PREVALENCE AND FACTORS ASSOCIATED WITH DEPRESSION AMONGST PREGNANT WOMEN AT HELENE FRANZ HOSPITAL OF THE LIMPOPO PROVINCE, SOUTH AFRICA

by

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MINI-DISSERTATION

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DEDICATION

I dedicate this work to my mother Sara, my sister Annah and my brothers for the unwavering support that they have given to me during my studies.

To my husband Moloko Molomo for continually making me feel that the academic race is worth running at whatever pace, and that all that matters is to arrive at the finishing line.

To my dearest daughter Letago for her to know the importance of education.

This is also dedicated to all pregnant women.

DECLARATION

I declare that the **PREVALENCE AND FACTORS ASSOCIATED WITH DEPRESSION AMONGST PREGNANT WOMEN AT HELENE FRANZ HOSPITAL OF THE LIMPOPO PROVINCE, SOUTH AFRICA** mini -dissertation hereby submitted to the University of Limpopo, for the degree of **MASTER OF PUBLIC HEALTH** has not previously been submitted by me for a degree at this or any other university; that it is my work in design and execution, and that all material contained herein has been duly acknowledged.

..... **.....**

Ramohlola Motjatji Catherine Date

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DEFINITION OF CONCEPTS

Prevalence

Prevalence is the number of people in a population who have a certain condition in a given time period (national institute of mental health, 2017). In this study prevalence shall mean the number of pregnant women who suffer from depression.

Depression

Depression is a mood disorder that leads to continuous feelings of sadness and loss of interest and may lead to emotional and physical problems (mayo clinic, 2019). In this study depression shall mean feelings of sadness and emotional stress relating to pregnancy.

Factors

Factors are things that help produce or influence a result (Merriam Webster dictionary, 2019). In this study factors shall mean associated factors that may lead to depression.

Pregnant

Being pregnant is the state of carrying a developing embryo within the female body (Merriam Webster, 2019). In this study study being pregnant shall mean having tested positive for beta HCG and having a developing embryo in the uterus

LIST OF ABBREVIATIONS

ANC: Antenatal care

HIV: Human immunodeficiency virus

WHO: World health organisation

ABSTRACT

Background:

Pregnancy and childbearing are most of the crucial milestones in women's lives as they look forward to becoming mothers. During this time, they have positive expectations while pregnant, however, the physical, hormonal, neurotransmitters and psychosocial changes that occur can make pregnancy to be stressful and overwhelming. The disability associated with depression and its impact on maternal and child health has important implications for public health policy. While the prevalence of postnatal depression is high, there are no prevalence data and associated risk factors on antenatal depression in Helen Franz Hospital of Limpopo Province, South Africa. The purpose of this study was to determine the prevalence and factors associated with depression amongst pregnant women at Helene Franz Hospital.

Methodology:

A quantitative retrospective design was used in the study and a sample size of 336 was required which was calculated based on the 95% confidence interval, 5% sampling error and 38.5% prevalence of depression amongst pregnant women in KZN. A self-administered questionnaire with close-ended questions which was adopted from the Edinburgh postnatal depression scale was given to the participants to complete. The scoring of the questionnaire was that the maximum score was 30 and the persons who scored 10 or greater were considered depressed according to the Edinburg scale for assessing depression. Data were analysed using SPSS V.21.0 and a p-value of less than 0.05 was considered statistically significant.

Results:

The participants ranged from 18 to 47 years with the mean age of 27.8±6.9 years. The majority of the pregnant women were in the age groups 20-24 years and 25-29 years. The mean depression score for pregnant women was 7.87±5.2 and ranged from 0 to 23. The prevalence rate of depression symptoms was 31%. Maternal age was not significantly associated with depression and a significantly higher proportion of married pregnant women were depressed as compared to unmarried women at *p=0.017*. Pregnant women who smoke were significantly more likely to be depressed than those who do not smoke at *p=0.002*. Pregnant women without financial support from partner

were significantly likely to be depressed than those who receive financial support at *p-=0.002*. A significantly greater proportion of pregnant women with partner violent were likely to be depressed than those with non-violent partner at *p <0.001*. Pregnant women in relationships with unemployed spouses were significantly likely to experience depression than the employed spouse at *p=0.035*. lastly, pregnant women in relationship with a spouse with lower educational level were significantly likely to be depressed than the other groups at *p-.006*.

Conclusion:

The prevalence of depression among pregnant women was high and the main risk factors involved in the onset of antenatal depression have highlighted a complex multifactorial aetiology. These are related to different sources of chronic diseases, psychosocial, environmental, obstetric and pregnancy- related risk factors have been highlighted. Correctly identifying women at risk of suffering from depression would provide an opportunity to target those women who would benefit from preventive and supportive interventions. Therefore, a psychosocial assessment, in the sense of a comprehensive and multidimensional evaluation of a woman's psychosocial circumstances should be common practice for all women during the antenatal period.

Key concepts

Antenatal care; Pregnancy; Childbearing; Depression; Psychosocial

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1. CHAPTER 1: OVERVIEW OF THE STUDY

1.1. INTRODUCTION AND BACKGROUND

Pregnancy and childbearing are most of the crucial milestones in a woman's life as they look forward to becoming mothers . During this time, they have positive expectations while pregnant. However the physical, hormonal, neurotransmitters and psychosocial changes that occur can make pregnancy to be stressful and overwhelming (Better health pregnancy, 2018).Pregnancy-related depression occurs during conception. It is characterised by persistent sadness, decreased energy, sleep disturbance, weight loss, lack of appetite and poor concentration (Sharma & Pope, 2012).

Depression is the most common mental health disorder during pregnancy, and it is usually linked with psychosocial and clinical obstetric factors (Tadesse, Telake, Kassahun, Haregoin, Zewditu & Abel, 2016). Antenatal depression is explained by Eastwood, Ogbo, Henry, Noble and Group (2017) as a mental health problem affecting about one in five women worldwide and it is a notable contributor to maternal morbidity and mortality worldwide, if left untreated antenatal depression can lead to irreversible damage to women and their families (Fitzpatrick, McGready, Plugge & Fazel,2018). Depression contributes to the global burden of diseases, which affect around 322 million people worldwide and it is the leading cause of suicide (National Mental Health Strategy of Ethiopia, 2015).

Depression in pregnancy remains high and undertreated in most African countries including Nigeria, even though evidenced-based treatment seems to be available (Tomlinsom & Lund, 2012). Other studies conducted in sub-Saharan countries show that untreated antenatal depression may lead to increased risk of low birth weight, intra-uterine growth retardation, neurobehavioral development, childhood behavioural disturbances, unhealthy maternal behaviours, substance abuse and poor parenting (Dunkel, Schetter & Tanner, 2012). Antenatal depression is a common public health

problem in sub-Saharan Africa at 8 to 40% (Hartley, Tomlinson, Greo, Scott Comulada, Steward & Ingrid, 2011).

A study that was conducted in KwaZulu Natal indicated that depression can be detrimental to a mother's functional status and mental health status, thus affecting her decision making capabilities, thus leading to non-compliance of basic antenatal care non- adherence to prescribed treatment that should be taken for the duration of the pregnancy and that increase the risk of adverse pregnancy outcomes (Hartley et al, 2011).

The Cape Town brief on maternal mental health published by the perinatal mental health indicates that the high rates of maternal depression may be associated with Human Immunodeficiency Virus and Acquired Immunodeficiency Syndrome (HIV/AIDS), violence, lack of social support, substance abuse and teenage pregnancy (Perinatal Mental Health Project, 2019). The international and national priority is to improve maternal and child health. The United Nations millennium development goals listed child health and maternal health as two of the eight goals, while in South Africa maternal and child health is one of the four priority programmes. Dealing with depression during pregnancy is relevant to achieving better outcomes for mothers and infants in South Africa.

1.2. PROBLEM STATEMENT

Pregnancy is a time of joy and hopeful expectation although it could also be overwrought with worries and anxiety about the physiological and emotional changes that take place during this time. While depression and anxiety are commonly occurring mental conditions during pregnancy, there is emerging evidence that the presence of depression may be much more common than that of anxiety (Nath, Venkatesh, Balan, Metgud, Krishna & Murthy, 2019). Depression in pregnancy remains a major public health concern worldwide particularly in developing countries (WHO, 2014). According to the World Health Organisation (WHO) depression is the most leading cause of suicide and will be the second cause of Global Disease Burden by the year 2030 (WHO, 2017).

Depression during pregnancy has adverse effects for both the mother (Nachega, Uthman & Anderson, 2012) and the fetus (Kingston, Tough & Whitfield, 2012) which includes early neonatal deaths, preterm birth, miscarriage, stillbirth, low birth weight and a decrease in breastfeeding initiative (Staneva, Bogossian, Pritchard & Wittkowski, 2015). In a study conducted by Rochat, Tomlinson, Bärnighausen, Newell, and Stein, (2011) at the primary health clinic, in a rural part of South Africa it was reported that the prevalence of depression was high at 47%, with over half of the depressed women 67% reporting episode duration greater than two months. In Helene Franz district hospital of the Limpopo province, between January and December 2018, 50 stillbirths and 45 early neonatal deaths were reported. There is sufficient evidence on the association of pregnancy-specific anxiety with adverse pregnancy outcomes (Nath et al., 2019). However, studies on depression during pregnancy from low and middle income countries are limited particular in South Africa and in Limpopo Province. Therefore, the current study investigated the precise estimate of the prevalence of depression related to pregnancy at Helene Franz in Limpopo Province and therefore the conduct of this study is based on the above background.

1.3. AIM OF THE STUDY

The aim of the study was to investigate the prevalence and factors associated with depression amongst pregnant women at Helene Franz Hospital

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1.4. OBJECTIVES OF THE STUDY

- To determine the demographics of pregnant women attending antenatal care at Helene Franz hospital.
- To determine the prevalence of depression amongst pregnant women
- To determine factors associated with depression amongst pregnant women.
- To determine support structures for pregnant women.

1.4. RESEARCH QUESTION

What is the prevalence and factors associated with depression amongst pregnant women at Helen Franz Hospital of the Limpopo Province, South Africa?

1.5. LITERATURE REVIEW

A literature review is the summary and synthesis of existing scholarly research on a particular study. A literature review is a form academic writing used in the sciences, social science, and humanities. Literature reviews organise and present existing research. Literature reviews are more than a list of sources consulted as they summarise and critically evaluate those sources. The importance of literature is to help the researcher justify the research that is about to be undertaken and to give the researcher a chance to demonstrate expertise in the topic being researched (Valdes, 2020). A detailed literature review is provided in Chapter 2.

1.6. RESEARCH METHODOLOGY

Quantitative cross-sectional research design was used guide this research. Quantitative research is a formal, objective, systematic process implemented to obtain numerical data for understanding aspect of the world (Grove, Burns & Gray, 2013). A cross sectional design was conducted in Helene Franz district hospital of the Limpopo Province from January to March 2021. Cross-sectional studies collect data in a defined population at a point in time (Detels, Gulliford, Karim & Tan, 2015). The researcher provided the respondents with a questionnaire that asked them about their personal information and their pregnancies and assessing how they feel regarding their current situations. The research methodology employed in this study will be discussed in detail in chapter 3.

1.7. SIGNIFICANCE OF THE STUDY

The data from the study will help to determine the prevalence and associated factors of depression in pregnant women and might help in finding interventions for depression. This could help in managing and reducing the factors that contribute to depression as this is higher during the perinatal period and is of growing concern because of its impact on both mother and child. As depression during the perinatal

period is associated with a range of foetal and obstetric problems and adverse developmental child outcomes, the study might help the Limpopo Department of Health in addressing the burden of depression and factors leading to it in rural areas. Lastly, strategies for early identification and treatment of antenatal depression may be thought for further research with an aim to improve pregnancy outcomes and prevent postnatal depression.

1.8. OUTLINE OF CHAPTERS

- Chapter 1
    - This chapter comprises the study's introduction, background, and the research framework.
- Chapter 2
    - This chapter covers the literature review in the context of the research undertaken.
- Chapter 3
    - This chapter describes the research methodology and the study design used.
- Chapter 4
    - This chapter discusses the findings in relation to the literature control.
- Chapter 5
    - This chapter provides a summary of the results, limitations, recommendations, and conclusion in the context of the aim and objectives of the study.

1.9. CONCLUSION

In Chapter 1, the researcher provided an introduction, and background of, the study, the research problem, research aim, research question and the research objectives. In this chapter, the researcher further introduced the literature review, research methodology and discussed significance of the study. In Chapter 2, the researcher will present a detailed review of the literature.

2. CHAPTER 2: LITERATURE REVIEW

2.1. INTRODUCTION

This chapter provides the literature review for the study. The purpose of a literature review is to discuss the findings from previous research on the topic. The information was obtained from published articles, online resources, books, journals and reports that are related to the prevalence of depression and associated factors during pregnancy. Depression is a mental disorder characterised by feelings of depressed mood, loss of interest or pleasure in activities, and loss of energy that lasts for 2 weeks or more(American psychiatric association, 2013) Everybody experiences mood changes, but when the depressive symptoms last longer over a period of days or weeks with changes in appetite and sleep pattern and disturbances in daily routine activities, a diagnosis of depression needs to be considered (American psychiatric association,2013).

2.2. PREVALENCE OF DEPRESSION IN PREGNANCY WORLDWIDE.

Depression is a significant source of disease burden among females and has been ranked by the Global Burden of Disease Study (2015) as the leading source of disease burden in Australian women in terms of disability-adjusted life years at 81% (Institute of health metrics and evaluation, 2015). Depressive disorders after giving birth have a strong association with depressive disorders during pregnancy (Yazici, Kirkan, Aslan, Ayadin & Yazic, 2015). Pregnancy is viewed by the public and the medical profession as a period that is protected against mental disorders, but basic antenatal care prioritises physical health and overlook the emotional health (Alder, Fink & Urech et al 2011). Maternal and Child Health Programmes in developing countries such as Australia and India are commonly focused upon improving the nutritional status and less importance is given towards a woman's emotional and mental health during and after pregnancy (Rahman, Patel, Maselko & Kirkwood, 2008).

About 10% of pregnant women and 13% of women in the puerperium stage experience a mental disorder in a form of depression. Depression in developing countries is higher

at 15.6% during pregnancy and 19.8% after childbirth(WHO, 2013) In India, the proportion of women who screened positive for depression during pregnancy was 35.7% (Sheeba, Nath, Metgud, Krishna, Venkatesh, Vindhya & Murthy, 2019). In Iran, the prevalence of postpartum depression was 43.5% in new mothers (Vaezi, Soojoodi, Banihashemi & Nojomi, 2019). In South America, the prevalence of depression in pregnancy is approximately 29% (Martínez-Paredes & Jácome-Pérez, 2019).

2.3. PREVALENCE OF DEPRESSION IN PREGNANCY IN AFRICA

According (WHO) 2017 estimate, 322 million people are living with depression, and 29.9 million (9%) of these are living in Africa. Another World Health Organisation estimate showed that depression affected 3.9% of the population in Nigeria which is an estimate of about 7 million Nigerians (WHO, 2017). A study conducted by Ashley, Harper and Arms-Chaves et al(2016) indicated that symptoms of depression are more prevalent during pregnancy than during the postnatal period. In Zimbabwe, the prevalence of depression during pregnancy was 39.4% among HIV positive women (Nyamukoho, Mangezi, Marimbe, Verhey & Chibanda, 2019). Biratu and Haile (2015) in their study conducted in Ethiopia reported the prevalence of antenatal depression of 24.9%. Antenatal depression affects about 1/10 women in high income countries. Depression is a common public health problem in sub-Saharan Africa ranging from 8% to 40%(Martínez-Paredes & Jácome-Pérez, 2019)

According to Kinyanda, Hoskins and Nakku(2011) amongst HIV-infected women in Uganda and other sub-Saharan African countries,15-50% screen positive for probable depression. A high incidence of pregnancy and burden of perinatal depression amongst HIV- infected women further compromise HIV related clinical, immunological and virological outcomes as well as overall maternal and child health outcomes (Nachega, Uthman & Anderson, 2012). Women with depressive symptoms have an increased risk of having more non-scheduled antenatal care visits and increased number of emergency healthcare visits for pregnancy-related emergencies (Bitew, Hanlon, Kebede, Medhin & Fekadu, 2016). Increased depressive symptoms are also associated with no

engagement in favourable health practices during pregnancy (Alhusen, Ayres & Depriest, 2016). A cohort study in Malaysia revealed that women with antenatal depression were more likely to stop breast feeding before six months than their counterparts (Yusuff, Tang, Bims & Lee, 2015)

2.4. PREVALENCE OF DEPRESSION SOUTH AFRICA

In South Africa, the prevalence of women at high risk of depression or suffering from depression ranges between 21% and 39% antenatally (Redinger, Norris, Pearson, Richter, Rochat, 2017). Prevalence rates of antenatal depression in South Africa are found to be 38.5% in urban Kwa-Zulu Natal, 39% in Cape Town, and 48.7% in Mpumalanga (Rochat, Tomlinson, Newell & Stein, 2013). Some of the studies conducted in Kwazulu- natal namely: Antenatal depression and its risk factors and Prevalence and associated risks factors among adolescents in KZN, South Africa that used the Edinburgh Postnatal Depression Scale as a screening tool have reported similar high prevalence rates ranging between 42%-46% (Tsai, Tomlison, Dewing et al, 2014). In Gauteng, the prevalence of depression during pregnancy was 25% among HIV positive women (Mokhele, Nattey, Jinga , Mongwenyana, Fox & Onoya, 2019), while in Mpumalanga, the prevalence was 48.7% (Peltzer, Rodriguez & Jones, 2016).

In South Africa, the prevalence rate of women aged 15 to 49 living with HIV is approximately 24% (UNAIDS, 2017) and evidence indicates that perinatal depression is more common among HIV-positive women (Pelter, Rodriguez & Jones, 2016). The rates of alcohol consumption per capita are also very high in South Africa (WHO,2014), in recent studies conducted in low-income areas of Cape Town, hazardous drinking was reported by 7.1% of women at 8 months' gestation (Davis, Rotheram-Borus, Weichle, Rezai & Tomlinson, 2017).

Kapetanovic, Dass-Brailsford, Nora and Talisman (2014) indicates that in a recent review of literature on the mental health outcomes of HIV positive pregnant women in South Africa only six studies were identified. However only one of these specifically

sought to assess the prevalence, risk factors and psychosocial correlates of prenatal depression among HIV-positive women in an urban area of South Africa. The evidence for socio-economic risk factors is mixed in South Africa (Redinger et al, 2017). However, food insecurity which is defined as the inability to access a sufficient quantity of healthy food on a daily basis and reported by 38% of households in South Africa has consistently been identified as a risk factor for antenatal and postnatal depression in the Western Cape (Abrahams, Lund, Field & Honikman, 2018).

2.5. FACTORS ASSOCIATED WITH DEPRESSION IN PREGNANCY

There are factors that predispose women to antenatal depression and they are almost the same in different countries. Most of the existing data, research, and practice policies regarding perinatal mental disorders focus on the postnatal period and there is less research related to depression during pregnancy (Howard, Molyneaux, Dennis, Rochat, Stein & Milgrom, 2014). The importance of screening for depression during pregnancy is that prenatal depression, if not treated and diagnosed early, may continue as postnatal depression (Tachibana, Koizumi, Takehara, Kakee, Tsuji & Mori, 2015). The risk factors associated with depression in pregnancy can be grouped in five groups which are: chronic disease,related risk factors, Psychological and psychiatric risk factors; Social support and marital relationship risk factors; Socio-demographic and economic risk factors; and Obstetric and pregnancy- related risk factors.

2.5.1. Chronic disease related risk factors

HIV-infected pregnant women have to deal with specific psychosocial issues related to pregnancy or to the child, such as maternal guilt, fear of infecting the foetus, stigma, insufficient social network, stress, poverty, and interpersonal issues emerging around diagnostic disclosure. Perinatal depression (PND) has been associated with history of psychiatric illness, substance use during pregnancy, social stress during pregnancy and CD4 nadir during pregnancy (≤200 cells/mm^3) (Arseniou, Arvaniti & Samakouri, 2014; Bavle, Chandahalli, Phatak et al, 2016). A study conducted by Spies and Seedat in 2014 shows that

depression is more prevalent in HIV- infected population, with HIV- infected individuals being at risk of being depressed when compared to those who are not infected. Age has been reported by (Hartley, Tomlinson, Greco, Comulada, Steward, le Roux et al, 2011) as one of the sociodemographic factors that are linked with depressive symptoms in HIV-positive pregnant women. Single marital status as identified by Manikkam and Burns(2012), financial insecurity and non-satisfaction with the ability to access basic needs were also identified as factors associated with depressive symptoms.

There are also health-related risk factors associated with depression which are poor physical health(kaida, Matthews, Ashaba, Tsai, Kanters et al, 2014) and having had a previous depressive episode (Kaaya, Mbwambo, Kilonzo, Van Den Borne, Leshabari et al, 2010). Psychosocial variables, such as low self-esteem, perceived stress, lack of emotional support, lower perceived social support, disengagement coping, unplanned pregnancy, conflicts with the current partner and experience of intimate partner violence (Steward, Umar, Tomenson, Creed, et al, 2014) have also been associated with depressive symptoms.

2.5.2. Psychological and psychiatric risk factors

According to Varreault et al (2014) depression and anxiety can occur at the same time during the antenatal period, and indeed high anxiety during pregnancy is one of the strongest risk factors for depression. Women with feelings of anxiety are at increased risk of suffering from depression during pregnancy. A recent study conducted by Mohamed Yusuff et al (2015) has found that women who had experienced antenatal anxiety were about three times more likely to suffer from depression during pregnancy. A previous history of mental illness, in particular a history of anxiety and depression and a history of psychiatric treatment during a previous pregnancy or at any time during the lifetime, is also a well-established risk factor in the development of antenatal anxiety and depression (Akcal, Ayd, Yaz, Aksay, Kirkan & Daloglu, 2014). A study conducted by Raisanes, Lehto, Nielson, Gissler, Kramer and Heinonen (2014) found that, despite a previous

history of depression being the strongest risk factor for a new episode during pregnancy, half of the women depressed during pregnancy had never been depressed before. This suggests that it is not uncommon for the first episode of depression to occur during pregnancy.

2.5.3. Social support and marital relationship risk factors

Lack of social support is another factor strongly associated with an increased risk of antenatal depression. Social support is a multidimensional concept and includes informational support (information and advice), instrumental support (practical help) and emotional support (expression of caring and holding in esteem). Perceived lack of partner support and social support are important risk factors for antenatal depression (Bayrampour, McDonald & Tough, 2015). Factors such as marital status or how long one has been in a relationship length may also influence the amount of support the pregnant woman receives and could be considered to be risk factors for anxiety and depression during pregnancy (Raisanes et al, 2014).

2.5.4. Socio-demographic and economic risk factors

Previous studies have indicated that some of the most common risk factors for antenatal depression include younger age, low income, unemployment, single marital status, low educational status, psychiatric histories, use of substances, lack of social support, marital conflict, multigravidity, less number of parities, more number of children, unplanned pregnancy, history of abortion, and history of obstetric complications (Zeng, Cui & Li, 2015). A study conducted by Rubertsson, Hellstrom, Cross and Sydsjo (2014) found a significant correlation between young age and depression during pregnancy whereby adolescents were at an increased risk of becoming depressed during pregnancy. However, some studies indicated that older age was positively associated with high depression scores during pregnancy (Siegel &Brandon, 2014). A study conducted by Abuidhail and Abujilhan (2014) found that age was not associated with depression during pregnancy.

Antenatal depression is more common in women with low educational achievements (Abuidhail & Abujilhan, 2014). One study conducted in Bangladesh indicated that antenatal depression was associated with the level of education. In other studies conducted in Malawi by Stewart, Tomenson and Creed (2014) found that women with higher level of education were more likely to experience symptoms of depression. Antenatal depression is found to be more prevalent in unemployed women and housewives compared with employed women (Dibaba, Fantahun & Hindin,2013). Moreover, women whose husbands were unemployed were more likely to experience antenatal depression (Akcal et al, 2014). Some studies found that low income or financial difficulties to be relevant factors that may lead to depression.

A study from the UK assessed the intergenerational transmission of depression from mothers to offspring (Garber & Cole, 2010). In this study, exposure to prenatal depression by age of 12 years predicated the progression of depression in adolescence. Adjusting such potential mediators in the statistical models may increase the robustness of the estimates. Antenatal depression was also associated with the socio-economic status of women. For example, a population-based cohort study conducted in the Netherlands that included a total of 5398 pregnant mothers reported a statistically significant association between antenatal depression and income (Verbeek, Bockting. Beijers, Meijer, van Pampus & Burger, 2019).

2.5.5. Obstetric and pregnancy- related risk factors

An increased risk of antenatal depression has been found in women with unplanned and unwanted pregnancies (Ajinkya, Jadhav & Srivastana, 2013). Multiparous women were at increased risk of developing antenatal depression (Abuidhail & Abujilban, 2014). One study conducted by (Raisanen et al,2014) indicated that primiparous women are more at risk of developing antenatal depression more as compared to the multiparous women. Women with current or past complications of pregnancy or delivery and also those who have experienced

a pregnancy loss, pregnancy terminations or stillbirth have been found to be more likely to experience antenatal depression (Ajinkya et al, 2013).

2.6. TREATMENT OF DEPRESSION IN PREGNANCY

Depression in pregnancy can be treated using both pharmacologic and non-pharmacologic approaches (Wichman & Stern, 2015) The non-pharmacologic methods include cognitive-behavioral therapy, supportive psychotherapy, and conjoint therapy (with the partner), improvement in nutrition and diet, elimination of caffeine, nicotine, and alcohol; and facilitation of proper sleep hygiene, referral to local support groups. The pharmacologic treatment is considered when a pregnant woman is struggling with moderate to severe symptoms of depression (Martínez-Paredes & Jácome-Pérez, 2019; Johansen, Robakis, Williams & Rasgon, 2019).

2.7. PUBLIC HEALTH INTERVENTIONS TO PREVENT AND CONTROL DEPRESSION IN PREGNANCY

There is evidence to suggest that interventions delivered in pregnancy can be effective in preventing postnatal depression. However, these interventions may be better conceptualised as *treatment* than *prevention* as they were delivered to women experiencing antenatal depression. There is a need to identify pregnant women experiencing depression and deliver evidence-based psychological interventions (Clatworthy, 2012). Women participating in an exercise and education programs were found to be having a better postnatal well-being and less depressive symptoms than women only receiving education (Songøygard, Stafne, Evensen, Salvesen, Vik & MØRkved, 2012).

Counselling interventions can be effective in preventing perinatal depression, although most evidence was limited to women at increased risk for perinatal depression (O'Connor, Senger, Henninger, Coppola & Gaynes, 2019). In a study conducted in a low-income township area of Cape Town, South Africa, it was recommended that appropriately trained and supervised non-specialist CHWs in sub-Saharan Africa can provide effective and cost-effective structured psychological

interventions for maternal depression (Lund, Schneider, Davies, Nyatsanza, Honikman & Bhana et al., 2014). This is supported by Deimling et al., (2018) as the reported that the use of task shifting may be a potentially viable option for increasing access to mental health care. The Government of Ethiopia has launched and enforced a mental health strategy (2012/13-2015/2016) which aimed to provide mental health services at all levels of the existing health system including health posts. However, still there is a gap in mainstreaming a mental health service with the routine maternal health services, like antenatal care in the country (Johansson, Strand, Fekadu & Chisholm, 2017).

2.8. CONCLUSION

The literature review revealed that antenatal depression remains a major public health emergency that needs to be attended to with caution. It emphasises that basic antenatal care should also include mental health status assessment to provide quality care that will benefit both the mother and the baby in utero. The research methodology used in the current study will be discussed in the next chapter.

3. CHAPTER 3: RESEARCH METHODOLOGY

3.1. Introduction

In Chapter 2, the researcher discussed the literature on the prevalence and associated factors of depression from studies that were done internationally, on the African continent and in South Africa. In this chapter, the researcher will outline the research design, research setting, study population, sampling method, pilot study, inclusion and exclusion criteria, data collection, data analysis and ethical considerations. The researcher further discusses the data collection method, data analysis, reliability, validity, and bias in this chapter.

3.2. Research design

Quantitative cross-sectional design was used to investigate the prevalence and factors associated with depression amongst pregnant women in Helene Franz Hospital of the Limpopo province. A cross-sectional study is a study design in which data is collected at a single point in time (Setia, 2016). This design was chosen because it is quick, inexpensive and presents no challenges with respect to participants being lost to follow-up (Bland, Copeland, Klimberg & Gradishar, 2018). A cross-sectional study design is a type of an observational study design whereby the investigator measures the outcome and the exposure at the same time, therefore in this study the researcher will be measuring the two variables which is: depressed vs not depressed.

3.3. Research settings

The study was conducted in Helene Franz hospital situated in the Blouberg municipality, of the Limpopo province, South Africa. The province is within the borders of Zimbabwe and Botswana. The hospital is a district hospital which has 22 feeders' primary health care facilities serving the population of Blouberg. It has 159 beds. Helene Franz is a district hospital, it has the following units, general wards (known as female ward and male ward), paediatric unit, theatre, outpatient department, casualty and maternity ward. Maternity ward has the following sub-divisions: labour ward

reproductive health clinic, High risk clinic, postnatal ward and neonatal ward.

Figure 2: Area map of the research site

3.4. Population

Population refers to a group of individuals who share one or more characteristics from which data can be gathered and analysed (Brink, 2006). The population in this study were all pregnant women aged 18 years and older who attended antenatal care at Helene Frans hospital.

3.5. Inclusion and exclusion criteria

3.5.1. Inclusion criteria

All pregnant women who attended the above-mentioned health facility were included in the study. This was mainly because the study aimed to investigate depression and factors leading to depression amongst pregnant women.

3.5.2. Exclusion criteria

All pregnant women below the age of 18 years and those who are mentally ill were excluded from participating in the study, reason being that they required consent from the parents or legal guardian to participate in the study.

3.6. Sampling

Sampling is a specific technique used to select members of the population for inclusion in a study (Dudovskiy, 2018). A consecutive sampling technique was used in this study to select the patients who fulfilled the inclusion criteria. A consecutive sampling technique is a non-probability sample where each consecutive eligible patient who presents for care were approached for enrolment (Mathieson, 2014). A non- prpbability sampling was used in the study because it is less costly and convenient as compred to the probability sampling.Consecutive sampling provides some structure and thus additional rigor in that it includes all patients who are accessible within the defined study time period and in this study all pregnant women who fulfilled the inclusion criteria were asked to participate in this study. A sample size of 336 was required for the study which was calculated based on 95% confidence interval, 5% sampling error and 38, 5% prevalence of depression amongst pregnant women in KZN (Rochat et al., 2013). The sample size was calculated based on the formula below:

$$n = \frac{Z^2 p(1-p)}{(e)^2}$$

Where

Z is the 95% confidence interval

p-prevalence of depression amongst pregnant women

e-sampling error

3.7. Data collection

Data collection is a term used to describe a process of preparing and collecting information (Brink, 2006). Data were collected during the week over a period of six weeks from the 8th March to the 12th April 2021. A self- administered questionnaire with close-ended questions was given to the participants to fill **(Appendix A).** The questionnaire was written in English for those who did not speak and understand Sepedi, and it was also translated in Sepedi for those who did not understand and speak English. The questionnaire was developed using literature, however, to assess

depression Edinburgh postnatal depression scale was adopted, it has been validated to be used in pregnant women and has satisfactory sensitivity (79%) and specificity (21%) (Howard, Ryan, Trevilian, Anderson & Bick,2018).

The scoring of the questionnaire was done as follows:

- Questions 1, 2 &4 are scored 0,1,2 or 3 with the 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 was 30 and the person who scored 10 or greater was considered depressed according to Edinburg scale for assessing depression.

The questionnaire was translated into Sepedi for those who couldn't read and did not understand English (**Appendix B**). The researcher gave an explanation to the participants and gave clarity where they didn't understand. Participants were given time to complete the questionnaires and it was the responsibility of the researcher to make sure questionnaires were filled properly.

3.8. Data analysis

Data analysis involves critically analysing numbers to provide an interpretation in order to establish the rationale for the main findings. Mean standard deviations, frequencies and percentages were used to interpret the data. In a quantitative study, raw numbers are turned into meaningful data by applying rational and critical thinking (Dudovskiy, 2018). In data analysis, statistical tests are used to draw valid conclusions from the data (Albers, 2017).

The data were entered into a Microsoft Excel Spreadsheet and analysed using SPSS V.21.0. Each participant's score was summed up and their mean age was 27.8. The mean score was used as the cut-off point and the data was dichotomised into depressed or not depressed. Comparison between depressed and non-depressed pregnant women will be performed using student t-test and chi-square test for

continuous and categorical data, respectively. A p-value of less than 0.05 will be considered statistically significant.

3.9. Reliability and validity

3.9.1. Reliability

Reliability is the consistency with which a tool measures what it is intended to (Moule & Goodman, 2014). For an instrument to be said is reliable it should give consistent results, even if the study is repeated or done by another researcher. To ensure reliability the questionnaire was pilot tested using 10 volunteers who attended a different district hospital (Seshego) which was not part of the sample in order to check its feasibility and to detect possible flaws in the data collection instrument that is checking whether the questionnaire is measuring what it is intended to measure. The pilot study also helped the researcher to estimate the time and resources needed for the actual study (Crossman, 2019) and to ensure that the data collection instrument measured what the researcher intended it to measure. The data collected during the pilot study were not analysed as part of the main study.

3.9.2. Validity

Validity is a measure of checking whether a data collection tool accurately measures what it is supposed to measure (Moule & Goodman, 2014). When an instrument is valid, the results obtained truly reflect the concept the instrument is designed to measure. The objective of the study was to determine the prevalence of depression, so it was pertinent of the researcher to use quantitative research methodology by issuing questionnaires to the participants and, as such, a questionnaire was a valid instrument for this study. The questionnaire was sent to various experts in the field for review to ensure content validity of the questionnaire. There are three types of validity that were ensured in the study.

3.9.2.1. Content validity

The questionnaire that was used by the researcher adequately covered all the content with respect to the variable that it should have. The questionnaire was constructed such that it covered the entire domain related to the variable (Heale & Twycross, 2015).

3.9.2.2. Construct validity

Construct validity is focussed on whether the questionnaire could draw inferences about test scores related to the concept being studied. Construct validity was established by assessing the suitability of measurement tool to measure the phenomenon being studied (Dudovskiy, 2018).

3.9.2.3. Criterion validity

This type of validity determines whether there is any other instrument that could measure the same variable. To ensure criterion validity, correlation was done to compare the extent to which different instruments measure the same variable (Heale & Twycross, 2015). During collection of questionnaires from the participants, they were checked for completeness.

3.10. Bias

Bias is the tendency of a statistics to overestimate or underestimate a parameter (statistics how to 2017). Bias leads to distortion of the results of the study. It was the core responsibility of a researcher to avoid bias by being transparent and accurate, and by not deviating away from the truth in research question formulation, data collection, data analysis and interpretation, which could lead to false conclusion (Galdas, 2017).

3.10.1. Selection bias

Selection bias occurs when the researcher chooses participants who will not be of benefit to the study (Nunan, Bankhead & Aronson, 2017). Selection bias was minimised by selecting all pregnant women who presented to the healthcare facility during the period of the study, and those who met the inclusion criteria.

3.10.2. Information bias

Information bias is the misclassification of information (data) and is the most common source of bias that affects the validity of a study (Althubaiti, 2016). Information bias was minimised by having a questionnaire that was clear, precise, unambiguous with close ended questions. The researcher avoided asking leading questions, since this would affect data analysis and interpretation, as well as drawing conclusions from the data for the study.

3.11. Pilot study

Before the actual data collection can commence the questionnaire was pilot tested in Seshego hospital. After obtaining a written permission from the Department of Health, a verbal permission was also obtained from the hospital management. A pilot study gives the researcher an idea of what is going to happen in the actual study. A pilot study represents a fundamental phase of the research process and is used to assess the feasibility of the approach to be used in the main study. The pilot study helped the researcher to estimate time and resources needed for the actual study (Crossman, 2019). The questionnaire was pilot tested by administering it to a representative sample of 10 participants determined by the rule of thumb (Belle, Whitehead & Julious, 2018). The participants in the pilot study were not be part of the sample for the main study. The results of the pilot study indicated that the full-scale study can be conducted in the way that it has been planned, and the results also showed that the study is feasible.

3.12. Ethical consdirations

3.12.1. Ethical clearance and permission

The research proposal was presented at the Department of Public Health then was submitted to the School of Healthcare Sciences and the Faculty of Health Science at University of Limpopo for reviews. The reviewed proposal was submitted to the University of Turfloop Research Ethics Committee (TREC) for ethical clearance at University of Limpopo. The proposal was then submitted to the Limpopo

Department of Health for permission to conduct the study in the healthcare facility after approval by the university. A letter was written to the CEO of the hospital asking for permission to collect data.

3.12.2. Informed consent

In order to obtain the participants, consent, comprehensive and clear information was provided to the respondents regarding their participation in the study, which included the aim and objectives of the study followed by an option to accept or decline participation in the study. After explaining the aims and objectives of the study, more information on the study was given to participants to enable them to voluntarily decides whether to participate or not. The process of consenting was ongoing, and it was made clear to the participant that it is his/her right to withdraw from the study anytime. The consent forms were written in the language that the participants understood.

3.12.3. Anonymity, Privacy, and confidentiality

To ensure anonymity, no names will be written on the questionnaires, the questionnaires will be numbered in that way participants won't be able to be traced. To ensure the privacy of participants, no personal information, including a person's health or disability, and information that relates to a health service a participant received was obtained from the participants, as suggested by Flanagin, Bauchner and Fontanarosa (2020). Confidentiality means that the information gathered remains between the researcher and the respondent (Allen, 2017). To ensure confidentiality, information from the completed questionnaires was only shared with the researcher's supervisors. To protect the identity of the respondents, completed questionnaires were stored safely in sealed envelopes, as suggested by Al Tajir (2018).

3.12.4. Addressing harm

The principle addresses the potential risks of participation and constitutes what causes harm that could be physiological, emotional, social, and even economic in

nature. To fulfil this principle the study avoided any form of harm to the participants by not asking questions that were embarrassing or questions that made participants uncomfortable. Psychological and emotional harm in the current study had to be addressed as most participants it was their first time experience to participate in a research study. The research had the desire to leave changes in their psychological wellbeing and emotional wellbeing which may lead to confusion, anxiety, feeling of stress, guilt, panic and loss of self-esteem (Dixon & Quirke, 2018). Therefore, participants were given psychological support by involving a psychologist or counsellors. Lastly, participants were debriefed to obtain information about the nature, results and conclusion of the study.

Social harm was avoided in patients who showed less understanding in a way that they were not embarrassed. The study did not diminish the social status and reputation of the participants (Dixon & Quirke, 2018). The researcher as a health care professional was familiar with the guidelines of preventing the spread and transmission of Covid 19. To prevent the spread of Covid 19, the researcher was wearing a face shield and mask coupled with sanitizing of hands and the pen used to complete the questionnaire. Participants sanitised their hands before and after completing the questionnaires, and they were putting on their mask during the process of completing questionnaires.

3.13. Conclusion

In this chapter, the researcher detailed the research methodology used in the study on the prevalence of depression and associated factors among pregnant women in Helene Franz hospital. The sampling method, pilot study, inclusion and exclusion criteria, data collection procedure and data analysis methods were all explained. The measures put in place to ensure reliability and validity, as well as ethical considerations, were discussed. In the next chapter, the researcher will present the results of the study.

4. CHAPTER 4: PRESENTATION AND INTERPRETATION OF RESULTS

4.1. INTRODUCTION

In the previous chapter, the study design, setting, study population, inclusion and exclusion criteria, sampling technique and sample size, data collection, data analysis, reliability, validity and the ethical considerations of the study were outlined by the researcher. In this chapter, the findings of the study are presented and interpreted. The chapter is divided into three sub-sections, namely, the demographic characteristics of the study participants, the prevalence of depression amongst the participants and factors associated with depression amongst pregnant women.

4.2. Data management and analysis

After the data collection process was finalized, the completed database was securely stored. The information was captured on a Microsoft Excel spreadsheet then stored on a compact disc for confidentiality and privacy reasons. Descriptive statistical analysis was undertaken using the SPSS version V.21.0 to identify frequencies and percentages of answers to the research questions using the student-t test and the chi-square. The statistical significance was set at 0.05.

4.3. Demographic characteristics

A total of 336 pregnant women participated in this study. Their mean age was 27.8±6.9 years range from 18 to 47 years. A greater proportion (27%) of the pregnant women were in the age groups 20-24 years and 25-29 years followed by those in age group 35 years and above at 19% and age group 30-34 years at 18%. The least number of participants were in the age group 20 years and below at 11% as presented in (Figure 4.1) below.

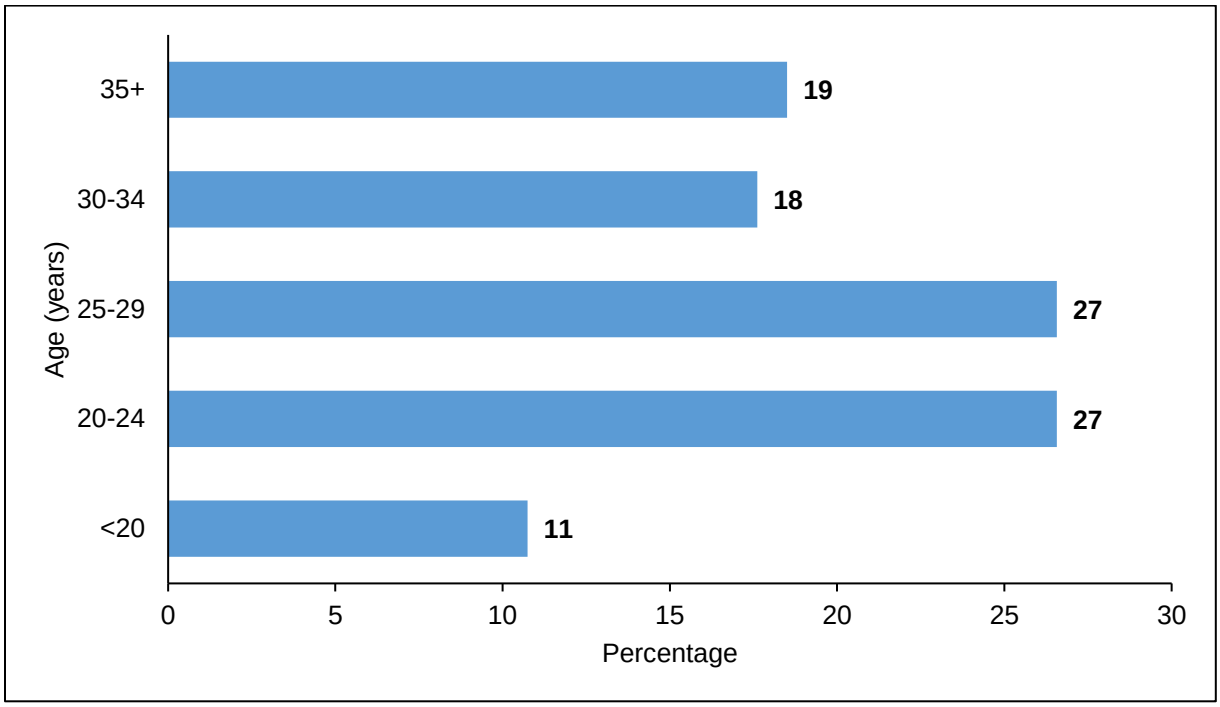

Figure 4.1: Age distribution of the pregnant women

Figure 4.2 below presents the marital status of the participants and majority participants were pregnant women who were unmarried at 82% followed by those who were married at 18%.

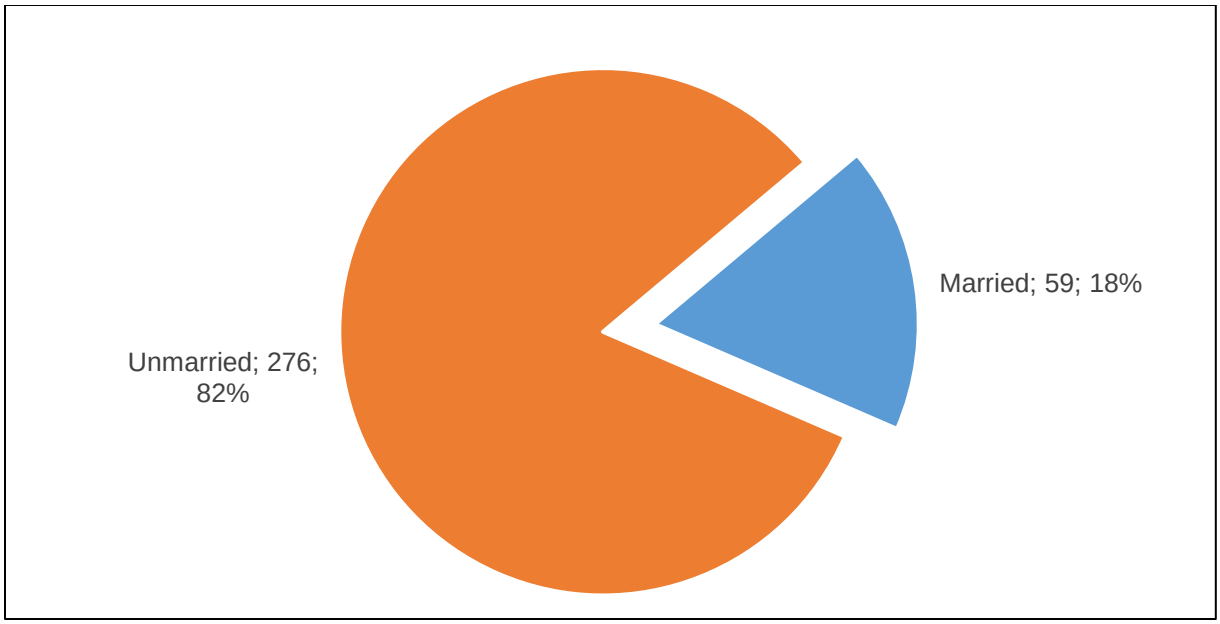

Figure 4.2: Distribution of marital status of pregnant women

In considering the educational status of the participants, slightly more than two-thirds (67%) of the women had secondary education followed by those with tertiary education and primary or no education at 26% and 8% respectively as presented in Figure 4.3 below.

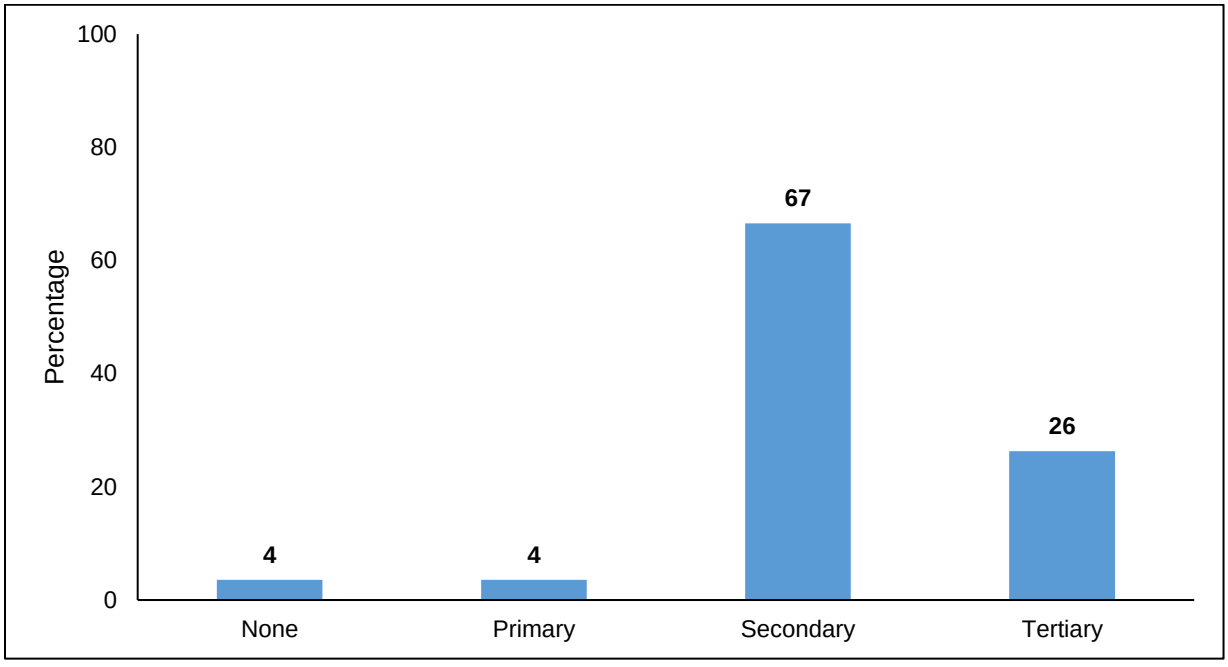

Figure 4.3: Distribution of level of education of pregnant women

The pregnancy characteristics and the lifestyle of pregnant women are presented in Table 4. 1 below. The current study revealed that most of the pregnant women said that their pregnancies were planned at 71% while 29% of the women did not plan their pregnancies. Only 6% and 4% of the pregnant women were drinking alcohol and smoking respectively. Approximately (32%) of pregnant women had 1 pregnancy that resulted in the birth of an infant capable of survival (parity) followed by those who had three or more pregnancies and two pregnancies that resulted in the birth of an infant capable of survival (parity) 34% and 26% respectively whereas 9% are pregnant for the first time. Fifteen percent of the pregnant women were HIV positive and 74% of the pregnant women indicated that they have financial support from their partners while only 9% of the pregnant women reported their partners to be violent.

Table 4.1: Pregnancy characteristics and pregnant women lifestyle

	No	%
Pregnancy planned		
Yes	238	71
No	97	29
Drinking alcohol		
Yes	19	6
No	316	94
Smoking status		
Yes	13	4
No	322	96
Parity		

0	29	9
1	106	32
2	87	26
3+	113	34
HIV status		
Yes	51	15
No	284	85
Financial support by partner		
Yes	247	74
No	88	26
Partner violence		
Yes	30	9
No	305	91

Table 4.2: Spouse demographic Information

	No	**%**
Employment Status		
Employed	151	45
Unemployed	184	55
Level of education		

None	18	5
Primary	9	3
Secondary	205	61
Tertiary	130	31
Smoke		
Yes	57	17
No	278	83
Drink alcohol		
Yes	92	28
No	243	72

More than half (55%) of the spouse were unemployed and nearly two-thirds (61%) had secondary education, (83%) non-smokers and 72% drink no alcohol (Table 4.2).

4.2 Prevalence of depression among participants

The mean depression score for pregnant women was 7.87±5.2 range from 0 to 23. As illustrated in Figure 4.4, the prevalence rate of depression symptoms was 31% (95% CI: 26.1-36.3).

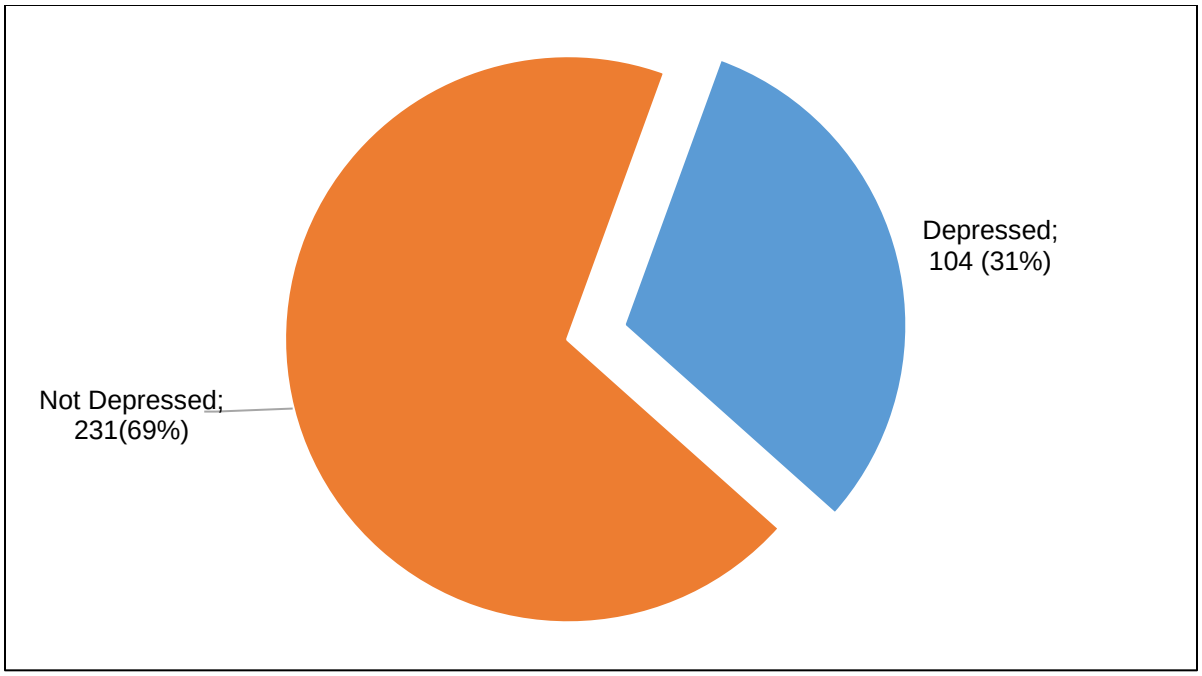

Figure 4.4: Prevalence of depression amongst pregnant women

4.3 Factors associated with depression among pregnant women

Table 4.3 presents maternal factors associated with depression among pregnant women attending antenatal care during study period. Maternal age was not significantly associated with depression and a significant higher proportion of married pregnant women were depressed as compared to unmarried women (44% versus 28% at *p-value = 0.017*). Pregnant women who smoke were significantly more likely to be depressed than those who don't smoke (69% versus 30% at *p-value =0.002*).

The results of this study revealed that pregnant women without financial support from partner were significantly likely to be depressed than those who receive financial support (44% versus 26% at *p-value = 0.002*). A significant greater proportion of pregnant women with partner violent were likely to be depressed than those with non-violent partner (57% versus 27% at *p-value <0.001*). There was no statistical significant difference between the two groups regarding level of education, employment status, drink alcohol, parity, and HIV status.

Table 4.3: Maternal factor associated with depression among pregnant women

	Depressed		p-value
	Yes	No	
Age (years)			
<20	15(42)	21(58)	
20-24	24(27)	65(73)	
25-29	28(32)	61(69)	0.163
30-34	13(22)	46(78)	
35+	24(39)	38(61)	
Marital status			
Married	26(44)	33(56)	0.017
Unmarried	78(28)	198(72)	
Education			
None/Primary	10(42)	14(58)	
Secondary	72(32)	151(68)	0.231
Tertiary	22(25)	66(75)	
Employed			
Yes	17(33)	35(67)	0.780
No	87(31)	196(69)	
Drink alcohol			
Yes	8(42)	11(58)	0.283
No	96(30)	220(70)	
Smoke			

Yes	9(69)	4(31)	0.002
No	95(30)	227(70)	
Pregnancy planned			
Yes	69(29)	169(71)	0.203
No	35(36)	62(64)	
Parity			
1	41(30)	94(70)	0.742
2	25(29)	62(71)	
3+	38(34)	75(66)	
HIV status			
Yes	14(28)	37(72)	0.547
No	90(32)	194(68)	
Financial support by partner			
Yes	65(26)	182(74)	0.002
No	39(44)	49(56)	
Partner violence			
Yes	17(57)	13(43)	<0.001
No	87(27)	218(72)	

Table 4.4 presents spouse factors related with depression among pregnant women. Pregnant women in relationship with unemployed spouse were significantly likely to experience depression than the employed spouse (36% versus 25% at *p-value =0.035*).

Again, pregnant women in relationship with a spouse with lower educational level were significantly likely to be depressed than the other groups at *p-value =0.006*. There was no significant relationship between pregnant women depression and spouse who drink alcohol and smoke.

Table 4.4: Spouse factor associated with depression among pregnant women

	Depressed		p-value
	Yes	No	
Employment Status			
Employed	38(25)	113(75)	0.035
Unemployed	66(36)	118(64)	
Level of education			
None/Primary	13(48)	14(52)	
Secondary	70(34)	135(66)	0.006
Tertiary	21(20)	82(80)	
Smoke			
Yes	23(40)	34(60)	0.096

No	81(29)	197(71)	
Drink alcohol			
Yes	25(27)	67(73)	0.346
No	79(33)	164(67)	

4.4 Overview of research findings

Comparison between depressed and non-depressed pregnant women was performed using student t-test and chi-square test for continuous and categorical data, respectively. Out of 336 pregnant women that participated in the study, 31% were depressed and 69% were not depressed.

The results of this study revealed that pregnant women without financial support from partner were significantly likely to be depressed than those who receive financial support (44% versus 26% at *p-value = 0.002*).The results also indicated that there was no statistical significant difference between the two groups regarding level of education, employment status, drink alcohol, parity, and HIV status.

4.5 Conclusion

In Chapter 4, the researcher described the findings of the study on the prevalence and associated factors of depression amongst pregnant women in Helene Franz hospital. The results focused on the demographic characteristics of patients, on their mental status that is assessing whether they are depressed or not, and the factors associated with depression. In Chapter 5, the researcher will present a discussion of the findings of this study.

5 CHAPTER 5: DISCUSSION AND CONCLUSSION

5.2 INTRODUCTION

In the previous chapter, the researcher presented and interpreted the results of this study. In this chapter, the findings of this study are discussed and compared to the relevant literature. The main purpose of this study was to investigate the prevalence and factors associated with depression amongst pregnant women in Helene Frans hospital. This chapter is divided into the following subsections: (1) socio-demographics, (2) prevalence of depression (3) factors associated with depression (4) conclusion, (5) recommendations and (6) limitations.

5.3 PREVALENCE OF DEPRESSION AMONGST PREGNANT WOMEN

Depression is the most common mental health disorder during pregnancy, and it is usually linked with psychosocial and clinical obstetric factors (Tadesse, Telake, Kassahun, Haregoin, Zewditu & Abel, 2016).In the present study the mean depression score for pregnant women was 7.87±5.2 range from 0 to 23 and the prevalence rate of depression symptoms was 31% (95% CI: 26.1-36.3), which is suggestive of a high probability of depression (using an EPDS cut-off score of equals or greater than13) among the respondents. A south African study conducted by Redinger et al (2017) indicated that the prevalence of depression amongst pregnant women ranges between 21 and 39% during the antenatal period. These are lower rates as compared to the prevalence of depression in Thailand at 46,8% (Phoosuwan, Eriksson & Lundberg, 2018).

5.4 FACTORS ASSOCIATED WITH DEPRESSION

5.4.1 Age

In this study maternal age was not significantly associated with depression and a significant higher proportion of married pregnant women were depressed as compared to unmarried women (44% versus 28% at *p-value = 0.017*). A study conducted by Fellenzer and Cibula (2014) found a significant correlation between young age and depression/anxiety during pregnancy. It further indicated that adolescents are at increased risk of becoming depressed during pregnancy. This was also confirmed by a systematic review about adolescence and mental health during pregnancy (Siegel & Brandon, 2014).

5.4.2 Smoking

In this study it was found that pregnant women who smoke were likely to be depressed at 69% as compared to the non-smokers at 30%. In a recent study by Smedberg et al (2015) found that women who continued to smoke during pregnancy were more likely to suffer from depression as compared to women who quit smoking during pregnancy, with twice the prevalence of continuing smoking during pregnancy in women with depression than in healthy women. Cigarette smoking increase the risk of antenatal depression even if women stopped smoking

cigarettes before pregnancy (Jeong, Lim, Lee et al, 2013). Another study by Fellenzer and Cibula (2014) indicated that not only smoking during pregnancy was associated with depression but the number of cigarettes smoked per day was associated with higher levels of depression.

5.4.3 Financial support

In this study pregnant women with no financial support were more likely to be depressed at 44% when compared to their counterparts at 26%. This is also supported by findings of a study conducted by Bisetegn, Mihretie and Muche (2016) which reported that the risk of depression during pregnancy is greater in women with no financial support. Furthermore, a population-based cohort study conducted in Netherlands reported a statistically significant association between depression and financial support (Verbeek, Bockting, Beijers, Meijer, Van Pampus & Burger, 2019).

5.4.4 Obstetric related factors

In this study 71% of the pregnancies and 29% were not planned. Unplanned pregnancies increase the odds of depression during pregnancy. The probability of having depression during pregnancy is greater if the pregnancy is unplanned (Shah, Bowen, Afridi, Nowshad & Muhujarine,2011). A study conducted in Malawi reported that planned pregnancies were linked to minimal risk of depression (Hall, Barret, Phiri et al,2018). An unplanned pregnancy may result from not using contraceptives, contraceptive failure, or rape. The women may develop depression because of stress, which is linked to the transition into unintended, unprepared motherhood (Phipps & Nunes, 2012). A study by Raisenen et al (2014) observed that an unwanted pregnancy was a significant predictor of depression mostly in the first trimester than other trimesters. They further indicated that initially women find it difficult to cope with an unexpected and undesired event and therefore are more likely to become depressed, however as the pregnancy progresses, they shock reduces and they develop a relationship with the foetus, then the shock reduces, the relationship with their unborn babies become stronger,

they accept the pregnancy thus the depressive symptoms decrease. Another study by Glover (2015) indicated that fear of childbirth and negative thoughts about delivery are associated with increased risk of depression which proves that a negative experience of pregnancy was significantly associated with antenatal depression.

5.4.5 HIV/AIDS

Depression is more prevalent among HIV infected pregnant women and the denial of its existence exacerbate the stress pregnant women experience (Nydoo, Naicker & Moodley, 2017). HIV infection has a major impact on mental health. The prevalence of HIV among south African pregnant adolescents and young women in the age group 15-24 years was 19% in 2015(National Department of Health,2017). According to the Lancet Maternal Health series (2014) many African women learn about their HIV diagnosis during pregnancy and this increases their susceptibility to depression. In the current study there is no statistical significant regarding HIV status, meaning that HIV seropositivity was not associated with maternal depression, this was also the findings of a KwaZulu- Natal study conducted by Naidoo et al (2017).

5.4.6 Intimate Partner Violence

South Africa has a predominantly patriarchal social structure, whereby males are more dominant over women in aspects of relationships, political leadership, and social privilege, this results in high levels of domestic violence (Lopes,2016). Intimate partner violence is ranked as the second highest burden of disease after HIV/AIDS (Lopes,2016). Furthermore, South Africa has the highest rate of female homicide because of intimate partner violence, and the murder rate of South African women is six times the rate of the world average (Kothari, Liepman & Shama Tareen, 2016). The current study corroborated these findings whereby 57% of pregnant women were depressed due to intimate partner violence and 25% were not depressed.

5.4.7 Financial support

The results of this study revealed that pregnant women without financial support from partner were significantly likely to be depressed than those who receive financial support (44% versus 26% at *p-value = 0.002*). This is supported by other studies that showed that a pregnant woman may suffer from depression if she lacks support from her partner (Stapleton, Shetter & Westlimg, 2012). Most pregnant women attending antenatal clinics in low-resource settings depend on their partners for financial support (Steward, Umar, Tomenson & Creed, 2014), and are at risk of depression if they do not receive adequate psychosocial support (Lancaster, Gold, Flynn, Yoo, Marcus & Davis, 2010). Psychosocial support serves as a buffer from stressful life events by providing resources, support, and strength during pregnancy (Dibaba, Fantahun & Hindin, 2013).

5.4.8 Marital status

Marital status or length of a relationship may influence the amount of support the new mother receives and could be a risk factor for depression during pregnancy. Some studies have identified that women experiencing depressive symptoms in the antenatal period are more likely to be unmarried, single or to have a partner not living in the same household (Brittain, Myer, Koen, Koopowitz, Donald, Barnet, Zar & Stein, 2015). A study by Raisanen et al (2014) found a higher level of depression in women living with friends as compared to those living with their partners. And it has been observed that the evidenced that single mothers report higher levels of depressive symptom during pregnancy than women with supportive partners may be explained by a previous history of depression, current emotional problems, previous abuse and maternal perception of the infant and income level. In this study a significant higher proportion of married pregnant women were depressed as compared to unmarried women (44% versus 28% at *p-value = 0.017*). A study conducted by Agostini, Neri, Salvatori, Dellabartola and Bozicevic (2015) did not find marital status as a significant predictor of antenatal depression. These findings highlight the importance of considering not only marital status but also the quality of the relationship. Given these results it was concluded

that being a single mother is way better than having a difficult and unsupportive partner.

5.4.9 Education level

In this current study there was no statistical significant regarding level of education, but according to a study conducted by Abuidhail and Abujilban (2014) antenatal depression is more common in women with low educational achievements. A study conducted by Agostini et al (2015) did not find education to be a significant predictor of antenatal depression.

5.5 LIMITATIONS OF THE STUDY

The current study had some limitations. Antenatal care at such hospitals is mostly availed by pregnant women from the lower and middle—income groups in a community. Hence the findings from this study cannot be extrapolated to pregnant women belonging to the high-income group as there could be variations in the psychosocial factors and standard of living. The study may have been affected by selection bias because pregnant women who did not attend antenatal care during the period of the study were not represented. A relatively small sample size of 336 pregnant women who accessed maternal health services at on rural peripheral district hospital was selected, therefore the results may not be generalised to all district hospitals in South Africa.

5.6 RECOMMENDATIONS

The study findings bring with them a number of recommendations such as:

- A psychosocial assessment, in the sense of a comprehensive and multidimensional evaluation of a woman's psychosocial circumstances for example, sources of support, quality of her relationships, recent life stressors, past or current physical or sexual abuse, should be common practice for all women during the antenatal period. In fact, this assessment would help health

professionals to identify women with a high-risk profile but not currently symptomatic and, therefore, to offer them preventive interventions.

- For early detection and appropriate intervention, antenatal clinics should develop screening tools for depression during the routine antenatal care as per WHO's emphasis on "No health without perinatal mental health".
- Mental health needs to be integrated into reproductive health programmes and primary health care settings, this will not only ensure early and effective identification of women with mental health problems, but it will also reduce the stigma that is associated with seeking help.

5.7 CONCLUSION

Pregnancy is a time of increased vulnerability and it might lead to the development of depression. Some women may experience their first episode of depression during pregnancy while others are at risk of recurrence due to a previous history of depression. Literature shows the main risk factors involved in the onnet of antenatal depression and have highlighted a complex multi-factoral aetiology, different sources of psychosocial, environmental, obstetric and pregnancy related risk factors have been highlighted. Correctly identifying women at risk of suffering from depression would give us the opportunity to target those women who would benefit from preventive and supportive interventions, also identifying the women at risk would allow healthcare workers to follow them up during the course of their pregnancies and recognise earlier symptoms of depression as they develop and therefore implement therapeutic interventions if needed.

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Appendix A: Data Collection Tool

ID | | | | |

SECTION A: MATERNAL DEMOGRAPHICS

A1 Age (years) ☐

A2 Marital status ☐ Unmarried ☐ Married

A3 Education level ☐ None ☐ Primary ☐ Secondary ☐ Tertiary

A4 Employment status ☐ Employed ☐ Unemployed

A5 Drinking alcohol ☐ Yes ☐ No

A6 Smoking ☐ Yes ☐ No

A7 Financial support by partner ☐ Yes ☐ No

A8 Partner violence ☐ Yes ☐ No

A9 Pregnancy planned ☐ Yes ☐ No

A10 Parity ☐

A11 HIV status ☐ Positive ☐ Negative

SECTION B: SPOUSAL DEMOGRAPHICS

B1 Employment status ☐ Employed ☐ Unemployed

B2 Education level ☐ None ☐ Primary ☐ Secondary

☐ Tertiary

B3 Smoking ☐ Yes ☐ No

B4 Drinking alcohol ☐ Yes ☐ No

SECTION C: DEPRESSION SCORE

In the past 7 days:

C1 I've 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

C2 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

C3 I have blamed myself unnecessary when things went wrong

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

C4 I have been anxious or worried for no good reason

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

C5 I have felt scared or panicky for no very good reason

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

C6	Things have been getting too much for 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
C7	I have been so unhappy that I have difficulty sleeping	☐	Yes, most of the time
		☐	Yes, sometimes
		☐	Not very often
		☐	No, not at all
C8	I have felt sad or miserable	☐	Yes, most of the time
		☐	Yes, quite often
		☐	Not very often
		☐	No , not at all
C9	I have been so unhappy that I have been crying	☐	Yes, most of the time
		☐	Yes, quite often
		☐	Only occasionally
		☐	No ,never
C10	The thought of harming myself have occurred to me	☐	Yes, quite often
		☐	Sometimes
		☐	Hardly ever
		☐	Never

Appendix B: LETTER TO REQUEST PERMISSION FOR DATA COLLECTION

UNIVERSITY OF LIMPOPO

DEPARTMENT OF PUBLIC HEALTH

PRIVATE BAG X1106

SOVENGA

0727

THE HEAD OF DEPARTMENT

DEPARTMENT OF HEALTH

PRIVATE BAG X9316

POLOKWANE

0700

ATTENTION: PROVINCIAL RESEARCH ETHICS COMMITTEE CO-ORDINATOR

REQUEST FOR PERMISSION TO CONDUCT A STUDY AT HELENE FRANS HOSPITAL

Dear Sir/Madam

I Ramohlola MC student at the University of Limpopo under the supervision of Dr TS Ntuli hereby like to request permission to conduct a research study at the healthcare facility that is Helene France hospital of Limpopo province. The title of my research proposal is PREVALENCE AND FACTORS ASSOCIATED WITH DEPRESSION AMONGST PREGNANT WOMEN AT HELENE FRANS HOSPITAL.

The main purpose of the study is to investigate the prevalence of depression amongst pregnant women.

The objectives are to determine the prevalence of depression and factors associated with depression amongst pregnant women and to determine support structures for pregnant women.

Findings of the study will benefit both the institution and the department, and results will be made available on request.

I trust that my application will receive your favourable consideration

With regards

Ramohlola MC

Appendix C: CONSENT FORM

Statement concerning participation in a research study

Name of study: PREVALENCE AND FACTORS ASSOCIATED WITH DEPRESSION AMONGST PREGNANT WOMEN AT HELENE FRANS HOSPITAL

I have read the information on the proposed study and was provided the opportunity to ask questions and given adequate time to rethink the issue. The aim and objectives of the study are sufficiently clear to me. I have not been pressurized to participate in anyway. I am fully aware that this material may be used in scientific publications which will be electronically available throughout the world. I consent to this provided that my name and hospital are not revealed.

I understand that participation in this study is completely voluntary and that I may withdraw from it at any time and without supplying reasons. This will have no influence on the regular treatment and the care that I receive. I know that this study has been approved by the Turfloop Research and Ethics (TREC). Im fully aware that the results of this study will be used for scientific purposes and may be published. I agree to this provided privacy is guaranteed.

I hereby give consent to participate in this study

Name…… signature……

Place …… Date ……

Witness……

Statement by researcher

I provided verbal information regarding the study. I agree to answer any future questions concerning the study as best as I can. I will adhere to the approved protocol

Name of researcher……. signature……

Place……. Date ……

Appendix D: FOROMO YA TUMELELANO

Setatamente mabapi le go tjea karolo ka projeke ya dinyakishisho tja klinikhale

Leina la dinyakishisho:

Seemo sa bolwetji bja kgatelelo ya monagano e lego depression le dilo tjeo e lego gore di hlola bolwetji bjo gobomme ba baimana ka sepetlela sa Helene Franz

Ke badile ka ga tshedimosho mabapi le morero wa dinyakishisho tjeo di shishintjwego gomme ke ile ka fiwa monyetla wa go botjisha dipotjisho kaba ka fiwa nako ye e lekanego gore ke naganishe ka ga taba ye. Ke tloga ke kweshisha maikemishetjo le morero wa dinyakishisho the gabotse. Ga se ka gapeletjwa go kgatha tema ka tsela efe goba efe.

Kea kweshisha gore go kgatha tema dinyakishishong tja klinikhale ke ka boithaopo bjaka gomme nka tlogela go kgatha tema nako yenngwe le yenngwe ntle le gofa mabaka. Se se ka se khuefatje kalafo yaka ya ka mehla.

Kea tseba gore dinyakishisho di dumeletjwe ke Turfloop research ethics committee. Ke a tseba gore dipoelo tja dinyakishisho di ka phatlalatjwa, ke dumelelana le se ge fela bosephiri bjaka boka tiishetjwa

Mo ke fa tumelelo ya go khatha tema

Leina la moithaopi……. Mosaeno……

Lefelo…….. hlatse……..

Letjatjikgwedi……..

Setatamente ka Monyakishishi

Ke fane ka tshedimosho ka molomo mabapi le dinyakishisho. Ke dumela go araba dipotjisho dife goba dife tja ka moso mabapi le dinyakishisho ka moo nka kgonago ka gona. Ke tla latela melao yeo e dumeletjwego. Leina la monyakishishi……. mosaeno……Letjatji kgwedi…….

APPENDIX E: Approval from Turfloop Research Ethics Committee (TREC)

University of Limpopo
Department of Research Administration and Development
Private Bag X1106, Sovenga, 0727, South Africa
Tel: (015) 268 3766, Fax: (015) 268 2306, Email:makoetja.ramusi@ul.ac.za

TURFLOOP RESEARCH ETHICS COMMITTEE

ETHICS CLEARANCE CERTIFICATE

MEETING: 21 October 2020

PROJECT NUMBER: TREC/326/2020: PG

PROJECT:

Title:	Prevalence and Factors Associated with Depression Amongst Pregnant Women At Helen Franz Hospital Of The Limpopo Province, South Africa
Researcher:	MC Ramohlola
Supervisor:	Dr E Maimela
Co-Supervisor/s:	Dr TS Ntuli
School:	Health Care Sciences
Degree:	Master of Public Health

PROF P MASOKO
CHAIRPERSON: TURFLOOP RESEARCH ETHICS COMMITTEE
The Turfloop Research Ethics Committee (TREC) is registered with the National Health Research Ethics Council, Registration Number: **REC-0310111-031**

Note:

i) **This Ethics Clearance Certificate will be valid for one (1) year, as from the abovementioned date. Application for annual renewal (or annual review) need to be received by TREC one month before lapse of this period.**

ii) **Should any departure be contemplated from the research procedure as approved, the researcher(s) must re-submit the protocol to the committee, together with the Application for Amendment form.**

iii) **PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES.**

Finding solutions for Africa

APPENDIX F: Approval from Limpopo Department of Health

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

Department of Health

Ref	:	LP_2020_11_028
Enquires	:	Ms PN Motimele
Tel	:	015-293 6028
Email	:	Phoebe.Mahlokwane@dhsd.limpopo.gov.za

Motjatji Catherine

PERMISSION TO CONDUCT RESEARCH IN DEPARTMENTAL FACILITIES

Your Study Topic as indicated below;

Prevalence and Factors Associated with Depression Amongst Pregnant Women At Helen Franz Hospital Of The Limpopo Province, South Africa.

1. Permission to conduct research study as per your research proposal is hereby Granted.
2. Kindly note the following:
    a. Present this letter of permission to the institution supervisor/s a week before the study is conducted.
    b. In the course of your study, there should be no action that disrupts the routine services, or incur any cost on the Department.
    c. After completion of study, it is mandatory that the findings should be submitted to the Department to serve as a resource.
    d. The researcher should be prepared to assist in the interpretation and implementation of the study recommendation where possible.
    e. The approval is only valid for a 1-year period.
    f. If the proposal has been amended, a new approval should be sought from the Department of Health
    g. Kindly note that, the Department can withdraw the approval at any time.

Your cooperation will be highly appreciated

08/02/2021

A/Director Research
Dr. Ramalivhana NJ

Date

Private Bag X9302 Polokwane
Fidel Castro Ruz House, 18 College Street. Polokwane 0700. Tel: 015 293 6000/12. Fax: 015 293 6211.
Website: http/www.limpopo.gov.za

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APPENDIX G: Approval from Helen Franz Hospital

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH
OFFICE OF THE CHIEF EXECUTIVE OFFICER
HELENE FRANZ HOSPITAL

Enq: Ms Lebogo S.J
015 505 8505

To: Ms Ramohlola M.C
TREC/326/2020: PG
University of Limpopo

Date: 09 March 2021

RE: PERMISSION TO CONDUCT RESEARCH STUDY IN HELENE FRANZ HOSPITAL

1. The above matter bears reference:
2. You are hereby granted the permission to conduct your research study as per your request on your research proposal in our facility Helene Franz Hospital
   "Prevalence and Factors Associated With Depression Amongst Pregnant Women at Helene Franz Hospital of Limpopo Province, South Africa"
   - You are advised to present this approval letter when you conduct your research process in our health facility at all times
   - That all research processes must be well planned and coordinated in a manner that will not disrupt service delivery
   - That you must abide by the directive stipulated on other permission letters
   - The Hospital reserve the right to withdraw the approval at any given time should you deviate from the arrangements given to you by the department
   - The Hospital Management wishes you well in your academic program
3. Your Cooperation will be highly appreciated on this regard

Kinds Regards

Simango H.A
Chief Executive officer
Helene Franz Hospital

Signature

Private Bag X5002, Senwabarwana, 080790, Capricorn District
Tel: 015 505 8500 Fax: 015 505 0027

APPENDIX H: Evidence of language editing

Tiyiselani & Rapetsoa scientific services

Article Publishing • Proof-reading • Editing

85 Compensatie Street,
Duplex Park No 5,
Polokwane, 0699
Postnet Suite 179 • Private Bag X9307 • Polokwane •
0700 Tel: 072 190 2999 • Fax: 0864154022

Date: 04 July 2021

To Whom it May Concern

I hereby confirm that I have proof-read the document entitled: "RPrevalence and factors associated with depression amongst pregnant women at Helen Franz Hospital of the Limpopo Province, South Africa" authored by Ramohlola MC with student number 200810051. The document has been edited and proofread for grammar, spelling, punctuation, overall style and logical flow. Considering the suggested changes that the author may or may not accept, at his/her discretion, each of us has our own unique voice as far as both spoken and written language is concerned. In my role as proof-reader, I try not to let my own "written voice" overshadow the voice of the author, while at the same time attempting to ensure a readable document.

Please refer any queries to me.

Rapetsoa DB