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**PREVALENCE AND DETERMINANTS OF POSTPARTUM DEPRESSION IN  
FIRST-TIME MOTHERS AT KORLE BU TEACHING HOSPITAL**

**BY**

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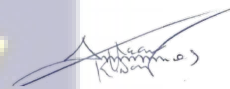
## DECLARATION

I, Lydia Afia Ayisi, declare that except for other people's studies which have been duly acknowledged, this dissertation is the result of my original research undertaken under supervision and that it has neither in whole nor in part been presented for another degree in this university or elsewhere.



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## DEDICATION

This dissertation is dedicated to my children Adepa and Keita-Asher, who continue to teach me the intricacies of motherhood. You inspire me to reach for greater heights.

I also dedicate this piece of work to all first-time mothers all over the world. A day at a time, motherhood does get better with time!



## ACKNOWLEDGEMENT

My heartfelt gratitude goes first and foremost to God Almighty for sustaining me throughout this programme and bringing me this far.

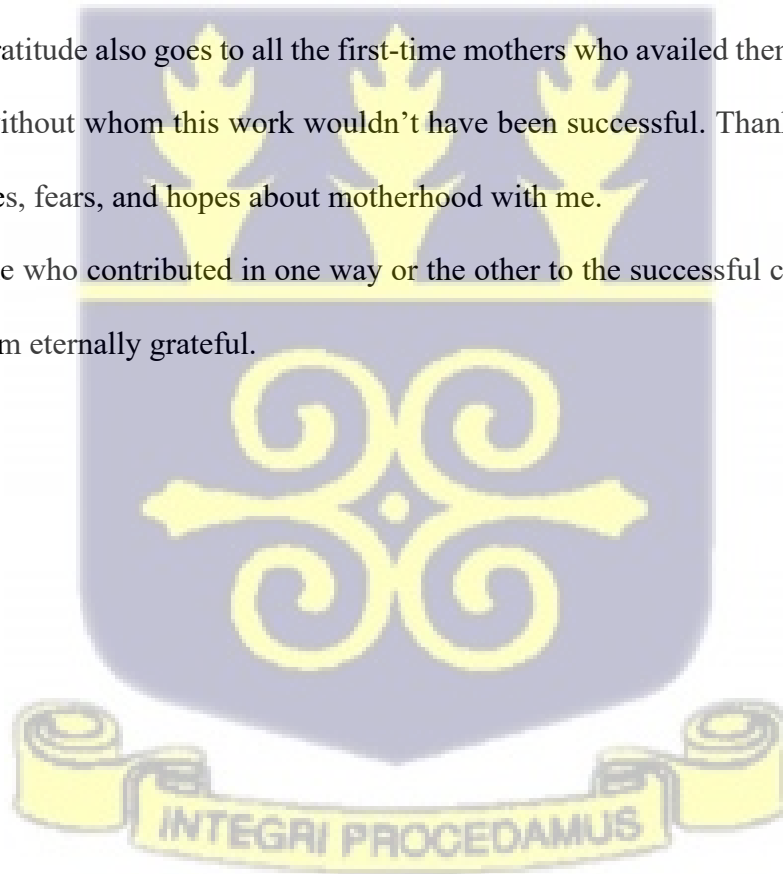
My sincere appreciation also goes to my supervisor, Professor Amos Laar for his indispensable direction and for seeing to the successful completion of this work.

To my interim supervisor, Dr. John Ganle for his immeasurable support, guidance, and assistance. For always ready to listen to me and offer advice.

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## ABSTRACT

**Background:** Although postpartum depression (PPD) in mothers has been extensively studied, little is known about the rates, correlates, and effects of postpartum depression in first-time mothers. The main objective of this study was to determine the prevalence and correlates of postpartum depression in first-time mothers within 6 months of childbirth at Korle Bu Teaching Hospital (KBTH).

**Methods:** A cross-sectional quantitative study was carried out between November 2022 and December 2022. Consecutive sampling technique was used to select participants. In all, 150 first-time mothers who were attending the postnatal/child welfare clinic at Korle Bu Teaching Hospital were recruited and interviewed. The Edinburgh Postnatal Depression Scale (EPDS) and a structured questionnaire were used for data collection. Descriptive analyses were done using frequency tables. Bivariate analysis (using chi-square) was done to determine the associations between independent (explanatory) variables and the outcome variable. Simple logistic regression was used to test for the strength of associations between the explanatory variables and the outcome variable. Multivariable logistic regression analysis was used to control for confounders and identify the determinants of PPD.

**Results:** Overall, the prevalence of postpartum depression was 19.3%. Only 16% of the mothers received health professional counselling on PPD during antenatal. Age, employment status, divorced/separated recently, monthly expenditure, planned/expected pregnancy, number of antenatal visits attended, type of delivery, length of hospital stay after delivery, maternal anxiety, having a baby with special needs, previous history of depression, partner reliability and having an abusive partner were factors significantly associated with PPD. However, after adjusting for confounders, age (AOR=0.08, CI: 0.01-0.75) and maternal anxiety

(AOR=16.93, CI: 2.31-123.84) were the only two factors that strongly predicted postpartum depression.

**Conclusion:** This study has shown that the prevalence of postpartum depression in first-time mothers at Korle Bu Teaching Hospital is relatively high. This presents a significant public health concern that requires prompt action as it impacts not just the health and well-being of mothers, but also that of their children and families. There is a need for urgent measures for early detection and diagnosis, including counselling and psychosocial support both at home and in medical facilities. Further research, preferably using mixed-methods design may provide elucidation on not only the magnitude of the problem or its correlates but also the effects of postpartum depression and the lived experiences of first-time mothers.



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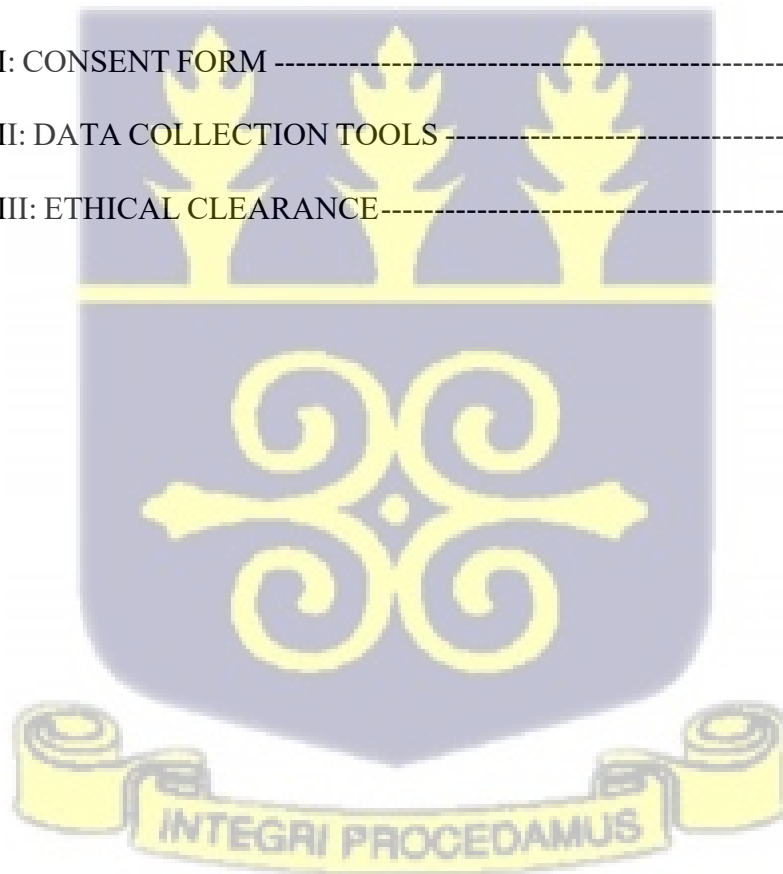
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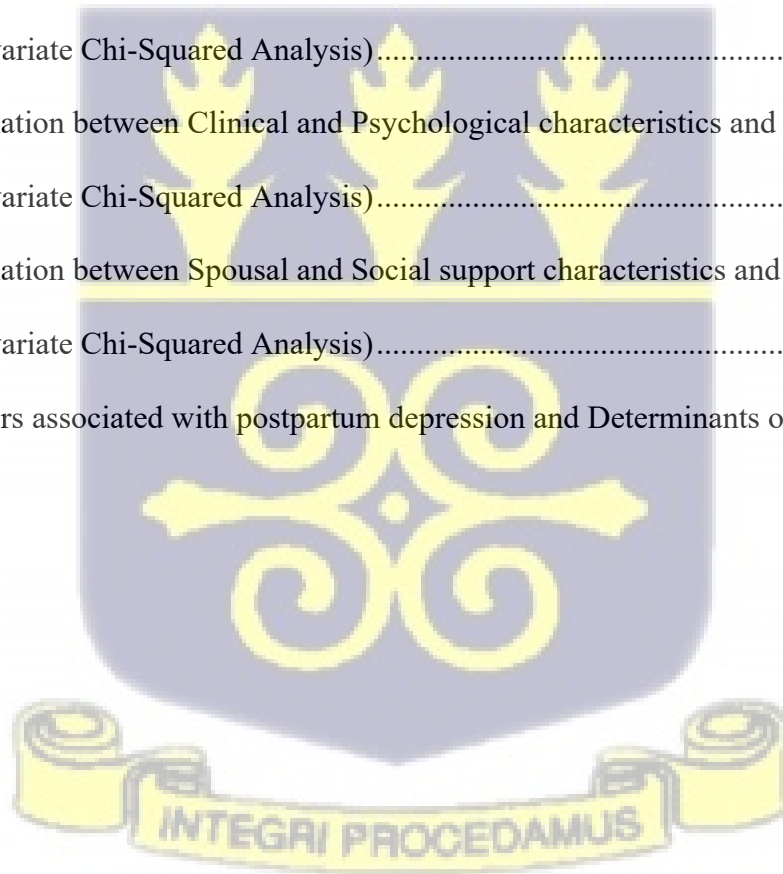
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## LIST OF ABBREVIATIONS

PPD	Postpartum Depression
KBTH	Korle Bu Teaching Hospital
EPDS	Edinburgh Postnatal Depression Scale
CWC	Child Welfare Clinic
DSM	Diagnostic and Statistical Manual
ANC	Antenatal Care
BDI	Beck Depression Inventory
CES-D	Center for Epidemiological Studies Depression
GHQ	General Health Questionnaire
PDSS	Postpartum Depression Screening Scale
PRQ	Pregnancy Risk Questionnaire
PRAMS	Pregnancy Risk Assessment Monitoring System
PHQ	Patient Health Questionnaire
PROM	Patient-Reported Outcome Measure
SVD	Spontaneous Vaginal Delivery
CS	Caesarean Section



## CHAPTER ONE

### INTRODUCTION

#### 1.0. Background

The postpartum period is a difficult period of adjustment after childbirth, and nearly one in ten women develop postpartum depression. (Inekwe & Lee, 2022). Depression that develops after having a baby is known as postpartum depression (PPD). Unlike “baby blues”, which is the feeling of worry, sadness, and tiredness after childbirth, postpartum depression symptoms are more pronounced, persist longer, and typically do not resolve on their own (Centers for Disease Control and Prevention [CDC], 2022).

Early postpartum depression symptoms detection and treatment are essential for the mother, child, and family's general health. When left untreated, postpartum depression symptoms can harm a child's development in both the short and long term, disrupt the home environment, and have a substantial impact on the bonding between a mother and her newborn (Suri & Altshuler, 2012).

According to Azad et al., (2019), postpartum depression is a severe public health issue and is known to negatively impact both the physical and cognitive growth of the child as well as the mother's perinatal health. One of the major mental and public health problems, postpartum depression is a non-psychotic mood or mental disease that starts within the first four to six weeks after childbirth and can last up to one year, with the first six months being when it is most severe, where mothers are at a high risk of developing it (Alam et al., 2021; Inekwe & Lee, 2022; O'Hara & Mc Cabe, 2013).

It presents with disabling symptoms which include changes in sleeping and eating patterns, fatigue, social withdrawal, sadness, crying, anxiety, guilt, loneliness, stress, and exhaustion (Coast, Leone, Hirose, & Jones, 2012). This makes it difficult for mothers to care for themselves and their babies, which in turn impacts the physical, social and cognitive development of the child negatively (Haithar, Kuria, Sheikh, Kumah, & Vander, 2018).

Postpartum disorders however serious they are, have been underrecognized and undermanaged for various reasons. According to Suri & Altshuler (2012), this is partly because pregnant women receive little or no education about the risk of postpartum psychiatric illnesses, and many times symptoms go undetected by obstetricians. Also, some women are made to believe that these symptoms are normal with postpartum and would eventually resolve on their own.

Furthermore, women who have depressive symptoms frequently don't seek professional assistance because they feel guilty for feeling downcast at a time when they should be joyous. Other reasons which may explain the underdiagnosis of postpartum depression are the fear of abandonment and lack of support owing to the stigma new mothers face upon disclosure of their insecurities and depressive symptoms (Mughal, Azhar, & Siddiqui, 2021). Meanwhile, studies show that the social support a woman receives after delivery, coupled with her maternal feeling of self-efficacy as a parent has the potential of influencing her mental status (Abdollahi, Agajani-Delavar, Zarghami, & Lye, 2016a).

While the postpartum period can be a time of joy and positive expectations, it can also be a time of difficulty, stress, and increased vulnerability (Biaggi, Conroy, Pawlby, & Pariante, 2016). This is because mothers go through numerous psychological and physical alterations and face many challenges during this period (Khatun et al., 2018). This makes it a very

challenging time for mothers, and new mothers are required to learn quickly to adapt to this new role of motherhood.

While this may be difficult for most mothers, first-time mothers may particularly have a harder time adapting to the mother's role, and so are more vulnerable to postpartum depression, whose symptoms can make motherhood take on a rather frustrating turn (Abdollahi et al., 2016).

Findings from a study show that women with prior children showed a markedly lower prevalence of postpartum depression than first-time mothers across all age groups (UVAHealth, 2022). Evidence from a recent study in Dhaka city, Bangladesh also found that the probability of postpartum depression among first-time mothers was 2.08 times higher compared to others who were second-time or more (Alam et al., 2021).

These investigations, among others, demonstrate that first-time mothers have a higher risk of developing postpartum depression. However, there is a scarcity of data exploring postpartum depressive symptoms in first-time mothers globally, especially in LMICs, precisely Sub-Saharan African countries, including Ghana. This suggests the need for more experimental studies on the subject in places like Ghana.

### **1.1 Problem Statement**

Depression is the leading contributor to the global burden of disease (Rahman, Surkan, Cayetano, Rwagatare, & Dickson, 2013) and found to have adverse effects on families and caregivers (Reynolds & Patel, 2017).

A mother's sensitivity, attachment, and parenting style are critical for the healthy development of the cognitive, social, and behavioral skills of her infant (Brummelte & Galea, 2016).

Evidence shows that maternal depression, which includes postpartum depression, is linked to poor outcomes in infants such as undernutrition in the first year of life, higher rates of diarrheal and febrile diseases, and early cessation of breastfeeding (Guo et al., 2013; Okronipa et al., 2012; Ystrom, 2012).

Research shows that about 1 in 8 women with a recent live birth experience symptoms of PPD. Estimates of the number of women affected by PPD differ by age, race/ethnicity, and state (Centers for Disease Control and Prevention, 2022). Approximately, 10–15% of women are affected by PPD (Brummelte & Galea, 2016). The prevalence of postpartum depression ranges from approximately 10% to 30% depending on the criteria used for diagnosis (Brummelte & Galea, 2016). The period prevalence of depression among women within the first postpartum year is 21.9% (Wisner et al., 2013). Globally, postpartum depression (PPD) has been reported to affect 10–20% of women (Brummelte & Galea, 2016; Fisher et al., 2012).

Over the years, PPD has received attention because of its detrimental effects on both maternal and child health.

Alterations in maternal hormones; steroid and peptide alter the hypothalamic pituitary adrenal (HPA) and hypothalamic pituitary gonadal (HPG) axes and subsequently affect maternal mood which in turn impairs mother-infant interaction.

It is reported that mothers with PPD often exhibit less sensitivity and attachment, and harsher or more disturbed parenting behaviors, which may contribute to adverse child outcomes in their children (Brummelte & Galea, 2016).

The global prevalence of PPD ranges from 0.5% to 60.8%, with lower percentages in high-income countries (6-13%) compared to about 20% in low-and-middle-income countries

(LMICs) (Alam et al., 2021; Fisher et al., 2012). Studies show high prevalence rates in the majority of African countries than in high-income countries. For instance, PPD prevalence was reported to be 9.7% in Zambia, 33% in Zimbabwe, Nigeria (13.2%), Ethiopia (13.7%), Morocco (17.9%), South Africa (20.0%), Malawi (30.4%), Burkina Faso (44.0%) with lowest rates reported in Uganda (7.1%) (Parsons, Young, Rochat, Kringelbach, & Stein, 2011).

Studies in Ghana reveal the prevalence of postpartum depression ranges from 7% to 32.6% (Anokye, Acheampong, Budu-Ainooson, Obeng, & Akwasi, 2018; Cadri, Aziz, Gyan, & Adomah-Afari, 2020; Saeed & Wemakor, 2019; Weobong et al., 2014).

A recent study at Korle Bu Teaching Hospital found the prevalence of postpartum depression at 2 weeks postpartum to be 41.1% among mothers younger than 20 years and above 35 years (Sefogah, Samba, Mumuni, & Kudzi, 2020).

While there is existing literature on postpartum depression in Ghana, there is however little information on the prevalence and correlates of depression in first-time mothers in Ghana (Saeed & Wemakor, 2019). Also, very little data exists on postpartum depression at the Korle Bu Teaching Hospital. Even though studies show a higher risk of PPD in first-time mothers than in other new mothers, there is still a paucity of data that examine PPD among first-time mothers in African countries like Ghana. To the best of my knowledge, this will be the first study on PPD in first-time mothers in Ghana. Therefore, this study aims to close this gap by examining the prevalence and correlates of PPD among first-time mothers at Korle Bu Teaching Hospital- a quaternary hospital in Ghana.

## 1.2 Objectives

The objectives of the study were divided into general and specific objectives

### 1.2.1 General Objective

The general objective of the study was to determine the prevalence and correlates of postpartum depression in first-time mothers within 6 months of childbirth at Korle Bu Teaching Hospital.

### 1.2.2 Specific Objectives

The specific objectives were to:

1. Estimate the proportion of first-time mothers within 6 months of childbirth with postpartum depression symptoms at the Korle Bu Teaching Hospital.
2. Describe the characteristics (e.g., obstetric, maternal, infant, clinical, and psychological) of first-time mothers within 6 months of childbirth attending postnatal/child welfare clinic (CWC) at the Korle Bu Teaching Hospital.
3. Identify the factors associated with postpartum depression in first-time mothers within 6 months of childbirth attending postnatal/CWC at the Korle Bu Teaching Hospital.

## 1.3 Research questions

To achieve the research objectives above, the following research questions were investigated:

1. What proportion of first-time mothers attending postnatal/CWC at Korle Bu Teaching Hospital have postpartum depression symptoms?
2. What are the characteristics (e.g., obstetric, maternal, infant, clinical, and psychological) of first-time mothers attending postnatal/CWC at the Korle Bu Teaching Hospital with postpartum depression?
3. What are the factors associated with postpartum depression in first-time mothers attending postnatal clinic/CWC at the Korle Bu Teaching Hospital?

#### 1.4 Justification for the study

Postpartum depression poses substantial health risks to both mother and baby (Sinclair, 2013). Globally, depression accounts for the largest proportion of the burden associated with mental or neurological disorders in women of child-bearing age (Murray et al., 2012). Maternal depression is the second leading cause of disease burden in women worldwide, following infections and parasitic diseases. It can lead to suicide, which is a leading cause of mortality in women of childbearing age and has long-term negative effects on the physical and cognitive development of infants (Rahman et al., 2013).

According to Epperson (1999), the risk for PPD may be greatest for first-time mothers because they hold high expectations regarding childbearing but have no personal experience with which to compare their experiences.

Postpartum depressive mood and self-care action were reported to be significantly related to fatigue in a study of first-time mothers of which a high proportion was found to have depressive mood (Khatun et al., 2018).

New mothers tend to normalize depressive symptoms because they may be unable to recognize that what they are experiencing is PPD. They may also do so for fear of being judged as exhibiting maternal responses that are unfitting for motherhood (Logsdon, Foltz, Scheetz, & Myers, 2010). First-time mothers especially are less likely to seek help due to the seeming stigma attached to depression and so may hesitate to report depressive symptoms (Mughal et al., 2021). This often results in first-time mothers feeling more isolated and unequipped to deal with the multiple changes associated with the postpartum period, which can negatively impact their health status and parental efficacy (Pessagno & Hunker, 2013).

Untreated PPD accompanied by fear and the lack of maternal experience in first-time mothers can lead to a host of maladaptations for both mother and baby which may lead to decreased mother-child bonding, severe social isolation, reduced maternal ability to care for the infant, reduced rate of identifying infant cues and increased incidence of developmental delay in infants (Reich, Silbert-Mazzarella, Spence, & Spiegel, 2005).

Given the detrimental effects of PPD on both mothers and infants, epidemiological studies are required to implement early prevention and intervention measures. Although few studies have been conducted on PPD in first-time mothers, they were mostly done in Asia and other countries, which are not contextually fit for Ghana. To date, no study has investigated PPD, its determinants, or associated factors among first-time mothers in Ghana. Therefore, bridging this gap may contribute to guiding how the healthcare team plans care for first-time mothers in Ghana, improve the quality of their self-care, and develop their self-efficacy to protect their health and care for their newborns.

Also, knowledge of the factors associated with postpartum depression in first-time mothers, its predictors or determinants, can help early identification of women at increased risk of affective disorders, and also provide a basis for early intervention.

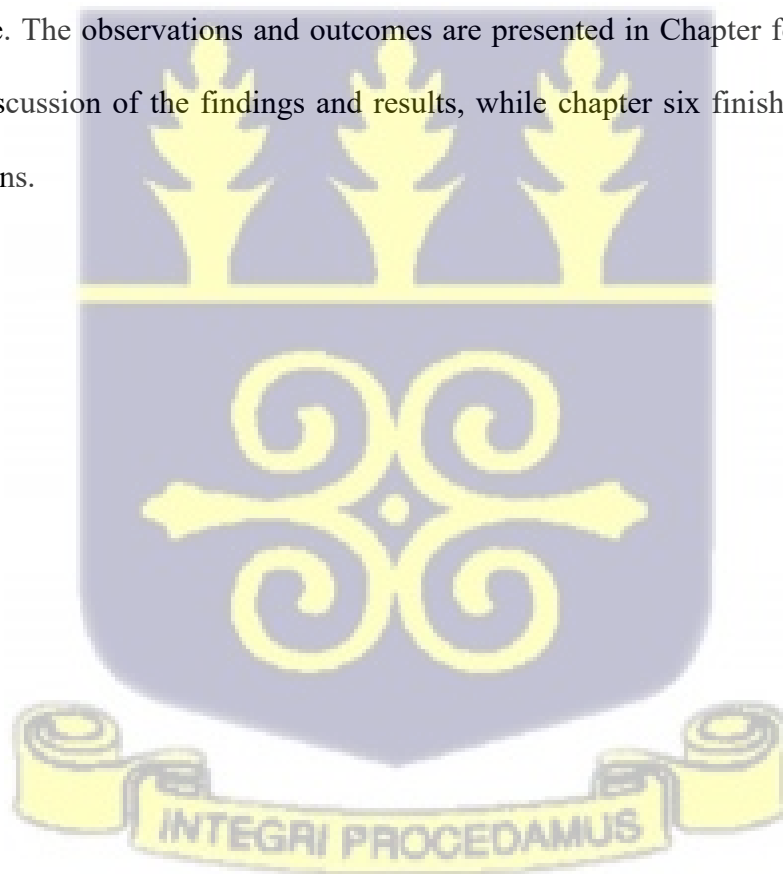
The results of this study may advance understanding and practice as well as aid healthcare professionals in correctly evaluating, screening for, and spotting early depressive symptoms in first-time mothers. It could also pave a way for policymakers to prioritize and subsequently include maternal mental health into maternal and child health care programmes and policies, and also to integrate mental health screening into routine primary care for pregnant and postpartum women and to follow up this screening with treatment or referral and with follow-up care.

More so, the findings of this study would also serve as an important body of literature for upcoming scholars.

### **1.5 Chapter Summary and Dissertation Outline**

The above chapter provided a background to the study. The problem and the need for doing this study in Ghana were both extensively described in the chapter. This was followed by an outline of the objectives of the study and research questions, as well as the justification for the study. The dissertation's remaining sections are organized as follows;

The second chapter examines existing literature on postpartum depression with a particular emphasis on the factors associated with it. The study's methodology will be covered in detail in chapter three. The observations and outcomes are presented in Chapter four. Chapter five will detail a discussion of the findings and results, while chapter six finishes with pertinent recommendations.



## CHAPTER TWO

### LITERATURE REVIEW

#### 2.0 Introduction

This chapter discusses in general terms the concept of postpartum depression, its prevalence, diagnosis, and treatment, its causes, and contributing factors, as well as the various screening procedures used to identify postpartum depressive symptoms. Also presented is the conceptual framework that will serve as the study's compass.

#### 2.1 The concept of postpartum affective disorders

Affective / mood disorders are mental disorders that affect the emotional state of a person (Molly Burford, 2021). Baby blues, postpartum depression, and puerperal psychosis are three common mood disorders in women following childbirth. The mildest of these three is baby blues, while puerperal psychosis is the most severe (MGH Center for Women's Mental Health, 2018).

##### 2.1.1 Baby Blues

“Baby blues” is a term used to describe mild mood symptoms that affect women after giving birth. It occurs early postpartum, around 2 to 5 days after childbirth, and lasts around 10 days to approximately 2 weeks. Crying episodes, changes in appetite, exhaustion, fatigue, sleep disturbance, restlessness, confusion, and sadness are some of its symptoms (CDC, 2022; Mughal et al., 2021).

Unlike PPD whose symptoms are more intense, persistent, and severe, baby blues have little impact on daily activities or a mother's capacity to care for her child, and symptoms usually

resolve spontaneously on their own within a few days, without sequelae (CDC, 2022; Meltzer-Brody, 2011).

### **2.1.2 Postpartum Psychosis**

Postpartum psychosis is a psychiatric emergency that occurs within the first few days or weeks after delivery, with a potential risk of suicide and infanticide. It is an acute start of depressive or manic psychosis where the puerperal woman can experience serious symptoms such as unusual behavior, hallucinations, agitation, numerous nights of sleep deprivation, and delusions (Mughal et al., 2021). It is rare, the severest of psychiatric illnesses during the postpartum period, and affects 1 to 2 women out of 1000 after childbirth (MGH Center for Women's Mental Health, 2018).

### **2.1.3 Overview of Postpartum Depression**

Mughal et al. (2021) describe PPD as a significant depressive episode that occurs at the beginning of pregnancy or within four weeks of birth. The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) recognizes postpartum depression as a condition when a patient has a major depressive episode concurrent with the peripartum start but does not recognize it as a distinct disease.

In addition to having a history of childbirth, PPD exhibits similar signs and symptoms as non-puerperal depression. Depressed mood, altered sleep and eating patterns, loss of interest, feelings of worthlessness, an inability to focus, as well as anxiety and suicidal thoughts are some of the symptoms (Mughal et al., 2021). Others may cry more frequently than usual, feel angry, isolate themselves from loved ones, feel numb or detached from their child, worry that they may injure their child, feel guilty about not being a good mother, or have doubts about their capacity to care for their child (CDC, 2022). Delusions and hallucinations (voices saying

to harm infant) are some examples of the psychotic symptoms that certain patients may experience (Mughal et al., 2021).

Risk factors for PPD include lack of social support, prior depression, stressful life events, a family history of depression, having multiples, such as twins or triplets, being a teenage mother, preterm labor and delivery (before 37 weeks), pregnancy and birth complications, and difficulty in conceiving. Postpartum depression, however, can also happen to women who had a healthy pregnancy and delivery (CDC, 2022).

It is estimated that over 40% of women will experience their first depressive episode during the postpartum period. (Wisner et al., 2013). During the first postpartum year, depression is prevalent in women at a rate of 21.9%.

## **2.2 Assessment and Diagnosis**

To measure depressive symptomatology, both general and postpartum-specific depression measures have been used. Among the instruments used are Self-report questionnaires, Standardized interviews, and Clinician-rated assessments (Stone et al., 2015).

### **2.2.1 Standardized Interviews**

Among the standardized interviews are the Schedule of Affective Disorders and Schizophrenia (SADS), Structured Clinical Interview for DSM-IV-R (SCID), Standard Psychiatric Interview (SPI), and Present State Examination (PSE).

### **2.2.2 Self-Report Questionnaires**

There are numerous self-reported assessments available to evaluate depressive symptoms and track treatment effectiveness. Typically, participants are asked to rate the frequency or

seriousness of depression symptoms on these questionnaires; They cannot, however, be used to diagnose depression, thus respondents who score highly should be followed up with a clinical evaluation (Ogoe, 2018).

Self-report questionnaires include, but are not limited to; the Beck Depression Inventory (BDI), Self-Report Questionnaire (SRQ), Hospital Anxiety and Depression Scale (HADS), Center for Epidemiological Studies Depression Scale (CES-D), General Health Questionnaire (GHQ), Depression Adjective Checklist (DAACL), Postpartum Depression Screening Scale (PDSS), Profile of Mood States (POMS), Pitt Depression Scale, Zung Self-Rating Depression Scale (ZSDS), Patient Health Questionnaire (PHQ), and the Edinburgh Postnatal Depression Scale (EPDS). They cannot, however, be used to diagnose depression.

### **2.2.3 Clinician-Rated Scales**

The Hamilton Rating Scale for Depression (HRSD) and the Montgomery-Asberg Depression Rating Scale (MADRS) are some examples of clinical-rated scales for PPD.

### **2.2.4 Diagnosis**

A diagnosis of postpartum depression is made when at least five depressive symptoms last for at least two weeks. In addition to the five symptoms, which may include: Depressed mood (subjective or observed) present most of the day, Psychomotor retardation or agitation, Loss of interest or pleasure, most of the day, Insomnia or hypersomnia, Loss of energy or fatigue, Worthlessness or guilt, Suicidal ideation or attempt and recurrent thoughts of death, Impaired concentration or indecisiveness and Change in weight or appetite (weight change 5% over 1 month), the diagnosis must include either depression or anhedonia (loss of interest) (Mughal et al., 2021).

### 2.3 Comparisons between Screening Instruments

To identify potential PPD cases, a range of self-report screening techniques are utilized in clinical practice and research. The most popular self-report measures for PPD identification are the Edinburgh Postnatal Depression Scale (EPDS) and the Beck Depression Inventory (BDI), which have 10 and 21 items, respectively. The DSM-IV diagnostic criteria are the foundation of the Patient Health Questionnaire (PHQ-9), a nine-item depression screening tool that is frequently used in clinical settings to identify probable instances of depression and has also been validated in perinatal populations (Davis, Pearlstein, Stuart, O'Hara, & Zlotnick, 2013).

Davis et al. (2013) assessed the accuracy of the BDI in 534 perinatal women at various time points. Based on the time period examined, the BDI's Receiver Operating Characteristic (ROC) values ranged from 0.8 to 0.9, making it equivalent to diagnostic interviews for identifying PPD. The best cut-off point for the BDI, however, was found to vary according to the perinatal time period, according to this study.

In the same study, the diagnostic validity of the Pregnancy Risk Assessment Monitoring System (PRAMS)-6, PHQ-9, PRAMS-3D, and PRAMS-3A were evaluated against the Hamilton Rating Scale for Depression and the Structured Clinical Interview for DSM-IV (SCID). The PRAMS-6, PHQ-9, PRAMS-3D, and PRAMS-3A all demonstrated a fair degree of accuracy in identifying PPD.

Sidebottom, Harrison, Godecker, and Kim (2012) found that, using a PHQ-9 cutoff of 10, the sensitivity and specificity rates for a diagnosis of depression were 85 percent and 84 percent, respectively, and for a sub diagnosis, they were 75 percent and 88 percent, respectively.

Depressive symptoms in the postpartum period have been evaluated using a variety of methods. Nevertheless, some of these tools weren't created expressly to measure PPD. This is true of the General Health Questionnaire (GHQ), the Inventory of Depressive Symptomatology (IDS), the Zung Self-Rating Depression Scale (Zung SDS), the Center for Epidemiological Studies Depression Scale (CES-D), and the Beck Depression Inventory (BDI and BDI-II).

These are, in reality, tools for measuring the discomfort that is related to and connected with general depressive symptoms. Additionally, some techniques haven't had their psychometric qualities well described and others haven't been used very often when measuring depressed symptoms.

Conversely, a number of other researchers have put particular screening techniques to the test in order to look into depressive illnesses. These are the Edinburgh Postpartum Depression Scale and the Postpartum Depression Screening Scale (PDSS) (Zubaran, Schumacher, Roxo, & Foresti, 2010).

Out of four screening instruments that were assessed in a systematic review, the Postpartum Depression Screening Scale (PDSS) and the Edinburgh Postnatal Depression Scale (EPDS) both demonstrated significant sensitivity and specificity. When used in various cultural situations, however, none of screening the tools could be deemed perfect (Zubaran et al., 2010).

According to Sultan et al., (2022), the EPDS is the best Patient-Reported Outcome Measure (PROM) currently in use to screen for postpartum depression in mothers. These findings indicate that the EPDS should be utilized by clinicians and in upcoming research studies to screen for maternal postpartum depression because it was the PROM that performed the best and was most thoroughly examined in various healthcare settings. The EPDS has ten screening questions for postpartum depression, and the results are given as a total score between 0 and

30 (lower scores indicate less postpartum depression). Using a different cutoff value will affect the EPDS's sensitivity and specificity. According to a thorough study of 58 investigations (including non-obstetric studies), the EPDS's combined sensitivity and specificity are maximized at a cutoff value of 11 or higher.

## 2.4 Child outcomes

Postpartum depression has detrimental effects on child outcomes. It has been linked to critical factors that affect a child's survival such as poor infant nutritional status, diarrhea, and respiratory illness, as well as worse outcomes concerning the physical and psychological development of the child (Mughal et al., 2021). It has been discovered that children of women who experienced postpartum depression display noticeable behavioral alterations, decreased cognitive growth, and early start of depressive disorders. More so, these children frequently struggle with social interaction problems and obesity (Mughal et al., 2021).

A study by researchers at the University of Michigan suggests that, for efforts to improve infant growth, health, and nutritional status, and reduce child mortality in less-developed countries to succeed, they must address the mental health of new mothers (Sinclair, 2013). They noted that children with mothers who are depressed in low- and middle-income nations (LMINs) are almost twice as likely to be underweight and to experience growth stunting.

According to Mughal et al. (2021), children of mothers who have untreated depression can develop behavioral and emotional problems. Common effects of PPD on child outcomes are delays in language development. Others include sleeping problems, excessive crying, eating difficulties, attention-deficit/hyperactivity disorder (ADHD), early onset of depressive illness, obesity, and dysfunction in social interactions.

## **2.5 Maternal outcomes**

Maternal outcomes of PPD include poor maternal-infant bonds, failure of breastfeeding, negative parenting practices, and marital discord. If not treated promptly, PPD can lead to chronic depressive disorder. Even if treated, patients still stand the risk of future episodes of major depression (Mughal et al., 2021).

Postpartum depression makes mothers less concerned about their infants, hence do not respond positively when they cry, make gestures, or make eye contact. As a result of their inability to properly care for their child, the mothers stop breastfeeding. Making personal adjustments is difficult for mothers who are experiencing postpartum blues. However, due to mothers' poor care and refusal to breastfeed, babies can be fussy and easily injured. In addition, postpartum mothers lack the motivation to breastfeed their infants, which hinders their development and growth. Compared to babies who do not receive breast milk, those who are breastfed by their mothers will have a stronger immune system (Handini & Puspitasari, 2021).

## **2.6 Prevention and treatment of postpartum depression**

Prevention strategy includes any method that lowers an individual's risk of contracting a disease or condition (primary prevention), stops or slows the progression of a disease or condition through early detection and treatment (secondary prevention), or stops or slows the progression of a disease or condition and lessens the disability that results from it through the treatment of an already-existing disease (tertiary prevention). This is considered a preventive intervention (Molyneaux, Trevillion, & Howard, 2015).

Depression is treatable, and most people who receive treatment recover from it (CDC, 2022). Early detection and treatment for PPD symptoms are crucial to guarantee the mother, child, and family's well-being.

Treatment of PPD requires a multimodal approach, taking into consideration education, psychotherapy, support, pharmacological and biological treatment options. It is imperative to consider the role of breastfeeding when pharmacological treatment is considered (Suri & Altshuler, 2012).

An investigation employed brief group therapy as an evidence-based treatment for first-time mothers at risk for postpartum depression. It was discovered that mothers who took part in the brief group psychotherapy intervention saw a decline in their scores on the Edinburgh Postnatal Depression Scale, decreasing their risk for PPD (Pessagno & Hunker, 2013).

### **2.7 Prevalence of postpartum depression in first-time mothers**

Few studies have been conducted on PPD in first-time mothers globally.

In a study determining the prevalence and the associations that exist between structural social support and functional support in first-time mothers, the prevalence of PPD was found to be 13.2% and 9.8% at 6 weeks and 12 weeks postpartum respectively using the EPDS cutoff of >11 (Leahy-Warren, McCarthy, & Corcoran, 2011).

In another study examining the correlates of PPD in first-time mothers without prior psychiatric contact, the prevalence of PPD was reported as 10.3% at five days and 6.4% at 6 weeks

postpartum using the EPDS cut-off  $\geq 12$  (Sylvén, Thomopoulos, Kollia, Jonsson, & Skalkidou, 2017).

Findings from a study on perinatal parenting stress, anxiety, and depression outcomes in first-time mothers and fathers show a prevalence of 17.1% in first-time mothers at 3 months and 9.4% at 6 months using an EPDS cut-off of  $> 13$  (Vismara et al., 2016).

Results from a study assessing the relationships between postpartum fatigue, depressive mood, self-care agency, and self-care action of first-time mothers in Bangladesh reveal depressive mood in 73.4% of the participants at EPDS  $\geq 9$  (Khatun et al., 2018).

A study of Chinese first-time mothers and fathers on depression, social support, and perceived stress reported PPD prevalence of 13.8% in first-time mothers (Gao, Chan, & Mao, 2009).

Abdollahi et al. (2016), found the incidence of depression in first-time Iranian mothers at three months postpartum to be 10.7% using the EPDS cut-off score of  $> 12$ .

Campbell & Cohn (1991) found the prevalence of PPD in first-time mothers to be 9.3% using the modified Research Diagnostic Criteria for depression.

In a prospective cohort study of older first-time mothers who conceived naturally or through assisted reproductive technology, the prevalence of major depressive disorder was 7.9% (McMahon et al., 2011).

## 2.8 Factors associated with postpartum depression

### 2.8.1 Sociodemographic factors

According to Fiala et al. (2017), a range of sociodemographic characteristics, such as the mother's age, marital status, number of children, educational attainment, the child's sex, and length of connection with partner have the ability to affect postpartum depression in postpartum women. However, their investigation found no strong correlation between these characteristics and postpartum depressive symptoms in postpartum women.

Results from a study on first-time Japanese mothers showed that current age and the EPDS score were inversely related ( $\beta = -.185, p < .0001$ ) (Torashima et al., 2022).

Another study indicated that compared to adult mothers with lower or greater levels of resources, postpartum depression was significantly more prevalent among first-time teenage mothers. (Lanzi, Bert, & Jacobs, 2009).

No correlation was found between a first-time mother's age, her living arrangement with the baby's father, her employment status, or her level of education and her mood (Kristensen et al., 2018).

In a study, socioeconomic status, past histories of depression and PPD, history of stressful situations, family support, preference for a male child, and unintended pregnancy were statistically significant factors associated with PPD ( $p < 0.05$ ) (Ahmed, Elbeh, Shams, Malek, & Ibrahim, 2021).

According to a study by Goyal, Gay, Lee, & Jose (2010), postpartum depressive symptoms are more likely to occur in first-time mothers with socioeconomic traits such as being unmarried, having low education, being unemployed, and having a low income.

### **2.8.2 Obstetric, Maternal and infant-related factors**

Though the postpartum period is recognized as a vulnerable time for maternal mental health in high-income countries, the situation is entirely different in low-income nations where the majority of the people perceive symptoms of depression as spiritual or personal problems rather than as a psychiatric disorder that could be treated (Sinclair, 2013).

High-risk pregnancies which may result in emergency cesarean section and hospitalizations during pregnancy or after delivery are maternal factors associated with PPD. Infant-related factors may include meconium passage, umbilical cord prolapse, preterm or low birth infant, and low hemoglobin (Mughal et al., 2021).

Poverty (Coast et al., 2012), neonatal complications, no support from husband, joblessness, being a first-time mother, and unplanned pregnancy are factors found to be correlated with PPD (Alam et al., 2021).

Results from a parallel randomized control trial of PPD among first-time mothers show preterm birth, lack of pain relief during labour, low attendance of the midwife in the delivery room, impromptu caesarean section, low Apgar score, unpreparedness for hospital discharge, inadequate knowledge about breastfeeding, none or minor breastfeeding in the early postpartum period, poor or fair self-rated mental health, and uncertain or weak attachment to the newborn child as factors associated with PPD (Maimburg & Væth, 2015).

Higher PPD symptoms were substantially correlated with difficulties with breastfeeding (coefficient 0.77, 95% CI: 0.02, 1.53). Hospitalization during pregnancy and unexpected pregnancies were other problems linked to an EPDS score (Koutra et al., 2018).

PPD risk factors have also included previous infant loss and pregnancy-related issues such as low hemoglobin levels during birth (Goshtasebi et al., 2013).

Postpartum depression is more likely to occur in mothers whose newborns had medical conditions, were born prematurely, or have difficult temperaments. When compared to women who had intended pregnancies, those who had unwanted pregnancies had a higher rate of postpartum depression (6.7% vs. 4.3%,  $p < 0.05$ ). However, after adjusting for covariates, unplanned pregnancy was no longer linked to postpartum depression (adjusted OR 1.41; 95% CI 0.91–2.1) (Abbasi, Chuang, Dagher, Zhu, & Kjerulff, 2013).

### **2.8.3 Psychosocial, Clinical & Psychological factors**

Lack of social support, smoking during pregnancy, and domestic violence in the form of spousal sexual, physical, and verbal abuse are risk factors for developing PPD (Mughal et al., 2021).

A study of first-time mothers shows perceived social isolation, maternal parental self-efficacy, and marital satisfaction stress exposure as contributing factors to PPD (Abdollahi et al., 2016).

History of anxiety and depression, dissatisfaction with the baby's gender, negative attitude toward the baby, premenstrual syndrome (PMS), and history of sexual abuse are unending risk factors of postpartum depression (Mughal et al., 2021).

In a recent study, anxiety, marital dissatisfaction, stress, insufficient/ lack of social support, financial difficulties, and single parenting were identified as psychosocial determinants of PPD (Paddy et al., 2021).

High levels of depressive symptoms in the postnatal period are strongly related to having experienced domestic abuse, according to Howard, Oram, Galley, Trevillion, & Feder (2013).

Postpartum depression is significantly influenced by antenatal depression and anxiety, previous mental illness, an unhappy marriage, stressful life events, a disliking toward pregnancy, and a lack of social support. Dysfunctional marriages and life difficulties are important factors that put women at risk for PPD in both developed and developing countries. Other psychological factors that raise the incidence of PPD include stress related to childcare and poor attitudes toward pregnancy (Norhayati, Nik, Asrenee, & Wan, 2015).

According to studies, women who have a history of mental illness are more likely to have postpartum depression (Suri & Altshuler, 2012). Prior depression is the greatest risk factor for PPD (Wisner et al., 2013).

#### **2.8.4 Cultural factors**

Postpartum confinement, in which women are held indoors for a month, is a custom among Taiwanese women. Women receive assistance with home duties, special diet, and protection from harsh weather during this time. According to Chien et al. (2012), this postpartum confinement period is linked to a lower risk of having PPD. However, this same practice contributes to a higher incidence of PPD among Singaporean women (Chee et al., 2005).

## 2.9 Conceptual framework

Below is the conceptual framework of the study. It shows the factors that could contribute to PPD which include sociodemographic factors, socioeconomic factors, obstetric factors (pregnancy & antenatal-related factors and delivery history), maternal and infant-related factors, spousal & social support, and clinical & psychological factors.



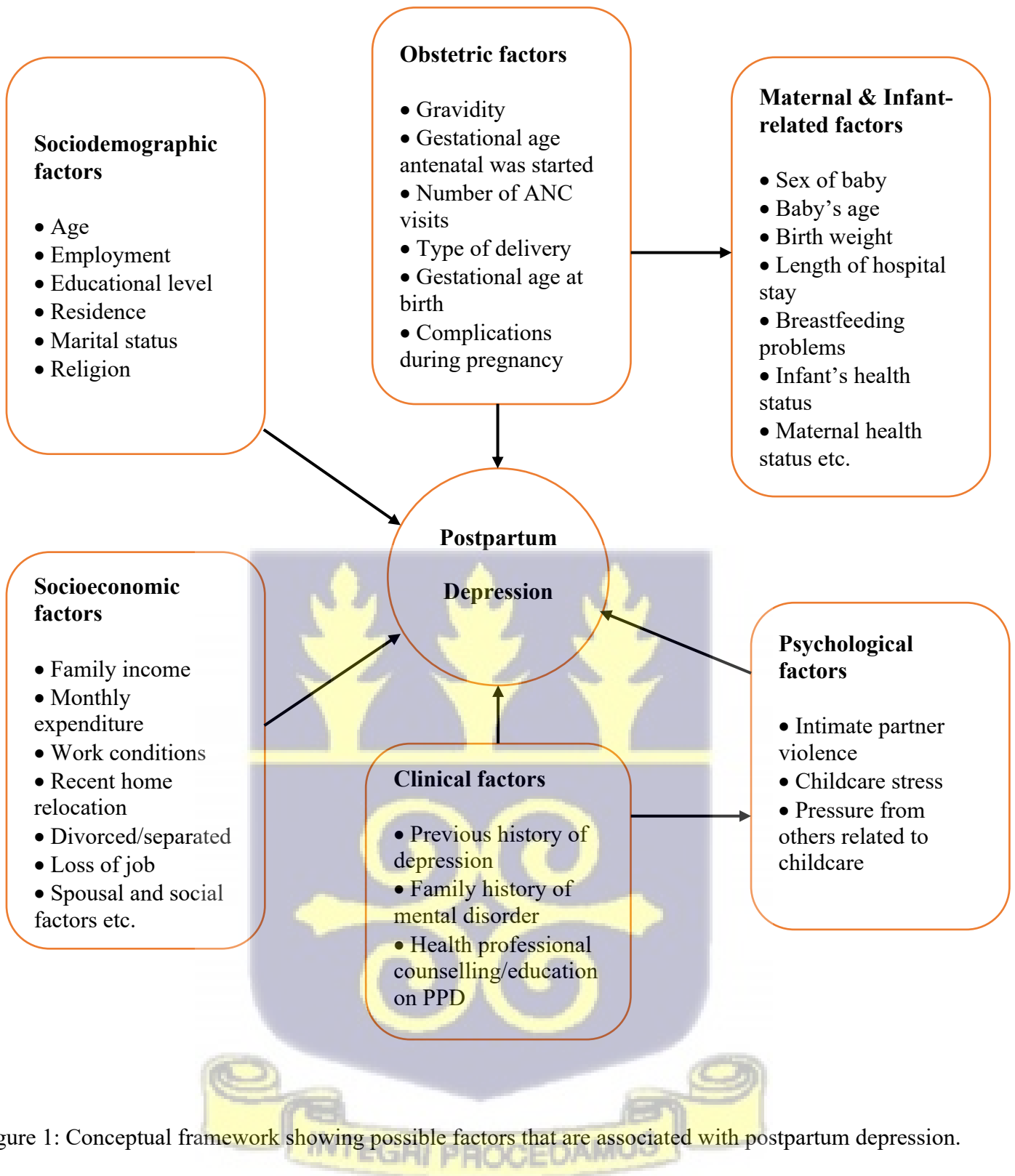


Figure 1: Conceptual framework showing possible factors that are associated with postpartum depression.

Source: Author's own construct based on review of literature

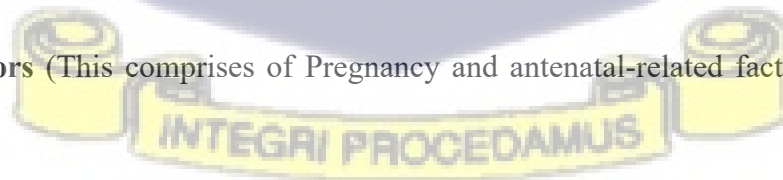
**Socio-demographic factors include:**

- Age
- Employment
- Educational level
- Residence
- Marital status
- Religion

**Socio-economic factors**

- Monthly family income
- Work conditions
- Financial difficulties
- Financial dependence
- Monthly expenditure
- Recent home relocation
- Divorced/separated
- Death of a loved one
- Loss of job
- Cultural practices and beliefs

**Obstetric factors** (This comprises of Pregnancy and antenatal-related factors and Delivery history)



**Pregnancy and antenatal-related factors**

- Gravidity
- Unplanned/unexpected pregnancy

- Complications in pregnancy
- Previous miscarriage(s)
- Antenatal care (ANC) attendance and number of visits
- Past infertility treatment
- Health professional counselling on PPD during ANC
- Gestational age ANC was started
- Previous knowledge about PPD

### **Delivery history**

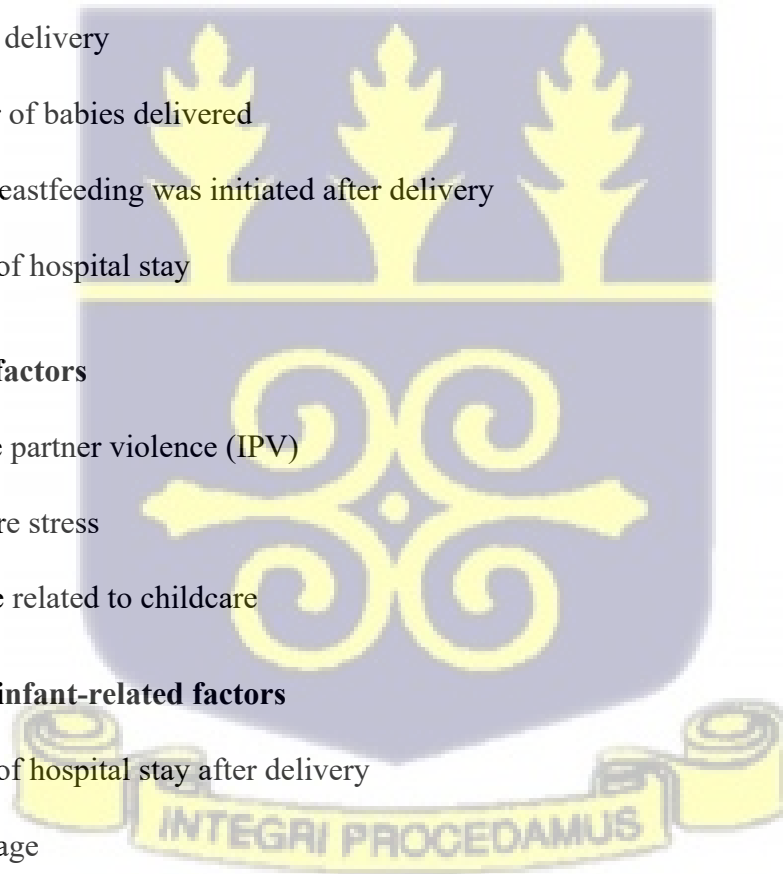
- Gestational age at birth
- Type of delivery
- Number of babies delivered
- Time breastfeeding was initiated after delivery
- Length of hospital stay

### **Psychological factors**

- Intimate partner violence (IPV)
- Childcare stress
- Pressure related to childcare

### **Maternal and infant-related factors**

- Length of hospital stay after delivery
- Baby's age
- Baby's sex
- Baby's sex expected
- Baby's weight at birth



- Maternal health status
- Ill baby
- Breastfeeding problems
- Baby's health status
- Temperament of baby

### **Spousal and social support**

- Partner reliability
- Marital relationship satisfaction
- Relationship with parents and parents-in-law
- Intimate partner violence (IPV)
- Family and social support

### **Clinical factors**

- Previous history of depression
- Family history of mental disorder
- Health professional counselling/education on PPD.

The conceptual framework implies that a variety of sociodemographic factors, including maternal age, occupation/employment, educational level, place/ type of residence, marital status, and religion may affect the occurrence of postpartum depressive symptoms.

It is thought that age can influence a woman's preparation to give birth and that mothers are most prepared to support and care for their infants between the ages of 20 and 30. Paramedics believe that between the ages of 20 and 30 is best because there is the least chance of developing medical problems (Handini & Puspitasari, 2021). Because age has an impact on uterine health,

postpartum blues are correlated with age. Postpartum blues left untreated may develop into PPD. While mothers under the age of 20 are more likely to experience complications during childbirth and hospital treatments and may require the assistance of medical professionals, mothers over the age of 35 also run the risk of PPD because of exhaustion and inadequate anatomical preparation for childbirth and pregnancy (Handini & Puspitasari, 2021).

According to Handini & Puspitasari (2021), low-educated mothers tend to have more children and are more likely to have postpartum depression because they cannot give enough care. Conversely, mothers with higher education will face social pressure and conflicting expectations regarding their roles as housewives and workers.

It is impossible to overstate the significance of socioeconomic status in the development of mental health disorders and depression. Socioeconomic factors include low family income, unstable jobs, financial difficulties, financial dependence on partner, high monthly expenditure, recent home relocation, recently divorced/separated, the recent death of a loved one, and loss of job.

Handini & Puspitasari (2021) assert that hormonal changes brought on by the family economy and a lack of confidence might cause anxiety in new mothers, and that poor family financial circumstances can give a mother the impression that killing her child is preferable to enduring suffering. Poverty, no support from husband, joblessness, being a first-time, and unplanned pregnancy are factors found to be associated with PPD (Alam et al., 2021; Coast et al., 2012).

The quality of a marriage may influence the husband's involvement and support during the pregnancy, delivery, and postpartum period, ultimately influencing mothers' postpartum

depressive symptoms and improving their health behavior. Couples with greater family incomes and fewer children were more likely to have a positive marital relationship (Handini & Puspitasari, 2021). The mother's and the rest of the family's preparation to welcome a new member is influenced by family support. Husbands are particularly crucial since they play a supportive role from the time of conception till the baby is born.

Clinical factors include a previous history of depression, family history of mental disorder, and health professional counselling/education on PPD. Previous studies show that women with a history of mental illness are more likely to experience postpartum depression, with prior depression being the biggest risk factor (Suri & Altshuler, 2012; Wisner et al., 2013).

Problems with breastfeeding are also considered to be a strong risk factor for developing PPD (Fiala et al., 2017).

In summary, the conceptual framework illustrates elements that could cause postpartum depression. Early detection of postpartum depression and the subsequent promotion of early treatment are goals that awareness, communication, and support may help achieve.

## **2.10 Chapter summary and outstanding gaps in literature**

The postpartum period is well-known as a time of difficulty for new mothers, especially first-time mothers who have no prior experience in how to care for a child and have little knowledge of what to expect. This makes them more vulnerable to developing PPD.

Even though there is substantial literature on the prevalence and correlates of PPD in mothers globally and locally, little is known about the prevalence and factors associated with PPD in

first-time mothers generally, especially in LMIC and for that matter, Africa and Ghana. The few studies which have been conducted on first-time mothers were in Asia and Europe.

This calls for more research to be done among first-time mothers in these settings to be able to better understand the factors that contribute to developing PPD in these areas.



## CHAPTER THREE

### METHODOLOGY

#### 3.0 Introduction

This chapter covers in detail the methods and procedures that were used to carry out the study. The study's setting and ethical issues were also discussed.

#### 3.1 Study design

This study was a facility-based cross-sectional study involving first-time mothers within 6 months of childbirth attending the postnatal or child welfare clinic at the Korle Bu Teaching Hospital (KBTH). The study was conducted between November 2022 and December 2022.

#### 3.2 Study Area

The Korle-Bu Teaching Hospital is the leading tertiary healthcare facility in Ghana. It was established on October 9<sup>th</sup> 1923 as a General Hospital to serve the healthcare needs of the population under the administration of Sir Frederick Gordon Guggisberg, then Governor of the Gold Coast (KBTH, 2022). The hospital is situated in the Ablekuma South constituency in Korle-Gonno, a suburb of Accra.

Being the largest of the three (3) Sub Metropolitan District Councils of the Accra Metropolitan Assembly (AMA), the Ablekuma South Sub Metropolitan District Council covers an area of 15.1 sqkm and shares its boundaries with Ablekuma Central, Ablekuma North Municipal Assembly, and Ashiedu Keteke Sub Metropolitan District Council. It is estimated to have a population of 257,543 people, 22,751 homes, and 69,401 households as per the 2010 housing

census. Ablekuma South's population is anticipated to reach 315,051 in 2018, based on the Greater Accra Growth Rate of 3.1% (Accra Metropolitan Assembly, 2022).

Since most of the communities are located near the coast, fishing and fishmongering are the primary economic activities of the locals, and as a result, the Sub Metro area has made significant contributions to Accra's economic growth. Other commercial establishments like educational institutions, banks, supermarkets, gas stations, and hotels are also housed there. The Tuesday Market in Korle Gonno and the Dansoman Market are its two primary markets. (Wikipedia, 2022).

The boundary from the current office location travels through the Kpakpo Oti Road intersection to Ring Road West (Mortuary Road), then travels east on Ring Road West to Laterbiokorshie Road (Zoti), turning left from Laterbiokorshie Road to Link Road Intersection to Chemu Road (Summer Hut Junction). Following that, takes Mampong Stream to Oblogo Road via Sempe Traffic Light Street (I.B.E), and then turns left at the intersection of Mars Road. to the Dansoman roundabout from the intersection of Mars Road. From the Dansoman Main Road, Poultry Farm Avenue, the Dansoman High Street, the SSNIT apartments, and then back to the Otorjor, Opetekwei, Gbegbeyise, and Shaibu Communities. There are 5 electoral areas in the Sub-Metro: Korle Gonno, Korle-Bu, Chorkor, Mamprobi, and New Mamprobi.(Accra Metropolitan Assembly, 2022; Wikipedia, 2022)

Population growth and the effectiveness of hospital-based therapy led to an increase in hospital attendance shortly after the Korle Bu Teaching Hospital was founded. This development resulted in severe congestion when utilizing the hospital's services, necessitating an expansion in 1953.

With 2,000 beds, 17 clinical and diagnostic Departments/Units, and a total staff strength of over 5000, the hospital is currently the third-largest hospital in Africa and the main national referral center in Ghana. There are around 250 in-patient admissions each day and 1,500 patients on average daily attendance. In addition to serving as a reference hospital for other facilities in the nation, it also serves as one for other nations in the West African Subregion.

The hospital's clinical and diagnostic divisions include Accident & Emergency, Family Medicine/Polyclinic, Psychiatry, Reconstructive Plastic Surgery and Burns Center, Child Health, Surgery, Obstetrics and Gynecology, Anaesthesia, and Internal Medicine and Therapeutics. Other fields include pharmacy, pathology, laboratory, and radiology, which includes subspecialties in neurosurgery, pediatric surgery, dental/oral maxillofacial surgery, ophthalmology, ear, nose, and throat (ENT), renal, orthopedic, oncology, dermatology, reconstructive plastic surgery, cardiothoracic surgery, and radiotherapy & nuclear medicine.

The hospital has three centers of excellence: The National Cardiothoracic Centre, the National Reconstructive Plastic Surgery and Burns Centre, and the National Centre for Radiotherapy and Nuclear Medicine. These centers draw a sizable number of patrons from both within the nation and from neighboring nations, including Burkina Faso, Nigeria, Togo, and Benin, among others (KBTH, 2022).

The hospital acquired its status as a teaching hospital for the training of physicians in 1962, with the founding of the University of Ghana Medical School (UGMS) (Ministry Of Health, 2022).

### 3.3 Study population

First-time mothers within 6 months of childbirth attending the postnatal or child welfare clinic within the period of November and December 2022 at the Korle Bu Teaching Hospital (KBTH).

#### Study sites

##### Postnatal clinic

The postnatal clinic is located within the obstetric OPD of the Obstetrics & Gynaecology department of the Korle Bu Teaching Hospital. The clinic operates from Mondays to Fridays. It serves all postnatal women who delivered in the facility two weeks after delivery and then six weeks post-delivery. Those with special problems are seen more frequently. The unit sees an average of 80 mothers per day. The clinic recorded 18,088 postnatal cases in 2013 compared to 16,088 in 2012 and 15,795 in 2011 (Korle Bu Teaching Hospital, 2013).

##### Child Welfare Clinic (CWC)

The child welfare clinic is one of the support clinics under the Department of Child Health of the Korle Bu Teaching Hospital. The Department was established in 1964 under the leadership of its first Head Dr. Susan De-Graft Johnson. It is a tertiary referral center for children under 13 years with medical and surgical problems (Korle-Bu Teaching Hospital, 2022). In 2016, the OPD attendance was 28,152 (Korle Bu Teaching Hospital, 2016). The OPD General Clinic recorded 18,572 cases in 2013 while the Sub-Specialty Clinics, which include the Child Welfare Clinic recorded 10,776 cases (Korle Bu Teaching Hospital, 2013). The Child Welfare Clinic serves children from 6 weeks old to 5 years through continual growth monitoring and immunization. On average, 60 babies are seen per day.

### 3.3.1 Inclusion criteria

The study included first-time mothers who fully met these criteria:

1. Within six months of delivery
2. Between 15-45 years
2. Had a full or pre-term delivery
3. Discharged with baby/babies
4. Had spontaneous vaginal delivery, delivery by CS, or assisted delivery (e.g. vacuum delivery, forceps delivery).

### 3.3.2 Exclusion criteria

The following categories of first-time mothers were excluded from the study:

1. Those whose babies had died
2. Those with known mental disorders

### 3.4 Sample size determination

194 first-time mothers made up the total sample size for this study. The Cochran formula was

used to determine this:  $n = \frac{z_{\alpha/2}^2 P(1-P)}{e^2}$

Where,

$Z_{\alpha/2}$  – score at 5% significance level = 1.96

$e$  – 0.05, the margin of error, set at 5%

$\alpha$  = significance level = 5%

$P$  = Prevalence of PPD in first-time mothers = 13.2% (Leahy-Warren, McCarthy, & Corcoran, 2011)

$$n = \frac{1.96^2 \times 0.132 (1-0.132)}{0.05^2} = 176.06$$

$\Rightarrow n = \text{Minimum required sample size} = 176.06$ , approximately 176.

A nonresponsive rate of 10% was added to allow room for no responsiveness and dropout of respondents.

Adjusting for a non-response rate of 10% =  $176 + 0.10 (176) = 193.6$

$\therefore$  Total sample size = 194

A total sample size of 194 was calculated for the study. However, due to the difficulty in finding first-time mothers at both clinics within the short period of the study and in order to meet the university deadline for submission of the final work, only 150 first-time mothers were able to be recruited for the study, forming about 80% of the total sample size.

### **3.5 Sampling procedure**

Consecutive sampling technique was used given the constraint of time and difficulty in finding first-time mothers within six months postpartum.

Every first-time mother who came to the postnatal or child welfare clinic and met the inclusion criteria was recruited until the required sample size was attained.

### **3.6 Data collection methods**

A quantitative survey was conducted using structured interviews.

The principal investigator was available at the child welfare clinic on clinic days (Mondays and Fridays) and at the postnatal clinic from Tuesdays to Thursdays every week from November 16<sup>th</sup> to December 30<sup>th</sup> for the recruitment of participants for the study. Mothers who met the selection criteria were identified and approached. The study was explained to them and after consent was obtained, data was collected from participants.

Data was collected using a structured questionnaire and the Edinburgh Postnatal Depression Scale (EPDS). The structured questionnaire and EPDS were administered to each mother by the principal investigator. This took approximately 15 minutes to complete. The questionnaires were read aloud to mothers verbatim in their preferred language (whether local or English). Mothers at the postnatal clinic were interviewed while they waited their turn to be examined by the midwife-in-charge. This was after their vital signs had been taken and their babies weighed. Mothers at the Child Welfare Clinic were interviewed while they waited their turn to weigh their babies, or while they waited their turn for their babies to be vaccinated. This was to prevent unduly delaying mothers at the clinics.

### **3.7 Instrument for data collection**

Information on participants' characteristics and other independent (explanatory) variables was gathered using a structured questionnaire, while the EPDS was used for assessing symptoms of postpartum depression.

The EPDS is a valuable, self-rated screening tool used for the early identification of postpartum depressive symptoms. It is the most widely used and most validated screening tool for depression during the perinatal period (Cox, Holden, & Sagovsky, 1987).

The 10-item self-reported tool comprises two positive and eight negative items designed to assess postpartum depression symptomatology in new mothers from their experiences in the previous week that is well known for its validity and reliability and has become a globally accepted tool in PPD research (Affonso, De, Horowitz, & Mayberry, 2000; Maimburg & Væth, 2015; Weobong et al., 2009). It includes questions like “I have been able to laugh and see the

funny side of things”, “I have blamed myself unnecessarily when things went wrong” and “I have been anxious or worried for no good reason”, among others.

There are four possible responses for each item; from 0 to 3, with 0 as the minimum score and 30 representing the maximum score (Paddy et al., 2021). It is made up of four-point response options, i.e. (0,1,2,3) which gives a total maximum score of 30 (Weobong et al., 2009).

The scale is effective as it shows sensitivity and specificity (Atuhaire, Brennaman, Cumber, Rukundo, & Nambozi, 2020). Questions related to somatic complaints such as changes in appetite and fatigue are not included in the scale as such complaints would not help distinguish women who are depressed from those who are not (Murray & Carothers, 1990).

The cutoff value used to identify women as high risk for postpartum depression varies. However, a cutoff score of  $\geq 10$  or  $\geq 12$  is typically used in research to identify women who are at high risk for postpartum depression.

A cut-off of  $\geq 10$  is diagnosed as severe PPD as recommended in the original publication by Murray & Carothers (1990), with a sensitivity of 85% and specificity of 77%.

The combined sensitivity and specificity to detect major depression in postpartum women were higher for a cut-off value of 12 or higher (sensitivity 0.86, specificity 0.87, 15 studies) than for a cut-off value of 10 or higher (sensitivity 0.92, specificity 0.77, 14 studies), or for a cut-off value of 13 or higher (sensitivity 0.79, specificity 0.89, 18 studies), among a total of 18 studies, according to a previous meta-analysis that looked at the accuracy of the EPDS (Hewitt et al., 2009).

According to WebMD (2022), a score of 12 or greater indicates the likelihood of depression but not severity. Although scores cannot be interpreted as diagnostic, they can indicate the need for further evaluation.

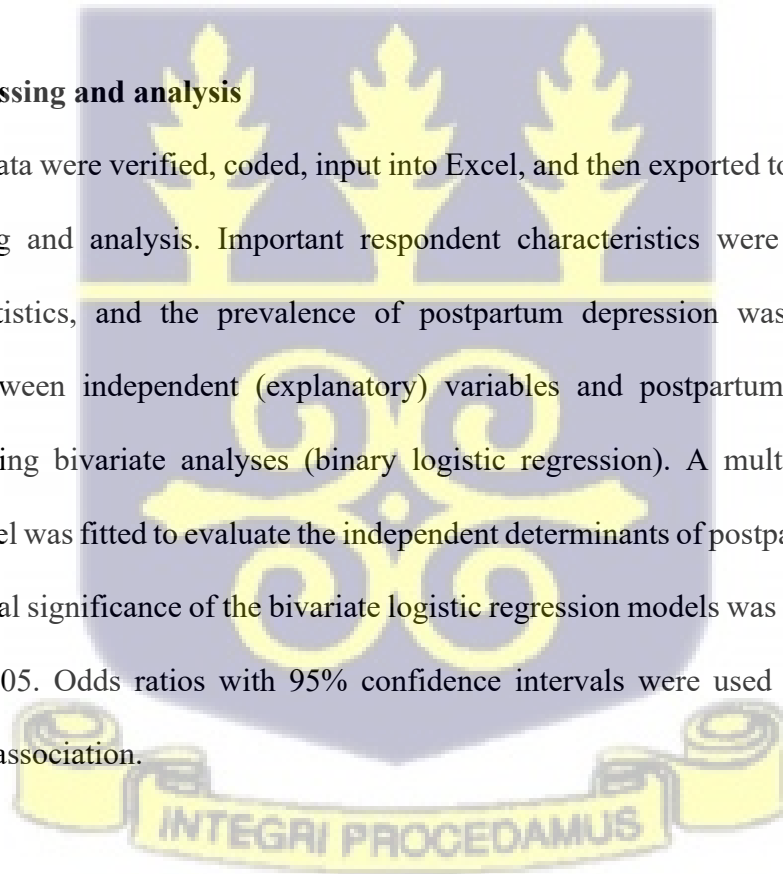
A cutoff score of  $\geq 12$  was used to identify PPD in this study.

### 3.8 Pre-test

The Greater Accra Regional Hospital was used as a pre-test site for the study tools (questionnaires) since it shares similarities with Korle Bu Teaching Hospital. This pre-test mostly assessed the questions' applicability, predicted how long the study would take, and finalized the tools for the main investigation.

### 3.9 Data processing and analysis

The collected data were verified, coded, input into Excel, and then exported to STATA version 17 for cleaning and analysis. Important respondent characteristics were described using descriptive statistics, and the prevalence of postpartum depression was estimated. The association between independent (explanatory) variables and postpartum depression was investigated using bivariate analyses (binary logistic regression). A multivariable logistic regression model was fitted to evaluate the independent determinants of postpartum depression, and the statistical significance of the bivariate logistic regression models was determined using a p-value of 0.05. Odds ratios with 95% confidence intervals were used to determine the strength of the association.



### 3.10 Variables

#### 3.10.1 Outcome variable

Postpartum depression symptom(s) is the outcome variable. The EPDS was used to measure this. There are 10 questions on the EPDS. Responses are given a score of 0, 1, 2, or 3 depending on whether the symptom is absent, present, or has become more severe. The sum of the scores for each of the 10 elements was used to calculate the overall score. Mothers with scores of 12 points and higher were categorized as having postpartum depression symptoms, whereas those with lower total EPDS scores (0-11 points) weren't.

#### 3.10.2 Independent (Explanatory) Variables

The structured questionnaire was used to define and measure a variety of independent (explanatory) variables. These variables were broadly divided into six main factors: socio-demographic, socioeconomic, obstetric (pregnancy and antenatal-related factors and delivery history), maternal and infant-related, spousal & social support, and clinical & psychological factors.

##### **Socio-demographic factors**

The socio-demographic factors comprised maternal age, occupation/employment, educational level, place/ type of residence, marital status, and religion.

##### **Socio-economic factors**

The socioeconomic factors included monthly family income, working conditions, financial difficulties, economic dependence on partner or financial independence, monthly expenditure, recent home relocation, recently divorced/separated, the recent death of a loved one, loss of job, and cultural practices and beliefs e.g., some customs dictate that new mothers should not

be seen outside for some time; hence, women are forced to remain indoors several days after delivery. Another cultural practice is sitting on hot water after delivery, which might cause more pain and discomfort to a new mother.

**Obstetric factors** comprised pregnancy and antenatal-related factors and delivery history of respondents.

Pregnancy and antenatal-related factors consisted of gravidity, whether the pregnancy was planned, bed rest during pregnancy, previous miscarriages, antenatal care (ANC) attendance and numbers of visits, bed rest during pregnancy, and past infertility treatment, health professional counselling on PPD during ANC, gestational age ANC was started and previous knowledge about PPD.

Delivery history was made of gestational age at birth, type of delivery, number of babies delivered, time breastfeeding was initiated after delivery and length of hospital stay.

**Maternal and infant-related factors**

Included previous knowledge of postpartum depression, gestational age at birth, complications intra or postpartum, length of hospital stay after delivery, baby's age, baby's sex, whether baby's sex was expected, baby's weight at birth, maternal health condition, baby ever ill, inability of the child to suckle properly, baby's current health condition, temperament of baby, difficulty feeding baby and whether baby has special needs.

### **Spousal, social support, and psychological factors**

These included whether the mother can rely on her partner for help, whether she can share all her problems with her partner, marital relationship satisfaction, relationship with parents and parents-in-law, family support in taking care of the baby.

### **Clinical factors**

Clinical factors comprised past depression history, family history of mental disorder, and health professional counselling/education on PPD.

### **Psychological factors**

Included intimate partner violence (IPV), childcare stress, and pressure related to childcare

### **3.10 Quality assurance**

A pilot study was done to correct all feasibility concerns and issues with the data collection instrument before the survey or data collection itself began. Daily data collection was carried out. The researcher cross-examined the completed questionnaires at the end of the day to look for any missing data, completeness, and consistency. Microsoft Excel was used to enter and clean the data simultaneously.

### **3.11 Ethical issues**

Ethical clearance was obtained from the Korle Bu Institutional Review Board with approval number **KBTH-IRB 000169/2022** before the study was carried out. The consent of participants was also sought before interviews were done.

The Researcher did not anticipate any direct risks to be associated with this study although participants were urged not to provide any private or sensitive information that made them

uncomfortable. In the unlikely event that there was some risk, the Researcher believes such will be lower than Minimal Risk. Minimal Risk to subjects per NIH guidelines “means that the probability and magnitude of harm or discomfort anticipated in the research are not greater than those ordinarily encountered in daily life or during the performance of routine physical and psychological examinations or tests and that confidentiality is adequately protected” (NIMH » *NIMH Guidance on Risk-Based Monitoring*, n.d.).

There were no direct benefits for the participants of this study. However, the respondents were informed that the information they provide may advance a general understanding of postpartum depression. Also, participants were made to understand that participation in the study is voluntary and that withdrawal from the study was allowed without any penalty.

Data collected for the study were kept confidential and used solely for the purpose indicated for the study. Interviews were conducted in a separate room set aside specifically for the project to ensure privacy. Electronic data files were password protected while hard copy data were stored securely in locked file cabinets without the study participants' names, and access was limited to the study's Principal Investigator.

Parental consent was obtained before minors were recruited into the study. Some challenges encountered with enrolling minors into the study were difficulty in accessing parents for consent. This is because some minors who visited the postnatal/child welfare clinics were not accompanied by a parent, making it difficult to get consent. Minors who were accompanied by a guardian could not speak freely or respond truthfully to some questions in the presence of their parent/guardian. Another problem experienced with the presence of a parent was an increase in interview time as two people had to be interviewed instead of one. Also, for minors

who attended the clinics alone, the phone number of their parent was taken. Phone calls had to be made to the parents to obtain consent to interview their wards which had its own challenges. For instance, sometimes the parent was not in the same location as the child to give them the phone, so would then either give another phone number to reach the child, or give a time that they thought they would be with the child. Also, the already high expense of telephone surveys with teenagers was made even higher by the fact that interviews over the phone frequently needed more time and effort and necessitated follow-up calls to try to contact them.

### **3.12 Chapter Summary**

In summary, this chapter elaborated on the descriptive cross-sectional quantitative study design used in the study. Also, the procedures and tools for gathering data, as well as quality control and ethical concerns, were covered in detail. Results are presented in the following chapter.



## CHAPTER FOUR

### RESULTS

#### 4.1 Introduction

This chapter focuses on the presentation of the study's findings and their interpretations. These findings are presented according to the objectives of the study which include a report on the obstetric, maternal and infant-related, clinical, and psychological characteristics of respondents, as well as the prevalence and factors associated with postpartum depression in first-time mothers at KBTH, but are preceded by the background and socio-demographic characteristics. For clarity purposes, the chapter is organized into subheadings.

#### 4.2 Background and Sociodemographic characteristics of first-time mothers

The study recruited 150 first-time mothers who met the inclusion criteria. Majority (41.3%) of the respondents were between the ages 26 and 30 years, with only about 7.3% above 35 years. A greater percentage (63.3%) of the mothers were married. Most (60.7%) of them lived in rented apartments. About 43.3% of them had attained tertiary education with most (38%) having had diploma and undergraduate education. A little above half (52%) of the mothers had partners who had attained tertiary education. Only a few of them (2.7%) had partners who were unemployed.

Most of the respondents (66%) had a family income below average (i.e., <GH¢5000). More than half (62.7%) of them had stable jobs and 60% had no financial difficulties. Overall, half (50.7%) of the mothers had a monthly expenditure between GH¢ 500-999. Majority (59.3%) of the mothers were economically dependent on their partners. A little above half (54.7%) of them were forced to stay indoors after delivery. A greater percentage (87.3%) received some

form of family support in caring for their babies. A few of them (8.7%) were recently divorced/separated.

The background and sociodemographic characteristics of respondents have been summarized in Table 1.



**Table 1: Background and Sociodemographic characteristics of respondents (n=150)**

Variable	Frequency	Percent (%)
<b>Age of respondent (in years)</b>		
< 20	12	8
20-25	37	24.7
26-30	62	41.3
31-35	28	18.7
>35	11	7.3
<b>Employment</b>		
Civil servant	22	14.7
Health professional	34	22.7
Unemployed	23	15.3
Trader/Business	19	12.7
Housewife	1	0.7
Student	5	3.3
Other	46	30.7
<b>Educational level</b>		
None	1	0.7
Basic school	5	3.3
Junior high school/MLSC	36	24
Senior high school	43	28.7
Diploma/Undergraduate	57	38
Postgraduate	8	5.3
<b>Residence type</b>		
Private	39	26
Parent's house	20	13.3
Rented	91	60.7
<b>Marital status</b>		
Married	95	63.3
Unmarried	31	20.7
Cohabiting	23	15.3
Separated	1	0.7
<b>Religion</b>		
None	2	1.3
Christian	131	87.3
Muslim	17	11.3

**Partner's educational status**

No formal education	1	0.7
Primary	3	2
JSS/JHS/MLSC	22	14.7
Secondary/SHS	46	30.7
Tertiary	78	52

**Partner's occupation**

Trading/Businessman	24	16
Civil servant	28	18.7
Student	5	3.3
Health worker	14	9.3
White color job	13	8.7
Unemployed	4	2.7
Other	62	41.3

**Family income (combined)**

Below average (<GH¢5000)	99	66
Average (GH¢5000)	26	17.3
Above average (>GH¢5000)	25	16.7

**Had stable working conditions** 94 62.7

**Had financial difficulty** 60 40

**Economically dependent on partner** 89 59.3

**Forced to stay indoors after delivery** 87 58.0

**Forced to sit on hot water after delivery** 31 20.7

**Received some form of family support in taking care of baby** 131 87.3

**Lost a loved one recently** 19 12.7

**Gone through a divorce/separation recently** 13 8.7

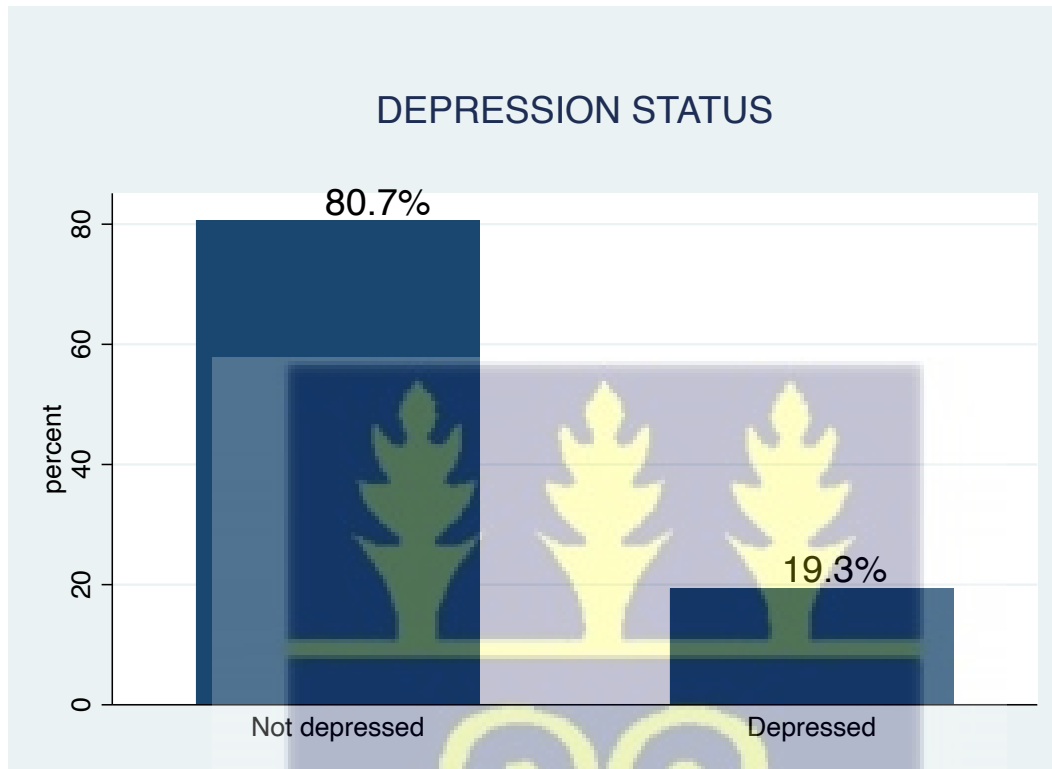
**Relocated to a new home recently** 39 26

**Amount spent in a month**

< GH¢200	3	2
GH¢200 - 499	27	18
GH¢500 – 999	76	50.7
GH¢1000 & above	44	29.3

### 4.3 Prevalence of Postpartum Depression

Out of 150 first-time mothers who were screened, 19.3% (29/150) were identified to have PPD using the EPDS cut-off of  $\geq 12$ . Figure 2 shows the prevalence of postpartum depression in first-time mothers within 6 months of childbirth at the KBTH.



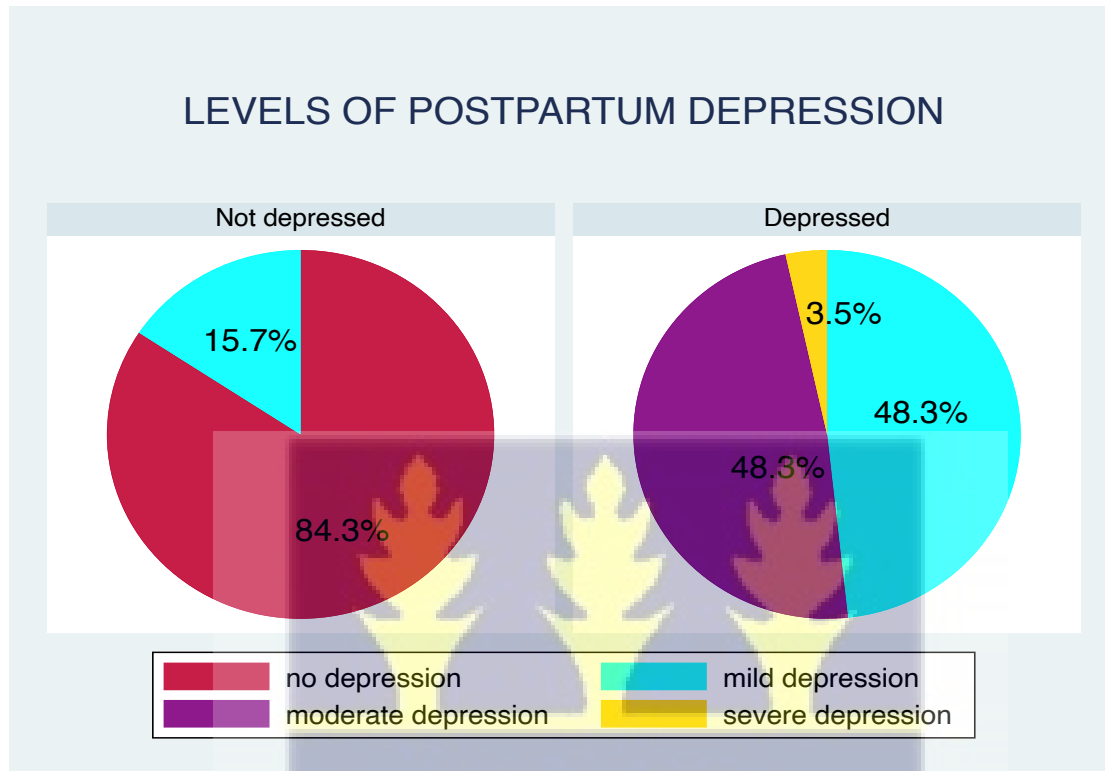
**Figure 2: Prevalence of Postpartum Depression (PPD)**

#### 4.3.1 Classification of PPD in respondents by severity

The study further attempted to classify depressed first-time mothers by adopting the classification of PPD according to the severity ranges established for the Edinburgh Postpartum Depression Scale by McCabe-Beane, Segre, Perkhounkova, Stuart, & O'Hara (2016). This suggests a score of 0–6 as No depression, 7–13 as Mild depression, 14–19 (Moderate depression), and 19–30 as Severe depression.

The results show that out of the 19.3% of first-time mothers who were depressed, 48.3% had mild depression; same for moderate depression, while the remaining 3.5% were severely

depressed. Even for the rest of the study population who were found to have no PPD, it is observed that 15.7% had mild depression. Figure 3 provides a summary of the classifications of PPD by severity.



**Figure 3: Classification of PPD by severity**

#### 4.3.2 Classification of PPD in respondents by possibility/probability

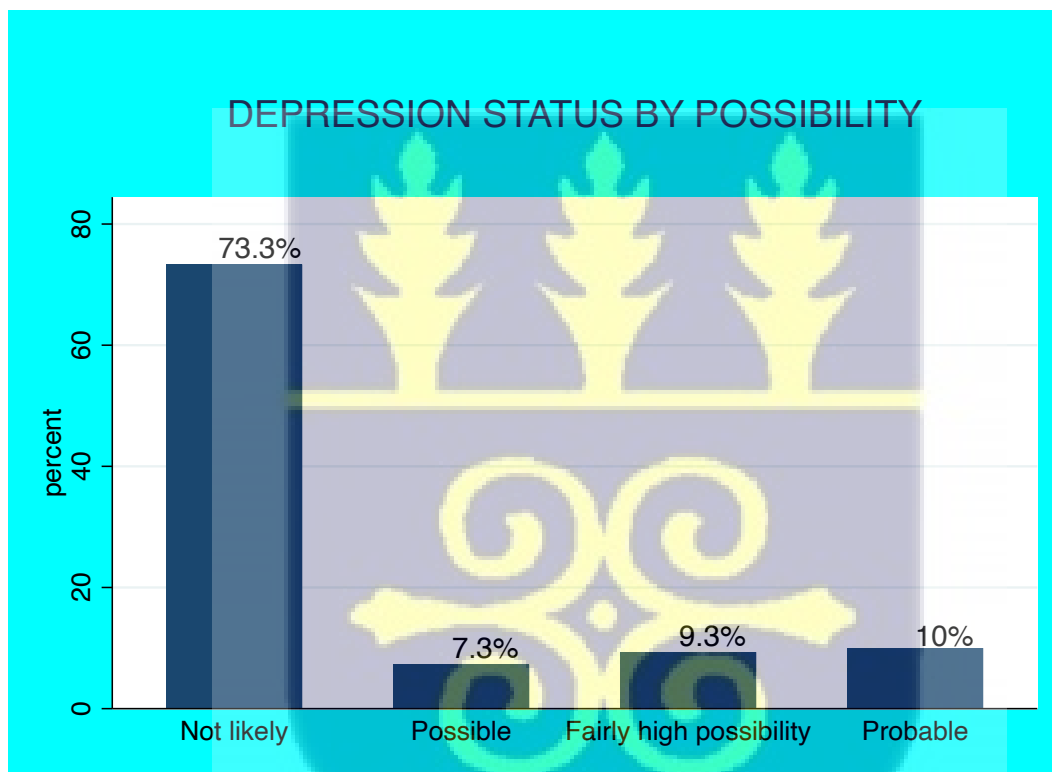
The study also adopted the classification of PPD according to the probability ranges established for the Edinburgh Postpartum Depression Scale by (Edinburgh Postnatal Depression Scale (EPDS), n.d.) which suggests the interpretation for PPD probability below.

EPDS Score	Interpretation	Action
<8	Depression not likely	Continue support
9–11	Depression possible	Support, re-screen in 2 – 4 weeks. Consider referral to primary care provider (PCP).
12–13	Fairly high possibility of depression	Monitor, support and offer education. Refer to PCP.
14 and higher (positive screen)	Probable depression	Diagnostic assessment and treatment by PCP and/or specialist.

The results show that one in ten (10%) first-time mothers was probably depressed. 9.3% of them had a fairly high possibility of depression. 7.3% of the mothers were possibly depressed, and majority (73.3%) of the respondents were not likely to have depression.

Figure 4 provides a summary of the classification of PPD in the respondents by possibility/probability.

This goes to suggest that by using different scales of classification, the rates of depression may vary.



**Figure 4: Classification of PPD by possibility/probability**

#### 4.3.3 Postpartum depression status by some selected characteristics of respondents

The study also explored postpartum depression status by some selected characteristics of respondents that are consistent in literature. It revealed that first-time mothers between the ages of 20 and 25 years formed the majority (31.0%) of respondents with PPD.

Mothers with below-average family income (<GH¢5000) formed the greater percentage (75.9%) of mothers with PPD. PPD rate was also high (65.5%) in first-time mothers who had unplanned/unexpected pregnancies. As expected, mothers who delivered through assisted delivery/CS constituted majority of mothers with PPD. Interestingly, first-time mothers who had support from their partners were more depressed than those who did not.

The rest of the characteristics of respondents by depression status have been described in

Figure 5.

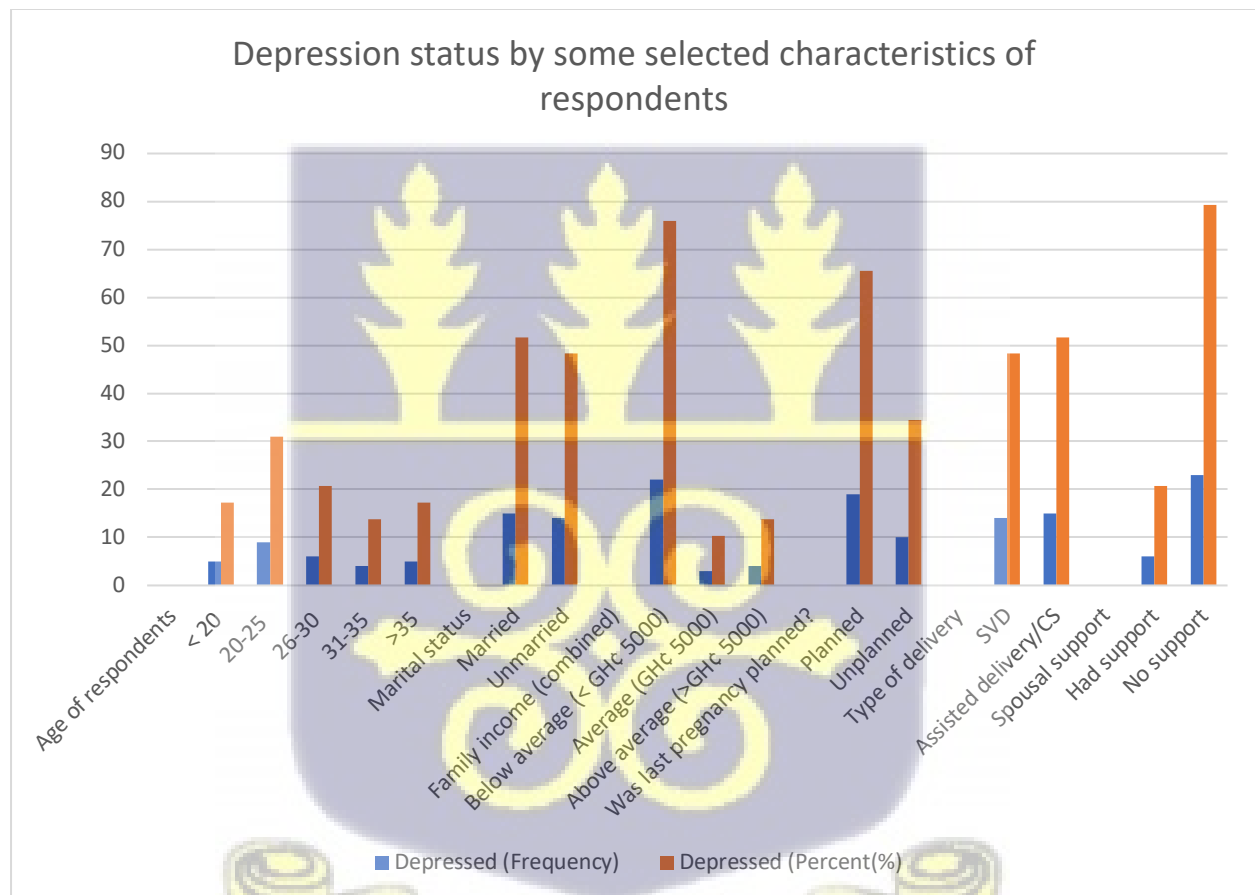


Figure 5: Depression status by selected characteristics of respondents

#### **4.4 Obstetric, maternal and infant, clinical and psychological characteristics of respondents**

##### **4.4.1 Obstetric characteristics of respondents**

A number of obstetric factors were examined. These were grouped under two main factors; Pregnancy & antenatal-related characteristics and Delivery history of respondents.

##### **4.4.1.1 Pregnancy and Antenatal-related characteristics of respondents**

For majority (78.7%) of the respondents, the last pregnancy was their first time being pregnant. A little more than half (51.3%) of the mothers planned their pregnancy. Nearly all (99.3%) attended antenatal clinic during pregnancy, of which a greater percentage (90.7%) attended more than four times. Most (66%) of the mothers had no previous knowledge about postpartum depression, and only 16% received health professional counselling on PPD during antenatal. 15.3% had bedrest during pregnancy due to pregnancy complication. A few (12%) of them had had a previous miscarriage, and 16% had treatment for infertility in the past.

##### **4.4.1.2 Delivery history of respondents**

Out of the 150 respondents, 46% delivered between 39 to 40 weeks gestation, with 8% having delivered below 37 weeks. Majority (64%) of them delivered by spontaneous vaginal delivery (SVD). A greater percentage (98%) had singletons. Almost half (49.3%) of the mothers initiated breastfeeding within one hour of birth. Most (65.3%) of them spent one to three days at the hospital after delivery.

Table 2 provides a summary of the obstetric characteristics of respondents.

**Table 2: Obstetric characteristics of respondents**

Variable	Frequency (N=150)	Percent (%)
<b>Gravidity of last pregnancy</b>		
First	118	78.7
Second	24	16
Third	8	5.3
<b>Last pregnancy was planned</b>	77	51.3
<b>Attended antenatal during pregnancy</b>	149	99.3
<b>Gestational age when antenatal was started</b>		
< 3 months	83	55.3
3-6 months	64	42.7
> 6 months	3	2
<b>Number of antenatal visits attended</b>		
< 4 times	7	4.7
4 times	7	4.7
> 4 times	136	90.7
<b>Had previous knowledge on PPD</b>	51	34
<b>Received a health professional counselling on PPD during ANC</b>	24	16
<b>Had bed rest due to a pregnancy complication</b>	23	15.3
<b>Had a previous miscarriage</b>	18	12
<b>Had treatment for infertility in the past</b>	24	16
<b>Gestational age at birth (in weeks)</b>		
< 37	12	8
37 – 38	42	28
39 – 40	69	46
> 40	27	18
<b>Type of delivery</b>		
Spontaneous Vaginal Delivery (SVD)	96	64
Caesarean Section (CS)	49	32.67
Assisted delivery	5	3.33

**Number of babies delivered**

Singleton	147	98
Multiples	3	2

**Time breastfeeding was initiated after delivery**

Within 1hr of birth	74	49.3
1 - 3 hours later	37	24.7
4 – 6 hours later	28	18.7
24hrs	11	7.3

**Length of hospital stay**

1 - 3 days	98	65.3
4 – 7 days	40	26.7
> 1 week	12	8

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**4.4.2 Maternal and infant-related characteristics**

Table 3 summarizes the maternal and infant characteristics of respondents.

Results from the study show that majority (76.7%) of the first-time mothers recruited were in excellent health. While 29.3% revealed that they were anxious about something, 70.7% of them showed no signs of anxiety at all. Only 20.7% of them agreed to have ever exercised after childbirth. Furthermore, 16.0% of them asserted to have experienced difficulty with breastfeeding, while 36.7% revealed that this happened in the early stages. Most of the mothers expressed great satisfaction with their marital relationships (84%), relationship with their parents (86.7%), and relationship with their in-laws (77.3%).

The table further revealed that a little above half (50.7%) of the babies delivered were females. For most (88.7%) of the mothers, the sex of the baby was expected. 48.7% of the babies delivered weighed between 3.1 to 4.0kg. While 12.7% weighed below 2.5kg, only a few (2.7%) of them weighed above 4kg. Approximately 40% of the babies were between 5 to 8 weeks old at the time of the study.

Nearly all (99.3%) of them were in good health. Only a few (9.3%) of them were ever ill after delivery. A greater percentage (90.7%) were able to breastfeed properly. 28.7% were reported to have a difficult temperament and only a few (3.3%) of them had special needs.



**Table 3: Maternal and infant-related characteristics of respondents**

Variable	Frequency (N=150)	Percent (%)
<b>Mother's current health status</b>		
Poor	1	0.7
Fair	8	5.3
Good	26	17.3
Very good/excellent	115	76.7
<b>Mother is anxious about something</b>	44	29.3
<b>Exercised after delivery</b>	31	20.7
<b>Experienced difficulty in breastfeeding baby</b>		
No	71	47.3
Yes	24	16
Early stages	55	36.7
<b>Marital relationship satisfaction</b>		
Very dissatisfied	2	1.3
Dissatisfied	5	3.3
Neither satisfied nor dissatisfied	7	4.7
Somewhat satisfied	10	6.7
Very satisfied	126	84
<b>Relationship with parents</b>		
Deceased	4	2.7
Very dissatisfied	2	1.3
Dissatisfied	2	1.3
Neither satisfied nor dissatisfied	2	1.3
Somewhat satisfied	10	6.7
Very satisfied	130	86.7
<b>Relationship with in-laws</b>		
Deceased	1	0.7
Very dissatisfied	9	6
Dissatisfied	6	4
Neither satisfied nor dissatisfied	6	4
Somewhat satisfied	12	8
Very satisfied	116	77.3
<b>Infant-related characteristics</b>		
<b>Sex of child</b>		
Male	74	49.3
Female	76	50.7
<b>Baby's sex was expected</b>	133	88.7
<b>Birth weight of baby (in kg)</b>		
< 2.5	19	12.7
2.5 - 3.0	54	36
3.1 – 4.0	73	48.7
> 4	4	2.7

<b>Baby's age (in weeks)</b>		
< 2	26	17.3
2 – 4	24	16
5 – 8	59	39.3
9 –12	14	9.3
13–16	16	10.7
17– 20	2	1.3
21–24	9	6
<b>Baby's current health status</b>		
Good	149	99.3
Not good	1	0.7
<b>Baby fell ill or was admitted after delivery</b>	14	9.3
<b>Child is able to breastfeed properly</b>	136	90.7
<b>Baby has a difficult temperament</b>		
No	87	58
Yes	43	28.7
Sometimes	20	13.3
<b>Baby has special needs</b>	5	3.3

#### 4.4.3 Clinical and psychological characteristics of respondents

The clinical and psychological characteristics of respondents are presented in Table 4. Out of 150 respondents, 4.67% had a previous history of depression with a few (2%) with a family history of mental disorder. 19.3% affirmed that they feel extremely tired when caring for their baby, another 19.3% revealed that they also do sometimes. 6.7% reported having been abused by their partner recently. A few (16.7%) experienced some sort of pressure with regard to how to care for their child, most (13.3%) of which came from the family.



**Table 4: Clinical and psychological characteristics of respondents**

Variable	Frequency (n=150)	Percent (%)
<b>Had a previous history of depression</b>	7	4.7
<b>Has a family history of mental disorder</b>	3	2
<b>Feels extremely tired caring for baby</b>		
No	92	61.3
Yes	29	19.3
Sometimes	29	19.3
<b>Was abused by partner recently</b>	10	6.7
<b>Experienced any sort of pressure with regards to how to care for baby</b>		
No	120	80
Yes	25	16.7
Sometimes	5	3.3
<b>Source of pressure</b>		
Partner	1	0.7
In-laws	12	8
Friends	4	2.7
Family	20	13.3

#### **4.5 Factors associated with postpartum depression**

The main objective of this study was to determine the prevalence and correlates of postpartum depression in first-time mothers within 6 months of childbirth. Hence, bivariate analyses were first conducted to determine whether there existed any associations between sociodemographic factors and PPD among respondents, followed by the other independent factors.

##### **4.5.1 Background and sociodemographic factors associated with postpartum depression**

The results showed that among the sociodemographic factors examined, age ( $p=0.008$ ) and employment ( $p=0.023$ ) were the two factors found to be significantly associated with postpartum depression. Among the socioeconomic factors investigated, having gone through a divorce/separation recently ( $p=0.010$ ) and the amount spent in a month (monthly expenditure)

( $p=0.024$ ) were the two factors found to be significantly associated with postpartum depression as presented in Table 5.



**Table 5: Association between sociodemographic characteristics and postpartum depression (Bivariate Chi-Squared Analysis)**

Variable	Postpartum Depression status		P-value
	Not Depressed (%)	Depressed (%)	
<b>Age (in years)</b>			<b>0.008*</b>
< 20	7 (5.8)	5 (17.2)	
20-25	28 (23.1)	9 (31.0)	
26-30	56 (46.3)	6 (20.7)	
31-35	24 (19.8)	4 (13.8)	
>35	6 (5.0)	5 (17.2)	
<b>Employment</b>			<b>0.023*</b>
Civil servant	19 (15.70)	3 (10.3)	
Health professional	29 (23.97)	5 (17.2)	
Unemployed	15 (12.40)	8 (27.6)	
Trader/Business	19 (15.70)	0 (0.00)	
Housewife	0 (0.00)	1 (3.5)	
Student	4 (3.3)	1 (3.5)	
Other	35 (28.9)	11 (37.9)	
<b>Educational level</b>			0.845
None	1 (0.8)	0 (0.0)	
Basic school	5 (4.1)	0 (0.0)	
Junior high school/MLSC	27 (22.3)	9 (31.0)	
Senior high school	34 (28.1)	9 (31.0)	
Diploma/Undergraduate	47 (38.8)	10 (34.5)	
Postgraduate	7 (5.8)	1 (3.5)	
<b>Residence type</b>			0.120
Private	34 (28.1)	5 (17.2)	
Parent's house	13 (10.7)	7 (24.1)	
Rented	74 (61.2)	17 (58.6)	
<b>Marital status</b>			0.411
Married	80 (66.1)	15 (51.7)	
Unmarried	23 (19.0)	8 (27.6)	
Cohabiting	17 (14.1)	6 (20.7)	
Separated	1 (0.8)	0 (0.0)	
<b>Religion</b>			0.33
None	1 (0.8)	1 (3.5)	
Christian	105 (86.8)	26 (89.7)	
Muslim	15 (12.4)	2 (6.9)	
<b>Partner's educational status</b>			0.137
No formal education	1 (0.8)	0 (0.0)	
Primary	1 (0.8)	2 (6.9)	
JSS/JHS/MLSC	17 (14.1)	5 (17.2)	
Secondary/SHS	35 (28.9)	11 (37.9)	

Tertiary	67 (55.4)	11 (37.9)	
<b>Partner's occupation</b>			0.067
Trading/Businessman	19 (15.7)	5 (17.2)	
Civil servant	25 (20.7)	3 (10.3)	
Student	1 (0.8)	4 (13.8)	
Health worker	12 (9.9)	2 (6.9)	
White collar job	10 (8.3)	3 (10.3)	
Unemployed	4 (3.3)	0 (0.0)	
Other	50 (41.3)	12 (41.4)	
<b>Family income (combined)</b>			0.463
Below average (<GH¢5000)	77 (63.6)	22 (75.9)	
Average (GH¢5000)	23 (19.0)	3 (10.3)	
Above average (>GH¢5000)	21 (17.4)	4 (13.78)	
<b>Had stable working conditions</b>	79 (65.3)	15 (51.7)	0.175
<b>Had financial difficulty</b>	47 (38.8)	13 (44.8)	0.555
<b>Economically dependent on partner</b>	71 (58.7)	18 (62.1)	0.738
<b>Forced to stay indoors after delivery</b>			0.339
No	54 (44.6)	9 (31.0)	
Yes	63 (52.1)	19 (65.5)	
Sometimes	4 (3.3)	1 (3.5)	
<b>Forced to sit on hot water after delivery</b>	25 (20.7)	6 (20.7)	0.997
<b>Received some form of family support in taking care of baby</b>	108 (89.3)	23 (79.3)	0.148
<b>Lost a loved one recently</b>	16 (13.2)	3 (10.3)	1
<b>Gone through a divorce/separation recently</b>	7 (5.8)	6 (20.7)	0.010*
<b>Relocated to a new home recently</b>	32 (26.5)	7 (24.1)	0.799
<b>Amount spent in a month</b>			0.024*
< GH¢200	0 (0.0)	3 (10.3)	
GH¢200-499	22 (18.2)	5 (17.2)	
GH¢500-999	63 (52.1)	13 (44.8)	
GH¢1000 & above	36 (29.8)	8 (27.6)	

95% CI =Confidence Interval, \* Significant at  $p < 0.05$ , Ref =Reference

#### 4.5.2 Obstetric factors associated with postpartum depression

The study also investigated the link between a number of obstetric characteristics and postpartum depression. The results (Table 6) show that planned/expected pregnancy ( $p=0.043$ ), the number of antenatal visits attended ( $p=0.011$ ), type of delivery ( $p=0.025$ ), and length of hospital stay after delivery ( $p=0.014$ ) were the significant obstetric factors associated with postpartum depression.



**Table 6: Association between Obstetric characteristics and postpartum depression**

**(Bivariate Chi-Squared Analysis)**

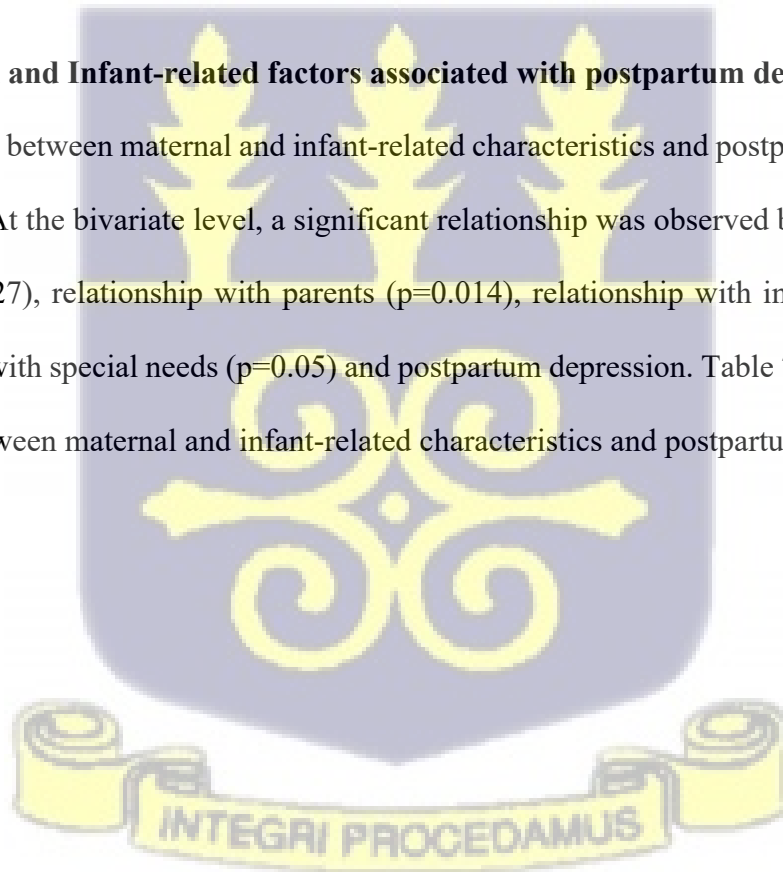
Variable	Postpartum Depression status		P-value
	Not Depressed (%)	Depressed (%)	
<b>Gravidity of last pregnancy</b>			0.786
First	96 (79.3)	22 (75.9)	
Second	19 (15.7)	5 (17.2)	
Third	6 (5.0)	2 (6.9)	
<b>Last pregnancy was planned</b>	67 (55.4)	10 (34.5)	<b>0.043*</b>
<b>Attended antenatal during pregnancy</b>	121 (100.0)	28 (96.6)	0.193
<b>Gestational age when antenatal was started</b>			0.508
< 3 months	69 (57.0)	14 (48.3)	
3-6 months	49 (40.5)	15 (51.7)	
> 6 months	3 (2.5)	0 (0.0)	
<b>Number of antenatal visits attended</b>			<b>0.011*</b>
< 4 times	3 (2.5)	4 (13.8)	
4 times	4 (3.3)	3 (10.3)	
> 4 times	114 (94.2)	22 (75.9)	
<b>Had previous knowledge on PPD</b>	41 (33.9)	10 (34.5)	0.951 (0.004)
<b>Received a health professional counselling on PPD during ANC</b>	20 (16.5)	4 (13.8)	1
<b>Had bed rest due to a pregnancy complication</b>	20 (16.5)	3 (10.3)	0.569
<b>Had a previous miscarriage</b>	13 (10.7)	5 (17.2)	0.334 (0.94)
<b>Had treatment for infertility in the past</b>	18 (14.9)	6 (20.7)	0.443 (0.59)
<b>Gestational age at birth (in weeks)</b>			0.170 (5.02)
< 37	7 (5.8)	5 (17.2)	
37 – 38	34 (28.1)	8 (27.6)	
39 – 40	59 (48.8)	10 (34.5)	
> 40	21 (17.4)	6 (20.7)	
<b>Type of delivery</b>			<b>0.025*</b>
SVD	82 (67.8)	14 (48.3)	
CS	37 (30.6)	12 (41.4)	
Assisted delivery	2 (1.7)	3 (10.3)	

<b>Number of babies delivered</b>			0.096
Singleton	120 (99.2)	27 (93.1)	
Multiples	1 (0.8)	2 (6.9)	
<b>Time breastfeeding was initiated after delivery</b>			0.082
Within 1hr of birth	65 (53.7)	9 (31.0)	
1 - 3 hours later	29 (24.0)	8 (27.6)	
4 – 6 hours later	20 (16.5)	8 (27.6)	
24hrs	7 (5.8)	4 (13.8)	
<b>Length of hospital stay after delivery</b>			<b>0.014*</b>
1 - 3 days	80 (66.1)	18 (62.1)	
4 – 7 days	35 (28.9)	5 (17.2)	
> 1 week	6 (5.0)	6 (20.7)	

95% CI =Confidence Interval, \* Significant at  $p < 0.05$ , Ref =Reference

#### 4.5.3 Maternal and Infant-related factors associated with postpartum depression

The association between maternal and infant-related characteristics and postpartum depression was explored. At the bivariate level, a significant relationship was observed between maternal anxiety ( $p=0.027$ ), relationship with parents ( $p=0.014$ ), relationship with in-laws ( $p=0.003$ ), having a baby with special needs ( $p=0.05$ ) and postpartum depression. Table 7 summarizes the association between maternal and infant-related characteristics and postpartum depression.



**Table 7: Association between maternal and infant-related characteristics and postpartum depression (Bivariate Chi-Squared Analysis)**

Variable	Postpartum Depression status		P-value
	Not Depressed (%)	Depressed (%)	
<b>Mother's current health status</b>			0.297
Poor	1 (0.8)	0 (0.0)	
Fair	6 (5.0)	2 (6.9)	
Good	18 (14.9)	8 (27.6)	
Very good/excellent	96 (79.3)	19 (65.5)	
<b>Mother is anxious about something</b>	30 (24.8)	14(48.3)	<b>0.027*</b>
<b>Ever exercised after delivery</b>	25 (20.6)	6 (20.6)	1
<b>Experienced difficulty in breastfeeding baby</b>			0.155
No	60 (49.6)	11 (37.9)	
Yes	16 (13.2)	8 (27.6)	
Early stages	45 (37.2)	10 (34.5)	
<b>Marital relationship satisfaction</b>			0.051
Very dissatisfied	2 (1.7)	0 (0.0)	
Dissatisfied	3 (2.5)	2 (6.9)	
Neither satisfied nor dissatisfied	4 (3.3)	3 (10.3)	
Somewhat satisfied	6 (5.0)	4 (13.8)	
Very satisfied	106 (87.6)	20 (69.0)	
<b>Relationship with parents</b>			<b>0.014*</b>
Deceased	4 (3.3)	0 (0.0)	
Very dissatisfied	0 (0.0)	2 (6.9)	
Dissatisfied	2 (1.7)	0 (0.0)	
Neither satisfied nor dissatisfied	2 (1.7)	0 (0.0)	
Somewhat satisfied	5 (4.1)	5 (4.1)	
Very satisfied	108 (89.3)	22 (75.9)	
<b>Relationship with in-laws</b>			<b>0.003*</b>
Deceased	1 (0.8)	0 (0.0)	
Very dissatisfied	8 (6.6)	1 (3.5)	
Dissatisfied	3 (2.5)	3 (10.3)	
Neither satisfied nor dissatisfied	3 (2.5)	3 (10.3)	
Somewhat satisfied	6 (5.0)	6 (20.7)	
Very satisfied	100 (82.6)	16 (55.2)	
<b>Sex of child</b>			0.484
Male	58 (47.9)	16 (55.2)	
Female	63 (52.1)	13 (44.8)	
<b>Sex of baby was expected</b>	107 (88.4)	26 (89.7)	1
<b>Birth weight of baby (in kg)</b>			0.426

< 2.5	13 (10.7)	6 (20.7)	
2.5 - 3.0	43 (35.5)	11 (37.9)	
3.1 – 4.0	61 (50.4)	12 (41.4)	
> 4	4 (3.3)	0 (0.0)	
<b>Baby's age (in weeks)</b>			0.463
< 2	21 (17.4)	5 (17.2)	
2 – 4	20 (16.5)	4 (13.8)	
5 – 8	44 (36.4)	15 (51.7)	
9 – 12	14 (11.6)	0 (0.0)	
13 – 16	13 (10.7)	3 (10.3)	
17 – 20	2 (1.7)	0 (0.0)	
21 – 24	7 (5.8)	2 (6.9)	
<b>Baby's current health status is good</b>	120 (99.2)	29 (100.0)	1
<b>Baby fell ill or was admitted after delivery</b>	10 (8.3)	4 (13.8)	0.474
<b>Child is able to breastfeed properly</b>	111 (91.7)	25 (86.2)	0.474
<b>Baby has a difficult temperament</b>			0.117
No	74 (61.2)	13 (44.8)	
Yes	34 (28.1)	9 (31.0)	
Sometimes	13 (10.7)	7 (24.1)	
<b>Baby has special needs</b>	2 (1.7)	3 (10.3)	

95% CI =Confidence Interval, \* Significant at  $p < 0.05$ , Ref =Reference

#### 4.5.4 Clinical and Psychological factors associated with postpartum depression

Further analysis was done to examine the association between clinical and psychological characteristics of respondents and postpartum depression. Out of the characteristics examined, only previous history of depression was significantly associated with postpartum depression ( $p=0.003$ ) (Table 8).



**Table 8: Association between Clinical and Psychological characteristics and postpartum depression (Bivariate Chi-Squared Analysis)**

Variable	Postpartum Depression status		P-value
	Not Depressed (%)	Depressed (%)	
<b>Has a previous history of depression</b>	2 (1.7)	5 (17.2)	<b>0.003*</b>
<b>Has a family history of mental disorder</b>	2 (1.7)	1 (3.5)	0.478
<b>Feels extremely tired caring for baby</b>			0.102
No	79 (65.3)	13 (44.8)	
Yes	20 (16.5)	9 (31.0)	
Sometimes	22 (18.2)	7 (24.1)	
<b>Was abused by partner recently</b>	8 (6.6)	2 (6.9)	1
<b>Experienced some sort of pressure with regards to how to care for baby</b>	25 (20.6)	5 (17.2)	0.824
<b>Had pressure from partner</b>	0 (0.0)	1 (3.5)	0.193
<b>Had pressure from in-laws</b>	9 (7.4)	3 (10.3)	0.702
<b>Had pressure from friends</b>	3 (2.5)	1 (3.5)	0.581
<b>Had pressure from family</b>	15 (12.4)	5 (17.2)	0.491

95% CI =Confidence Interval, \* Significant at  $p < 0.05$ , Ref =Reference

#### 4.5.5 Spousal and Social support factors associated with postpartum depression

Bivariate analysis was also done to establish the relationship between some spousal and social support characteristics of respondents and postpartum depression. The results (see Table 9) suggest a significant association between a partner's reliability ( $p=0.019$ ) and having an abusive partner ( $p=0.05$ ) and postpartum depression.

**Table 9: Association between Spousal and Social support characteristics and postpartum depression (Bivariate Chi-Squared Analysis)**

Variable	Postpartum Depression status		P-value
	Not Depressed (%)	Depressed (%)	
Can rely on partner for help	108 (89.3)	21 (72.4)	<b>0.019*</b>
Can share all problems with partner	101 (83.5)	22 (75.9)	0.338
Has an abusive partner	2 (1.7)	3 (10.3)	<b>0.05*</b>
Received some form of social support in taking care of baby	108 (89.3)	23 (79.3)	0.148
Received sufficient support from partner	94 (77.7)	23 (79.3)	0.85
Received sufficient support from family	99 (81.8)	25 (86.2)	0.786
Received sufficient support from in-laws	58 (47.9)	9 (31.0)	0.1
Received sufficient support from friends	8 (6.6)	1 (3.5)	1

95% CI =Confidence Interval, \* Significant at  $p < 0.05$ , Ref =Reference

#### 4.6 Determinants of postpartum depression

##### 4.6.1 Associations between factors associated with PPD at the bivariate level and Postpartum depression (Simple Logistic Regression analysis)

The odds ratios (OR) were calculated to determine the strength of association between independent variables and postpartum depression.

These factors include age, employment, divorced/separated recently, monthly expenditure, planned/expected pregnancy, number of antenatal visits attended, type of delivery, length of

hospital stay after delivery, maternal anxiety, relationship with parents, relationship with in-laws, having a baby with special needs, previous history of depression, partner reliability and having an abusive partner.

The results indicate that age, divorced/separated recently, planned/expected pregnancy, the number of antenatal visits attended, type of delivery, length of hospital stay after delivery, maternal anxiety, having a baby with special needs, previous history of depression, partner reliability and having an abusive partner were all significantly associated with PPD.

First-time mothers with ages between 26 and 30 years were less likely to have PPD (OR=0.15, CI: 0.04-0.62) compared to teenage (<20 years) first-time mothers. Mothers who had gone through a divorce or separation recently were about four times more likely to have PPD (OR=4.25, CI: 1.31-13.81). Mothers who had planned/ expected pregnancies had decreased odds of developing PPD (OR=0.42, CI: 0.18-0.99) compared to those who had unplanned/unexpected pregnancies.

Furthermore, compared to first-time mothers who had attended  $\leq 4$  antenatal visits during pregnancy, mothers who had attended antenatal more than four times during the period of pregnancy were less likely to develop PPD (OR=0.19, CI: 0.06-0.61). Results from the study also showed that first-time mothers who delivered through assisted delivery/caesarean section (CS) were two times more likely to develop PPD compared to those who delivered by SVD (OR=2.25, CI: 0.99-5.12). Also, mothers who had a longer length of hospital stay (>1 week) after delivery were four times more likely to be depressed compared to their counterparts.

More so, the odds of developing PPD were four times more (OR=4.04, CI: 1.26-13.01) in mothers who were anxious than those without any form of maternal anxiety.

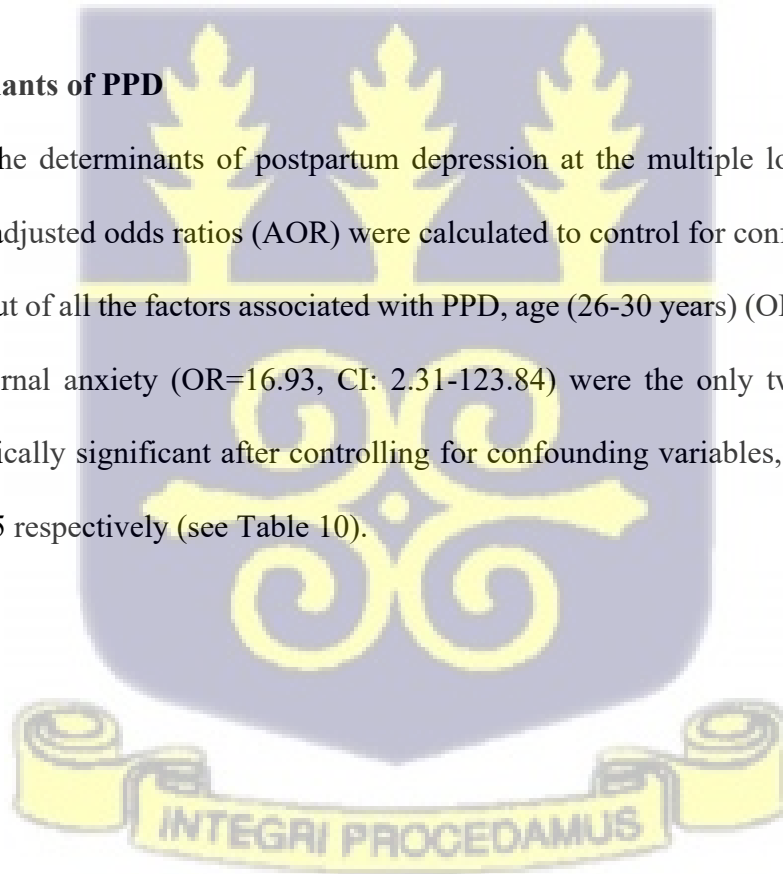
As expected, first-time mothers having babies with special needs were about seven times more likely to have PPD compared to their counterparts, and mothers with a previous history of depression had increased odds (OR=12.40, CI: 2.27-67.68) of developing PPD as compared to those with no previous history of depression.

Mothers having abusive partners were also found to be about seven times (OR=6.87, CI: 1.09-43.18) more likely to have PPD compared to their counterparts, and mothers who could rely on their partners for help had decreased odds of developing PPD compared to those who could not rely on their partners for help.

#### **4.6.2 Determinants of PPD**

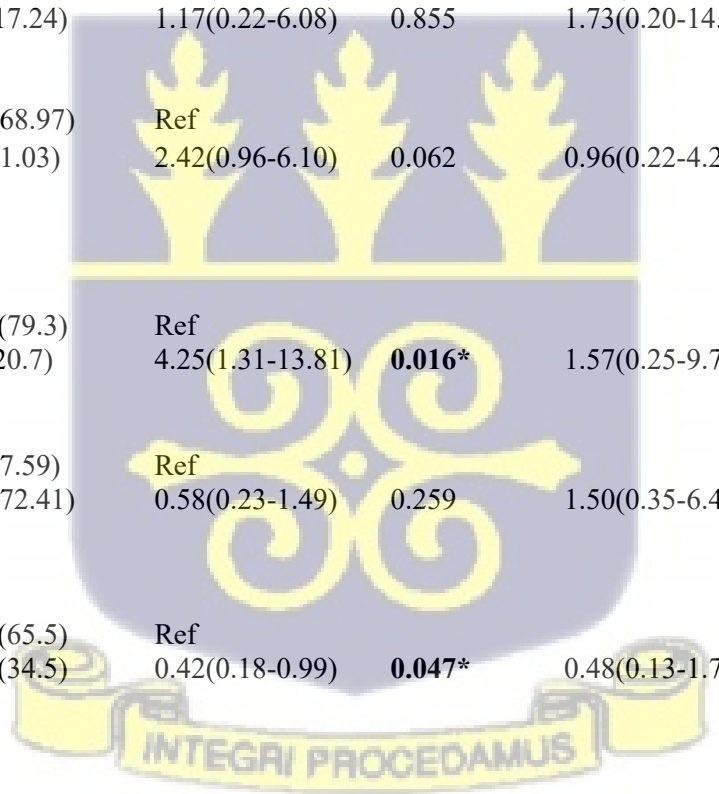
To determine the determinants of postpartum depression at the multiple logistic regression analysis level, adjusted odds ratios (AOR) were calculated to control for confounders.

Interestingly, out of all the factors associated with PPD, age (26-30 years) (OR=0.08, CI: 0.01-0.75) and maternal anxiety (OR=16.93, CI: 2.31-123.84) were the only two variables that emerged statistically significant after controlling for confounding variables, with p-values of 0.026 and 0.005 respectively (see Table 10).



**Table 10: Factors associated with postpartum depression and Determinants of PPD**

Characteristics	Postpartum Depression status		Unadjusted		Adjusted	
	Not Depressed (%)	Depressed (%)	OR (95% CI)	P-value	OR (95% CI)	P-value
<b>Age (in years)</b>						
< 20	7 (5.79)	5 (17.24)	Ref			
20-25	28 (23.14)	9 (31.03)	0.45(0.11-1.77)	0.254	0.73(0.13-4.23)	0.724
26-30	56 (46.28)	6 (20.69)	0.15(0.04-0.62)	<b>0.009*</b>	0.08(0.01-0.75)	<b>0.026*</b>
31-35	24 (19.83)	4 (13.79)	0.23(0.49-1.11)	0.068	0.25(0.03-2.26)	0.219
>35	6 (4.96)	5 (17.24)	1.17(0.22-6.08)	0.855	1.73(0.20-14.94)	0.617
<b>Employment</b>						
Employed	102(84.30)	20(68.97)	Ref			
Unemployed	19(15.70)	9(31.03)	2.42(0.96-6.10)	0.062	0.96(0.22-4.23)	0.961
<b>Gone through a divorce/separation recently</b>						
No	114 (94.2)	23 (79.3)	Ref			
Yes	7 (5.8)	6 (20.7)	4.25(1.31-13.81)	<b>0.016*</b>	1.57(0.25-9.77)	0.626
<b>Monthly expenditure</b>						
≤500	22(18.18)	8(27.59)	Ref			
>500	99(81.82)	21(72.41)	0.58(0.23-1.49)	0.259	1.50(0.35-6.48)	0.584
<b>Planned/expected pregnancy</b>						
No	54 (44.6)	19 (65.5)	Ref			
Yes	67 (55.4)	10 (34.5)	0.42(0.18-0.99)	<b>0.047*</b>	0.48(0.13-1.75)	0.267



**Number of ANC visits attended**

≤4 times	7 (5.79)	7(24.14)	Ref			
>4 times	114 (94.2)	22(75.86)	0.19(0.06-0.61)	<b>0.005*</b>	0.39(0.05-3.37)	0.393

**Type of delivery**

SVD	82(67.8)	14(48.3)	Ref			
Assisted delivery/CS	39(32.2)	15(51.7)	2.25(0.99-5.12)	<b>0.053*</b>	3.08(0.74-12.77)	0.122

**Length of hospital stay after delivery**

1 - 3 days	80 (66.1)	18 (62.1)	Ref			
4 – 7 days	35 (28.9)	5 (17.2)	0.63(0.22-1.85)	0.404	0.35(0.08-1.54)	0.165
> 1 week	6 (5.0)	6 (20.7)	4.44(1.28-15.39)	<b>0.019*</b>	5.48(0.75-40.24)	0.094

**Mother has anxiety**

No	91 (75.2)	15 (51.7)	Ref			
Yes	30 (24.8)	14(48.3)	4.04(1.26-13.01)	<b>0.019*</b>	16.93(2.31-123.84)	<b>0.005*</b>

**Relationship with parents**

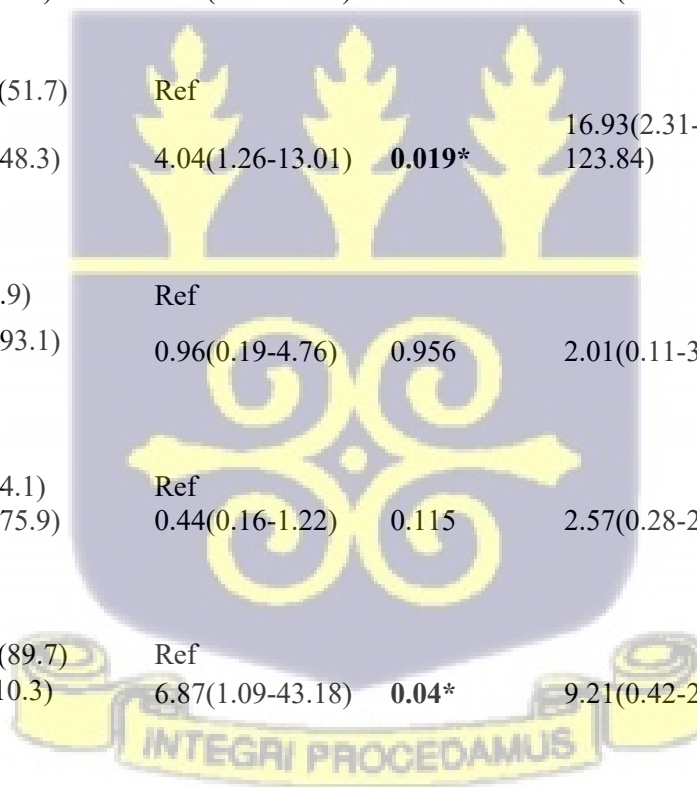
Not good	8(6.6)	2(6.9)	Ref			
Good	113(93.4)	27(93.1)	0.96(0.19-4.76)	0.956	2.01(0.11-35.95)	0.635

**Relationship with in-laws**

Not good	15(12.4)	7(24.1)	Ref			
Good	106(87.6)	22(75.9)	0.44(0.16-1.22)	0.115	2.57(0.28-23.45)	0.403

**Baby has special needs**

No	119 (98.4)	26 (89.7)	Ref			
Yes	2 (1.7)	3 (10.3)	6.87(1.09-43.18)	<b>0.04*</b>	9.21(0.42-200.46)	0.158



<b>Previous history of depression</b>						
No	119 (98.4)	24 (82.8)	Ref			
Yes	2 (1.7)	5 (17.2)	12.40(2.27-67.68)	<b>0.004*</b>	6.36(0.50-81.54)	0.155
<b>Partner abusive</b>						
No	119 (98.4)	26 (89.7)	Ref			
Yes	2 (1.7)	3 (10.3)	6.87(1.09-43.18)	<b>0.04*</b>	16.06(0.61-425.62)	0.097
<b>Can rely on partner for help</b>						
No	13 (10.7)	8 (27.6)	Ref			
Yes	108 (89.3)	21 (72.4)	0.32(0.12-0.86)	<b>0.024*</b>	0.40(0.07-2.25)	0.3

95% CI =Confidence Interval, \* Significant at  $p < 0.05$ , Ref =Reference



## CHAPTER FIVE

### DISCUSSION

#### 5.1 Introduction

This chapter discusses the findings obtained in the previous chapter. The discussion includes an overview of the results, a comparison of the findings with those of other research in academic literature, and an explanation of the results and their implications. The strengths and limitations of the study are also covered in this chapter.

This study sought to determine the prevalence of postpartum depression in first-time mothers. It also provides evidence of the factors associated with postpartum depression.

#### 5.2 Summary of Findings

This study revealed that the estimated proportion of first-time mothers attending postnatal/child welfare clinic at KBTH with postpartum depression is 19.3%. It also revealed that only 16% of the mothers received health professional counselling on PPD during antenatal. 4.7% of them reported having a previous history of depression.

Age, employment status, divorced/separated recently, monthly expenditure, planned/expected pregnancy, the number of antenatal visits attended, type of delivery, length of hospital stay after delivery, maternal anxiety, having a baby with special needs, previous history of depression, partner reliability and having an abusive partner were factors significantly associated with PPD at the bivariate level.

However, age and maternal anxiety were the only two factors that strongly predicted postpartum depression after all the other factors were controlled for. Specifically, first-time mothers between 26 and 30 years had decreased odds of developing PPD than teenage first-

time mothers (AOR=0.08, CI: 0.01-0.75). Also, first-time mothers with maternal anxiety had about 17 times the odds of developing PPD compared to those who had no maternal anxiety (AOR=16.93, CI: 2.31-123.84).

### **5.3 Background and sociodemographic characteristics of respondents and Postpartum depression.**

In this study, no association was found between marital status, family income, loss of a loved one, relocation to a new home, having been forced to sit on hot water or stay indoors after delivery, financial difficulty, or being economically dependent on the partner and postpartum depression. Partner's occupation and educational level were also not significantly associated with PPD. On the other hand, age ( $p=0.008$ ) and employment ( $p=0.023$ ) were significantly related to postpartum depression.

Contrary to the findings of the current study, no association was found between a first-time mother's age and employment status and postpartum depression in a study by Kristensen et al. (2018). However, they also found no correlation between a first-time mother's level of education, her living arrangement, and postpartum depression. This is consistent with this study's findings where educational level and residence type were not statistically associated with postpartum.

While the findings of the present study demonstrated no relationship between a first-time mother's educational level, family income, and postpartum depression, a study by Goyal et al. (2010) found that the risk of postpartum depression symptoms was enhanced by socioeconomic status (SES) factors such as poor education, low income, singleness, and unemployment. Even after controlling for the severity of prenatal depressive symptoms, they discovered that women

with four SES risk factors (low monthly income, less than a college education, single, and unemployed) were 11 times more likely than women without SES risk factors to have clinically elevated depression scores at 3 months postpartum.

Having gone through a divorce/separation recently ( $X^2=6.57$ ;  $p=0.010$ ) and the amount spent in a month (monthly expenditure) ( $p=0.024$ ) were the two socioeconomic characteristics factors found to be significantly associated with postpartum depression in this study.

#### **5.4 Prevalence of Postpartum depression in first-time mothers**

The findings of this study demonstrate that postpartum depression is a significant problem at the KBTH where this study was conducted. In this population, postpartum depression was shown to be 19.3% prevalent. This finding is far greater than the numbers provided by Campbell & Cohn. (1991) (9.3%), Abdollahi et al. (2016) (10.7% at 3 months postpartum), and Sylvén et al. (2017) (10.3% at five days and 6.4% at 6 weeks postpartum).

It also showed a higher prevalence compared to 13.2% and 9.8% at 6 weeks and 12 weeks postpartum by Leahy-Warren et al. (2011), 9.4% at 6 months postpartum by Vismara et al. (2016) and 13.8% as found in Chinese first-time mothers by Gao et al. (2009).

However, the findings of this study are comparable to that of Vismara et al. (2016) who found a prevalence of 17.1% in first-time mothers at 3 months postpartum.

A much higher figure was recorded by Khatun et al. (2018) who found the prevalence of postpartum depression to be 73.4% in Bengali first-time mothers.

The difference in prevalence could be largely due to procedural and geographical reasons. The variation in screening tools and the timing of the investigations could also be a contributing factor. Mothers were screened in some studies at 5 days, 6 weeks, 12 weeks, and even 6 months after giving birth which produced varying results. Even though most of the studies used the EPDS, different cutoff scores were used, hence producing different prevalence rates.

Given that the study was clinic-based, it is possible that it missed women who did not visit the postnatal/child welfare clinics, as well as women who failed to seek medical care for mental health disorders.

### **5.5 Factors associated with Postpartum Depression**

The factors that were associated with postpartum depression in this study were age, employment status, divorced/separated recently, monthly expenditure, planned/expected pregnancy, the number of antenatal visits attended, type of delivery, length of hospital stay after delivery, maternal anxiety, having a baby with special needs, previous history of depression, can rely on partner for help and having an abusive partner. However, after adjusting for confounders, only age and maternal anxiety were found to be associated with PPD.

Lanzi et al. (2009) found that first-time teenage mothers were significantly more likely to develop postpartum depression than adult mothers with lower or greater levels of resources. This was in line with findings from this study where first-time mothers between 26 and 30 years were less likely to have PPD (OR=0.15, CI: 0.04-0.62) compared to teenage (<20 years) first-time mothers. Possible explanations for this could be that teenage first-time mothers may not be experienced or psychologically mature enough to be able to cope with the challenges that come with motherhood. Also, due to the stigma that usually comes with teenage pregnancy

and birth, teenage first-time mothers may not receive the family/social support needed for a smooth transition to motherhood. It can also be due to the fact that mothers are most prepared to support and care for their infants between the ages of 20 and 30 and also because there is the least chance of developing medical problems between ages 20 and 30 years according to Handini & Puspitasari (2021).

However, according to research on first-time Japanese mothers, current age was negatively correlated with PPD ( $\beta = -.185$ ,  $p < .0001$ ) (Torashima et al., 2022).

This study further revealed that the odds of developing PPD was about 17 times in first-time mothers with anxiety compared to those who had no maternal anxiety (AOR=16.93, CI: 2.31-123.84). Anxiety in first-time mothers in this study was related to birth injury to baby; 10.3% of mothers in this study reported having babies with Erb's Palsy. Other causes of anxiety in the mothers were related to discomfort from perineal tear, gaped perineal wounds, financial difficulties, lack of partner support, having a baby out of wedlock and unpreparedness to resume work after maternity leave is exhausted.

Contrary to the results from a parallel randomized control trial of PPD among first-time mothers where preterm birth, impromptu caesarean section, among others as factors were associated with PPD (Maimburg & Væth, 2015), no association was found between preterm birth and PPD in this study. However, results from this current study showed that first-time mothers who delivered through assisted delivery/caesarean section (CS) were two times more likely to develop PPD compared to those who delivered by SVD (OR=2.25, CI: 0.99-5.12).

According to Abbasi et al. (2013), postpartum depression is more likely to occur in mothers of babies who were born prematurely, or have difficult temperaments. None of these factors were

associated with PPD in this study. They also found that mothers whose newborns had medical conditions were more likely to develop PPD. Similarly, findings from this study show that first-time mothers having babies with special needs were about seven times more likely to have PPD compared to their counterparts (OR=6.87, CI: 1.09-43.18).

Furthermore, this study shows that the odds of developing PPD was lower in mothers who had planned/expected pregnancies (OR=0.42, CI: 0.18-0.99) compared to those who had unplanned/unexpected pregnancies. But after testing for confounders, no correlation was found between unplanned pregnancies and PPD.

Taken together, this finding seems to agree with that of Abbasi et al. (2013) who reported that when compared to women who had intended pregnancies, those who had unwanted pregnancies had a greater rate of postpartum depression (6.7% vs. 4.3%,  $p < 0.05$ ). However, after adjusting for covariates, unplanned pregnancy was no longer linked to postpartum depression (adjusted OR 1.41; 95% CI 0.91–2.18).

While Abdollahi et al. (2016) found an association between lack of marital satisfaction and PPD (OR = 0.91; 95% CI = 0.86 - 0.97), this study found no relation between the two.

The results of this study contradict those of Sylvén et al. (2017), who reported that assisted vaginal birth and caesarean sections were linked to lower depressive symptoms in postpartum women. In this study delivery by caesarean section increased first-time mothers' chances of developing PPD.

Nonetheless, their findings imply a favorable correlation between anxiety susceptibility and depressed symptoms at five days and six weeks after delivery which agrees with the result of

this study where maternal anxiety was found to be associated with PPD (OR=16.93, CI: 2.31-123.84).

### **5.6 Strengths and Limitations of the study**

This study contributes to data to facilitate the appreciation of the prevalence of postpartum depression and its correlates in first-time mothers at Korle Bu Teaching Hospital. This sets the tone for further research into the subject area in the continent of Africa.

It also has significant implications for policy interventions and strategies on maternal and child health in the sub-region.

#### **The results of this study however are limited in the following ways;**

1. As a cross-sectional study, causal relationship could not be established because exposure and disease were determined at the same point in time.
2. Given that the sample under study consisted only of first-time mothers and were recruited from only one health facility, the results of the current study cannot be extrapolated to the entire population.
3. Time and convenience restrictions prevented the study from recruiting the required number of participants (i.e., 194 first-time mothers). Only 150 first-time were recruited and interviewed.
4. Being a facility-based study, it is possible that, in contrast to a population-based study, depressed first-time mothers who did not visit the facility were left out of the study.
5. Since most of the information provided by the respondents was self-reported, respondents' bias, particularly recall bias, may have constrained the study's findings as the data could not have been independently validated by a clinical psychologist.

6. Although majority of studies show that the EPDS has excellent validity, it would have been ideal to confirm depression in females with higher EPDS scores using the revised diagnostic interview schedule, version III (DIS).
7. The risk of sampling bias is high since non-probability sampling was used.

### **5.7 Chapter Summary**

This chapter discussed the study's findings in accordance with the study objectives. The discussion showed that first-time mothers within 6 months of childbirth who had anxiety had increased odds of developing PPD compared to those with no anxiety. Also, first-time mothers between 26 and 30 years were less likely to develop PPD compared to teenage first-time mothers. Conclusions and recommendations are made in the following chapter.



## CHAPTER SIX

### CONCLUSION AND RECOMMENDATIONS

#### 6.1 Conclusion

This study determined the prevalence and determinants of postpartum depression among first-time postnatal mothers within 6 months of childbirth who attended the postnatal/child welfare clinic at the Korle Bu Teaching Hospital.

Nearly 2 in 5 of the mothers had postpartum depression using the Edinburgh Postnatal Depression Scale (EPDS) cut-off  $\geq 12$ . This raises a problem that needs to be addressed in order to protect not just the health and well-being of mothers, but also that of their children and families.

Age, divorced/separated recently, planned/expected pregnancy, number of antenatal visits attended, type of delivery, length of hospital stay after delivery, maternal anxiety, having a baby with special needs, previous history of depression, partner's reliability and having an abusive partner were factors significantly associated with PPD.

Only age and anxiety significantly predicted postpartum depression after potential confounders were controlled for.

Based on these findings, it is concluded that postpartum depression among first-time mothers requires immediate action, including counselling and psychosocial support both at home and in medical facilities.

## 6.2 Recommendation

In light of the results and analyses covered in the last two chapters, the following recommendations are hereby made for clinical, public health, and research-related considerations.

### Clinical

- Given that the prevalence of PPD in first-time mothers at KBTH was estimated to be relatively high, the management of KBTH should prioritize including screening for depression in maternal and child health services because of the condition's delicate nature, as well as the fact that the majority of cases go undetected and untreated. Also, women who exhibit postpartum depression symptoms should be referred to a clinical psychologist for further assessment and treatment.
- Given that majority (84%) of the first-time mothers received no health professional counselling on PPD during ANC, midwives and obstetrician-gynaecologists at the antenatal unit of KBTH should make an effort to educate pregnant women on PPD, how to recognize depressive symptoms, and what to do when they occur. This will equip pregnant women and mothers in the timely identification of PPD symptoms.

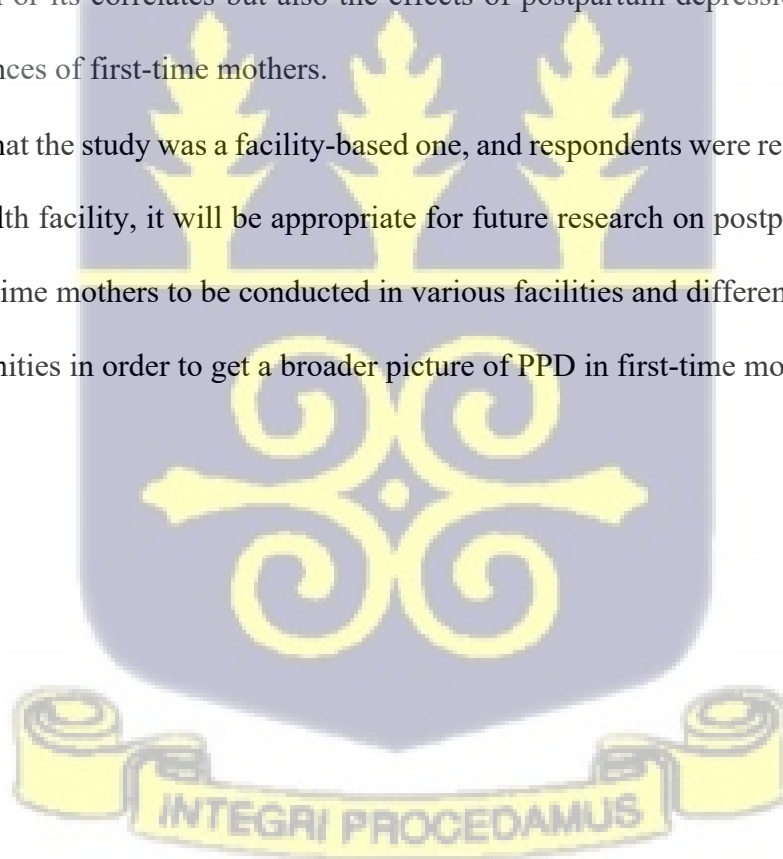
### Public Health

- Owing to the fact that most (66%) of the mothers had no previous knowledge about postpartum depression, there should be adequate community-level sensitization and awareness creation on the topic. This will make it possible for women and their families to timely recognize maternal behaviours that point to the need for assistance.

- Given the detrimental effects of PPD on mothers, babies and families, policymakers should prioritize and subsequently include maternal mental health into maternal and child health care programmes and policies, and also integrate mental health screening into routine primary care for pregnant and postpartum women.

### Research

- The management of KBTH should invest in further research to assess the knowledge of health staff on postpartum depression and its management.
- Considering that this study was quantitative, future researchers could use mixed-methods designs as this may provide an understanding of not only the magnitude of the problem or its correlates but also the effects of postpartum depression and the lived-experiences of first-time mothers.
- Given that the study was a facility-based one, and respondents were recruited from only one health facility, it will be appropriate for future research on postpartum depression in first-time mothers to be conducted in various facilities and different settings such as communities in order to get a broader picture of PPD in first-time mothers.



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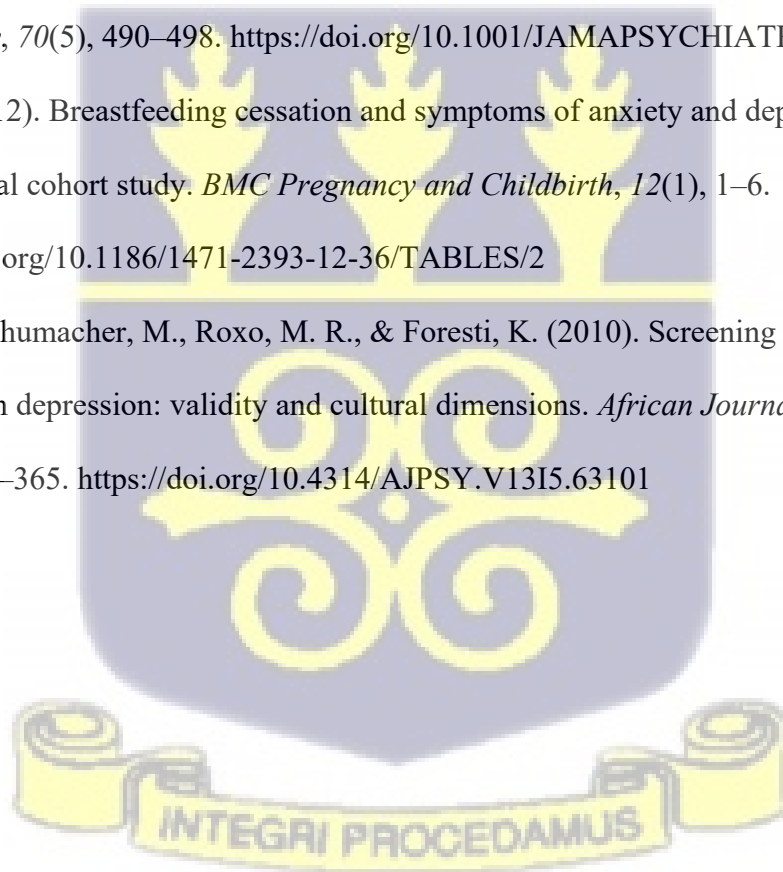
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Zubaran, C., Schumacher, M., Roxo, M. R., & Foresti, K. (2010). Screening tools for postpartum depression: validity and cultural dimensions. *African Journal of Psychiatry, 13*(5), 357–365. <https://doi.org/10.4314/AJPSY.V13I5.63101>



## APPENDIX

### APPENDIX I: CONSENT FORM

**Study Title:** PREVALENCE AND DETERMINANTS OF POSTPARTUM DEPRESSION IN FIRST-TIME MOTHERS AT KORLE BU TEACHING HOSPITAL

**Investigator:** LYDIA AFIA AYISI

**Address:** Department of Population, Family and Reproductive Health, School of Public Health. College of Health Sciences, University of Ghana

#### **Information:**

Dear participant, my name is Lydia Afia Ayisi. I am a student from the School of Public Health, University of Ghana, Legon. The purpose of the study is to determine the prevalence and correlates of postpartum depression in first-time mothers within 6 months of childbirth at Korle Bu Teaching Hospital. A structured interview would be conducted by use of a structured questionnaire and the Edinburgh Postpartum Depression Scale. The questionnaires would be administered to you in your preferred language. This would take approximately 15 minutes. To be sure that you are informed about your participation in this research, I am asking that you read (or have read to you) this consent form. This form might contain some words that are unfamiliar to you. Please ask for an explanation of anything that you may not understand.

#### **Potential risks**

There may be inconveniences due to the length of the interview and discussion of sensitive personal issues. I will try to be as brief as possible.

**Potential benefits**

There are no direct benefits to you or your child from this study. However, your participation may help us develop better interventions in the area of maternal mental health.

**Right to refuse**

Participating in the study is voluntary and respondents can choose not to answer any question that is uncomfortable. Respondents are at liberty to withdraw from the study at any time. Participation is encouraged since it allows your opinion to be heard.

**Confidentiality**

Any information given would be respected and kept confidential. Information provided would be used purposely for the study.

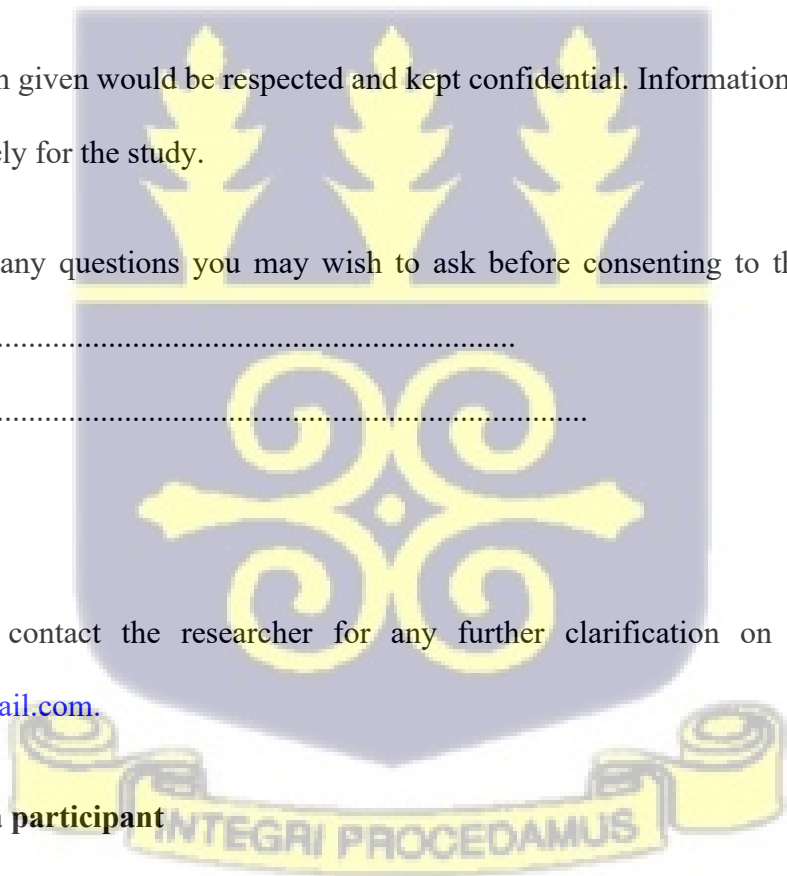
NB: Are there any questions you may wish to ask before consenting to the study. If yes,

.....  
.....

**Contact**

You can also contact the researcher for any further clarification on 0542658533 or [lyannayisi@gmail.com](mailto:lyannayisi@gmail.com).

**Your right as a participant**



This research has been reviewed and approved by the Institutional Review Board of Korle Bu Teaching Hospital for Medical Research (KBTH-IRB). If you have any questions about your

rights as a research participant you can contact the IRB Office between the hours of 8am-5pm through the landline 0302666766 or email addresses: [rdo@kbth.gov.gh](mailto:rdo@kbth.gov.gh)

### VOLUNTARY AGREEMENT

The above document describing the benefits, risks and procedures for the research title (PREVALENCE AND DETERMINANTS OF POSTPARTUM DEPRESSION IN FIRST-TIME MOTHERS AT KORLE BU TEACHING HOSPITAL) has been read and explained to me. I have been given an opportunity to have any questions about the research answered to my satisfaction. I agree to participate as a volunteer.

.....  
Name and signature or mark of parent or guardian

.....  
Date

**If volunteers cannot read the form themselves, a witness must sign here:**

I was present while the benefits, risks and procedures were read to the volunteer. All questions were answered and the volunteer has agreed to take part in the research.

.....  
Name and signature of witness

.....  
Date



I certify that the nature and purpose, the potential benefits, and possible risks associated with participating in this research have been explained to the above individual.

.....

.....

Name Signature of Person Who Obtained Consent

Date



## APPENDIX II: DATA COLLECTION TOOLS

### PREVALENCE AND DETERMINANTS OF POSTPARTUM DEPRESSION IN FIRST-TIME MOTHERS AT KORLE BU TEACHING HOSPITAL

Questionnaire No:

The purpose of the study is to determine the prevalence and correlates of postpartum depression in first-time mothers within 6 months of childbirth at Korle Bu Teaching Hospital. Participation in this study is entirely voluntary and all responses will be anonymous.

#### A. Socio-Demographics

*(Circle the number of the option that applies to you)*

1. Age

1= < 20

2= 20-25

3= 26-30

4= 31-35

5= >35

2. Employment

1= Civil servant

2= Health professional

3= Unemployed

4= Trader/Businesswoman

5= Housewife

6= Student

7= Other (please specify) .....

3. Educational level

1= None



2= Basic School

3= Junior high

4= Senior high

5= Undergraduate

6= Postgraduate

4. What is your current place of residence?

1= Private /own house

2= Parent's house

3= Rented house

5. Marital status

1= Married

2= Unmarried

3= Cohabiting

4= Separated

5= Divorced

6= Widowed

6. Religion

1= None

2= Christian

3= Muslim

4= Traditional African

5= Other (please specify) .....

7. What is your partner's educational level?

1. No formal education

2. Primary

3. JSS/JHS/MLSC

4. Secondary/SHS



5. Tertiary
8. What is your partner's occupation?
  1. Trading/Businessman
  2. Civil servant
  3. Student
  4. Health worker
  5. White color job
  6. Unemployed
  7. Other

**B. Economic Factors**

9. How would you rate your family income?

1= Below average (< GHC5,000 a month)

2= Average (GHC5,000 a month)

3= Above average (> GHC5,000 a month)

10. How would you describe your working conditions?

1= Stable

2= Unstable

*(Stable here means a job with steady pay and likely to be kept for a long period)*

11. Do you have financial difficulties?

1= no

2= yes

12. Are you economically dependent on your husband?

1= no

2= yes

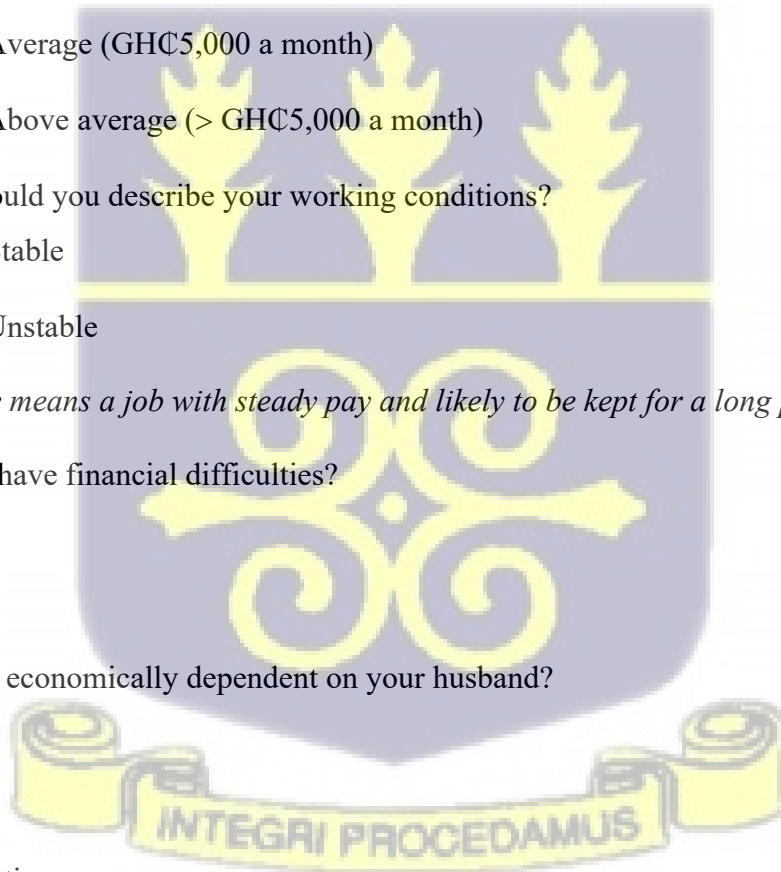
3= sometimes

13. Were you forced to stay indoors after delivery?

1= no

2= yes

3= sometimes



14. Were you forced to sit on hot water after delivery?

1= no

2=yes

15. Did you receive any form of family support in taking care of your baby?

1= no

2= yes

16. Have you lost a loved one recently?

1= no

2= yes

17. Have you gone through a divorce/separation recently?

1= no

2= yes

18. Have you relocated to a new home recently?

1= no

2= yes

19. How much do you spend in a month?

1= < GH¢ 200

2= GH¢ 200 – 499

3= GH¢ 500 – 999

4= GH¢1000 & above

**C. Pregnancy and Antenatal-related factors**

20. Number of pregnancy (Gravidity)

1= First

2= Second

3= Third

4= Fourth

21. Was the pregnancy expected?

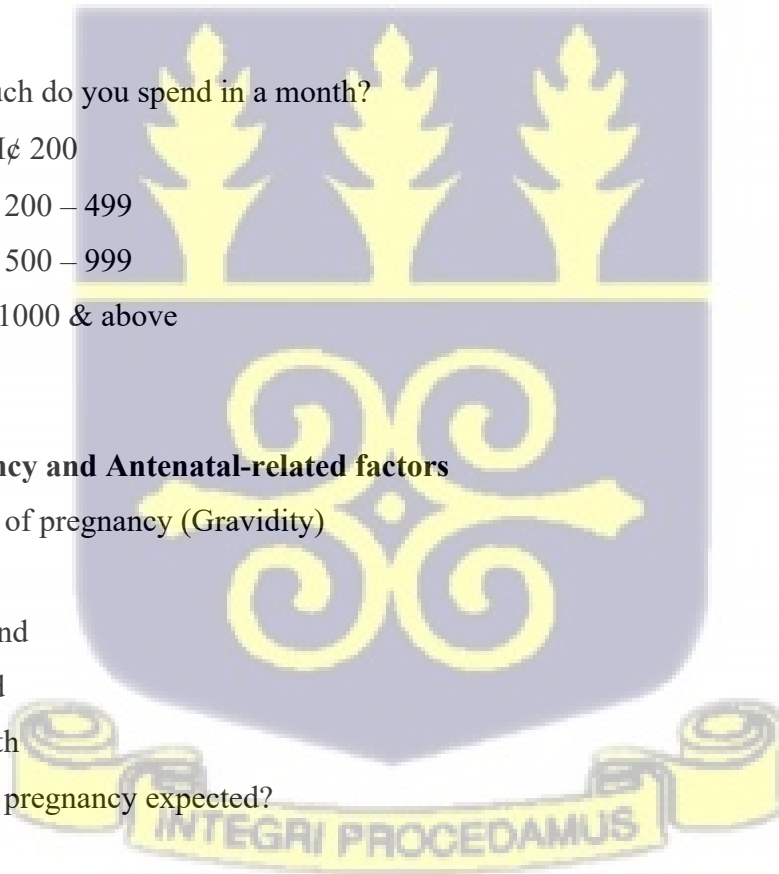
1= no

2= yes

22. Did you attend antenatal during pregnancy?

1= no

2= yes



23. How old was the pregnancy when you first started antenatal?

1= < 3 months

2= 3 – 6 months

3= > 6 months

24. Number of antenatal visits during the entire period of pregnancy

1= < 4 times

2= 4 times

3= > 4 times

25. Did you receive health professional counselling on PPD during antenatal?

1= no

2= yes

26. Were you asked to have bed rest during pregnancy due to a complication?

1= no

2= yes

27. Have you had a previous miscarriage?

1= no

2= yes

28. Have you had treatment for infertility in the past?

1= no

2= yes

#### **D. Delivery history**

29. Gestational age at birth (in weeks)

1. < 37

2. 37 – 38

3. 39 – 40

4. > 40

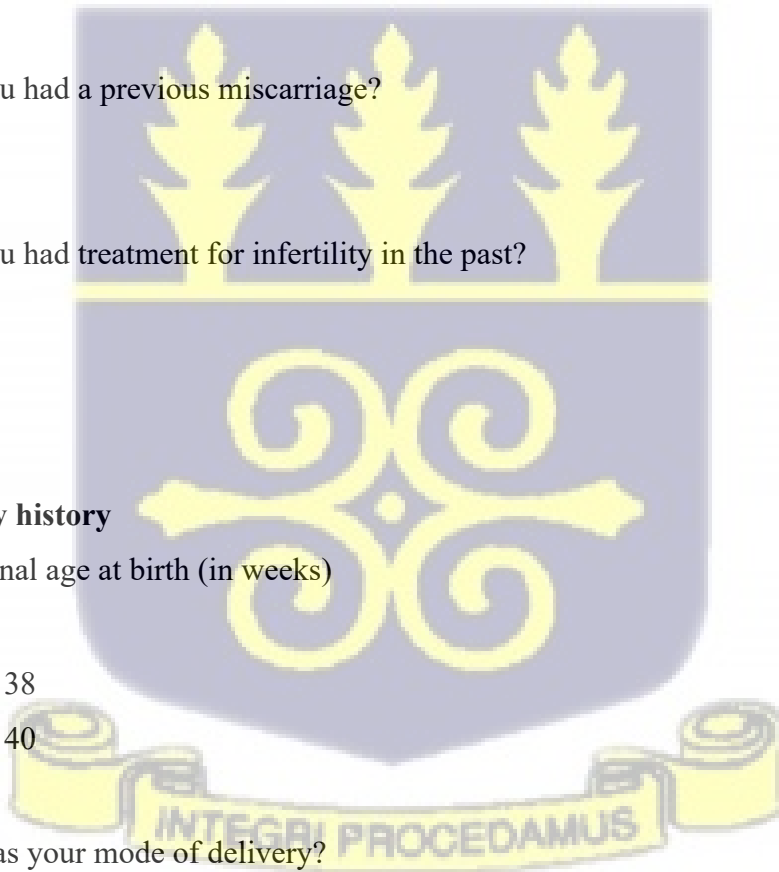
30. What was your mode of delivery?

1. SVD

2. Assisted delivery/CS

31. How many babies did you deliver?

1. Singleton



2. Multiples

32. How many days did you spend at the hospital after delivery?

1= 1-3 days

2= 4-7 days

3= > 1 week

33. At what time baby was brought for breastfeeding after delivery?

1= within 1 hour of birth

2= 1-3 hours after birth

3= 4-6 hours after birth

4= 24 hours later or more

**E. Maternal and Infant-related characteristics**

34. How would you rate your physical health?

1= Poor

2= Fair

3= Good

4= Very good/ excellent

35. Are you anxious about other matters in addition to giving birth?

1= no

2= yes

36. Did you ever exercise after giving birth?

1= no

2= yes

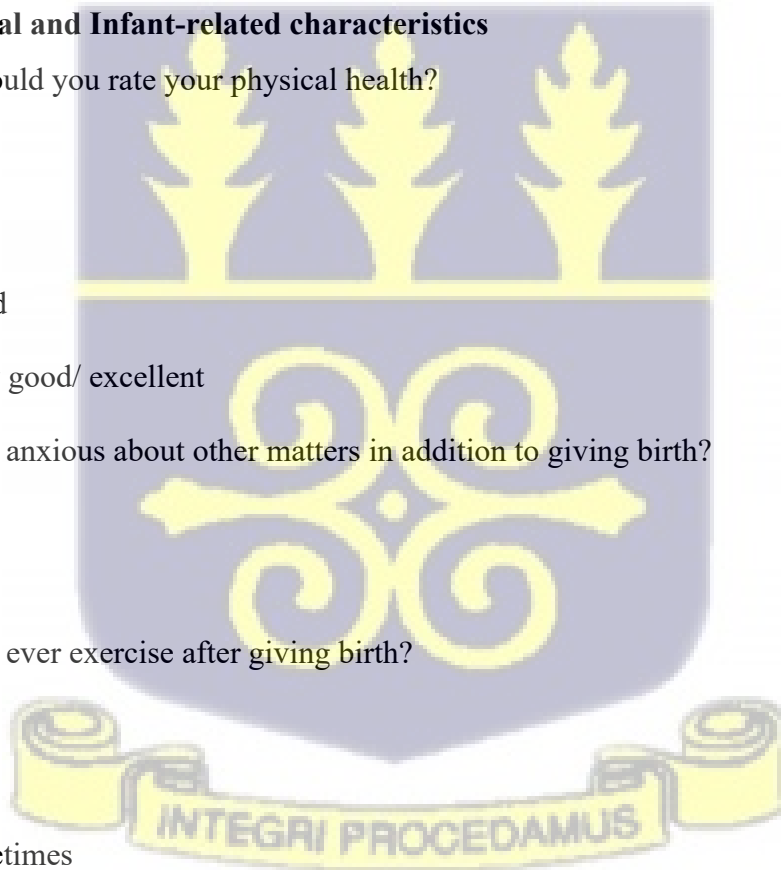
3= sometimes

37. Did you experience any difficulty with breastfeeding?

1= no

2= yes

3= at the early stages



no	Question	1= Very satisfied	2= Somewhat satisfied	3= Neither satisfied nor dissatisfied	4= Dissatisfied	5= Very dissatisfied
38.	Marital relationship satisfaction					
39.	How would you rate your relationship with your parents?					
40.	How would you rate your relationship with your parents-in-law?					

41. What is the sex of your baby?

1= Male

2= Female

42. Was the baby's gender expected?

1= no

2= yes

43. How would you describe your baby's health?

1= Good

2= Not good

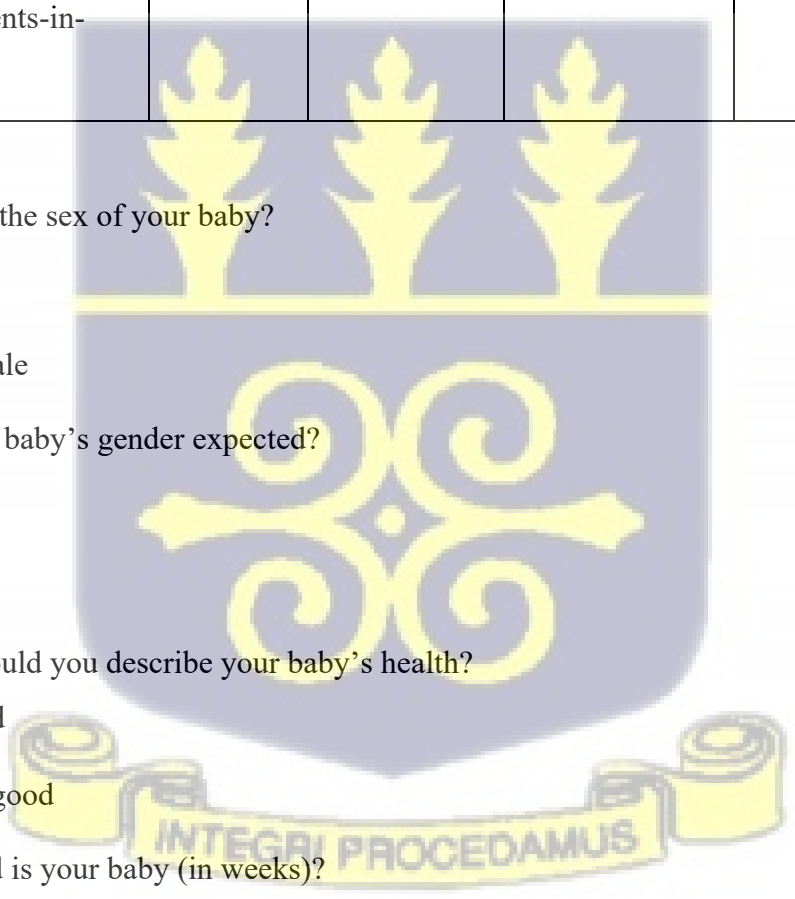
44. How old is your baby (in weeks)?

1. < 2.5

2. 2.5 - 3.0

3. 3.1 – 4.0

4. >4



45. What was your baby's weight at birth?

1. < 2
2. 2 – 4
3. 5 – 8
4. 9 – 12
5. 13 – 16
6. 17 – 20
7. 21 - 24

46. Has your baby ever fallen ill during the postnatal period?

1= no

2= yes

47. Is your child able to breastfeed well?

1= no

2= yes

48. Does your baby have a difficult temperament?

1= no

2= yes

49. Does your baby have special needs?

1= no

2= yes

**F. Clinical and psychological characteristics**

50. Do you have a previous history of depression?

1= no

2= yes

51. Do you have a family history of mental disorder?

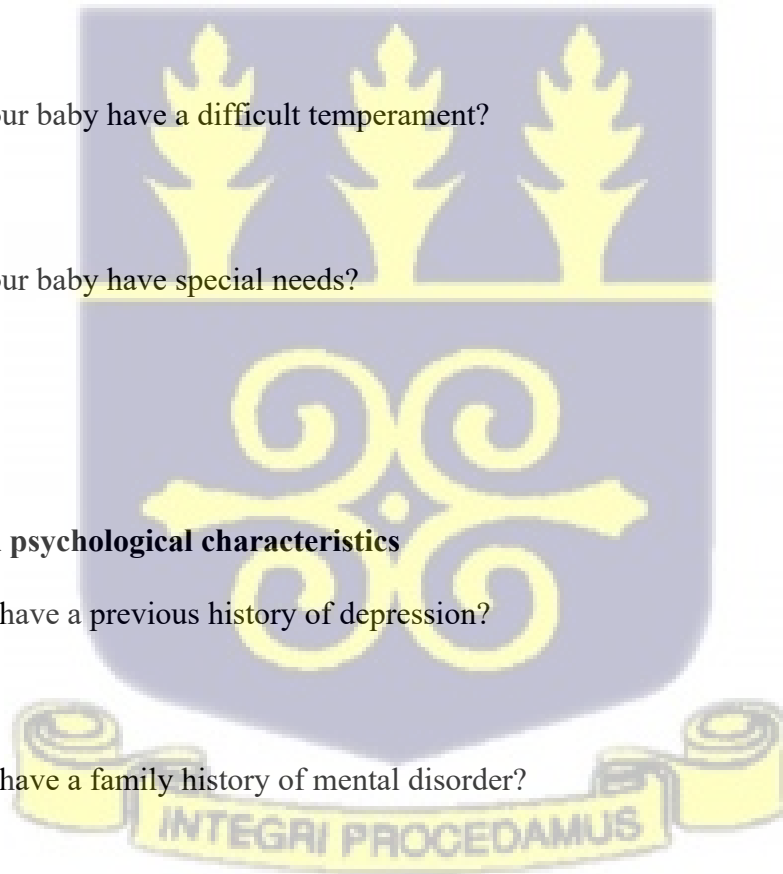
1= no

2= yes

52. Do you feel extremely tired when caring for your baby?

1= no

2= yes



53. Did you experience any sort of pressure with regard to how to care for baby?

1= no

2= yes

54. Source of pressure

1= Partner

2= In-laws

3= Friends

4= Family

**G. Spousal and Social support factors**

*(Tick the box which applies to you)*

no	Question	1= No	2= Yes
55.	Can you rely on your partner for help?		
56.	Can you share all your problems with your partner?		
57.	Is your partner abusive?		
58.	Were you ever abused by your partner in the last 12 months?		

59. From which of the following people do you receive sufficient support from?

*(Circle all that apply)*

1= Husband

2= Parents

3= In-laws

4= Friends

5= Other (please specify) .....

**THANK YOU FOR YOUR TIME!**

Questionnaire No:

### **EDINBURGH POSTPARTUM DEPRESSION SCALE (EPDS)**

The questionnaire below is called the Edinburgh Postnatal Depression Scale (EDPS). The EDPS was developed to identify women who may have postpartum depression. Each answer is given a score of 0 to 3 . The maximum score is 30. As you have recently had a baby, we would like to know how you are feeling.

**Please select the answer that comes closest to how you have felt in the past 7 days, not just how you feel today:**

Below 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

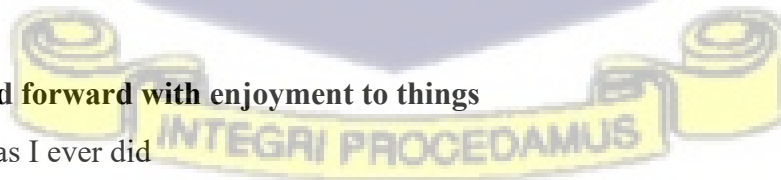
This would mean: "I have felt happy most of the time" in the past week. Please complete the other questions in the same way.

**1. I have been able to laugh and see the funny side of things**

- 0= As much as I always could
- 1= Not quite so much now
- 2= Definitely not so much now
- 3= Not at all

**2. I have looked forward with enjoyment to things**

- 0= As much as I ever did
- 1= Rather less than I used to
- 2= Definitely less than I used to
- 3= Hardly at all



**3. I have blamed myself unnecessarily when things went wrong**

- O 0= Yes, most of the time
- O 1= Yes, some of the time
- O 2= Not very often
- O 3= No, never

**4. I have been anxious or worried for no good reason**

- O 0= No, not at all
- O 1= Hardly ever
- O 2= Yes, sometimes
- O 3= Yes, very often

**5. I have felt scared or panicky for no very good reason**

- O 0= Yes, quite a lot
- O 1= Yes, sometimes
- O 2= No, not much
- O 3= No, not at all

**6. Things have been getting on top of me**

- O 0= Yes, most of the time I haven't been able to cope at all.
- O 1= Yes, sometimes I haven't been coping as well as usual
- O 2= No, most of the time I have coped quite well.
- O 3= No, I have been coping as well as ever.

**7. I have been so unhappy that I have had difficulty sleeping**

- O 0= Yes, most of the time
- O 1= Yes, sometimes
- O 2= Not very often
- O 3= No, not at all

**8. I have felt sad or miserable**

- O 0= Yes, most of the time



O 1= Yes, quite often

O 2= Not very often

O 3= No, not at all

**9. I have been so unhappy that I have been crying**

O 0= Yes, most of the time

O 1= Yes, quite often

O 2= Only occasionally

O 3= No, never

**10. The thought of harming myself has occurred to me**

O 0= Yes, quite often

O 1= Sometimes

O 2= Hardly ever

O 3= Never

---

**TOTAL SCORE:**

---

Adopted from

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



### APPENDIX III: ETHICAL CLEARANCE

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

My Ref. No. *KBTH/MD/CR3/27*  
Your Ref. No. ....



**KORLE BU TEACHING HOSPITAL**  
P. O. BOX KB 77,  
KORLE BU, ACCRA.

Tel: +233 302 667759/673034-6  
Fax: +233 302 667759  
Email: [Info@kbth.gov.gh](mailto:Info@kbth.gov.gh)  
[pr@kbth.gov.gh](mailto:pr@kbth.gov.gh)  
Website: [www.kbth.gov.gh](http://www.kbth.gov.gh)

15<sup>th</sup> November, 2022

LYDIA AFIA AYISI  
SCHOOL OF PUBLIC HEALTH  
COLLEGE OF HEALTH SCIENCES  
UNIVERSITY OF GHANA, LEGON

**PREVALENCE AND DETERMINANTS OF POSTPARTUM DEPRESSION IN FIRST TIME MOTHERS AT KORLE BU TEACHING HOSPITAL**

**KBTH-IRB 000169/2022**

Investigator: LYDIA AFIA AYISI

The Korle Bu Teaching Hospital Institutional Review Board (KBTH IRB) reviewed and granted approval to the study entitled: "Prevalence and Determinants of Postpartum Depression in First Time Mothers at Korle Bu Teaching Hospital"

Please note that the Board requires you to submit a final review report on completion of this study to the KBTH-IRB.

Kindly, note that, any modification/amendment to the approved study protocol without approval from KBTH-IRB renders this certificate invalid.

Please report all serious adverse events related to this study to KBTH-IRB within seven days verbally and fourteen days in writing.

This IRB approval is valid till 31<sup>st</sup> October, 2023. You are to submit annual report for continuing review.

Sincere regards,

DR. DANIEL ANKRAH  
VICE CHAIR (KBTH-IRB)  
FOR: CHAIR (KBTH-IRB)

Cc: The Chief Executive Officer, KBTH  
The Director of Medical Affairs, KBTH

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

My Ref. No. *KBTH/MS/08/22*

Your Ref. No. ....



KORLE BU TEACHING HOS  
P. O. BOX KB 77,  
KORLE BU, ACCRA.

Tel: +233 302 667759/673034-  
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[pr@kbth.gov.gh](mailto:pr@kbth.gov.gh)  
Website: [www.kbth.gov.gh](http://www.kbth.gov.gh)

30<sup>th</sup> October, 2022

AYISI LYDIA AFIA  
SCHOOL OF PUBLIC HEALTH  
COLLEGE OF HEALTH SCIENCES  
UNIVERSITY OF GHANA

**SCIENTIFIC AND TECHNICAL COMMITTEE APPROVAL**  
**PROTOCOL IDENTIFICATION NUMBER: KBTH-STC 000169/2022**

The Korle Bu Teaching Hospital Scientific and Technical Committee (KBTH-STC), on 30<sup>th</sup> October, 2022, approved your submitted study protocol.

TITLE OF PROTOCOL: "Prevalence and Determinants of Postpartum Depression in First-Time Mothers at Korle Bu Teaching Hospital"

This approval requires that you forward your approved document to Korle Bu Teaching Hospital –Institutional Review Board (KBTH-IRB) for the ethical aspect of the proposal to be assessed before the project can be initiated.

PRINCIPAL INVESTIGATOR: Ayisi Lydia Afia


This STC approval is valid till 30<sup>th</sup> March, 2023

You may, however, request extension of the approval period, or renewal as the case may be, should the study extend beyond the stated period.

Upon completion, you are required to submit a final report on the study to the STC. This is to enable the STC ensure among others that, the project has been implemented as per the approved protocol. You are also required to inform the KBTH-STC and Research Directorate of any publications that may emanate from the research findings.

Kindly note that, should the need arise, the KBTH-STC or IRB may institute appropriate measures to satisfy itself that study is being conducted according to the highest scientific and ethical standards.

Please note that any modification to the study protocol without Scientific Technical Committee (STC) approval renders this approval invalid.

  
Prof. G. Obeng Adjei  
Chairman, KBTH-STC

Cc: The Chairman, KBTH-IRB

  
INTEGRI PROCEDAMUS