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POSTPARTUM DEPRESSION, BREASTFEEDING PRACTICES AND NUTRITIONAL STATUS OF CHILDREN AT TWO HEALTH FACILITIES IN ACCRA, GHANA

BY

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DECLARATION

I, Hikmatu Abdulai, hereby declare that with exception of the references made to other people's work which I have duly acknowledged, this dissertation which is my original work has neither in whole nor in part been presented to the University or elsewhere for another degree.

Signature……..

Date……..

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Date……..

DR JULIANA YARTEY ENOS (SUPERVISOR)

DEDICATION

I dedicate this work to my loving parents Mr Issifu Alhassan Abdulai and Mrs Aisha Abdulai.

I am so grateful for their prayers, sacrifices and support.

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ABSTRACT

Background: Postpartum depression (PPD) is one of the most common psychiatric complications of childbirth. Unfortunately, most PPD cases are undetected and untreated, with attendant significant effects on maternal and neonatal health outcomes.

Methodology: A cross sectional study of 300 mothers aged 15 to 45 years was undertaken to examine the association between PPD, breastfeeding practices and nutritional status of their children (0-12 months) attending the Greater Accra Regional and Police hospitals. Convenience sampling was used to select participants. A semi-structured questionnaire was used to obtain sociodemographic information. The Patient Health Questionnaire 9 (PHQ-9), a diagnostic tool for mental health disorders, was used to assess the presence and severity of depression. WHO Anthropometric Standards were employed to assess the nutritional status of children, and a modified USAID Tool kit for breastfeeding evaluation was used to assess breastfeeding practices. Data was analyzed using Stata version 15.0.

Results: The prevalence of postpartum depression was found to be 27%; with about 4% of the mothers having severe depression. Employment status and the timing of initiation of breastfeeding were found to be significantly associated with depression. Women who were unable to start breastfeeding immediately after birth were twice as likely to be depressed compared to those who initiated breastfeeding at birth (AOR=2.40; 95% CI=1.08-5.36). Although 17% of the children enrolled in this study were found to be malnourished, no significant association between child nutritional status and PPD was observed.

Conclusion: The high prevalence of PPD among mothers in this study (27%) presents a significant public health concern that requires prompt action as it impacts the family. Measures should be put in place for early detection and diagnosis, as well as appropriate interventions. Further studies are needed to unravel the effects of maternal depression on breastfeeding practices and nutritional status of children.

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LIST OF ABBREVIATIONS

APA …… American Psychiatric Association

CMD …… Common Mental Disorder

DSM …… Diagnostic and Statistical Manual of Mental Disorders

EPDS …… Edinburgh Postnatal Depression Scale

GAR …… Greater Accra Regional

GDHS …… Ghana Demographic Health Survey

GHS …… Ghana Health Service

ICD …… International Statistical Classification of Diseases and Related Health Problems

PHQ…… Patient Health Questionnaire

PPD ……. Postpartum depression

SD …… Standard Deviation

UNICEF …. United Nations Children Fund

USAID …… United States Agency for International Development

WHO …… World Health Organization

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Depression contributes significantly to the global disease burden and affects people throughout the world **(**World Federation for Mental Health, 2012). Postpartum depression (PPD), a major health concern, has harmful consequences on mothers, their children, and families (Klainin & Arthur, 2009). Women of childbearing age are at particular danger of depression, many experiencing elevated rates of social morbidity and depressive symptoms that are often unrecognized and untreated (Klainin & Arthur, 2009). Maternal depression is one of the major causes of disease burden for women throughout the world. Symptoms of depression impede the capacity of women to work in an optimal manner (Vos et al., 2012). Women may be especially vulnerable to depression in the perinatal period due to the major changes and challenges presented by childbearing (Biaggi, Conroy, Pawlby & Pariante, 2016).

One pathway through which maternal mental health problems may lead to adverse child health outcomes are through poor child care and feeding practices (Rahman et al., 2016). Maternal mental health problems are associated with sub-optimal child feeding practices, including early cessation of breastfeeding and non-responsive feeding styles, as well as insecure maternal-infant attachment (Rahman et al., 2016). Previous studies have shown that maternal depression predicts bad nutritional status outcomes for children, which can lead to increased disease risk (Guo et al., 2013).

Maternal depression has implications for the growth of the child (Canadian Paediatric Society, 2004). Since health workers who care for women and children constantly meet mothers, it is essential that they have the expertise and abilities to detect maternal depression symptoms (Canadian Paediatric Society, 2004). The physical, mental and social aspects of

health are interrelated, and physical health improvements will affect mental health and vice versa.

Growing evidence indicates that psychosocial factors, including maternal mental health, play a significant part in the outcome of child nutrition (Rahman, Patel, Maselko & Kirkwood, 2008) and that improving maternal mental health could lead to better child health. The WHO's concept of mental health, a state of well-being in which people understand their potential, can deal with normal life difficulties, can operate productively and can contribute to their society, is practically what is required to attain sustainable development goals by 2030. It is, therefore, imperative that maternal mental health is given the necessary attention so that mothers will be able to fully carry out their very important role of child caring.

1.2 Problem Statement

Approximately 13–19% of women experience postpartum depression, a serious mental health challenge after delivery, especially within 14 weeks of childbirth (O'Hara and McCabe, 2013). If the duration of pregnancy is also taken into consideration, a lot more women face a depressive episode in the course of pregnancy or the first three months following delivery (O'Hara and McCabe, 2013). Up to 50% of cases of this mood disorder remain unrecognized (Borra ,Iacovou & Sevilla , 2015). Early detection is one of the key challenges clinicians face in addressing postpartum depression (Borra et al., 2015). Clinicians ' inability to question women after delivery about PPD-related symptoms is another barrier to recognizing the condition (Borra et al., 2015). A striking feature of this destructive mood disorder is how secretly mothers suffer (Borra et al., 2015). Post-natal depression immediately affects mothers and jeopardizes their future mental health (Borra et al., 2015).

Postpartum depression is defined in new mothers as a constant low mood, often followed by emotions of sorrow, worthlessness, and/or lack of hope (O'Hara and McCabe, 2013). While the postpartum depression clinical profile is comparable to depression at other times in a woman's life, owing to the intense physiological changes during pregnancy and postpartum, it may differ in some respects (O'Hara and McCabe, 2013). The Australian Maternal Health Study found that 7.3% of women reported serious early pregnancy anxiety or panic attacks, increasing to 15.7% of women in the first three months postpartum (Woolhouse, James, Gartland , MacDonald & Brown, 2016).

Conserving the mental health of a mother should be prioritized as it affects bonding with her child and consequently a woman's ability to care for her baby, which may impair the growth and development of the child (Woolhouse, James, Gartland , MacDonald & Brown, 2016). A crucial aspect of this care taking role is breastfeeding and infant feeding practices. Studies have shown that impaired maternal mental health interferes with how best a mother is able to feed and care for her child (Rahman et al., 2016). In extreme cases, mothers suffering from PPD may refuse to breastfeed, putting their children at risk of malnutrition and attaining optimal physical and cognitive development. The effects can be long-lasting (Rahman et al., 2016).

Despite policies to promote exclusive breastfeeding in Ghana, such as enforcing the International Code of Marketing for Breast Milk Substitutes, implementing parental protection legislation and encouraging baby-friendly hospitals throughout the nation, exclusive breastfeeding rates are still low (GSS/GHS/ICF, 2014), and this can be considered a major public health problem. Data from the Ghana Demographic Health Survey (GDHS) indicates that the percentage of exclusively breastfed children 0-5 months decreased by 17 percent from 63% in 2008 to 52% in 2014 (GSS/GHS/ICF, 2014). In the last decade, the

percentage of young children who are bottle-fed has rather increased (GSS/GHS/ICF, 2014).

In 2003 and 2008, 11% and 12% of children under 6 months of age were fed with nipple bottles respectively; in 2014, this percentage increased to 16% (GSS/GHS/ICF, 2014).

Many reasons have been attributed to the cessation or short duration of exclusive breast feeding such as socio-economic and cultural circumstances, age-related issues, maternity education, family earnings, early introduction of teats, and variables such as the amount of prenatal consultations, postpartum hospital practice, maternity stay, fundamental health care monitoring, among others (Silva, Lima , Sequeira-de-Andrade , Oliveira, Lima et al., 2017). However, one very important factor that may not be receiving the needed attention is the mental health of mothers. Recent studies have proposed a connection between postpartum depression (PPD) symptoms and early breastfeeding disturbance (Silva et al., 2017). A mother who is mentally unstable may not be able to properly feed and care for her child, increasing the child's risk of being malnourished or failing to thrive (Silva et al., 2017). There is evidence from developing countries that poor maternal mental health is associated with child malnutrition and physical health reduction (Dennis & McQueen , 2007).

Infant feeding practices play a crucial role in determining a child's nutritional status. More than half of the deaths occurring as a result of malnutrition happens during the first year of life and are associated with inappropriate methods of feeding (Ghandi, Thomas & Desai , 2017). Poor dietary practices during infancy and early childhood, leading to malnutrition, result in cognitive and social development deficiency, bad school performance and subsequent productivity (Ghandi, Thomas & Desai , 2017). Since women who are depressed are less likely to seek professional help (Klainin & Arthur, 2009), prevention and early detection of depressive symptoms are the most efficient methods of treating or managing PPD. Identifying risk factors for PPD enables early recognition and timely measures to

protect high-risk populations (Klainin & Arthur, 2009) and subsequently ensure that women and their children live healthier.

Research on maternal mental health and its association with breastfeeding practices and nutritional status of children in Ghana is scanty. Although assessment of maternal mental health exists in our health policies and protocols, this area needs to be strengthened.

1.3 Significance of study

As primary caregivers of infants, any condition that affects mothers, and has an impact on motherhood, affects child health. Postpartum depression is a serious health challenge for many women from diverse societies, but it frequently goes undiagnosed, untreated and not well documented. Maternal mental health has been defined as a missing "m" in maternal and child health and postpartum depression as a stolen motherhood phenomenon. This only goes to emphasize that maternal mental health has not been given the attention it deserves despite its importance. Studies assessing relationships between maternal mental health issues in sub-Saharan Africa have produced mixed outcomes. The first 12 months of a child's life are a critical growth period and therefore the potential negative impacts of postpartum depression on the growth of the child emphasizes the need for early identification and effective therapy (Madeghe, 2014). Evidence suggests that treating a mother's depression results in enhanced newborn growth and development and decreases the probability of diarrhea and malnutrition among children (Guo et al., 2013). Post-natal clinics should be concerned not only with breastfeeding, immunization, infant development and childhood disease prevention, but also with mothers frequently screening for depression as the state of mind of a mother impacts the above-mentioned practices and outcomes. Only when a mother is mentally fit can she effectively perform child care practices that ensure optimum growth and development (Rahman et al., 2016).

Research involving maternal mental health, complementary feeding and malnutrition in Ghana is scanty. The information gathered from this study may be beneficial in guiding clinical and public health decision making and programming. It will help to define which women need more systematic monitoring and women who are found to show high levels of depressive symptoms can be referred to appropriate care services. It will also inform efficient preventive or therapeutic measures to enhance women and children's quality of life.

1.4 Research Questions

1. What is the prevalence of postpartum depression among mothers who attend postnatal clinic at the Greater Accra Regional and Police hospitals?
2. What are the breastfeeding practices of the mothers?
3. What is the nutritional status of infants born to mothers with and without postpartum depression?
4. How does postpartum depression influence breastfeeding practices and nutritional status of children?

1.5 General Objective

To examine the relationship between maternal postpartum depression, breastfeeding practices and nutritional status of children accessing postnatal care at the Greater Accra Regional (GAR) and Police Hospitals in Accra

1.5.1 Specific Objectives

1. To determine the prevalence of postpartum depression among mothers aged 15-45 years attending the GAR and Police hospitals for postnatal care
2. To assess breastfeeding practices among mothers attending the GAR and Police hospitals
3. To assess the nutritional status of infants born to mothers attending the GAR and Police hospitals for postnatal care
4. To determine the relationship between PPD, breastfeeding practices and nutritional status of children attending postnatal care with their mothers.

1.5.2 Conceptual Framework describing the relationship between Postpartum Depression of mothers, Breastfeeding Practices and Nutritional Status of children

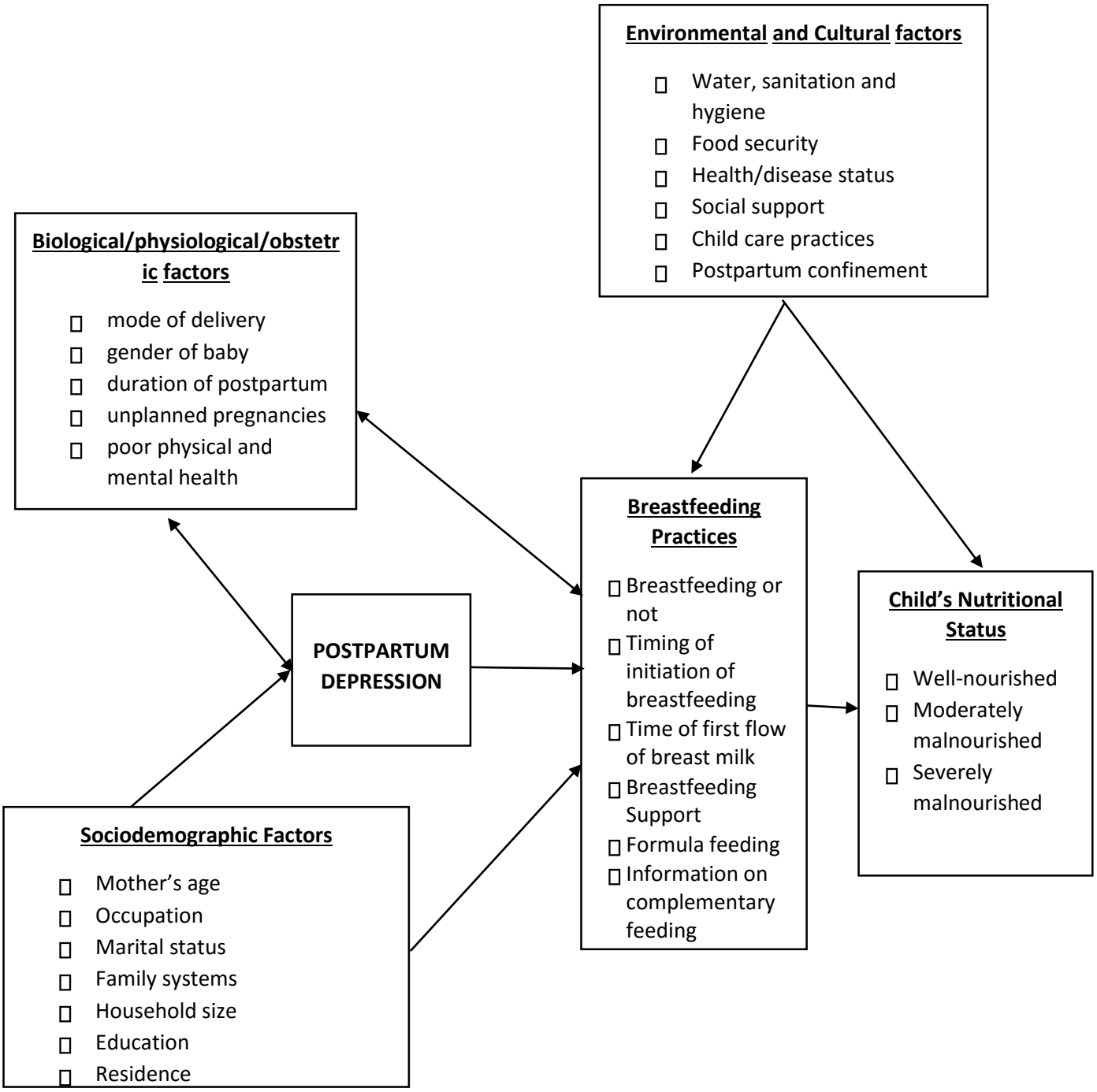

Figure 1: Conceptual framework adapted from the Theoretical model of the social production of disease

1.5.3 Narration on conceptual framework

The conceptual framework above was adapted from the Theoretical model of the social production of disease. It argues that illnesses are created and spread socially and not just part of nature or biology. Class, gender and ethnicity are key factors that shape disease development and distribution, and how professional organizations describe circumstances as illnesses (Levin & Browner, 2005). Health and disease are cultural products and people as social agents respond to, transform and are shaped by health and disease experiences. Sociologists think that the sickness and disease experience is the result of society's organization. The theory also emphasizes that disease and inequality are closely related in that the social gradient of health is the result of unequal allocation of the political, financial and social resources needed for a good life (Levin & Browner, 2005). Although postpartum depression may result from complicated relationships between biological and physiological variables, it is not possible to overlook environmental and social factors. Social factors like parity, age, family system, child sex, etc. can delay the recovery of a mother from birth (Biaggi, Conroy, Pawlby & Pariante, 2016). A woman who has had several female births may be disappointed in hoping for a male child or may be afraid of others ' judgement if she has another female child. If a mother's mental health is compromised, it impacts the bonding with her child and consequently the capacity of the woman to cater for her baby, which can lead to impairment of the child's growth and development. Factors affecting malnutrition are multifactorial and so even though this study seeks to find how PPD influences nutritional status, it must be emphasized that important environmental elements such as food security, child care practices, sanitation issues and disease state among others are key contributors of malnutrition.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Being pregnant and twelve months postpartum represent the perinatal length, a critical period for women as they undergo bodily, physiological, psychological and social changes (Baskin, Hill, Jacka, O'Neil & Skouteris, 2017).

In the course of this time women also are at an excessive hazard of experiencing severe mental health problems. If left untreated, it can impact the health and wellness of the mother and infant. Impaired maternal mental health has been related to an increased danger of preeclampsia, unfavorable pregnancy outcomes and poor child growth (Baskin et al., 2017).

Postpartum depression has been defined by two existing diagnostic systems; the Diagnostic and Statistical Manual of Mental Disorders (DSM IVTR; APA, 1994) and the International Statistical Classification of Diseases and Related Health Problems (ICD-10; WHO, 1992). The DSM IV-TR recognizes PPD as a major depressive disorder with postpartum onset and indicates that depressive symptoms commence usually within 4 weeks postpartum. According to the ICD-10, PPD is a mild mental and behavioral disorder that starts within 6 weeks of delivery. Clinical features of PPD may include depressed mood, significantly decreased pleasure in almost all operations, insomnia or hyperinsomnia, notable weight loss or weight gain, psychomotor agitation or retardation, loss of energy, emotions of worthlessness, excessive guilt, decreased self-esteem and self-confidence, difficulty in concentration and suicidal thoughts (APA, 2000).

Postpartum blues are quite common within the first week to 10 days after delivery. It is indicated by transient symptoms, such as crying, sadness, anxiety, irritability and mood

lability. There is a more extreme case of postpartum psychosis, which constitutes a psychiatric emergency due to risk of infanticide and suicide. Postpartum psychosis presents with delusions, hallucinations, confusion and disorganized behavior (Sharma & Sommerdyke , 2013).

Table 1: Postpartum affective disorders

Disorder	Prevalence	Onset	Duration	Treatment
Blues	30-75%	Day 3-4	Hour to days	No treatment required other than reassurance
Postpartum depression	10-15%	Within 12 months	Weeks to months	Treatment usually required
Puerperal Psychosis	0.1% - 0.2%	Within 2 weeks	Weeks to months	Hospitalization usually required Postpartum

Source: (Stewart, et al, 2010)

Prevalence of PPD has been difficult to determine due of the difference in criteria for the time of onset used by the DSM-IV and that used by most epidemiological studies. Also, underreporting by mothers themselves, poses a challenge in establishing the true number of cases of PPD (Anokye et al., 2018). Only 20% of women who experience symptoms of PPD, are estimated to report to their healthcare providers. Prevalence of PPD in Africa has been reported to be 18.3% according to Sawyer, Ayers & Smith (2010) and Chinawa et al. (2016). Different diagnostic tools employed also account for non-uniformity in prevalence rates. For instance, Anokye et al., 2018 found prevalence of PPD to be 7% in Komfo Anokye

Teaching hospital, using the Patient Health Questionnaire-9. Meanwhile Buabeng (2015) used the EPDS and found PPD to be 22.3% in the same facility. A new analysis by the Center for Disease Control and Prevention (CDC) reveals that the rate of pregnant women diagnosed with depression at delivery increased seven times from 2000 to 2015(Ko et al., 2017). The CDC also reports that about 1 in 9 women experience symptoms of postpartum depression (Ko et al., 2017).

2.2 Risk factors for postpartum depression

The exact causes of postpartum depression are unknown, even though several feasible biological, cultural and psychological theories have been explored (Weil, 2018). Postpartum depression is a complicated occurrence that consists of an interplay among biochemical, genetic, psychosocial, and situational existence-pressure factors. There is presently no easy consensus on the causes of postpartum depression (Judge & Beck, 2008).

2.2.1 Sociodemographic Factors

Low socioeconomic status has been discovered to be associated with postpartum depression (Goyal et al., 2010). Low schooling, unemployment and absence of social guide have also been continually identified as factors influencing PPD. Studies have proven in developing and developed nations that the absence of social support is an impartial predictor of PPD (Yagmur and Ulukola, 2010). Much less measured factors related with PPD is migration status and home violence (Dennis and Vigod, 2013). Especially in developing countries, having an unemployed or uneducated spouse, intimate partner violence or domestic violence, living in unfavorable circumstances and polygamous marriages are identified as extra components of risk to PPD (Ahmed et al., 2012).

Other factors which could increase a person's danger of postpartum depression include younger age, being unmarried/divorced/separated, ill-timed or unplanned pregnancies, history of smoking or consumption of alcohol, history of physical or sexual abuse, birth and postpartum stressors, history of mental illness and antidepressant use, primiparity, dwelling in big city regions and the goal of returning to work during the early postpartum period (Pope & Mazmanian , 2016).

One most important risk factor for developing PPD is prenatal depression or a history of depression before pregnancy (Robertson, Grace , Tamara & Stewart, 2004). In developed countries, physical and biological factors such as poor physical health, body shaming and weight issues are associated with PPD (Gaillard et al., 2014). Correspondingly, poor physical health was reported in developing countries. Women who were underweight had a higher risk of PPD among the Nepalese (Ho-Yen et al., 2007). A record of health conditions and premenstrual syndrome were also reported (Kara et al., 2008).

2.2.2 Psychological factors

In both advanced and developing nations, dysfunctional marriage relationships and life challenges are significant aspects that predispose women to PPD. Child care stress and negative perspectives towards pregnancy have also been identified as psychological factors increasing the risk of PPD (Norhayati et al., 2014)

In developed countries, factors such sexual, physical and psychological abuse have been found to have significant associations with PPD (Silverman and London, 2010).

2.2.3 Obstetric and Paediatric factors

Findings are not conclusive on the association between obstetric and pediatric variables, and PPD. Gaillard et al. (2014) presented a mixed finding on the effect of unplanned

pregnancy and mode of delivery on PPD. Koutra et al. (2014) identified a statistically significant increase in levels of PPD scores among mothers who delivered through caesarean section, which was in conformity with the findings of Lee et al. (2011). In the meantime, cohort studies have shown that delivery methods are not related to PPD (Gaillard et al., 2007). Other risk factors such as breastfeeding deficiency or non-initiation, parity and sex of baby showed different findings. Mothers whose children had medical conditions, were born preterm and are temperamentally difficult have high risks of experiencing postpartum depression (Abassi et al., 2013). Prior loss of a baby and pregnancy-related problems such as low Hb level during delivery have also been identified as risk factors for PPD (Goshtasebi et al., 2013).

2.2.4 Cultural factors

A traditional practice among the Taiwanese women is postpartum confinement, where women are kept indoors for a month. During this period, women are assisted with household chores, given special diet and are protected from harsh weather conditions Chien et al. (2012) found that this postpartum confinement period is associated with a decreased chance of developing PPD. This same practice however is a factor increasing the risk of PPD among Singaporean women (Chee et al., 2005).

2.3 Measurement of postpartum depression

The prevalence of postpartum depression is deduced by the use of either self-reported questionnaires or scientific interviews established or both. Self-stated questionnaires are used to show the clinically relevant signs of depression and structured scientific interviews are used to determine the prognosis of major or minor depressive problems.

The most frequently used measure of symptoms of postpartum depression is the Edinburgh Postnatal Depression Scale (EPDS) but it does not correspond directly to DSM-IV-TR (Gaynes et al., 2005). Yawn et al. (2010) found through their research that screening for postpartum depression is viable in primary care situations and the EPDS and PHQ-9 scores were consistent for most women who were screened.

In their validation research of the PHQ-9 and EPDS, Santos et al. (2016) found that the two instruments could be used in a setting with equal confidence in screening for major depressive episodes. For maternal depression evaluation, both PHQ-9 and EPDS are accurate and valid scales. Results from research conducted by Zhong et al. (2014) indicate that concurrent administration of both scales could enhance the identification of antepartum depressive disorders in clinical environments.

Weobong et al. (2009) expanded the proof of the PHQ-9's validity, reliability and superiority over other screening evaluations. They found that the PHQ-9 is concisely administered, less daunting and acceptable to a mainly uneducated population of Ghanaian women from five to eleven weeks postpartum. Again, the PHQ-9 has been validated against in-depth mental health interviews and is reported to be specific (>86% at scores of >10) for identification of people with major depressive disorders (MDD) (Anokye et al., 2018). This informed the use of PHQ-9 in this study.

2.4 Effects of Postpartum depression

Postpartum depression has been determined to be the most common maternal psychiatric malfunction that could result in bad outcomes on the mother-child relationship and on child development (Gonzalez et al., 2017).

Across the Africa region, postpartum depression is an important public health issue because it goes beyond affecting mothers. It impairs the fitness and health of their babies and

families as well (Madeghe, 2014). Current literature suggests that PPD results in significant morbidity for both mothers and infants. Its ripple effects go as far as hindering child growth with an ingrained impact.

In a huge cohort study, depressed mothers reported more emergency room visits and hospitalizations for their children in the past year and in the first two years after birth; they attended fewer well-child hospitals (Minkovitz et al., 2005).

Postpartum depression also has enormous terrible consequences for the physical, cognitive and social improvement of children whose mothers have been affected. Furthermore, postnatal depression involves heavy economic rates, cost sentences to healthcare systems and productivity losses through maternal absenteeism from work, early retirement and long-term unemployment. (Borra et al., 2015).

A child's intellectual health is directly influenced by the bond between mother and child. Therefore, this relationship must be amiable, intimate, unending and affectionate, providing pleasure and luxury for each (Perrelli, Zambaldi, Cantilino & Sougey, 2014). A decline in quality in mother–infant interactions are related to unfavorable child outcomes (Murray et al., 2015). Especially if it is extreme, extended and affects vulnerable populations, studies suggest that PPD creates a negative impact on child improvement (Ali et al., 2013). There is new evidence for the affiliation between maternal postnatal depression and child mortality in low- and middle-income countries (Weobong et al., 2015).

Further to the financial losses that mental problems represent, intangible costs in terms of human struggling and the whole effect of those mental health issues on physical problems are conceptually and methodologically hard to estimate. There is proof that mental health challenges throughout the perinatal duration threaten and/or worsen obstetric results, which include preterm labour, obstetric headaches etc. (Silva et al., 2017).

The effect on children goes beyond delayed psychosocial enhancement. It also involves low birth weight, decreased breastfeeding, restricted development, severe malnutrition, extended episodes of diarrhoea, and lower immunization schedules.

2.5 Managing Postpartum depression

PPD can be managed through pharmacologic interventions, supportive interpersonal and cognitive therapy, psychosocial support through support groups, professionally-based postpartum home visits and complementary therapies. Electroconvulsant therapy has proven beneficial for mothers with severe PPD (Chinawa et al. 2016). In extreme cases, especially where mothers are at risk of suicide, inpatient hospitalization may be required (Anokye et al., 2018). Amongst the interventions identified, psychosocial support has proven to be the most effective intervention in managing PPD (Anokye et al., 2018).

Beck, Records and Rice (2006) documented that participating in support group activities can offer mothers a feeling of hope through the realization that they are not alone. Couple support groups can teach coping strategies and provide encouragement. They also give couples a chance, to express needs and fears in a nonjudgmental setting.

It is also recommended that interpersonal psychotherapy be initiated during pregnancy for women who are considered at high risk of having PPD (Anokye et al., 2018). This is to psych them up, particularly about role changes that accompany parenthood. Current research suggests that women who receive interpersonal psychotherapy are more likely to have a reduction in depressive symptoms and may recover faster from PPD compared to women who do not receive interpersonal psychotherapy (Anokye et al., 2018).

A study from the United Kingdom discovered that three brief home-based visits using counseling methods were effective in speeding up recovery rates for women with PPD (O'Hara & McCabe, 2013).

2.6 Breastfeeding Practices

Infant feeding practices is vitally important for the growth and survival of children from the time they are born (World Health Organization, 2009). Feeding practices are the primary determinants of child's nutritional status (GHS/GSS/ICF, 2014).

According to the World Health Organization, sub-optimal feeding practices related to insufficient meals intake, may be the cause of approximately one-third of malnutrition, depending on populace, vicinity, time and season, and further to contributory factors which include infection and food shortage or insecurity (Madeghe, 2014). Breastmilk is an appropriate supply of nutrition for the growth and development of a child (WHO, 2011). Studies indicate that the nutritional and immunological gains of breastfeeding are multiplied with an extended duration and intensity breastfeeding (Chantry et al., 2008). The WHO and UNICEF recommend that breastfeeding be started in the first hour of life and that breastfeeding be carried out on demand, as often as the child wants. The importance of breastfeeding for maternal and child health are well mentioned in literature. Taking its value into account, the World Health Organization (WHO) recommends exclusive breastfeeding for the first six months of life, followed by the introduction of complementary age appropriate and nutritious feeding while maintaining breastfeeding for up to 2 years or more (Silva et al., 2017). Breastfeeding is the physiologic norm for infant feeding. Children who are not breastfed stand a higher risk of developing otitis media and nonspecific gastroenteritis (Watkins, Meltzer-Brody, Zolnoun & Stuebe, 2011). Breastfeeding is vital for both mother and child when initiated in a timely fashion. Early suckling triggers the discharge of prolactin which aids the production of milk and oxytocin which is accountable for the emission of milk. It is encouraged that children be breastfed colostrum promptly after birth, exactly within an hour (GHS/GSS/ICF, 2014). Ghana has seen a sluggish growth of the proportion of children who commenced breastfeeding inside one hour of delivery

from 46% in 2003 to 56% in 2014 (GHS/GSS/ICF, 2014. Continuing studies investigating PPD's etiology have discovered lower levels of depression among breastfeeding mothers. Longitudinal studies seem to guide a bidirectional connection between breastfeeding and PPD, but the mechanisms underlying these organizations remain unsure (Gregory, Butz, Ghazarian, Gross & Johnson, 2015). At 2 months postpartum, women with unfavorable early experiences of breastfeeding are much more probable to have depressive signs and symptoms. Depressive signs must be tested for mothers with breastfeeding problems (Watkins, Melter-Brody, Zolnoun & Stuebe, 2011).

Mothers suffering from postpartum depression may be at increased risk of poor infant feeding practices, including decreased chances of exclusive breastfeeding and other breastfeeding difficulties, which is certainly a cause for concern (Dennis & McQueen, 2009). In addition, depressed mothers were much more likely to breastfeed at a reduced intensity, practice mixed feeding and begin solid meals in advance than recommended, which could also provide additional insight into the higher weight benefit of 6 months postpartum among children of mothers with postpartum depression (Gaffney, Kitsantas, Brito & Swamidoss, 2014). Due to this, babies of depressed mothers may also benefit less from breastfeeding, including immune protection. Similarly, these results may also play a role within the said expanded medical institution event and visits to emergency rooms.

Silva et al. (2017) indicated that postpartum depression contributed to the reduced practice of exclusive breastfeeding and suggested that the phenomenon should be covered in prenatal and early postpartum support guidelines for breastfeeding especially among women with low socioeconomic status.

2.7 Postpartum depression and poor child growth

In developing countries, more than 150 million children under five are poorly nourished (Rahman, Iqbal, Bunn, Lovel & Harrington, 2004). Poor nutritional status in young children predispose them to higher risks of morbidity (GHS/GSS/ICF, 2014). Malnutrition is implicated in greater than half of all infant deaths worldwide, and nutritional deficiencies at all stages of growth have later unfavorable effects on the cognitive and mental development of children. Malnutrition as a result, represents a magnanimous waste in the abilities of millions of children (Rahman et al., 2004).

A decent percentage of these fatalities happen over the course of the first year of life, which may often be linked to inappropriate feeding methods. Worldwide, no more than 35% of babies are breastfed solely during the first four months of their lives (Ghandi, Thomas & Desai, 2017).

Complementary feeding often begins too early or too late, and ingredients are often insufficient in nutrition and unsafe. Malnourished children who live to tell the tale are more regularly unwell and go through the persisting effects of impaired development. Poor nutrition is a crucial threat to social and economic development and contributes to the obstacles to child health and well-being (Ghandi, Thomas & Desai, 2017).

Even though environmental and nutritional elements play a critical function in the nutritional status of children, maternal mental health has been shown to play a major contributing role, in all likelihood through interfering with the mother's obligation for baby care (Ashaba et al., 2017). Maternal depression has damaging effects on the nutrition and development of a child (Ashaba et al., 2017).

Several studies have shown that mothers with depressive symptoms are likely to have children who are either underweight or stunted compared to non-depressed mothers,

suggesting a consistent connection between development and maternal depression (Surkan et al., 2011).

In a prospective cohort study carried out in Pakistan, maternal depression was recognized as a risk factor for malnutrition and disease in rural children. Results showed a significant growth retardation in infants of mothers who suffered depression prenatally. The research found that maternal depression predicts poorer development and enhanced risk of diarrhea among children in a community sample during antenatal and postnatal phases (Stewart et al., 2010).

Another research was performed in Ghana to examine with a 2-year follow-up the connection between maternal depression and febrile disease in children registered in a potential birth cohort. Perinatal depression was common and linked with febrile disease in infants. Results showed that depression could pose a severe danger to mothers and their children due to the elevated incidence of depression in sub-Saharan Africa (Guo et al., 2013).

Robert et al. (2008) performed a cross-sectional study at a Malawi district health facility where they recruited mothers and their babies who had been vaccinated for measles. Weight-for-age and length-for-age Z scores among infants of mothers with and without Common Mental Disorder were compared (CMD). Mothers with CMD had their infants scoring low weight and length-for-age Z scores compared to mothers without CMD. The study showed the link between maternal CMD and impairment of infant growth in rural Sub-Saharan Africa.

In a cross-sectional study in Zambia, mothers with infants between 2 and 12 months were selected from five clinics in three different locations and a self-reported questionnaire was used to measure depression. Researchers sought to find an association between depression,

infant size (weight and height) and infant health. Results implied that unfavorable infant health outcomes were comparably higher in infants of depressed mothers. The research found that low weight-for-age and length-for-age scores were correlated considerably with maternal depression (Ndokera & MacArthur, 2011).

On the contrary, in research from Ethiopia and South Africa, there was no connection between maternal depressive symptoms and child malnutrition (Parsons et al., 2012)

CHAPTER THREE

STUDY DESIGN AND METHODS

3.1 Study Design

This study was a cross sectional study among women with infants attending postnatal and child welfare clinics at the Greater Accra Regional and Police hospitals in Accra.

3.2 Variables

The study explored the factors associated with postpartum depression among mothers, their breastfeeding practices and the nutritional status of their children. Nutritional status of children was the main dependent or outcome variable of this study. It was determined by the independent variables including the sociodemographic characteristics such as mother's age, occupation, type of delivery, etc. and the breastfeeding practices such as formula feeding, mode of feeding etc. Mothers' depression status was also considered as an independent variable which predicted the outcome variable of whether a child is malnourished or not (nutritional status).

Table 2: Variables and Definitions

Variables	Indicators	Operational Definition	Scale of measurement
Sociodemographic factors (independent variables)	Age at last birthday	Mother's current age in years to be grouped	Ordinal
	Marital status	Single/married/ divorced/ separated	Nominal
	Occupation	Categorized under professional/technical/managerial, sales and services, clerical, skilled manual and not earning an income currently	Nominal
	Household size	Number of people in a house/family	Ordinal
	Type of delivery	Vaginal or caesarean section	Nominal
	Gender of baby	Male or female	Nominal
	Postpartum duration	Number of months after delivery to be categorized	Ordinal
Breastfeeding practices (independent variables)	Breastfeeding	Yes or No	Binary
	Duration before 1st breastfeeding	Number of minutes/hours or days prior to initial breastfeeding	Ratio
	Time of first flow of breast milk	How many days it took for breast milk to flow	Ratio
	Hospital support in breastfeeding	Whether or not mother received breastfeeding support after delivery (Yes or No)	Binary
	Formula feeding status	Whether or not baby has been fed formula (Yes or No)	Binary
	Healthcare worker information on when to start complementary food	Whether or not mother received information regarding complementary feeding (Yes or No)	Binary
	Age at which baby was formula fed	If baby has been formula fed, at which month was he or she fed?	Ratio
	Feeling about breastfeeding the 1st time	The degree to which the mother liked or disliked the practice of breastfeeding during the first week post delivery	Ordinal
	Feeling about breastfeeding now	The degree to which the mother liked or disliked the practice of breastfeeding now	Ordinal

Table 2: Variables and Definitions cont'd

Variables	Indicators	Operational Definition	Scale of measurement
Postpartum depression	Depression scores on the PHQ-9	Categorizes mothers as having minimum symptoms of depression, minor depression, moderately severe depression and major severe depression	Ordinal
Nutritional status (dependent variable)	Well nourished	Weight-for-age Z score greater than -2.0 standard deviation	Ordinal
	Moderately malnourished	Weight-for-age Z score between -3.0 and -2.0 standard deviation	Ordinal
	Severely malnourished	Weight-for-age Z score less than -3.0	Ordinal
	Baby's weight	Body weight measured in kilograms	Ordinal

3.3 Data collection instruments

The instruments used in the study include;

- Sociodemographic questionnaire
- The Patient Health Questionnaire
- Modified USAID Tool kit for monitoring and evaluating breastfeeding practices
- Weighing scales used in hospital
- Growth monitoring charts

3.4 Study Site

The study was done at the postnatal and child welfare clinics of Greater Accra Regional Hospital and Police Hospital, both in Accra.

Greater Accra Regional Hospital: The hospital is presently one of the biggest hospitals in the Greater Accra region with a 620-bed capacity with additional housing units for 48 staff members and their families, two oxygen plants, maternity wards, mortuary and medical office accommodation**.** The Greater Accra Regional Hospital, as a Regional Referral Center in the capital, has all the vital facilities in line with its mandate as the secondary referral center that encompasses maternal and child health facilities.

Police Hospital: The Police Hospital is a 100-bed health facility established primarily to provide quality health care for members of the Ghana Police Service, their families and the general public. The hospital's Department of Public Health addresses issues of family planning, pre-natal, antenatal, and post-natal care.

These two selected hospitals conduct a lot of deliveries and have a comparatively high turnout for post-natal care according to a report by the Ghana Health Service. People of different sociodemographic backgrounds can be captured there as well.

3.5 Study Population

The study involved women between the ages of 15 and 45 with infants of ages 0-12 months attending post-natal and child welfare clinic at the GAR and Police hospitals in Accra.

3.5.1 Inclusion Criteria

- Women who consented
- Women between 15-45 years with babies 0-12 months
- Women who attended postnatal and child welfare clinics at the GAR and Police hospitals

3.5.2 Exclusion Criteria

- Women with multiple births, given the high risk associated with postnatal depression.

3.6 Sample Size Determination

3.6.1 Sample Size Calculation

Sample size was determined based on the prevalence of PPD in Africa, which is 18.3% according to Sawyer, Ayers & Smith (2010) and Chinawa et al. (2016).

Minimum required sample size was calculated using the prevalence formula by Cochran's (1963) cited in Cochran (1977).

$n= z^2 p (1-p)/d^2$

Degree of precision at 5%

Z =represents the standard normal deviate corresponding to the 95% confidence level

=1.96

p = the estimated prevalence of the characteristic studies, in this case an estimate prevalence of women with depression symptoms in Africa is 18.3% (Chinawa et al., 2016).

Therefore, value of p= 0.183

$1.96^2 \times 0.183 (1-0.183) /0.05^2$

=229. 7

≈ 230 participants plus 10% of sample size for incompletes and missing data =

253 participants

3.7 Sampling Method

Convenience sampling method was used where every mother with her infant who came to the postnatal clinic or child welfare clinic and met the inclusion criteria was recruited until the required sample size was attained.

With reference to postnatal care data sourced from the district health information management systems (DHIMS II), and accessed on 22nd October 2018, there was a higher turnout at the GAR hospital compared to the Police hospital. Computations were made based on figures provided in the DHIMS. A total of 157 participants representing 62% of the total number of participants was selected from the GAR hospital and 96 participants representing 38% of the total number of participants was selected from the Police hospital. However, on the field, there was a higher attendance rate at the Police hospital hence 76.6% of the participants were recruited from Police hospital and 22.3% from the Greater Accra Regional hospital, contrary to the initial proposed figures.

3.8 Data Collection

The principal investigator was available at the facility on clinic days (Wednesdays and Thursdays) with research assistants from May 30 to June 19th, 2019 for recruitment of participants for the study. Mothers who met the criteria for selection were identified and approached. The study was explained to them and after consenting by signing the consent form, data was collected from participants. Mothers who were unwilling to partake in the study were not coerced, they were assured of receiving continuous quality health care regardless of their decision. Interviews were done in English and local languages, Ga and Twi.

A modified semi-structured questionnaire adopted from a similar study by Madeghe (2014) was used to obtain information on demographic characteristics, such as age, residence, type of delivery, marital status, occupation etc. to help determine an association of these parameters with postpartum depression, breast feeding practices and nutritional status of infants. Current weights of the babies were recorded from weighing cards after nurses had measured using a weighing scale.

Postpartum depression was evaluated using the Patient Health Questionnaire 9. It is a multipurpose tool to screen, diagnose, monitor and measure depression severity. It includes diagnostic requirements for DSM-IV depression with other significant symptoms of depression into a short self-report instrument. The tool specifies the frequency of symptoms that contribute to the severity-scoring index. A total score of 5-9 denotes minimal symptoms of depression; 10-14 suggests minor depression. PHQ scores of 15-19 suggests moderately severe depression whereas a score greater than 20 is suggestive of major, severe depression (Kroenke, Spitzer & Williams, 2001).

Breastfeeding practices was determined using modified USAID Tool Kit for monitoring and evaluating breastfeeding practices based on WHO infant and young children feeding practices recommendations.

Nutritional status was assessed using anthropometric measurement (weight). Weights of infants were taken by the nurses using a weighing scale and were recorded by the researchers. Weight-for age Z scores were then determined using WHO Anthroplus by inputting the weight, dates of birth and gender of the infants. Weight-for-age, reflects either underweight and or wasting. It compares the weight of a child with the weight of a healthy child of the same age in the reference population. All infants in this study with weight for age Z score of -2.0 or greater were considered well nourished. Those with Z scores between

-3.0 and -2.0 were considered moderately malnourished while a Z score of less than -3.0 indicated severe malnutrition.

3.9 Data Analysis

The data was cleaned before the analysis was done and all errors and omissions were verified against the original source of data.

The PHQ-9 was used to assess depression amongst mothers. Nine questions were asked and scored accordingly. A response of 'not at all' attracted a score of "0", 'several days' attracted a score of "1", 'more than half of the days' had a score of "2" and 'nearly every day' had a score of "3". Responding to 'Nearly every day' showed a higher severity of depression. Total scores between 5-9 suggests mild depression. Scoring between 10-14 is suggestive of moderate depression. Individuals who have a total score of 15-19 are classified as having moderately severe depression, while a cumulative score of 20-27 suggests severe depression. Individual assessment of the questions showed a trend suggesting that there were less mothers affected by severe depression, while most of the mothers had minimum symptoms of depression.

The WHO Anthroplus software was used to generate weight-for-age Z scores. Z scores were used to determine the nutritional status of the children. Children with Z scores greater than -2 S.D were classified as well-nourished whereas those with Z scores less than -2 S.D were classified as malnourished. Malnutrition was further grouped under moderate malnutrition (weight-for-age -3.0< Z score < -2.0 S.D) and severe malnutrition (Z score < 3.0 S.D)

Data was imported into Stata version 15.0 and properly labeled for analysis. The software was used to describe the data for central tendency and variability measurements and graphical representation. The categorical variables of the socio-demographic data were

summarized using frequency distribution tables. Data was presented as frequency tables, graphs and bar charts. Descriptive statistics were computed, frequencies and percentages for categorical variables, and means and standard deviations for continuous variables. Chisquare test was used to test for associations between the dependent variable (child nutritional status) and all independent variables (sociodemographic factors, breastfeeding practices and PPD). Statistical significance was set at $p<0.05$ with 95% confidence interval. Multiple logistic regression was used to determine the strength of association between the dependent and the independent variables. Adjusted odds ratio was calculated for the variables found to have a significant association with the main outcome variable at 0.05 significant level and 95% confidence interval, the odds ratios were adjusted at the multivariate level to control for confounders or mediators. Fisher's exact test was used in analyzing data that had frequencies less than 5. Multiple linear regression was used to find associations between predictor variables and independent variables. Inferences was drawn based on the results.

Statistical significance was set at $P\leq0.05$.

3.9.1 Data Management

Data was collected, encoded and stored on a laptop with a secured password. Subjects were assigned codes to conceal their identities.

3.10 Ethical Issues and Confidentiality

3.10.1 Consenting process

Informed consent was sought from the mothers after a clear explanation of the objectives of the study and all procedures involved in the study. Assent was sought from parents and guardians of mothers below 18 years. Questionnaires were administered and body weights

of the babies were recorded, only after the mothers had agreed to participate in the study by either signing or thumb printing the consent form.

3.10.2 Voluntary withdrawal

Information on voluntary participation and withdrawal from the study at any time without any consequences was explained to the participants. Participants were not compelled to partake in the study and they had a choice of not answering some of the questions. Participants were reassured they could pull out of the study at any time and their decision was not going to affect the quality of care being provided for them at the health facilities. Participants were informed of any potential discomforts whilst answering some of the questions.

3.10.3 Potential risks/benefits

There were no risks associated with participants who took part in the study. Interviews were conducted as briefly as possible and participants were briefed about the potentially sensitive questions before the interviews begun. Participants were given small packs of tissue as a token. There were no other direct benefits from the study. However, the study findings may result in implementation of better interventions for mothers with postpartum depression and children who are malnourished.

3.10.4 Privacy and Confidentiality

All data obtained were kept in a locked file cabinet and access limited to only the principal investigator and trained staff. Electronic database was encrypted and restricted to only principal investigator and trained staff. Participants' privacy was ensured using codes.

3.10.5 Quality control

Research Assistants were trained on appropriate data collection and data entry methods, to ensure uniformity and accuracy of data collected.

3.11 Ethical Consideration

Ethical clearance was sought from the Ghana Health Service Ethics Review Committee (Number; GHS-ERC 022/02/19) before the study commenced.

CHAPTER FOUR

RESULTS

This chapter presents the research findings and their interpretations. The chapter is organized under subheadings for clarity purposes**.**

4.1 Sociodemographic characteristics of mothers

The study recruited 300 mothers with their infants who met the inclusion criteria. Most of the mothers were between ages 25 to 34 years (n=195; 65%). About 86% of the mothers were married. Approximately 38% of the mothers were professionals or occupied technical and managerial positions. About 70% of them had a vaginal delivery and a little more than half of the babies were males (55.7%). More than half of the study population had a household size between two and four. Sociodemographic characteristics have been summarized table 3.

Table 3: Sociodemographic characteristics of mothers

Variable	Frequency N=300	Percentage (%)
Age Group (Years) 15 to 24	44	14.7
25 to 34	195	65.0
≥35	61	20.3
Marital Status		
Single	43	14.3
Married/ Cohabiting	257	85.6
Occupation		
Professional/Technical/Managerial	112	37.5
Clerical	20	6.7
Sales and services	75	25.1
Skilled manual	70	23.4
Non-income earning	22	7.4
Type of delivery		
Vaginal Delivery	215	71.7
Caesarian Section	85	28.3
Household Size		
2 to 4	155	51.7
5 to 7	100	33.3
≥8	45	15.0
Baby's Gender		
Female	133	44.3
Male	167	55.7
Baby's Weight (kg)		
2-5	104	34.7
5.1 to 8	132	44.0
8.1 to 13	64	21.3
Weight for Age Z-score		
Z score < -3.0 S.D	19	6.3
-3.0 < Z score < -2.0 S.D	33	11.0
Z score > -2.0 S.D	248	82.67

4.2 Assessment of depression using patient health questionnaire

More than half of the mothers screened (65.3%) had not felt down, depressed, irritable or hopeless. Only 2.7% reported having had that feeling nearly every day. Most of the women (67.7%) had not lost interest or pleasure in doing things or had poor appetite. A number of the mothers (36.7%) however reported having little energy or feeling tired, with 11.0% of them experiencing that nearly every day.

Majority of the mothers did not have bad feelings about themselves (81.7%) and were able to concentrate on activities such as school, work, reading or watching television.

More than half (78.0%) of the women reported no changes in their movement or speech, noticeable by others. Of the 300 mothers screened, 95.7% had had no thoughts of hurting themselves, 0.7% of them had ever entertained those thoughts nearly every day.

Table 4: Assessment of depressive symptoms

	Frequency (n)	Percentage (%)
Feeling down, depressed, irritable or hopeless?		
Not at all		
Several days	196	65.3
More than half the day	77	25.7
Nearly everyday	19	6.3
	8	2.7
Little interest or pleasure in doing things?		
Not at all	209	67.7
Several days	61	20.3
More than half of the days	13	4.3
Nearly every day	17	5.7
Trouble falling or staying asleep, or sleeping too much?		
Not at all	209	69.7
Several days	51	17.0
More than half a day	20	6.7
Nearly every day	20	6.7
Poor appetite, weight loss or overeating?		
Not at all	213	71.0
Several days	62	20.7
More than half a day	10	3.3
Nearly every day	15	5.0
Feeling tired or having little energy Not at all	124	41.3
Several days	110	36.7
More than half a day	33	11.0
Nearly every day	33	11.0
Feeling bad about herself		
Not at all	245	81.7
Several days	39	13.0
More than half a day	5	1.7
Nearly every day	11	3.7

Table [1]: Assessment of depressive symptoms cont'd

Trouble concentrating on things like school, work, reading or TV?		
Not at all	227	75.7
Several days	55	18.3
More than half a day	4	1.3
Nearly every day	14	4.7
Moving or speaking so slowly that other people could have noticed		
Not at all	234	78.0
Several days	30	10.0
More than half a day	7	2.3
Nearly every day	29	9.7
Thought of hurting yourself		
Not at all	287	95.7
Several days	8	2.7
More than half a day	3	1.0
Nearly every day	2	0.7

[1] .3 Prevalence of Postpartum depression

Out of 300 mothers who were screened, 82 (27%) of them were identified to be depressed by the PHQ-9 diagnostic tool for mental health.

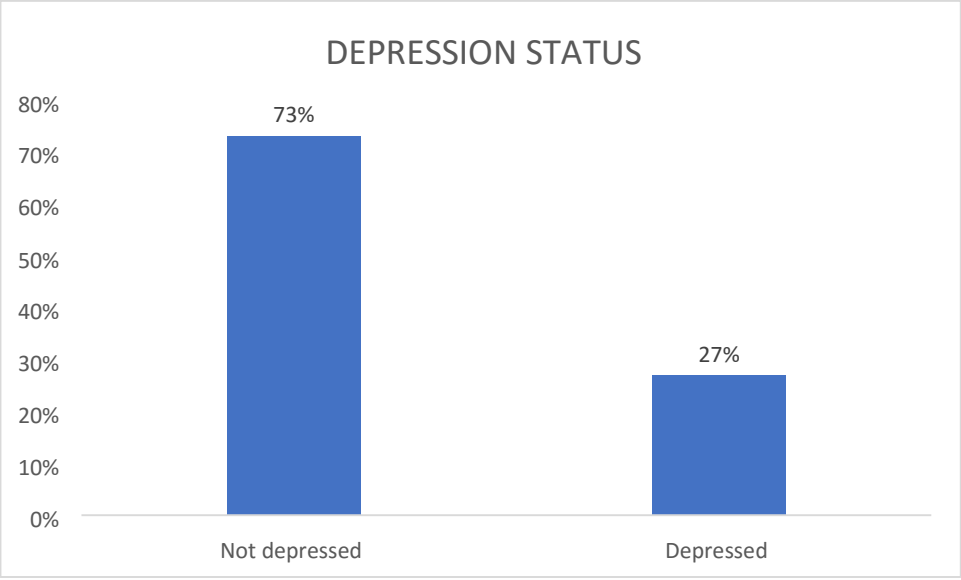

Figure 2: Prevalence of Postpartum Depression

Of the mothers who were found to be depressed, 66% (54/82) had mild depression; 22% (18/82) had moderate depression; 9% (7/82) had moderately severe depression and 4% (2/82) had severe depression.

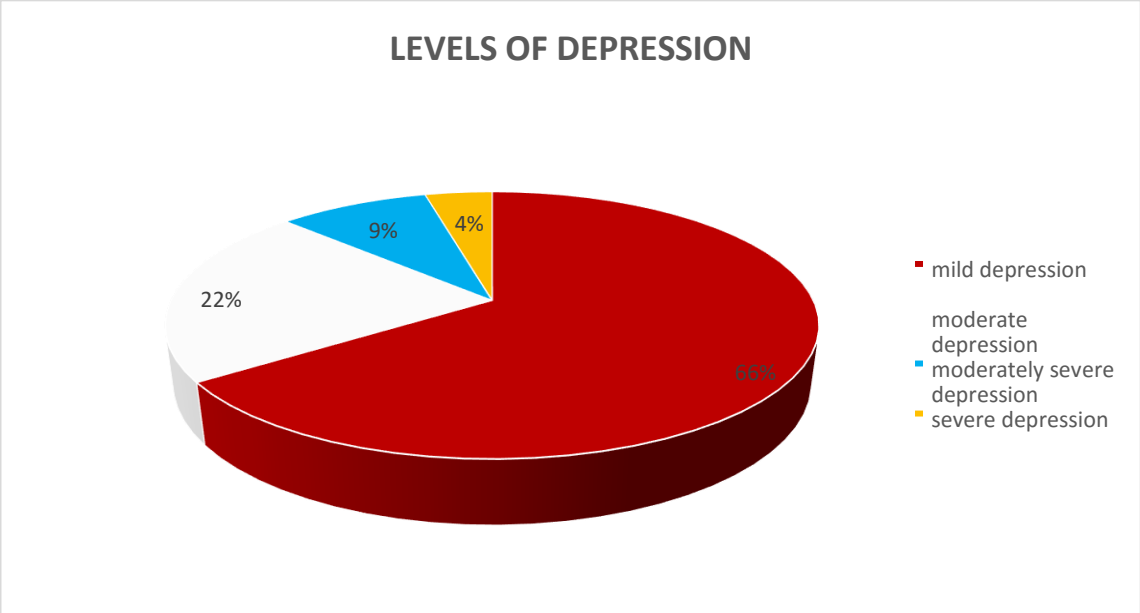

Figure 3: Distribution of levels of depression

4.4 Socio-demographic characteristics of depressed mothers

Of the respondents who were found to be depressed (n=82) (Table 4), most (59.8%) were between the ages of 25 to 34 years. Majority (86.6%) were married or cohabiting; 42.7% were professionals, occupied technical or managerial positions at their work places and 15.9% were involved in sales and services.

A significant proportion of mothers who were found to be depressed (69.5%) gave birth by vaginal delivery. Most (48.8%) of the depressed participants were living in a household size of 2 to 4 persons.

More than half of the mothers who were found to be depressed (51.2%) had male babies with postpartum duration between 2 to 3 months.

Table 5: Sociodemographic characteristics of depressed mothers

	n	(%)
Age Group (Years) 15 to 24	13	14.7
25 to 34	49	59.8
≥35	20	18.8
Total	82	100
Marital Status		
Single	11	13.4
Married/ Cohabiting	71	86.6
Total	82	100
Employment Status		
Professional/Technical/Managerial	35	42.7
Clerical	7	8.5
Sales and services	13	15.9
Skilled manual	17	24.4
Not earning/Student	10	12.2
Total	82	100
Type of delivery		
Vaginal Delivery	57	69.5
Caesarian Section	25	30.5
Total	82	100
Household size		
2 to 4	40	48.8
5 to 7	31	37.8
≥8	11	13.4
Total	82	100
Baby's Gender		
Female	40	48.8
Male	42	51.2
Total	82	100
Postpartum Duration (Months)		
≤ 1	14	13.3
2-3	22	31.6
4-6	18	23.9
>6	28	31.2
Total	82	100

4.4.1 Results of bivariate analysis showing relationship between mother's occupation and depression

A bivariate analysis using Pearson Chi-square analysis at an alpha level of 0.05 suggest significant relationship between mother's occupation and depression (X^2=9.18; p=0.05).

Table 6: Sociodemographic characteristics and postpartum depression

	Depression(n=82)	**No depression(n =218)**	**Chi square**	**p-Value**
Age Group (Years)			1.50	**0.47**
15 to 24	13	31		
25 to 34	49	146		
≥35	20	20		
Marital Status			0.08	**0.78**
Single	11	32		
Married/ Cohabiting	71	186		
Occupation			9.18	**0.05***
Professional/Technical/Managerial	35	77		
Clerical	7	13		
Sales and services	13	62		
Skilled manual	17	17		
Not earning/Student	10	12		
Type of delivery			0.26	**0.61**
Vaginal Delivery	57	158		
Caesarian Section	25	60		
Household size			1.05	**0.59**
2 to 4	40	115		
5 to 7	31	69		
≥8	11	8		
Baby's Gender			0.90	**0.34**

Female		40	93		
Male		42	125		
Postpartum (Months)	**Duration**			1.30	**0.73**
≤ 1		14	29		
2-3		22	69		
4-6		18	52		
>6		28	68		

4.4.2 Relationship between sociodemographic characteristics and depression status

Occupation and other variables known as predictors for depression in mothers were selected for logistic regression analysis. The logistic regression shows significant association between employment and depression status, with depression status as a dichotomous variable of depressed and not depressed. It further indicates that engaging in sales and services was protective of depression compared to occupying a professional/technical/ managerial position (OR=1.18, C.1=0.43-3.22). The result remains significant even after adjusting for cofounders (AOR= 0.46), that is, holding other factors constant.

Table 7: Relationship between sociodemographic characteristics and depression status

Variable	OR (95% CI)	AOR (95% CI)
Age Group (Years) 15 to 24	Ref	
25 to 34	0.80 (0.39-1.65)	
≥35	1.16(0.50-2.69)	
Marital Status		
Single	Ref	
Married/ Cohabiting	1.11(0.53-2.32)	
Occupation		
Professional/Technical/Managerial	Ref	Ref
Clerical	1.18(0.43-3.22)	1.17(0.42-3.24)
Sales and services	0.46(0.22-0.95)*	0.46(0.22-0.95)*
Skilled manual	0.70(0.36-1.39)	0.68(0.35-1.36)
Not earning/Student	1.83(0.72-4.64)	
Type of delivery		
Vaginal Delivery	Ref	
Caesarian Section	1.15(0.66-2.01)	
Household Size		
2-4	Ref	
5-7	1.30(0.74-2.25)	
≥8	0.93(0.43-2.01)	
Gender		
Male	Ref	
Female	1.28(0.77-2.13)	
Baby's Weight (kg)		
2-5	Ref	
5.1-8	1.12(0.63-2.01)	
8.1-13	1.36(0.21-5.19)	
Weight for Age Z-Score	Ref	

Z score > -2.0 S.D	
-3.0 < Z score < -2.0 S.D	0.66(0.25-1.75)
Z score < -3.0 S.D	0.52(0.18-1.56)

4.5 Assessment of Breastfeeding practices

Almost all the mothers breastfed their babies (98.3%) with 36.3% of them being able to breastfeed within the first 30 minutes of delivery. More than half of the mothers (62.7%) had support from a health worker in breastfeeding after delivery and 66.3% reported they liked the practice of breastfeeding. Of the 300 mothers included in this study, 43.0 % of them had ever fed their children formula and majority (93.7%) said they had received information on when to start breastfeeding. Breastfeeding practices have been summarized in table 8.

Table 8: Breastfeeding practices among mothers

Responses	Frequency (n)	Percentage (%)
Breast feeding		
Yes	295	98.3
No	5	1.7
First time breastfeeding		
Less than 30 minutes	109	36.3
Within 1 hour	58	19.3
1 to 2 hours	44	14.7
More than one day	89	29.7
Time to first breast milk		
One day or less	178	59.3
Two days	66	22.0
Three days	39	13.0
Four days or more	17	5.7
Health care staff helped mother to put the baby to the breast in order to breastfeed		
Yes	188	62.7
No	112	37.3
Formula feeding status		
Yes	129	43.0
No	171	57.0
Timing of initiation of formula feeding		
Never fed	171	57.0
One day or less	31	10.3
Two to six days	5	1.7
Seven to thirteen days	13	4.3
Fourteen to Twenty days	5	1.7
More than Twenty days	75	25.0
Healthcare worker provided information on when to start complementary food		
Yes	278	93.7
No	22	7.3
How would you say you felt about breastfeeding during the first week you were breastfeeding		

Disliked	10	3.3
Liked	199	66.3
Like very much	91	30.3
How would you say you feel about breastfeeding now that your baby is several weeks old?		
Disliked	10	3.3
Liked	199	66.3
Like very much	91	30.3

4.5.1 Bivariate analysis showing relationship between information on complementary feeding and depression

A bivariate analysis shows significant association between the information on when to start complementary food (X=6.14; p-Value=0.01) and depression status. There was no significant association between other variables on breast feeding practices and depression status. Table 9 shows results of Fisher's exact test used to confirm this outcome.

Table 9: Breastfeeding practices and postpartum depression

	Depression Status		
Responses	**Yes**	**No**	**p-Value**
Breast feeding			0.52
Yes	80	215	
No	2	3	
First time breastfeeding			0.61
Less than 30 minutes	76	33	
Within 1 hour		44	
1 to 2 hours	14	30	
More than one day	21	68	
Time of first flow of breast milk			0.57
One day or less	45	133	
Two days	19	47	
Three days	14	25	
Four days or more	4	13	
Health care staff helped mother to put the baby to the breast in order to breastfeed			0.36
Yes	48	140	
No	34	78	
Formula feeding status			
Yes	36	93	
No	46	125	
Timing of initiation of formula feeding			0.14
Never fed	46	125	
One day or less	4	27	
Two to six days	2	3	
Seven to thirteen days	5	8	
Fourteen to Twenty days	3	5	
More than Twenty days	22	53	
Healthcare Worker provided information on when to start complementary food			0.01*
Yes	71	207	
No	11	11	

4.5.2 Relationship between breastfeeding practices and depression status

The logistic regression shows that mothers who were unable to start breastfeeding immediately after birth were twice as likely to be depressed compared to those who initiated breastfeeding at birth (AOR=2.40; 95% CI=1.08-5.36). Also, mothers who were not informed by a health worker about when to start complementary food were three times more likely to be depressed (AOR=2.91; 95% CI= 1.21-7.02).

Interestingly, mothers who initiated formula feeding within one day after birth were less likely to be depressed (AOR=0.28; 95% CI=0.78-0.99), compared to mothers whose babies were never fed baby formula, holding other factors constant.

Table 10: Relationship between breastfeeding practices and postpartum depression

Variable	OR (95% CI)	AOR (95% CI)
Breast feeding		
Yes	Ref	Ref
No	1.80(0.29-10.90)	1.51(0.20-11.35)
First time breastfeeding		
Less than 30 minutes	Ref	Ref
Within 1 hour	0.73(0.35-1.51)	0.70(0.32-1.50)
1 to 2 hours	1.07(0.50-2.28)	1.07(0.48-2.42)
More than one day	0.71(0.37-1.34)	0.70(0.34-1.41)
Time of first flow of breast milk		
One day or less	Ref	Ref
Two days	1.20(0.64-2.25)	1.39(0.69-2.78)
Three days	1.65(0.79-3.45)	2.40(1.08-5.36)*
Four days or more	0.91(0.28-2.93)	1.13(0.32-4.05)
Hospital helped mother to put the baby to the breast in order to breastfeed		
Yes	Ref	Ref
No	0.95(0.57-1.59)	1.03(0.58-1.84)
Formula feeding status		
Yes	Ref	Ref
No	1.27(0.76-2.14)	0.74(0.39-1.41)
Health worker information on when to start complementary food		
Yes	Ref	Ref
No	2.91(1.21-7.02)*	3.05(1.26-7.37)*
Time of initiation of formula feeding		
Never fed	Ref	Ref
One day or less	0.40(0.13-1.21)	0.28(0.78-0.99)*
Two to six days	1.81(0.29-11.19)	2.01(0.32-12.45)
Seven to thirteen days	1.69(0.53-5.46)	1.39(0.413-4.70)
Fourteen to Twenty days	4.08(0.6 6-25.18)	3.66(0.57-23.60)
More than Twenty days	1.13(0.62-2.06)	1.23(0.67-2.26)

4.6 Infants' Nutritional status

Cumulatively 17% (52/300) of the children in this study were malnourished (Z score < -2.0 S.D)

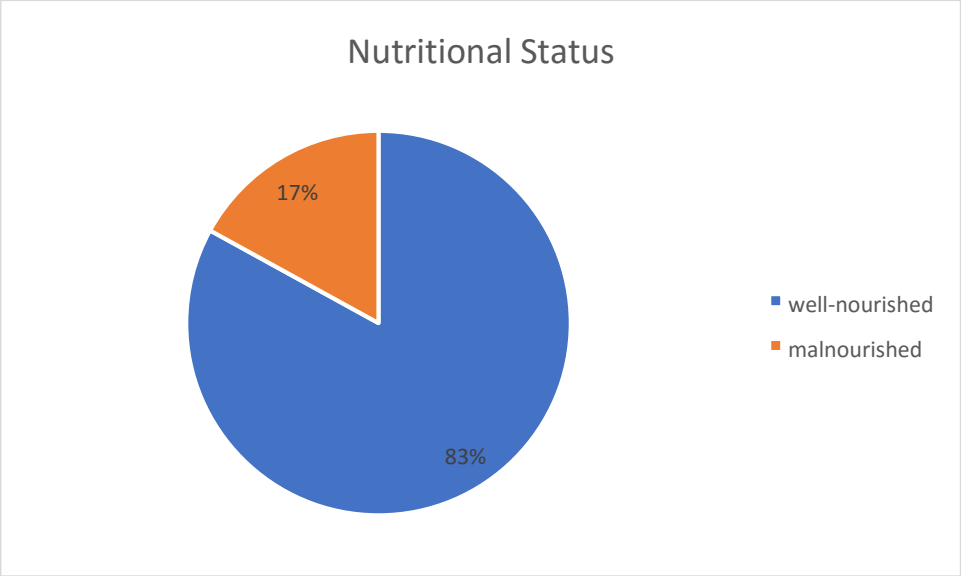

Figure 4: Infant's nutritional status

Approximately, 63.5% (33/52) of children in this study were moderately malnourished (weight-for-age -3.0< Z score < -2.0) and 36.5% (19/52) were severely malnourished (Z score < -3.0).

Table 11 below describes mothers' depression status and children's nutritional status. Interestingly, mothers who were not depressed (normal) had more (13.3%) malnourished children than mothers who were found to have symptoms of depression.

Table 11: Descriptive analysis of mother's depression status and nutritional status of children

Depression category	Well Nourished n(%)	Moderately Malnourished n(%)	Severely Malnourished n(%)	Total n
Normal (no depression)	178(59.3)	28(9.3)	12(4.0)	218
Mild	47(15.7)	4(1.3)	3(1.0)	54
Moderate	16(5.3)	0(0)	2(0.7)	18
Moderately severe	6(2.0)	1(0.3)	0(0)	7
Severe	1(0.3)	0(0)	2(0.7)	3
Total	248(82.6)	33(11.0)	19(6.3)	300

4.6.1 Descriptive analysis of nutritional status and depression status as dichotomous variables

Depression and Nutritional status were grouped into dichotomous variables for further analysis. Results show that 13.3% (n=40) of infants belonging to mothers without depression were malnourished. On the other hand, only 4% (n=12) of infants of depressed mothers were malnourished.

Table 12: Nutritional status and depression status as dichotomous variables

	Well Nourished N (%)	Malnourished N (%)
Normal	178(59.3)	40(13.3)
Depressed	70(23.3)	12(4.0)

4.6.2 Relationship between postpartum depression and nutritional status

The Pearson Chi-square analysis demonstrates no significant association between mothers with depression and malnourished infants (X^2=0.57; p-Value=0.45).

Table 13: Postpartum depression and Nutritional Status

	Well Nourished	Malnourished	X^2	p-Value
Normal	178	40	0.57	0.45
Depressed	70	12		

A logistic regression was performed to ascertain the effects of depression status, breastfeeding practices and sociodemographic characteristics on the nutritional status of children. Depression levels were analyzed individually initially and was further reorganized into two categories, merging minimum and minor depression into one group and moderately severe and major severe depression into another category to observe any difference in results. No association was found between breastfeeding practices and nutritional status. Variables including mother's age, marital status, household size, type of delivery, months of postpartum, gender of baby and depression status remained in the model after controlling for the other variables. The logistic regression model was statistically significant, χ^2 (8) = 26.604, $p < 0.05$. Only duration of postpartum was able to predict infant nutritional status. Increasing duration of postpartum was more likely (OR= 1.265, p value = 0.00) to be associated with a unit increase in the probability of a child being well nourished.

Table 14: Factors affecting infant nutritional status

Characteristics	Odds ratio	95% CI	p-value
Mother's age	**0.993**	**0.932 – 1.057**	**0.819**
Marital status			
Single	Reference		
Married	1.464	0.569-3.770	0.429
Household size	**1.015**	**0.913-1.129**	**0.780**
Type of delivery			
Vaginal delivery	Reference		
Caesarean delivery	0.936	0.465-1.885	0.853
Months postpartum	**1.265**	**1.126-1.421**	**0.00**
Gender of baby			
Boy	Reference		
Girl	1.189	0.618-2.285	0.604
Depression status			
Normal	Reference		
Mild + Moderate	0.632	0.320-1.247	0.186
Moderately severe + Severe	328467086.540	000	0.999

CHAPTER FIVE

DISCUSSION

5.1 Prevalence of postpartum depression

The results of this study show that postpartum depression is a significant problem in the two hospitals where this study was undertaken. Prevalence of postpartum depression was found to be 27% in this population. This observation is much higher than figures reported by Madeghe (2012) (13.5%), and (16.1%) by Guo et al. (2013). This study's results are however comparable to that reported by Buabeng (2015) who found a prevalence of 22.3 % in her study in Ghana. Wemakor and Iddrisu (2018) estimated a greater incidence of maternal depression in Northern Ghana (33.5%) than earlier recorded for a sub-population in Ghana (3.8%–27.8%). Chinawa et al. (2016) also found that postpartum depression prevalence in Enugu, Nigeria was 22.9%. Much higher figures have been recorded by Tomlinson et al. (2006) who found prevalence of postpartum depression to be 34.7% in a peri-urban settlement in Cape Town South Africa and Parsons et al. (2008) in Zambia also reported prevalence of 33%.

The difference could be methodological and geographical. Another possible reason may be due to the difference in screening instruments and timing at which studies were done. Some studies screened mothers at 2 weeks, 8 weeks, 3 months and some up to 12 months after delivery and produced mixed findings. Most studies also use the Edinburgh Postnatal Depression Scale (EPDS) whose general cut-offs is 13 and above. The PHQ-9 has rather lower cut-off points and measure depressive symptoms based on the last 14 days, compared to the EPDS that measures depression over the past 7 days. The PHQ-9 can therefore pick up more symptoms of depression.

Considering that the study was clinic-based, it may have missed out on those women who do not visit postnatal and child welfare clinics and also women who fail to seek medical attention for mental health conditions.

5.2 Sociodemographic characteristics and postpartum depression

Chinawa et al. (2016) found no association between postpartum depression and sociodemographic indices of mothers, including age, occupation and mode of delivery. This study however found an association between mother's employment status and depression ($p < 0.05$). Mothers who were professionals, managers and occupied technical positions at work were more likely to show signs of depression while mothers who worked in the sales and services category were less likely to exhibit signs of depression. Possible explanations for this could be that professional mothers may be worried about returning to work and how best to care for their babies while dealing with the stress of work. Mothers who are traders may be less worried because most of them are self-employed and may be able to continue sales even at home through courier services and on-line marketing. Studies should be carried out to further identify factors which influence women's risk of developing postpartum depression.

This study found no association between postpartum depression and mode of delivery. Carter et al. (2006) did a systematic review of five studies and noted no association between postpartum depression and mode of delivery. Other studies have however speculated that mothers who go through caesarean sections are more likely to be depressed since it is considered a stressful event and women in traditional settings are likely to feel guilty and shamed for not being able to give birth vaginally.

Heron et al. (2004) reported an increased incidence of depression at 3 and 12 months postpartum for mothers but results of this study found no association between postpartum duration and depression. This could be due to difference in scale of measurement and settings.

The results of the current study showed no association between mother's age and marital status and postpartum depression. This is consistent with a study done by Pope, Mazmanian, Bedard and Sharma (2016) who also found that marital status and maternal age were not significantly associated with postpartum depression.

A latest French research released in the Clinical Nursing Journal discovered that giving birth to male children could increase the risk of severe postpartum depression. The results of this study however have been described as premature. In Sub Saharan Africa where male babies are more preferred, women who continuously produce females are more likely to be depressed. More women amongst the depressed category in this study had male babies but a logistic regression analysis showed no significant association between gender of baby and depression.

5.3 Breastfeeding practices

Results showed that most mothers irrespective of their depression status were breastfeeding. This finding refutes the reports from Silva et al. (2017) who indicated that postpartum depression contributed to reduced rate of breastfeeding and Nishioka et al. (2011) who also documented that the onset of depressive symptoms seems to encourage breastfeeding to be discontinued at 5 months postpartum. However, Pope & Mazmanian (2016) also reported breastfeeding status only, might not be an outstanding risk factor for postpartum depression. Most mothers who reported having fed formula did so because they failed to produce

enough breastmilk the first few days after delivery. Most of the mothers who underwent caesarean sections also reported not being able to breastfeed immediately after delivery. This study found that women who were unable to produce breastmilk for the first three days postdelivery were at an increased risk of developing depression. This is consistent with studies suggesting that women with difficulty breastfeeding or with negative breastfeeding experiences may be at risk for postpartum depression. This is because mothers who intended breastfeeding are racked with guilt if they are unable to do so especially during early postpartum and they lose self-confidence in their ability to properly play the motherly role.

Hatton et al. (2014) stated that women with more depressive symptoms are less likely to breastfeed early in the postpartum period and this interaction may not be detected by sampling performed later in the postpartum period. Some women reported disliking breastfeeding in the early days after delivery. They were stressed earlier because of delay in milk production, sore nipples and inability to get babies to latch well on to the breasts. Nevertheless, they also remarked that things eased out later and they began to enjoy the practice of breastfeeding. This suggests that postpartum depression is greater during early postpartum than late as speculated by many studies therefore it is important that in subsequent studies the postpartum period interval is clearly defined in order to make more accurate assessments.

The current study suggests that getting information on when to start complementary feeding reduces the risk of depression. Mothers who are well informed and have received the necessary education and support on how to care and feed their children may probably be more confident in performing child care practices, reducing their risk of being depressed. However, the connection of maternal anxiety or depression with early implementation of solid food is uncertain and the topic begs for further research.

Data from this study also suggests that mothers whose babies are fed formula in early postpartum were less likely to be depressed compared to mothers who had never formulated. This is quite interesting to know because several studies have reported the reverse.

Mothers who were unable to initiate breastfeeding early settled for formula feeds and that may have reduced their anxiety and concerns about their babies' nourishment. Contrary to our findings, current studies suggest that breastfeeding mothers are less depressed and breastfeeding may decrease PPD. This goes to highlight the complexities between breastfeeding practices and postpartum depression.

Studies on breastfeeding and postpartum depression have produced conflicting results and are inconclusive. There is insufficient evidence of the association between breastfeeding and postpartum depression. The direction of the relationship between breastfeeding and higher or lower depression rates is particularly unclear. According to a 2018 systematic review by the Agency for Health Research and Quality (ARHQ), clarifying the connection between breastfeeding and postpartum depression is challenging because women with depression may find it difficult to initiate and maintain breastfeeding, and women with breastfeeding problems may develop depression. Further research especially in our setting will help explore and understand this area better.

5.4 Nutritional status of children

Findings on the association between postpartum depression and nutritional status in this study contradicts reports by Robert et al. (2008) and Stewart et al. (2010) who found an association between postpartum depression and nutritional status of children. Surkan et al. (2011) found an association between maternal depression and poor child growth in 2011 as well.

However, the findings of this study are consistent with studies in Ethiopia and South Africa, which also found no relationship between maternal depressive symptoms and child malnutrition (Parsons et al., 2012). A 2018 research by Wemakor and Iddrisu in the Tamale Metropolis of Ghana also showed that although maternal depression and child stunting are common in northern Ghana, there is a lack of proof of an association between maternal depression and child feeding methods or nutritional status in the study population. This is comparable to findings of the current study.

More mothers who were not depressed, according to the PHQ-9 diagnostic tool used in this study, had malnourished children in this study. This is possible because even though maternal mental health contributes to development of a child, other factors strongly affect the association between the two variables. The causes of malnutrition are multifaceted. Some mothers interviewed in this study reported that some of the children had ill health, were not feeding properly and were born prematurely. This could have accounted for the low weight-for-age Z scores recorded and not the mother's depression status exactly. This may imply that more malnourished children reported to the clinics and perhaps less depressed mothers showed up since mothers were visiting the facilities for the health of their babies and not necessarily their own health. Most of the mothers confirmed that they had support in caring for their babies at home. Child care assistance is known to reduce the impact of maternal mental illness on child growth indicators. Most adults in the family contribute to child care in most Ghanaian households, and this may have led to ensuring that the depression status of a mother does not affect her children's feeding or nutritional status. These findings should be investigated and confirmed by future studies with strong methodologies.

This study found an association between the period of postpartum and a child's nutritional status. It suggested that increasing postpartum period is likely to improve a child's nutritional status. The possible reason for this may be that women become more confident in breastfeeding and caring for their children. In addition, mothers who had faced earlier challenges with feeding such as sore nipples and low milk production may have these issues resolved; accounting for better feeding practices and consequently improved infant nutrition. The introduction of formula and solid foods over the period may account for improved nutritional outcomes as well.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

More than a quarter of women in this study showed depressive symptoms. This presents a concern that should be addressed in order to ensure the health and well-being of not only mothers, but their children and families as well.

Mother's occupation was significantly associated with their depression status. More studies to explore this association is needed to identify women who are at high risk of postpartum depression.

Women who were unable to initiate breastfeeding immediately were at a higher risk of being depressed. It is important that women, especially first-time mothers receive maximum support in breastfeeding to avoid negative breastfeeding experiences that will make them susceptible to depression.

Even though 17% of the children enrolled in this study were found to be malnourished, no significant association between child nutritional status and PPD was observed. Further research is needed to verify the influence of maternal depression on breastfeeding and other child feeding practices and nutritional status.

6.2 Recommendations

1. Screening women for depression should be prioritized among services provided during post-natal and child welfare clinics due to the subtle nature of the condition and the fact that most cases go undiagnosed and treated, threatening the health and wellbeing of mothers, children and their families.

2. There should be sensitization and awareness creation about the symptoms and characteristics of postpartum depression among women and their families at the community level. This will enable health workers and families to appropriately and immediately identify behaviors portrayed by mothers that indicate a need to seek help.
3. Women need to be supported in caring for their newborns to ease the burden and anxiety associated with child care. Husbands or partners of women, as well as other family members should provide assistance at home to ensure that these women are not overwhelmed with work.
4. There should be appropriate nutrition interventions for mothers whose children are malnourished and adequate nutrition education on the need for exclusive breastfeeding in the first 6 months of life followed by appropriate complementary feeding.
5. More research on postpartum depression should be conducted in different settings, using different study designs, such as longitudinal community-based study to investigate the prevalence of PPD and factors contributing to it, as well as its effect on various aspects of health.
6. Policy makers should allocate resources to minimize the occurrence of PPD among women of reproductive age as one way of reducing maternal and child mortality.

6.3 Limitations

1. Findings of this study cannot be generalized considering that participants were recruited from only two health facilities in Accra.
2. Causal inference could not be ascertained because exposure and disease were determined at the same point in time.

3. Time and convenience constraints did not allow the study to explore other child feeding practices and indicators of nutritional status.
4. Weights were recorded from weighing charts and could be subject to systematic errors.
5. The PHQ-9 questionnaire was interview assisted and answers were provided based on the psychological orientation of the participants. Response may have been under or over reported if they were given based on the moods of mothers on the day of interview.
6. The study being facility-based suggests that the study may have excluded other depressed mothers who do not come to the facility in comparison with a population-based study.

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APPENDICES

APPENDIX A: CONSENT FORM

Study Title: Postpartum depression, breastfeeding practices and nutritional status of children at two health facilities in Accra, Ghana

Investigator: Hikmatu Abdulai

Address: Department of Population, Family and Reproductive Health, School of Public Health

College of Health Sciences, University of Ghana

Information: To be read or translated to participant in a language they understand

Dear volunteer,

This consent form contains information about the research entitled "Postpartum depression, breastfeeding practices and nutritional status of children at two health facilities in Accra, Ghana." To be sure that you are informed about you and your child's 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 explanation of anything that you may not understand.

Why this study is planned

The main aim of this study is to examine the relationship between postpartum depression, breastfeeding practices and nutritional status of children.

This study will also determine your child's breastfeeding status, socio-demographic characteristics and anthropometric indices.

General information and your part in the study

For you to qualify to be part of this study you should be between 15 and 45 years of age with a baby and an attendant of the postnatal clinic at the health facility involved in this study. If you agree for your child to be part of this study, you will be required to provide answers to questions in the questionnaire form. These include information about you and your child, your child's food intake and his/her anthropometric measurements. Do not be embarrassed to provide the right answers. All the information you provide will be kept confidential as provided by law.

Possible 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.

Risk factors

There may be inconveniences due to the length of the interview, discussion of sensitive personal issues; assessing baby nutritional status which involves undressing a baby. We will try to be as brief as possible and put measures in place to allow the mother to undress her baby to reduce discomfort for the baby.

Withdrawal from study

I would like to stress that your participation in this study is strictly voluntary. Your decision will not affect the usual health care you and your child receive.

Confidentiality

All information gathered would be treated in strict confidentiality. We will protect information about your taking part in this research to the best of our ability. You will not be named in any reports. If you have any questions, please feel free to ask the researcher in charge.

Contacts

If you ever have any questions about the research study or study-related problems, you may contact: Hikmatu Abdulai (0277664112) or Mrs. Juliana Yartey Enos (0504229909)

For questions about the ethical aspects of this study or your right as a volunteer, you may contact:

The Ethics and Protocol Review Committee of Ghana Health Services.

The chairman
GHS-Ethical Review
Committee P.O Box MB 190
Accra-Ghana.

Contact Persons
Hannah Frimpong GHS-ERC Administrator Office: +233 302 681109 Mobile: 233 (0) 243235225 or 0507041223
Email: HannahFrimpong@ghsmail.org

Nana Abena Kwaa GHS-ERC Administrator Assistant
Mobile:0244712919 Email: nanatuesdaykad@yahoo.com

DECLARATION

I ……. wish to state that the procedures involved in this research has been fully explained to my understanding and agree to be part of this study.

…… Date…….

(Signature/thumbprint of parent or guardian)

APPENDIX B: QUESTIONNAIRE

Sociodemographic information

Date of interview….

Code…

Age at last birthday: ____ Marital

status:

1) single 2) Married 3) Divorced/separated 4) Widowed Occupation:

1) Health worker 2) Teacher 3) Artisan 4) Engineer/Architect

5) Administrator/Accountant 6) Trader 7) Others……

Residence: _____

Household size: _____ Type

of delivery:

1)Vaginal delivery 2) Caesarean section

Modified USAID Tool kit for monitoring and evaluating breastfeeding practices

1. Date of interview ……

2. Child's date of birth ……

3. Is your baby a boy or a girl? Boy..... Girl.....

Feeding Practices

1 Are you breastfeeding? Yes ..... No.....

2 About how long after your delivery did you breastfeed or try to breastfeed your baby for the very first time? Less than 30 min..... Within 1hour……
1hour to 2hours ……More than one day…… 3

How long did it take for your milk to come in?

- 1 Day or less.....
- 2 Days.....
- 3 Days..... More than 4 days.....

4 Has anyone in this hospital helped you to put the baby on the breast in order to breastfeed well? Yes…….no…….

5 How did you feed your baby after leaving the birth center? Whenever he or she

cried or seemed hungry..... on a schedule or routine.....

6.How would you say you felt about breastfeeding during the first week you were breastfeeding?

1. Liked
2. Like very much
3. Disliked
4. Dislike very much

7. How would you say you feel about breastfeeding now that your baby is several weeks old?
    1. Like
    2. Like very much
    3. Dislike
    4. Dislike very much

8. How old was your baby when he or she was first fed formula?

1day or less …… 7 to 13 days..... More than 20 days.....

2to 6 days ..... 14 to 20 days..... Never fed formula.....

9. Have they told you here in the hospital how old your baby should be when you begin to give tea, juice or other foods to the baby?

Yes…….no…….

10. What age did they tell you? Months (….) Weeks (….)

[The response is Correct, ONLY if the mothers respond at around six (6 months)

ANTHROPOMETRICS

Weight: ____g/kg Length: ___cm weight-for-length: _____ weight-for-age: _____

Patient Health Questionnaire (PHQ-9)

Name: _____

Date: _____

Instructions: How often have you been bothered by each of the following symptoms during the past two weeks?

For each symptom, put an "X" in the box beneath the answer that best describes how you have been feeling.

	Not at all	Several days	More th half day	the	Nearly everyday
Feeling down, depressed, irritable or hopeless?					
Little interest or pleasure in doing things?					
Trouble falling or staying asleep, or sleeping too much?					
Poor appetite, weight loss or overeating?					
Feeling tired or having little energy?					
Feeling bad about yourself — feeling that you are a failure, or that you have let yourself or your family down?					
Trouble concentrating on things like school, work, reading or TV?					
Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual?					
Thought that you would be better off dead or thought of hurting yourself in some way?					

Appendix C: Ethical Clearance

GHANA HEALTH SERVICE ETHICS REVIEW COMMITTEE

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

MyRef ghs rdd erc Admin amend app 19 187
Your Ref. No.

Research & Development Division
Ghana Health Service
P. O. Box MB 190
Accra
GPS Address: GA-050-3303
Tel: +233-0302-960628
Fax + 233-0302-685424
Email:ghserc@gmail.com
Email: info.research@ghsmail.org

16th September, 2019

Hikmatu Abdulai
University of Ghana
School of Public Health
Legon

RE: APPLICATION FOR AMENDMENT TO RESEARCH PROTOCOL Version 1 Dated: 10th September, 2019

Reference is made to your letter dated 10th September, 2019 on the above subject matter.

The Ghana Health Service Ethics Review Committee (GHS-ERC) has reviewed the documents submitted, and the rationale for the request for amendment. The GHS-ERC has given approval for the amendment to be implemented.

GHS-ERC Number	**GHSERC: 022/02/19**
Project Title	Postpartum depression, breastfeeding practices and nutritional status of children at two health facilities in Accra
Effective Date for Approval of Amendment	16th September, 2019
GHS-ERC Decision	**Amendment Version 1 dated 10/09/2019 Approved**

The approval covers the following only:

1. **Study Title:** Change of original study title from "The impact of postpartum depression on child care practices and nutritional status of children at Ridge and Police hospital" **to "Postpartum depression, breastfeeding practices and nutritional status of children at two health facilities in Accra"**

2. **Rewording of Research questions:**

a) **From** "What is the prevalence of postpartum depression among women who attend postnatal clinic at the Police and Ridge hospitals in Accra" **to** "What is the prevalence of postpartum depression among women who attend postnatal clinic at the Greater Accra Regional and Police hospitals"

b) **From** "What are the infant feeding practices of these women?" **to** "What are the breastfeeding practices of the mothers"

c) **From** " How does postpartum depression impact on the relationship between mother and baby" **to** "What is the nutritional status of infants born to mothers with and without postpartum depression?"

d) **From** "What is the nutritional status of infants born to mothers with postpartum depression" **to** "How does postpartum depression influence breastfeeding practices and nutritional status of children?"

3. **Rewording of Objectives:**
   a) **From** "To determine the prevalence of postpartum depression among women between 15 - 45 years with infants who attend Ridge and Police hospital for postnatal care" **to** "To describe the sociodemographic characteristics of women with postpartum depression"
   b) **From** "To assess infant feeding practices among women with postpartum depression based on WHO Infant and child feeding guidelines" **to** " To determine the prevalence of postpartum depression among mothers aged 15-45 years who attend the GAR and Police hospitals with and without postpartum depression"
   c) **From** "To assess infants' nutritional status by using anthropometric indices and comparing to WHO Growth charts" **to** "To assess breastfeeding practices among mothers attending the GAR and Police hospitals with and without postpartum depression"
   d) **From** "To relate sociodemographic indicies to postpartum depression, mother-infant bonding, infant feeding practices and nutritional status of their infants" **to** " To assess the nutritional status of infants born to mothers attending the GAR and Police hospitals for postnatal care, with and without postpartum depression"

4. **Study Site:** Change of hospital name from "Ridge hospital" **to** "Greater Accra Regional (GAR) hospital".

5. **New Conceptual framework:** provision of more information on variables under each sub topic.

6. **Subject Omission:** "Mother-infant bond/relationship between mother and child / how does postpartum depression impact on the relationship between mother and child" has been omitted.

The following applies:

- Submission of yearly progress report of the study to the Ethics Review Committee (ERC).
- Renewal of ethical approval if the study lasts for more than 12 months.
- Reporting of all serious adverse events related to this study to the ERC within three days verbally and seven days in writing.
- Submission of a final report **after completion** of the study.
- Informing ERC if study is discontinued and reasons why.
- Informing the ERC and your sponsor (where applicable) before any publication of the research findings.

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

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

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

SIGNED.....

Dr. Cynthia Bannerman
(GHS-ERC Chairperson)

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

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