KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

KUMASI, GHANA

COLLEGE OF HEALTH SCIENCES

SCHOOL OF PUBLIC HEALTH

DEPARTMENT OF POPULATION, FAMILY AND REPRODUCTIVE HEALTH

RISK FACTORS INFLUENCING POSTPARTUM DEPRESION AMONG WOMEN ATTENDING POSTNATAL CLINIC AT KOMFO ANOKYE TEACHING HOSPITAL, KUMASI, GHANA.

BY

AKUA AFRIYIE BUABENG (BSC. HUMAN BIOLOGY, MBCHB)

APRIL 2015

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

KUMASI, GHANA

RISK FACTORS INFLUENCING POSTPARTUM DEPRESION AMONG WOMEN ATTENDING POSTNATAL CLINIC AT KOMFO ANOKYE TEACHING HOSPITAL, KUMASI, GHANA.

BY

AKUA AFRIYIE BUABENG (BSC. HUMAN BIOLOGY, MBCHB)

A THESIS SUBMITTED TO THE DEPARTMENT OF POPULATION, FAMILY & REPRODUCTIVE HEALTH

COLLEGE OF HEALTH SCIENCES, SCHOOL OF PUBLIC HEALTH, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PUBLIC HEALTH IN POPULATION, FAMILY AND REPRODUCTIVE HEALTH

APRIL 2015

DECLARATION

I hereby declare that this submission is my own work towards the award of the MPH degree and that to the best of my knowledge, it contains no material previously published by another person, nor material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text.

……

STUDENT NAME AND ID

SIGNATURE

DATE

CERTIFIED BY:

SUPERVISOR(S) NAME

SIGNATURE

DATE

HEAD OF DEPARTMENT'S NAME

SIGNATURE

DATE

ABSTRACT

The postpartum as well as pregnancy periods are associated with profound physical and emotional changes, which are also associated with mental disorders and symptoms ranging from mild to psychotic. Postpartum depression is a major public health concern known to affect an estimated 13% of pregnant women. This study was conducted to assess the extent of postpartum depression as well as factors influencing postpartum depression among mothers in the Kumasi metropolis.

The cross-sectional study, conducted in the Kumasi metropolis and involved 440 randomly selected mothers who have delivered and are within the first 6 weeks postpartum. A simple random sampling technique was employed and data were gathered with the use of questionnaires. The Edinburgh scale of postnatal depression was used to measure presence of symptoms of depressive illness. Data were analysed using STATA 11. A multivariable regression model was fitted to assess factors influencing postpartum depression among. Statistical significance was tested at $p < 0.05$.

22.3% of respondents scored above 10 on the Edinburgh postnatal depression scale, suggestive of PPD**.** About 41% however had never heard of PPD. The most cited source of information among those who had heard was family and friends. Mood changes before, during and after pregnancy had significant influence on PPD. Women who had never experienced mood swings during pregnancy also had odds of suffering PPD that was lesser than their counterparts in the same category (OR=0.41; 95% CI=0.22 - 0.75). The known predictors of PPD in this study were age, mood changes, relationship with baby's father and partner's support.

Women who suffered mood swings before and during pregnancy had increased tendencies of suggestive PPD. Special screening programmes for early detection of histories of PPD and mood swings before and during pregnancies should be instituted. Partners and husbands should also be encouraged to support expectant mothers throughout the entire pregnancy and postpartum periods.

DEDICATION

I dedicate this final work to God Almighty, for seeing me though from the beginning of this program until this point, and to my entire family and friends.

A special gratitude to my husband, John Mensah Bafana, a companion who has never left my side and is very special to me. I am grateful to God for my mum Juliana Appiah whose words of encouragement and quest for success has been my motivation throughout this journey. My children, Enam, Eyram and Sedem, you have been my inspiration, and I thank you guys for the numerous hours you kept me awake.

I also dedicate this dissertation to my wonderful friends I met during this programme, you were my cheerleaders. Finally I appreciate the support from my boss Prof. Yaw Osei throughout the process. God bless you all.

ACKNOWLEDGEMENTS

I wish to acknowledge my supervisor, Dr. Roderick Larsen-Reindorf, of School of Medical Sciences and School of Public Health, Kwame Nkrumah University of Science, and Technology, whose constructive criticisms and priceless proposals dictated the final form of this work. I genuinely appreciate his immense contributions.

My sincerest gratitude goes to the people who participated in the data collection for their cooperation in this research, and the health facilities that allowed data to be collected at their institutions.

To Mr. Daniel Boateng who guided me in the analysis of my data, my deepest appreciation.

Finally I am grateful to my family, colleagues and staff of the Department of Community Health for their support and encouragement during the MPH course.

TABLE OF CONTENTS

LIST OF ACRONYMS AND ABBREVIATIONS

ANC- ANTENATAL CARE

APA- AMERICAN PSYCHIATRIC ASSOCIATION

CDC- CENTRE FOR DISEASE CONTROL

CHPRE- COMMITTEE ON HUMAN RESEARCH, PUBLICATION AND ETHICS

C/S-CAESARIAN SECTION

DEENT-DENTAL, EYE, EAR, NOSE, AND THROAT

DSM-DIAGNOSTIC STATISTICAL MANUAL-IV

DYAS-DYADIC ADJUSTMENT SCALE

EPDS-EDINBURGH POSTNATAL DEPRESSION SCALE

GHS-GHANA HEALTH SERVICE

GSS- GHANA STATISTICAL SERVICE

ICD-10- INTERNATIONAL CLASSIFICATION OF DISEASE-10

JHS- JUNIOR HIGH SCHOOL

KATH- KOMFO ANOKYE TEACHING HOSPITAL

KMA-KUMASI METROPOLITANT ASSEMBLY

KNUST- KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

NICU-NEONATAL INTENSIVE CARE UNIT

OR-ODDS RATIO

PPD-POSTPARTUM DEPRESSION

SVD-SPONTANEOUS VAGINAL DELIVERY

WHO-WORLD HEALTH ORGANISATION

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

CHAPTER 1
INTRODUCTION

1.1 Background

During the last decades, there has been a great interest in psychiatric illness associated with childbirth. Pregnancy and postpartum periods are associated with profound physical and emotional changes. Pregnancy and the postpartum are also associated with mental disorders and symptoms ranging from mild to psychotic (Halbreich et al 2006, Geller; 2004).

The postnatal period is well established as an increased time of risk for the development of serious mood disorders.

The DSM IV-TR (APA; 2000) shows that postpartum disorders are distinguished by their timing- within the first 4 weeks postpartum and not by their phenomena. This ranges from the transient experience of "postpartum blue" to severe psychosis.

Traditionally, there are three common forms of postpartum affective illness: the blues (baby blues, maternity blues), postpartum (or postnatal) depression, and puerperal (postpartum or postnatal) psychosis each of which differs in its prevalence, clinical presentation, and management.

"Maternity blues" occurs for a short period of few hours to days, 4-7 days post-delivery. The symptoms include irritability, restlessness to mild confusion with or without hypochondriasis. (Halbreich et al 2006). No treatment is required other than assurance.

Postpartum blues is the most common observed puerperal mood disturbance, with estimates of prevalence ranging from 30-75% (O'Hara et al., 1984). The symptoms begin within a few days of delivery, usually on day 3 or 4, and persist for hours up to several days. The symptoms

include mood lability, irritability, tearfulness, generalized anxiety, and sleep and appetite disturbance. Postnatal blues are by definition time-limited and mild and do not require treatment other than reassurance, the symptoms remit within days (Kennerly & Gath, 1989; Pitt, 1973).

The propensity to develop blues is unrelated to psychiatric history, environmental stressors, cultural context, breastfeeding, or parity (Hapgood et al., 1988). However, those factors may influence whether the blues lead to major depression (Miller, 2002). Up to 20% of women with blues will go on to develop major depression in the first year postpartum (Campbell et al., 1992; O'Hara et al., 1991b).

Postpartum depression occurs later and is prolonged usually within 4-6weeks after delivery (Patel et al.; 2002). There is also evidence that PPD may develop as early as the first 2 weeks postpartum (Bloch et al, 2005). It is a serious condition (APA, 2000) and the symptoms include low mood, anhedonia, forgetfulness, anxiety, irritability and sleep disturbance (Stuchbery et al.; 1998). Treatment is required.

Postpartum psychosis is the gravest and uncommon form of postnatal affective illness, with rates of 1 – 2 episodes per 1000 deliveries (Kendell et al., 1987). The clinical onset is rapid, with symptoms presenting as early as the first 48 to 72 hours postpartum, and the majority of episodes developing within the first 2 weeks after delivery. The presenting symptoms are typically depressed or elated mood (which can fluctuate rapidly), disorganized behaviour, mood lability, and delusions and hallucinations (Brockington et al., 1981). Follow-up studies have shown that the majority of women with puerperal psychosis meet criteria for bipolar disorder (Brockington et al., 1981; Dean &Kendell, 1981; Kendell et al., 1987; Klompenhouwer & van Hulst, 1991; Kumar et al., 1995; Meltzer & Kumar, 1985; Okano et al., 1998; Robling et al., 2000; Schopf et al., 1984).

Hospitalization is required. It is characterized by confusion, delirium, delusions, hallucinations, and insomnia (Rahim and Al-Sabiae, 1991).

Table 1: The different types of postpartum disorders

Disorder	Prevalence	Onset	Duration	Treatment
Postpartum blues	30-75%	Day 3 or4	Hours to days	No treatment other than reassurance
Postpartum depression	10-15%	Within 12 months	Weeks- months	Treatment usually required
Pueperal psychosis	0.1-0.2%	Within 2 weeks	Weeks -months	Hospitalization usually required

Postpartum non-psychotic depression is the most common complication of childbearing affecting approximately 10-15% of women and as such represents a considerable public health problem affecting women and their families (Warner et al., 1996). The effects of postnatal depression on the mother, her marital relationship, and her children make it an important condition to diagnose, treat, and prevent (Robinson & Stewart, 2001).

Untreated postpartum depression can have adverse long-term effects. For the mother, the episode can be the precursor of chronic recurrent depression. For her children, a mother's ongoing depression can contribute to emotional, behavioral, cognitive, and interpersonal problems in later life (Jacobsen, 1999). If postpartum depression is to be prevented by clinical or public health intervention, its risk factors need to be reliably identified. However, numerous studies have produced inconsistent results (Appleby et al.1994; Cooper et al., 1988; Hannah et al., 1992; Warner et al., 1996).

1.2 Problem Statement

Depressive disorders rank among the leading causes of disability worldwide (World Health Organization, 2010). According to the WHO, depression is the second leading contributor to global burden of disease for men and women between the ages of 15 and 44 years (World Health Organization; 2010).

Postpartum depression, most often resembles other forms of major depression. It affects 10–20% of all mothers (Josefsson et al 2002).

Postpartum depression may have an adverse effect on the mother's social adjustment after birth, the marital relationship, as well as the mother-infant interaction. A mother's depression in the early years of an infant's life may affect the child's psychological development causing very significant intellectual deficits (Josefsson et al 2002).

Postpartum depression is a serious mood disorder that may carry life- long consequences for a woman and her family (Corwin et al 2010). Despite growing recognition of postpartum depression (PPD) as a global childbirth-related problem over the past two decades (Affonso, De, Horowitz, & Mayberry, 2000), the importance of detecting and treating postpartum depression has until recently been largely overlooked in practice (Gaynes et al., 2005).

Evidence of the impact of depression on mother-infant relationship has been increasingly demonstrated in recent years (WHO, 2010). It has been shown that postpartum depression can interfere with healthy child development and mother-child bonding during the first few months of life (Sarah Dilley). Extreme cases of postpartum depression can lead to suicide or even postpartum psychosis and infanticide. Childbirth followed by postpartum depression can also lead to the start of a chronic problem with depression in a woman's life, and this condition

occurs in approximately 10 to 20% of all mothers. There is also a 30-45% risk of relapse in subsequent pregnancies (Josefsson et al, 2001).

A study of women in US Armed Forces revealed that having PPD was a strong predictor of suicide during postpartum period and this was associated with 42.2 times the odds to be diagnosed with suicide compared to those without PPD (Do et al, 2013).

In Ghana, access to mental health is poor and obstetric care in the country does not cater for mother's mental care during pregnancy and the postpartum period. Indeed, during the first few days after delivery, mothers can present with the symptoms of postpartum blues: fatigue, anxiety, disordered sleeping and a changing mood. Postpartum depression is characterised by a changing mood, anxiety. It is important to be aware of the risk factors for postpartum depression because of the negative effect this illness can have on both the new mother and her child, and therefore put in place optimal intervention to improve the mental health of women during pregnancy and their babies'.

1.3 Rationale for Study

Pregnancy and the postpartum period are associated with profound and emotional changes. They are also associated with the mental symptoms and disorders ranging in severity from very mild to psychotic (Brockington, 2004; Geller, 2004)

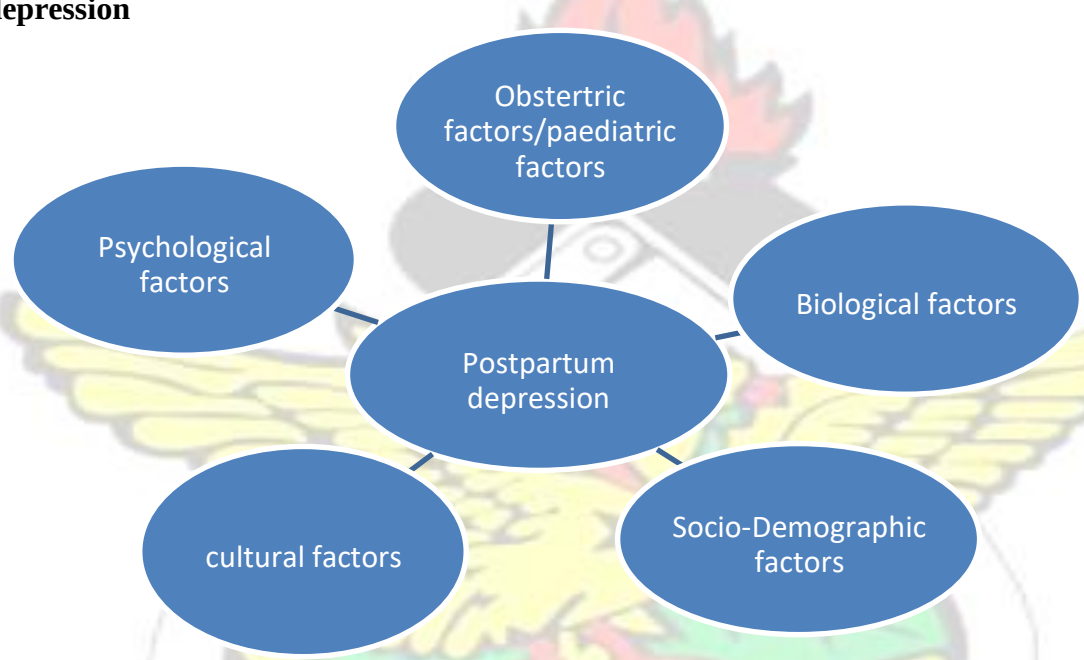
Postpartum depression is often undetected and under diagnosed and women at risk are rarely recognized during pregnancy or at delivery (Nielsen Forman, et al., 2000). This is especially common in developing countries where mental health is generally ignored (Reichenheim and Harpham, 1991).

The high rate of postpartum depression in young mothers represents a compounded public health hazard and therefore the need for further research in order to detect the risk factors and help physicians detect condition early for treatment and prevention.

The Effect of PPD

Knowledge of factors that predispose women to postpartum depression (PPD) may help to identify those who are at higher risk and this can help them benefit from early professional help. Early detection and identification of risk factors of postpartum depression can lead to preventive measures and decrease in long-term negative effects on children as well as their mothers.

Figure 1.1: Conceptual Framework showing risk factors of developing postpartum depression



(Source: Author's construct 2013)

From the above, it is observed that postpartum depression among women are influenced by a number of factors that may include, biological, obstetric or paediatric, psychological, cultural and socio-demographic factors.

Alternate Hypothesis (HA): (i) Partner support influence women developing postpartum Depression.

(ii) Pregnancy outcome influence the risk of developing postpartum depression

Null Hypothesis (H_O): (i) Partner support does not influence women developing postpartum depression.

(ii) Pregnancy outcome does not influence the risk of developing postpartum depression.

1.4 Research Questions

What are the risk factors that cause postpartum depression?

How does paternal support influence postpartum depression?

What is the effect of maternal mood changes before or during pregnancy on postpartum depression?

1.5 General Objective

To access the risk factors for developing postpartum depression.

1.6 Specific Objectives

1. To find out the knowledge of women on postpartum depression.
2. To assess the risk of maternal mood changes on postpartum depression.
3. To find out the effect of partner's support on postpartum depression.

1.7 Background of the Study Area

The Ashanti Region is the second most urbanized region after Greater Accra. As the third largest region it occupies 24,389 square kilometres of Ghana's land surface. According to the 2010 census it is the most populous region with a population of 4,780,380 (Ghana Statistical Services, 2011).

The Kumasi Metropolitan Assembly (KMA), the most populated of the 27 districts in the Ashanti region will be the site of the study. With an estimated 2012 population of 2, 14644 and an annual growth rate of 2.7%, it forms 42.6% of the region's population. Politically, there are 10 sub- metropolitan areas in the KMA. These are Manhyia, Tafo, Suame, Asokwa,

Oforikrom, Asawase, Bantama, Kwadaso, Nhyiaeso and Subin. The proportions of the population in the metropolis in terms of religion are; Christianity-78.8%, Islam- 16.0%, Traditional- 0.3% and others- 0.7%. Apart from these four groupings, there is another group termed "No Religion" which constitutes about 4.2% but this could vary (Ghana statistical Services, 2011 and KMA, 2006). Although the Kumasi Metropolis is dominated by people of Asante's ethnicity, almost all the other ethnic groups in Ghana are represented. This makes it an ideal area for the purposes of this research.

There are 209 communities in Kumasi. The health needs of these communities are catered for by five (5) sub- metropolitan health areas which are: Asokwa, Bantama, Manhyia-South, Manhyia-North and Subin.

Table 1.1 Population Distribution per Sub-Metro Health Areas

Sub-Metropolitan Area	% of the Total Estimated pop	No. of Communities
Asokwa	30.3	50
Bantama	24.2	50
Manhyia South	18.6	61
Manhyia North	16.0	25
Subin	10.9	23
Metro	100	209

The Metropolitan health services are organized around many hospitals, clinics and maternity homes. There is 1 Teaching Hospital, 5 District Hospitals (with one designated as the Regional

Hospital), 4 Quasi-Government, 7 Health centres, 3 Christian Health Association of Ghana (CHAG) institutions, 13 industrial clinics, 113 private hospitals/clinics, 55 maternity homes, 15 private laboratories, 672 pharmacies and 510 chemical shops.

This study was conducted at Komfo Anokye Teaching Hospital (KATH). KATH is located in Bantama Metropolis. It is the only teaching hospital in the Metropolis, and the Ashanti Region. As such, referrals are received from the three Northern regions namely Upper, East, Upper West and Northern region and Brong Ahafo, Central and parts of Volta Region.

In the 1940's, there was a hospital located on the hill overlooking Bantama Township designated Africans and Europeans Hospital. As their names implied, the African side treated Africans and Europeans were treated at the European side. However on some rear occasions, high-ranking African Government officials were given treatment in the European section.

By 1955, there was the need to construct a new hospital to cater for the fast increasing population in Kumasi hence the European hospital was therefore transferred to the Kwadaso Military Quarters to make way for the new project. In 1954-1955, the new hospital was completed and named the Kumasi Central Hospital. With the establishment of the school of Medical Sciences, it became the hospital for teaching medical students and the name was changed in 1975 to Komfo Anokye Teaching Hospital (KATH) in honour and memory of the powerful and legendary fetish priest Komfo Anokye.

The hospital works under twelve (12) directorates which include Obstetrics and Gynaecology, Child Health, Polyclinic, Anaesthesia and Intensive Care, Dental, Eye, Ear Nose and Throat (DEENT), Medicine, Diagnostics, Oncology and Accident and Emergency, Domestics , Pharmacy and Technical Services ,. The hospital has more than 3000 staffs which include Medical Practitioners, Nurses, Pharmacists, Anaesthetists, Laboratory Technicians,

Radiologist, Accounts Officer, Secretaries, Administrators, Health Care Assistants, Orderlies, etc.

The research was conducted at the Obstetrics and Gyaenacology directorate. The Obstetrics & Gynaecology directorate has six wards. Three of the wards are designated as labour wards and they are general, official, and high-risk wards. The department runs antenatal and postnatal services. It also has a family planning unit.

CHAPTER 2
LITERATURE REVIEW

2.1 Postpartum Depression

Postpartum depression (PPD) is considered a debilitating mental disorder with prevalence rates of 0.5–60.8% around the world depending on the used definitions (Halbreich and Karkun, 2006). The definition for PPD are provided by two existing diagnostic systems; the Diagnostic and Statistical Manual of Mental Disorders (DSM), fourth edition (APA, 2000), and the International Classification of Diseases (ICD), tenth edition (WHO, 2007). The DSM IV-TR identifies PPD as a major depressive disorder with postpartum onset and indicates that the depressive symptoms begin within the first 4 weeks of postpartum. According to the ICD-10, PPD is a mild mental and behavioral disorder beginning within the first 6 weeks of delivery.

Clinical manifestations of PPD may include a depressed mood, markedly diminished pleasure in almost all activities, significant weight loss or weight gain, psychomotor agitation or retardation, insomnia or hyper insomnia, loss of energy, feelings of worthlessness and guilt, low self-esteem and self-confidence, difficulty in concentration, and suicidal ideation (APA, 2000;WHO, 2007).

2.2 Postpartum Period & Increased Risk of Severe Psychiatric Illness

The association between the postpartum period and mood disturbances has been noted since the time of Hippocrates (Miller, 2002). Women are at increased risk of developing severe psychiatric illness during the puerperal. Studies have shown that a woman has a greatly increased risk of being admitted to a psychiatric hospital within the first month of the postpartum period than at any other time in her life (Kendell et al., 1987; Paffenbarger, 1982). The postpartum period is a high-risk period for the occurrence of anxious and depressive episodes.

Up to 12.5% of all psychiatric hospital, admissions of women occur during the postpartum period (Duffy, 1983). However, recent evidence from epidemiological and clinical studies suggests that mood disturbances following childbirth are not significantly different from affective illnesses that occur in women at other times. Population based studies in the USA and the United Kingdom, for instance, have revealed similar rates of less severe depressive illness in puerperal and non-puerperal cohorts (Cox et al.,1993; Kumar & Robson, 1984; O'Hara et al.,1991a). In addition, the clinical presentation of depression occurring in the pueperium is similar to major depression occurring at other times, with symptoms of depressed mood, anhedonia and low energy and suicidal ideation.

Postpartum depression is also characterized by a depressed mood most of the day, nearly every day. It can also be accompanied with symptoms such as disinterest in the new infant, negative feelings towards the new infant, decreased interest in and pleasure from activities. To be diagnosed with postpartum depression, a woman must suffer from these symptoms for at least two weeks within 4-12 weeks of giving birth (Howell, 2009).

The first symptoms usually appear between the fourth and sixth week postpartum. However, postpartum depression can start from the moment of birth, or may result from depression evolving continuously before or during pregnancy.

Postpartum depression develops in 10-15% of the more than 4 million women who deliver each year in United States of America. This accounts for more than 600,000 women annually (Centre for Disease Control; 2008).

In Hebei Province of Northern China, Rinat Armony-Sivan carried out a study which revealed the proportion of women with PPD at 6 weeks was 20.3%. An epidemiological survey on 342 Chinese women at 6 to 8 weeks postpartum reported a prevalence of 15.5%.

A study conducted on a border city in Iran showed the prevalence of PPD to be 34.8% (Taherifard et al, 2013).

A cohort study conducted by Youn and Jeong in 2013 in Korea reported the prevalence of PPD2weeks and 6 weeks after delivery are 36.3% and 36.7%respectively.

Postnatal depression is a key concept for mother-infant mental health. It is therefore important to identify the risk factors. Across Africa the prevalence of postpartum depression is a major health problem which affects mothers, their infants and their families (Kalayo et al 2012).

Postpartum depression is a serious health concern for the estimated 13% of pregnant women who are affected by it (Horowitz et al, 2011). Postpartum depression is more severe than the typical "baby blues" that many women experience for the first week after giving birth, but is less severe than postpartum psychosis, a serious psychological illness which occurs in only 0.1-
0.2 % of births (Howell, 2009).

Screening for postnatal mood disturbance can be difficult given the number of somatic symptoms typically associated with having a new baby that are also symptoms of major depression for example, sleep and appetite disturbance, diminished libido, and low energy (Nonacs & Cohen, 1998). Whilst very severe postnatal depressions are easily detected, the subtle presentations of depressive illness can be easily dismissed as normal or natural consequences of childbirth.

The literature on postpartum depression is somewhat problematic, with conflicting opinions about its uniqueness as a disorder, its etiology, and its risk factors (Robertson et al; 2004).

Up to 80% of women with PPD do not report it and are not diagnosed by their physicians (Kelly et al., 2001; Yonker et al., 2001; Whitton et al., 1996).

2.3 Risk Factors for Post Partum Depression

Compelling evidence from recent studies of puerperal psychosis suggest that the major risk factor for developing PPD is genetic (Stewart et al, 2003). Jones & Craddock (2001) found that the rate of puerperal psychosis after deliveries in women with bipolar disorder was 260 / 1000 deliveries, and the rates of puerperal psychosis for women with bipolar disorder who also had a family history of puerperal psychosis was 570 / 1000 deliveries. This is higher than the risk in the general population of 1-2 / 1000 deliveries.

The risk factors for PPD have been broadly been divided into five major groups: Biological, Psychological, Obstetric/Paediatric, Socio-Demographic and Cultural factors (Klainin et al.; 2009).

Beck (2001) conducted a meta-analysis to determine magnitude of the relationship between postpartum depression and its risk factors on 84 existing studies. The study identified 13 risk factors; 10 were of moderate effects and 3 of small effects. The moderate factors of postpartum depression included low self-esteem, history of previous PPD, poor marital relationship, and maternity blues. The small effect factors are low socioeconomic status and planned/ unplanned pregnancy.

2.3.1 Culture

In 2003, Rahman et al reported that surveys and epidemiological studies showed increasingly high rates of postpartum depression in diverse cultures across the world.

With a few notable exceptions, most of the relevant research into psychiatric disorders associated with childbearing has been confined to developed countries, mainly in Western Europe and North America (Kumar, 1994).

According to a study conducted by Kim and Buist in 2005, the women in the Asian cultures manifest their emotional problems through somatic symptoms while their Western counterparts express their depressive symptoms overtly.

The physiology of human pregnancy and childbirth is similar all over the world, but the event is conceptualized and structured, and hence, experienced by the mother and by her social group very differently (Kumar, 1994). It has been purported that postpartum depression simply does not exist within certain cultures. Stern and Kruckman (1983) wrote that a review of the anthropological literature revealed surprisingly little evidence of the phenomenon identified in Western diagnoses as postnatal depression.

Comparing postpartum depression across cultures on large scale studies has been found to be similar to those reported in Western Europe and North America. A Ugandan study by Cox in 1993 showed that African mothers become depressed at a similar rate to those in developed nations. Dennerstein et al. (1989) and Thorpe et al. (1992) also found similar rates of depression after childbirth in comparisons of Australian, Dutch and Italian mothers and of Greek and English mothers, respectively. Jadresic et al. (1992) reportedsimilar prevalence rates in Chilean women, and Shah et al. (1971) found that a quarter of women attending a well-baby clinic in India were diagnosed as suffering from “neurotic disorders with a post-partum onset”(likely to be depressive disorders).

In some cultures, traditional rituals and supportive mechanism dictated to the women who are believed to protect them from the crippling symptoms of depression (Halbreich and Karkun, 2006).

Culture as a risk factor however may possibly be limited by the use of existing assessment tools within different ethnic groups. For instance, Watson & Evans (1986) found out that some questions like, 'have you ever felt that life is not worth living' were perceived meaningless by Bengal mothers when they compared three different ethnic groups of childbearing women using the General Health Questionnaire (GHQ).

Some of the rituals practiced within cultures may be protective against postnatal depression because they provide social and practical support for the new mother (Halbreich and Karkun, 2006).

2.3.2 Biological Factors

Although the focus of the meta-analyses focused on non-biological risk factors, it is necessary to provide an overview of biological theories of postpartum depression.

The rapid decline in the levels of reproductive hormones that occur after delivery has been proposed as a possible cause of postpartum affective disorders (Wisner et al., 2002). Following childbirth, progesterone and estrogen levels fall rapidly, returning to pre-pregnancy levels within 3 days. When estrogen falls after birth, prolactin, which has risen during pregnancy, is no longer blocked and lactation is initiated. Suckling by the infant stimulates the secretion of oxytocin. The usual cyclical variation of androgens is absent during both pregnancy and lactation. Plasma corticosteroids reach a peak during labour and decrease significantly within 4 hours postpartum. Thyroid function returns to pre-pregnancy levels approximately 4 weeks after delivery (Robinson et al., 2001).

There is no conclusive evidence for a relationship between the various neurotransmitter systems, free or total tryptophan levels, or cortisol levels and symptoms of postpartum depression (Llewellyn, Stowe, & Nemeroff, 1997). However, Harris (1996) showed a minor association of postpartum depression and thyroid dysfunction in thyroid antibody positive women.

Although it has been suggested that low levels of progesterone or estrogen or high levels of prolactin cause postnatal depression, no consistent relationships have been found (Harris, 1994; Hendrick, Altshuler, &Suri, 1998).

A recent study by Bloch, Schmidt, Danaceau et al. (2000) tested the hypothesis that a subgroup of women may have a differential sensitivity to reproductive hormones, and that in this group normal endocrine events related to childbirth may trigger an affective episode. In order to test the hypothesis, they used a scaled down model to simulate some of the hormonal events of pregnancy and childbirth. They tested two groups of women, 8 of whom had a history of postnatal depression and 8 women without a history of postnatal depression. Both groups of women were given a gonadotropin releasing hormone agonist to simulate the supraphysiological gonadal steroid levels of pregnancy over an eight week period and then these were withdrawn to simulate childbirth.

Five of the eight women with a history of postpartum depression developed significant affective symptoms during the withdrawal period; none of the 8 women who did not have a history of postnatal depression experienced any mood symptoms during the withdrawal period.

The authors concluded that these data provided support for the involvement of estrogen and progesterone in the development of postnatal depression in a subgroup of women.

Such research according to Robinson et al., 2001 had several methodological problems that hampered studies on the biological basis of postpartum disorders. These included the

inaccurate hormone assays, particularly free unbound plasma concentrations, differences in psychological rating scales between the studies confounded by the normal physical symptoms of the pueperium. Blood sampling often took place at inappropriate times, ignoring activities such as breastfeeding which can alter hormone levels. Seasonal variations in hormones and circadian rhythms were often overlooked. Studies that examined one hormone were inadequate because of complex endocrine interactions.

Even if some women are more susceptible to hormonal changes the role of environmental factors in the development of the illness needs to be considered.

2.3.3 Obstetric Factors

Obstetric factors can include pregnancy related complications such as preeclampsia, hyperemesis, premature contractions as well as delivery related complications, such as emergency/elective caesarean, instrumental delivery, premature delivery and excessive bleeding intrapartum.

In their meta-analysis, O'Hara and Swain (1996) included 13 studies comprising over 1350 subjects that examined the effects of obstetric factors. They concluded that obstetric factors had a small effect (0.26) on the development of postpartum depression.

More recent studies, (published after the meta-analyses or those not included in the metaanalyses) found no overall statistically significant relationship between obstetric factors and postpartum depression.

For example, two large independent studies by Warner et al. (1996) (N=2375) and Forman et al (2000) (N=5292), found no statistical relationship between obstetric complications and postpartum depression based on both multivariate and univariate analysis.

Similarly, Johnstone et al. (2001) (N=490) reported no association between obstetric history, labour and delivery, complications of pregnancy and infant details and postpartum depression. They did, however find a nonsignificant trend between antepartum hemorrhage, forceps, multiparity and postpartum depression.

Josefsson et al. (2002), in their case control study (n=396), also reported a similar non significant association between delivery complications and depression at 6 months postpartum.

2.3.3.1 Unplanned / Unwanted Pregnancy

Beck (1996) examined the effects of an unplanned or unwanted pregnancy and the risk of developing postpartum depression. She used the results from 6 studies that comprised 1200 subjects, and found a small effect size. Warner et al. (1996) who observed a significant relationship between unplanned pregnancy and depression at 6 weeks postpartum in a sample of 2375 women supported these results.

2.3.3.2 Caesarean Section

Warner et al. (1996) and Forman et al. (2000) found no significant association between elective or emergency caesarean section and subsequent postpartum depression.

Johnstone et al. (2001) reported a non-significant trend between postpartum depression and caesarean section.

In 2013, a prospective study conducted by Sadat et al in Iran showed a negative correlation between mode of delivery and PPD although women with vaginal delivery had greater decrease in EPDS score from2 to 4 months postpartum.

A study on women living in Beirut, Lebanon revealed Caesarean section as a stronger protective factor against PPD (Chaaya et al 2002).

Boyce et al (1992) however, found a highly significant correlation between caesarean section and developing postpartum depression at 3 months. They reported that women who participated in their study who had an emergency caesarean section had more than six times the risk of developing postpartum depression. These results were supported by the work of Hannah et al. (1992) who found a strong association between caesarean section and postpartum depression at 6 weeks.

It is highly probable that the positive findings reported merely reflect statistical trends. Within such large samples, one would expect by probability alone to achieve statistically significant results for 1 in 5 tests (Stewart et al 2003).

2.3.3.3 Obstetric complications

Despite the fact that most of the studies were prospective, self-reported, multi-site sampling with large sample sizes, the timing of the evaluation of postpartum depression differed between studies. O'Hara and Swain (1996) indicated that using relatively short time frames (e.g. 2 weeks) had significant effects on the strength of the relationship between putative risk factors and postpartum depression.

However, there was heterogeneity between the methods of assessment of depression. Those studies that diagnosed depression using interview methods found a weak association between obstetric complications, but depression assessed through self-report measures was moderately related to these factors. These findings suggest that while higher level of obstetric complications may be weakly associated with a diagnosis of postpartum depression, they are moderately associated with higher levels of self-reported depressive symptomatology.

According to a study by Josefsson et al in 2002, mothers who gave birth to babies with major congenital malformations were also more depressed than the other women.

2.3.3.4 Breast Feeding

The evidence relating to breastfeeding as a potential risk factor is equivocal. Warner et al. (1996) found that the absence of breastfeeding at 6 weeks postpartum was significantly associated with postpartum depression (N=2375).

Hannah et al. (1992) supported these findings in a sample of 217 women. However, Forman et al. (2000) (N=5292) did not find any relationship between not breastfeeding and postpartum depression.

The reasons for the equivocal findings reported between breastfeeding and the onset of postpartum depression may reflect non-illness related factors, such as the woman's preference or hospital policy rather than an aetiological relationship.

2.3.4 Psychological factors

Psychological factors relate to factors such as having previously experienced psychiatric symptoms, having a family history of psychiatric illness, premenstrual mood changes, prenatal anxiety and other mood changes associated with pregnancy and their effect on the woman during postpartum.

2.3.4.1 Previous History of Depression

O'Hara and Swain's (1996) meta analyses included 14 studies of approximately 3000 subjects, which examined the mother's previous psychiatric history and postpartum depression. Beck's (2001) meta-analyses included 11 studies, which examined approximately 1000 subjects.

The results of both meta-analyses found that a previous history of depression was a moderate to strong predictor of subsequent postpartum depression. Subsequent studies consistently report that women with a previous history of postpartum depression are at increased risk of developing postpartum depression (Johnstone et al., 2001; Josefsson et al., 2002).

2.3.4.2 Family History of Depression

O'Hara and Swain (1996) combined data from 6 studies involving approximately 900 women to evaluate the association between a family history of depression and women's risk of postpartum depression.

The results showed no association between family history and postpartum depression. It was not a significant predictor of postpartum depression within the samples ($\delta = 0.05$, 95% CI – 0.06 / 0.16). *(Note: this finding does not apply to postpartum psychosis where family history is a significant predictor of postpartum psychosis).*

However, Johnstone et al. (2001) found an increased risk of postpartum depression in 490 women with a family history of psychiatric illness.

One of the challenges of establishing a positive family history of mental illness is that it requires the subject to be aware of a relative with psychiatric problems, and for them to be willing to disclose that vital information. It may be possible that there is relationship between family history and postpartum depression but the methods of eliciting accurate information are not available at present.

2.3.4.3 Mood during Pregnancy

Women are vulnerable to mood changes during pregnancy and the postpartum period.

After more than two decades of research it is now clear that the risk for affective disorders in women is at least as high, if not higher, during the perinatal period as at other times.(Ross et al, 2004) .

O'Hara and Swain (1996) included over 1000 subjects (women) in 13 studies for their analyses, whilst Beck (2002) included data from 21 studies which included over 2300 subjects.

These results have been replicated in a number of subsequent studies (Neter et al., 1995; Johnstone et al., 2001; Josefsson et al., 2002).

O'Hara further examined the relationship and found the association between depression during pregnancy and postnatal when accessed via self-report was stronger ($\delta = 0.84$; 95% CI 0.75 / 0.93) than the relationship when accessed via an interview ($\delta = 0.39$; 95% CI 0.22 / 0.56).

2.3.4.4 Prenatal Anxiety

In 1980 and 1984, Hayworth et al and Watson et al respectively reported an association between measurable anxiety during pregnancy and the level of postpartum depression.

Their findings were supported by Beck (2002) who analysed the results of 4 studies, a total of 428 subjects, and found anxiety to be a moderate predictor of postpartum depression.

O'Hara and Swain (1996) analyzed the results of 5 studies, comprising nearly 600 subjects and also found that anxiety during pregnancy was a strong-moderate predictor of subsequent depression following childbirth. Johnstone et al. (2001) and Neter et al. (1995) who found that higher levels of anxiety strongly predicted levels of postpartum depressive symptomatology supported these findings in the subsequent studies.

2.3.5 Psychological Factors

O'Hara and Swain (1996) compared maternal personality characteristics within studies to examine whether they were associated with postpartum depression.

These results have been replicated in subsequent studies. Lee et al. (2000) found that elevated scores on neuroticism were significantly associated with women with postpartum depression. Johnstone et al. (2001) found that women who were defined as 'being nervy', 'shy-selfconscious' or a 'worrier' through questionnaires, were significantly more likely to develop postpartum depression.

2.3.6 Social Factors

2.3.6.1 Life Events

The relationship between life events and the onset of depression is well established (Brown & Harris, 1978). Experiences such as the death of a loved one, relationship breakdowns or divorce, losing a job or moving home are known to cause stress and can trigger depressive episodes in individuals with no previous history of affective disturbance.

Pregnancy and birth are often regarded as stressful life events in their own right, and the stressfulness of these events may lead to depression (Holmes & Rahe, 1967). However, some researchers have studied the effects of additional stressful life events that women experience during pregnancy and the puerperium. These events, thought to reflect additional stress at a time during which women are vulnerable, may play a causal role in postpartum depression.

Paykel et al (1980), using a retrospective design, found that negative life events classified as moderate to severe were associated with increased probability of being diagnosed as clinically depressed.

O’Hara, Rehm and Campbell found that high levels of life events from the beginning of pregnancy until about 11 weeks postpartum were associated with higher levels of depressive symptomatology and a greater likelihood of being diagnosed with postpartum depression (O'Hara, Rehm, & Campbell, 1982; O'Hara, Rehm, & Campbell, 1983).

Hopkins, Campbell and Marcus (1987) found no association between life events and postpartum depression. At least two other large studies have not found an association between life events and postpartum depression (Holmes et al., 1967; Kumar et al., 1984).

One of the difficulties of assessing a possible relationship between life events and the onset of depression postpartum is the study design. Retrospective collection of data may lead to over reporting of life events as subjects (perhaps subconsciously) try to link a stressful event as a possible cause of the illness. The prospective collection of data eliminates this source of bias, as the outcome of postpartum depression is not known a priori.

In the recent meta-analyses, O’Hara and Swain took values from 15 studies, comprising data on over 1000 subjects that had prospectively recorded data on life events. They found a strongmoderate relationship between experiencing a life event and developing postpartum depression ($\delta = 0.60$, 95% CI: 0.54 / 0.67).

However, there was heterogeneity between studies, which related to where the study was conducted: studies undertaken in Britain and North America showed strong associations between postpartum depression and recent life events, while Japanese studies showed a no significant association. It is not clear why this should occur. The more recent study conducted by Lee et al. (2000) in Hong Kong did not find an association between life events and postpartum depression.

The method used to assess depression also explained heterogeneity of findings: interview based assessments demonstrated a moderate relationship with life events while self-report

evaluations yielded a significantly stronger relationship. The findings show that stressful events, even though they occur during pregnancy and not in the puerperium, are clear risk factors for developing postpartum depression.

Beck (2001) used a less rigorously defined measure of 'life stress' to assess studies which measured perceived stress within pregnancy and the early puerperium. She included 16 studies of over 2300 subjects and found a moderate relationship between perceived life stress and postpartum depression. Higher levels of perceived life stress were associated with postpartum depressive symptomatology.

2.3.6.2 Social Support

Receiving social support through friends and relatives during stressful times is thought to be a protective factor against developing depression (Brugha et al., 1998) and several earlier studies have evaluated the role of social support in reducing postpartum depression

Social support is a multidimensional concept. The sources of support include a spouse, relatives, friends or associates. There are also different types of social support, for example *informational* support (where advice and guidance is given), *instrumental* support (practical help in terms of material aid or assistance with tasks) and *emotional* support (expressions of caring and esteem) (Stewart et al; 2003).

Researchers have also examined the effects of *perceived* support (a person's general perception or belief that people in their social network would provide assistance in times of need) and *received* support (where supportive exchanges may be directly observed or measured by asking people). Received support is complex and multidimensional, as one needs to measure both the quantity of support given (i.e. the frequency of supportive acts, number of network members)

and also the quality of the support received (Collins et al.,1993; Dunkel-Schetter& Bennett, 1990; House & Kahn, 1985; Neter et al., 1995).

Studies have consistently shown a negative correlation between postpartum depression and emotional and instrumental support (Beck, 1996a; Menaghann, 1990; Richman et al., 1991; Seguin et al., 1999). Two recent studies have found that perceived social isolation (or lack of social support) was a strong risk factor for depressive symptoms postpartum (Forman et al., 2000; Seguin et al., 1999).

However, there may be differences between perceived and received social support. Logsdon et al (2000) studied social support among African-American low-income pregnant women. Although she found a significant relationship between perceived support and depressive symptomatology following delivery, there was no relationship between received support and postpartum depression. This confirmed the findings of earlier studies.

O'Hara, Rehm and Campbell (1983) studied *perceived* social support and found that depressed women reported that their spouse was deficient in providing instrumental and emotional support following delivery.

However, these women did not identify their spouse as being less supportive during pregnancy any more than non-depressed women. To a lesser degree, friends and parents of the depressed women were also perceived as being less supportive during the puerperium, but not during the pregnancy. These results were confirmed in a second study (O'Hara, 1986).

O'Hara and Swain (1996) examined 5 studies in which overall levels of social support were measured during pregnancy, based on over 500 subjects. They found that there was a strong negative relationship between social support and postpartum depression (δ = -0.63; 95% CI – 0.75 / -0.51). This suggests that women who do not receive good social support during pregnancy are more likely to develop postpartum depression. This concept was confirmed in a

recent study, which argued that receiving informational support from a large number of social network members was protective against postpartum depression (Seguin et al., 1999).

In order to try and further examine the concept of social support, O'Hara and Swain specifically looked at perceived support from the baby's father. They found a moderate strength relationship (δ = -0.53; 95% CI–0.67 / -0.39) however there was heterogeneity in findings from studies dependent upon how depression was assessed**.**

They concluded that poor support from the baby's father, per se, was not significantly associated with being diagnosed with postpartum depression. However, poor support was strongly negatively related with the severity of depressive symptoms.

The effects of parenthood on all aspects of the mother's psychosocial functioning should not be underestimated. Robinson and Stewart (2001) discuss how, in many cases, the family system must be reorganized, and many couples adopt more traditional roles. The mother usually tends to do the greater share of parenting tasks, and the parents must decide how their new roles will affect their previous work patterns and implement the necessary changes. With the added burden of childcare, the relationship between the partners often suffers, and there is less time for socializing. A supportive relationship with the father can help mitigate the stresses of being a new mother. These stresses should be borne in mind when evaluating the role of factors in the development of postpartum depression.

2.3.6.3 Marital Relationship and Partner Support

Mothers' depression is associated with their own personality and a range of infant-related, partner-related and other factors. The partner related factors includes a poor relationship with the baby's father, partner being unavailable at the time of the baby's birth and his provision of

what is perceived by her to be insufficient emotional or practical support, including low participation in infant care (Adrienne Burges, 2011).

The father's duty as a partner and a support person is central to the lives of the mother and the baby. A father's role can contribute significantly to the mother and baby's well-being, even during the most difficult circumstances, and if his support is not forthcoming this represents a significant deficit for the family.

The Millennium Cohort study, which followed babies born in the year 2000, found only4.4% of mothers saying they were 'not in a relationship' with their baby's father at the time of the birth (Adrienne Burgess, 2011).

Women with postpartum depression perceive their husbands to be less supportive than women who were not depressed, but these differences are apparent only at postpartum and not during pregnancy (O'Hara, 1986; O'Hara et al., 1983).

Marital relationship was measured between studies using a variety of different instruments, the limitations of which need to be briefly discussed. The range of measurement went from a simple Likert scale on which women indicate their level of satisfaction with the relationship, to standardized measures such as the Dyadic Adjustment Scale (DYAS) (Spanier, 1976).

Studies which assessed marital relationship using more global measures such as Likert scales or through open questions were assessed in both meta analyses. Beck included 14 studies comprising over 1500 subjects, while O'Hara and Swain included 8 studies of over 950 subjects.

Beck found a moderate association between poor marital relationship and postpartum depression, whilst O'Hara and Swain reported a small negative relationship.

It was interesting that differing methods of assessment produced different effect sizes. Marital relationship accessed via interviews was not as predictive as when measured via self -report.

O'Hara and Swain (1996) examined the association between mother's prepartum relationships with their spouse, focusing on studies which used the Dyadic Adjustment Scale (DYAS). The DYAS is a self-report measure which has proven psychometric properties, and is a standardized measure of the quality of the marital relationship.

The results from 6 studies, on over 1100 subjects which used the DYAS indicated a small but significant negative relationship between marital satisfaction on the DYAS and incidence of PPD (δ = -0.13; 95% CI – 0.20 / -0.06).

2.6.3.4 Socioeconomic Status

The role of socioeconomic status in the aetiology of mental health disorders and depression has received much attention. Socioeconomic deprivation indicators such as unemployment, low income, and low education have been cited as risk factors in mental health disorders (Bartley,

1994; Jenkins, 1985; Patel et al., 1999; Weich et al., 1997; World Health Organization, 2001). Recent studies from North America, Latin America and Europe reported that depression is more common among poorer countries (World Health Organization, 2001).

Beck (2001) examined 8 studies of 1732 subjects and found a small effect (0.19 - -0.22) between socioeconomic status and postpartum depression.

Recent studies, which were not included in the meta-analyses, found that unemployment and financial strain were significantly associated with postpartum depression (Lee et al., 2000; Patel et al., 2002; Seguin et al., 1999; Warner et al., 1996).

Lee (2000), Patel (2002) and Seguin (1999) all specifically studied the effect of low income populations within India, China and Canada respectively and found that financial strain was an important risk factor in postpartum depression within these populations.

2.3.6.5 Sex of the baby and child care

Recent studies from India (Patel et al.,2002) (n=171) and China (Lee et al.,2000) (n=220) provided evidence which suggest that spousal disappointment with the sex of the baby specifically if the baby is a girl, is significantly associated with developing postpartum depression. Therefore, the parent's reaction to the sex of the baby may be a potential risk factor for postpartum depression within certain cultural groups.

Beck (2001) studied two variables related to the infant, child temperament and childcare stress. She found that childcare stress and having an infant with a difficult temperament were moderately predictive of postpartum depressive symptomatology (N=789).

It has been found that mothers suffering from postpartum depression give more negative descriptions of their children than control mothers and report more behavioral problems in their infants (Murray, 1988).

Therefore, the mothers' symptoms may be a source of bias in the reporting of infant characteristics.

CHAPTER 3
METHODOLOGY

This chapter describes the research design, study population, study setting, sampling and the sample size and the data collection tool.

3.1 Study Design

This will be a descriptive cross-sectional study employing quantitative and qualitative techniques. An appropriate sample size will be used using systematic random sampling.

The study will be conducted at Komfo Anokye Teaching Hospital and it will be a cross-sectional study. The location was chosen because of convenience to the researcher and because Komfo Anokye Hospital is the biggest hospital in Kumasi and will have a large number of postpartum clients. The study population will be all mothers within six weeks of delivery and age (15 – 49years).

Responses in the quantitative study will be obtained from the information provided in a using self-administered and interviewer based closed- ended questionnaire. The questionnaire will ask clients to provide responses on certain socioeconomic and demographic characteristics.

3.2 Study Population

The targeted population for the study were women between the ages of 15-49 years who have delivered from first day of delivery to 6 weeks postpartum and receiving care at the Komfo Anokye Teaching Hospital.

3.2.1 Inclusion Criteria

1. Women who have delivered and are within the first 6 weeks and has given informed consent to participate.

3*.2.2 Exclusion Criteria*

1. All patients who have delivered but more than 6 weeks postpartum
2. Women who have delivered elsewhere and are in KATH for care
3. Critically ill postpartum women
4. Refusal to give consent.

3.3 Study Variables and Indicators

The variables under study would be age, sex, educational level, religion, occupation, marital status, partner's occupation, menstrual history, obstetrics history and psychological history to assess the risk of developing postpartum depression in women.

Table 3.1 Study variables and operational definitions

Variable	Operational Definitions	Measurement of Indicators
Moderate to severe mood changes	Extreme fluctuation in one's emotional state involving alternating between feelings of happiness and well-being and feelings of anger, irritability or depression	Frequency of mood changes
Congenital malformation	Any birth defect a baby is born with	Birth defects such as; hydrocephalus, congenital anomalies of the heart e.t.c
Weight of the baby	The birth weight of the baby	The weight of the baby at the time of delivery Under weight: less than 2.5kg Normal weight: 2.5kg – 4kg Over weight: greater than 2.5kg
The sex of the baby	The gender of the baby at birth	Whether the baby is a boy or girl
Delivery of the baby	The mode of delivery of the baby	Spontaneous vaginal delivery or caesarean section
Complications during delivery	Any complications encountered during delivery	Delivery complications like postpartum haemorrhage, eclampsia, etc.
Emotional relationship with partner	Provisions of care, empathy, love, and trust	Personal assessment of provision of attention, love by partner

3.4 Sampling Technique and Sample Size

Selective simple random sampling is a non-probability sampling technique where subjects are selected because of their convenient accessibility and proximity to the researcher. More of the patients turn away from answering the questionnaire. The whole population could not be included because some of the women were not well oriented to all spheres and some had impaired good judgement. Only those who are willing to take part voluntarily were captured.

Calculate for the sample size

Using the formula: $n = \frac{z^2(p)(q)}{(d)^2}$

Where n is the sample size

Z is the confidence level at 95% (standard value of 1.96),

P is the estimated prevalence postpartum depression at KATH (50%), E

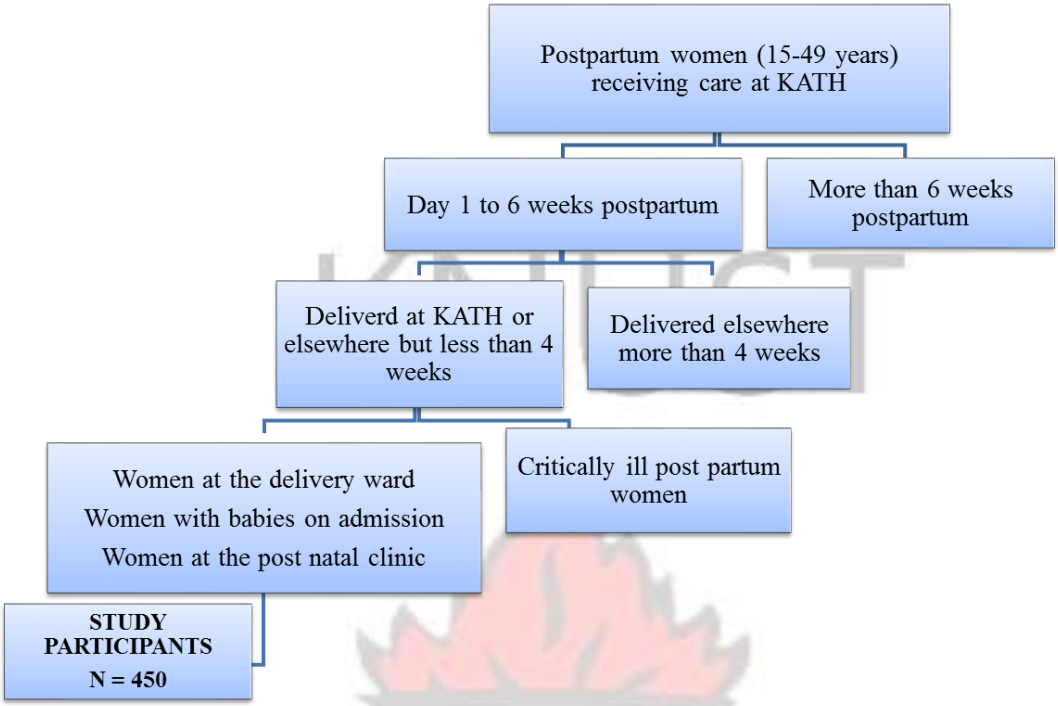
is the margin of error at 4.75%

$n = \frac{(1.96)^2(0.5)(0.5)}{(0.0475)^2} = 425.66$

Allowing for non response of 5% the sample size becomes 0.05*425.66

Sample size becomes 425.66+21.28=446.74 (≈450)

Fig 3.1: Steps in Selecting Sample for the Study



3.5 Data Collection Tool(s) or Technique

Structured questionnaire are the main data gathering tool which were used to gather information from the participants. The questionnaire comprised both closed -and open- ended questions. All the questionnaires were written in English. Most of the designed questions were closed ended to provide responses for respondents to choose from and this is meant to limit unnecessary answers that had no bearing on the study objectives. Steps were taken to avoid ambiguity and the use of jargons in the construction of the questionnaires.

The Edinburgh scale of postnatal depression was used to measure presence of symptoms of depressive illness.

3.6 Pretesting

All questionnaires to be used in the research were developed using standard procedures. After receiving approval from the Committee on Human Research, Publications and Ethics (CHIPRE) of the University, a pretest was conducted by the researcher at Suntreso that was not included in the major study.

Pre testing of the questionnaire were to ascertain overall quality and clarity of the instrument, find out total time to complete the survey, and establish the data coding procedures in the STATA 11. Clients were asked to write their comments about confusing questions, as well as any other suggestions they found helpful. After the pretesting exercise, appropriate revisions were made to the instrument before the major study took place.

3.7 Data handling and analysis

The data were cleaned after collection by the researcher to ensure that all incomplete questionnaires are discarded, and completed ones arranged chronologically. It was also coded to make it easy for data entry. The data were analysed using Stata 11. The results are presented pictorially using frequencies, tables and charts.

3.8 Ethical consideration

This study was conducted when ethical clearance has been sought and received from the Committee on Human Research, Publications, and Ethics of the Kwame Nkrumah University of Science and Technology.

Signed informed consent, for clients who were literates and verbal informed consent with thumbprints for the illiterates were obtained from each study respondent, at the start of the interview. Each subject was informed about the objectives of the study, and assured of confidentiality concerning any information obtained from them. Participation of subjects was conformed to the required ethical guidelines for the use of human subjects.

3.9 Limitation(s) and Assumptions of the Study

3.9.1 Limitations

Due to the limited time frame and difficulty getting reliable patients to administer the questionnaires to, the research work was limited to only to women who had delivered from day 1 to 6 weeks. Both inpatients and outpatients were chosen accordingly.

The questionnaires and interviews were conducted in the "twi" language and there is the potential of misinterpretation of the questions by research assistants, which could lead to information bias.

3.9.2 Assumptions

Assumptions are facts concerning the study that are established but cannot necessarily be proven true.

The following assumptions are being made for this study:

- Participants will respond to the survey items accurately and honestly.
- Participants of this study are representative of the women of reproductive age who have developed postpartum depression at KATH.
- Survey instrument is valid and reliable based upon its extensive development and review by the researcher and supervisors.

CHAPTER 4
RESULTS

This chapter presents findings of the study. Results are presented in tables and figures proceeded by narrations. All questionnaires given out merited inclusion into the analysis.

4.1 Background characteristics of respondents

Table 4.1 shows the summary of socio-demographic characteristics of respondent involved in the study. The mean age of the women was 29 years (SD=6.6) and the majority was in the age range of 25-34 (54.7%). Most of the respondents were Akan (66%) whereas 20.6% belonged to other ethnic origins. About 59% of the women in this study were married whiles 31.2% were living together. Only 8.5% and 1.4% were never married and divorced or separated respectively. Majority of the respondents had basic education (primary or Junior Secondary) whereas 18.3% had completed Senor high or vocational school. About 10.2% had no formal education. About 46.2% of the respondents were traders whereas 11.2% were civil servants. About 17.8% were however, unemployed whiles 22.5% had other occupations and this included tailor, hairdressers, and farmers as disclosed by respondents. With respect to their monthly income, about half of the respondents earned GHS 200.00. More than 80% of the women were Christians whiles 14.1 were Muslims. Most of the women were in their first three weeks of postpartum, with 52.7% being in the first as at the time of the study.

Table 4.1: Results of socio-demographic characteristics of respondents

Variables	Frequency	Percentage
Age (n=439)		
<25	105	23.9
25-34	240	54.7
35-44	92	21.0
>44	2	0.5
Mean (SD)	***29 (6.6)***	
Ethnicity (n=441)		
Akan	291	66.0
Ga	9	2.0
Ewe	18	4.1
Guan	1	0.2
Mole Dagbaani	9	2.0
Hausa	25	5.7

- Others 83 20.6
- Refused 5 1.1

Marital status (n=443)

- Never in union 37 8.3
- Married 260 58.7
- Living together 138 31.2
- Divorced/Separated 6 1.4
- widowed 2 0.4

Education (n=442)

- None 45 10.2
- Primary 50 11.3
- Middle/JSS/JHS 203 45.9
- Senior high/vocational/tech 81 18.3
- Higher 63 14.2

Average monthly income from all sources (n=392)

- <GHS 200.00 196 50.0
- GHS 200.00 -499.99 91 23.2
- GHS 500 - 999.99 51 13.0
- GHS1000 -1499.99 32 8.2
- >/= GHS 1500.00 22 5.6

Occupation (n=437)

- Unemployed 78 17.8
- Housewife 2 0.5
- Trader 202 46.2
- Student 8 1.8
- Civil servant 49 11.2
- Other 98 22.5

Religion (n=441)

- Christian 376 85.3
- Muslim 62 14.1
- Traditionalist 2 0.5
- Other 1 0.2

Weeks in postpartum (n=

- 1 week 206 52.7
- 2 weeks 68 17.4
- 3 weeks 43 11.0
- 4 weeks 32 8.2
- 5 weeks 12 3.1
- 6 weeks 30 7.6

4.2 Knowledge and understanding of postpartum depression

Table 4.2 presents results of respondents' knowledge on and understanding of postpartum depression. Majority 59% of the women interviewed had heard of postpartum depression with family and friends being the most cited source of information (52.2%) followed by Health facility/professionals (16.3%). The mass media were cited by 14.7%. On respondents' personal understanding of PPD, some described it as mothers being depressed after delivery. Others descriptions included "*new mothers behaving like they have high fever*", "*mothers felling sad and hatred for the baby*", *"malfunctioning of mother's brain after delivery"* and *"psychological problems, pain and depression after delivery"*.

About 55.2% of the respondents believed that a women can develop post partum depression only immediately after delivery whereas 34.4% stated after delivery until 6 weeks. With respect to treatment or cure for PPD, 27.7% opined that there is treatment but no cure, 67.7% indicated that there is cure whiles 4.7% stated there is no treatment or cure. Most of the women (86.9%) agreed that there are factors contributing to PPD and responses on the factors influencing PPD included stress mood changes (57.4%), history of PPD (39.4%), poor partner relationship/support (68.5%), and poor socio-economic status (55.8%) as shown in Figure 4.1.

Table 4.2: Results of respondents' knowledge and understanding of postpartum depression

Variables	Frequency	Percentage
Ever heard of postpartum depression (n=430)		
Yes	253	59.0
No	177	41.0
Source of information (251)		
Family and friends	129	51.4
Health facility/professional/activity/event	41	16.3
Mass media (radio, TV, newspaper, internet etc.)	37	14.7

- Other 37 14.7
- 7 2.8
- Don't know

Period a woman can develop post partum depression (n=250)

- Only immediately after delivery 138 55.2
- After delivery till 6 weeks 86 34.4
- Only after 6 weeks following delivery 26 10.4

Treatments/a cure for postpartum depression (n=253)

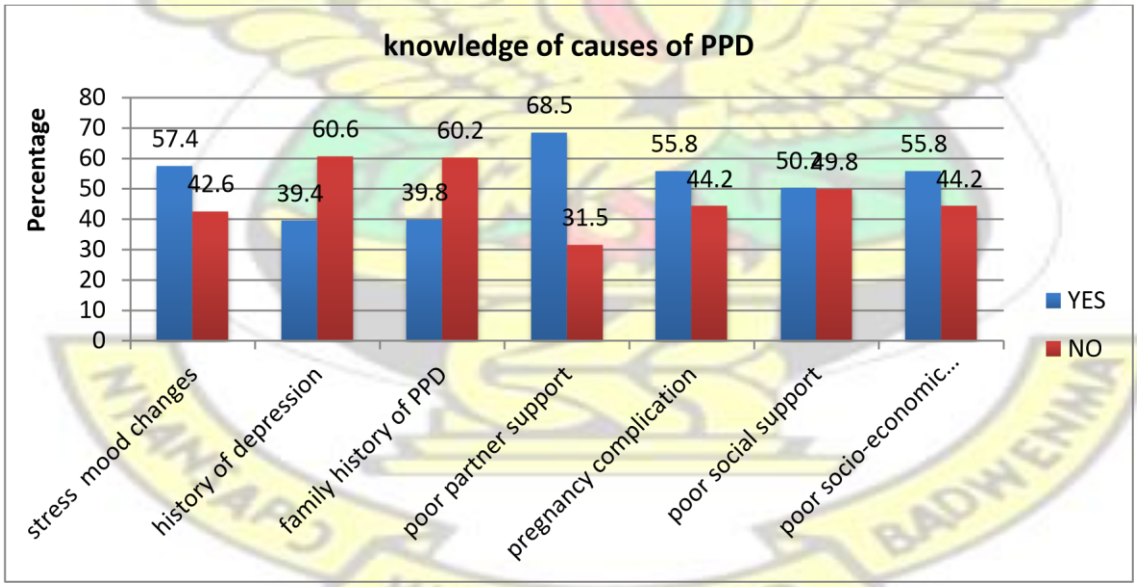
- Yes, there is treatment but no cure 70 27.7
- Yes, there is a cure 171 67.6
- No, there is no treatment or cure 12 4.7

Believe there are factors contributing to PPD (n=253)

- Yes 220 86.9
- No 5 2.0
- Don't know 28 11.1

Source: Field data, 2014

Figure 4.1 Respondents knowledge on factors that influence postpartum depression



Source: Field data, 2014

4.3 Risk factors for postpartum depression

Table 4.3 presents responses on experiences of mood changes or swings among the respondents before, during, and after pregnancy. As shown, only 7.2% indicated that they suffered mood changes all the time before their pregnancy whereas 48.9% stated that they never experienced that. The mean Edinburgh Postnatal Depression Scale (EPDS) score was significantly higher among those who suffered mood changes all the time ($p<0.001$). During their pregnancy, 48.6% disclosed that they sometimes experienced mood changes; whiles 14.5% suffered that all the time. The mean EPDS score again decreased significantly with decreasing frequency of experiencing mood changes during pregnancy. About 37% however never experienced that. Majority, 57.7% never suffered mood swings after their pregnancy whiles 12.4% did all the time.

Table 4.3 Experiences of mood changes/swings before, during, and after pregnancy

Variables	N (%)	EPDS Mean (SD)	F
Suffer from moderate to severe mood changes/swings before you got pregnant (n=442)			
All the time	32 (7.2)	12.1 (6.3)	
Sometimes	194 (43.9)	9.7 (6.0)	10.8***
Never	216 (48.9)	7.5 (4.6)	
Suffer from moderate to severe mood changes/swings during the pregnancy (n=442)			
All the time	64 (14.5)	11.3 (6.50	9.9***
Sometimes	215 (48.6)	9.3 (5.4)	
Never	163 (36.9)	7.3 (5.2)	
Suffered/ are suffering from moderate to severe mood changes/swings since you have delivered (n=442)			
All the time	55 (12.4)	13.7 (6.3)	28.72***
Sometimes	132 (29.9)	9.9 (5.7)	
Never	255 (57.7)	7.2 (4.6)	

Source: Field data, 2014 ***EPDS->Edinburgh Postnatal Depression Scale*** ******p<0.001***

As shown on Table 4.4, 19.1% accorded that their babies were born with some form of congenital disease or malformations or admitted on Neonatal Intensive Care Unit (NICU) whereas most of the respondents indicated otherwise. Majority of the women in this study disclosed that their pregnancies were wanted. However, 46% of 396 respondents stated that their pregnancies were not planned. Only 1.8% of the respondents had vaginal delivery at home with 38.5%, 17.2%, and 42.5% having SVD, elective CS, and emergency CS at the health facility respectively. Majority, 51.1% of the mothers had no complications as well as their babies during delivery whiles 25% and 21.6% had complications or their babies respectively.

Table 4.4 Results of obstetric factors and delivery outcomes

Variables	Frequency	Percentage
Baby born with any congenital diseases, conditions and/or malformations or admitted on NICU (n=439)		
Yes	84	19.1
No	337	76.8
Refused	18	4.1
Baby the sex/gender that you wanted/hoped to have before and during your pregnancy (n=441)		
Yes	152 83	34.5
No	195	18.8
Didn't have any specific hope	11	44.2
Refused		2.5
Was pregnancy wanted (n=440)		
Yes	301	68.4
No	123	27.9
Somewhat	30	2.3
Refused	6	1.4
If yes, was pregnancy planned (n=396)		
Yes	199	50.2
No	182	46.0
Somewhat	9	2.3
Refused	6	1.5
Mode of delivery (n=442)		
Safe vaginal delivery (SVD) at home	8	1.8
Safe Vaginal delivery at a health facility	170 76	38.5
Elective caesarean section	188	17.2
Emergency caesarean section		42.5

Complications either with you or the baby during delivery (n=436)		
No, nothing with either of us	223	51.1
Yes, complications with me	109	25.0
Yes, complications with the baby	94	21.6
Complications with both mother and baby Refused	6	1.4
	4	0.9

Source: Field data, 2014

4.3.1 Partner's relationship and support

Table 4.5 shows results of support from the partners of respondents in this study. About 233 respondents representing 53.3% opined that they were very satisfied with the support from their partners whiles 11.2% described the support as extremely satisfying. However about 12.4% described their partner's support and relationship as extremely of very dissatisfying. Most of the women also indicated that the father of the babies were very supportive in taking care of the babies whiles 80.7% also stated that the babies' fathers were part of the lives. Almost 90% agreed that the fathers of the babies provide financial support for them with 61% and 26.2% describing the support as sufficient respectively.

Table 4.5 Partner relationship and support

Variables	Frequency	Percentage
Emotional relationship with your baby's father (n=437)		
Extremely dissatisfying	23	5.3
Very dissatisfying	31	7.1
Somewhat dissatisfying	13	3.0
Somewhat satisfying	71	16.2
Very satisfying	233	53.3
Extremely satisfying	49	11.2
Don't know	17	3.9
Father of your baby provide support in taking care of the baby's everyday needs (n=437)		
Very supportive	318	72.8
Somewhat supportive	57	13.0
Very unsupportive	43 8	9.8
Somewhat unsupportive	11	1.8
Don't know		2.5

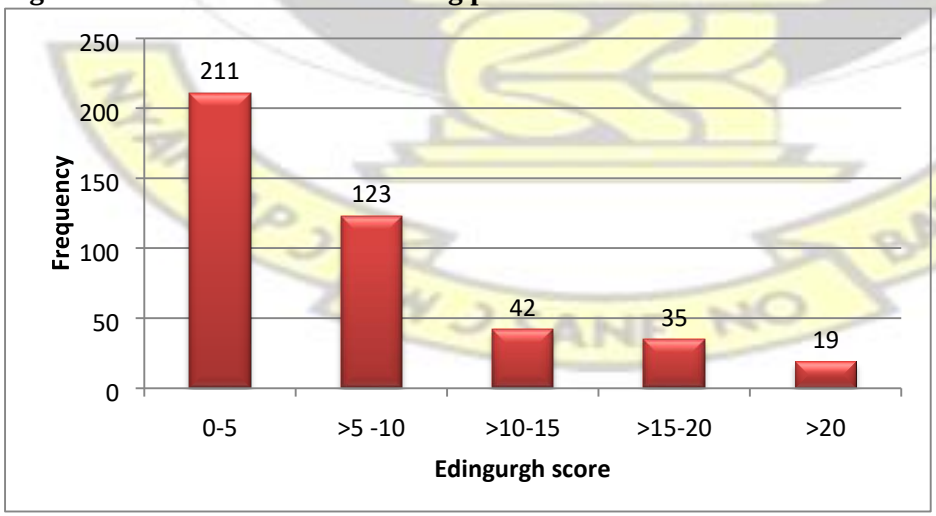
Father of you baby part of you and the baby's life (n=432)		
▯ Yes (he's fully part of our lives)	356	80.7
▯ No (he's not part of our lives at all)	39	9.0
▯ Somewhat (he's only part of some aspects)	40	9.3
Father of your baby provide financial support for you and the baby (n=432)		
▯ Yes	386	89.3
▯ No	46	10.7
If yes is money sufficient (n=408)		
▯ Very sufficient	249	61.0
▯ Somewhat sufficient	107	26.2
▯ Somewhat insufficient	28	6.9
▯ Not sufficient at all	24	5.9

Source: Field data, 2014

4.4 Factors influencing postpartum depression

This section presents results of the factors influencing PPD among the women under study. Figure 4.2 shows the score for the responses on the Edinburgh postnatal depression scale. As shown, 211 women had scores of 0 to 5 whereas 123 had score of 6 to 10. In total, 67 respondents scored from 11 to 20 whereas 19 women scored above 20. Women who scored above 10 were suggested to have PPD and this constituted 22.3% of respondents.

Figure 4.2 Prevalence of PPD among postnatal women



Source: Field data, 2014

4.4.1 Influence of socio-demographic factors on postpartum depression

Table 4.6 presents results on the influence of socio-demographic factors on PPD among women attending postnatal clinic at the Komfo Anokye Teaching Hospital. In the univariate analysis, the age, marital status, and income status of the women influenced their experience of PPD. Respondents who were 35years and above had increased odds of getting PPD as compared to those who were 25 to 34 years (OR=2.41; p<0.01). Being married or living together also decreased the likelihood of getting PPD as compared to those who were never in a union. Increased income from GHS 500.00 and above as compared to those who had average monthly income of less than GHS 200.00. When the various variables were adjusted, the influence of age and marital status remained significant as detailed in Table 4.6.

Table 4.6 Results of socio-demographic factors influencing PPD

Variables	Categories	OR (95% CI)	AOR (95% CI)
Age	25-34	1	1
	<25	0.87 (0.52, 1.46)	0.92 (0.53, 1.58)
	35 and above	2.41 (1.33, 4.34)**	2.14 (1.01, 4.28)*
Marital status	Never in union	1	1
	Married/living together	0.31 (0.16, 0.61)**	0.33 (0.13, 0.84)*
	Divorced/Separated/widowed	0.45 (0.22, 0.90)*	0.27 (0.11, 0.69)**
Average monthly income from all sources	<GHS 200.00	1	1
	GHS 200.00 -499.99	0.66 (0.39, 1.12)	0.80 (0.44, 1.44)
	GHS 500 - 999.99	0.44 (0.22, 0.89)*	0.67 (0.32, 1.43)
	>/= GHS1000	0.50 (0.26, 0.97)*	0.60 (0.28, 1.27)
Weeks in postpartum	1 – 3 weeks	1	1
	4-6 weeks	0.74 (0.42, 1.28)	0.80 (0.44, 1.43)

p<0.05; **p<0.01; ***p<0.001

4.4.2 Influence of mood changes on postpartum depression

Mood changes or swings before, during, and after pregnancy also influenced the experience of PPD among the women studied. Women who never experienced moderate to severe mood changes had 70% decrease in the risk of getting PPD as compared to those who had mood swings all the time (OR=0.30; p<0.05). This association was however not significant when the experiences of mood changes during

and after pregnancy were adjusted for. Women who had never experienced mood swings during and after pregnancy also had odds of suffering PPD that were lesser than their counterparts were in the same category as detailed were in Table 4.7. When the variables were adjusted, the influence of mood changes after pregnancy on was still statistically significant.

Table 4.7 Results of influence of mood swings on PPD

Variables	Categories	OR (95% CI)	AOR (95% CI)
Moderate to severe mood changes/swings before pregnancy	All the time	1	1
	Sometimes	0.5 (0.23, 1.05)	0.81 (0.34, 1.93)
	Never	0.30 (0.14, 0.65)**	0.62 (0.25, 1.52)
Moderate to severe mood changes/swings during pregnancy	All the time	1	1
	Sometimes	0.64 (0.36, 1.14)	0.89 (0.46, 1.73)
	Never	0.41 (0.22, 0.75)**	0.78 (0.38, 1.58)
Moderate to severe mood changes/swings after pregnancy	All the time	1	1
	Sometimes	0.38 (0.19, 0.73)**	0.43 (0.21, 0.89)*
	Never	0.16 (0.09, 0.31)***	0.19 (0.10, 0.39)**

p<0.05; **p<0.01; ***p<0.001

4.4.3 Influence of obstetric factors and delivery outcome on postpartum depression

Table 4.8 shows the obstetric factors and delivery outcomes that influence PPD among the women studied. Women who did not want their pregnancies were more likely to suffer PPD as compared to those who wanted their pregnancies (OR=2.13; p<0.001) and this positive relationship was still observed when the other factors were adjusted for (OR=1.89; p<0.01). The results again showed an inverse relationship between not birthing a baby with congenital disease or condition and suffering PPD, which remained almost same when the other factors were adjusted for (0.5 and 051 respectively).

Table 4.8 Obstetric factors and delivery outcomes influencing PPD

Variables	Categories	OR (95% CI)	AOR (95% CI)

Was pregnancy wanted	Yes	1	1
	No	2.13 (1.40, 3.23)***	1.89 (1.23, 2.94)**
Baby the sex/gender that you wanted/hoped to have	Yes	1	1
	No/ no specific hope	1.29 (0.85, 1.94)	1.20 (0.78, 1.87)
Mode of delivery	SVD at home	1	1
	SVD at a health facility	0.23 (0.04, 1.17)	0.22 (0.04, 1.15)
	Elective CS	0.08 (0.15, 0.46)**	0.09 (0.01, 0.48)**
	Emergency CS	0.23 (0.04, 1.15)	0.21 (0.04, 1.12)
Complications during delivery	Yes	1	1
	No	1.15 (0.77, 1.72)	1.03 (0.67, 1.58)
Baby born with any congenital diseases, conditions and/or malformations or admitted at NICU	Yes	1	1
	No	0.50 (0.31, 0.82)**	0.51 (0.31, 0.85)*

p<0.05; **p<0.01; ***p<0.001

4.4.4 Influence of partner support and relationship issues on postpartum depression

Table 4.9 shows the factors relating to partners support that influence PPD among the mother studied. As compared to mothers who were satisfied with the emotional support from baby's father, those who found the support dissatisfying were less likely to suffer PPD. Mothers who described the support from baby's father in taking care of baby as unsupportive had increased risk of suffering PPD (OR=4.82; p<0.001). Father not being part of the life of mother and baby and not providing financial support also increased the risk of suffering PPD as detailed in Table 4.9. However when the factors where adjusted, the influence of provision of financial support was no more significant.

Table 4.9 Results of influence of partner support on PPD

Variables	Categories	OR (95% CI)	AOR (95% CI)

Emotional relationship with your baby's father	Satisfying	1	1
	Dissatisfying	0.23 (0.13, 0.41)***	0.45 (0.21, 1.24)
	Don't know	0.85 (0.27, 2.65)	0.36 (0.07, 1.89)
Father provides support in taking care of the baby's everyday needs	Supportive	1	1
	Unsupportive	4.82 (2.52, 9.20)***	0.60 (0.18, 1.99)
	Don't know	19.15 (2.39, 45.96)**	1.87 (0.10, 20.01)
Father part of you and the baby's life	Yes	1	1
	No	10.52 (4.48, 24.79)***	5.47 (0.89, 33.83)
	Somewhat	6.64 (5.10, 14.23)***	3.63 (1.42, 9.29)*
Father provides financial support for you and the baby	Yes	1	1
	No	7.90 (3.68, 16.96)****	1.50 (0.34, 6.56)
Financial support sufficient	Yes	1	1
	No	8.29 (3.25, 21.14)***	6.31 (2.11, 18.94)**
	Somewhat	11.25 (3.73, 33.89)***	3.16 (0.76, 13.09)

p<0.05; **p<0.01; ***p<0.001

The multivariate model presents the adjusted odds ratios of the significant variables from the various factors studied. Not all the factors showed significant association in the multivariate studies. As shown in Table 4.10 aged 35 years and above still showed increased likelihood of suffering PPD as compared to those in the age category of 25 to 34years. Women who sometimes or never suffered moderate to severe mood swings also had decreased risk of suffering PPD as compared to those who experience mood swings all the time. Mothers who viewed their financial support from baby's father as insufficient also showed increased risk of suffering PPD (OR=4.04; p<0.05).

Table 4.10 Results of influence of risk factors on PPD

Variables	Categories	AOR	95% CI	Std. error

Age	25-34	1		
	<25	0.90	0.50, 1.70	0.32
	35-44	2.71*	1.28, 5.71	0.38
Marital status	Never in union	1		
	Married/living together	1.52	0.47, 4.93	0.91
	Divorced/Separated/widowed	0.95	0.30, 5.00	0.56
Moderate to severe mood changes/swings after pregnancy	All the time	1		
	Sometimes	0.38*	0.17, 0.87	0.16
	Never	0.18**	0.08, 0.40	0.07
Was pregnancy wanted	Yes	1		
	No	1.00	0.56, 1.80	0.30
Mode of delivery	SVD at home	1		
	SVD at a health facility	1.59	0.16, 15.46	1.84
	Voluntary CS	0.62	0.06, 6.57	0.74
	Emergency CS	1.45	0.15, 14.26	1.69
Baby born with any congenital diseases or admitted at NICU	Yes	1		
	No	0.59	0.31, 1.12	0.19
Emotional relationship with your baby's father	Satisfying	1		
	Dissatisfying	0.44*	0.20, 0.96	0.18
	Don't know	0.30	0.06, 1.57	0.25
Father part of you and the baby's life	Yes	1		
	No	4.51	0.85, 24.54	5.89
	Somewhat	2.48	0.93, 8.83	1.24
Financial support sufficient	Yes	1		
	No	4.04*	1.32, 12.34	2.30
	Somewhat	1.92	0.43, 8.45	1.45
N	**394**			
Log likelihood	**-200.897**			
Prob>chi2	**<0.0000**			

p<0.05; **p<0.01; ***p<0.001

CHAPTER 5
5.0 DISCUSSION

This chapter discusses the important findings of this study in relation to available literature.

The sections are organized according to the objectives of the study.

5.1. Prevalence of PPD

The postpartum period is known to be associated with mood disturbances and this has been noted since the time of Hippocrates (Miller, 2002). Postpartum depression is a serious health concern for the estimated 13% of pregnant women who are affected by it (Horowitz et al, 2011). It is more severe than the typical "baby blues" that many women experience for the first week after giving birth, but is less severe than postpartum psychosis, a serious psychological illness which occurs in only 0.1-0.2 % of births (Howell, 2009). Women are at increased risk of developing severe psychiatric illness during the puerperium. Studies have shown that a woman has a greatly increased risk of being admitted to a psychiatric hospital within the first month of the postpartum period than at any other time in her life (Stewart et al, 2003), because the postpartum period is a high-risk period for the occurrence of anxious and depressive episodes.

Scores on the Edinburgh Postnatal Depression Scale (EPDS) was used to determine PPD in this study. Almost a quarter (22.3%) of respondents scored above 10 and was suggested to have PPD. Although this could be higher than reports from most population studies, it reflects the extent of urgency needed in tackling stress issues relating to mothers during pregnancy periods. According to Stewart et al (2003), up to 12.5% of all psychiatric hospital admissions of women occur during the postpartum period and in the United States of America, postpartum depression develops in 10-15% of the more than 4 million women who deliver each year (Centre for Disease Control, 2008). Even with these figures, there are arguments of underreporting since reports shows that up to 80% of women with PPD do not report it and are not diagnosed by their physicians (Kelly et al., 2001; Yonker et al., 2001; Whitton et al., 1996).

5.2 Knowledge of women about postpartum depression

The relationship between knowledge and behavioral change has been established in previous studies. Knowledge has been proposed to account for health behaviors and sustained behavioral changes in several models (Rosenstock, Stretcher and Becker, 1988; Prochaska, DiClemente and Norcross JC, 1992). These models stress the importance of evaluating the perceptions, attitudes, beliefs, and outcome expectations of individuals as crucial means to understand observed behaviors and to guide behavioral change although these models may differ in content and perspective. A good knowledge of PPD among the women could translate to adopting positive behaviors towards prevention of PPD.

This study revealed that majority, 59% of the women interviewed had heard of postpartum depression. About 41% however had never heard of PPD (Table 4.2), indicating a wide awareness gap of PPD among the women, which needs to be addressed. The sources of information on PPD stated by the women included self, church, health facility/ professional and mass media. The most cited source of information on PPD was family and friends. Descriptions of PPD giving by the mothers included "*new mothers behaving like they have high fever*", "*mothers feeling sad and hatred for the baby*", *"malfunctioning of mother's brain after delivery"* and *"psychological problems, pain and depression after delivery"*.

Although awareness was quite high among the women, understanding of PPD was not universal among the respondents with some gaps in knowledge of PPD. Some women believed a women can develop postpartum depression only immediately after delivery whereas others stated after delivery until 6 weeks. About 37.5% however had no idea on the period a woman could develop PPD. Knowledge on treatment and cure for PPD also varied among respondents with about 34% having no idea of the existence of treatment or cure for PPD. Belief of factors influencing PPD was high among the women although 26.1% had no idea. Some factors cited by the women

included stress mood changes, history of PPD, poor partner relationship/support and poor socio-economic status.

5.3 Relationship between mood changes and postpartum depression

Psychological factors, which involve previous experience of psychiatric symptoms, having a family history of psychiatric illness, menstrual mood changes, prenatal anxiety and other mood changes associated with pregnancy have shown to influence PPD. This study assessed the influence of mood changes before, during, and after pregnancy and PPD.

Previous studies by Johnstone et al (2001) and Josefsson et al (2002), reported an increased risk of developing postpartum depression among women with previous history of depression. In this study, only 7.2% indicated that they suffered mood changes all the time before their pregnancy whereas 48.9% stated that they never experienced that. The results revealed a significant association between antenatal mood swings and PPD. The mean Edinburgh Postnatal Depression Scale (EPDS) score was significantly higher among those who suffered mood changes all the time ($p<0.001$).Women who never experienced moderate to severe mood changes before their pregnancies had decreased odds of getting PPD as compared to those who had mood swings all the time (OR=0.30; $p<0.05$). This is consistent with meta analyses by O'Hara and Swain's (1996) and Becks (2001).

Almost half of respondents in this study disclosed that they sometimes experienced mood changes during their pregnancy, whiles 14.5% experienced mood changes all the time. About 12.4% also suffered mood changes all the time after their pregnancy. Women who had never experienced mood swings during pregnancy also had odds of suffering PPD that was lesser than their counterparts were in the same category (OR=0.41; 95% CI=0.22 - 0.75). Mood swings after pregnancy also significantly influenced PPD, in the univariate and multiple regression

analysis. In line with this outcome, O'Hara and Swain (1996) and Beck (2002) also found depressed mood during pregnancy as a moderate to strong predictor of postpartum depression. Similarly, previous studies by Neter et al (1995), Johnstone et al (2001) and Josefsson et al (2002) produced consistent results in their respective studies.

5.4 Influence of obstetric factors and pregnancy outcome and developing postpartum depression

This study further assessed the relationship between obstetric factors as well as pregnancy outcome and developing postpartum depression. The obstetric and delivery factors considered in this study were whether pregnancy was wanted, whether baby gender was wanted, mode of delivery, complications during delivery and state of baby at birth (whether baby was born with congenital malformations or was sick and required admission at NICU).

Studies on the influence of obstetric factors on the development of postpartum depression have produced inconclusive results. The meta-analysis by O'Hara and Swain (1996), which included 13 studies comprising over 1350 subjects concluded that obstetric factors had a small effect (0.26) on the development of postpartum depression whereas most recent publications found no overall statistically significant relationship between obstetric factors and postpartum depression. However, the outcome of this study revealed influence of some obstetric factors on PPD.

Majority of the mothers indicated that they did not have babies with congenital malformations or on admission at NICU, although 19.1% accorded that their babies were born with some form of congenital disease or malformations or were admitted at NICU. This study revealed a significantly negative relationship between not birthing a baby with congenital disease or sick to warrant admission at NICU and suffering PPD. Mothers who did not birth babies who were

sick or with congenital malformations were likely to have PPD as compared to those who gave birth to babies with congenital malformations. This was however inconsistent with the study by Johnstone et al (2001), which found no significant association between infant details and congenital malformations. Complications during delivery however did not have any influence on PPD in this study. This is consistent to the results from previous studies by the Warner et al (1996) and Forman et al (2000), which found no statistical relationship between obstetric complications and postpartum depression. Again, reports from a case control study by Josefsson et al (2002), as well as the study by Johnstone et al (2001), also reported a similar non-significant association between delivery complications and depression at 6 months postpartum. The differences in the association between obstetric complications and postpartum depression have been attributed to the different methods of assessment.

As stated above (Table 4.8) unplanned pregnancies were associated with postpartum depression. Although majority of the women in this study disclosed that their pregnancies were wanted, about 46% indicated that their pregnancies were not planned. Mothers who didn't want their pregnancies had increased odds of PPD as compared to those who wanted their pregnancies (OR=2.13; AOR=1.89).In consistence with this study, results from the study by Warner et al (1996), using 2375 women, showed a significant relationship between unplanned pregnancy and depression at 6 weeks of postpartum. Similarly, Beck (1996), using results form six studies, also found an influence of unplanned or unwanted pregnancy and the risk of developing postpartum depression.

In this study, 38.5%, 17.2% and 42.5% had SVD, elective CS and emergency CS at the health facility respectively. There was no significant association between caesarian section and postpartum depression. This is in line with evidence from previous studies, which also suggest no association between caesarean section and PPD. This includes previous studies by Warner et al. (1996) and Forman et al. (2000) found no significant association between elective or

emergency caesarean section and subsequent postpartum depression. Again, the study by Johnstone et al. (2001) also reported a non-significant trend between postpartum depression and caesarean section. The outcome of this study was however inconsistent with the study by Boyce et al (1992), which found a highly significant correlation between caesarean section and developing postpartum depression at 3 months. In their study, women who had an emergency caesarean section had more than six times the risk of developing postpartum depression. Again, the study by Hannah et al. (1992) found a strong association between caesarean section and postpartum depression at 6 weeks, and this is inconsistent with this study outcome.

Among the obstetric factors studied, mothers' expectations of the sex of the baby did not have significant influence on PPD. This is however inconsistent with the study by Patel et al (2002) in India, which found that spousal disappointment with the sex of the baby specifically if the baby is a girl, is significantly associated with developing postpartum depression. They concluded that parent's reaction to the sex of the baby may be a potential risk factor for postpartum depression within certain cultural groups, but was not observed in this study.

5.5 The effect of paternal support in reducing postpartum depression.

Generally, life events including relationship breakdowns or divorce, losing a job or moving home are known to cause stress and can trigger depressive episodes in individuals with no previous history of affective disturbance (Brown & Harris, 1978). The study by Beck (2001) found higher levels of perceived life stress to be associated with postpartum depressive symptomatology. O'Hara, Rehm, and Campbell (1983) also found that high levels of life events from the beginning of pregnancy until about 11 weeks postpartum were associated with higher levels of depressive symptomatology and a greater likelihood of being diagnosed with postpartum depression. Relationships and partners support are essential in helping postpartum mother cope with stressful situations. Women with postpartum depression perceive their

husbands to be less supportive than women who were not depressed, but these differences are apparent only at postpartum and not during pregnancy (O'Hara, 1986; O'Hara et al., 1983).

The outcome of this study revealed a significant association between emotional relationship with the baby's father and PPD. Majority of the women described their relationship with the baby's father as satisfying and these mothers were less likely to suffer PPD. This is consistent with previous studies by Beck (1996), and O'Hara and Swain (1996), which also found association between poor marital relationship and postpartum depression. The study by O'Hara and Swain (1996), which used the Dyadic Adjustment Scale (DYAS) to assess postpartum relationship with spouse, found significant negative relationship between marital satisfaction on the DYAS and incidence of PPD.

Receiving social support through friends and relatives during stressful times is thought to be a protective factor against developing depression (Brugha et al., 1998) and several earlier studies have evaluated the role of social support in reducing postpartum depression. Majority of the women studied were also happy with the support their baby's father provides in taking care of the baby's everyday needs. However, about 12% disclosed their partners were unsupportive and these women had increased odds of suffering PPD as revealed in this study. This is consistent with previous studies by Forman et al (2000) and Seguin et al (1999), which found lack of social support as a strong risk factor for depressive symptoms postpartum. In line with this, other studies have also shown a negative correlation between postpartum depression and emotional and instrumental support (Beck, 1996; Menaghann, 1990; Richman et al., 1991; Seguin et al., 1999; O'Hara and Swain, 1996).

These findings suggest the importance of partner support in helping women deal with PPD related symptoms. This concept was confirmed in others studies that extended the support to cover members in other social networks. The study by Seguin et al (1999) for instance argued

that receiving informational support from a large number of social network members was protective against postpartum depression. However, the study by Logsdon et al (2000) on social support among African-American low income pregnant women found no association between received support and postpartum depression although perceived support was associated with PPD in that study.

The importance of improved income status in the prevention of PPD is well examined (Beck, 2001). Again, financial constraints were found as an important risk factor for postpartum depression (Lee, 2000; Patel, 2002; Seguin, 1999). Husbands or partners financial support is very necessary in this regard. This study again revealed a high level of financial support to mothers by fathers of babies. Moreover, 61% and 26.2% described the support as sufficient respectively. However, about 11% of the women disclosed that fathers of their babies provide no financial support for them and the babies and these women were more likely to suffer PPD. Mothers who viewed partners financial support as insufficient were also more likely to suffer PPD (OR=8.3; AOR=6.3). Social interventions should therefore look at encouraging men to support their partners especially during the pregnancy and postpartum periods.

CHAPTER 6

6.0 CONCLUSION AND RECOMMENDATION

6.1 Conclusion

This section presents the conclusion of the study based on the major findings and make recommendations for improving the current situation. This was a cross-sectional study and was

aimed at assessing the factors influencing postpartum depression. The findings of this study show that the percentage of women suggested of having postpartum depression was 22.3%.

6.1.1 Knowledge on postpartum depression

This study also revealed high awareness gap of postpartum depression among the women with about 41% never heard of PPD. The most cited source of information on PPD was family and friends. Understanding of PPD was also not universal among the respondents with some gaps in knowledge of PPD. About 37.5% had no idea on the period a woman could develop PPD, 34% on the existence of treatment or cure for PPD, and 26.1% on factors influencing PPD.

6.1.2 Relationship between mood changes and postpartum depression

The study also found that 7.2%, 14.5% and 12.4% of postpartum women suffered mood changes all the time before, during, and after their pregnancy respectively. The study also observed that mood swings was significantly associated with PPD. Never experiencing mood swings before, during and after pregnancy decreased the likelihood of suffering postpartum depression as compared to those who experienced mood swings.

6.1.3 Influence of obstetric factors and pregnancy outcome and developing postpartum depression

The study also found a very low level of babies born with congenital malformations and there was a significantly negative relationship between not birthing a baby with congenital disease or condition and suggestive PPD. The percentage of mothers who had unplanned pregnancies was 46% and unplanned pregnancy was associated with increased odds of suggestive PPD.

About 38.5%, 17.2% and 42.5% had SVD, elective CS and emergency CS at the health facility respectively. Caesarian section and postpartum depression were no associated in this study.

6.1.4 The effect of paternal support in reducing postpartum depression

This study again observed that most mothers were satisfied with their relationship with the baby's fathers and emotional relationship with baby's father was significantly associated with suggestive PPD. Most of the women were also happy with the support from their baby's father and women with unsupportive partners had increased odds of suffering PPD as revealed in this study. Most mothers received sufficient financial support and having insufficient support was associated with increased likelihood of suggestive PPD.

6.2 Recommendations

Ministry of health/ Ghana Health Service

- The study outcome showed some gaps in awareness and knowledge of women on postpartum depression. There should be increased efforts to institute effective interventional programmes to educate women on postpartum depression.

- It should be added to education given at ANC, which has over 98% patronage in Ghana.
- At the facility level, specific programmes targeted at educating pregnant women on postpartum depression should be integrated into the general antenatal care programmes.

- Women who suffered mood swings before and during pregnancy had increased tendencies of suggestive PPD. Special screening programmes to early detect past histories of PPD and

mood swings before and during pregnancies should be instituted. This will help early detection of women at risk of possible PPD for counseling and other support services.

- A suggested tool can be used at ANC to pick women who are at risk to develop PPD. This tool can be validated slowly in a separate study.

  SCREENING TOOL;

  1. Was this pregnancy planned? [Yes] [No]
  2. Did you want this pregnancy? [Yes] [No]
  3. Do you experience mood changes all the time before or during this pregnancy? [Yes] [No]
  4. Is your partner supportive emotionally and financially? [Yes] [No]
  5. Was your previous baby born with a defect or was sick to warrant admission at NICU? [Yes] [No]

Community/household/family

- At the community level, programmes should be instituted to educate and counsel male partners to offer the requisite support emotionally and financially to their spouse's women as this has shown to have protective effect on postpartum depression among women.

- Family and other social support for the pregnant woman during and after birth should also be encouraged at the household and community level.

Further research

- Further research on exploring the influence of domestic violence and other community related factors on postpartum depression is recommended.

REFERENCES

Affonso, D.D., De, A.K., Horowitz, J.A., Mayberry, L.J., 2000. An international study exploring levels of postpartum depressive symptomatology. J. Psychosom. Res. 49 (3), 207–216.

American Psychiatric Association, 2000. Diagnostic and Statistical Manual of Mental Disorders, Text Revision, DSM-IV-TR™4th ed. American Psychiatric Press, Inc., Washington D.C.

Appleby, L., Gregoire, A., Platz, C., Prince, M., & Kumar, R. (1994). Screening women for high risk of postnatal depression. *Journal of Psychosomatic Research, 38,* 539-545

Armony-Sivan R, Shao J, Zhao G, Xu G, Zhou M, Zhan J, et al. (2012). No relationship between maternal iron status and postpartum depression in two samples in China. J Pregnancy; Epub ahead of print.

Armony-Sivan, R., Shao, J., Li, M., Zhao, G., Zhao, Z., Xu, G., Lozoff, B. (2012). No Relationship between Maternal Iron Status and Postpartum Depression in Two Samples in China. Journal of Pregnancy, 2012, 521431. http://doi.org/10.1155/2012/521431

Bartley, M. (1994). Unemployment and ill health: understanding the relationship. *J Epidemiol.Community Health, 48,* 333-337.

Beck, C. T. (1992). The lived experience of postpartum depression: a phenomenological study. *Nursing Research, 41,* 166-170.

Beck, C. T. (1996a). A meta-analysis of predictors of postpartum depression. *Nursing Research, 45,* 297-303.

Beck, C. T. (1996b). Postpartum depressed mothers' experiences interacting with their children. *Nursing Research, 45,* 98-104.

Beck, C. T. (2001). Predictors of postpartum depression: an update. *Nursing Research, 50,* 275285.

Beck, C. T. (2002). Postpartum depression: a meta-synthesis. *Qualitative Health Research, 12,* 453-472.

Bloch, M., Rotenberg, N., Koren, D., & Klein, E. (2006). Risk factors for early postpartum depressive symptoms. General Hospital Psychiatry, 28, 3-8.

Bloch, M., Schmidt, P. J., Danaceau, M., Murphy, J., Nieman, L., &Rubinow, D. R. (2000). Effects of gonadal steroids in women with a history of postpartum depression. *American Journal of Psychiatry, 157*, 924-930.

Boyce, P. M., & Todd, A. L. (1992). Increased risk of postnatal depression after emergency caesarean section. *Med.J.Aust., 157,* 172-174.

Brockington, I. F., Cernik, K. F., Schofield, E. M., Downing, A. R., Francis, A. F., &Keelan, C. (1981). Puerperal Psychosis. Phenomena and diagnosis. *Arch.Gen.Psychiatry, 38,* 829-833.

Brown, G. W. & Harris, T. (1978). Social Origins of Depression: A Study of Psychiatric Disorder in Women. New York: The Free Press.

Brugha, T. S., Sharp, H. M., Cooper, S. A., Weisender, C., Britto, D., Shinkwin, R. et al. (1998). The Leicester 500 Project. Social support and the development of postnatal depressive symptoms, a prospective cohort survey. *Psychological Medicine, 28,* 63-79.

Burgess, Adrienne (2011). Fathers' roles in perinatal mental health: causes, interactions and effects

Campbell, S. B., Cohn, J. F., Flanagan, C., Popper, S., & Meyers, T. (1992). Course and correlates Of postpartum depression during the transition to parenthood. *Development and Psychopathology, 4,* 29-47.

CDC, 2008: Centers for Disease Control and Prevention and National Association of Chronic Disease Directors. The state of mental health and aging in America Issue Brief 1: what do the data tell us?, 2008. Available at http://apps.nccd.cdc.gov/MAHA/MahaHome.aspx.

Chaaya M, Campbell OM, EI Kak F, Shaaar D, Harb H, KaddourA. Postpartum depression: prevalence and determinants in Lebanon. Arch Womens Mental Health 2002; 5(2): 65-72.

Collins, N. L., Dunkel-Schetter, C., Lobel, M., & Scrimshaw, S. C. (1993). Social support in pregnancy: psychosocial correlates of birth outcomes and postpartum depression. *J.Pers.Soc.Psychol., 65,* 1243-1258.

Cooper, P. J., Campbell, E. A., Day, A., Kennerley, H., & Bond, A. (1988). Non-psychotic psychiatric disorder after childbirth. A prospective study of prevalence, incidence, course and nature. *BritishJournal of Psychiatry, 152*, 799-806.

Cox, J. L., Murray, D., & Chapman, G. (1993). A controlled study of the onset, duration and prevalence of postnatal depression. *British Journal of Psychiatry, 163*, 27-31.

Dennerstein, L., Leherr, P., & Riphagen, F. (1989). Postpartum depression-risk factors. *J PsychosomObstetGynaecol, 10,* 53-67.

Do T, Hu Z, Otto J, Rohrbeck P. (2007). Depression and suicidality duringthe postpartum period after first time deliveries, active component servicewomen and dependent spouses, U.S Armed Forces. MSMR2013; 20(9): 2-7.

Duffy, C. L. (1983). Postpartum depression: identifying women at risk. *Genesis, 11,* 21.

Dunkel-Schetter, C. & Bennett, T. L. (1990). Differentiating the cognitive and behavioral aspects of social support. In B.R.Sarason & G. R. Pierce (Eds.), Social support: An interactive view (pp. 267-296). New York: Wiley.

Forman, D. N., Videbech, P., Hedegaard, M., Salvig, J. D., &Secher, N. J. (2000). Postpartum depression:identification of women at risk. *British Journal of Obstetrics &Gynaecology, 107,* 1210-1217.

Gaynes, B. N., Gavin, N., Meltzer-Brody, S., Lohr, K. N., Swinson, T., Gartlehner, G., et al. (2005). Perinataldepression: Prevalence, screening accuracy, and screening outcomes. Summary, Evidence Report/Technology Assessment No. 119. AHRQ Publication No. 05-E006- 1. Rockville, MD.

Geller, P.A., 2004. Pregnancy as a stressful life event. CNS Spectr. 9 (3), 188–197.

Halbreich U, karkun S. Cross-cultural and social diversity of prevalence of postpartum depression and depressive symptoms. J. Affect Disorder 2006; 91:97-111.

Hannah, P., Adams, D., Lee, A., Glover, V., & Sandler, M. (1992). Links between early postpartum mood and post-natal depression. *British Journal of Psychiatry, 160,* 777-780.

Hapgood, C. C., Elkind, G. S., & Wright, J. J. (1988). Maternity blues: phenomena and relationship to later postpartum depression. *Australian and New Zealand Journal of Psychiatry, 22,* 299-306.

Harris, B. (1994). Biological and hormonal aspects of postpartum depressed mood. *British Journal of Psychiatry, 164,* 288-292.

Harris, B. (1996). Hormonal aspects of postnatal depression. *International Review of Psychiatry, 8,* 27-36.

Hayworth J, Little BC, Carter SB, Raptopoulos P, Priest RG, Sandler M. A predictive study of post-partum depression: some predisposing characteristics. Br J Med Psychol 1980;53:161–7.

Hendrick V. (1998), Evaluation of mental health and depression during pregnancy. Pharmacology Bulleting 34, 329- 299

Holmes TH, Rahe RH. The Social Readjustment Rating Scale. J Psychosom Res 1967;11:213–8.

Hopkins, J., Campbell, S. B., & Marcus, M. (1989). Postpartum depression and postpartum adaptation: overlapping constructs? *Journal of Affective Disorders, 17*(3), 251-254.

Horowitz, J. A., Bell, M., Trybulski, J., Munro, B. H., Moser, D., Hartz, S. A. et al. (2001). Promoting responsiveness between mothers with depressive symptoms and their infants. *J.Nurs.Scholarsh., 33,* 323-329.

House, J. S. & Kahn, R. (1985). Measuring social support. In S.Cohen& S. L. Syme (Eds.), *Social support and health* (pp. 83-108). Orlando,FL: Academic.

Howell, E., Mora, P., Di Bonaventra, M, & Leventhal, H.(2009). Modifiable factors associated with changes in postpartum depressive symptoms. Archive's Women's Health, 12, 113-120.

Jacobsen, T. (1999). Effects of postpartum disorders on parenting and on offspring. In L.J.Miller (Ed.), *Postpartum Mood Disorders* (pp. 119-139). Washington, DC.: American Psychiatric Press

Jadresic, E., Jara, C., Miranda, M., Arrau, B., & Araya, R. (1992). Emotional disorders in pregnancy and the puerperium: a prospective study of 108 women. *Rev ChilNeuropsiquiatr, 30,* 99-106.

Jenkins, R. 1985. Sex differences in minor psychiatric morbidity. Psychological Medicine (monograph suppl.) 7: 1-53.

Johnstone, S. J., Boyce, P. M., Hickey, A. R., Morris-Yatees, A. D., & Harris, M. G. (2001). Obstetric risk factors for postnatal depression in urban and rural community samples. *Australian and New ZealandJournal of Psychiatry, 35,* 69-74.

Jones, I. & Craddock, N. (2001). Familiality of the puerperal trigger in bipolar disorder: results of a family study. *Am J Psychiatry, 158,* 913-917.

Josefsson, A., Berg, G., Nordin, C., &Sydsjo, G. (2001). Prevalence of depressive symptoms in late pregnancy and postpartum. *ActaObstetricia et GynecologicaScandinavica, 80*(3), 251-255.

Kelly,R.H.,Russo,J.,& Katon,W. (2001). Somatic complaints among pregnant women care or in obstetrics: normal pregnancy or depressive and anxiety symptom amplification revisited? General Hospital Psychiatry, 23:107–113.

Kendell RE, Chalmers JC, Platz C. Epidemiology of puerperal psychoses. Br J Psychiatry 1987;150:662–73.

Kennerly H, Gath D. Maternity blues. I. Detection and measurement by questionnaire. Br J Psychiatry 1989;155:356–62.

Kim, J., & Buist, A., 2005. Postnatal depression: a Korean perspective. Australian Psychiatry 13 (1), 68–71.

Klanin P, Arthur D.G, Martinson 1. Stress in women with postpartum depression in Asian cultures: A literature review. International journal of nursing studies, 2007: 46: 13551373. (PubMed).

Klompenhouwer, J. L. & van Hulst, A. M. (1991). Classification of postpartum psychosis: a study of 250 mother and baby admissions in The Netherlands. *ActaPsychiatrScand, 84,* 255-261.

Kumar R, Robson KM. A prospective study of emotional disorders in childbearing women. Br J Psychiatry 1984;144:35–47.

Kumar, R., Marks, M., Platz, C., & Yoshida, K. (1995). Clinical survey of a psychiatric mother and babyunit: characteristics of 100 consecutive admissions. *Journal of Affective Disorders, **33**,* 11-22.

Lee, D. T., Yip, A. S., Leung, T. Y., & Chung, T. K. (2000). Identifying women at risk of postnatal depression: prospective longitudinal study. *Hong.Kong.Med.J., 6,* 349-354.

Llewellyn, A. M., Stowe, Z. N., &Nemeroff, C. B. (1997). Depression during pregnancy and thepuerperium. *Journal of Clinical Psychiatry, 58 Suppl 15,* 26-32.

Logsdon, M. C., Birkimer, J. C., &Usui, W. M. (2000). The link of social support and postpartum depressive symptoms in African-American women with low incomes. *MCN Am.J.Matern.ChildNurs., 25,* 262-266.

Menaghann EG. Social stress and individual distress. Res Community Ment Health 1990;6:107–41.

Miller, L. J. (2002). Postpartum depression. JAMA, 287, 762-765.

Murray, L. (1988). Effects of postnatal depression on infant development: direct studies of early mother infant interactions. In R.Kumar & I. F. Brockington (Eds.), Motherhood & Mental Ilness 2: Causes and Consequences London: Wright.

Neter E, Collins NL, Lobel M, Dunkel-Schetter C. Psychosocial predictors of postpartum depressed mood in socioeconomically disadvantaged women. Womens Health 1995;1:51–75.

Nonacs R, Cohen LS. Postpartum mood disorders: diagnosis and treatment guidelines. J Clin Psychiatry 1998;59(Suppl 2):34–40.

O'Hara, M. W. (1986). Social support, life events, and depression during pregnancy and the puerperium. *Arch.Gen.Psychiatry, 43,* 569-573.

O'Hara, M. W. (1994). *Postpartum depression:Causes and Consequences*. New York: Springer-Verlag.

O'Hara, M. W., Neunaber, D. J., &Zekoski, E. M. (1984). Prospective study of postpartum depression: prevalence, course, and predictive factors. *Journal of Abnormal Psychology, 93*, 158-171.

O'Hara, M. W., Rehm, L. P., & Campbell, S. B. (1982). Predicting depressive symptomatology: cognitive behavioral models and postpartum depression. *Journal of Abnormal Psychology, 91*, 457-461.

O'Hara, M. W., Rehm, L. P., & Campbell, S. B. (1983). Postpartum depression. A role for social network and life stress variables. *J.Nerv.Ment.Dis., 171*, 336-341.

O'Hara, M. W., Schlechte, J. A., Lewis, D. A., & Varner, M. W. (1991a). Controlled prospective study of postpartum mood disorders: psychological, environmental, and hormonal variables. *Journal ofAbnormal Psychology, 100*, 63-73.

O'Hara, M., & Swain, A. (1996). Rates and risk of postpartum depression - a meta-analysis. *International Review of Psychiatry, 8*, 37-54.

Okano, T., Nagata, S., Hasegawa, M., Nomura, J., & Kumar, R. (1998). Effectiveness of antenatal education about postnatal depression: A comparison of two groups of Japanese mothers. *Journal of MentalHealth, 7*(2), 191-198.

Paffenbarger RS. Epidemiological aspects of mental illness associated with childbearing. In: Brockington IF, Kumar R, editors. Motherhood and mental illness. London: Academic Press, 1982. p. 21–36.

Patel V, Araya R, de Lima M, Ludermir A, Todd C. Women, poverty and common mental disorders in four restructuring societies. SocSci Med 1999;49:1461–71.

Patel V, Rodrigues M, DeSouza N. Gender, poverty, and postnatal depression: a study of mothers in Goa, India. Am J Psychiatry 2002;159:43–7.

Paykel, E. S., Emms, E. M., Fletcher, J., &Rassaby, E. S. (1980). Life events and social support in puerperal depression. *British Journal of Psychiatry, 136*, 339-346.

Rahman A, Iqbal 2, Harrington R. life events, social support and depression in childbirth: perspectives from a rural community in the developing world. Psychol Med 2003; 33:1161-7.

Richman JA, Raskin VD, Gaines C. Gender roles, social support, and postpartum depressive symptomatology. The benefits of caring. J NervMent Dis 1991;179:139–47.

Robertson E., Grace S., Wallington T., & Stewart D.E. (2004). Antenatal risk factors for postpartum depression: a synthesis of recent literature. General Hospital Psychiatry. 2004; 26(4):289–295. [PubMed]

Robinson GE, Stewart DE. Postpartum disorders. In: Stotland NL, Stewart DE, editors. Psychological aspects of women's health care. Washington (DC), American Psychiatric Press, Inc., 2001. p. 117–39.

Robinson, G. E. & Stewart, D. E. (2001). Postpartum disorders. In N.L.Stotland & D. E. Stewart (Eds.), Psychological aspects of women's health care (2nd ed. ed., pp. 117139). Washington, DC: American Psychiatric Press,Inc.

Robling SA, Paykel ES, Dunn VJ, Abbott R, Katona C. Long-term outcome of severe puerperal psychiatric illness: a 23 year follow-up study. Psychol Med 2000;30:1263–71.

Ross LE, Sellers EM, Gilbert Evans SE, Romach MK. Mood changesduring pregnancy and the postpartum period: development of abiopsychosocialmodel.ActaPsychiatrScand 2004: 109: 457–466

Ross, L.E, Sellers, E.M, Gilbert Evans, S.E, & Romach, M.K. (2004). Mood changes during pregnancy and the post partum period: development of a biopsychosocial model. Acta psychiatric Scandinavica, 109, 457-466.

Sadat Z, KafaeiAtrian M, MasoudiAlavi N, AbbaszadehF,Karimian Z, Taherian A. Effect of mode of delivery on postpartum depression in Iranian women. J ObstetGynaecol Res 2013; Epubahead of print.

Schopf J, Bryois C, Jonquiere M, Le PK. On the nosology of severe psychiatric post-partum disorders. Results of a catamnestic investigation.Eur Arch Psychiatry NeurolSci 984;234:54–63.

Seguin L, Potvin L, St Denis M, Loiselle J. Depressive symptoms in the late postpartum among low socioeconomic status women. Birth 1999;26:157–63.

Shah, D. K., Wig, N. N., &Akhtar, S. (1971). Status of postpartum mental illness in psychiatric nosology. *Indian J Psychiatry, 13*, 14-20.

Spanier, G. B. (1976). Measuring dyadic adjustment: new scales for assessing the quality of marriage and similar dyads. *Journal of Marriage and the Family, 38*, 15-28.

Stern, G. &Kruckman, L. (1983). Multi-disciplinary perspectives on post-partum depression: ananthropological critique. *SocSci.Med., 17*, 1027-1041.

Stewart J.W, Bruder G.E, McGrath PJ et al: Do age of onset and course of illness define biological distinct groups within atypical depression? J Abnormal Psychology 112: 253-262, 2003.

Stewart, D. E. (2001). Women and selective serotonin receptor inhibitor antidepressants in the real world. *Medscape Womens Health, 6*(3), 1.

Taherifard P, Delpisheh A, Shirali R, Afkhamzadeh A, VeisaniY. Socioeconomic, psychiatric and materiality determinants andrisk of postpartum depression in border city of Ilam, Western Iran.Depress Res Treat 2013; Epub ahead of print.

Thorpe, K. J., Dragonas, T., & Golding, J. (1992). The effects of psychological factors on the mother's emotional well-being during early parenthood:A cross-sectional study of Britain and Greece. J.Reprod Infant Psychol., 10, 205-217.

Wan EY, Moyer CA, Harlow SD, Fan Z, Jie Y, Yang H.Postpartum depression and traditional postpartum care in China:role of zuoyuezi. Int J GynaecolObstet2009;

Warner, R., Appleby, L., Whitton, A., &Faragher, B. (1996). Demographic and obstetric risk factors for postnatal psychiatric morbidity. *British Journal of Psychiatry, 168*, 607611.

Watson, E. & Evans, S. J. (1986). An example of cross-cultural measurement of psychological symptoms in post-partum mothers. *Soc.Sci.Med., 23*, 869-874.

Weich, S., Churchill, R., Lewis, G., & Mann, A. (1997). Do socio-economic risk factors predict the incidence and maintenance of psychiatric disorder in primary care? *Psychological Medicine, 27*, 73-80.

Whitton, A., Appleby, L., & Warner, R. (1996). Maternal thinking and the treatment of postnatal depression. *International Review of Psychiatry, 8*(1), 73-78.

Wisner, K. L., Parry, B. L., &Piontek, C. M. (2002). Clinical practice. Postpartum depression. *N.Engl.J.Med., 347,* 194-199.

Wisner, K. L., Parry, B. L., &Piontek, C. M. (2002). Postpartum depression. *New England Journal of Medicine, 347*(3), 194-199.

Wisner, K., Peindl, K., Perel, J., Hanusa, B., Piontek, C., &Findling, R. (2002). *Sertraline prevents postpartum depression.* Paper presented at the TheMarce Society International Biennial Scientific Meeting, Sydney, Australia.

World Health Organization. The World Health Report 2001: determinants of mental and behavioral disorders. Web site, 2001. World Health Organization. Available at: http://www.who.int/whr2001/ 2001/main/en/chapter2/0021.htm.

World Health Organization–U.N. Fund for Population Activities. (2007). UNFPA-WHO consensus statement on maternal mental health and child survival/health/development in resource-constrained settings for achieving the millennium development goals. Geneva, Switzerland: WHO.

Yonkers KA, Ramin SM, Rush AJ et al. (2001). Onset and persistence of postpartum depression in an inner-city maternal health clinic system. Am J Psychiatry 158(11):1856-1863. - See more at: http://www.psychiatrictimes.com/articles/psychosocial-approach-postpartumdepression#sthash.y9uWhbvW.dpuf

Youn JH, Jeong IS. Predictors of postpartum depression:prospective cohort study. J Korean AcadNurs2013; 43(2): 225-235.

APPENDICES
Appendix: 1: QUESTIONNAIRE

The researcher is a final year post graduate student of the Kwame Nkrumah University of Science and Technology, Kumasi, who is conducting a study on the risk factors for postpartum depression on patients at KomfoAnokye Teaching Hospital. It would be very much appreciated if you could be as honest as possible in providing answers to the questions. All information provided would be used only for research purposes. Confidentiality would be greatly assured.

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF MEDICAL SCIENCES

DEPARTMENT OF COMMUNITY HEALTH

Good day Madam,

We are a research team conducting a research on the factors influencing postpartum depression amongst post natal mothers attending the post-natal clinic at the Komfo Anokye Teaching Hospital, Kumasi.

We request your kind assistance in completing this research. It would be appreciated if you could spend a few minutes of your time to kindly respond to the items on the questionnaire. Please read all the questions and options given carefully and, follow the correct instructions at each section.

Please note that the information is being used for research purposes, therefore all information collected is confidential and as such will be kept secure by all researchers. You may begin to answer the questionnaire after reading and signing/thumb printing the informed consent form.

Thank you very much for your cooperation.

TOPIC: ASSESSING THE RISK FACTORS INFLUENCING WOMEN DEVELOPING POSTPARTUM DEPRESION AT KOMFO ANOKYE TEACHING HOSPITAL

TARGET GROUP: WOMEN BETWEEN THE AGES OF 15-49 YEARS WHO HAVE DELIVERED FROM FIRST DAY OF DELIVERY TO 6 WEEKS POSTPARTUM AND RECEIVING CARE AT THE KOMFO ANOKYE TEACHING HOSPITAL.

DATE OF INTERVIEW: ……..

INTERVIEWER NAME: ……..

PARTICIPANT CODE:

SECTION 1: DEMOGRAPHIC INFORMATION			
Questions		Response	Code
A	How old were you on your last birthday? (in years)	----------	
B	What is your ethnic background?	Akan Ga/Dangme Ewe Guan Mole /Dagbani Hausa Other Refused	1 2 3 4 5 6 7 8
C	Are you currently married or living together with a man as if married?	No, never in union Yes, currently married Yes, living with a man but not married Not currently in union: Divorced/Separated Not currently in union: Widow	1 2 3 4 5

D	What is the highest level of school you have attended?	Never Attended Primary Middle / JSS/JSH Secondary / SSS/SHS Higher	1 2 3 4 5
E	Over the past year, what has been the average monthly income from all sources?	Less than GH CEDIS 200.00 GH Cedis 200.00 to less than GH Cedis 500.00 GH Cedis 500 to less than GH Cedis 1000 GH Cedis 1000 to less than GH Cedis 1500 More than or equal to GH Cedis 1500	1 2 3 4 5
F	What is your current occupation?	Unemployed Housewife Trader Student Civil servant (doctor, nurse, teacher, e.t.c) Other (please specify)……	1 2 3 4 5 6
G	Religious affiliation *the* *(Please circle corresponding number)*	Christian Moslem Traditionalist Other (please specify)……	1 2 3 4
H	How many weeks postpartum are you?	1 week 2 weeks 3 weeks	1 2 3

		4 weeks 5 weeks 6 weeks	4 5 6
SECTION 2: KNOWLEDGE ABOUT POST PARTUM DEPRESSION *(Please circle the corresponding numbers)*			
Questions		Response	Code
H	Have you ever heard of postpartum depression?	YES NO	1 2
I	Where did you obtain your information about post partum depression?	Family and friends Health facility/professional/activity/event Mass media(radio, TV, newspaper, internet etc.) Other……	1 2 3 4
J	In your own words, how would you explain postpartum depression? --- --- --- ---		
K	When do you think a woman can develop post partum depression?	Only immediately after delivery After delivery till 6 weeks Only after 6 weeks following delivery Don't know	1 2 3 4

L	In your own words, what could be the signs and symptoms of post partum delivery? ---------- ----------		
M	Are there treatments/a cure for postpartum depression?	YES, there is treatment but no cure YES, there is a cure NO, there is no treatment or cure DON'T KNOW	1 2 3 4
N	Do you believe there are factors that could influence/cause postpartum depression in a woman?	YES NO DON'T KNOW	1 2 3

O	Which of these factors could influence/cause postpartum depression in a woman?	Stress/mood changes	1
		History of depression	2
		Family history of postpartum depression	3
		Poor partner relationship/support	4
		Pregnancy complications and outcome	5
		Poor social support	6
		Poor socioeconomic status	7
		Other……	8

SECTION 3: RISK FACTORS INFORMATION		
Questions	Response	Code
Section 3.1: Mood Changes		

P	Did you suffer from moderate to severe mood changes/swings before you got pregnant?	All the time Sometimes Never	1 2 3
	Did you suffer from moderate to severe mood changes/swings during the pregnancy?	All the time Sometimes Never	1 2 3
	Have you suffered/ are suffering from moderate to severe mood changes/swings since you have delivered?	All the time Sometimes Never	1 2 3
Section 3.2: Delivery Outcome *(The questions below concern sensitive issues. Kindly note that there is the option of refusing to answer the questions. Refusal will not affect your participation).*			
Q	Was your baby born with any congenital diseases, or malformations or was your baby admitted at NICU?	Yes No Refused	1 2 3
R	What was the birth weight of your baby?		

S	Is your baby the sex/gender that you wanted/hoped to have before and during your pregnancy?	Yes No Didn't have any specific hope Refused	1 2 3 4
Section 3.3: Obstetric Factors *(The questions below concern sensitive issues. Kindly note that there is the option of refusing to answer the questions . Refusal will not affect your participation).*			
T	Was this pregnancy planned?	Yes No Somewhat Refused	1 2 3 4
	If YES, was this pregnancy wanted?	Yes No Somewhat Refused	1 2 3 4
U	How did you deliver this baby?	Safe vaginal delivery (SVD) at home Safe Vaginal delivery at a health facility	1 2

		Elective caesarean section	3
		Emergency caesarean section	4
V	Were there any complications either with you or the baby during delivery?	No, nothing with either of us	1
		Yes, complications with me	2
		Yes, complications with the baby	3
		Refused	4
Questions		Response	Code
SECTION 4: PARTNER RELATIONSHIP/SUPPORT			
W	How would you rate your emotional relationship with your baby's father? (In your opinion, does he provide the necessary emotional support you need)	Extremely dissatisfying	1
		Very dissatisfying	2
		Somewhat dissatisfying	3
		Somewhat satisfying	4
		Very satisfying	5
		Extremely satisfying	6
		Don't know	7

X	Does the father of your baby provide support in taking care of the baby's everyday needs	Very supportive Somewhat supportive Very unsupportive	1 2 3
	(Example; feeding the baby, bathing the baby, carrying the baby around, putting the baby to sleep etc)	Somewhat unsupportive Don't know	4 5
Y	Is the father of you baby part of you and the baby's life?	YES (he's fully part of our lives) NO (he's not part of our lives at all) SOMEWHAT (he's only part of some aspects)	1 2 3
Z	Does the father of your baby provide financial support for you and the baby? In your opinion, is the money he provides sufficient for the proper upkeep and care of your baby?	YES NO Very sufficient Somewhat sufficient Somewhat insufficient Not sufficient at all	1 2 1 2 3 4

EDINBURGH POSTNATAL DEPRESSION SCALE In the past week I have been able to laugh and see the funny side of things:

- As much as I always could
- Not quite so much now
- Definitely not so much now
- Not at all

In the past week I have looked forward with enjoyment to things:

- As much as I ever did
- Rather less than I used to
- Definitely less than I used to
- Hardly at all

In the past week I have blamed myself unnecessarily when things went wrong:

- Yes, most of the time
- Yes, some of the time
- Not very often
- No, never

In the past week I have been anxious or worried for no good reason:

- No, not at all
- Hardly ever
- Yes, sometimes
- Yes, very often

In the last week I have felt scared or panicky for no very good reason:

- Yes, quite a lot
- Yes, sometimes
- No, not much
- No, not at all

In the past week things have been getting on top of me:

- Yes, most of the time I haven't been able to cope at all
- Yes, sometimes I haven't been coping as well as usual
- No, most of the time I have coped quite well

- No, I have been coping as well as ever

In the past week I have been so unhappy that I have difficulty sleeping:

- Yes, most of the time
- Yes, sometimes
- Not very often
- No, not at all

In the past week I have felt sad or miserable:

- Yes, most of the time
- Yes, quite often
- Not very often
- No, not at all

In the past week I have been so unhappy that I have been crying:

- Yes, most of the time
- Yes, quite often
- Only occasionally
- No, never

In the past week the thought of harming myself has occurred to me:

- Yes, quite often
- Sometimes
- Hardly ever
- Never

THANK YOU FOR YOUR COOPERATION!