ASSESSMENT OF COMMON PERINATAL MENTAL DISORDERS IN A SELECTED DISTRICT HOSPITAL OF THE EASTERN PROVINCE IN RWANDA

By

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KEYWORDS

Antenatal anxiety

Antenatal depression

Common perinatal mental disorders

Edinburgh Postnatal Depression Scale (EPDS)

Perinatal mental health

Perinatal period

Postnatal anxiety

Postnatal depression

Rwanda

Self-rating Anxiety Scale (SAS)

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ABSTRACT

Common perinatal mental disorders (CPMDs) are increasingly being recognised as an important public health issue including depression and anxiety. In low and middle income countries such as Rwanda, CPMDs are prevalent among women in perinatal period. In Africa, the estimated prevalence rates of depression are 11.3% and 18.3% during ante-postnatal respectively, while ante-postnatal anxiety rates are 14.8% and 14% respectively. However, in Rwanda there is limited literature on CPMDs.

This study was aimed at determining the occurrence of CPMDs in a selected district hospital of the Eastern Province in Rwanda as well as the factors associated with CPMDs in the selected study area. A descriptive quantitative cross-sectional survey was conducted with a sample of one hundred and sixty five mothers in perinatal period, who were selected systematically. Demographic data and factors associated with CPMDs were determined using structured questionnaire and combined screening tools such as Zungu Self-rating anxiety scale (SAS) and Edinburgh Postnatal Depression Scale (EPDS). The Cronbach alpha values were 0.87 and 0.89 for SAS and EPDS respectively. SPSS Version 21 was utilized to analyse data.

Univariate, bivariate correlational and multivariate analyses were performed. Most of the respondents (38.2%) were aged 25-29 years; Protestants (77.6%); married (44.8%); unemployed (77%) and had a primary school level of education (60.6%). With respect to participants in antenatal period (51.5%); 14.5% had a clinical level of anxiety and 19.4% had depression. In terms of participants in postnatal period (46.7%); 22.5% had a clinical level of anxiety and 29.7% had depression. However, participants in both periods (1.8%) all had a normal level of anxiety and 1.2% had depression.

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Results revealed that there is statistically significant relationship between EPDS scores and marital status ($\chi^2_{(3)} = 17.559$, p= .001), level of education ($\chi^2_{(3)} = 16.857$, p= .001). It is confirmed that there is statistically significant association between SAS scores and husband/partner relationship ($\chi^2_{(2)} = 12.045$, p= .002) and EPDS as well ($\chi^2_{(1)} = 38.207$, p= .000). So far, significant relationship between SAS scores and husbands' behaviour ($\chi^2_{(8)} = 16.401$, p= .037) was found, the same with EPDS ($\chi^2_{(4)} = 43.242$, p= .000). There is significant association linked to number of children and CPMDs ($\chi^2_{(8)} = 16.017$, p= .042 & $\chi^2_{(4)} = 18.554$, p= .001), anxiety and depression respectively. The analysis also demonstrated a link between personal stressful events and CPMDs ($\chi^2_{(14)} = 55.035$, p= .000 & $\chi^2_{(7)} = 30.232$, p= .000), anxiety and depression respectively.

The findings from the logistic regression indicate that the relationship with husband was the only predictor of perinatal anxiety with Odd ration= 0.437<1, Confidence interval (CI) = 0.211-0.905). Moreover, the results indicate that age was the strongest determinants of perinatal depression (Odd ratio: 131.973>1, C.I. = 4.604- 3782.816).

In sum, CPMDs are thus prevalent and need to be given attention in order to prevent further complications they may cause on mothers and their infants.

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DECLARATION

I declare that "*Assessment of common perinatal mental disorders in a selected district hospital of the Eastern Province in Rwanda"* is my own work, that it has not been submitted for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged by complete references.

MARIE PROVIDENCE UMUZIGA **June 2014**

Signature.....

DEDICATION

This study is dedicated to my husband Mugabo Jean-Clément, our sons and daughters Mugabo I. Armand, Mugabo I. Arsène, Mugabo K. Trissa, Mugabo K. Sheina and my parents; Kiroha Antoine and Ryumuyange Concessa.

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ABBREVIATIONS

ANA:	Antenatal anxiety
AND:	Antenatal depression
CPMDs:	Common Perinatal Mental Disorders
EPDS:	Edinburgh Postnatal Depression Scale
KHI:	Kigali Health Institute
LMIC:	Low and Middle Income Country
PNA:	Postnatal anxiety
PND:	Postnatal depression
SAS:	Zung Self-rating Anxiety Scale
SPSS:	Statistical Package for Social Sciences
UWC:	University of the Western Cape
WHO:	World Health Organization
WA:	Western Australia
UNFPA:	United Nations Funds for Population Activities

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CHAPTER ONE: INTRODUCTION

1.1 Background of the study

Common perinatal mental disorders (CPMDs) in women are increasingly being recognized as a significant public health concern (Rahaman et al. 2013, p. 593). CPMDs are associated with reduced social participation and care-giving capacity (Harvey et al. 2012, p. 76; Fisher et al. 2010, p. 737). CPMDs include depression and anxiety occurring in pregnancy and postnatal period (Giardinelli et al. 2012, p. 22; Fisher et al. 2011a, p.2 & Hanlon et al. 2008, p. 252).

According to Western Australian (WA) Perinatal Mental Health Unit (2011, p. 4), the prevalence rates of antenatal depression range from 8 to 15%, while post natal depression range from 10 to 15%. It has been suggested that rates of first onset and severe depression are three times higher in the postnatal period than in other periods of women's lives (UNFPA & WHO, 2008, p. 3). Furthermore, about 14-16% of women have a clinical level of anxiety during their pregnancy, while 8-10% of women will have clinical levels of anxiety postnatal (WA Perinatal Mental Health Unit, 2011, p. 5).

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In Africa, the estimated prevalence rates of depression are 11.3% and 18.3% during ante- postnatal respectively, while prevalence rates of pre-postnatal anxiety are 14.8% and 14% respectively (Sawyer et al. 2010, p. 22). Hanlon et al. (2008, p. 252) indicated that the estimated prevalence of CPMD in sub-Saharan Africa ranges from 12.5 to 27.1% in pregnancy and from 10.0 to 34.5% postnatally.

In a low-income, informal settlement outside of Cape Town, 39% of pregnant women screened positive on the Edinburgh Postnatal Depression Scale (EPDS) for depressed mood and 34.7% of postnatal women were diagnosed with depression (Hartley et al. 2011, p. 3). Additionally, Stewart

et al. (2009, p. 1) reported that CPMD is a significant health burden among women with infants in rural Malawi, and is associated with poverty, relationship difficulties, and infant health problems. In a study conducted in Uganda; 43% of the participants were found to have postpartum depressive symptoms on the Edinburgh Postnatal Depression Scale (EPDS) (Kakyo et al. 2011, p. 1).

In Rwanda, there is limited evidence in the literature highlighting CPMDs; available literatures indicate that mental health problems are prevalent in the Rwandan population.

Munyandamutsa and Mahoro (2009, p.5) reported that, 2.65 million people (approximately 28.54%) of the total population in Rwanda have in some way suffered from post-traumatic stress disorder (PTSD). Also a study assessing the prevalence of depression and PTSD disorders among HIV infected women in Rwanda by Cohen et al. (2009, p. 1783), found that depressive symptoms were higher among HIV-infected women (81%) compared to HIV- negative women (65%). Systematic reviews reported that depression and anxiety are commonly experienced by women during antenatal or postnatal period (Fisher et al. 2012, p. 139 & Sawyer et al. 2010, p. 18), thus the current study was including only depression and anxiety as the most prevalent mental disorders during perinatal period.

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1.2 Problem statement

Common perinatal mental disorders are increasingly recognised to be an important public health issues and can have serious consequences on women's long-term mental health (Rothera & Oates, 2011, p. 304). CPMDs include depression and anxiety occurring in pregnancy and postnatally (Fisher et al. 2012, p. 139). According to WHO (2009, p. 9), there is an increasing evidence that common mental health problems are two to three times more prevalent among pregnant women and mothers of infants in low income countries including Rwanda than in high-income countries.

In African countries including Rwanda CPMDs such as depression and anxiety during antenatal and postnatal period are prevalent (Sawyer et al. 2010, p. 22).

In Rwanda, anxiety and depression are common (Munyandamutsa & Mahoro 2009, p. 9 & Cohen et al. 2009, 1783). However, there is limited literature highlighting CPMDs. Furthermore, risk factors for maternal mental health problems include poverty, low education levels, negative life events, marital problems and prior mental health problems (Kakyo et al. 2011, p. 6; Sawyer et al. 2010, p. 26 & Patel et al. 2004, p. 820), all of which are widely prevalent in Rwanda. Consequently rates of common perinatal mental disorders may therefore be particularly high in the Rwandan context, and this requires to be verified through a process of research.

1.3 Purpose of the study

The purpose of this study is to determine common perinatal mental disorders in a selected district hospital of the Eastern Province in Rwanda.

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1.4 Research questions

- What are common perinatal mental disorders in a selected district hospital of the Eastern Province in Rwanda?
- What are the determinants of common perinatal mental disorders in the selected district hospital?

1.5 Research objectives

- Identify the common perinatal mental disorders in the selected district hospital of the Eastern Province in Rwanda.

- To describe determinants of common perinatal mental disorders in the district hospital.

1.6 Significance of the study

The research results indicated the common perinatal mental disorders and its determinants in Rwanda. Findings will be accessible to everyone concerned, especially the health professionals and administrative authorities working in the health sector in Rwanda. Having such available data will make it possible for the health authorities in Rwanda to design and apply appropriate interventions to address the needs of mothers in perinatal period. The research findings will be adding to a limited body of knowledge concerning CPMD in Rwanda. Results will act as baseline for the funding project of Maternal Newborn and Child Health in Rwanda and this will make the project to determine new areas for project extension particularly focusing on CPMDs in Rwanda.

1.7 Definition of key concepts

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1.7.1 Perinatal period

The perinatal period refers to the time around a baby's birth, including pregnancy and up to one year after birth (McCaul & Stokes, 2011, p. 17).

1.7.2 Perinatal mental health

As perinatal period is described as being from conception to one year following birth, hence perinatal mental health deals with the mental health of women during pregnancy, childbirth and the first postnatal year. Perinatal mental health includes not only perinatal mental illness, but also the problems faced by women with pre-existing psychiatric disorder who become pregnant and the

effects of the disorders and their treatment on the unborn and developing child (Mwape et al. 2012 p. 1; Austin, 2010, p. 41). This study focused on pregnant women and mothers of infants.

1.7.2 Common perinatal mental disorders

Common perinatal mental disorders within this study are defined as the most prevalent mental disorders during perinatal period and these include depression and anxiety occurring in pregnancy and postnatal period.

1.8 Chapter outline

The thesis is divided into five main chapters as follows; the first chapter which constituted the Introduction presents among others the background to the study, problem statement, purpose, research questions, objectives, significance and definition of key concepts. Chapter Two discusses the literature review and conceptual framework. Chapter Three presents the research methodology, research design, setting, population, sample size determination and sampling procedure, inclusion criteria, data collection and analysis. The fourth chapter highlights the presentation and interpretation of the results, while the fifth chapter provides the discussion of the study, conclusion and recommendations.

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1.9 Conclusion

This chapter provided an overview of the study. It covered the background of the study; the problem statement, significance of the study, purpose, research questions and objectives. It also presented the definition of key terms and gave the outline of the study. The next chapter provides a review of relevant literature that informs the study.

CHAPTER TWO: LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

2.1 Introduction

This chapter is divided into two main sections, namely; literature review and conceptual framework. The literature review discusses specific aspects related to Common Perinatal Mental Disorders (CPMDs) such as perinatal anxiety and depression which represent the areas of focus for this study. The literature review also includes risk factors associated with CPMDs. According to Grove, Burns and Gray (2013, p. 97), literature review is an organized written presentation of what has been found through reviewing the literature, directs the development and implementation of the study in quantitative research and includes both theoretical and empirical sources that document the current knowledge of the problem. These scholars are of the view that the theoretical component consists of theories, models and conceptual frameworks while the empirical component consists of sources from various studies published in journals, books and theses (p. 99). Therefore, resources that can provide adequate information were accessed and included databases such as *CINAHL Plus*, MEDLINE, PubMed, Science direct, *PsycARTICLE,* Women's Studies International, the World Health Organization and other resources such as books, journals as well as previous theses and dissertations related to the topic of this study.

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2.2 Literature review

Mental health problems associated with pregnancy and postnatal period are not uncommon (Rahman et al. 2012, p. 593). In women, common perinatal mental disorders are associated with reduced social participation and caregiving capacity and constitute a significant public health problem (Fisher et al. 2010, p. 737). For some women they may experience disturbances in their

mental wellbeing but for others it may be a reoccurrence of previous difficulties which may be exacerbated (Patience et al. 2010, p. 10). Perinatal mental illnesses are widespread and are one of the leading causes of maternal deaths and mortality (Harvey et al. 2012, p. 75; Rothera, & Oates, 2011, p. 304).

Additionally, the prevalence of common perinatal mental disorders in Low and Middle Income Countries (LMICs) is higher than in High Income Countries (HIC), and is more likely to be persistent (UNFPA & WHO, 2008, p. 3 & Hanlon et al. 2008, p. 253).

Patel and Prince (2006, p. 284) added that depression and anxiety decisively contribute to the high burden of health risks faced by mothers and their offspring around birth in LMICs. Recent systematic reviews by Fisher et al. (2012, p. 139) and Sawyer et al. (2010, p. 22) also reported that depression and anxiety are commonly experienced by women during ante- or postnatal period. Thus the current study discusses only on depression and anxiety as the most commonly reported mental disorders during perinatal period.

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2.2.1 The perinatal period

The perinatal period is one of rapid biological, social, and emotional change, when women are highly vulnerable physically, emotionally, and psychologically (Harvey et al. 2012, p. 75). This period has been described by Highet et al. (2011, p 224), as being from conception to one year following birth.

According to Mwape et al. (2012, p1), the perinatal period has been considered as a time of crisis brought about by emotional, psychological and social stress, and for many women it can be a time of heightened risk for mental health and emotional responses. Moreover, the same authors

maintain that the transition to motherhood is said to be associated with a decline in personal well-being and a general increase in distress resulting from the magnitude of adjustments made as a result of the changes that occur during this period; depressive symptoms, hostility and heightened anxiety have been reported during the transition (p.2). However, women in the perinatal period may be increasingly vulnerable to CPMDs, for some a pre-existing common mental disorder such as depression and anxiety can be exacerbated (Patience et al. 2010, p. 10), and for others, the perinatal period might bring the first experience of mental difficulties and psychological distress (Mwape et al. 2012, p. 3).

Common perinatal mental disorders disturb bio-psychosocial adaptation to pregnancy and disable women with regards to everyday functioning, family and community life requirements, and women are known to be more vulnerable to common mental disorders (CMD) than men (Bindt et al. 2012, p. 2).

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2.2.2 Overview of Common Perinatal Mental Disorders

According to WHO (2009, p3), when a firm diagnosis of a psychiatric disorder is made, the most frequently found condition both during pregnancy and after childbirth is depression followed by anxiety disorders. The WHO (2008a, p. 2) highlighted that mental health problems such as depression and anxiety are very common during pregnancy and after childbirth in all parts of the world. One in three to one in five women in developing countries, and about one in ten in developed countries, have a significant mental health problem during pregnancy and after childbirth (WHO, 2008b, p. 3). For example, high rates of mental health problems in pregnant women and mothers of infants have been reported from many countries in Africa such as Ethiopia, Nigeria, Senegal, South Africa, Uganda, Zimbabwe and many others (WHO, 2008b, p. 2).

In Africa, the estimate prevalence rates of depression are 11.3% and 18.3% during ante- postnatal period respectively; while prevalence rates of ante-postnatal anxiety are 14.8% and 14%, respectively (Sawyer et al. 2010, p. 22). In sub-Saharan Africa, Hanlon et al. (2008, p. 252) pointed out that the estimated prevalence of CPMDs ranges from 12.5 to 27.1% in pregnancy and from 10.0 to 34.5% postnatally.

In Rwanda, little is known about mental health problems among mothers in perinatal period; only a few studies examined the mental health status of Rwanda's post-genocide population, but all show high rates of mental health disorders, particularly depression and PTSD (Scholte et al. 2011, p. 2; Munyandamutsa & Mahoro, 2009, p.5 & Cohen et al. 2009, p. 1783).

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2.2.2.1 Perinatal depression

Depression related to child bearing can occur during pregnancy (antenatal depression; AND), after birth (postnatal depression; PND), or both (Giardinelli et al. 2012, p. 21; Leigh & Milgrom 2008, p. 9). The WHO (1994) International Classification of Diseases (ICD-10) describes depression as the persistent presence for at least two weeks of a sad lowered mood, loss of interest in activities usually experienced as pleasurable, reduced energy, and at least two other symptoms including diminished concentration; reduced self-confidence; guilt; a bleak and pessimistic view of the future; ideas or acts of self-harm or suicide; disturbed sleep and diminished appetite. Therefore, symptoms of perinatal depression do not differ from symptoms identified in ICD-10.

Patience et al. (2010, p. 9) indicate that antenatal depression (AND) is thought to affect one in ten pregnant women and has found to peak at 32 weeks of pregnancy. They continued that the AND includes symptoms of depression such as inability to concentrate, extreme irritability with others

and self, sleeping and eating disturbances, feeling tired all of the time, inability to enjoy anything anymore, constant sadness crying more than usual, scared to leave the house or be in social situation (p 10). Postnatal depression has been described as a depressive episode experienced longer than two weeks after birth or sometimes months later during the first year after birth; it is manifested by powerlessness, despair, and extremely dependent, low libido, fatigue, tearful for no specific reason and absurd fear that the baby is in danger or something will happen to the baby (Abrahams 2011, p. 13).

Furthermore, estimates of the prevalence and incidence of perinatal depression vary widely (from 5% to more than 25% of pregnant women and mothers of infants) depending on the assessment method, the timing of the assessment, and population characteristics (Giardinelli et al. 2012, p. 21). However, systematic reviews have concluded that 10 to 15% of women from industrialized countries experience major depression in pregnancy while in resource-constrained settings rates were found two to three times higher (Fisher et al. 2011a, p3).

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Similarly, Sawyer et al. (2010, p. 22) contend that the prevalence of PND is between 10 and 15% while antenatal depression prevalence ranges from 8.5% to 11% at different times during pregnancy in Western Countries while in Africa the estimate prevalence rates of depression are 11.3% and 18.3% during antenatal and postnatal periods respectively; indicating that the prevalence of PND and AND might be similar to postnatal levels. This is confirmed by WA Perinatal Mental Health Unit's (2011, p. 4) reporting that the prevalence rates of antenatal depression range from 8 to 15% while postnatal depression range from 10 to 15%. It has been suggested so far that rates of first onset and severe depression are three times higher in the postnatal period than in other periods of women's lives (UNFPA & WHO 2008, p. 3).

Besides, recent studies (Manikkam & Burns, 2012, p. 941; Rochat et al. 2011, p. 362; Kakyo et al. 2011, p. 5) reported that perinatal depression is prevalent in rural areas. In a low-income, informal settlement outside of Cape Town, 39% of pregnant women screened positive on the Edinburgh Postnatal Depression Scale (EPDS) for depressed mood and 34.7% of postnatal women were diagnosed with depression (Hartley et al. 2011, p.1). In a study conducted in a rural district of Uganda, 43% of the participants were found to have postpartum depressive symptoms on the EPDS (Kakyo et al. 2011, p.1) while in the urban area PND prevalence reported was only 6.1% of mothers (Nakku et al. 2006, p. 207).

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2.2.2.2. Perinatal anxiety

According to the WA Perinatal Mental Health Unit (2011, p. 3), anxiety in perinatal period has the same symptoms as anxiety at other times; symptoms may include feeling restless, nervous, nauseous; finding it hard to relax; having a racing mind, a churning stomach and feeling a sense of dread. Yiu et al. (2009, p. 113) pointed out that the focus of antenatal anxiety could be: fear of foetal abnormalities, foetal loss, stillbirth (especially after previous reproductive abnormalities and losses), childbirth and inadequacy as a mother; while the focus of postnatal anxiety include: fear of the newborn, based on the awesome responsibility of care; some mothers develop infant-focused anxiety, or obsessive impulses and thoughts, with phobias about the baby. Mothers are excessively troubled about the health and safety of their children. Fisher et al. (2011a, p. 3) added that perinatal anxiety symptoms can include panic attacks, hyperventilation, excessive worry, restless sleep, and repeated thoughts or images of frightening things happening to the baby.

Sawyer et al. (2010, p.21) stress that there is a limited research into the range of perinatal anxiety disorders and there is no homogeneous data that considering anxiety disorders during perinatal period (Giardinelli et al. 2012, p. 22). However, a growing body of research suggests that anxiety disorders in perinatal period are at least as disruptive as depression and possibly more prevalent (Swalm et al. 2010, p. 515). In African context, Sawyer et al. (2010, p. 22) found that ante-postnatal anxiety prevalence rates were 14.8% and 14%, respectively, while the prevalence rate of postnatal anxiety in Nigeria using the Zung Self-rating Anxiety Scale (SAS) was 13.4% (Adewuya & Afolabi, 2005, p. 257). The study of Borri et al. (2008, p. 1617) reported a prevalence of 21.7% for anxiety during pregnancy, confirmed by the study of Grant et al. (2008, p. 101) that shows a value of 21%. Additionally, other studies using different screening tools reported a high prevalence of anxiety in antenatal period (24.7%) (Giardinelli et al. 2012, p. 21) than in postnatal (16.2%) (Austin et al. 2010, p. 395). Furthermore, WA Perinatal Mental Health Unit (2011, p. 4) reported that about 14-16% of women have clinical levels of anxiety during their pregnancy; while 8-10% of women will have clinical levels of anxiety postnatally.

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2.1. 2 Determinants of common perinatal mental disorders

Risk factors for common perinatal mental disorders are generally similar to those for mental disorders outside the perinatal period (Haward et al. 2013, p. 1). Indeed, the state of a person's wellbeing is affected by complex interaction of the internal and external factors and is sensitive to stressors mediated by a person's biology, neurochemistry, psychosocial and environmental factors. Purdie, Dudgeon and Walker (2010, p. 229) emphasized that physiologically, alterations in cerebral serotonin and noradrenalin metabolism and uptake, and hormonal changes, along with the interplay of psychosocial stressors such as stress of pregnancy, childbirth and constant caring for

an infant, lack of support, concerns about the infant, sleep deprivation, and financial worries may lead to syndrome of anxiety and depression.

It has been stated that the family is the central point from which society derive its strength and forge the future (Purdie et al. 2010, p. 230). However, recent studies (Abrahams 2011, p. 42; Fisher et al. 2011b, p. 143), reported that lack of support from nuclear family and death in the family were associated with CPMDs. Community-based studies show that women in the antenatal period are not significantly more vulnerable to depression than their non-pregnant or postnatal counterparts (Vesga-Lopez et al. 2008, p. 606). However, Giardinelli et al. (2012, p. 21) reported that women of low-income and those living in low and middle income countries are known to be at particularly high risk of both antenatal and postnatal depression.

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Haward et al. (2013, p. 2) pointed out that previous research has found an association between mental disorder and being a victim of domestic violence (i.e., intimate partner violence and/or violence perpetrated by another family member). Giardinelli et al. (2012, p. 21) also emphasized that research indicates that abuse during and after pregnancy is associated with mental health problems in women during the perinatal period. According to a study conducted by Cerulli et al. (2011, p. 1797), mothers reporting intimate partner violence were more likely to be diagnosed with mood and/or anxiety diagnoses specifically depression and panic disorder, whilst Stramrood et al. (2011, p. 88) reported that emergency caesarean section, severe labor pain, and poor coping skills were associated with more posttraumatic stress symptoms. In addition, in a systematic review conducted by Fisher et al. (2012, p. 97), the risk of CPMDs was higher among women whose postpartum care was provided by their mothers-in-law or who had difficult in interpersonal

relationship with her in-laws, and also insufficient social support, lack of affectionate and trusting relationship with their own mothers.

A systematic review and meta-analysis found that high levels of symptoms of all types of perinatal mental disorders (anxiety and depression) were associated with having experienced domestic violence (Haward et al. 2013, p. 2). Moreover, Sawyer et al. (2010, p. 21) stressed that in comparison to socio-demographic and obstetric factors, psychosocial variables appear to play a more consistent role in postnatal psychological disorders. Social support in particular appears to be related to postnatal mental health. In line with that, Kakyo et al. (2011, p. 5) highlighted that women with postnatal depression were more likely than non-depressed women to report a lack of support from husband/partner and the antenatal anxiety represents an important risk factor for postnatal depression.

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Furthermore, some studies conducted in Africa (Abrahams, 2011, p. 42; Kakyo et al. 2011, p. 6 & Sawyer et al. 2010, p. 22; Nakku et al. 2006, p. 208) reported that common perinatal mental disorders were significantly associated with young age, being single, negative life events, unplanned pregnancy, unwanted sex of baby and current physical illness in both mother and newborn and lack of support from husband and family.

The WHO and UNFPA meeting (2008, p. 8) reported a non-exhaustive list of risk factors (many particularly relevant to LMICs and some cultures) which could explain the high prevalence of mental health problems in the perinatal period; this list includes during pregnancy: adolescent pregnancy, being unmarried or separated, unwanted pregnancy, marital relationship: unsupportive; polygamous, previous stillbirth or repeated miscarriage, nulliparity, poverty and lack of financial resources, lack of practical support, pregnancy as a result of rape, spouse/domestic violence,

difficult relationship with in-laws. After childbirth the same report includes: difficulties with husband's behaviour (physical violence; verbal abuse; alcohol use; being illiterate and unemployed; providing little assistance; rejecting the pregnancy), inability to confide in partner, poverty (low income; lack of personal income generating activity; inadequate housing), overcrowding and lack of privacy, unintended pregnancy, adolescent pregnancy, unmarried, antenatal depression or severe anxiety, illnesses during pregnancy, antenatal hospital admission, caesarean section, large number of children, infant unsettled, sick, not thriving, problematic relationship with in-law family (mother-in-law and sister-in-law), birth of a girl child in cultures over-valuing boy child, past psychiatric history and other stressful life events (p.9).

2.3 Conceptual Framework

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The Stress Vulnerability Model identified by Uys and Middleton (2010, p. 196) was used to sketch the study's theoretical framework. According to this model, the onset of a mental illness results from interactions among three factors namely: basic vulnerabilities (biological vulnerability), environmental stressors, and personal and environmental protectors (Uys & Middleton, 2010, p. 197). The model offers a framework within which to ground both the biomedical and psychosocial dimensions. Fisher et al. (2011a, p. 1) highlighted that CPMDs are multifactorially determined and in general a biopsychosocial aetiological model is proposed. They continued that individual psychological and biological factors cannot explain wide inter-and intra-country prevalence variations and social factors are predominant determinants.

The model postulates that the onset and course of mental health problems in women during the perinatal period can be viewed in terms of stress vulnerability. A variety of biological and psychological factors and personal and environmental stressors can influence a woman's

vulnerability to mental illness (Harvey et al. 2012, p. 76). The model guided the current research whereby the researcher identified different factors which may put a woman during the perinatal period at risk of getting a mental illness and served to determine common perinatal mental disorders which are the most prevalent in women during perinatal period (Fisher et al. 2011b, p. 139).

2.3.1 Basic vulnerability

Basic vulnerability can be referred to as biological vulnerability. In order for a person to develop a psychiatric disorder, he or she must have some biological tendency to that disorder. The actual amount of vulnerability varies from one person to the next, as does the severity of the disorder. According to Uys and Middleton (2010, p. 196), an individual's vulnerability is thought to be determined from genetic factors and early biological factors (such as exposure to viral infection or other diseases when the baby is in the womb, early environmental factors etc).

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2.3.2 Environmental stressors

Stressors are defined as transient or ambient events that demand adaptive changes from the individual and that challenge their existing coping and competence, and they include a range of events, situations and experiences that the individual perceives as stressful (Uys & Middleton, 2010, p. 196). Moreover, stress has an impact on vulnerability that can either trigger the onset of the disorder or worsen its course. It can be thought of as a response to life situations that require the individual to adapt or change. If the person is not capable of adapting to the stress, psychiatric symptoms will develop or worsen. Some examples of stressors include: life events (such as the

death of a loved one, exposure to traumatic event, child abuse and a major move), and tense relationships.

2.3.3 Personal and environmental protectors

Personal and environmental protectors are resources that act as a buffer against the effect of stress on vulnerability (Uys & Middleton, 2010). Personal protectors include self-competent beliefs about self, competence in problem-solving, managing emotions and interpersonal relations. People draw upon personal coping behaviours and environmental resources in striving to cope. Coping refers to the process of striving to master environmental stressors or challenges (Hankin & Abela, 2005, p. 32). Environmental protectors are resources outside of the person and which confer some degree of protection against stress, and these are supportive family members, friends and supportive living environments (Uys & Middleton, 2010).

Given the fact that there are many factors involved in this dynamic system, it is difficult to be precise about what amount of change in stressors or protectors will initiate the trajectory toward mental illness in a given person at a particular time. However, the effects of vulnerability and stressors on symptoms, coping and functional abilities are lessened by the presence and action of personal and environmental protective factors that exist within the person and their environment (Uys & Middleton, 2010, p. 197).

In addition, Hankin and Abela (2005, p. 32) indicated that there is a relationship between the experience of a stressful life events and the onset of depression or anxiety among mothers in perinatal period as it has been also reported in various studies cited above in this chapter.

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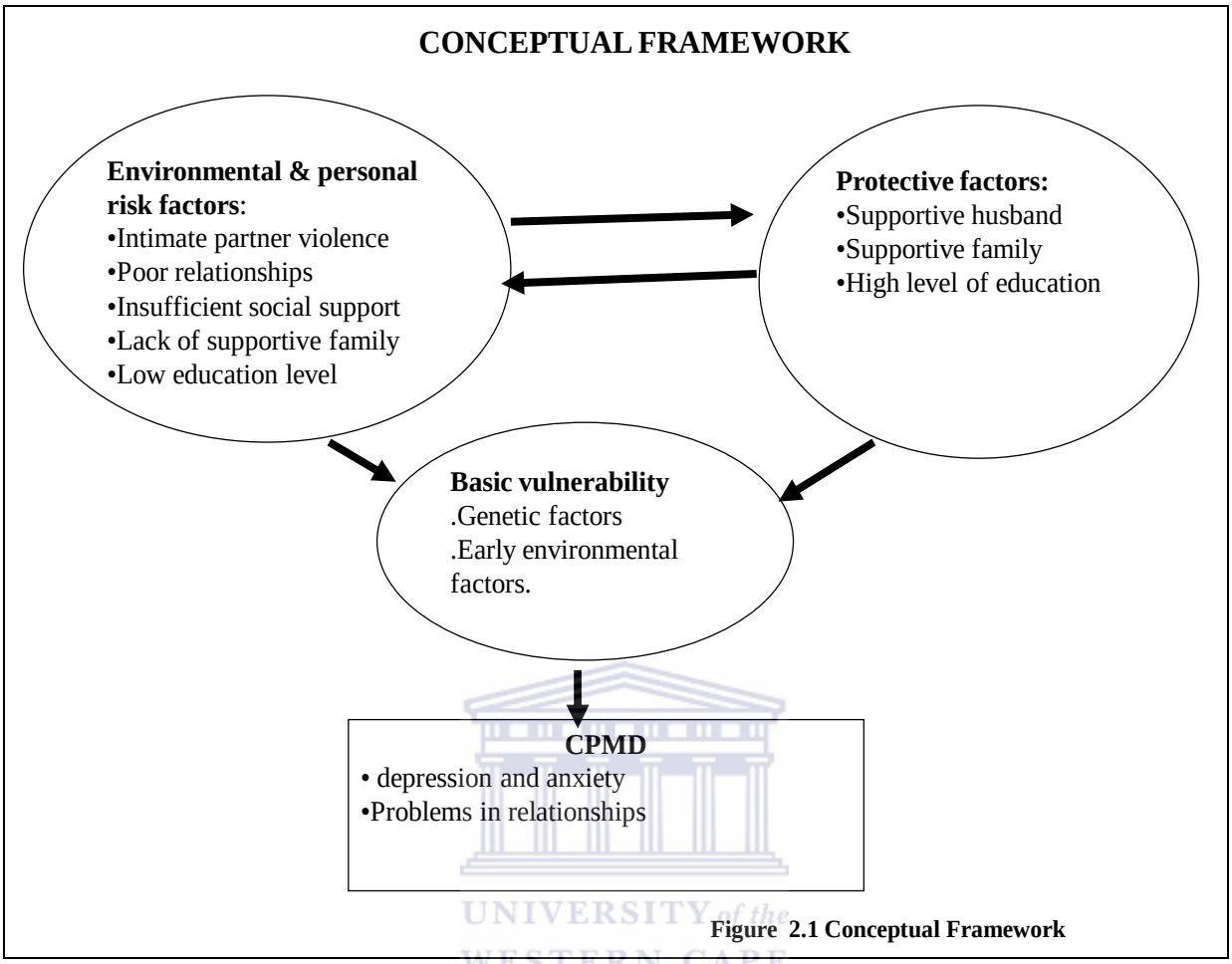

Figure 2.1 Conceptual Framework

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2.4 Conclusion

This chapter was aimed at searching supporting literature to describe the Common Perinatal Mental Disorders and its determinants. The conceptual framework which guided the study was also described. In the light of the above discussion, the perinatal period has been described as being from conception to one year following birth and it is one of rapid biological, social, and emotional change. This period has been also considered as a transition to motherhood which is said to be associated with a decline in personal well-being and a general increase in distress resulting

from the magnitude of adjustments made as a result of the changes that occur during this period; depressive symptoms, hostility and heightened anxiety have been reported during the transition.

Recent studies have suggested that depression and anxiety commonly experienced by women during ante- or postnatal period are public health concerns in LMICs and are associated with various risk factors such as environmental, social and personal stressful events. The WHO also reported that depression and anxiety are very common during pregnancy and after childbirth in all parts of the world; one in three to one in five women in developing countries including Rwanda, and about one in ten in developed countries, have a significant mental health problem during pregnancy and after childbirth. For example, high rates of mental health problems in pregnant women and mothers have been reported from many countries in Africa such as Ethiopia, Nigeria, Senegal, South Africa, Uganda, Zimbabwe and many others.

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In Africa, the estimated prevalence rates of depression are 11.3% and 18.3% during ante- postnatal period respectively; while prevalence rates of ante-postnatal anxiety are 14.8% and 14%, respectively. However, despite the extent of CPMDs and its consequences on maternal and child's health and development, little is known about mental health problems among mothers in perinatal period in Rwanda; only a few studies examined the mental health status of Rwanda's population, but all show high rates of mental health disorders, particularly depression and anxiety. Thus this study had only included these disorders as the most commonly reported by literatures. The next chapter describes the methodology applied for this study.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter focused on the research methodology and presents the research design, setting, population, sampling procedure, sample size determination, inclusion and exclusion criteria, data collection instrument, validity and reliability and data collection procedure. It also includes data analysis and ethical considerations for the study.

3. 2 Study design

A descriptive quantitative cross-sectional survey of pregnant women and mothers of infants was conducted to determine common perinatal mental disorders and describe their determinants in a selected district hospital of the Eastern Province in Rwanda. According to Grove et al. (2013, p. 220), a cross-sectional design examines a group of subjects in various stages of development, trends, patterns, and changes simultaneously with the intent to describe changes in the phenomenon across stages, and data on the selected variables are collected at a single point in time.

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3. 2 Study setting

This study was conducted at a district hospital that is located in one of seven administrative districts of the Eastern Province in Rwanda. The administrative district of this study setting comprises an area of 1337 Km^2 and borders Burundi on its southern edge (Logie, Rowson & Ndagije, 2008, p. 256). It has a population of 299,630 people, 53.2% of which is female and it is a

primarily rural district with one main town, serving as the district capital and has 14 health centers which function as primary health facilities (Joharifard et al. 2012, p. 2).

The Rwandan Ministry of Health's data suggest that 66.1% of women in the selected district, deliver in health facilities (national average = 69.2%, rank 16 of 30 districts), 97.4% attend at least one ANC visit (national average = 98.0%, rank 20 of 30 districts), and 21% attend at least four visits (national average = 35.4%, rank 29 of 30 districts) (MoH annual report, 2012, p. 24). Therefore, the selection of this district hospital as the setting for this research is based on the fact that it is located in a province which is assumed to be the most populated and has more marginal health indicators as compared to other districts in Rwanda (Joharifard et al. 2012, p. 3).

3.3 Study population

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The study population comprised of pregnant mothers attending antenatal care (ANC) and mothers of infants who gave birth in the selected district hospital. According to Grove et al. (2013, p. 351), a population is a particular group of people or type of elements that is the focus of the research and who meet sampling criteria. The 2012 annual report of the selected study area and the 2012 annual report of MoH have estimated a total number of 895 women per month who had been registered for ANC and delivered in the selected district hospital and this constituted the study population for this study.

3.4 Sampling procedure

To obtain the required sample, a systematic sampling technique was used. According to Polit and Beck (2006, p. 312), systematic sampling involves the selection of every *k*th individual on the list, using a randomly selected starting point selected randomly. The above authors also posit that by

dividing the population size by the desired sample size, the researcher establishes the sampling interval, which is the standard distance between the selected elements. Therefore, with 895 potential participants, one in every 5 women at the starting point, every 5^{th} client was admitted into the study.

3.5 Sample size determination

Based on the Cochran (1963, p. 75) formula mostly used in epidemiology, the formula for small populations was used to determine the sample required for analysis. This formula is as follows;

$$n = \frac{n_o}{1 + \frac{(n_o - 1)}{N}}$$

Where $n_o = \frac{Z^2 * P * Q}{e^2}$

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n_o is the sample size, Z equals the desired confidence level (1.96), P is the expected proportion of prevalence and Q =1-p, while e= the desired level of precision, n_o is the sample size for large population, Q=1-P, and N equals population size of the area under study.

In our study, Z=1.96, p= 0.61which is the estimated maximum prevalence of CPMDs in Sub Saharan Africa including Rwanda (Hanlon et al. 2008, p. 252), e= 0.07(Israel, 2009, p. 3) and N=895 which is the estimated number of the population for the current study (Rwanda Ministry of Health, 2012, p. 20) and this gives the approximated sample size of 128. We added 37 more questionnaires to increase the accuracy of our estimates; thus a sample size of 165 was used for analysis.

3.6 Inclusion and exclusion criteria

Women during childbirth and who have just delivered in the first two weeks postpartum were excluded because most women during this particular period experience unstable mood in the early weeks postpartum due to physiological changes (Fisher et al. 2010, p. 738). Only women who are more than 15 years of age and are pregnant or have a child up to one year of age were included. This inclusion criteria was based on the fact that in Sub-Saharan Africa including Rwanda the average rate of births per 1000 females 15-19 years of age is 143 which is very high compared to the world average of 65 (WHO, 2004, p. 5). Moreover, in developing countries teenage pregnancy (15-19 years) is an unresolved problem and they are at risk of perinatal complications including CPMDs (Sulaiman et al. 2013, p. 80, Coelho et al. 2013, p. 52). Women, who came to the clinic with other serious illnesses like tuberculosis and severe malaria etc., were excluded.

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3.7 Data collection

3.7.1 Data collection instrument

The main instrument constituted a questionnaire composed of two parts; the first part was designed by the researcher and sought to obtain information on socio-demographic characteristics of participants and determinants of common perinatal mental disorders. The content specifically included the variables such as age; perinatal period; religion; number of children, marital status; level of education; occupation of participants and planned pregnancy, nuclear family and information about husband (relationship, behaviour characteristics and occupation). This part also included personal stressful events.

The second part concerned with identifying participants' common perinatal mental disorders (anxiety and depression), adopted the following most widely validated screening tools for

depression and anxiety during perinatal period across a range of cultural settings (Fisher et al. 2010, p. 737; Hanlon et al. 2008, p. 252; Kakyo et al. 2012, p. 2; Tran et al. 2012 & Adewuya et al. 2005). The first screening tool is the Edinburgh Postnatal Depression Scale (EPDS) which is a screening instrument for depression in pregnancy and the postnatal period and is composed of 10 questions. Questions 1, 2, and 4 are scored 0, 1, 2, 3 with top box scored as 0 and the bottom box scored as 3. Questions 3, 5-10 are reverse scored with the top box scored as a 3 and the bottom box scored as 0. The maximum score is 30; for scores of 10 or greater possible depression is detected. The second screening tool is the Zungu Self-rating Anxiety Scale (SAS) for detection of anxiety, and it consists of 20 items noted on a 1-4 likert scale (based on these replies: none or a little of the time, some of the time, good part of the time and most of the time), questions 5, 9, 13, 17 and 19 are reverse scored. The total SAS raw scores range from 20 to 80 and need to then be converted into an Anxiety Index used to determine clinical interpretation of one's level of anxiety. Thus the total raw scores below 45 determine normal range of anxiety; 45-59 moderate; 60-74 severe and 75 and over determine extreme anxiety. The questionnaire was translated into Kinyarwanda local language by professional translator and mental health experts in order to preserve its validity and it was back translated to English to ensure its consistency.

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3.7.2 Validity

The validity of an instrument determines the extent to which it actually reflects or is able to measure the construct being examined (Grove et al. 2013). To ensure face validity, the research was presented in different academic forums for feedback and concerning the content validity; the researcher presented the instrument to her supervisor in order to evaluate the content in

comparison with the research objectives and the conceptual framework. The research was also given to specialists apart from the supervisor to determine the clarity.

3.7.3 Reliability

The Cronbach alpha of the second part of the questionnaire has already been tested across a range of cultural settings by a lot of previous studies. The latest studies pointed out that Cronbach alpha was found around 0.82 for EPDS and 0.84 for SAS (Fisher et al. 2012, Kakyo et al. 2012 & Tran et al. 2012). The reliability refers to the accuracy and consistency of information obtained in a study, thus assesses how consistently the measurement technique measures a concept (Grove et al. 2013, p. 45). Therefore, for the sake of enhancing reliability, the translation of the data collection instrument was done by a professional translator and mental health experts and the expert statistician assisted the researcher while interpreting and analysing the results from this study.

Also, a pilot study was conducted and the purpose was to test the feasibility of the study, the instruments and suitability of the research design. A sample of (n=16/10%) of the sample of the main study was drawn according to the specific criteria set for the main study. A total of 16 participants were examined under the same circumstances as the main study which contributed to the validity and reliability. The participants of the pilot study were excluded from the main study. Shortcomings regarding the instruments and design were rectified before the main study began.

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3.7.4 Data collection procedure

Permission to collect data was sought in writing from the Director of the institution where the study was conducted. When ethical clearance letters were obtained and permission was granted, the data collection was started with a target to reach 20 or more participants per day using the

questionnaire discussed above. The researcher recruited research assistant to help in data collection who is a mental health nurse skilled in working with women through his experience when he was working in psychiatric hospital and his previous involvement in various studies at Kigali Health Institute (KHI). He was trained and provided with sufficient explanations about the purpose, objectives of the study, ethics and data collection instrument before starting data collection. Data collection was planned within the period of two weeks. On data collection days, the research assistant was introduced to each mother by the nurse or midwife in-charge of the services while participants were waiting for their follow-ups care or that of their infants.

3.8 Data analysis

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The researcher used a Statistical Package for Social Sciences (SPSS) version 21 to capture and analyse data. First, the reliability analysis was done and results were presented, second the univariate analysis was used to summarize data in terms of frequency distributions of the variables under study, third, the bivariate correlational analysis was utilised to determine the relationship between the dependent variables (common perinatal mental disorders) and independent variables (participants' socio-demographic variables, information about husband, nuclear family, number of children, planned pregnancy, personal stressful events). In this case, the cross-tabulations together with the chi-square test for independence were employed as variables under study were categorical. Lastly, the multivariate analysis was conducted to find out the extent to which independent variables affect dependent variables. Then a logistic regression model was used to determine the extent to which independent variables affect the dependent variables. The captured and analysed data were reviewed by a statistician for possible mistakes at the department of statistics at the University of the Western Cape.

3.9 Ethical considerations

Ethical approval from the University of Western Cape/ South Africa and Kigali Health Institute/ Rwanda Institutional Review Board was obtained (Appendix 1 and 2 respectively). A letter requesting permission to collect data from the selected district hospital was addressed to the Director of the selected district hospital and permission was granted (see Appendix 3 and 4). The nature and purpose of the study were explained to the Director of the Hospital and to participants as well. An informed consent (Appendix 7) was obtained from participants, anonymity was ensured throughout the study by not having any identification on the data collection tool and data could not be traced back to an individual. Participants were informed (Appendix 6) that participation is strictly voluntary and that failure to volunteer will not result in any penalty or loss of benefits. They were also informed that they have the right to withdraw from the study and to refuse to provide any specific piece of information. The data collected were kept in a locked cupboard, and no one else had access to the completed data collection tools filled during the research process, except the researcher, her supervisor and statistician. Participants, who were found to have EPDS scores above 10 (depression) or positive on item 10 (suicidal thoughts), and also participants who had SAS scores above 60 (severe anxiety), were first informed and allowed to make decision to seek treatment. If accepted, they were then helped to make appointment with the mental health team after getting their care. The research assistant did not participate in the care or treatment of such participants after referral to the mental health team.

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3.10 Conclusion

The aim of this chapter was to provide the reader with a clear picture of the research methods and data collection instrument. This included an explanation of how the instrument was obtained and implemented as well as the statistical methods that were used in the analysis of the data. Also, attention was given to ethical considerations. In the following chapter, results of this study are presented in table form and interpretation will go with.

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CHAPTER FOUR: PRESENTATION OF RESULTS

4.1 Introduction and sample characteristics

This chapter presents the results of the current study aimed at determining common perinatal mental disorders and its associated determinants. A total number of 165 participants were selected systematically to participate in the study. The sample was restricted to women in the perinatal period and included pregnant mothers attending the antenatal care, mothers of young infants attending the health facility for the care of their young infants aged up to one year. However, mothers during child-birth up to two weeks postnatal were excluded as well as mothers aged less than 15years.

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The researcher used a Statistical Package for Social Sciences (SPSS) version 21 to capture and analyse the data. In section 4.2, the reliability analysis results are presented. In section 4.3, results of the univariate analysis used to summarize data in terms of frequency distributions of the variables under study are presented followed by section 4.4 presenting the results of the bivariate correlational analysis to determine the relationship between the dependent variables (common perinatal mental disorders) and independent variables (participants' socio-demographic variables, information about husband, nuclear family, number of children, planned pregnancy, personal stressful events). In this case, the crosstabulations together with the chi-square test for independence were employed as variables under study were categorical. Lastly in section 4.5, the multivariate analysis was conducted to find out the extent to which independent variables affect dependent variables; then the logistic regression model was used to determine the extent to which independent variables affect the dependent variables.

4.2 Results of reliability analysis

In this study, demographic data and risk factors of common perinatal mental disorders were determined using structured questionnaire with open-ended and closed-ended questions while common perinatal mental disorders were determined using combined screening tools such as Self-rating anxiety scale (SAS) to determine anxiety among participants and Edinburgh Postnatal Depression Scale (EPDS) for depression.

The above screening tools are the most widely used to screen for depression and anxiety in perinatal period, for latest studies (Fisher et al. 2012, Kakyo et al. 2012 & Tran et al. 2012) the Cronbach alpha values of 0.82 and 0.84 were found for EPDS and SAS respectively.
For this study, the Cronbach's alpha was 0.87 for SAS and 0.89 for EPDS (Table 4.1).

Table 4.1: Reliability statistics results of SAS and EPDS scales

Scales	Number of Items	Cronbach's Alpha
SAS	20	.877
EPDS	10	.891

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4.2 Results of univariate and descriptive analysis

4.2.1 Introduction

The univariate analysis was used to summarize data in terms of frequency distributions of the variables under study. In this case socio-demographic characteristics of respondents such as age, religion, marital status, level of education and occupation are being described in terms of frequency and distribution, information about husband/ partner (relationship with husband/partner, behavioural characteristics and occupation), as well as other variables such as nuclear family,

number of children, planned pregnancy, personal vulnerability and stressful events. In addition, distribution of respondents by SAS and EPDS scores and perinatal period are also described.

4.2.2 Socio-demographic characteristics of participants

As shown in the Table 4.2, the sample is comprised of 165 participants. The ages of participants in the sample population ranged from 15 and above. For analysis purposes, a simple division of the sample into 5-year age categories was created. The same table illustrates the distribution of the socio-demographic characteristics of the respondents such as age, religion, marital status, level of education and occupation.

The results indicate that most of respondents (38.2%) were in the age group of 25-29 years followed by 20-24 years (27.9%). Participants aged 30-34 years represent 15.8% of the sample population, whereas 12.7% were mothers in the age group of 35 years or above and only 5.5% were mothers aged 15-19 years. With regard to the religion of participants, results show that the majority of women were mostly Protestants (77.6%) followed by Catholics (18%) and most of mothers were married (44.8%) or living with their partner (41.8%). In relation to the level of education, the results reveal that the proportion of respondents with low education level is higher compared to those that have an advanced level of education (60.6%, 26%, 10.9%, 2.4%, primary, no education, secondary and tertiary, respectively). The findings also indicate that the percentage of mothers who were unemployed (77%) is extremely higher compared to that of employed mothers (1.8%).

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Table 4.2: Participants' socio-demographic characteristics

Demographic characteristics	Frequency (n=165)	Percent (%)
Age in years		
15-19	9	5,5
20-24	46	27,9
25-29	63	38,2
30-34	26	15,8
35 and more	21	12,7
Religion		
No religion	1	0,6
Catholic	31	18,8
Protestant	128	77,6
Muslim	5	3,0
Marital status		
Single	8	4,8
Married	74	44,8
Living together	69	41,8
Separated/divorce	14	8,5
Level of education		
No education	43	26,1
Primary	100	60,6
Secondary	18	10,9
Tertiary	4	2,4
Occupation		
Employed	3	1,8
Unemployed	127	77
Self-employed	31	18,8
No permanent job	4	2,4

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4.2.3 Other variables

4.2.3.1 Information about participants' husbands/ partners

Results shown in the Table 4.3 demonstrate that more than a half of participants (69.1%) had strong relationships with their husbands/partners, while 30.9% of respondents reported poor relationships. Findings also indicate that most participants (46%) reported that their husbands were unemployed compared to those who had employed husband/partner (25.5%). Other respondents reported that their husbands/partners had no permanent job or were self-employed (16.4%, 12.1%, respectively). Furthermore, results reveal that 67.9 % of mothers had supportive husbands and the rest of respondents reported that their husbands were alcoholic, non supportive, violent and/or unfaithful (11.5%, 8.5%, 8.5%, 3.5%, respectively).

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Table 4.3 Distribution of respondents by information about husband/partner

Information about husband/partner	Frequency (n=165)	Percent (%)
Relationship with husband/partner		
Strong relationships	114	69,1
Poor relationship	51	30.9
Total	**165**	**100**
Occupation		
Employed	42	25,5
Unemployed	76	46
Self-employed	20	12,1
No permanent job	27	16,4
Total	**165**	**100**
Husband/partner characteristics		
Supportive	112	67,9
Non supportive	14	8,5
Violent	14	8,5
Alcoholic	19	11,5
Unfaithful	6	3,6
Total	**165**	**100**

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4.2.3.2 Distribution of respondents by other selected variables

The table 4.4 shows that the majority (35.7%) of respondents had parents and siblings alive while the rest of respondents had at least lost a parent, sibling or both parents and siblings (29.7%, 18.2%, 16.4%, respectively). In regard to the perinatal period, results indicate that more than a half (51.5%) of the sample population were pregnant mothers followed by mothers in postnatal period (46.7%) and mothers in both perinatal periods (1.8%) who were pregnant and at the same time had infants of less than one year of age. The results in the same table illustrate that proportion for the planned pregnancy (59.6%) is higher compared to that of unplanned pregnancy (40.6%). Furthermore, the respondents who had one child were accounted for 26.1% followed by two (23.6%) while 20.6% of the respondents had four or more children.

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Table 4.4 Distribution of participants by other selected variables

Other selected variables	Frequency (n=165)	Percent (%)
Participants nuclear family		
Both parents/siblings alive	59	35,7
Lost a parent	49	29.7
Lost a sibling	30	18.2
Lost both parents/all siblings	27	16.4
Total	**165**	**100**
Perinatal period		
Antenatal (Pregnancy)	85	51,5
Postnatal (Mothers of young infant)	77	46,7
Both	3	1,8
Total	**165**	**100**
Planned pregnancy		
Yes	98	59,4
No	67	40,6
Total	**165**	**100**
Number of children		
No child	29	17,6
One	43	26,1
Two	39	23,6
Three	20	12,1
Four and more	34	20,6
Total	**165**	**100**

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4.2.3.3 Distribution of respondents by personal vulnerability and other stressful events

The table 4.7 demonstrates that the majority of participants (41.8 %) did not report any experienced other stressful events. However, the proportion of respondents with a history of family mental illness (15.8%) was higher compared to other stressful events followed by child abuse (14.5%), sexual abuse (10.9%), personal mental illness (7.9%), poverty (3.6%), and lastly, the respondents who reported a loss of husband/child and intimate partner violence (3%, 2.4%, respectively).

Table 4.5 Distribution of participants by other stressful events

Personal stressful events	**Frequency (n=165)**	**Percent (%)**
No other stressful events	69	41,8
Child abuse	24	14,5
Sexual abuse	18	10,9
Family mental illness	26	15,8
Personal mental illness	13	7,9
Poverty	6	3,6
Loss of husband/child	5	3,0
Intimate partner violence	4	2,4
Total	**165**	**100**

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4.2. 4. Distribution of respondents by occurrence of common perinatal mental disorders: Average of scores

The participants' scores on the Self-rating Anxiety Scale (SAS) and Edinburgh Postnatal Depression Scale (EPDS) were computed and interpreted (see cut-off standards in Chapter three)

as follows: for the normal range of perinatal anxiety, the score is 20-44 while the score for a clinical level of anxiety is score 45-80 for SAS. Furthermore, the score of the normal range of depression is 0-9 while when the score is 10 or greater, possible depression is detected.

The findings reveal that the minimum and maximum SAS score is 23 and 74, respectively, with the mean score of 42.24 and Std deviation of 12.306. As far as EPDS is concerned, the minimum score is 0 while the maximum is 30 with the mean (M) score of 10.85 and Standard (Std) deviation of 8.127. The results in the table 4.6 indicate that more than a half of the respondents (63%) were found in the normal range of anxiety while at least 37% had a clinical level of anxiety. Findings reveal that more than a half of the respondents (50.3%) fall under the range of possible depression. However, mothers in perinatal period are more likely to suffer from depression than anxiety. The following table illustrates findings related to SAS and EPDS scores.

Table 4.6 Distribution of respondents by SAS and EPDS scores

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Scales	Frequency (n)	Percent (%)
Self-rating Anxiety Scale scores (M*= 42.24, Std*= 12.306)		
Normal range	104	63,0
Clinical level	61	37,0
Total	**165**	**100,0**
Edinburgh Postnatal Depression Scale scores (M= 10.85, Std=8.127)		
Normal range	82	49,7
Possible depression	83	50,3
Total	**165**	**100,0**

M*= Mean, Std*= Standard deviation

4.2.5. Distribution of respondents by Self-rating Anxiety Scale scores and Edinburgh Postnatal Scale scores in relation to perinatal period

Using the Self-rating Anxiety Scale and Edinburgh Postnatal Scale, we have been able to determine the occurrence of perinatal anxiety and depression, respectively. The respondents' scores were computed and categorised based on the total scores given and standards instructions for each scale determining a certain level of perinatal mental disorder. For SAS, scores categorized and interpreted as follows: the normal range (score 20-44), moderate level (score 45-59); severe level (score 60-74); and extreme level (score 75-80). For the EPDS, scores are interpreted as above. Results shown in Table 4.7 indicate that more than a half (51.5%) of respondents in the antenatal period (pregnant); thirty seven percent (37%) of respondents in antenatal period were found to be in the normal range of anxiety; moderate anxiety (10.3%) and severe anxiety level (4.2%). Findings also demonstrate that 46.7% of respondents were in postnatal period (mothers of young infants); the proportion of 24.2% accounted for those that had normal level of anxiety; moderate anxiety (15.2%); while 7.3% were in the range of severe anxiety. The respondents found to be in both perinatal periods (1.8%) were all in the normal range of anxiety. However, the findings highlight that none of respondents were found to be in the range of extreme anxiety.

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Besides, with regard to perinatal depression findings indicate that the majority of participants (51.5%) in antenatal period; the proportion of 32.1% of them were in the normal range of depression, whereas 19.4% all into the category of possible depression. Furthermore, findings suggested that 46.7% of respondents were in postnatal period; most of them (29.7%) had possible depression, whilst 17% fall in the normal range of depression according to the EPDS scores. The results also illustrate that only 1.8% of respondents were found to be in both perinatal periods

(respondents who were pregnant and at the same time had a young infant) and 1.2% had depression.

Table 4.7 SAS and EPDS scores by perinatal period

Anxiety				
Perinatal period	**Self-rating anxiety scores**			**Total n (%)**
	Normal n(%)	**Moderate n(%)**	**Severe n(%)**	
Antenatal	61(37)	17(10.3)	7(4.2)	85(51.5)
Postnatal	40(24.2)	25(15.2)	12(7.3)	77(46.7)
Both	3(1.8)	0(0)	0(0)	3(1.8)
Total	**104(63)**	**42(25.5)**	**19(11.5)**	**165(100)**
Depression				
Perinatal period	**EPDS scores**			**Total n(%)**
	Normal range n(%)		**Depression n(%)**	
Antenatal	53(32,1)		32(19,4)	85(51,5)
Postnatal	28(17)		49(29,7)	77(46,7)
Both	1(,6)		2(1,2)	3(1,8)
Total	**82(49,7)**		**83(50,3)**	**165(100)**

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4.3 Results of bivariate analysis

4.3.1 Introduction

The results of bivariate analysis are divided into two main sections such as section 4.3.2 and 4.3.3. The section 4.3.2 shows the correlation between two screening tools (Self-rating Anxiety Scale and Edinburg Postnatal Depression Scale) and section 4.3.3 presents factors associated with CPMDs.

In section 4.3.2 Chi-square Tests for Independence were used to determine the correlation between SAS and EPDS scales then Cramer's V test was used to measure the strength of the association between both scales. In section 4.3.3, factors associated with Common Perinatal Mental Disorders were also identified using a Chi-square Test for independence. Correlations were computed between scales (SAS & EPDS) and participants' demographic characteristics (age, religion, marital status & level of education and occupation), and other variables under study (husbands' information, nuclear family, number of children and planned pregnancy, as well as personal stressful events). The results in this section are presented separately for both scales (SAS and EPDS). However, the level of significance was set to 5%. This means that any p-value less than 0.05 indicated that there is statistically significant association between two variables under study.

4.3.2 Correlation between the Self-rating Anxiety Scale and Edinburgh Postnatal Depression Scale

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The findings in Table 4.8 reveal that 18% of the respondents in the SAS who fall under the normal range have depression. The participants with moderate anxiety disorders (20%) where also found to have depression. As far as respondents with severe anxiety are concerned, it has been found that all participants with severe anxiety (11.5%) were found in the category of depression. The Chi-square test for independence indicated that there was a statistically significant association between EPDS and SAS ($\chi^2_{(2)}$ =49.672, p=.000) and the Cramer's V measure of the strength of the association between categorical variables indicated that the two scales were probably measuring the same concept (Cramer's V= .549).

Table 4.8 Correlation between the Self-rating Anxiety Scale and Edinburgh Postnatal Depression Scale

Scales				*χ^2	Df	P-value
SAS	**EPDS**			49.672	2	**.000***
	Normal range n (%)	Possible depression n(%)	Total			
Normal range	73 (44.2)	31 (18.8)	104 (63)			
Moderate	9 (5.5)	33 (20)	42 (25.5)			
Severe	0 (0)	19 (11.5)	19 (11.5)			
Total	**82 (49.7)**	**83 (50.3)**	**165 (100)**			

*: Significant at 5% level

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4.3.3. Factors associated with common perinatal mental disorders: Perinatal anxiety

4.3.3.1 Distribution of self-rating anxiety scales by respondents' demographic characteristics

Findings (Table 4.9) indicate that most of participants (38.2%) were aged 25-29 years, the proportion of 7.9% of them had moderate anxiety, while 4.2% of them had severe anxiety. The respondents aged 20-24 years (27.9%) had moderate and severe anxiety (6.7%, 3%, respectively). The results reveal that 12.7% of respondents fall in the age category of 35 or more and 6.1% of them had moderate anxiety while 1.2% had severe anxiety. Moreover, 5.5% of participants were found in the age group of 15-19 years and 2.4% fall in the normal range of anxiety as well. However, results did not indicate any statistically significant relationship between SAS scores and the age ($\chi^2_{(8)}$ =11.229, p=.189).

According to the same table, Protestant religion is the most common among participants with a total number of 77.6% of respondents, yet 19.4% and 9.7% had a moderate and severe anxiety, respectively. A statistically significant difference is shown between SAS scores and religion ($\chi^2_{(6)}$ = 1.946, p=.925). The results indicate further that most of participants (44.8%) were married and 10.3% of them were in the range of moderate anxiety and only 3.6% had severe anxiety level. However, there is statistically significant difference between SAS scores and marital status ($\chi^2_{(6)}$ = 11.805, p=.066).

In addition, the results indicate that a big number (60.6%) of respondents had a primary education level and among them 15.2% and 5.5% had moderate and severe anxiety, respectively. Moreover, the respondents with no education (26.1%) fall under the range of moderate (6.1%) and severe anxiety (5.5%). Therefore, the findings did not indicate any statistically significant relationship between SAS scores and level of education ($\chi^2_{(6)}$ = 6.001, p=.423). Lastly, it has been found that more than a half (77%) of respondents were unemployed and fall in the category of moderate (21.2%) and severe (8.5%) anxiety. Based on the results shown in Table 4.7, there is no statistically significant relationship between SAS scores and occupation of participants ($\chi^2_{(6)}$ = 3.649, p=.724).

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Table 4.9 Distribution of SAS by respondents' demographic characteristics

Demographic characteristics	Self-rating anxiety scale scores			Total n (%)	*χ	Df	P-value
	Normal n (%)	Moderate n (%)	Severe n (%)				
Age					**11.229**	**8**	**.189**
15-19	4(2.4)	2(1.2)	3(1.8)	9 (5.5)			
20-24	30 (18.2)	11(6.7)	5(3)	46(27.9)			
25-29	43(26.1)	13(7.9)	7(4.2)	63(38.2)			
30-34	18 (10.9)	6 (3.6)	2(1.2)	26(15.8)			
35 and more	9(5.5)	10 (6.1)	2(1.2)	21(12.7)			
Total	**104(63)**	**42(25.5)**	**19(11.5)**	**165(100)**			
Religion					**1.946**	**6**	**.925**
No religion	1(.6)	0(0)	0(0)	1(.6)			
Catholic	20 (12.1)	9(5.5)	2(1.2)	31(18.8)			
Protestant	80(48.5)	32(19.4)	16(9.7)	128(77.6)			
Muslim	3(1.8)	1(.6)	1(.6)	5(3.)			
Total	**104(63)**	**42(25.5)**	**19(11.5)**	**165(100)**			
Marital status					**11.805**	**6**	**.066**
Single	5(3.0)	2(1.2)	1(.6)	8(4.8)			
Married	51(30.9)	17(10.3)	6(3.6)	74(44.8)			
Living together	44(26.7)	18(10.9)	7(4.2)	69(41.8)			
Separated/divorced	4(2.4)	5(3.0)	5(3.0%)	14(8.5)			
Total	**104(63)**	**42(25.5)**	**19(11.5)**	**165(100)**			
Level of education					**6.001**	**6**	**.423**
No education	24(14.5)	10 (6.1)	9(5.5)	43 (26.1)			
Primary	66(40.0)	25(15.2)	9(5.5)	100(60.6)			
Secondary	11(6.7)	6(3.6)	1(.6)	18(10.9)			
Tertiary	3(1.8)	1(.6)	0(0)	4(2.4)			
Total	**104(63)**	**42(25.5)**	**19(11.5)**	**165 (100)**			
Occupation					**3.649**	**6**	**.724**
Employed	3(1.8)	0(0)	0(0)	3(1.8)			
Unemployed	78(47.3)	35(21.2)	14(8.5)	127(77)			
Self-employed	20(12.1)	6(3.6)	5(3)	31(18.8)			
No permanent job	3(1.8)	1(0.6)	0(0)	4(2.4)			
Total	**104(63)**	**42(25.5)**	**19(11.5)**	**165(100)**			

Pearson chi-square test (*χ^2), degree of freedom (*df), P-value (p) *significant p (<.05)

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4.3.3.2 Distribution of SAS scores by respondents' information about husband/partner

Results in Table 4.8 show that more than a half (69.1%) of participants reported strong relationships with their husbands/partners. They were found in the range of moderate (15.2%) and severe (4.8%) anxiety. In relation to mothers who reported poor relationship with husband/partner (30.9%); findings suggest that 10.3% fall in the range of moderate and severe (6.7%) anxiety as well. Therefore, results indicate that there is statistically significant relationship between SAS scores and relationship with husband/partner ($\chi^2_{(2)} = 12.045$, p= .002).

Likewise, findings demonstrate that the majority of respondents (67.9%) reported supportive husbands/partners; 15.8% of them were found in the range of moderate anxiety while 4.2% suffered from severe anxiety. A total number of 11.5% of mothers reported alcoholic husbands; this shows that it was the highest husband's behavioral characteristic reported by respondents, although results shows that it has the lowest proportion of clinical level of anxiety compared to others (3.6%, 1.8% moderate and severe anxiety, respectively). Thus, findings suggest that there is statistically significant relationship between SAS scores and husbands' behavior ($\chi^2_{(8)} = 16.401$, p= .037).

Furthermore, findings highlight that a total number of 46.1% of mothers also reported unemployment of husband/partner, the proportion of 12.1% and 5.5% were found in the range of moderate and severe anxiety, respectively. However, results did not indicate any statistically significant relationship between SAS scores and husband/partner's occupation ($\chi^2_{(6)} = 2.031$, p= .917).

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Table 4.10 Distribution of SAS scores by information about husband

Information about husband/partner	Self-rating anxiety scale			Total n (%)	*χ^2	Df*	p-value
	Normal n (%)	Moderate n (%)	Severe n (%)				
Relationship					**12.045**	**2**	**.002***
Strong	81 (49,1)	25(15,2)	8(4,8)	114(69,1)			
Poor	23(13,9)	17(10,3)	11(6,7)	51(30,9)			
Behaviour					**16.401**	**8**	**.037***
Supportive	79(47,9)	26(15,8)	7(4,2)	112(67,9)			
Non supportive	7(4,2)	3(1,8)	4(2,4)	14(8,5)			
Violent	7(4,2)	4(2,4)	3(1,8)	14(8,5)			
Alcoholic	10(6,1)	6(3,6)	3(1,8)	19(11,5)			
Unfaithful	1(,6)	3(1,8)	2(1,2)	6(3,6)			
Total	104(63)	42(25,5)	19(11,5)	165(100)			
Occupation					**2.031**	**6**	**.917**
Employed	26(15,8)	12(7,3)	4(2,4)	42(25,5)			
Unemployed	47(28,5)	20(12,1)	9(5,5)	76(46,1)			
Self-employed	15(9,1)	3(1,8)	2(1,2)	20(12,1)			
No permanent job	16(9,7)	7(4,2)	4(2,4)	27(16,4)			
Total	104(63)	42(25,5)	19(11,5)	165(100)			

Pearson chi-square test (*χ^2) *Degree of freedom (df), *significant p (<.05)

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4.3.3.4 Distribution of SAS by other selected variables

Results in Table 4.11 indicate that most of participants (35.8%) had both parents and siblings alive; 9.1% and 1.8% of them fall in the range of moderate and severe anxiety, respectively. 29.7% of respondents lost their parents; had moderate (6.7%) and severe (3%) anxiety. Participants also reported loss of a sibling (18.2%) and were found to have a moderate (4.2%) and severe (3.6%) anxiety. The same table illustrates that 16.4% of the sample population lost both parents and all

siblings; 5.5% fall in the range of moderate anxiety and 3% in severe as well. Therefore, there is statistically significant difference between SAS scores and nuclear family information ($\chi^2_{(6)} =$ **7**.780, p= .255).

It has been found as well that 26.1% of respondents had one child, 23.6% two children, and 20.6% reported four or more, whereas 17.6% had not yet children and lastly 12.1% reported three. Among respondents, a total number of 25.5% and 11.5% were found in the category of moderate and severe anxiety, respectively. Findings indicated however, that there is no statistically significant difference between SAS scores and number of children ($\chi^2_{(8)} =$ 16.017, p= .042).

In addition, results highlight that more than a half (59.4%) of respondents reported a planned pregnancy; a total of 12.7% had moderate anxiety and 4.2% had severe anxiety. Although, the proportion of clinical level of anxiety in mothers who did not plan for pregnancy (40.6%) is significantly higher (12.7%, 7.2% moderate and severe anxiety, respectively) compared to those who planned for pregnancy. Thus, the results showed that there is statistically significant relationship between SAS scores and planned pregnancy ($\chi^2_{(2)} =$ 8.244, p= .016).

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Furthermore, findings reveal that most of respondents (41.8%) did not report any other experienced stressful events and only 3.6% and 3% of them had moderate and severe anxiety, respectively. A history of mental illness in the family was the highest personal vulnerability and experienced stressful event reported by 15.8% of mothers; hence among them only 4.8% had moderate anxiety. A history of child abuse was ranked second among stressors (14.5%); 4.2% and 5.5% of respondents with a history of child abuse, they had moderate and severe anxiety respectively. 10.9% of participants with a history of sexual abuse; 3.6% of them had moderate anxiety and only one (0.6%) had severe anxiety. The proportion of 7.9% of respondents had a

history of personal mental illness and only 4.2% of them had a moderate anxiety. So far, findings showed that 3.6% reported poverty as an experienced stressful event; 1.8% and 1.2% had moderate and severe anxiety respectively. Three percent (3%) of the sample population reported a loss of husband/child; and 1.2% of them had moderate anxiety. Lastly, 2.4% of respondents who reported intimate partner violence; all of them had moderate anxiety level. Therefore, results approved a statistically significant association between SAS scores and personal stressful events experienced by participants ($\chi^2_{(14)} = 55.035$, p= .000).

Table 4.11 SAS scores by other variables

Other variables	Self-rating anxiety scale scores			Total n (%)	χ^2	df*	P-value
	Normal n (%)	Moderate n (%)	Severe n (%)				
Nuclear family					**7.780**	**6**	**.255**
Both parents/siblings alive	41(2.8)	15(9.1)	3(1.8)	59(35.8)			
Lost a parent	33(20)	11(6.7)	5(3)	49(29.7)			
Lost a sibling	17(18.9)	7(4.2)	6(3.6)	30(18.2)			
Lost both parents/ all siblings	13(7.9)	9(5.5)	5(3)	27(16.4)			
Total	**104(63)**	**42(25.5)**	**19(11.5)**	**165(100)**			
Number of children					**16.017**	**8**	**.042***
no child	24(14.5)	3(1.8)	2(1.2)	29(17.6)			
One	28(17)	8(4.8)	7(4.2	43(26.1)			
Two	27(16.4)	8(4.8)	4(2.4)	39(23.6)			
Three	9(5.5)	9(5.5)	2(1.2)	20(12.1)			
four and more	16(9.7)	14(8.5)	4(2.4)	34(20.6)			
Total	**104(63)**	**42(25.5)**	**19(11.5)**	**165(100)**			
Planned pregnancy					**8.244**	**2**	**.016***
Yes	70(42.4)	21(12.7)	7(4.2)	98(59.4)			
Non	34(20.6)	21(12.7)	12(7.3)	67(40.6)			
Total	**104(63)**	**42(25.5)**	**19(11.5)**	**165(100)**			
Stressful events					**55.035**	**14**	**.000***
No stressful events	58(35,2)	6(3,6)	5(3)	69(41,8)			
Child abuse	8(4,8)	7(4,2)	9(5,5)	24(14,5)			
Sexual abuse	11(6,7)	6(3,6)	1(,6)	18(10,9)			
Family mental illness	18(10,9)	8(4,8)	0(0)	26(15,8)			
Personal mental illness	5(3)	7(4,2)	1(,6)	13(7,9)			
Poverty	1(,6)	3(1,8)	2(1,2)	6(3,6)			
Loss of husband/child	3(1,8)	2(1,2)	0(0)	5(3)			
IPV	0(0)	3(1,8)	1(,6)	4(2,4)			
Total	**104(63)**	**42(25,5)**	**19(11,5)**	**165(100)**			

Pearson chi-square test (χ^2), *degree of freedom (df), *significant p (<.05), IPV(intimate partner violence

4.3.4 Factors Associated with Common Perinatal Mental Disorders: Perinatal Depression

4.3.4.1 Distribution of EPDS scores by respondents' demographic characteristics

The results in Table 4.12, show that the prevalence of depression is extremely high among respondents (50.3%) using cut-off of >10 score on EPDS. The respondents aged 25-29 years accounted for 38.2%, and 17.6% of them found to be in the category of possible depression. Respondents aged 20-24 years (27.9%); only 12.1% of them were found in the range of possible depression. Among respondents in the age category of 30-34 years (15.8%); the depression was found in 7.3% of them. Also, participants with 35 years or more accounted for 12.7% and most of them (8.5%) were found in the category of possible depression. With regard to the respondents aged 15-19 years (5.5%), depression was found in 4.8% of them. However, the findings did not indicate statistically significant relationship between EPDS scores and age ($\chi^2_{(4)} = 9.105$ p= .059).

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It has to be stressed that most of respondents were Protestants (77.6%) and most of them (40.6%) were found to be in the range of possible depression. However, results did not indicate any statistically significant correlation between EPDS scores and religion ($\chi^2_{(3)} = 3.056$, p= .383). The findings show further that most of the participants who were found to be married (26.7% out of 44.8%) were in the normal range of depression; whereas 18.2% of them fall in the category of depression according to EPDS scores. Those who were living together were accounted for 41.8%; and 21.8% of them had normal range of depression while 20% were found to suffer from depression. The respondents found to be separated/ divorced accounted for 8.5%; almost all of them (7.9) had depression. Among 4.8% of the sample population are single and almost all of them

(4.2%) were found in the range of possible depression. Therefore, there is statistically significant association between EPDS scores and marital status ($\chi^2_{(3)} = 17.559$, p= .001).

In relation to the level of education, the results indicate that more than a half of respondents (60.6%) had primary level of education; and 25.5% of them were in the category of possible depression. The percentage of 26.1% of the respondents had no educational level and almost all of them (20%) had depression according to EPDS scores. As a result, there is statistically significant relationship between EPDS scores and the level of education ($\chi^2_{(3)} = 16.857$, p= .001). Findings illustrate that more than a half of respondents (77%) were not employed and most of them (38.8%) were in the range of depression according to EPDS scores. Thus, there is no statistically significant relationship between EPDS scores and occupation of participants ($\chi^2_{(3)} = .367$, p= .947).

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Table 4.12 Distribution of EPDS scores by respondents' demographic characteristics

Demographic characteristics	EPDS scale		Total n (%)	*χ^2	df*	P-value
	Normal n(%)	Depression n (%)				
Age				**9.105**	**4**	**.059**
15-19	1(.6)	8(4.8)	9(5.5)			
20-24	26(15.8)	20(12.1)	46(27.9)			
25-29	34(20.6)	29(17.6)	63(38.2)			
30-34	14(8.5)	12(7.3)	26(15.8)			
35 and more	7(4.2)	14(8.5)	21(12.7)			
Total	**82(49.7)**	**83(50.3)**	**165(100)**			
Religion				**3.056**	**3**	**.383**
No religion	0(0)	1(0.6)	1(0.6)			
Catholic	19(11.5)	12(7.3)	31(18.8)			
Protestant	61(37)	67(40.6)	128(77.6)			
Muslim	2(1.2)	3(1.8)	5(3)			
Total	**82(49.7)**	**83(50.3)**	**165(100)**			
Marital status				**17.559**	**3**	**.001***
Single	1(.6)	7(4.2)	8(4.8)			
Married	44(26.7)	30(18.2)	74(44.8)			
Living together	36(21.8)	33(20)	69(41.8)			
Separated/divorced	1(.6)	13(7.9)	14(8.5)			
Total	**82(49.7)**	**83(50.3)**	**165(100)**			
Level of education				**16.857**	**3**	**.001***
No education	10(6.1)	33(20)	43(26.1)			
Primary	58(35.2)	42(25.5)	100(60.6)			
Secondary	12(7.3)	6(3.6)	18(10.9)			
Tertiary	2(1.2)	2(1.2)	4(2.4)			
Total	**82(49.7)**	**83(50.3)**	**165(100)**			
Occupation				**.367**	**3**	**.947**
Employed	2(1.2)	1(.6)	3(1.8)			
Unemployed	63(38.2)	64(38.8)	127(77)			
Self-employed	15(9.1)	16(9.7)	31(18.8)			
No permanent job	2(1.2)	2(1.2)	4(2.4)			
Total	**82 (49.7)**	**83(50.3)**	**165(100)**			

Pearson chi-square test (*χ^2)*df: degree of freedom, P-value*: significant at 5% level

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4.3.4.2 Distribution of EPDS scores by respondents' information about husband/partner

Results shown in Table 4.13 indicate that 69.1% of mothers had strong relationships with their husbands/partners; but 23.6% of them had depression according to EPDS scores. The proportion of 30.9% of the sample population had poor relationships with husbands/partners; almost all of them (20.7%) had depression according to EPDS scores. The results indicate so far that there is statistically significant relationship between EPDS scores and relationship with husband/partner ($\chi^2_{(1)} =$ 38.207, p= .000). In relation to participants' husband/partner behavioral characteristics, the majority of respondents (67.9%) had supportive husbands/ partners; although 22.4% of them were found in the range of depression in accordance with EPDS. Among mothers who reported alcoholic husbands (11.5%), 10.9% had depression. Therefore, it can be highlighted that the proportion of clinical level of depression was higher among participants reporting alcoholic husband compared to the others (non supportive, violent and unfaithful; 8.5%, 8.5%, 3.6% respectively).

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Therefore, the results show that there is a statistically significant association between EPDS scores and husbands' behavior ($\chi^2_{(4)} =$ 43.242, p= .000). In terms of husband/ partner's occupation; the husband's unemployment proportion (46.1%) is high and almost two times higher compared to employment (25.5%), similarly, findings suggest that many participants reporting husbands/partners' unemployment were suffering from depression (26.7%) according to EPDS. In short, results indicate statistically significant difference between EPDS scores and husband/partner's occupation ($\chi^2_{(3)} =$ 3.746, p= .290).

Table 4.13 EPDS scores by respondents' information about husband/partner

Information about husband	EPDS scores		Total n (%)	χ^2	df*	p-value
	Normal n (%)	Depression n (%)				
Relationship				**38.207**	**1**	**.000***
Strong	75(45.5)	39(23.6)	114(69.1)			
Poor	7(4.2)	44(26.7)	51(30.9)			
Behaviour				**43.242**	**4**	**.000***
Supportive	75(45.5)	37(22.4)	112(67.9)			
Non supportive	3(1.8)	11(6.7)	14(8.5)			
Violent	3(1.8)	11(6.7)	14(8.5)			
Alcoholic	1(.6)	18(10.9)	19(11.5)			
Unfaithful	0(0)	6(3.6)	6(3.6)			
Total	82(49.7)	83(50.3)	165(100)			
Occupation				**3.746[a]**	**3**	**.290**
Employed	25(15.2)	17(10.3)	42(25.5)			
Unemployed	32(19.4)	44(26.7)	76(46.1)			
Self-employed	10(6.1)	10(6.1)	20(12.1)			
No permanent job	15(9.1)	12(7.3)	27(16.4)			
Total	82(49.7)	83(50.3)	165(100)			

Pearson chi-square test (*χ^2) *df: degree of freedom, P-value*: significant at 5% level

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4.3.4.3 Distribution of EPDS scores by other selected variables

Results shown in Table 4.12 indicate that 35.8% of the respondents had both parents and siblings alive; 13.3% of them were found in the range of depression on EPDS while 29.7% lost a parent and 18.2% of them were in the range of depression. 18.2% of respondents lost a sibling and 10.3% of them were screened with depression on EPDS. Also, findings suggest that 16.4% of respondents lost both parents and all siblings; 8.5% of them found themselves in the range of possible

depression on EPDS. Thus, the results indicate that there is statistically significant difference between EPDS scores and nuclear family ($\chi^2_{(3)} = 6.848$, p= .077).

It has been found as well, that out of 26.1% of mothers who had one child; 13.3% of them had depression on EPDS. Those who had four and more children (20.6%) were found to have big number (15.2%) screened with depression on EPDS compared to those who had less than four. However, findings revealed that there is no statistically significant difference between EPDS scores and number of children ($\chi^2_{(4)} = 18.554$, p= .001). Results suggest further that most of the respondents (59.4%) reported planned pregnancy; 21.8% of them fall under depression range in accordance with EPDS. 40.6% of the sample population reported unplanned pregnancy; most of them (28.5%) were screened with depression according to EPDS. Therefore, findings indicate statistically strong significant association between EPDS and planned pregnancy ($\chi^2_{(1)} = 17.773$, p= .000).

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According to the same table, most of respondents (41.8%) reported any experienced stressful event, but 14.5% of them were in the range of possible depression. Moreover, results suggest that 15.5% of the sample population reported a mental illness in the family; few of them (4.8%) had depression in accordance with EPDS. 14.5% of respondents reported child abuse experienced as stressful event; and many of them (10.3%) had depression according to EPDS. Results further suggest that 10.9% of respondents reported sexual abuse and most of them (8.5%) had depression according to EPDS. Consequently, results indicated statistically significant association between EPDS scores and personal stressful events ($\chi^2_{(7)} = 30.232$, p= .000).

Table 4.14 Distribution of EPDS scores by other variables

Other variables	EPDS scores		Total n (%)	*χ^2	*df	P-value
	Normal n (%)	Depression n (%)				
Nuclear family				**6.848[a]**	**3**	**.077**
Both parents/siblings alive	37(22.4)	22(13.3)	59(35.8)			
Lost a parent	19(11.5)	30(18.2)	49(29.7)			
Lost a sibling	13(7.9)	17(10.3)	30(18.2)			
Lost both parents/siblings	13(7.9)	14(8.5)	27(16.4)			
Total	**82(49.7)**	**83(50.3)**	**165(100)**			
Number of children				**18.544[a]**	**4**	**.001***
no child	23(13.9)	6(3.6)	29(17.6)			
One	21(12.7)	22(13.3)	43(26.1)			
Two	21(12.7)	18(10.9)	39(23.6)			
Three	8(4.8)	12(7.3)	20(12.1)			
four and more	9(5.5)	25(15.2)	34(20.6)			
Total	**82(49.7)**	**83(50.3)**	**165(100)**			
Planned pregnancy				**17.773[a]**	**1**	**.000***
Yes	62(37.6)	36(21.8)	98(59.4)			
Non	20(12.1)	47(28.5)	67(40.6)			
Total	**82(49.7)**	**83(50.3)**	**165(100)**			
Personal stressful events				**30.232[a]**	**7**	**.000***
No stressful events	45(27.3)	24(14.5)	69(41.8)			
Child abuse	7(4.2)	17(10.3)	24(14.5)			
Sexual abuse	4(2.4)	14(8.5)	18(10.9)			
Family mental illness	18(10.9)	8(4.8)	26(15.8)			
Personal mental illness	6(3.6)	7(4.2)	13(7.9)			
Poverty	0(0)	6(3.6)	6(3.6)			
Loss of husband/child	2(1.2)	3(1.8)	5(3)			
Intimate partner violence	0(0)	4(2.4)	4(2.4)			
Total	**82(49.7)**	**83(50.3)**	**165(100)**			

Pearson chi-square test (*χ^2)*df: degree of freedom, P-value*: significant at 5% level

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4.4. Results of multivariate analysis

4.4.1 Factors associated with common perinatal mental disorders: Perinatal anxiety

A logistic regression model was used to determine the extent to which variables such as the relationship with husband, number of children, planned pregnancy and personal stressful events affect the self-rating anxiety scale (SAS) of the respondents. The choice of this model was based on the fact that SAS was dichotomous, coded as "0" for the respondents with a normal range anxiety and "1" for those with a clinical level of anxiety (moderate and severe). The full model containing the above factors was statistically significant as shown by the Hosmer- Lemeshow goodness-of-fit test with a Chi-square value of 3.948 with 7 degree of freedom and a p-value of 0.786. To support the logistic model, the p-value of Hosmer- Lemeshow goodness-of-fit test is expected to be greater than 0.05.

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The results indicate that the relationship with the husband was the only predictor of perinatal anxiety. Indeed, respondents reporting a strong relationship with husband were found to be less likely to have a clinical level of anxiety (Odds ratios=0.437 <1, Confidence Interval (C.I. = 0.211-0.905) than those with a poor relationship with their husbands. The results are shown in the table 4.15.

Table 4.15: **Logistic regression predicting the likelihood of perinatal anxiety**

Independent variables	B	Wald	df	P - value	Odds Ratio	95% C.I. for Odds Ratio	
						Lower	Upper
Relationship with the husband*							
Strong	-.827	4.964	1	**.026**	.437	.211	.905
Poor (r)					1.000		
Number of Children		6.760	4	.149			
No Child	-1.268	4.067	1	.044	.281	.082	.965
One	-.470	.900	1	.343	.625	.237	1.650
Two	-.569	1.218	1	.270	.566	.206	1.555
Three	.322	.298	1	.585	1.380	.434	4.389
Four and more					1.000		
Personnal sterssful Event							
No stressfull event							
Identified stressful event	-.551	2.348	1	.125	.577	.285	1.166
Constant	.733	3.109	1	.078	2.081		

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4.4.2 Factors associated with common perinatal mental disorders: Perinatal anxiety

As shown in Table 4.16, the binary logistic regression was performed to assess the impact of factors on the likelihood of perinatal depression (EPDS score >10). The model contained various independent variables which were found to be significant (age, level of education, relationship with husband, number of children and stressful life events). The full model containing these predictors was statistically significant as shown by the Hosmer- Lemeshow goodness-of-fit test with a Chi-square value of 5.390 with a degree of freedom of 8 and a P-value of 0.715 >0.05.

Therefore, results of this test indicate that the model was able to distinguish between factors which are more likely to predict perinatal depression (EPDS score >10). As shown in the same table, age was the strongest predictor reporting a p-value of 0.011<0.05. The respondents aged 15-19 years are more likely to have perinatal depression than those aged 35 or more (Odds ratio: 131.973>1, C.I. =4.604- 3782.816). The level of education was also predicting perinatal depression with a p-value of 0.11<0.05. The respondents with no education appeared to be more likely to have perinatal depression than those who have an advanced level of education (odds ratio: 4.003., C.I. = 373-42.983).

Furthermore, the other determinants of perinatal depression were found to be the relationship with the husband (odds ratio: .089<1, C.I. = .030-.266); the number of children (odds ratio= .028<1, C.I. = .003-.261); and personal stressful events (odds ratio=.347<1, C.I. =.143-.843). Indeed, it was found that, respondents with strong relationship with husband are less likely to have the perinatal depression, and the respondents who had not yet a child were less likely to have the perinatal depression than those that have four or more children, while the respondents reporting any experienced stressful events are less likely to have perinatal depression than those that reporting a personal stressful event experienced.

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Table 4.16: **Logistic regression predicting the likelihood of perinatal depression**

Independent variables	B	Wald	df	P-Value	Odds Ratio	95% C.I. for Odds Ratio	
						Lower	Upper
Age*		13.112	4	**.011**			
15-19	4.883	8.133	1	.004	131.973	4.604	3782.816
20-24	.983	1.130	1	.288	2.672	.436	16.357
25-29	.124	.022	1	.883	1.133	.215	5.977
30-34	-.879	1.114	1	.291	.415	.081	2.123
35 and more (r)					1.000		
Level of education*		11.150	3	**.011**			
No Education	1.387	1.312	1	.252	4.003	.373	42.983
Primary	-.236	.042	1	.838	.789	.082	7.569
Secondary	1.268	.866	1	.352	3.553	.246	51.307
Tertialy (r)					1.000		
Relationship with the husband*							
Strong	-2.415	18.812	1	**.000**	.089	.030	.266
Poor(r)					1.000		
Number of children*		11.877	4	**.018**			
No Child	-3.570	9.890	1	.002	.028	.003	.261
One	-1.387	2.699	1	.100	.250	.048	1.307
Two	-.893	1.206	1	.272	.409	.083	2.015
Three	-.188	.050	1	.823	.828	.160	4.292
Four and more (r)					1.000		
Personal Stressful event							
No stressful event	-1.059	5.455	1	**.020**	.347	.143	.843
Identified stressful event (r)					1.000		
Constant	2.883	4.413	1	.036	17.862		

Note: *: Predicators with a significant P-value, "r": Reference category, df: degree of freedom; p: P-value; B: Regression coefficients

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4.5 Summary of findings

Most of the respondents (38.2%) were aged 25-29 years; Protestants (77.6%); married (44.8%); unemployed (77%) and had primary school level of education (60.6%). Results reveal that 14.5% of the participants in the antenatal period had a clinical level of anxiety (moderate and severe)

while 19.4% had depression. Similarly, 22.5% of participants in postnatal period fall under a clinical level of anxiety while 29.7% were found in the range of depression. Findings also suggest that 1.8% were participants in both periods and had all a normal level of anxiety while 1.2% had depression. Based on findings, it can be concluded that common perinatal mental disorders are common among respondents; particularly postnatal depression is the most CPMDs.

It has been found in line with this study that some socio-demographic characteristics and other important variables were found to be associated with CPMDs. Regarding socio-demographic characteristics; the results revealed that there is no statistically significant association between SAS scores and socio-demographic characteristics such as age ($\chi^2_{(8)}$ =11.229, p=.189); religion ($\chi^2_{(6)}$ = 1.946, p=.925); marital status ($\chi^2_{(6)}$ = 11.805, p=.066); level of education ($\chi^2_{(6)}$ = 6.001, p=.423) and occupation as well ($\chi^2_{(6)}$ = 3.649, p=.724). In short, based on the findings perinatal anxiety is not associated with socio-demographic characteristics.

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Besides, some statistically significant associations and differences were found between EPDS scores and socio-demographic characteristics; the findings only indicate statistically significant relationships between EPDS scores and marital status ($\chi^2_{(3)}$ = 17.559, p= .001). The same applies to the level of education ($\chi^2_{(3)}$ = 16.857, p= .001). It is confirmed by findings that participants' husband/partner relationships are associated with CPMDs; there is statistically significant relationship between husband/partner relationship and SAS scores ($\chi^2_{(2)}$ = 12.045, p= .002) and EPDS as well ($\chi^2_{(1)}$ = 38.207, p= .000). So far, it has been found significant positive relationship between SAS scores and husbands' behaviour ($\chi^2_{(8)}$ = 16.401, p= .037) and the same with EPDS ($\chi^2_{(4)}$ = 43.242, p= .000). Regarding number of children; the results showed no significant differences linked to the number of children and CPMDs ($\chi^2_{(8)}$ = 16.017, p= .042; $\chi^2_{(4)}$ = 18.554, p=

.001 anxiety and depression respectively). It has been evidenced as well that there is the link between personal stressful events and CPMDs ($\chi^2_{(14)} = 55.035$, p= .000 and $\chi^2_{(7)} = 30.232$, p= .000, anxiety and depression respectively).

The findings from the logistic regression indicate that the relationship with husband is was the only predictor of perinatal anxiety with Odd ration= 0.437<1, Confidence interval (CI)= 0.211-0.905). Moreover, the results indicate age was the strongest determinants of perinatal depression (Odd ratio: 131.973>1, C.I. = 4.604- 3782.816).

4.6 Conclusion

This chapter four presented the results of the current study. It also provided information on the sample characteristics, results of reliability analysis, univariate and descriptive analysis, as well as results of bivariate and multivariate analysis. The next chapter discusses the results in light of their relevance and how they compare with other relevant researches in the field. More so, the conclusion and recommendations based on the ensuing findings are also provided.

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CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter discusses the main results of the study in relation to the purpose and objectives. It also provides the conclusion and recommendations based on the ensuing findings. The purpose of the study was to determine the occurrence of common perinatal mental disorders in a selected district hospital of the Eastern Province in Rwanda. As far as the study objectives are concerned, this research sought to identify the presence of common perinatal mental disorders and to describe risk factors associated with them in that selected hospital. However, the discussion is divided into two main subjects responding to study objectives or questions; and those are section 5.2.1 regarding CPMDs identified and section 5.2.2 regarding risk factors found to be associated with CPMDs.

5.2 Discussion of the results

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5.2.1 The occurrence of common perinatal mental disorders

In relation to the research objective of identifying the occurrence of common perinatal mental disorders, the Edinburgh Postnatal depression scale (EPDS) and Self-rating anxiety scale (SAS) were utilized for screening for depression and anxiety, respectively.

According to the findings, the participants with moderate (20%) and severe anxiety (11.5%) levels were also found to fall under the category of depression. The results show that there is statistically a significant association between the Self-rating Anxiety Scale and the Edinburgh Postnatal Depression Scale ($\chi^2_{(2)}$ =49.672, p=.000, Cramer's V= .549). In line with the findings, Swalm et al. (2010, p. 515) emphasized that perinatal anxiety and depression occur frequently and often

together. However, in a study conducted by Swanson et al. (2011, p. 556) using the EPDS to screen for perinatal anxiety, they reported that the relationships between anxiety symptoms and depression are not straightforward and relate to whether or not the women is pregnant or postpartum (p. 556). Probably, with the item 3, 4 and 5 to screen for anxiety symptoms using EPDS (Swalm et al. 2010, p. 521), this may make it possible with regard to our findings that perinatal anxiety and depression occurred concurrently.

5.2.1.1 Perinatal depression

Using the Edinburgh Postnatal Depression Scale, we found that perinatal depression is extremely common among mothers in a selected district hospital of the Eastern Province in Rwanda (50.3% in Table 4.12). Subsequently, it has been found that the proportion of postnatal depression (29.7%) is higher than antenatal depression (19.4%). Comparing to the findings, the proportion of postnatal depression in Sub Saharan Africa (10 to 37%) is consistently reported higher than antenatal depression (12.5 to 27.1%) (Hanlon et al. 2008, p252). Constantly, a study conducted in a rural district of the neighbouring country Uganda (Kakyo et al. 2011, p. 374) also reported that postnatal depression is extremely prevalent among postnatal mothers (43%). Furthermore, the prevalence of postnatal depression in this study is more than the prevalence estimates in Africa (18.3%) as a region (Sawyer et al., 2010, p. 22). However, compared to the prevalence from some other African countries such as Uganda (43%) (Kakyo et al. 2011, p. 374) and South Africa (34.7%) (Hartley et al. 2011, p. 1), postnatal depression is likely to be less common in Rwanda (29.7%).

In contrast with the findings, a study by Rochat et al. (2011, p. 363) conducted in a rural district in South Africa found a high prevalence of antenatal depression (47%) using DSM-IV diagnostic criteria, while it was found to be also high (38.5%) using EPDS (Manikkam & Burns, 2012, p.

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940). Moreover, based on findings the prevalence of antenatal depression (19.4%) is particularly higher than the prevalence estimates (11.3%) of Africa (Sawyer et al., 2010, p. 27). However, antenatal depression (19.4%) is less common than postnatal in this study, like in the study conducted in Sri Lanka where it was also reported to be relatively low (16.2%) on EPDS (Agampodi & Agampodi, 2013, p. 1) compared to postnatal depression. Therefore, low prevalence of antenatal depression should not be neglected as long as it is known to negatively impact on the uptake of antenatal care, foetal and obstetrics outcomes, and AND was found to be a strong predictor of postnatal depression in a study conducted in rural South Africa (Rochat et al. 2011, p369). It can be concluded from the findings of this study that postnatal depression is common among mothers while antenatal depression is less common, but when compared to the estimates given for Africa, the study shows that perinatal depression prevalence is higher in Rwanda.

5.2.1.2 Perinatal anxiety

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Using Self-rating Anxiety Scale, we found that anxiety is common among perinatal mothers (37%) suggesting that pre-postnatal related anxiety should not be neglected. As Table 4.7 shows, only 14.5% of the respondents in the antenatal period were found to be in the range of moderate and severe anxiety level, while 22.5% of respondents in postnatal period were found to have a moderate and severe anxiety. Comparing the findings from this study, it can be highlighted that the rates of antenatal anxiety are consistent with the rates given by WA Perinatal Mental Health Unit (2011, p. 4), where about 14-16% of women have a clinical level of anxiety during their pregnancy, while the rates of postnatal anxiety are in contrary two times higher (8-10%) (WA Perinatal Mental Health Unit, 2011, p. 5).

There is a limited research into the range of perinatal anxiety disorders (Sawyer et al. 2010, p. 22), and there is no homogeneous data that considering anxiety disorders during perinatal period (Giardinelli et al. 2012, p. 22). However, a growing body of research suggests that perinatal anxiety is at least as disruptive as depression and possibly more prevalent (Swalm et al. 2010, p. 515). In contrast with this study, it has been found that perinatal anxiety is less common than perinatal depression.

In Africa as region, the pre- and postnatal anxiety prevalence rates are 14.8% and 14%, respectively (Sawyer et al. 2010, p. 17), while the prevalence rates of postnatal anxiety in Nigeria was 13.4% (Adewuya & Afolabi 2005, p. 256). Comparing with the pattern of this study results, antenatal anxiety has homogeneous data while postnatal anxiety is consistently higher. Indeed, there is no homogenous data about perinatal anxiety; recent studies also reported a higher prevalence of anxiety in antenatal period (24.7%) (Giardinelli et al. 2012, p. 22) than in postnatal (16.2%) (Austin et al. 2010, p. 396). Even if there are limited corroborative studies about perinatal anxiety, the perinatal anxiety should not be ignored with the fact that it is a risk of potential adverse consequence on the mother's health and early infant relationship and child's health and development (Sawyer et al. 2010, p. 17).

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5.2.2 Determinants of common perinatal mental disorders

Factors associated with Common Perinatal Mental Disorders were identified using Chi-square Tests. Correlations were computed between both scales (SAS & EPDS) and participants' demographic characteristics (age, religion, marital status & level of education and occupation), and other variables under study (husbands' information: relationship, behaviour and occupation,

nuclear family, number of children and planned pregnancy, as well as personal stressful events). In addition, the binary logistic regression model was used to determine the extent to which independent variables affect the dependent variables.

5.2.2.1 Socio-demographic characteristics

The results revealed that socio-demographic characteristics are not statistically associated with perinatal anxiety (Table 4.9). Although, some statistically significant associations were found between perinatal depression and socio-demographic characteristics such as age ($\chi^2_{(4)} = 9.105$ p= .059), marital status ($\chi^2_{(3)} = 17.559$, p= .001) and level of education ($\chi^2_{(3)} = 16.857$, p= .001). Furthermore, age was the strongest predictor (Odds ratio: 131.973) of perinatal depression; the respondents aged 15-19 years are more likely to have perinatal depression than those aged 35 or more. According to these results, it can be concluded that age of perinatal mothers does not contribute to perinatal anxiety while the young age can contribute to perinatal depression. However, previous studies (Fisher et al. 2011b, p. 144; Fisher et al. 2012, p. 97 & Nakku et al. 2006, p. 207) revealed that young age was significantly associated with both perinatal anxiety and depression. Women aged 35 years old or older (8.5%) in our study were found in the range of depression, although they were less likely to have perinatal depression (Table 4. 16), in relation to these findings, in a study conducted by Gartland et al. (2010, p. 413) this age category was significantly associated with better perinatal mental health.

Based on the findings, marital status is not significantly associated with perinatal anxiety while it does with perinatal depression. Recent studies (Fisher et al. 2012, p. 100; Sawyer et al. 2010, p. 28 & Rochat et al. 2011, p. 370) confirmed this study results that marital status was associated with perinatal depression.

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Furthermore, the socio-demographic variables that show a good socioeconomic and education level may represent a protective factor for mood and anxiety disorders in perinatal period (Giardinelli et al. 2012, p. 27). Therefore, our study proves a link between level of education and perinatal depression opposed to perinatal anxiety. The findings show further that respondents with no education level appeared to be more likely to have perinatal depression compared to those that have an advanced level of education (odd ration: 4.003). This is confirmed by Fisher et al. (2012, p. 100) who found that the risk of CPMDs was lower among women having advanced level of education.

In addition, the results show that the level of education was not significantly associated with perinatal anxiety ($\chi^2_{(6)}$ = 6.001, p=.423). Giardinelli et al. (2012, p. 28) confirm that the level of education is not statistically relevant but can show us a real tendency of the increase of the risk of developing a CPMD. According to Fisher et al. (2012, p. 98), having a permanent job has been associated with protective factor for mothers in perinatal period. However, in this study most of mothers (77%) were reported unemployed and it has to be stressed that occupation was not statistically significant associated with perinatal anxiety and depression.

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5.2.2.2 Information about husband/partner: relationship, behaviour and occupation

In line with this study, the relationship with husband was found to be a determinant of perinatal anxiety and depression. Indeed, respondents reporting a strong relationship with husband were found to be less likely to have perinatal anxiety (Odd ratio =0.437) and perinatal depression (odds ratio=.089). Other studies (Kakyo et al. 2011, p. 379; Sawyer et al. 2010, p. 27, Hartley et al. 2011, p. 5) have also noted that marital problems and lack of emotional and practical support from spouses are important in the development of CPMDs. Fisher et al. (2010, p. 738), highlighted that

nurturing and confiding intimate relationships exercise a protective influence on maternal mental health. However, this explained that how much relationships with husband/ partner and behaviour characteristics were associated with CPMDs in our study.

Moreover, high levels of symptoms of perinatal depression and anxiety are significantly associated with having experienced domestic violence (Howard et al. 2013, p. 1). In line with this study behaviour characteristics which include violent husband (8.5%) and personal stressful events which include also intimate partner violence (2.4%) found to be statistically associated with both perinatal anxiety and depression. It can be concluded that violent husband and Intimate Partner Violence (IPV) are risk factors to CPMDs; thus, they should be taken into consideration in mothers' perinatal care.

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5.2.2.3 Other factors

Common perinatal mental disorders in women are governed by multiple factors such as number of children and planned pregnancy as well as personal vulnerability and stressful events.

The findings indicate that there is statistically significant association between the number of children and CPMDs ($\chi^2_{(8)} = 16.017$, p= .042 & $\chi^2_{(4)} = 18.554$, p= .001, anxiety and depression respectively). Moreover, the number of children was also found to be a predictor of common perinatal depression, certainly respondents who had not yet children were less likely to have perinatal depression than those that have children or more (odds ratio= .028). Bloch et al. (2006) and Giardinelli et al. (2012) in their studies have also confirmed this association. The results suggested further that 40.6% of respondents reported unplanned pregnancy and most of them were found to have CPMDs. Therefore, findings indicated a statistically significant relationship between unplanned pregnancy and CPMDs ($\chi^2_{(1)} = 17.773$, p= .000 & ($\chi^2_{(2)} = 8.244$, p= .016; depression and

anxiety respectively). In similarity with recent studies (Nakku et al. 2006, p. 207; Sawyer et al., 2010, p. 27 & Fisher et al. 2012, p.99); unplanned pregnancy was statistically significant associated with CPMDs while on the contrary, Hartley et al. (2011, p. 4) reported that having an unplanned pregnancy was not associated with depressed mood in pregnancy.

It has been evidenced so far in this study the link between personal vulnerability and stressful events and CPMDs ($\chi^2_{(14)} = 55.035$, p= .000 and $\chi^2_{(7)} = 30.232$, p= .000, anxiety and depression respectively). In some studies (Giardinelli et al. 2012, p. 30; Kakyo et al. 2011, p. 379; Sawyer et al. 2010, p. 29 & Nakku et al. 2006, p. 207) personal stressful events have indeed been reported to be precursors of CPMDs. Among personal stressful events found to be statistically associated with CPMDs in our study, a mental illness in the family (15.5%) was included, followed by child abuse (14.5%), sexual abuse (10.9%) and a history of personal mental illness (7.9%). In contrast with the study of Yiu et al. (2009, p. 114) a history of family mental illness was not statistically associated with CPMDs while recent studies (Fisher et al. 2012, p. 140 & Giardinelli et al. 2012, p. 28) indicated that past history of mental illness was statistically significant associated with CPMDs. It has been further highlighted by Seimyr et al. (2013, p. 122) that women with prior mental health problem are vulnerable for maternal distress. Haward et al. (2013, p. 1) have added that risk factors for common perinatal mental disorders are generally similar to those for mental disorders outside the perinatal period and include a family and personal history of mental disorders.

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5.3 Conclusion

Common perinatal mental disorders (CPMDs) are increasingly recognised to be an important public health issue in Africa and particularly in Rwanda. Therefore, the study was aimed at determining the occurrence of CPMDs in a selected district hospital of the Eastern Province in Rwanda.

The results from descriptive analysis showed that common perinatal mental disorders are prevalent among mothers from the selected study area, and some factors were found to be statistically associated with CPMDs. Findings reveal that the proportion of 37% of the respondents were found to have a clinical level of perinatal anxiety while more than a half of the respondents (50.3%) fall under the category of depression.

Factors found to be statistically associated with perinatal anxiety are: relationship with husband/partner ($\chi^2_{(2)} = 12.045$, p= .002), husband/partner's behaviour ($\chi^2_{(8)} = 16.401$, p= .037), number of children ($\chi^2_{(8)} = 16.017$, p= .042), planned pregnancy ($\chi^2_{(2)} = 8.244$, p= .016), stressful events ($\chi^2_{(14)} = 55.035$, p= .000). Among these variables, the relationship with husband/partner was found to be the only predictor of perinatal anxiety (Odd ratio= 0.437).

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With regard to perinatal depression, factors found to be associated with perinatal depression are: marital status ($\chi^2_{(3)} = 17.559$, p= .001), level of education ($\chi^2_{(3)} = 16.857$, p= .001), husband/partner relationship ($\chi^2_{(1)} = 38.207$, p= .000), husbands' behaviour ($\chi^2_{(4)} = 43.242$, p= .000), number of children ($\chi^2_{(4)} = 18.554$, p= .001), planned pregnancy ($\chi^2_{(1)} = 17.773$, p= .000), personal stressful events ($\chi^2_{(7)} = 30.232$, p= .000). Moreover, the results indicate age was the strongest determinants of perinatal depression (Odd ratio: 131.973).

5.4 Limitations to the study

Our study with its small sample size cannot be generalized and with the fact that it was hospital based study, it may underestimate the prevalence of CPMDs because the mothers who had not their appointment time within the period of the study were not sampled.

In addition, women who may be suffering from a severe CPMD may lack interest to visit a health facility not only for themselves but also for the care of their infants. Thus, there is a need for community based research to assess common perinatal mental disorders.

5.5 Recommendations

5.5.1 Implications for further research

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There is a need for community-based and population-based studies detecting common perinatal mental disorders in other areas of the Eastern Province or in other provinces, and a national survey is also needed.

Further research in determining the knowledge and attitudes of mental health nurses and midwives about CPMDs should be useful. In this case, the research's results may highlight areas of focus in developing guidelines for management of CPMDs. There should also be research validating the screening tools (EPDS and SAS) used for this study in Rwandan context.

5.5.2. Implications for clinical practice

In Rwanda, maternal mental wellbeing such as screening for CPMDs is not included in the pregnancy care programme. However, findings of this study prove that CPMDs are more prevalent

in Rwanda than the African estimates given by Sawyer et al. (2010). Therefore, it is imperative to include screening for CPMDs in order to foresee/plan for early detection and interventions.

Public education about common perinatal mental disorders and training for all providers of services for pregnant and postpartum women could be essential consecutively to increase awareness and early detection as well as to ease access to care.

In light of the ever growing literature on the potential deleterious effects of CPMDs on mothers' health, early-infant relationship and child's health and development, it is imperative that research be conducted on these areas. Therefore, early identification and treatment for CPMDs may improve pregnancy outcomes and could help to prevent postnatal depression or anxiety and further complications associated with CPMDs.

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In line with our study; unplanned pregnancy was found to be associated with perinatal depression and anxiety. However, there should be a constant emphasis on family planning in Rwanda especially in the selected district hospital and mothers who failed to abide by the family planning should be taken care of and reassured.

It should be recommended that EPDS and SAS be used as screening tools to detect CPMDs as they have been proved in this study to reflect internal consistency (Cronbach alpha was 0.87 and 0.89, SAS and EPDS respectively).

Mental health nurses and midwives should emphasise on the psychosocial assessment and male involvement in postpartum care to increase opportunities of identifying mothers at risk of CPMDs and implementing interventions that target men.

Obstetricians, paediatricians, psychologists, midwives and other clinicians caring for pregnant women and mothers of infants after childbirth should be conscious that certain women are at a greater risk of experiencing emotional distress and early parenting difficulties in the post partum period. Maternal mental wellbeing, quality of relationship with intimate partner, unplanned pregnancy, teenage pregnancy and number of children should be taken into consideration in mothers who are in perinatal period.

5.5.3 Implications for health and education authorities

Primary health care should consider the integration of maternal mental health care into maternal health. Thus, mental health nurses and midwives and other health care providers concerned should receive continuous professional development and in-service training to ensure that they are skilled and competent in recognizing risk factors, detecting and intervening early CPMDs.

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This study recommends that stakeholders in education should include or emphasize on revisiting the curriculum of mental health nurses and midwives considering the full integration of maternal mental health.

Authorities in the health sector should design policies and guidelines addressing maternal mental health needs with all stakeholders including religious leaders and also facilitate the integration of maternal mental health care into the antenatal and postnatal care and vice-versa.

The Maternal Newborn and Child Health Project in Rwanda should focus on facilitating the integration of maternal mental health into antenatal and postnatal care and vice-versa (early detection and interventions of anxiety and depression as the most common perinatal mental disorders).

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APPENDICES

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Appendix: 1

OFFICE OF THE DEAN

DEPARTMENT OF RESEARCH DEVELOPMENT

03 October 2013

To Whom It May Concern

I hereby certify that the Senate Research Committee of the University of the Western Cape approved the methodology and ethics of the following research project by
Ms PM Umuziga (School of Nursing)

UNIVERSITY of the
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Research Project: Assessment of common perinatal mental disorders in selected district hospital setting of Eastern Province in Rwanda.

Registration no: 13/8/9

Any amendments, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

The Committee must be informed of any serious adverse event and/or termination of the study.

Ms Patricia Josias
Research Ethics Committee Officer
University of the Western Cape
Private Bag X17, Bellville 7535, South Africa
T: +27 21 959 2988/2948 . F: +27 21 959 3170
Email: pjosias@uwc.ac.za
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a place to grow, from hope
to action through knowledge

Appendix 2

KIGALI HEALTH INSTITUTE

B.P. 3286 Kigali, RWANDA
Tel: + (250) 572172; +250 571788

Institutional Review Board

24th June 2013

KHI/IRB/26/2013

Ms UMUZIGA Providence
Faculty of Nursing Sciences
Kigali Health Institute

UNIVERSITY of the WESTERN CAPE

Dear Ms UMUZIGA Providence

RE: ETHICS CLEARANCE

Reference is made to your application for ethics clearance for the study entitled ***"Assessment of Common Perinatal Mental Disorders in Selected District Hospital Setting of Eastern Province in Rwanda"*** You will be pleased to learn that the ethics clearance has been granted to your study by the KHI Institutional Review Board (IRB) on behalf of the National Ethics Committee (NEC) in accordance with the authority granted to the IRB by the National Ethics Committee letter of 13th May 2010 and in line with the "Rwanda Ministry of Health Guidelines for Researchers Intending to do Health Research in Rwanda" of February 2012.

You shall, be required to submit the progress report and any other major changes made in the proposal during the implementation stage. Also, at the end of the study the Institutional Review Board shall also require to be given a final report of the study.

I wish you success in this important study.

Kigali Health Institute K.H.I. INSTITUTIONAL REVIEW BOARD

Prof. Kato J. NJUNWA
Chairperson, KHI Institutional Review Board

Cc:

- Rector, KHI
- Vice Rector, Academics and Research, KHI
- Chairperson, Rwanda National Ethics Committee
- Members of IRB

Appendix 3

UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21 9593024 (O) Fax: +27 86 5108806

E-mail: oadejumo@uwc.ac.za

C/O University of the Western Cape
Private Bag X 17, Bellville 7535,
South Africa

October 3, 2013

The Director of Nyamata District Hospital
Bugesera District,
Eastern Province,
RWANDA.

RE: Request for permission to conduct research entitled "Assessment of Common Perinatal Mental Disorders in a selected District Hospital of the Eastern Province in Rwanda".

Dear Sir/Madam,

I am **UMUZIGA M. PROVIDENCE**, a postgraduate student at the University of The Western Cape/ South Africa, Nursing Department.

For the fulfilment of the requirement for master's degree, I am required to conduct a research on the above mentioned topic.

The purpose of this study is to determine common perinatal mental disorders in a selected district hospital setting of the Eastern Province in Rwanda.

Therefore, I am writing to request for your permission to conduct the study in your hospital as the chosen study area including the health facilities which fall under your supervision.

Thanking you in anticipation.

Yours sincerely

UMUZIGA M. PROVIDENCE

Appendix 4

REPUBLIQUE DU RWANDA
DISTRICT DE BUGESERA

ADEPR

HOPITAL NYAMATA

BP : 7112 Kigali

Tél : 0788130100

E-Mail : *hop.nyamata@rwanda1.com*

No 562/HN/2013

Nyamata, October 7th 2013

Madam UMUZIGA M. PROVIDENCE

Nursing School

University of the Western Cape

SOUTH AFRICA.

UNIVERSITY of the
WESTERN CAPE

Dear Madam,

RE: Your application to conduct a research at Nyamata District Hospital

Reference is made to your application of October 3rd, 2013 relating to your request for permission to conduct a research project in our hospital including health centers which title is "Assessment of Common Perinatal Mental Disorders in a selected District Hospital of the Eastern Province in Rwanda; I am pleased to inform you that your request has been recognized. Therefore, you are allowed to collect data in maternity, pediatric services and health centers under hospital supervision.

I wish you success in your studies.

Dr Alfred RUTAGENGWA

Nyamata District Hospital

Appendix 5

50 TWILLEY GARDENS,

TWILLEY STREET,

KENILWORTH, 7708

CAPE TOWN

22 November 2013

To whom it may concern,

ASSESSMENT OF COMMON PERINATAL MENTAL DISORDERS IN A SELECTED DISTRICT HOSPITAL OF THE EASTERN PROVINCE IN RWANDA

I am an experienced editor with background in social sciences. I have thoroughly read the above dissertation by **MARIE PROVIDENCE UMUZIGA**and made the required changes to grammar, spelling, referencing, punctuation, paragraphing and formatting. This was done in line with UWC's guide to dissertations.

UNIVERSITY of the WESTERN CAPE

Adam Andani

Tel: 078 268 4761

Appendix 6

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INFORMATION SHEET

Project Title: Assessment of Common Perinatal Mental Disorders in Selected District Hospital Setting of Eastern Province in Rwanda

What is this study about?

This is a research project being conducted by **UMUZIGA M. PROVIDENCE** at the University of the Western Cape/South Africa. We are inviting you to participate in this research project because you are meeting inclusion criteria for the current research population of interest (pregnant mothers and mothers of young infants who came for immunization programs).

The purpose of this research project is to determine common perinatal mental disorders in a selected district hospital of the Eastern Province/ Rwanda. Results will highlight the common perinatal mental disorders and its determinants in Rwanda. Findings will be accessible to everyone concerned, especially the health professionals and administrative authorities working in the health sector in Rwanda. Having such available data will make it possible for the health authorities in Rwanda to design and apply appropriate interventions to address the mental health needs of mothers in perinatal period.

What will I be asked to do if I agree to participate?

You will be asked to come in the area chosen and fill in the informed consent after the researcher/ research assistant will explain the questionnaire and ask you to answer questions. It will take less than 30 min to participate. The questionnaire includes social demographic information, questions about risk factors and identification of common perinatal mental disorders.

Would my participation in this study be kept confidential?

We will do our best to keep your personal information confidential. To help protect your confidentiality, the data collected will be kept in a locked cupboard, and no one else will have access to the completed data collection tools filled during the research process, except the researcher, her supervisor and statistician. No identification will appear on the data collection tool and data could not be traced back to an individual.

If we write a report or article about this research project, your identity will be protected to the maximum extent possible.

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Participants, who will be found to have EPDS scores above 10 (depression) or positive on item 10 (suicidal thoughts), and also participant who will have SAS scores above 60 (severe anxiety), will first be informed and be allowed to make decision to seek treatment. If accepted, they will then be helped to make appointment to the mental health team after getting their care.

What are the risks of this research?

There may be some risks from participating in this research study such as feeling uncomfortable (fear, embarrassment or fatigue), because of some questions which can remind you your difficulties, a researcher or research assistant will show you a prepared room calm and safe where you can sit and rest before you leave, and if it continues they will escort you to the mental health team of the health facility.

What are the benefits of this research?

This research is not designed to help you personally, but the results may help the investigator learn more about common perinatal mental disorders and its determinants among mothers in this area and Rwanda in general. We hope that, in the future, other people might benefit from this study through improved understanding of maternal mental health problems.

Do I have to be in this research and may I stop participating at any time?

Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify.

What if I have questions?

This research is being conducted by **UMUZIGA M. PROVIDENCE/ ADVANCED MENTAL HEALTH NURSING DEPARTMENT** at the University of the Western Cape. If you have any questions about the research study itself, please contact at: **UMUZIGA M. PROVIDENCE (+250)788500479, (+27)0604101371, *e-mail address:***

***umuprov20@yahoo.com*.**

Should you have any question regarding this study and your rights as a research participant or if you wish to report any problems you have experienced related to the study, please contact:

Head of Department: Prof. K. Jooste

Private Bag X17, Bellville 7535

Tel (021) 959 2274

E-mail: kjooste @uwc.ac.za

Dean of the Faculty of Community and Health Sciences:

Prof. J. Frantz (Acting)

University of the Western Cape

Private Bag X17

Bellville 7535

Tel: (021)-959 2631, E-mail: jfrantz@uwc.ac.za

This research has been approved by the University of the Western Cape's Senate Research Committee and Ethics Committee and Kigali Health Institute Institutional Review Board.

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Appendix 7

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E-mail: oadejumo@uwc.ac.za

IFISHI Y'AMAKURU /UBUSOBANURO

Inyito y' ubushakashatsi:

Assessment of Common Perinatal Mental Disorders in Selected District Hospital Setting of Eastern Province in Rwanda/ Gusuzuma indwara zo mu mutwe zikunze kuboneka mu gihe umubyeyi atwite cyangwa afite uruhinja mu bitaro bimwe byo muntara y'Iburasirazuba mu Rwanda

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Ni iki ubushakashatsi bugamije?

Ubu bushakatsi bukorwa na UMUZIGA M. PROVIDENCE umunyeshuri muri Kaminuza yo muri Afurika y'epfo yitwa "**The University of the Western Cape"**. Turagutumira gukorerwaho ubushakatsi kuko wujuje ibasabwa.

Ubu bushakashatsi bugamije kugaragaza indwara zo mu mutwe zikunze kuboneka mu gihe umubyeyi atwite cyangwa afite uruhinja mu bitaro bimwe byo muntara y'Iburasirazuba mu Rwanda. Ibizabuvamo bizagaragaza uko izo ndwara zihagaze muri ibi bitaro byanyu hanyuma bigezwe kunzego z'ubuzima ndetse n'Ibitaro hashyirweho ingamba zihamye zo kurushaho kwita kubadamu batwite n'abafite impinja.

Ni iki nsabwa niba nemeye gukorerwaho ubushakatsi?

Urasabwa kuza aho twateguye gukorera hanyuma wuzuze urupapuro rugaragaza ko wemeye gukorerwaho ubushakashatsi, hakurikireho ko uhabwa ubusobanuro bw'ibibazo usabwe gusubiza. Bifata iminota 30. Urupapuro rw'ibibazo by'ubushakashatsi bukubiyemo amakuru ajyanye n'umwirondoro n'irangamimerere, ibijyanye n'ingaruka zimwe zagira uruhare mu burwayi twavuze hejuru ndetse n'ibindi biranga ubwo burwayi.

Uruhare rwanjye muri ubu bushakatsi buzaba ibanga?

Tuzakora uko dushoboye kubika neza umwirondoro wawe. Kugirango turusheho kubikana ibanga umwirondoro wawe, ibizakusanywa n'ubushakatsi bizabikwa ahafungwa. Ntawundi muntu uzabigiraho uruhare keretse ukora ubushakasha na mwarimu we. Ntamwirondoro uzagaragara kurupapuro rw'ibibazo by'ubushakashatsi cg kuba ibyavuye muribwo bigaragaza umwirondoro.

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Nitwandika raporo y'ubushakashatsi cg tugatangaza ibyavuye muri bwo, umwirondoro wawe tuzawusigasira uko tuzabishobora.

Abazinjira mu bushakashatsi bazaba hari uburwayi bagaragayeho (EPDS scores 10 and SAS scores 60 and above: severe anxiety) cg basanzweho ko bafite ibitekerezo byo kumva biyanze banakwipfira (positive on item 10: suicidal thoughts), bazamenyeshwa banasobanurirwe hanyuma bifatire ikemezo cyo gushaka ubufasha banahabwe amakuru y'aho basanga ubufasha, hanyuma bafashwe kubona itariki bazagira kwivuza.

Ni izihe garuka zijyanye n'ubu bushakashatsi?

Birashoboka ko habaho ingaruka zijyanye n'ubu bushakashatsi, nko kumva utamerewe neza (ubwoba, kubangamirwa cyangwa se umunaniro), bitewe n'ibibazo bimwe bishobora kuba byakwibutsa ingorane zawe. Umushakashatsi cyangwa umwungirije bazakwereka icyumba cyabiteguriwe gituje kandi gifite umutekano aho ushobora kuruhukira mbere yo gutaha. Mu gihe bikomeje, bazaguherekeza ku baganga bashinzwe ubuzima bwo mu mutwe ku ivuliro.

Ni izihe nyungu ziri muri ubu bushakashatsi?

Ubushakashatsi, mu miterere yabwo, ntabwo bugufitiye inyungu z'umwihariko, ariko ibizava muribwo bishobora gufasha umushakashatsi kugaragaza uko izo ndwara zo mu mutwe zikunze kuboneka mu gihe umubyeyi atwite cyangwa afite uruhinja zigaragara ndetse no kumenya igitera izo ndwara muri aka karere by'umwihariko ndetse no mu Rwanda muri rusange. Twizera ko mugihe kizaza, abandi bantu bashobora kubona inyungu z'ubu bushakashatsi basobanukirwa kurushaho n'ibibazo byo mu mutwe umubyeyi ahura nabyo.

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Ese ni ngomba kuba muri ubu bushakashatsi, ese nemerewe kuvamo igihe cyose mbonye ari ngombwa?

Kuba muri ubu bushakashatsi si agahato. Ushobora guhitamo kutabujyamo. Mu gihe wemeye kwinjira muri ubu bushakashatsi, wemerewe kuvamo igihe icyo aricyo cyose kandi bitakugizeho ingaruka cyangwa izindi nkurikizi.

Nabyifatamo nte ngize ikibazo?

Ubu bushakashatsi buri gukorwa na **UMUZIGA M. PROVIDENCE/** Ishami ryigisha ubuzima bwo mu mutwe muri kaminuza ya Western Cape. Uramutse ugize ikibazo kijyanye n'ubu bushakashatitsi, ushobora guhamagara cyangwa ukandikira **UMUZIGA M. PROVIDENCE (+250)788500479, (+27)0604101371, *e-mail address:***

***umuprov20@yahoo.com*.**

Mu gihe ugize ikibazo kijyanye n'ubu bushakashatis, cyangwa se ku bijyanye n'uburenganzira bwawe nk'umuntu ukorerwaho ubushakashatsi, cyangwa se mu gihe wifuza kumenyekanisha ikibazo waba warahuye nacyo muri ubu bushakashatsi, watelefona cyangwa ukandikira:

Head of Department: Prof. K. Jooste

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Tel (021) 959 2274

E-mail: kjooste @uwc.ac.za

Dean of the Faculty of Community and Health Sciences:

Prof. J. Frantz (Acting)

University of the Western Cape

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Ubu bushakashatsi bwemewe na kaminuza ya Western Cape ndetse n'ishuli rikuru ry'ubuzima rya Kigali.

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Appendix 8

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CONSENT FORM

Title of Research Project: Assessment of Common Perinatal Mental Disorders in Selected District Hospital of Eastern Province in Rwanda

The study has been described to me in language that I understand and I freely and voluntarily agree to participate. My questions about the study have been answered. I understand that my identity will not be disclosed and that I may withdraw from the study without giving a reason at any time and this will not negatively affect me in any way.

Participant's name……

Participant's signature……

Witness……

Date……

Should you have any questions regarding this study or wish to report any problems you have experienced related to the study, please contact the study coordinator:

Study Coordinator's Name: Prof Oluyinka Adejumo

University of the Western Cape

Private Bag X17, Belville 7535

Telephone: (021)959- 3024

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IFISHI YO KWEMERA GUKORERWAHO UBUSHAKASHATSI

Inyito y'ubushakashatsi: Gusuzuma indwara zo mu mutwe zikunze kuboneka mu gihe umubyeyi atwite cyangwa afite uruhinja mu bitaro bimwe byo muntara y'Iburasirazuba mu Rwanda

Nasobanuriwe ubushakashatsi mu rurimi numva, kandi nemeye nta gahato gukorerwaho ubushakashatsi. Ibibazo nari mfite kubushakashatsi nabisobanuriwe. Nasobanuriwe ko umwirondoro wanjye ntawe azagaragarira kandi ko nemerewe kuva mu bushakashatsi nta bisobanuro ntanze igihe cyose nsanze ari ngombwa kandi ibi ntibizangireho ingaruka izo arizo zose.

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Izina ry'ukorerwaho ubushakashatsi……..

Umugabo ubihamya.....

Itariki.....

Mu gihe ugize ikibazo icyo aricyo cyose kijyanye n'ubu bushakashatsi, cyangwa se mu gihe wifuje kumenyekanisha ikibazo wahuye nacyo muri ubu bushakashatsi, ushobora guhamagara cyangwa ukandikira umuhuzabikorwa w'ubushakashatitsi.

Amazina y'umuhuzabikorwa w'ubushakashatis: Prof Oluyinka Adejumo
University of the Western Cape
Private Bag X17, Belville 7535
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Fax: (021)959-86 5108806
Email: oadejumo@uwc.ac.za

Appendix 10

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QUESTIONNAIRE

Participant's code: …….. .....…… Date…….

SECTION A: SOCIO-DEMOGRAPHIC, OBSTETRIC, HUSBAND AND FAMILY INFORMATION OF PARTICIPANTS.

NUMBER	QUESTION	ALTERNATIVE RESPONSE	CODE
A1	How old are you? Ufite imyaka ingahe?	a.15-19 b. 20-24 c. 25-29 d. 30-34 e. 35 >	1 2 3 4 5
A2	Perinatal period Ikiciro urimo	a. Pregnancy/ aratwite b. Mother of young infants/ afite uruhinja c. both (byombi)	1 2 3
A3	Age of pregnancy Ubukuru bw'inda	a. No pregnancy/ ntatwite b. First term/ igihembwe cya 1 c. Second term / igihembwe cya 2 d. Third term/ igihembwe cya 3	0 1 2 3
A4	Age of last born infants Imyaka y'umwana uheruka kubyara	a. No infant /ntamwana acukije b. 1-4 months /amezi c. 5-8 months /amezi d. 9-12 months /amezi e. >13 months /amezi	0 1 2 3 4
A5	What is your	a. No religion /nta dini agira	1

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	religion? Idini ryawe ni irihe?	b. Catholic /Gatolika b. Protestants churches /abaporoso d. Muslim/ Abayisiramu	2 3 4
A6	Number of children Umubare w'abana wabyaye	a. one/ umwe b. two/ babiri c. three /batatu d. four and above /bane cg hejuru	1 2 3 4
A7	Marital status Irangamimerere	a. single /ingaragu b. married /barasezeranye c. Living together/baribanira badasezeranye d. Separated/divorced/baratandukanye/ bafite gatanya e. Widowed/ yarapfakaye	1 2 3 4 5
A8	Level of education Amashuri yize	a. No education /ntabwo yize b. Primary school /amashuri abanza d. Secondary school /ayisumbuye e. Tertiary /amakuru	1 2 3 4
A 9	Occupation Icyakora	a. Employed /afite akazi b. Unemployed /ntakazi c. Self-employed /arikorera d. No permanent job/ ntakazi gahoraho	1 2 3 4
A10	Type of delivery on last pregnancy Uko yabyaye ku nda iheruka	a. Caesarean section /yarabazwe b. Normal vaginal delivery/ yabyaye neza	1 2
A11	Sex of the last born child Igitsina cy'umwana uheruka kuvuka	a. Boy /umuhungu b. Girl umukobwa	1 2
A12	Planned pregnancy Gutwita	a. Yes /yego b. No /oya	1 2

	wabyiteguye		
A13	Nuclear family Umuryango bwite avukamo	a. both parents and siblings alive/ ababyeyi bombi n'abavandimwe bariho b. lost a parent /yapfushije umubyeyi c. lost a sibling/ yapfushije umuvandimwe g. lost both parents and all siblings/ yapfushije ababyeyi bombi n'abavandimwe bose	1 2 3 4
A14	Relationship with husband Imibanire n'umugabo	a. strong relationship/babanye neza b. poor relationship/ amakimbirane	1 2
A15	Occupation of husband Umurimo umugabo akora	a. Employed/ arakora b. Unemployed/ ntakora c. Self-employed/ arikorera d. No permanent job/ afite akazi kadahoraho	1 2 3 4
A16	Husband characteristics/ Imiterere y'umugabo	a. Supportive/ aramufasha b. Non supportive/ ntamufasha c. Violent/ aramuhohotera d. alcoholic/ ni umusinzi e. other and specify /ikindi sobanuro	1 2 3 4 5
A16	Personal stressful events Ibizazane yahuye nabyo	a. History of child abuse/ yarahohotewe akiri muto b. History sexual abuse/yafashwe kungufu c. History of mental illness in the family/ uburwayi bwo mu mutwe mu muryango d. History of personal mental illness/ yagize uburwayi bwo mu mutwe e. no stressful event /ntakibazo yagize f. other and specify/ ikindi sobanuro	1 2 3 4 5 6

SECTION B: IDENTIFICATION OF COMMON PERINATAL MENTAL DISORDERS:

Anxiety/ Self-rating Anxiety Scale (SAS)

Items 5, 9, 13, 17, and 19 are reverse scored

NO.	QUESTION	ALTERNATIVE RESPONSE	SCORE
B1	1. Do you feel more nervous and anxious than usual? Ujya wumva ufite umunabi n'ishavu birenze ibisanzwe?	a. None or a little of the time/ oya cg gake b. Some of the time/ rimwe na rimwe c. Good part of the time/ bikunze kukubaho d. Most or all of the time/ bikubaho kenshi cg igihe cyose	1 2 3 4
B2	2. Do you feel afraid for no reason at all? Ujya ugira ubwoba nta mpamvu	a. None or a little of the time /ntabwo cg gake b. Some of the time /rimwe na rimwe c. Good part of the time/ bikunze kukubaho d. Most or all of the time/ bikubaho kenshi cg igihe cyose	1 2 3 4
B3	3. Do you get upset easily or feel panicky? Ujya wumva ufite igihunga	a. None or a little of the time/ ntanarimwe cg gake b. Some of the time/ rimwe na rimwe c. Good part of the time/ Biringaniye d. Most or all of the time/ Hafi ya buri gihe cg igihe cyose	1 2 3 4

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B4	4. Do you feel you are falling apart and going to pieces? Supplementary questions: Do you feel that everything is going wrong and there is nothing you can do about it? Do you feel you can't cope/carry on with things anymore? Ujya wumva ntakigenda? Ntanubushobozi ufite bwo kugira icyo ubikoraho?	a. None or a little of the time/ ntanarimwe cg gake b. Some of the time /rimwe na rimwe c. Good part of the time/ Biringaniye d. Most or all of the time/ Hafi ya buri gihe cg igihe cyose	1 2 3 4
B5	5. Do you feel that everything is alright and nothing bad will happen? Ujya wumva ibintu byose bigenda neza ntakibi cyakubaho? Supplementary questions: Do you worry in case anything terrible might happen, do you feel everything is going to be fine?	a. None or a little of the time/ ntanarimwe cg gake b. Some of the time/ rimwe na rimwe c. Good part of the time/ Biringaniye d. Most or all of the time/ Hafi ya buri gihe cg igihe cyose	4 3 2 1
B6	6. Do your arms and legs shake and tremble? Ujya wumva amaguru n'amaboko bihinda umushyitsi?	a. None or a little of the time ntanarimwe cg gake b. Some of the time /rimwe na rimwe c. Good part of the time/ Biringaniye d. Most or all of the time/ Hafi ya buri gihe cg igihe cyose	1 2 3 4
B7	7. Are you bothered by headaches, neck and back pains? Supplementary question: Are you bothered by a sore head, a	a. None or a little of the time /ntanarimwe cg gake b. Some of the time /rimwe na rimwe	1 2

	sore neck or a sore back? Ujya ubangamirwa no kuribwa umwutwe, ijosi n'umugongo?	c. Good part of the time /Biringaniye d. Most or all of the time / Hafi ya buri gihe cg igihe cyose	3 4
B8	8. Do you feel weak and get tired easily? Ujya ucika intege ukanananirwa vuba?	a. None or a little of the time /ntanarimwe cg gake b. Some of the time/ rimwe na rimwe c. Good part of the time/ Biringaniye d. Most or all of the time / Hafi ya buri gihe cg igihe cyose	1 2 3 4
B9	9. Do you feel calm and can you sit still easily? Ujya wumva utuje kandi ukicara ahantu hamwe bitakugoye?	a. None or a little of the time/ ntanarimwe cg gake b. Some of the time/ rimwe na rimwe c. Good part of the time/ Biringaniye d. Most or all of the time/ Hafi ya buri gihe cg igihe cyose	4 3 2 1
B10	10. Can you feel your heart beating fast? Ujya wumva umutima utera cyane cg ugusimbuka?	a. None or a little of the time/ ntanarimwe cg gake b. Some of the time/ rimwe na rimwe c. Good part of the time/ Biringaniye d. Most or all of the time/ Hafi ya buri gihe cg igihe cyose	1 2 3 4
B11	11. Are you bothered by dizzy spells? Ujya ugira isereri?	a. None or a little of the time /ntanarimwe cg gake b. Some of the time/	1 2

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		rimwe na rimwe c. Good part of the time/ Biringaniye d. Most or all of the time/ Hafi ya buri gihe cg igihe cyose	 3 4
B12	12. Do you have fainting spells or feel like it? Supplementary question: Do you feel you are going to fall down because you are weak or dizzy? Wumva wenda kugwa kubera isereri?	a. None or a little of the time/ ntanarimwe cg gake b. Some of the time/ rimwe na rimwe c. Good part of the time/ Biringaniye d. Most or all of the time/ Hafi ya buri gihe cg igihe cyose	1 2 3 4
B13	13. Can you breathe in and out easily? Ushobora guhumeka winjiza umwuka ukanawusohora bikoroheye?	a. None or a little of the time/ ntanarimwe cg gake b. Some of the time/ rimwe na rimwe c. Good part of the time/ Biringaniye d. Most or all of the time/ Hafi ya buri gihe cg igihe cyose	4 3 2 1
B14	14. Do you get feelings of numbness and tingling in your fingers and toes? Supplementary question: Do you ever get pins and needles in your fingers and toes; do you ever get any funny feelings in your fingers and toes? Ujya wumva ubaye nk'igiti kandi ukumva udushinge tukujomba mu ntoki n'amano?	a. None or a little of the time/ ntanarimwe cg gake b. Some of the time/ rimwe na rimwe c. Good part of the time/ Biringaniye d. Most or all of the time/ Hafi ya buri gihe cg igihe cyose	1 2 3 4

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B15	15. Are you bothered by stomach aches or indigestion? Supplementary question: Are you bothered by a sore stomach, do you ever get a burning feeling in the middle of your chest? Ujya wumva uribwa mu gifu?	a. None or a little of the time /ntanarimwe cg gake b. Some of the time/ rimwe na rimwe c. Good part of the time /Biringaniye d. Most or all of the time /Hafi ya buri gihe cg igihe cyose	1 2 3 4
B16	16. Do you have to empty your bladder often? Supplementary question: Do you have to go to the toilet to pee a lot? Ujya ushaka kwihagarika burikanya?	a. None or a little of the time /ntanarimwe cg gake b. Some of the time/ rimwe na rimwe c. Good part of the time/ Biringaniye d. Most or all of the time/ Hafi ya buri gihe cg igihe cyose	1 2 3 4
B17	17. Are your hands usually dry and warm? Ibiganza byawe bikunze kuma kandi bikanashyuha?	a. None or a little of the time/ ntanarimwe cg gake b. Some of the time/rimwe na rimwe c. Good part of the time/ Biringaniye d. Most or all of the time/ Hafi ya buri gihe cg igihe cyose	4 3 2 1
B18	18. Does your face get hot and go red? Ujya wumva ushyuhiranye mu maso?	a. None or a little of the time /ntanarimwe cg gake b. Some of the time/ rimwe na rimwe c. Good part of the time/ Biringaniye d. Most or all of the time/ Hafi ya	1 2 3 4

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		buri gihe cg igihe cyose	
B19	19. Do you fall asleep easily and get a good night's rest? Usinzira bikoroheye kandi ukumva uruhutse neza?	a. None or a little of the time/ ntanarimwe cg gake b. Some of the time/ rimwe na rimwe c. Good part of the time/ Biringaniye d. Most or all of the time/ Hafi ya buri gihe cg igihe cyose	4 3 2 1
B20	20. Do you have nightmares? Supplementary question: Do you have bad/frightening dreams Ujya urota inzozi mbi zigutera ubwoba?	a. None or a little of the time /ntanarimwe cg gake b. Some of the time/ rimwe na rimwe c. Good part of the time/ Biringaniye d. Most or all of the time/Hafi ya buri gihe cg igihe cyose	1 2 3 4

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SECTION C: IDENTIFICATION OF COMMON PERINATAL MENTAL DISORDERS: Depression/Edinburgh Postnatal Depression Scale (EPDS)

QUESTIONS 3, 5-10 are reverse scored

NUMBER	QUESTION	ALTERNATIVE RESPONSE	SCORE
C1	1. In the last week, have you been able to laugh and see the funny side of things? For example: can you laugh at things which normally make you laugh? Mu cyumweru gishize, wigeze	a. As much as I always used to cyane nk' ibisanzwe b. Not as much as I used to/ bitari cyane nk'ibisanzwe c. Certainly not as much	0 1 2

	wishima? Washoboye guseka hari ikigusekeje?	as I used to/ ntabwo bisanzwe d. Not at all/Nta na gake	 3
C2	2. In the last week, have you looked forward with enjoyment to things? Mu cyumweru gishize, waba hari icyagushimishije?	a. Yes As much as I always used to/Cyane nk' ibisanzwe b. Rather less/biringaniye c. Certainly less/buhoro d. Never looked forward/ Sinjya nishima	0 1 2 3
C3	3. In the last week, have you blamed yourself unnecessarily when things went wrong? Mu cyumweru gishize, hari ikitaragenze neza waba warishinje ko ubifitemo uruhare bidakwiye	a. Most of the time/Hafi ya buri gihe? b.Sometimes/Rimwe na rimwe c.Not often/Bitari burigihe d. Never/Nta na rimwe	3 2 1 0
C4	4. In the last week, have you been anxious or worried for no good reason? Mu cyumweru gishize, waba waragize ishavu, cg warahangayitse nta mpamvu igaragagara?	a. No, not at all/Nta na rimwe b. No, rarely/ Gake c. Sometimes/Rimwe na rimwe d. Most of the time/Hafi ya buri gihe?	0 1 2 3
C5	5. In the last week, have you felt scared or panicky for no good reason? Mu cyumweru gishize wigeze wumva ufite ubwoba cg iguhunga ntampamvu igaragara	a. Most of the time /Hafi ya buri gihe? b. Sometimes /Rimwe na rimwe c. Rarely /Gake d. Never /Nta narimwe	3 2 1 0
C6	6. In the last week, have things	a. Most of the time	3

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	been getting on top of you? Mu cyumweru gishize, wumvise ibintu bikurenze?	unable to cope hafi yaburigihe bikakunarira kugira icyo ubikoraho b. Sometimes unable Rimwe na rimwe bikakunanira c. No Mostly able/Oya hafi yaburigihe d. Coping as usual Nshobora kugira icyo mbikoraho nk'ibisanzwe	2 1 0
C7	7. In the last week, have you been so unhappy that you have had difficulty sleeping? Mu cyumweru gishize wigeze wumva ubabaye cyane kuburyo byakugoye kubona ibitotsi?	a. Yes, most of the time Hafi ya buri gihe b. Yes, sometimes /Rimwe na rimwe c. Not very often/ bitari cyane d. No, not at all / ntabwo byambayeho	3 2 1 0
C8	8. In the last week, have you felt sad or miserable? Mu cyumweru gishize, wagize ishavu?	a. Most of the time Hafi ya buri gihe b. Quite often Kenshi c. Occasionally/Rimwe na rimwe d. Never /Ntanarimwe	3 2 1 0
C9	9. In the last week, have you felt so unhappy that you have been crying? Mu cyumweru gishize wigeze wumva ubabaye byatumye	a. Most of the time/ Hafi ya burigihe b. Quite often Kenshi c. Occasionally/Rimwe na rimwe	3 2 1

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	urira?	d. Never Ntanarimwe	0
C10	10. In the last week, has the thought of harming yourself occurred to you? Mu cyumweru gishize, waba waragize ibitekerezo byo gupfa cg kwigirira nabi?	a. Frequently/ Kenshi b. Sometimes/ Rimwe na rimwe c. No Not often/Oya sicyane d. Never/ Nta narimwe	3 2 1 0

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NAME _____ DATE _____

Zung Anxiety Self-Assessment Scale

	None or a little of the time	Some of the time	Good part of the time	Most or all of the time
1. I feel more nervous and anxious than usual	1	2	3	4
2. I feel afraid for no reason at all	1	2	3	4
3. I get upset easily or feel panicky	1	2	3	4
4. I feel like I'm falling apart and going to pieces	1	2	3	4
5. I feel that everything is all right and nothing bad will happen	4	3	2	1
6. My arms and legs shake and tremble	1	2	3	4
7. I am bothered by headaches, neck and back pains	1	2	3	4
8. I feel weak and get tired easily	1	2	3	4
9. I feel calm and and can sit still easily	4	3	2	1
10. I can feel my heart beating fast	1	2	3	4
11. I am bothered by dizzy spells	1	2	3	4
12. I have fainting spells or feel faint	1	2	3	4
13. I can breath in and out easily	4	3	2	1
14. I get feelings of numbness and tingling in my fingers and toes	1	2	3	4
15. I am bothered by stomachaches or indigestion	1	2	3	4
16. I have to empty my bladder often	1	2	3	4
17. My hands are usually dry and warm	4	3	2	1
18. My face gets hot and blushes	1	2	3	4
19. I fall asleep easily and get a good night's rest	4	3	2	1
20. I have nightmares	1	2	3	4

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Converting Raw Score Total to Anxiety Index

RAW SCORE	ANXIETY INDEX	RAW SCORE	ANXIETY INDEX	RAW SCORE	ANXIETY INDEX
20	25	40	50	60	75
21	26	41	51	61	76
22	28	42	53	62	78
23	29	43	54	63	79
24	30	44	55	64	80
25	31	45	56	65	81
26	33	46	58	66	83
27	34	47	59	67	84
28	35	48	60	68	85
29	36	49	61	69	86
30	38	50	63	70	88

Raw Score Total ____ **Anxiety Index** ____

Interpreting the Anxiety Index

Anxiety Index	Clinical Interpretation
Below 45	Within normal range
45 – 59	Minimal to moderate anxiety
60 – 74	Marked to severe anxiety

31	39	51	64	71	89
32	40	52	65	72	90
33	41	53	66	73	91
34	43	54	68	74	92
35	44	55	69	75	94
36	45	56	70	76	95
37	46	57	71	77	96
38	48	58	73	78	98
39	49	59	74	79	99
				80	100

75 and over	Most extreme anxiety

- **Check that all statements have been answered**
- **Scoring values are printed next to the response**
- **Add up the Raw Total Score**
- **Convert the Raw Total to the Anxiety Index**

Instruction for use: (Zung Anxiety Assessment Tool)

1. The same caregiver should administer this test each time.
2. Choose a quiet place, preferably the same location each time the test is administered.
3. The administration of this test should not be immediately after some mental trauma or unsteady period.
4. Speak in a soft, pleasant tone.
5. Answer all questions by placing a check in the box to the left of the number under the appropriate answer.
6. Add the Raw Score values (numbers to the right of the check) for all questions and record the total in the **"RAW SCORE TOTAL"** box.
7. Compare the raw score to the anxiety index on the conversion chart and record the corresponding anxiety index in the **"ANXIETY INDEX"** box.
8. Compare the anxiety index with the clinical interpretation chart.

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Appendix 12

Edinburgh Postnatal Depression Scale[1] (EPDS)

Name: _____ Address: _____

Your Date of Birth: _____ _____

Baby's Date of Birth: _____ Phone: _____

As you are pregnant or have recently had a baby, we would like to know how you are feeling. Please check the answer that comes closest to how you have felt **IN THE PAST 7 DAYS**, not just how you feel today.

Here is an example, already completed.

I have felt happy:
- □ Yes, all the time
- ☒ Yes, most of the time
- □ No, not very often
- □ No, not at all

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

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In the past 7 days:

1. 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

2. I have looked forward with enjoyment to things
   - ❒ As much as I ever did
   - ❒ Rather less than I used to
   - ❒ Definitely less than I used to
   - ❒ Hardly at all

*3. I have blamed myself unnecessarily when things went wrong
   - ❒ Yes, most of the time
   - ❒ Yes, some of the time
   - ❒ Not very often
   - ❒ No, never

4. I have been anxious or worried for no good reason
   - No, not at all
   - Hardly ever
   - Yes, sometimes
   - Yes, very often

*5 I have felt scared or panicky for no very good reason
   - Yes, quite a lot
   - Yes, sometimes

*6. Things have been getting on top of me
   - ❒ Yes, most of the time I haven't been able to cope at all
   - ❒ Yes, sometimes I haven't been coping as well as usual
   - ❒ No, most of the time I have coped quite well
   - ❒ No, I have been coping as well as ever

*7 I have been so unhappy that I have had difficulty sleeping
   - ❒ Yes, most of the time
   - ❒ Yes, sometimes
   - ❒ Not very often
   - ❒ No, not at all

*8 I have felt sad or miserable
   - ❒ Yes, most of the time
   - ❒ Yes, quite often
   - ❒ Not very often
   - ❒ No, not at all

*9 I have been so unhappy that I have been crying
   - Yes, most of the time
   - Yes, quite often
   - Only occasionally
   - No, never

*10 The thought of harming myself has occurred to me
   - Yes, quite often

❒ ❒
❒ ❒
❒ ❒
❒
❒ ❒
❒ No, not much ❒ Sometimes
❒ No, not at all ❒ Hardly ever
❒ Never

Administered/Reviewed by _____ Date _____

[1] Source: Cox, J.L., Holden, J.M., and Sagovsky, R. 1987. Detection of postnatal depression: Development of the 10-item Edinburgh Postnatal Depression Scale. *British Journal of Psychiatry* 150:782-786 .

[2] Source: K. L. Wisner, B. L. Parry, C. M. Piontek, Postpartum Depression N Engl J Med vol. 347, No 3, July 18, 2002, 194-199

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Edinburgh Postnatal Depression Scale[1] (EPDS)

Postpartum depression is the most common complication of childbearing. [2] The 10-question Edinburgh Postnatal Depression Scale (EPDS) is a valuable and efficient way of identifying patients at risk for "perinatal" depression. The EPDS is easy to administer and has proven to be an effective screening tool.

Mothers who score above 13 are likely to be suffering from a depressive illness of varying severity. The EPDS score should not override clinical judgment. A careful clinical assessment should be carried out to confirm the diagnosis. The scale indicates how the mother has felt ***during the previous week***. In doubtful cases it may be useful to repeat the tool after 2 weeks. The scale will not detect mothers with anxiety neuroses, phobias or personality disorders.

Women with postpartum depression need not feel alone. They may find useful information on the web sites of the National Women's Health Information Center <www.4women.gov> and from groups such as Postpartum Support International <www.chss.iup.edu/postpartum> and Depression after Delivery <www.depressionafterdelivery.com>.

SCORING

QUESTIONS 1, 2, & 4 (without an *)
Are scored 0, 1, 2 or 3 with top box scored as 0 and the bottom box scored as 3.

QUESTIONS 3, 5-10 (marked with an *)
Are reverse scored, with the top box scored as a 3 and the bottom box scored as 0.

Maximum score: 30
Possible Depression: 10 or greater
Always look at item 10 (suicidal thoughts)

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Instructions for using the Edinburgh Postnatal Depression Scale:

1. The mother is asked to check the response that comes closest to how she has been feeling in the previous 7 days.
2. All the items must be completed.
3. Care should be taken to avoid the possibility of the mother discussing her answers with others. (Answers come from the mother or pregnant woman.)
4. The mother should complete the scale herself, unless she has limited English or

has difficulty with reading.

[1] Source: Cox, J.L., Holden, J.M., and Sagovsky, R. 1987. Detection of postnatal depression: Development of the 10-item Edinburgh Postnatal Depression Scale. *British Journal of Psychiatry* 150:782-786.

[2] Source: K. L. Wisner, B. L. Parry, C. M. Piontek, Postpartum Depression N Engl J Med vol. 347, No 3, July 18, 2002, 194-199

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