a 2010 survey in Iran, 4.1 percent of Iranians were found to suffer from depression, with women being more prone than males to experience it. The frequency of PPD has been estimated to range from 19.8 to 82.1 percent in LMICs, which may have an impact on a mother's bond with her child. It is also typical in communities where Muslims predominate because of local beliefs and practices (Abdollahi & Zarghami, 2018).

Similarly, in a study carried out by Gjerdingen & Yawn, (2007) using both the DSM IV-TR, and ICD-10 classification of diseases criteria, with clinical signs of PPD, mothers were screened for depression. The results showed that out of 236 screened 86 (36.4%) were found to be depressed of the various forms of depression. Mothers who were found to be depressed experienced some

significant health and social consequences which included diminished pleasure in almost all activities, significant weight loss or weight gain, psychomotor agitation or retardation, insomnia or hyper insomnia, loss of energy, feelings of worthlessness and guilt, low self-esteem and self-confidence, difficulty in concentration, and suicidal ideation (Gjerdingen & Yawn, 2007).

Although, postpartum depression is not uncommon; however, in LMICs, its incidence is noticeably higher. Perinatal mental illnesses are also prevalent in high-income nations (10–12%), but they are more common in low- and middle-income countries (10–41%) (WHO, 2010). In the study conducted in a part of East Africa, the prevalence rate was found to be 37.6 percent, which the study found to be as a result of mental illnesses often underdiagnosed and undertreated in LMICs (WHO, 2010).

Additionally, while PPD incidence rates in Africa vary greatly from location to location, it is believed that the illness is three times more frequent in extremely less developed countries than in less developed countries with prevalence rates of 10-43 per cent (WHO, 2016). According to Halbreich & Karkun, (2006), in a study conducted in a part of Central Africa of 210 mothers attending clinic services in a hospital, they found that 34.7 per cent were depressed of various forms of depression. They believe that the variation in PPD prevalence rates across different countries might be attributed to many factors such as cultural variations, screening techniques, stigma associated with mental health, and socioeconomic backgrounds (Halbreich & Karkun, 2006).

In addition to that, the DSM-IV and most epidemiological research utilize different criteria for the definition of the onset of PPD, making it challenging to establish the prevalence of PPD, this was an observation made in a Ghanaian study (Anokye et al., 2018). Furthermore, mothers themselves fail to report or most often underreport, which has been a challenge determining the prevalence (Anokye et al., 2018). The study also discovered that approximately 20 per cent of mothers who suffer from PPD are believed to report for support late or whenever the symptoms have negative

consequences on them to medical professionals. Out of 257 mothers screened for depression 11.6 per cent of them were found to be depressed, at the Komfo Anokye Hospital, accessing services. The study found that postpartum depression symptoms are frequently downplayed by mothers and caregivers with inevitable outcomes of delivery, which is prevalent in Ghana. Studies suggest that mothers may be reluctant to talk about their depression because of concern for social stigma, with the possibility that their depression signs may be seen as proof that they are "bad mothers" (Anokye et al., 2018).

Table 1: below illustrates the three common forms of postpartum affective illness and their characteristics.

Table 1: Types of postpartum depression

Disorder	**Prevalence**	**Duration**	**Treatment**
Postpartum blues	30 – 70%	Hours to days 1 – 4 days	No treatment other than reassurance
Postpartum depression	11 – 43%	Weeks to months 2 weeks - 12 weeks	Treatment usually required
Postpartum psychosis	0.1 – 0.2%	Weeks to months 4 weeks	Hospitalization usually

Source: WHO, (2016)

In conclusion, PPD is a global health issue that requires culturally sensitive and accessible approaches to ensure that all women receive the care and support they need. Collaborative efforts between governments, health organizations, and communities are essential in addressing this complex condition.

2.3 Associated risk factors of PPD

Several risk factors are linked to PPD. These factors have been broadly categorized into biological, psychological, and social factors. Studies have showed that several factors are associated risk for PPD in women, globally. In a study conducted by Sunitha et al., (2023), the study revealed that factors associated with postpartum depression included age of the mother, mothers age at marriage, number of years of marriage, occupation of the mother, size of the family, gender of the infant, mode of breast feeding and age and birth weight of the child. The study concluded that there is a need to design suitable intervention programmes to eliminate such contributory factors which can substantially help to improve the emotional well-being of women in the vulnerable postnatal period (Sunitha et al., 2023). Understanding these risk factors can help in early identification and intervention, potentially reducing the severity or duration of postpartum depression.

The conceptual framework below by Engel's (1977), explains the biological, social, and psychological risk factors that influences PPD.

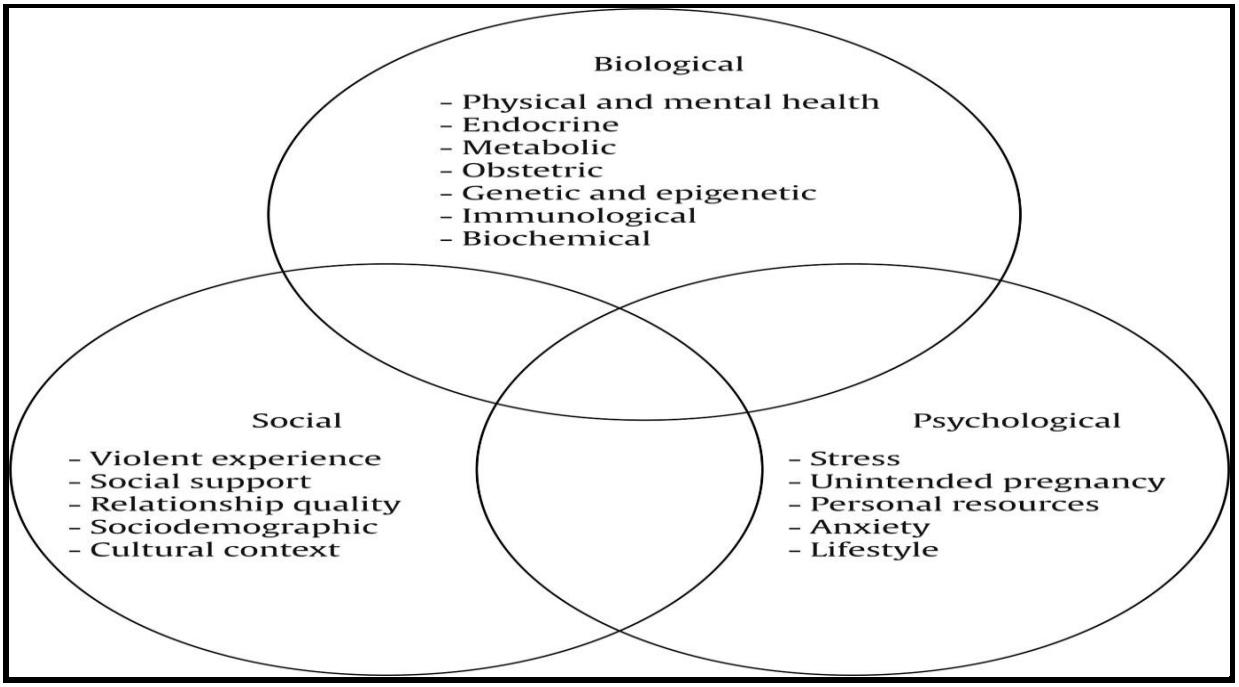

Figure 1. ***Conceptual Framework*** **of Postpartum Depression (*Source: Engel's (1977)***

The framework demonstrates how an individual's health and well-being are influenced by a variety of circumstances, including biological, psychological, and social determinants. This forms the foundation of the biopsychosocial theological model of postpartum depression, which is drawn from the Engel's (1977) conceptual framework. This model considers how these variables interact to contribute to the onset, course, and management of postpartum depression. Fluctuations in hormone levels, particularly estrogen and progesterone, during pregnancy and the postpartum period can contribute to mood disturbances and hormonal changes, a family history of depression or mood disorders can increase the likelihood of developing PPD and physiological processes (genetic predisposition) and the alterations in the levels of neurotransmitters such norepinephrine, serotonin, and dopamine (neurobiological factors) are described as the biological factors (Žutić, M., (2023).

Furthermore, according to Kassa, G., Batchelder, A., & Gross, D. (2024), in a study of 274 mothers who participated. The prevalence of Postpartum Depression was estimated at 31.39%, the circumstance surrounding risks of PPD was found to be unwanted, unplanned, denial by father/abandonment correlate to Postpartum Depression [p=0.015, OR=0.805, 95% CI 0.675 – 0.959]. Social support variables showing significant association with Postpartum Depression were partner support [p=0.005, OR=1.357 95% CI 1.096 – 1.682], experience of a larger support (from friends and community) [P=0.002, OR=0.713 95% CI 0.575 – 0.884], and ability to maintain a fair life balance in the postpartum period [P=0.011, OR=0.752 95% CI 0.603 – 0.936]. For adult mothers, factors associated with PPD included distance to the nearest health facility, medium social support, inadequate dietary diversity, and food insecurity. The findings suggested that targeted interventions by age group are needed to reduce the burden of PPD in Ethiopia (Kassa et al., 2024).

Social support, financial support from the partner, relationships with the partner, knowledge of HIV status, and having experienced a severe financial crisis were significantly associated with

PND symptoms. On a multivariate logistic regression, only financial support from a partner and having experienced a severe financial crisis remained significantly associated with the development of PND ($p = 0.05$). Risk factors for PND were mostly socio-economic. The high prevalence of PND highlighted the need to integrate routine screening of mothers for PND, which will enable early diagnosis and treatment and thus contribute to the improvement of maternal and child well-being in the country (Mokwena et al., 2024).

Moreover, investigating risk factors for PPD is important for its early detection and prevention (Patel et al., 2018). According to Cox et al., (1987), in a study they conducted, identified and categorized three risk factors for PPD, which included psychological, biological, and social. These factors they described included marital problems, the history of miscarriage in the family, poor family relationships and the history of a medical condition. Similarly, in a study carried out in a district in Eastern Africa, Puttalam, the study identified some potential risk factors which included unplanned pregnancy, marital problems, physical abuse during pregnancy, harsh words from a partner, friend's death, vaginal delivery, low birth weight, illness, and babies' poor sleep patterns at night (WHO, 2016).

In addition, studies from Yeboa, N.K., Baluwa, M.A., and colleagues found out that factors attributing to postpartum depression were mood changes, tiredness, inability to sleep, low self-esteem, tearfulness, loss of appetite, feelings of inadequacy, irritability, loss of interest and enjoyment, reduced energy, distress, detachment from baby, worry about injury to the infant, and feeling of guilt about motherhood role performance. The identified antecedents were the presence of pregnancy, labour, childbirth and its physiological and psychological stress. (Yeboa et al., 2023).

Psychological Factors include history of depression which increases the risk in mothers who have previously suffered from depression or other mood disorders. Depression symptoms in new mothers might worsen due to relationship issues, stressful life events, and a lack of social support.

The perception of stress related to motherhood, caregiving responsibilities, and adjustment to parenthood can contribute to the development of PPD and cognitive factors such as negative thinking patterns, self-criticism, and rumination may contribute to keep depression symptoms persisting (Žutić, M., (2023).

Moreover, factors such as sleep disturbances, loss of interest in daily activities, mood swings, frequent bouts of sadness and frustration or worry were all found to significantly increase the risk of PPD (Aljaffer et al., 2023).

Additionally, according to Bhakta et al., (2024), the mode of delivery showed a significance and a higher prevalence of PPD observed among those who underwent a lower segment caesarean section. Maternal age, anaemia, educational status, adverse life events, and lack of partner support significantly correlated with depression scores (Bhakta et al., 2024).

Similarly, in a study carried out identifying the prevalence rate of PPD and its adverse effects on pregnancy and birth outcomes in Tano North Municipality. The Edinburgh Postpartum Depression Scale [EPDS] was used to screen mothers who utilized the postnatal services at the Municipal Hospital (St. John of God Hospital, Duayaw Nkwanta) for the study. Three-hundred and eighty-six respondents were selected using purposive and systematic sampling technique. Logistic analysis showed that not being married (AOR=6.198, 95% CI=2.926-13.128), unemployed (AOR=1.587, 95% CI=0.778-3.235), women with 3-4 children were associated with increased risk of developing PPD. PPD was prevalent among 14.8% of postpartum mothers involved in the study, Socio-demographic factors of being single, unemployed and having 3-4 children were positive predictors of the condition. Obstetric risk factors of experiencing pregnancy and/or birth complications, having had a stillbirth and having had a baby born with weight less than 2.5 kg were also found to positively associate with the occurrence of PPD (Amponsah et al., 2023).

Postpartum depression (PPD) is a common social health problem that affects not only the mother and newborn but extends to other family members as well as various aspects of their lives. This

systematic review and meta-analysis aim to identify the prevalence and risk factors of postpartum among the women in Middle East countries. The team searched published articles from Web of Science, EMBASE, PubMed and Cochrane electronic databases to establish study articles. The common risk factors reported based on their review were poor economy, pregnancy associated complications, low education, unplanned pregnancy, housewife, inadequate social support from family members and the feeding by formula. Poor economic and complication during pregnancy presented a significant relationship regarding postpartum depression in meta-analysis (Alshikh Ahmad et al., 2021).

Also, in a study by Froeliger et al., (2024) among younger women (< 25 years), it was found out that financial support from the family, and difficulty in managing monthly income were associated with a higher risk of postpartum depression. Husband's employment, husband's support, and living in their own house were associated with a lower risk of postpartum depression. Maternity leave of more than 3 months increased the risk of depression during the first 3 months postpartum. From 3 to 6 months postpartum, Muslim women had a higher risk of depression whereas women who breastfed other children and in the past 7 days and perceived their infant as healthy had a lower risk of depression (Froeliger et al., 2024)

In a multicentre study, 257 mothers who attended three primary health care centres for immunization of their babies were recruited from January 2019 to January 2020. All participants were evaluated for socio-demographic features, Family affluence scale (FAS), Edinburgh Postnatal Depression Scale (EPDS) and associated risk factors. PPD was prevalent in 33.5%, with the possible risk factors of PPD were low SES, history of depression, history of PPD, history of stressful conditions, familial support, unwanted pregnancy, and male preference (Alshikh Ahmad et al., 2021)

To explore the prevalence of postpartum depression (PPD), as well as the relationship between delivery mode and postpartum depression among postnatal women utilizing the Arabic validated

version of the Edinburgh Postnatal Depression Scale (EPDS), 412 women with singleton gestation during their 3rd trimester without medical or psychological problems preceding or during pregnancy were included. All pregnant women were asked to fill out the Arabic version of Edinburgh Postnatal Depression Scale. Only women with EPDS score <13 during pregnancy were allowed to complete the study, 370 women were asked to repeat the EPDS at 8 and 16 weeks postnatal. The patients were divided into three groups according to their delivery mode: normal vaginal delivery, emergency or elective caesarean section. Prevalence of postpartum depression was found to be significantly higher in emergency caesarean section group at the 8th and 16th postnatal weeks (25% and 19%, respectively) when compared to elective caesarean section group (21% and 13%, respectively) or normal vaginal delivery group (7% and 1.7%, respectively) (Meky et al., 2020).

Furthermore, in a study conducted in a tertiary hospital in Nigeria, it was found that the prevalence of PPD was 27.2 per cent among mothers attending PNC at the hospital, using the EPDS to determine prevalence. The study revealed that preterm delivery had a significant risk factor associated to PPD (Adeyemo et al., 2020; Ebeigbe & Akhigbe, 2008).

Nevertheless, lack of support from partners, family, friends, or healthcare providers can increase the risk of PPD, financial strain, poverty, and inadequate access to healthcare services may contribute to the development of PPD, cultural expectation, norms, and attitudes about parenting and mental health may have an impact on how PPD manifests and is experienced and adjusting to the new role of motherhood, changes in social roles and responsibilities, and balancing work and childcare duties can impact maternal mental health these are described as the social factors (Žutić, M., (2023).

Nevertheless, in a study conducted by Segre & Davis, (2013) risk factors associated with PPD, includes anxiety during pregnancy, stressful life events experienced while pregnant, low levels of social support, a history of depression, a poor socioeconomic status, low self-esteem, stress from

childcare, marital status, temperament of the kid, and an unintended pregnancy (Segre & Davis, 2013).

To understand the development and experience of postpartum depression, the biopsychosocial model highlights the intricate interactions among these biological, psychological, and social components. This highlights the significance of considering many aspects and implementing a comprehensive strategy for evaluation, therapy, and assistance for women afflicted with PPD. Medical, psychological, and social support services that are individualized for each woman are frequently provided in conjunction for effective therapies (Žutić, M., (2023).

2.3.1 Psychosocial Factors associated with postpartum depression.

Psychosocial factors refer to the interrelation of social factors, individual thought and behaviour. These factors often play a significant role in shaping health outcomes, behaviours, and overall well-being. It's therefore important to consider how they influence the subject of the research.

In a study carried out by Fantahun et al., (2018), it was discovered that dissatisfaction with one's marriage, disputes with spouse, financial difficulties, and loss of employment were risk factors for PPD. Other risk factors discovered through univariate analysis were based on the absence of the father's financial or emotional support for the child, making it difficult to rely on or confide in him was another risk factor, with abortion having a strong link to PPD (Fantahun et al., 2018).

Additionally, according to Engle, (2009), it was found that giving birth alters women's roles as mothers, having a physical and psychological impact on them. It was discovered that for some women, these changes can be overwhelming and may lead to depression as they struggle to adjust. From a life without children to one filled with obligations, limited freedom, and stronger emotional bonds, women must adjust. Three hundred married mothers were sampled using the convenient and simple random sampling methods, where the EPDS was employed to ascertain the incidence

of depression, and the outcome revealed that most mothers within the urban setting are less depressed than the rural mothers (Engle, 2009).

Furthermore, Sockol and colleagues found out that lower socio-economic status and the presence of young children at home were risk factors for women in rural areas but not for urban women. This they predicted were due to the proximity to childcare and health services-urban women are accessible and therefore do not experience the stress rural women do, with childcare, farming and other domestic works (Sockol et al., 2013).

Moreover, these experiences of stressful life events during pregnancy, feeling of sadness and anxiety throughout the pregnancy, low levels of social support, and a history of depression were the most likely risk factors for PPD, according to Fan et al., (2020). The following factors were discovered to be predictors of PPD in a previous meta-analysis of the literature: pregnancy-related issues including limited social support, unintended or undesired pregnancy, low self-esteem, stress from childcare, prenatal anxiety, marriage, newborn temperament, and marital status (Fan et al., 2020).

Also, studies have indicated that there may not be a linear correlation between the number of children and depression; parents of large families, single parents, and those without children may be at higher risk (Kravdal et al., 2015).

In summary**,** psychosocial factors are critical determinants of health outcomes, behaviors, and overall well-being. And studies have demonstrated that dissatisfaction in marriage, financial difficulties, and lack of social support are significant risk factors for PPD. Overall, the interplay of these psychosocial factors underscores the complexity of PPD and the need for multifaceted approaches in research and intervention. Understanding and mitigating these risk factors is essential for improving maternal mental health outcomes and ensuring the well-being of both mothers and their children.

2.3.2 Psychological factors associated with postpartum depression.

Psychological factors refer to internal mental processes and emotional states that influence an individual's behaviour, well-being, and health. Understanding these psychological factors is crucial for identifying women at risk for PPD and developing interventions that address both mental health and practical support needs (WHO, 2016).

A perceived lack of parental competence, low self-efficacy, and low self-esteem are additional risk factors according to Fan et al., (2020). Based on a research conducted, it was found that, mothers with PPD were identified as having experienced stressful life events, which includes financial setbacks, marital challenges, problems in their relationships among others, however, mothers who got little in the way of social and emotional support were able to handle life's challenges (Segre & Davis, 2013). According to Danaci et al., (2002), Mothers receive a lot of support and attention just after the delivery, but this decreases over time, predisposing them to an increased risk of PPD and lead to rising levels of depression (Danaci et al., 2002).

Additionally, it was discovered that mother's psychological burden significantly increased, by the family members' displeasure with the birth of a female child. In Ghana, it's very uncommon for boys to be preferred over girls, especially in areas where the culture of lineage is particularly strong with males inheriting their fathers, especially within the northern regions. The traditional belief that only boys can carry on the family line contributes to this problem mother face (Fan et al., 2020b).

Furthermore, it can be challenging for mothers to anticipate the extent of change they will go through as they step into unfamiliar mental and physical territory (Green et al., 2006). As they attempt to adjust to motherhood, this may correspond to a period of increased depression. That notwithstanding, it has been discovered that having numerous births reduces the risk of PPD because of generalised drops in stress related to pregnancy and delivery (Kheirabadi et al., 2009). An unintended pregnancy, undesired pregnancy, depressive symptoms throughout pregnancy, and

anxiety during pregnancy were the factors connected to the previous pregnancy that were linked to PPD risk factors (Bener et al., 2012).

In summary, psychological factors significantly influence the risk and severity of PPD. Key aspects such as perceived parental competence, self-efficacy, and self-esteem play a critical role in shaping a mother's mental health. Stressful life events, diminishing social support, and cultural pressures further contribute to the risk of PPD.

2.3.3 Socio-Demographic Factors associated with postpartum depression.

Socio-demographic factors encompass various aspects of an individual's social and demographic background that can influence health outcomes and behaviours and can significantly impact the risk and experience of postpartum depression. Therefore, understanding these factors helps in identifying at-risk populations and tailoring interventions to address their specific needs.

Studies have discovered that having a large family, religious beliefs and getting married later in life were risk factors of PPD (Hamdan & Tamim, 2011). Additionally, in a study by Bener et al., (2012) it was shown that mothers from lower socioeconomic backgrounds were at an increased risk of PPD (Bener et al., 2012).

That notwithstanding, according Bener and colleagues (2012) and Kheirabadi and colleagues (2009) reported that younger mothers were more likely to have PPD, whereas Green and colleagues (2006) and Rizk and colleagues (2005) reported that older mothers were more likely to experience PPD, but Balaha et al., (2009) conducted case-control studies and found no differences. Analogously, findings about educational achievement have also been observed. According to Meltzer-Brody et al., (2018), three studies indicated that a lower level of education was linked to a higher risk of PPD, while other study had showed that a higher level of education is linked to a higher risk (Meltzer-Brody et al., 2018).

Additionally, according to Patel et al., (2018), it's critical to investigate PPD risk factors to recognise and prevent illness early. Social, biological, and psychological variables are the categories into which previously established PPD risk factors fall. Potential risk factors included unplanned pregnancies, husband-wife disputes, physical abuse during pregnancy, harsh words from a partner, friend deaths, vaginal deliveries, low birth weights, illnesses and babies' irregular sleep patterns at night (Ebeigbe & Akhigbe, 2008).

Furthermore, according to Bener et al., (2012), mothers who were employed were at decreased risk of PPD, even though being unemployed may interfere with childcare obligations and add to their stress. In 2009, Kheirabadi et al. presented evidence for a link between unemployment and depression caused by poverty. Workplace issues were also identified by Al-Hinai (2014) as a contributing factor in PPD.

In conclusion, socio-demographic factors play a role in the risk and experience of PPD. Factors such as family size, marital status, socioeconomic background, age, educational achievement, and employment status significantly influence mother's likelihood of developing PPD.

2.3.4 Social and Cultural factors associated with postpartum depression.

Social and cultural factors play a significant role in influencing postpartum depression and can shape how individuals experience and respond to this condition. Understanding these factors is vital for designing effective interventions and support systems.

In a study carried out by Bener et al., (2012), poor connections with the mothers-in-law were risk factor identified to be associated with postnatal depression, the study was conducted among Middle Eastern/Arab women residing in Australia, the UAE, Jordan, and Qatar (Bener et al., 2012). Mothers-in-law are essential to a marriage's success because boys maintain strong ties to their birth families and have a big impact on the lives of their daughters-in-law and grandchildren. Keeping in touch with female maternal relatives is linked to decreased PPD chances in new

mothers (Bener et al., 2012). Factors unique to this research include women's dependence on patriarchal family ties, the child's unexpected gender, father's death before the age of 13, polygamy, difficult relationships with the in-laws' family, and having an alcoholic relative (Bener et al., 2012).

Additionally, Smith et al., (2021) revealed that social support plays a crucial role in mitigating the risk of postpartum depression. In the study it was shown that women who have strong support networks whether from family, friends, or community organizations are less likely to experience severe symptoms of postpartum depression (Smith et al., 2021).

Conversely, social isolation has been identified as a significant risk factor for PPD, with studies indicating that women who lack adequate social support are more likely to report higher levels of depressive symptoms (Cho et al., 2022).

In addition, cultural beliefs also influence the experience of PPD; in cultures with rigid expectations regarding maternal roles, women who feel they cannot meet these expectations may be at higher risk for PPD (Chen et al., 2022).

Furthermore, cultural stigma surrounding mental health can impede women's willingness to seek help, further exacerbating the condition (Spada et al., 2022). A study by Khamis (2007) explored how cultural beliefs about motherhood influenced the experience of PPD among Arab women. The study found that cultural expectations around maternal roles and the stigma associated with mental health issues affected how women perceived and reported their symptoms (Khamis, 2007). Therefore, understanding these social and cultural dimensions is essential for developing effective support systems and interventions for PPD.

2.3.5 Biological (Obstetric) factors associated with postpartum depression.

Biological (obstetric) factors associated with PPD focus on the physiological and medical aspects that can influence the risk and severity of PPD. These factors interact to influence the risk, impacting on maternal mental health.

Studies conducted by Mohammed et al., (2011) and Bener et al., (2012) identified a number of paediatric and obstetric factors that raise the incidence of PPD. These factors include protracted labour, unplanned pregnancies, and issues with pregnancy, but the findings agreed that unplanned pregnancy was the most prevalent obstetric risk factor for PPD (Bener et al., 2012).

Furthermore, according to Sharifi, Sooky, Tagharrobi, & Akbari, (2007) the relationship between the mode of delivery and the emergence of PPD are incongruous, in Lebanon, PPD was found to be more common among vaginally delivering women, but in the United Arab Emirates, women who had caesarean sections reported feeling worse after giving birth; but in Iran, the study found no relationship between these two factors. Only an urgent cesarean section was found to be linked with PPD in Zangene and colleagues (2011) studies (Goweda & Metwally, 2020).

Additionally, the levels of progesterone and estrogen in a woman's body rapidly decrease following delivery. She experiences chemical changes in her brain as a result, which might cause mood swings. Many mothers also struggle to obtain the sleep they require to properly recuperate following giving birth. Continuous lack of sleep can cause physical discomfort and tiredness, which can exacerbate postpartum depression symptoms (Bhusal et al., 2016; Gjerdingen & Yawn, 2007). This condition (PPD) often progresses to severe depression and carries a significant risk of illness and death in situation when it is not properly recognized. If preventive treatments are not developed, it has been predicted that depression may rank among the top three causes of mortality worldwide by 2030 (WHO, 2016).

In addition, obstetricians often hesitate to perform caesarean sections (CSs) because of the increased obstetric risks associated. Recommending a vaginal birth in response to obstetricians' demands may result in increased stress and perhaps increase the risk of postpartum depression and anxiety. It is currently unknown whether the possibility of a CS upon request enhances the mother's mental health during the peripartum phase and whether potential positive effects on anxiety and

depression could balance the higher risk of complications associated with a surgical delivery (Sankapithilu, et al., (2010).

Furthermore, in a systematic review conducted classifying all vaginal births and all caesarean sections into one group. Postpartum depression was found to be more likely after caesarean delivery than after vaginal delivery (RR=1.300, 95% CI 1.227-1.378). The study also looks at more intricate linkages, for example, it found that PPD was less common in women who had a normal vaginal birth, assisted or not, compared to emergency caesarean sections (OR=0.67, $p<0.0001$; OR=0.56, $p<0.0001$) (Lucic, M., (2013).

In summary, although being a mother is a happy and joyful experience, for some women, it may also be emotionally trying for mothers susceptible to depression and other mental problems. Postpartum depression, which is characterized by mild to severely depressed non-psychotic illness that appears during the first year of life after giving birth, is a frequent condition among mothers. Biological, social, obstetric, and clinical risk factors are some of the variables that are risk factors associated with PPD to develop (Fan et al., 2020).

2.4 Health and social consequences of postpartum depression

Postpartum depression (PPD) is the most common psychological condition following childbirth and may have a detrimental effect on the social and cognitive health of spouses, infants, and children. According to Kassa et al., (2024) in a study they carried out, they identified some factors that have some negative consequences on the mother and family. The data revealed that low self-esteem was an effect of PPD. Factors associated with PPD differed between adolescent and adult mothers. Adolescent mothers with PPD were more likely to experience low self-esteem and affect work (Kassa et al., 2024). Postpartum depression can lead to significant health and social consequences. Health impacts include physical symptoms, impaired parenting, and increased risk

of chronic mental health issues. Socially, PPD can strain relationships, cause isolation, lead to economic difficulties, and disrupt family dynamics.

According to WHO, (2016), and Friedrich, (2017) depression is the primary cause of disability with the highest global disease burden, affecting more women than men. Postpartum depression is linked to several signs and consequences, such as anxiety, low mood, disturbed sleep, disturbed appetite, energy loss, disorientation, feelings of guilt or worthlessness, and suicidal thoughts (WHO, 2016). Depressive symptoms can have a significant impact on the mother and baby, potentially affecting the mother-infant bond as well as the growth and development of the child (Grace et al., 2003).

Furthermore, the consequence of postpartum depression in study was poor cognitive function of the infant, nutritional defects, mortalities associated with deprived infant care, maternal self-care deficit, social interaction impairment and inability to perform parental roles. The defining attributes and consequences can improve the identification of women with postpartum depression in Ghana and subsequently increase diagnosis and treatment (Yeboa et al., 2023).

In addition, several studies have demonstrated the long-term effects of PPD on mother-child relationships, healthy child growth, and the health and social ramifications of the disorder. It has a detrimental clinical impact on mother-infant attachments, affecting the health of the mother as well as the development of the child. The mother may exhibit withdrawn and disengaged behaviour, as well as hostile or invasive behaviour related to breastfeeding, communication, bonding, sleep disturbances, and other aspects of mother-infant relationships (Grace et al., 2003). PPD is not prioritised, and systematic screening for it is rarely carried out, regrettably, since mental health issues are commonly ignored or disregarded during and after delivery in most underdeveloped countries, including Ghana (Weobong et al., 2009).

Additionally, the mother's capacity to engage with her newborn and her spouse, as well as her ability to communicate, express anger, and pass judgment, may all be negatively impacted by PPD.

Early-life depression in a mother can have a profound impact on the child's psychosocial development, which may lead to severe intellectual deficiencies. (Afolayan et al., 2016).

Similarly, in a study carried out by Gjerdingen & Yawn, (2007) using both the DSM IV-TR, and ICD-10 classification of diseases criteria, with clinical signs of PPD which include a depressed mood, markedly diminished pleasure in almost all activities, significant weight loss or weight gain, psychomotor agitation or retardation, insomnia or hyper insomnia, loss of energy, feelings of worthlessness and guilt, low self-esteem and self-confidence, difficulty in concentration, and suicidal ideation were the health and social consequences identified (Gjerdingen & Yawn, 2007). However, according to Abdollahi & Zarghami, (2018), with a 4.7% global incidence, depression is known to be major public health issue, and its long-term effects on the mothers' mental health are worrying. Furthermore, it was found that untreated postpartum depression can lead to psychiatric disorders, which is the primary cause of maternal mortality during the first postpartum year. These mothers may not be willing to become pregnant again due to their episodes of PPD. They may also exhibit suicidal tendencies, poor appetite that causes anemia in severe cases, poor mother-to-child bonding, insomnia, and difficulties breastfeeding (Anokye et al., 2018).

Also, in a study conducted, three hundred married women were randomly sampled for the study, which aimed to determine the wide range of effects that mothers encounter during the postpartum period. Among the common effects experienced by mothers were poor communication, anemia, low productivity, crying, anxiety, insomnia, poor appetite, hyperactivity, lack of confidence, feelings of overwhelm, and decreased libido. The study was conducted on postpartum mothers who attend clinic services at a health facility (Letourneau et al., 2017).

Consequently, postpartum depression is often associated with ongoing life stresses, routine pressures, and everyday inconveniences. Research shows that, PPD has detrimental real-world repercussions including infanticides, fatalities, bad hygiene, temperament, suicidal thoughts, etc.

since depression predisposes mothers to these kinds of outcomes (Beck, 1998; Hay & Kumar, 1995; Reck et al., 2012).

Accordingly, Seguin, Potvin., Denis, and Loiselle, (2007) conducted a study to find out some of the effects mothers experience when depressed, using a sampled size of two hundred and twelve (212), who reported with depressive conditions, through interviewing, the findings revealed that loss of appetite leading to anaemia, poor concentration, poor communication and low productivity, were the effects mothers attested to from PPD (Seguin et al., 2007).

In addition to other obstetric and maternal characteristics, socioeconomic class and social support were evaluated. They discovered that, in contrast, 22.9 per cent of non-PPD mothers lacked social support, or a source of support, and 56 per cent of these PPD mothers who lacked these factors, were from a low class, and had stopped nursing eight weeks after giving birth. It's unclear if breastfeeding is stopped due to the onset of depressed symptoms or because the sadness was brought on by the baby's feeding issues (Peltzer et al., 2018).

Also in a study by Josefsson et al., (2001), Suicide and infanticide were found to be possible outcomes of severe PPD (postpartum psychosis). A woman may potentially experience the onset of a chronic depression later in life if she has PPD after giving birth; between 10 and 20 percent of mothers have this illness. Recurrence in subsequent pregnancies is similarly associated with a 30-45 percent chance of the effects (Josefsson et al., 2001).

However, the most severe and infrequent kind of postnatal affective disease, postpartum psychosis, occurs in 1–2 cases for every 1000 births (WHO, 2016). Clinical onsets are fast (occurs quickly), with symptoms starting to show up as early as 48 to 72 hours postpartum. That is to say, typically some effects identified in this study included mood swings, disorganised behaviour, mood lability, delusions and hallucinations (Gjerdingen & Yawn, 2007; Peltzer et al., 2018; WHO/UNICEF JMP, 2010). According to the World Health Organization (WHO), most women who experience puerperal psychosis also match the criteria above for bipolar disorder (it is a mental health

condition characterized by extreme mood swings that include emotional highs (mania or hypomania) and lows (depression), necessitating hospitalization (Beck, 1998; Hay & Kumar, 1995; WHO, 2016).

Moreover, in a study conducted, it was revealed that within three months after giving birth, women who are depressed wean their babies to milk substitutes, which has a negative influence on their health and social life, such as guilt, failure, or lack of sleep. Studies, however, indicate that PPD may have an impact on a mother's feeding habits, which may influence the baby's growth and development because of inadequate breastfeeding. Additionally, PPD may cause an early end to nursing, which could negatively impact breastfeeding (Abdollahi & Zarghami, 2018; Hay & Kumar, 1995; Heh, 2013; Meltzer-Brody et al., 2018).

Continuous, interactive communication between a mother and her child is developed, after successful delivery. And this is why the mother-child relationship is so important to a child's growth. Although this bond promotes healthy behavioural, cognitive, social, and interpersonal functioning and it is essential for creating a safe haven from which a young child or infant can start to explore the outside world, PPD can impede the infant's development and bonding (McCoy et al., 2006). To promote optimal growth and development, mothers can participate in specific harmonic or attuned behaviours, such as providing unambiguous cues and being receptive to their infants' cues. Additionally, the infant is expected to reciprocate the mother's caregiving, which the environment must encourage and facilitate this cycle. Mothers get attached to their babies when the procedure is successful. This process failing could lead to insecure relationships between the mother and child been raised (Wilkinson et al., 2017).

In an investigation carried out in Kumasi, it was demonstrated that mothers with PPD are prone to anaemia because of inadequate nourishment, poor hygiene practices and poor appetite (Gold et al., 2013). Weobong et al., (2015) conducted a study on mothers in rural Ghana and found that women

experiencing depression exhibit poor communication skills, poor sleep patterns and quality, weight loss, irritability, and maybe even neglecting their babies (Gold et al., 2013; Weobong et al., 2015). Although PPD is becoming more widely acknowledged as a condition associated with delivery worldwide, the interest and necessity of detecting and treating it has been largely overlooked in practice, and it appears that there is not much awareness and interest about this issue. The ramifications and repercussions of PPD, such as an elevated risk of suicide and infanticide, make it a significant societal concern. PPD is frequently underdiagnosed and neglected, hence initiatives to enhance prenatal mental healthcare are required (Anokye et al., 2018).

2.5 Summary of literature review

Postpartum depression is a critical global health issue affecting mothers across diverse cultures and socioeconomic backgrounds. It significantly contributes to maternal morbidity and mortality, with prevalence rates varying between (10%) and (43%) worldwide (WHO, 2016). High-income countries typically report PPD rates of (10–20%), while LMICs experience much higher rates, sometimes reaching 60.8% (Bhusal et al., 2016). The differences in prevalence are often linked to factors such as socioeconomic conditions, access to healthcare, cultural stigma, and mental health awareness (WHO, 2016).

The diagnostic criteria for PPD, as defined by the ICD-10 and the DSM-IV, contribute to variations in reported prevalence. Studies show that while up to 30 percent of postpartum women may experience mild to moderate symptoms, less than 1% experience severe psychosis (Fan et al., 2020).

Studies in Africa, such as those conducted in Ghana, indicate that (11.6%) of mothers were diagnosed with PPD at Komfo Anokye Hospital (Anokye et al., 2018). The reluctance of mothers to report symptoms due to social stigma often results in underreporting, making it difficult to assess the full scope of PPD. Additionally, mothers in rural areas may experience less depression than

those in urban settings due to stronger reliance on family and community support, as seen in studies from Korea and other regions (Weobong et al., 2015).

The biopsychosocial model provides a valuable framework for understanding the risk factors associated with PPD, which is influenced by a range of biological, psychological, socio-demographic, and social factors. Understanding these diverse risk factors is essential for the effective prevention, identification, and management of PPD. Hormonal fluctuations, genetic predispositions, and neurobiological changes play a significant role in the development of PPD. Rapid hormonal shifts post-delivery and genetic vulnerabilities must be considered when assessing risk related to the biological factors. A history of depression, stress, and adjustment difficulties are critical psychological risk factors. Negative thinking patterns and inadequate social support exacerbate symptoms, highlighting the need for targeted psychological support. Factors such as socioeconomic status, family size, and employment status influence PPD risk. While findings on age and education are mixed, addressing socio-economic and employment-related stressors can help mitigate PPD risk. Strong social support networks and cultural beliefs about motherhood significantly impact the experience of PPD. Social isolation and cultural stigma can hinder help-seeking behaviours, making supportive community networks and culturally sensitive interventions vital (Žuti, 2023).

Postpartum depression presents significant health and social challenges for mothers, impacting their physical health, parenting abilities, and long-term mental well-being. It also strains familial relationships, causes social isolation, and leads to economic difficulties. The disruption in mother-infant bonding and the potential developmental issues for the child underscore the importance of addressing PPD effectively (Abdollahi & Zarghami, 2018).

Given its high prevalence and the severe consequences associated with untreated PPD, there is a pressing need for systematic screening and early intervention. Increasing awareness, enhancing support systems, and improving prenatal mental health care are crucial steps to mitigate the adverse

effects of PPD and support both mothers and their infants in achieving optimal health and well-being (WHO, 2016).

2.6 The Biopsychosocial theoretical Framework

The Biopsychosocial-Theoretical (BPST) Framework on postpartum depression (PPD) integrates biological, psychological, social, and theoretical dimensions to provide a holistic understanding of the condition. This approach acknowledges the interplay between physical health, mental well-being, social influences, and spiritual beliefs in shaping a mother's postpartum experience.

This integrative framework recognizes that postpartum depression is not solely a medical condition but a multifaceted experience. Addressing it effectively requires acknowledging the interplay of biological changes, psychological challenges, social contexts, and spiritual needs. By bringing together these diverse perspectives, healthcare providers and faith communities can offer more compassionate, comprehensive, and effective support for mothers navigating postpartum depression and ultimately improving their mental health and overall well-being.

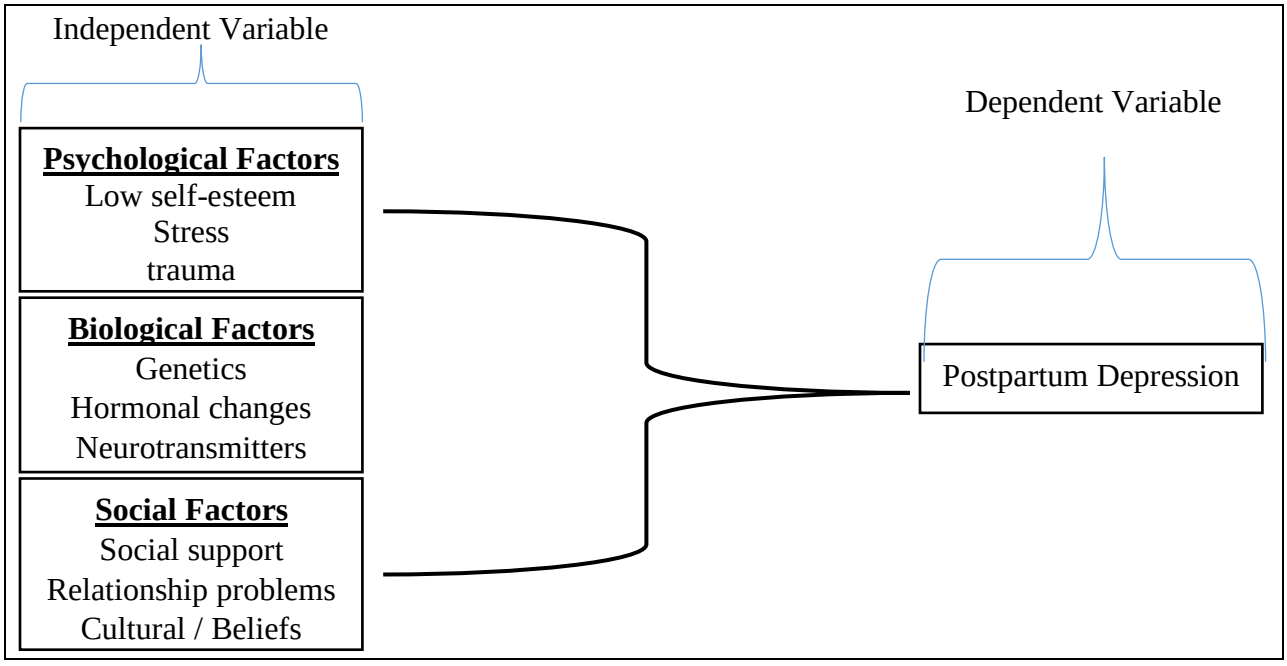

Figure 2: The Biopsychosocial theoretical Model of PPD (*Source: WHO, 2016)*

This theoretical framework demonstrates the structural pattern used in the literature review processes for the study. The focus is on PPD, where the understanding of depression and

postpartum depression was described, with relevant literature from the global perspectives. Postpartum depression is the dependent variable, while previous mental health issues, unplanned pregnancy, complications during pregnancy, relationship problems and culture/beliefs as independent variables (risk factors). Which are categorized into biological, social and psychological factors which interplay to predispose the woman to be depressed, resulting in the health and social consequences experienced by mothers. In summary PPD as a condition is influenced by biological, psychological, social, and spiritual factors. It emphasizes that no single factor alone causes PPD but rather a combination of interconnected influences.

In summary, this chapter reviewed literature from studies conducted by researchers related to the specific objectives of the study, which included the prevalence rates, risk factors and the health and social consequences of PPD among mothers.

2.7 Conclusion

Postpartum depression represents a significant global health challenge with wide-ranging impacts on mothers, families, and communities. The prevalence of PPD varies considerably between high-income and LMICs, reflecting disparities in socioeconomic conditions, healthcare access, and cultural attitudes. Despite varying diagnostic criteria and reported rates, it is evident that PPD affects a substantial proportion of new mothers, with severe consequences for their mental health, family relationships, and child development.

It is important to understand that this multifaceted risk factors associated with PPD ranging from biological and psychological to social and economic is essential for effective prevention, identification, management and mitigating the adverse effects of PPD. Enhancing support systems, promoting culturally sensitive mental health care, and improving prenatal mental health services can significantly contribute to better outcomes for mothers and their infants.

The next chapter three would look at the methodology the study employed, which would include the study setting, study population, inclusion criteria, study design, through to dissemination plan.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Introduction to the Methods

This chapter describes the methods and approaches adopted in the study. It details the study setting, study population, sample size and sampling procedures, inclusion and exclusion criteria, data collection, data analysis procedure, and ethical considerations are outlined. Finally, the plan for dissemination of study results is stated in this chapter.

3.2 Background to the Study Area

The Northern Regional Hospital also known as Tamale Central Hospital or Old Hospital is in Tamale, the capital of the Northern Region of Ghana. Established to serve as a referral center for the region, the hospital is one of the key healthcare facilities in Northern Ghana, providing specialized medical care to the population. It plays a crucial role in offering secondary and tertiary healthcare services, particularly for patients referred from other facilities (Abuaku et al., 2018).

3.3 Justification for Choice of Study Area

The choice of study area for this research on postpartum depression (PPD) at the Northern Regional Hospital is justified based on the following factors:

a. High Patient Turnout for Postnatal Care (PNC): The hospital serves as a major referral center for the Northern Region, catering to a large population of postpartum mothers. This provides a diverse sample for studying PPD prevalence and associated risk factors.
b. Availability of Maternal Mental Health Services: NRH has a well-established postnatal care unit where mothers routinely attend check-ups, making it an appropriate site for screening and assessing postpartum mental health conditions.
c. Diverse Socioeconomic and Cultural Representation: The hospital serves women from different socioeconomic backgrounds, including urban and rural settings. This allows for a

comprehensive analysis of the risk factors influencing PPD in varied social and economic conditions.

3.4 Justification for Study setting

Ghana's Northern Region consists of sixteen districts, including Tamale Metropolis. Originally established in 1988 as a municipal assembly, the Tamale Municipal District was formed from the previous West Dagomba District Council. In August of 2004, it was granted metropolitan assembly status. Later, on June 24, 2012, a tiny portion of the metropolis was carved out to form the Sagnarigu District; the remaining portion is still known as the Tamale Metropolitan Assembly. Tamale, the capital city of the Northern Region, serves as the gateway to the metropolis, which is situated in the northwest of the region (Gogue et al., 2020). The region's principal center for business is the city. As of 2023, its population was around 390,649 people. In the metropolis, the proportion of people living in urban areas (80.08%) is greater than that in rural areas (19.1%), and there are more females than males. The Metropolis has a Teaching hospital, Regional Hospital, 7 Health Facilities, 1 CHAG, and 47 CHPS zones, with a patient-doctor ratio of 9,570:1(Ghana Statistical Service, 2022).

The WIFA population for the Tamale Metro in 2023 was 93,756, and the expected pregnancy is 15,625. Antenatal Care (ANC) registrants and attendance are 1877 and 11,966 respectively, with 3134 mothers delivering in the facility (DHIMS, 2023). Midwives are crucial to the delivery of maternal health care, with 95 of them rotating between several units, including labour, ANC, and postnatal respectively. The figure on page 26 shows the Northern Regional Hospital.

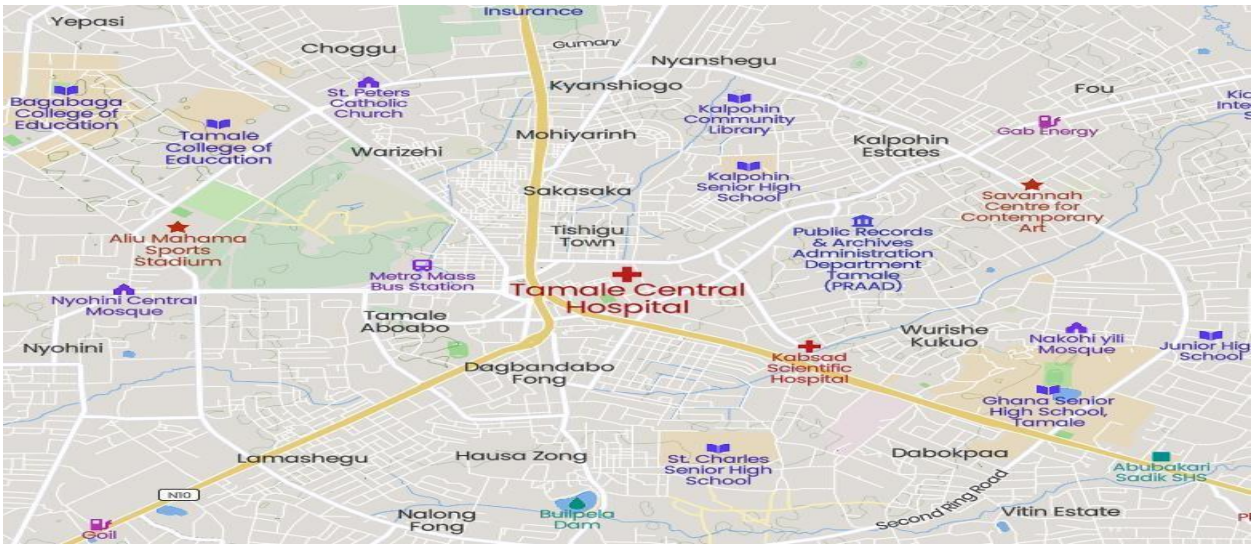

Figure 3: Map of Northern Regional Hospital (*Source – Map data @ 2023 google – GIS)*

3.5 Study design

A cross-sectional study design was used to investigate the prevalence and risk factors for PPD among mothers who attended the Northern Regional Hospital clinic. Cross-sectional designs are commonly used in public health and epidemiological research to provide snapshot of a population at a specific point in time. The ideal for assessing the prevalence of outcomes or characteristics in a population usually requires fewer resources and less time, reducing overall study costs and helps identify potential associations that can inform future, more in-depth research designs. This study design was suitable because cross-sectional studies are simple and do not require much more time. The simple design seeks to determine the frequency of a phenomenon, issue, problem, or attitude by capturing a cross-section or snapshot of the population. By doing this, an overall picture of the situation is obtained. These studies are often inexpensive to conduct and just need one interaction with the research population. However, it is difficult to use its results to generalize for the entire population. This design was selected because of time and budget constraints.

3.6 Study Setting

The study was conducted at the Northern Regional Hospital (NRH) in Tamale, the capital of the Northern Region of Ghana. NRH serves as a major referral and tertiary healthcare facility in the region, providing comprehensive maternal and child health services, including antenatal, delivery, and post-natal care.

3.7 Study population

Mothers who visited the Northern Regional Hospital postnatal clinic made up the research population. The hospital serves as a referral point or site for the region; mothers who are 18 years and above and gave their consent to participate were those included in the study.

3.8 Exclusion and inclusion criteria

3.8.1 Inclusion

a. Mothers who had live birth and are within 2 – 8 weeks (14 -56 days) after delivery.
b. Attending Postnatal Clinic at the Tamale Regional Hospital.
c. Who consented to participate and were 18 years and above.

3.8.2 Exclusion

a. The study excluded postnatal mothers who were seriously ill.
b. Mothers who were less than 18 years old at the time of recruitment,
c. Mothers who miscarry or have stillbirth.
d. Mothers who do not give consent.

3.9 Sampling Technique

Mothers at the facility's postnatal clinic were chosen at random using the lottery approach. This method was appropriate because mothers will have an even chance and likelihood of being selected, provides fair and unbiased representation and divergent views on the subject area. A total

of 3134 mothers who delivered within the period at the hospital from the postnatal register were the targeted population, where codes or numbers written on pieces of papers were assigned to represent each mother and a sample of 321 was selected, by reviewing their ANC cards to ensure that each mother selected meets the selection criteria to be part of the study.

3.10 Sample size determination

The sample size was determined using the formula below by (Kothari, 2004)

$N=\frac{Z^2\frac{a}{2}\times P(1-p)}{d^2}$

Where N=sample size

$z^{2^{a/2}}$= reliability co-efficient

P= prevalence

d^2= margin of error

The reliability coefficient used is 1.96 with a confidence interval of 95%. The prevalence of depression among mothers (A PPD study conducted for prevalence in a tertiary hospital in Nigeria by Ebeigbe & Akhigbe 2008) was 27%. The margin of error was 0.05 since the estimate should be within 5% of the true value.

$z^{2^{a/2}}$ = 1.96

P = 27%

d^2 = 0.05

$\frac{Z^2\frac{a}{2}\times P(1-p)}{d^2}$ = N

Therefore, sample size (N) = $\frac{(1.96)^2 \times 0.27\times(1-0.27)}{(0.05)^2}$= 302 Mothers.

(Adding 5% non-response rate, n = 302+ (302 x 0.05) = 302+15.3 = 317 respondents. The final sample size n = 321 respondents.

3.11 Study Variables

Independent variables

a Biological: Genetics (*family history of mental health issues, previous experience with depression, complications during pregnancy or childbirth)*, Hormonal Changes, Neurotransmitters etc.

b Psychological factors: Low self-esteem, Stress, Trauma

c Social Factors: Social support, Relationship problems, Cultural factors.

Dependent variables

Postpartum Depression

3.12 Indicators of the study

The study on postpartum depression (PPD) at the Northern Regional Hospital (NRH), Tamale, utilized key indicators to assess the prevalence, severity, and associated risk factors of PPD among postpartum mothers attending the postnatal clinic (PNC). These indicators measured the study's objectives effectively.

a. Outcome Indicators

These indicators measure the prevalence and severity of postpartum depression among the study population. Percentage of mothers scoring **≥10** on the Edinburgh Postnatal Depression Scale (EPDS). Severity of PPD: Proportion of mothers categorized as having mild, moderate, or severe PPD based on EPDS scores: Mild (10–15), Moderate (15–20), Severe (≥21).

Impact of PPD on Daily Functioning: Percentage of mothers reporting difficulties in daily activities, including breastfeeding, childcare, and household responsibilities.

Suicidal Ideation Prevalence*:* Proportion of mothers who express suicidal thoughts (based on EPDS Question 10).

b. Exposure/Risk Factor Indicators

These indicators assess the factors contributing to postpartum depression.

Psychosocial Factors: Percentage of mothers experiencing **relationship conflicts** (e.g., marital disputes, family issues). Percentage of mothers reporting **low social support** from partners, family, or community.

Obstetric and Medical Factors*:* Proportion of mothers with pregnancy or childbirth complications (e.g., caesarean section, preterm birth, excessive bleeding). Percentage of mothers with a history of previous pregnancy loss (e.g., miscarriage, stillbirth).

Psychiatric and Personal History: Proportion of mothers with a previous history of depression, anxiety, or mental health disorders. Percentage of mothers who experienced significant life stressors in the past year (e.g., financial difficulties, death of a loved one).

Economic and Socio-Demographic Factors: Percentage of mothers with unplanned or unwanted pregnancies.

3.13 Data Collection Instruments

The EPDS was adopted to determine the prevalence rate. A total of ten questions comprises the EPDS. Responses to questions 1, 2, and 4 are ranked 0,1,2,3, depending on how severe the symptoms were. It is reverse-scored, that is, 3, 2, 1, and 0 for questions 3 and 5–10. The whole score, which has a maximum score of 30, is calculated by summing up the scores for each of the 10 elements. A mother who had a score of 10 or higher on the depression rating scale was considered to be depressed, as the study's cutoff point was 10.

A structured questionnaire was designed to elicit responses on the associated risk and the health and social consequences of PPD. With the purpose of gathering primary data, closed-ended questions were employed. Although written in English, the questionnaire was orally translated into Dagbani etc. for some category of respondents who may be illiterates (cannot speak English). The questionnaire was pre-tested at the Tamale West Hospital to assess the validity and reliability of the instruments, and any contradictory concerns were addressed before the final data collection.

Direct administration of the questionnaires to the mothers took place. The purpose of the structured questions was to extract information on the related risks, which included obstetric, cultural, and psychological aspects, as well as the health and social consequences, which included the mother, child, and family.

Training for Research Assistants - Three (3) research assistants were trained to assist me collect data.

3.14 Data Quality Control

Ensuring high-quality data is critical for the accuracy and reliability of the study on postpartum depression (PPD) at Northern Regional Hospital, Tamale. The following measures were implemented through-out data collection, entry, and analysis to minimize errors and ensure validity.

Pre-Data Collection Measures (*Training of Data Collectors*): The three research assistants involved in data collection were trained on: Ethical considerations and informed consent procedures, standardized administration of the Edinburgh Postnatal Depression Scale (EPDS), how to enter the data to ensure accuracy and completeness.

Pre-Testing of Questionnaire: A pilot study was conducted at the West Hospital among a small sample of postpartum mothers (not included in the main study) to: Assess clarity, consistency, and appropriateness of questions, identify and correct ambiguities or errors in the questionnaire and ensure that the EPDS tool is correctly interpreted by respondents.

Standardized Data Collection Tools: The EPDS tool and structured questionnaire was used consistently across all respondents and translated into local languages (e.g., Dagbani) where necessary to ensure clarity.

Data Collection Measures (*Supervision and Monitoring*): Periodically checking data processes.

3.15 Study Strength and Limitation

The strengths of the study have to do with its holistic view of the prevalence and risk factors of PPD. Furthermore, this study has gone a step further to identify the impact of PPD on the family, affording a good picture of the effects mothers endure as a result of childbirth.

This study has some limitations in the sense that it only considered mothers attending clinic services at the Northern Regional Hospital, which makes it difficult to generalize the results for the entire metropolis.

3.16 Ethical issues

The research topic was approved by the University for Development Studies' School of Public Health, and a written letter requesting permission to collect data was sent to the Northern Regional Health Directorate. A support letter was written by the directorate which was attached to other documents for ethical clearance from the Ghana Health Service Ethics Review Committee. Ethical clearance was granted with the approval number GHS-ERC 038/11/23. The directorate, upon receiving the ethical clearance, wrote formally to the Northern Region Hospital introducing me to the facility and requesting permission to collect my data. Before the questionnaire was administered, respondents had the option to provide voluntary permission by agreeing, after explaining the purpose of the study, by either signing or thumbprinting the consent form. Instead of using names to identify the respondents, codes or numbers were used, ensuring their privacy and anonymity. Due to the diverse demographic features of the respondents, the questionnaire was carefully prepared considering some culturally sensitive issues and, views, etc. It was made clear to respondents that participation in the study was entirely voluntary, and they were free to leave at any time.

3.17 Data Analysis

For analysis, the responses were exported from a Kobo Collect tool into Excel and then imported into SPSS. To confirm the data's authenticity and reliability, the researcher kept an eye on it throughout the investigation. The tool developed had three (3) sections in the questionnaire, the first part collected data on the socio-demographic characteristics, the second part on the prevalence, the third on the risk factors, as well as the social and health consequences which formed the basis for the analysis.

The data was cleaned and entered into Microsoft excel version 2021 and exported to SPSS version 20 for analysis of means, frequencies, and associations. The results were then presented in tables for discussion, and a logistic regression model was used. Logistic regression models are statistical models used for binary classification tasks. Regression analysis is used when the dependent variable is binary (i.e., when there are two possible values, such as 0 and 1). The logistic regression model estimates the probability that a given input belongs to a certain category based on one or more independent variables. Logistic regression models were employed to find associations between sociodemographic characteristics, risks factors and prevalence. Responses to each question were summarized into tables and brief commentary made. The number of tables constructed reflects the number of questions responded to by mothers. To determine the risk factors (predictor variables) connected to PPD in women who visit the postnatal clinic at the Northern Regional Hospital, Binary logistic regression was used to model the likelihood that an observation belongs to one of these two groups (dependent variable and the predictors). To shed light on the relative contributions of each predictor variable to the chance of PPD developing in women, the variables that showed a significance level ($p < 0.05$) during bivariate analysis (Model 1) were included in the multivariate regression analysis (Model 2). The bivariate analysis's findings indicated that fourteen predictor factors were strongly linked to mothers' PPD. To account for confounders, a multivariate logistic regression model was applied. Only eight predictor variables

noting significant life stressors within the last year, planning pregnancy, pregnancy complications, ongoing conflicts or issues in relationships, recent major life events or changes, such as job loss or relocation showed a significant correlation with PPD in the analysis.

3.18 Dissemination Plan

To guarantee that the appropriate people are informed about the results of the study on PPD on mothers who visited the postnatal clinic. The following plans were adopted, findings of this research were shared with Ghana Health Service (GHS) to potentially influence policy and decision making. A copy of this thesis was presented to the University for Development Studies. And, to deliver the results in appropriate scholarly gatherings, symposia, or conferences, which would afford me the opportunity to interact with colleagues, get input, and grow network as a result. Furthermore, take advantage of durbars within the CHPS facilities, clinics, community centers etc. The primary objective of this study was to add to knowledge and literature by having the findings published in reputable international scientific journals in accordance with the guidelines of the University for Development Studies, Tamale.

In summary, the chapter above describes the methodology of the study. The next chapter four (4) would look at the results of the study based on the specific objectives for the study.

CHAPTER FOUR

4.0 RESULTS

4.1 Introduction

This chapter presents the results of the study, displayed in tables after the descriptive data. The sub-section in this chapter includes the socio-demographic characteristics, prevalence, risk factors and the health and social consequences. The objective of the study was to determine the prevalence and the associated risk factors of PPD among mothers attending PNC services at the Northern Regional Hospital.

4.2 Socio-demographics characteristics of study participants

Table 2. summarizes the demographic characteristics of the study participants. Out of 321 postnatal mothers included in this study, the majority 150(46.7%) were within 18-24 years, while the minority 43(13.4%) were within the ages of 35-49 years. A majority 282 (87.9%) of the respondents were married, and most 153(47.7%) of them were Christians. Most of the respondents 133(41.4%) had tertiary qualifications, while 12(3.7%) minority had no formal education. A little over 187 (58.3%) of the respondents were traders and 315(98.1%) had term delivery. A third of the mother's babies were aged 4 weeks or more 108(33.5%), followed by those aged 2 weeks 92(28.7%). Similarly, close to a third of the mothers had three children 103(32.1%). This result is consistent with research on the association between the number of children and depression in later life. In a Korean study, the number of children and depressive symptoms showed a U-shaped link; mothers without children and those with five or more children were shown to be at increased risk of postpartum depression (Kim, Lee, Shin, Choi, & Park, 2015).

A greater percentage of mothers 296(92.2%) gave birth normally, whereas 25(7.8%) had a caesarean procedure. The study's findings aligned with a systematic analysis conducted by Heh,

(2013), in which all vaginal births and caesarean sections were pooled together. The research found that while the mode of delivery is a risk factor for PPD, its severity is determined by other factors. Demographic characteristics play a very significant role or impact on mothers' level of depression or depression. This has been illustrated in table 2.

Table 1: ***Univariate analysis of socio-demographics among mothers attending postnatal clinic at the Northern Regional Hospital***

Variables	Frequency (%) n= 321
Age	
18-24	150(46.7)
25-34	128(39.9)
35-49	43(13.4)
Marital Status	
Co-habit	1(0.3)
Co-habitation	37(11.5)
Divorced	1(0.3)
Married	282(87.9)
Religious Affiliation	
Christian	153(47.7)
Muslim	152(47.4)
Traditionalist	16(5.0)
Educational Level	
JHS	54(16.8)
None	12(3.7)
Primary	36(11.2)
SHS	86(26.8)
Tertiary	133(41.4)
Occupation	
Civil Servant	88(27.4)
Farmer	15(4.7)
Housewife	27(8.4)

Others	4(1.2)
Trader/Businessperson	187(58.3)
Mode of delivery	
CS	25(7.8)
Normal	296(92.2)
Pregnancy outcome	
Preterm	6(1.9)
Term - Life birth	315(98.1)
No. of Children	
0	5(1.6)
1	53(16.5)
2	86(26.8)
3	103(32.1)
4	32(10.0)
5+	42(13.1)
Category of Mothers	
Multiparity	281(87.5)
Primigravid	40(12.5)
Age of Baby in weeks	
< 7days	25(7.8)
1 week	39(12.1)
2 weeks	92(28.7)
3 weeks	57(17.8)
4 weeks or more	108(33.5)

4.3 Prevalence of PPD Among Mothers

The majority of the 321 mothers in the sample (89.1%), were found to be unlikely to be depressed based on the EPDS assessment, however a significant number (10.9%) fell into the mild to severe depression categories, showing how crucial postpartum mental health screening and assistance are.

Table 2: ***Prevalence rate among mothers attending clinic at the Northern Regional Hospital.***

Level of PPD (EPDS Score)	**n= 321(%)**
Depression is not likely (Less than 9)	286(89.1)
Mild depression (10 to 14)	29(9.0)
Moderately depressed (15 to 20)	5(1.6)
Severe depression (21 above)	1(0.3)
Overall Prevalence	**36(10.9)**

Source: Study outcome

4.4 Risk factors of PPD Among Mothers

To determine the risk factors linked to PPD in mothers who visited the postnatal clinic at Northern Regional Hospital, binary logistic regression was used. To shed light on the relative contributions of each predictor variable to the chance of PPD developing in mothers, a multivariate regression analysis (Model 2) was conducted with the variables that showed a significant level ($p < 0.05$) in the bivariate analysis (Model 1). The bivariate analysis's findings indicated that fourteen predictor factors were strongly linked to mothers' PPD. A multivariate logistic regression model was used to adjust for potential confounders. Only eight predictor variables noting significant life stressors within the last year, planning a pregnancy, pregnancy complications, ongoing conflicts or issues in relationships, recent major life events or changes, such as job loss or relocation showed a significant correlation with postpartum depression in the analysis.

In the multivariate regression, mothers who had experienced significant life stressors of any kind in the preceding year were nearly nine times more likely to be depressed than their peers who did not experience any life stressors (AOR = 8.54 [95%CI (3.277,22.277)], p = 0.000). Pregnancy-related psychological disorders were less common among respondents who planned their pregnancy than in respondents who did not (AOR = 0.19 [95%CI (0.076,0.477)], p = 0.000). Respondents who felt at ease seeking assistance or support when required were less likely to experience depression than those who did not (AOR = 0.129 [95%CI (0.039,0.431)], p = 0.001).

Additionally, compared to respondents who had not encountered any pregnancy-related difficulties, with those who had encountered them, they were about three times more likely to suffer depression (AOR = 2.814 [95%CI (1.120,7.072)], p = 0.028). The study also showed that respondents experiencing interpersonal disputes or issues were four times more likely to experience depression than respondents not experiencing such issues (AOR = 4.402 [95%CI (1.888,10.266)], p = 0.001). Once more, respondents who had gone through any significant life events or changes, such moving or losing their job, were around three times more likely to have depression in contrast to the other groups (AOR = 3.225 [95%CI (1.325,7.850)], p = 0.010). Furthermore, it was shown that having major life stresses (AOR = 2.873 [95%CI (1.153,7.156)], p = 0.023) and dealing with relationship issues or problems (AOR = 4.050 [95%CI (1.502,10.920)], p = 0.006) increased the likelihood of getting PPD.

Table 3: *Bivariate and multivariate analysis of risk factors associated with postpartum depression among mothers who have postnatal care, Northern Regional Hospital, 2023*

Risk Factors		Postpartum Depression		**COR (95%CI)**	**p-value**	**AOR (95%CI)**	**p-value**
		No	Yes	**Model 1**		**Model 2**	
Personal and Family History							
Previous history of mental health issues	No	234(81.8)	24(68.6)	1 (Ref)		1 (Ref)	
	Yes	52(18.2)	11(31.4)	2.062(0.951,4.474)	0.067	0.851(.342,2.119)	0.729
Immediate family diagnosed or experienced depression or any other mental health disorder	No	244(85.3)	18(51.4)	1 (Ref)		1 (Ref)	
	Yes	42(14.7)	17(48.6)	5.487(2.62,11.492)	**0.000***	1.779(.724,4.375)	0.209
Experienced any significant life stressors in the past year	No	246(86.0)	12(34.3)	1 (Ref)		1 (Ref)	
	Yes	40(14.0)	23(65.7)	11.787(5.437,25.556)	**0.000***	8.544(3.277,22.277)	**0.000***
History of chronic physical health conditions	No	280(97.9)	30(85.7)	1 (Ref)		1 (Ref)	
	Yes	6(2.1)	5(14.3)	7.778(2.239,27.015)	**0.001***	1.832(.478,7.019)	0.377
Pregnancy and Childbirth factors							
Planned pregnancy	No	84(29.4)	27(77.1)	1 (Ref)		1 (Ref)	
	Yes	202(70.6)	8(22.9)	0.123(.054,0.282)	**0.000***	0.19(0.076,0.477)	**0.000***
Experience any complications during pregnancy	No	255(89.2)	18(51.4)	1 (Ref)		1 (Ref)	
	Yes	31(10.8)	17(48.6)	7.769(3.631,16.620)	**0.000***	2.814(1.120,7.072)	**0.028***
Any complications during childbirth?]	No	277(96.9)	28(80.0)	1 (Ref)		1 (Ref)	
	Yes	9(3.1)	7(20.0)	7.694(2.662,22.241)	**0.000***	3.828(0.794,18.444)	0.094
Traumatic birth experience?]	No	278(97.2)	29(82.9)	1 (Ref)		1 (Ref)	
	Yes	8(2.8)	6(17.1)	7.190(2.333,22.156)	**0.001***	1.516(0.234,9.845)	0.663
History of miscarriage or stillbirth?]	No	266(93.0)	25(71.4)	1 (Ref)		1 (Ref)	
	Yes	20(7.0)	10(28.6)	5.320(2.245,12.606)	**0.000***	2.023(0.730,5.604)	0.175

Social Support and Relationship							
Feel supported by your partner/spouse, family or friends during your pregnancy and postpartum period	No	102(35.7)	8(22.9)	1 (Ref)		1 (Ref)	
	Yes	184(64.3)	27(77.1)	1.871(0.820,4.270)	0.137	1.783(0.371,8.561)	0.47
Support from the family and friends?]	No	108(37.8)	6(17.1)	1 (Ref)		1 (Ref)	
	Yes	178(62.2)	29(82.9)	2.933(1.179,7.293)	**0.021***	3.713(0.672,20.522)	0.133
Feel comfortable asking for help or support when needed	No	110(38.5)	14(40.0)	1 (Ref)		1 (Ref)	
	Yes	176(61.5)	21(60.0)	0.938(0.458,1.920)	0.86	0.129(0.039,0.431)	**0.001***
Receive assistance with household chores or childcare responsibilities	No	115(40.2)	7(20.0)	1 (Ref)		1 (Ref)	
	Yes	171(59.8)	28(80.0)	2.690(1.137,6.365)	**0.024***	3.107(0.586,16.470)	0.183
Ongoing conflicts or problems in your relationships that may affect or affecting your well-being	No	251(87.8)	22(62.9)	1 (Ref)		1 (Ref)	
	Yes	35(12.2)	13(37.1)	4.238(1.959,9.166)	**0.000***	4.402(1.888,10.266)	**0.001***
Stress and Life Events							
Experienced any recent major life events or changes (e.g., relocation, job loss)	No	250(87.4)	20(57.1)	1 (Ref)		1 (Ref)	
	Yes	36(12.6)	15(42.9)	5.208(2.448,11.083)	**0.000***	3.225(1.325,7.850)	**0.010***
Currently experiencing any significant life stressors	No	221(77.3)	12(34.3)	1 (Ref)		1 (Ref)	
	Yes	65(22.7)	23(65.7)	6.517(3.076,13.806)	**0.000***	2.873(1.153,7.156)	**0.023***
Experiencing any relationship difficulties or challenges	No	268(93.7)	24(68.6)	1 (Ref)		1 (Ref)	
	Yes	18(6.3)	11(31.4)	6.824(2.892,16.102)	**0.000***	4.050(1.502,10.920)	**0.006***

Key: * = p-value less than 0.05 (statistically significant); COR crude odds ratio, AOR adjusted odds ratio, CI confidence interval, n = number of sampled participants

Source: Study Outcome

4.5 Health and social consequences of PPD on Mothers and Children

Table 5. summarizes the health and social consequences of PPD. Postpartum depression had physical and social repercussions in the 321 mothers who were screened: (19.3%) had a decline in daily tasks, (13.4%) experienced sadness, (27.7%) reported appetite changes and (22.1%) were fatigue. Relationships were affected, particularly those with partners (14%) and family members (12.1%). In addition, (10%) reported anxiety, (18.7%) experienced sleep difficulties, and (1.2%) considered self-harm. To address these issues, reliable support systems for new mothers and their families are required, with postpartum care treatments playing an important role.

Table 4: ***Univariate analysis of health and social consequences of postpartum depression on the mother, child, and family, Northern Regional Hospital, 2023***

Variables **(n=321)**	Yes	No
Impact on daily functioning		
Experienced or experiencing a decline in your ability to carry out daily tasks or responsibilities after giving birth	62(19.3)	259(80.7)
Challenges in maintaining your personal hygiene and self-care	15(4.7)	306(95.3)
Struggle with time management and adhering to schedules	30(9.3)	291(90.7)
Relationships with spouses, family and friends been affected	31(9.7)	290(90.3)
Experience some physical health problems	58(18.1)	263(81.9)
Emotional Well-being		
Feel sad or hopeless	43(13.4)	278(86.6)
Get anxious or worry excessively	32(10.0)	289(90.0)
Find it difficult concentrating or making decisions	18(5.6)	303(94.4)
Feel changes in your appetite (increase or decrease)	89(27.7)	232(72.3)
Experience sleep disturbances (insomnia or excessive sleep)	60(18.7)	261(81.3)
Experience thoughts of self-harm or suicide]	4(1.2)	317(98.8)
Experiencing any physical challenges or symptoms after delivery		
Fatigue or low energy levels	71(22.1)	250(77.9)
Physical pain or discomfort	53(16.5)	268(83.5)
Problem feeding or bathing the baby	18(5.6)	303(94.4)
Household chores (e.g., cooking, cleaning)	65(20.2)	256(79.8)

Relationships and Social Support (relationships with the following individuals been affected)		
Spouse or partner	45(14.0)	276(86.0)
Family members	39(12.1)	282(87.9)
Friends	21(6.5)	300(93.5)
Baby	7(2.2)	314(97.8)

In conclusion, the results chapter provided analysis from the data collected, which included socio demographic characteristics, prevalence, risks factors, with the health and social consequences of PPD. The next chapter will discuss the result of the study.

CHAPTER FIVE

5.0 DISCUSSION

5.1 Introduction

This chapter discusses the results outlined in chapter four in accordance with the objectives of the study. The chapter presents the discussion on the prevalence, risks factors and the social and health consequences of postpartum depression.

5.2 Prevalence of postpartum depression

The results provided valuable insights into the prevalence and severity of postpartum depression among the surveyed mothers based on their EPDS scores. The overall prevalence of PPD, considering all levels (mild, moderate, and severe), was 10.9 per cent. This suggests that a significant proportion of mothers in the sample experienced some degree of depression, which aligns with existing research indicating that PPD is relatively common among new mothers. This is consistent with the prevalence estimates of PPD by UNICEF and WHO, (2016) as 10–45 per cent in lower-income countries, particularly in Africa. Also, a study conducted at Komfo Anokye Teaching Hospital found a prevalence of 12.6 per cent among postpartum women using the EPDS, with a sample size of 257 mothers, which collaborates with this study findings. Most mothers (89.1%) scored below 9 on the EPDS, indicating that depression is not likely. However, a notable proportion of mothers (9.0%) scored between 10 and 14, indicating mild depression. A smaller percentage of mothers (1.6%) scored between 15 and 20, indicating moderate depression. Only one mother (0.3%) scored 21 and above, indicating severe depression. This distribution highlights the spectrum of PPD severity among the surveyed mothers, with the majority experiencing either no depression or mild symptoms. The data suggests that the severity of PPD among surveyed mothers is relatively low, with the majority experiencing mild or no depression.

However, the study findings thus not corroborate with the results of a study conducted by Ebeigbe & Akhigbe, (2008) which revealed a prevalence of 27.2 per cent among mothers attending clinic at tertiary hospital in Nigeria. It is noteworthy, however, that a 2013 study by Young and Jeong reported that 36.7% of mothers receiving clinic care at a government hospital in Korea had PPD, a much greater prevalence of PPD than the results of this study. Not to mention excluding other elements like culture and conflict that could have an impact on the study environments.

It is important to note that even mild depression can have significant impacts on a mother's well-being, which requires some level of attention and support. While the prevalence of severe PPD is low in this study, healthcare providers should still be vigilant in screening and addressing depression among new mothers. Routine screening for PPD using tools like the EPDS is essential to identify mothers at risk and facilitate early intervention. Healthcare providers should offer comprehensive support and resources to mothers experiencing any level of PPD, including access to counselling, support groups, and psychiatric care if needed. Strategies to promote maternal mental health, such as enhancing social support networks, encouraging self-care practices, and addressing psychosocial stressors, should be integrated into postnatal care programs. Public health efforts should focus on raising awareness about PPD, reducing stigma, and promoting mental health literacy among healthcare providers, families, and communities.

The implication of the results underscores the importance of recognizing and addressing PPD as a major threat to public health. Understanding the prevalence and severity of PPD, allows healthcare providers and support systems to better assist in the mental health and well-being of new mothers throughout the essential postpartum period by implementing appropriate intervention.

5.3 Risk factors of PPD

The findings in this study provided a significant understanding of the possible risk factors linked to PPD among mothers. The study revealed a trend suggesting that mothers with a history of mental

health illness had an increased risk of PPD, this association was not statistically significant after adjusting for other factors (p = 0.729). Mothers with family members diagnosed with mental health disorders showed significantly higher odds of experiencing PPD (p = 0.209), indicating a potential familial predisposition to PPD. Mothers who reported significant life stressors in the past year had notably higher risk of depression (p < 0.001), underlining the impact of external stressors on mother's mental health. While mothers with chronic physical health conditions showed increased risk of PPD in the unadjusted model, this association was not significant after adjusting for other variables (p = 0.377). Mothers with planned pregnancies had significantly lower risk of PPD (p < 0.001), suggesting that planned pregnancy served as a protective factor against PPD. Mothers who experienced complications during pregnancy had higher risk of PPD (p = 0.028), emphasising the role of pregnancy-related health issues in PPD. While the association between complications during childbirth and PPD was not statistically significant after adjustment, it still highlighted a trend (p = 0.094). Lack of support from family and friends showed a non-significant trend towards increased risk of PPD (p = 0.47), suggesting that social support played a role in mitigating PPD risk. Although receiving assistance showed increased risk of PPD, this association was not significant after adjusting for other variables (p = 0.183). Mothers who experienced ongoing relationship difficulties had significantly higher risk of PPD (p = 0.006), underscoring the impact of interpersonal conflicts on mother's mental health. Mothers who had experienced a recent major life events or transition had higher risk of PPD (p = 0.010), indicating the role of stressful life events in PPD. Mothers who currently experienced significant stressors had higher risk of PPD (p = 0.023), highlighting the importance of addressing ongoing stressors in PPD prevention and management.

The findings of this study corroborate with other studies, which found a significant correlation between PPD and several risk factors. According to Fan et al., (2020), the most significant risk factors for PPD, were prenatal anxiety and depression, experiencing stressful life events, lack of

social support, and a history of depression. Pregnancy-related sadness, low self-esteem, stress from childcare, marital relationship, infant temperament, limited social support, socioeconomic status, and unintended/unwanted pregnancy were all found to be factors of depression (Fan et al., 2020).

Dissatisfaction with one's marriage, fights with spouse, financial issues, and loss of work were the psychosocial factors that were found to be risk factors for PPD. Another risk factor, according to the analysis, was the absence of emotional support from family (Fantahun et al., 2018).

Overall, the results implied or suggested that a combination of personal, family, social, and environmental factors contributed to the risk of PPD. Which aligns with other study findings conducted also in Ghana by Gold et al., (2013) and Anokye et al., (2018). Effective prevention and intervention strategies such as early screening to detect PPD, should address these multifaceted risk factors to support mothers' mental health during the postpartum period. Additionally, further research may be needed to explore the interplay between these factors and their cumulative impact on PPD risk.

5.4 Health and social consequences

The results from the data analysed sheds light on the diverse challenges faced by mothers during the postpartum period, encompassing various aspects of daily functioning, emotional well-being, physical health, and social relationships. The findings revealed that a significant proportion of mothers reported experiencing a decline in their ability to carry out daily tasks or responsibilities (19.3%). This suggested that many mothers struggle with managing household chores, caring for themselves, and fulfilling their responsibilities after giving birth. Challenges in maintaining personal hygiene and self-care were also reported by a notable percentage of mothers (4.7%), this indicated that some mothers face difficulties in attending to their own basic needs during the postpartum period.

Struggles with time management and adhering to schedules were evident (9.3%), which exacerbated feelings of stress and overwhelmness among mothers, reflecting the adjustment required to balance caregiving responsibilities with other commitments and the impact on relationships with spouse, family, and friends revealed the strain that mothers encountered on social connections and support networks (9.7%). Additionally, a notable portion reported experiencing physical health problems such as headaches, and body pains because of PPD (18.1%).

A significant number of mothers reported experiencing feelings of sadness or hopelessness, indicating the prevalence of postpartum blues or depressive symptoms (13.4%), Anxiety or excessive worrying was also reported by a notable percentage of mothers, reflecting the heightened stress and anxiety commonly experienced during the postpartum period (10.0%), Difficulties with concentration and decision-making were noted, which further contributed to feelings of frustration and overwhelm (5.6%), changes in appetite (27.7%), sleep disturbances (18.7%), were prevalent, which were some associated effects related to postpartum adjustment and the presence of thoughts of self-harm or suicide (1.2%) among a small percentage of mothers is concerning and underscores the need for immediate intervention and support (Agrawal et al., 2022).

Postpartum physical challenges were also prevalent, including fatigue or low energy levels (22.1%), physical pain or discomfort (16.5%) attributed to the recovery process following childbirth, Difficulties in feeding or bathing the baby (5.6%), and managing household chores (20.2%), indicated the practical challenges that mothers faced in adjusting to their new role as caregivers.

Relationships with spouses or partners (14.0%), family members (12.1%), and friends (6.5%) were affected for a significant proportion of mothers, which revealed the strain of mothers regarding interpersonal connections. The impact on the relationship with the baby (2.2%), albeit reported by

a smaller percentage, underscores the challenges in bonding and adjusting to the demands of motherhood.

The findings in this study agree with, several studies that have demonstrated the health and social consequences of PPD on both child development and mother-infant bonding. According to Grace, Evindar, and Stewart (2003), PPD had an adverse effect on the mother's health as well as the child's development and had negative clinical implications for mother-infant attachments. The mother exhibited a withdrawn and disengaged behaviour or been overbearing and hostile toward the infant, which affected breastfeeding, communication, bonding, sleep patterns, and other aspects of mother-infant relationships (Grace et al., 2003).

Also, according to Abdollahi & Zarghami, (2018), in a study conducted found out that poor mother-to-child bonding, insomnia, breastfeeding difficulties, suicidal tendencies, poor appetite leading to anemia, and the lack of desire to become pregnant again were some of the health and social consequences mothers experienced as a result of depressive episodes (Abdollahi & Zarghami, 2018).

Furthermore, in a study conducted by Weobong et al., (2015) it was revealed that mothers who were depressed experienced some effects such as poor communication, poor sleeping patterns and quality, loss weigh, easily angry and also neglected their infants. Though the severity varied depending on the risk factors and the care given to the mothers in various study settings regarding PPD, these literatures reviewed found evidence that corroborate with the findings of this study (Weobong et al., 2015).

However, the findings draw attention to the variety of health and social effects that mothers are confronted with throughout the postpartum period. These effects not only impact their daily functioning and physical health but also significantly affect their emotional well-being and relationships. The prevalence of distressing symptoms such as feelings of sadness, anxiety, and

thoughts of self-harm or suicide highlights the critical need for comprehensive support and intervention strategies to address maternal mental health during this vulnerable period. Additionally, addressing physical health challenges and supporting daily tasks and responsibilities can contribute to overall well-being and adjustment to motherhood.

In conclusion, this chapter provided the discussion of the results of the study with respect to the relevant literature, the next chapter concludes the study.

CHAPTER SIX

6.0 SUMMARY, CONCLUSION AND RECOMMENDATION

6.1 Introduction

This chapter summarizes the study findings and makes comments on the implications of the findings. The section also draws conclusions based on the findings on this study and makes recommendations based on the conclusions to guide practice and policy.

6.2 Summary

In brief this study provided insights into the socio-demographics, prevalence, risk factors, and health and social consequences of PPD among mothers attending PNC services at the Northern Regional Hospital. The study revealed that a significant proportion of mothers had babies aged 4 weeks or more, and close to a third had three children. Additionally, most mothers gave birth normally, with a small percentage who had a caesarean section. These demographic factors are noted to impact the likelihood of experiencing PPD.

The prevalence of PPD, based on EPDS scores, was found to be 10.9 per cent. While most mothers scored below 9 on the EPDS, indicating no depression, a notable proportion experienced mild to severe depression. The study emphasised the importance of routine screening for PPD and the need for comprehensive support and interventions for affected mothers.

Various risk factors associated with PPD were identified to include a history of mental health issues, family history of mental health disorders, significant life stressors, complications during pregnancy, lack of social support, ongoing relationship difficulties, and recent major life events or transition. While some associations were statistically significant, others showed trends toward increased risk, highlighting the complex interplay of personal, family, social, and environmental factors. The findings were consistent with previous studies which emphasises the importance of

addressing diverse risk factors to support maternal mental health during the postpartum period with reference to risk factors.

With regards to the health and social consequences, the study revealed the diverse challenges faced by mothers during the postpartum period, which included difficulties in daily functioning, emotional well-being, physical health, and social relationships. Mothers reported a decline in their ability to carry out daily tasks, challenges in maintaining personal hygiene and self-care, struggled with time management, and a significant impact on relationships with spouse, family, and friends. Additionally, physical health problems, emotional distress, and difficulties in bonding with the baby were prevalent, underscoring the need for a holistic support and integrated strategies to address maternal mental health during this vulnerable period.

Generally, this study emphasised the importance of recognizing and addressing PPD as a significant public health concern, requiring a multidimensional approach to support maternal mental health during the critical postpartum period.

6.3 Conclusions

In conclusion the study found 10.9 per cent of the mothers depressed. Numerous risk factors, including societal, family, environmental, and personal ones, contributed to increased susceptibility. The complicated problem of PPD affected mothers' physical, and social interactions, in addition to their emotional and mental health. To successfully manage mothers' mental health during the postpartum period, integrated strategies that lower stress, build social support networks, and promote self-care behaviours are needed. Moreover, PPD must be recognized and treated as a serious public health issue by health professional, support networks, and policy makers.

6.4 Recommendations

Based on the study's findings, the following conclusions and recommendations are made to inform policy and practice to support mothers experiencing PPD and mitigate its impact:

6.4.1 Practical recommendations

Provision of routine screening, during antenatal and postpartum care visits, staffs should conduct routine PPD checks using validated instruments like the EPDS. For mothers who are experiencing or at risk of depression, this will make early detection and intervention easier.

Health facilities including the Northern Regional Hospital should as part of measures to mitigate the impact of PPD, offer comprehensive support services tailored to the needs of mothers experiencing PPD, including access to counselling, support groups, as well as psychiatric care. Programs for postnatal care should incorporate these services, and all mothers should have easy access to them.

Health staffs (Midwives) should liaise with the Mental Health Unit to provide psychoeducation to mothers and their families about PPD, its symptoms, risk factors, and available support systems. This will help increase awareness, reduce stigma, and promote early help-seeking behaviour among affected individuals.

6.4.2 Policy recommendations

Advocacy for policies that prioritise maternal mental health and allocate resources for PPD prevention, screening, and treatment programs. Policy support is essential for creating supportive environments and systems that promote maternal well-being and early intervention for PPD.

6.4.3 Research recommendations

Future studies are needed by academia, Ghana Health Service (GHS) research unit and also the metropolitan health directorate to understand the level of awareness, beliefs, or perception among community members. This would enable stakeholders develop appropriate strategies in reducing its burden PPD on mothers.

By implementing these recommendations, stakeholders can work together to address the multifaceted challenges of PPD and support the mental health and well-being of mothers during pregnancy and the postpartum period.

REFERENCES

Abdollahi, F., & Zarghami, M. (2018). Effect of postpartum depression on women's mental and physical health four years after childbirth. *Eastern Mediterranean Health Journal*, *24*(10), 1002–1009. https://doi.org/10.26719/2018.24.10.1002

Abdul Rahman, I., Yaqoob, U., & Bhatti, T. A. (2018). Post partum depression—It's time to pay attention. *Asian Journal of Psychiatry*. https://doi.org/10.1016/j.ajp.2018.02.010

Abuaku, B., Ahorlu, C., Psychas, P., Ricks, P., Oppong, S., Mensah, S., Sackey, W., & Koram, K. A. (2018). Impact of indoor residual spraying on malaria parasitaemia in the Bunkpurugu-Yunyoo District in northern Ghana. *Parasit Vectors.*, *11*(1), 555. https://doi.org/10.1186/s13071-018-3130-z

Adeyemo, E. O., Oluwole, E. O., Kanma-Okafor, O. J., Izuka, O. M., & Odeyemi, K. A. (2020). Prevalence and predictors of postpartum depression among postnatal women in Lagos, Nigeria. *African Health Sciences*, *20*(4), 1943–1954. https://doi.org/10.4314/AHS.V20I4.53

Afolayan, J. A., Onasoga, O. A., Rejuaro, F. M., Gambari, Y. A.-R., & Onuabueke, C. (2016). Knowledge of Postpartum Depression and its Associated Risk Factors Among Nurse-Midwives in a Nigerian Tertiary Hospital. *Sierra Leone Journal of Biomedical Research*. https://doi.org/10.4314/sljbr.v8i2.7

Agrawal, I., Mehendale, A. M., & Malhotra, R. (2022). Risk Factors of Postpartum Depression. *Cureus*. https://doi.org/10.7759/cureus.30898

Alshikh Ahmad, H., Alkhatib, A., & Luo, J. (2021). Prevalence and risk factors of postpartum depression in the Middle East: a systematic review and meta–analysis. *BMC Pregnancy and Childbirth*. https://doi.org/10.1186/s12884-021-04016-9

Anokye, R., Acheampong, E., Budu-Ainooson, A., Obeng, E. I., & Akwasi, A. G. (2018).

Prevalence of postpartum depression and interventions utilized for its management. *Annals of General Psychiatry*. https://doi.org/10.1186/s12991-018-0188-0

Apenkwa, J., Asante, L. S., Boakye-Boateng, S. K., & Donkor, M. (n.d.). 2023) Prevalence, Demographic and Obstetric Risk Factors of Postpartum Depression among Postnatal Clinic Attendants at St John of God Hospital, Duayaw Nkwanta. *Adv Pediatr Res*, *10*(2), 58. https://doi.org/10.35248/2385-4529.23.10.058

Atuhaire, C., Rukundo, G. Z., Nambozi, G., Ngonzi, J., Atwine, D., Cumber, S. N., & Brennaman, L. (2021). Prevalence of postpartum depression and associated factors among women in Mbarara and Rwampara districts of south-western Uganda. *BMC Pregnancy and Childbirth*, *21*(1), 1–12. https://doi.org/10.1186/S12884-021-03967-3/TABLES/3

Beck, C. T. (1998). The effects of postpartum depression on child development: A meta-analysis. *Archives of Psychiatric Nursing*. https://doi.org/10.1016/S0883-9417(98)80004-6

Becker, M., Weinberger, T., Chandy, A., & Schmukler, S. (2016). Depression During Pregnancy and Postpartum. In *Current Psychiatry Reports*. https://doi.org/10.1007/s11920-016-0664-7

Bener, A., Gerber, L. M., & Sheikh, J. (2012). Prevalence of psychiatric disorders and associated risk factors in women during their postpartum period: A major public health problem and global comparison. *International Journal of Women's Health*. https://doi.org/10.2147/IJWH.S29380

Bhakta, M., Satapathy, D. M., Padhy, M., Dalai, S., Panda, J. N., Marandi, P., SVN, S., & Pattnaik, A. (2024). Assessing the Prevalence and Risk Factors of Postpartum Depression: A Cross-Sectional Study Conducted in the Urban Areas of Ankuli in Southern Odisha. *Cureus*, *16*(6). https://doi.org/10.7759/CUREUS.61503

Bhusal, B. R., Bhandari, N., Chapagai, M., & Gavidia, T. (2016). Validating the edinburgh

postnatal depression scale as a screening tool for postpartum depression in kathmandu, Nepal. *International Journal of Mental Health Systems*. https://doi.org/10.1186/s13033-016-0102-6

Breese McCoy, S. J., Beal, M., Miller Shipman, S. B., Payton, M. E., & Watson, G. H. (2006). Risk factors for postpartum depression: A retrospective investigation at 4-weeks postnatal and a review of the literature. *Journal of the American Osteopathic Association*, *106*(4), 193–198.

Chen, Q., Li, W., & Xiong, J. (2022). *Prevalence and Risk Factors Associated with Postpartum Depression during the COVID-19 Pandemic : A Literature Review and Meta-Analysis*.

Cho, H., Lee, K., Choi, E., Cho, H. N., Park, B., & Suh, M. (2022). Association between social support and postpartum depression. *Scientific Reports*, 1–9. https://doi.org/10.1038/s41598-022-07248-7

Daliri, D. B., Afaya, A., Afaya, R. A., & Abagye, N. (2023). Postpartum depression: The prevalence and associated factors among women attending postnatal clinics in the Bawku municipality, Upper East Region of Ghana. *Psychiatry and Clinical Neurosciences Reports*, *2*(3), e143. https://doi.org/10.1002/PCN5.143

Ebeigbe, P. N., & Akhigbe, K. O. (2008). Incidence and associated risk factors of postpartum depression in a tertiary hospital in Nigeria. *The Nigerian Postgraduate Medical Journal*.

Engle, P. L. (2009). Maternal mental health: Program and policy implications. *American Journal of Clinical Nutrition*. https://doi.org/10.3945/ajcn.2008.26692G

Fan, Q., Long, Q., De Silva, V., Gunarathna, N., Jayathilaka, U., Dabrera, T., Lynn, H., & Østbye, T. (2020a). Prevalence and risk factors for postpartum depression in Sri Lanka: A population-based study. *Asian Journal of Psychiatry*, *47*, 101855.

https://doi.org/10.1016/J.AJP.2019.101855

Fan, Q., Long, Q., De Silva, V., Gunarathna, N., Jayathilaka, U., Dabrera, T., Lynn, H., & Østbye, T. (2020b). Prevalence and risk factors for postpartum depression in Sri Lanka: A population-based study. *Asian Journal of Psychiatry*. https://doi.org/10.1016/j.ajp.2019.101855

Fantahun, A., Cherie, A., & Deribe, L. (2018). Prevalence and Factors Associated with Postpartum Depression Among Mothers Attending Public Health Centers of Addis Ababa, Ethiopia, 2016. *Clinical Practice & Epidemiology in Mental Health*, *14*(1), 196–206. https://doi.org/10.2174/1745017901814010196

Froeliger, A., Deneux-Tharaux, C., Loussert, L., Bouchghoul, H., Madar, H., & Sentilhes, L. (2024). Prevalence and risk factors for postpartum depression 2 months after a vaginal delivery: a prospective multicenter study. *American Journal of Obstetrics and Gynecology*, *230*(3), S1128-S1137.e6. https://doi.org/10.1016/J.AJOG.2023.08.026

Gjerdingen, D. K., & Yawn, B. P. (2007). Postpartum Depression Screening: Importance, Methods, Barriers, and Recommendations for Practice. *The Journal of the American Board of Family Medicine*, *20*(3), 280–288. https://doi.org/10.3122/jabfm.2007.03.060171

Gogue, C., Wagman, J., Tynuv, K., Saibu, A., Yihdego, Y., Malm, K., Mohamed, W., Akplu, W., Tagoe, T., Ofosu, A., Williams, I., Asiedu, S., Richardson, J., Fornadel, C., Slutsker, L., & Robertson, M. (2020). An observational analysis of the impact of indoor residual spraying in Northern, Upper East, and Upper West Regions of Ghana: 2014 through 2017. *Malaria Journal*, *19*(1), 1–13. https://doi.org/10.1186/S12936-020-03318-1/FIGURES/4

Gold, K. J., Spangenberg, K., Wobil, P., & Schwenk, T. L. (2013). Depression and risk factors for depression among in Kumasi, Ghana. *International Journal of Gynecology & Obstetrics*.

https://doi.org/10.1016/j.ijgo.2012.09.016

Goweda, R., & Metwally, T. (2020). Prevalence and associated risk factors of postpartum depression: A cross sectional study. *Revista de Psiquiatria Clinica*. https://doi.org/10.1590/0101-60830000000242

Grace, S. L., Evindar, A., & Stewart, D. E. (2003). The effect of postpartum depression on child cognitive development and behavior: A review and critical analysis of the literature. In *Archives of Women's Mental Health*. https://doi.org/10.1007/s00737-003-0024-6

Gress-Smith, J. L., Luecken, L. J., Lemery-Chalfant, K., & Howe, R. (2012). Postpartum depression prevalence and impact on infant health, weight, and sleep in low-income and ethnic minority women and infants. *Maternal and Child Health Journal*. https://doi.org/10.1007/s10995-011-0812-y

Halbreich, U., & Karkun, S. (2006). Cross-cultural and social diversity of prevalence of postpartum depression and depressive symptoms. In *Journal of Affective Disorders*. https://doi.org/10.1016/j.jad.2005.12.051

Hay, D. F., & Kumar, R. (1995). Interpreting the effects of mothers' postnatal depression on children's intelligence: A critique and re-analysis. *Child Psychiatry and Human Development*. https://doi.org/10.1007/BF02251301

Heh, S. S. (2013). Postpartum depression. *Journal of Nursing*. https://doi.org/10.6224/JN.60.6.22

Josefsson, A., Berg, G., Nordin, C., & Sydsjö, G. (2001). Prevalence of depressive symptoms in late pregnancy and postpartum. *Acta Obstetricia et Gynecologica Scandinavica*. https://doi.org/10.1034/j.1600-0412.2001.080003251.x

Letourneau, N. L., Dennis, C. L., Cosic, N., & Linder, J. (2017). The effect of perinatal depression treatment for mothers on parenting and child development: A systematic review.

In *Depression and Anxiety*. https://doi.org/10.1002/da.22687

Mathisen, S. E., Glavin, K., Lien, L., & Lagerløv, P. (2013). Prevalence and risk factors for postpartum depressive symptoms in Argentina: A cross-sectional study. *International Journal of Women's Health*. https://doi.org/10.2147/IJWH.S51436

McCoy, S. J. B., Beal, J. M., Shipman, S. B. M., Payton, M. E., & Watson, G. H. (2006). Risk factors for postpartum depression: a retrospective investigation at 4-weeks postnatal and a review of the literature. *The Journal of the American Osteopathic Association*.

Meltzer-Brody, S., Howard, L. M., Bergink, V., Vigod, S., Jones, I., Munk-Olsen, T., Honikman, S., & Milgrom, J. (2018). Postpartum psychiatric disorders. *Nature Reviews Disease Primers*. https://doi.org/10.1038/nrdp.2018.22

Montazeri, A., Torkan, B., & Omidvari, S. (2007). The edinburgh postnatal depression scale (EPDS): Translation and validation study of the Iranian version. *BMC Psychiatry*. https://doi.org/10.1186/1471-244X-7-11

N., G., C., B. B., M.T., B., J., A.-P., R., H., D., B., M., K., S., P., S., D., C., B. B., L., S., A., J., S.B., N., K.A., E., E., N., H., T., S., E., Guo, N., Bindt, C., … Ehrhardt, S. (2013). Association of antepartum and postpartum depression in ghanaian and ivorian womenwith febrile illness in their offspring: A prospective birth cohort study. *American Journal of Epidemiology*. https://doi.org/10.1093/aje/kwt142

Peltzer, K., Rodriguez, V. J., Lee, T. K., & Jones, D. (2018). Prevalence of prenatal and postpartum depression and associated factors among HIV-infected women in public primary care in rural South Africa: A longitudinal study. *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV*. https://doi.org/10.1080/09540121.2018.1455960

Rai, S., Pathak, A., & Sharma, I. (2015). Postpartum psychiatric disorders: Early diagnosis and

management. *Indian Journal of Psychiatry*. https://doi.org/10.4103/0019-5545.161481

Reck, C., Noe, D., Gerstenlauer, J., & Stehle, E. (2012). Effects of postpartum anxiety disorders and depression on maternal self-confidence. *Infant Behavior and Development*. https://doi.org/10.1016/j.infbeh.2011.12.005

Segre, L., & Davis, W. (2013). *Postpartum depression and perinatal mood disorders in the DSM*. Postpartum Support International.

Shelke, A., & Chakole, S. (2022). A Review on Risk Factors of Postpartum Depression in India and Its Management. *Cureus*. https://doi.org/10.7759/cureus.29150

Sockol, L. E., Epperson, C. N., & Barber, J. P. (2013). Preventing postpartum depression: A meta-analytic review. In *Clinical Psychology Review*. https://doi.org/10.1016/j.cpr.2013.10.004

Spada, P. G. M. L., Brockman, N. S. I., Livingston, M. K. S., Kolko, E. M., & Nichols, N. (2022). Postpartum Depression — Identifying Risk and Access to Intervention. *Current Psychiatry Reports*, 889–896. https://doi.org/10.1007/s11920-022-01392-7

Wang, Z., Liu, J., Shuai, H., Cai, Z., Fu, X., Liu, Y., Xiao, X., Zhang, W., Krabbendam, E., Liu, S., Liu, Z., Li, Z., & Yang, B. X. (2021). Mapping global prevalence of depression among postpartum women. *Translational Psychiatry 2021 11:1*, *11*(1), 1–13. https://doi.org/10.1038/s41398-021-01663-6

Weobong, B., Akpalu, B., Doku, V., Owusu-Agyei, S., Hurt, L., Kirkwood, B., & Prince, M. (2009). The comparative validity of screening scales for postnatal common mental disorder in Kintampo, Ghana. *Journal of Affective Disorders*. https://doi.org/10.1016/j.jad.2008.05.009

Weobong, B., Ten Asbroek, A. H. A., Soremekun, S., Danso, S., Owusu-Agyei, S., Prince, M.,

& Kirkwood, B. R. (2015). Determinants of postnatal depression in rural Ghana: Findings from the don population based cohort study. *Depression and Anxiety*. https://doi.org/10.1002/da.22218

WHO/UNICEF JMP. (2010). World Health Organization and UNICEF 2010. *World Health.*

WHO. (2010). World Health Statistics 2010. In *WHO Library*.

WHO. (2016). WHO | Millennium Development Goals (MDGs). In *Who*. https://doi.org/10.1007/s10584-007-9305-9

Wilkinson, A., Anderson, S., & Wheeler, S. B. (2017). Screening for and Treating Postpartum Depression and Psychosis: A Cost-Effectiveness Analysis. *Maternal and Child Health Journal*. https://doi.org/10.1007/s10995-016-2192-9

Žuti, M. (2023). *Biopsychosocial Models of Peripartum Depression: A Narrative Review*. https://doi.org/10.5093/clysa2023a16

APPENDIX I – DATA COLLECTION TOOLS

UNIVERSITY FOR DEVELOPMENT STUDIES

SCHOOL OF PUBLIC HEALTH

DEPARTMENT OF GLOBAL AND INTERNATIONAL HEALTH

TOPIC: PREVALENCE AND ASSOCIATED RISKS FACTORS OF POSTPARTUM DEPRESSION AMONG MOTHERS ATTENDING POSTNATAL CLINICS AT THE NORTHERN REGIONAL HOSPITAL, N/R.

Dear Respondent,

I am a student at the University for Development Studies, School of Public Health and my interest is to investigate ***Prevalence and some risks factors that predispose mothers to postpartum depression who attend postnatal clinics at the Northern Regional Hospital, N/R.***

The questionnaire will collect information from your individual records on your pregnancy outcomes, and socio-demographic, some risk factors and associated effects experienced after delivery. The information will be used for research purposes only and will be kept confidential. Your participation is voluntary, and you can withdraw at any time without any consequences. The questionnaire will take about 15 minutes to complete. Please answer the questions by ticking the appropriate box or writing in the space provided. If you have any questions or concerns, please contact the researcher at the following address:

Code / Number……. **Date……**

Section A

Socio-demographic Data

Please tick or complete where appropriate.

Age	18-26	27-34	35-42	43-50	50+
Marital status	Single	Married	Divorced	Co-habit	Widowed
Religion	Christianity	Islam	Traditional	Others	
Education	None	Basic/Primary	JHS	SHS	Tertiary
Occupation	Housewife	Farmer	Civil servant	Business	
Mode of delivery	Normal	CS			
Pregnancy outcome	Term	Preterm	Still-birth		

Age of baby	< 7days	2 weeks (14 days)	3 weeks (21days)	4 weeks (28 days)	5 weeks (35 days)
No. of Child(ren)	1	2	3	4	5+
Category	Multiparity	Primigravid			

Section B

INSTRUCTIONS: Edinburgh Postnatal Depression Scale (EPDS) *Cox JL, Holden JM Sagovsky R (1987) Detection of postnatal depression: development of the 10-item Edinburgh postnatal depression scale. Brit J Psychiatry 150 782-86. Reproduced with permission.*

I would like to know how you have been feeling in the past week. Please indicate which of the following comes closest to how you have been feeling over the past seven days, not just how you feel today. Please tick one circle for each question that comes closest to how you have felt in the **last seven days.**

Here is an example already completed.

I have felt happy:

[ ] Yes, all of the time

[*] Yes, most of the time

[ ] No, not very often

[ ] No, not at all

This would mean: **'I have felt happy most of the time during the past week'.**

Please complete the other questions in the same way, by ticking the most appropriate

No.	Statement	Responses			
1	I have been able to laugh and see the funny side of things:	As much as I always could	Not quite as much now	Definitely not so much now	Not at all
		0	1	2	3
2	I have looked forward with enjoyment to things:	As much as I ever did	Rather less than I used to	Definitely less than I used to	Hardly at all
		0	1	2	3
3*	I have blamed myself unnecessarily when things went wrong:	Yes, most of the time	Yes, some of the time.	Not very often	No, never.
		3	2	1	0
4	I have been anxious or worried for no good reason:	No, not at all.	Hardly ever	Yes, sometimes.	Yes, very often.
		0	1	2	3
5*	I have felt scared or panicky for no very good reason:	Yes, quite a lot.	Yes, sometimes	No, not much	No, not at all.
		3	2	1	0
6*	Things have been getting on top of me:	Yes, most of the time I haven't been able to cope at all	Yes, sometimes I haven't been coping as well as usual	No, most of the time I have coped quite well.	No, I have been coping as well as ever.
		3	2	1	0

7*	I have been so unhappy that I have had difficulty sleeping:	Yes, most of the time	Yes, sometimes.	Not very often	No, not at all.
		3	2	1	0
8*	I have felt sad or miserable:	Yes, most of the time	Yes, quite often	Not very often	No, not at all
		3	2	1	0
9*	I have been so unhappy that I have been crying:	Yes, most of the time	Yes, quite often	Only occasionally	No, never
		3	2	1	0
10*	The thought of harming myself has occurred to me:	Yes, quite often	Sometimes	Hardly ever	Never
		3	2	1	0

EPDS SCORE	INTERPRETATION
Less than 10	Depression not likely
10 – 14	Mild depression (Depression possible)
15 – 20	Moderately depressed (high possibility of depression)
21 above	Severe depression

Section C (Risk Factors)

Personal and Family History (Mental Health Status)

No.	Statement	Yes	No
1	Do you have a previous history of mental health issues (e.g., depression, anxiety)?		
2	Has anyone in your immediate family (parents, siblings) been diagnosed or experienced depression or any other mental health disorder?		
3	Have you experienced any significant life stressors in the past year? (e.g., loss of a loved one, job loss, relationship difficulties)		
4	Do you have any history of chronic physical health conditions?		

Pregnancy and Childbirth factors

No.	Statement	Yes	No
1	Was your pregnancy planned?		
2	Did you experience any complications during pregnancy?		
3	Did you have any complications during childbirth?		
4	Did you have a traumatic birth experience?		
5	Do you have a history of miscarriage or stillbirth?		

Social Support and Relationship

No.	Statement	Yes	No
1	Do you feel supported by your partner/spouse, family or friends during your pregnancy and postpartum period?		

2	Do you have a strong support system from family and friends?		
3	Do you feel comfortable asking for help or support when needed?		
4	Have you received any assistance with household chores or childcare responsibilities?		
5	Are there any ongoing conflicts or strains in your relationships that may affect your well-being?		

Stress and Life Events

No.	Statement	Yes	No
1	Have you experienced recent major life events or changes (e.g., relocation, job loss) during pregnancy or postpartum?		
2	Are you currently experiencing significant life stressors (financial difficulties, relationship problems, work-related stress etc.)		
3	Are you experiencing some relationship difficulties.		

Section D (Impact or effects)

Impact on daily functioning

No.	Statement	Yes	No
1	Have you experienced a decline in your ability to carry out daily tasks or responsibilities since giving birth?		
2	Do you have challenges in maintaining personal hygiene and self-care?		
3	Do you struggle with time management and organization.		
4	Have your relationships with family and friends been affected?		
5	Do you have difficulty concentrating or making decisions?		
6	Do you experience some physical health problems (e.g., headaches, stomach-aches)?		

Emotional Well-being

No.	Statement	Yes	No
1	Do you feel of sad or hopeless		
2	Do you get anxious or worry excessively		
3	Can you say you are self-confidence and have self-esteem		
4	Do you find it difficult concentrating or making decisions		
5	Do you feel changes in your appetite (increase or decrease)		
6	Do you experience sleep disturbances (insomnia or excessive sleep)		
7	Do you experience thoughts of self-harm or suicide		

Physical Well-being

Have you been experiencing any physical symptoms after delivery?

No.	Statement	Yes	No
1	Fatigue or low energy levels		
2	Physical pain or discomfort		
3	Taking care of your baby's basic needs (e.g., feeding, bathing)		
4	Household chores (e.g., cooking, cleaning)		

Relationships and Social Support

Has the condition (postpartum depression) affected your relationships with the following individuals?

No.	Statement	Yes	No
1	Spouse or partner		
2	Family members		
3	Friends		
4	Baby		

I am sincerely grateful for your time and patience, wish you and your baby well and if you have any concern that you think I can assist, please don't hesitate to let me know. God bless you.

APPENDIX II – ETHICAL APPROVAL LETTER

GHANA HEALTH SERVICE ETHICS REVIEW COMMITTEE

In case of reply the number and date of this Letter should be quoted.

Research & Development Division
Ghana Health Service
P. O. Box MB 190
Accra
Digital Address: GA-050-3303
Mob: +233-50-3539896
Tel: +233-302-960628
Email: ethics.research@ghs.gov.gh

My Ref. GHS/RDD/ERC/Admin/App/24/054
Your Ref. No.

12th February 2024

Prosper Mbawuni
C/o Northern Regional Health Directorate
P.O. Box 99
Tamale

The Ghana Health Service Ethics Review Committee has reviewed and given approval for the implementation of your Study Protocol.

GHS-ERC Number	**GHS-ERC: 038/11/23**
Study Title	Prevalence and associated risks factors of postpartum depression among mothers attending postnatal clinic at the Tamale Regional Hospital, Northern Region
Approval Date	12th February, 2024
Expiry Date	11th February, 2025
GHS-ERC Decision	**Approved**

This approval requires the following from the Principal Investigator

- Submission of a yearly progress report of the study to the Ethics Review Committee (ERC)
- Renewal of ethical approval if the study lasts for more than 12 months,
- Reporting of all serious adverse events related to this study to the ERC within three days verbally and seven days in writing.
- Submission of a final report after completion of the study
- Informing ERC if study cannot be implemented or is discontinued and reasons why
- Informing the ERC and your sponsor (where applicable) before any publication of the research findings.

You are kindly advised to adhere to the national guidelines or protocols on the prevention of COVID -19

Please note that any modification of the study without ERC approval of the amendment is invalid.

The ERC may observe or cause to be observed procedures and records of the study during and after implementation.

Kindly quote the protocol identification number in all future correspondence in relation to this approved protocol

SIGNED.....
Mr. Kofi Wellington
(GHS ERC Chairperson)

Cc: The Director, Research & Development Division, Ghana Health Service, Accra

APPENDIX III: ADMINISTRATIVE APPROVAL LETTER

868

GHANA HEALTH SERVICE
REGIONAL HEALTH ... STAFF
NORTHERN REGION
28 FEB 2024
RECEIVED

UNIVERSITY FOR DEVELOPMENT STUDIES
(School of Public Health)

P.O. Box 1883
Tamale, Ghana

Our Ref: UDS/MPH/0045/21
Your Ref:

January 16, 2024

Department of Global and International Health

The Regional Director of Health Services
Ghana Health Service
Northern Region
Tamale

Dear Sir/Madam,

REQUEST TO COLLECT DATA FOR FINAL YEAR THESIS -PROSPER MBAWUNI

I write to request permission for Prosper Mbawuni, a final year Master of Public Health student, (Global Health Track) of the Department of Global and International Health, School of public Health to collect data from the Tamale Regional Hospital.

As part of the requirements for graduation, the student is undertaking a study titled "Prevalence and associated risks factors of postpartum depression among mothers attending postnatal clinic at the Tamale Regional Hospital". The school Will be very grateful if you could grant him the necessary support to facilitate the research process.

Thank you for your cooperation.

Yours Faithfully,

HEAD OF DEPT
DEP. OF GLOBAL & INTERNATIONAL HEALTH
SCHOOL OF PUBLIC HEALTH
UDS - TAMALE

Prof. Abdulai Abubakari
Pro. Abdulai Abubakari, MPH, PHD
(Head of Department)

RHIO
Fee x 9
22/02/2024

6

APPENDIX IV: ADMINISTRATIVE APPROVAL LETTER

OUR CORE VALUES:
1. People-centered
2. Professionalism
3. Team work
4. Innovation
5. Discipline
6. Integrity

My Ref No: GHS/NR/RHD/ 18 – 01 125
Your Ref No: .....

Regional Health Directorate
Ghana Health Service
P.O. Box 99
Tamale, Northern Region
Tel: +233 (03720)22912/22710/22146
GPS Address: NT-0001-7027
Email: rdhs.nr@ghs.gov.gh

Thursday, February 29, 2024

THE MEDICAL DIRECTOR,

NORTHERN REGIONAL HOSPITAL, TAMALE

LETTER OF INTRODUCTION

I write to introduce to you, **Mr. Prosper Mbawuni,** MPH student at the Department of Global and International Health, University for Development Studies, Tamale.
He is conducting a research on the topic **"Prevalence and Associated Risk Factors of Postpartum Depression among Mothers attending Postnatal Clinic at the Northern Regional Hospital".**

I will be very grateful if you could grant him the necessary permission to collect the required data at your facility.

He is to ensure ethical considerations during the process of data collection and after. I hope the findings will be shared with the region to inform management decision-making and policies to improve health service delivery in the region.

Thank you in anticipation of your support and cooperation in this regard.

DR. ABDULAI ABUKARI
REG. DIRECTOR OF HEALTH SERVICE
NORTHERN REGION

Cc:

- Regional Research Officer, RHD, Tamale
- *Mr Prosper Mbawuni, Regional Health Directorate, Tamale*
- File

PPENDIX V – PLAGIARISM REPORT

PREVALENCE OF POSTPARTUM DEPRESSION AND ITS ASSOCIATED RISK FACTORS AMONG POSTPARTUM MOTHERS ATTENDING POSTNATL CLINIC AT THE TAMALE REGIONAL HOSPITAL IN THE NORTHERN REGION

by Prosper Mbawuni

Submission date: 24-Apr-2024 04:33PM (UTC+0000)
Submission ID: 2360537145
File name: EDITED_NEW_THESIS_FINAL_2024_CURRENT_-_PLAGIARISM_CHECK-2.docx (1.33M)
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Ibrahim Mohammed
for: Campus Librarian

08-05-2024

PREVALENCE OF POSTPARTUM DEPRESSION AND ITS ASSOCIATED RISK FACTORS AMONG POSTPARTUM MOTHERS ATTENDING POSTNATL CLINIC AT THE TAMALE REGIONAL HOSPITAL IN THE NORTHERN REGION

ORIGINALITY REPORT

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