PREVALENCE AND AFFECTIVE OUTCOMES OF PRENATAL OBSESSIVE COMPULSIVE DISORDER AMONGST CLINIC ATTENDEES IN THE CAPRICORN DISTRICT, LIMPOPO PROVINCE

By

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DECLARATION

I, Raesetsa Dorothy Malemela, declare that this dissertation hereby submitted to the University of Limpopo for the degree of Master of Arts in Clinical Psychology is the result of my independent work, and that all the sources used have been acknowledged by means of complete references.

Signed at the University of Limpopo on the _____2017

_____

R. D. Malemela

DEDICATION

This project is dedicated to my loving grandmother, RAESIBE JOSEPHINE MALEMELA, for her everlasting, limitless support, and being the pillar of my strength. Ageee ngwana matebele!

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First and foremost, I give thanks to God the Almighty for His grace, and the gift which is this research. Jeremiah 29:11: “For I know the plans I have for you, declares the Lord, plans to prosper you and not to harm you, plans to give you hope and a future”
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ABSTRACT

The study investigated the prevalence of Obsessive-Compulsive Disorder (OCD) symptoms and their relationship with pregnancy-related anxiety, prenatal depression and clinical anger among African pregnant women. The sample consisted of 206 pregnant women attending their antenatal check-ups at the Mankweng, Nobody and Rethabile clinics, and Mankweng hospital in the Capricorn District, Limpopo Province. When correlational analysis was conducted, the patient characteristics of age, having undergone a medical check-up, and having previously delivered a live baby generally did not correlate with any of the main scales measuring OCD, namely, perinatal depression, pregnancy-related anxiety and clinical anger ($p > 0.05$). Findings from the study indicated that almost 81% of the pregnant women could be classified as obsessive-compulsive disordered, when using the Foa et al. (2002) cut-off score of 21. Furthermore, findings from the regression analyses indicated that higher age, the number of gestation weeks, having previously experienced pregnancy-related complications, perinatal depression, pregnancy-related anxiety and clinical anger were variably positive predictors of OCI-R measured OCD symptoms. The predictors are specific to each of the symptoms. It can be concluded from the study that there is a relationship between OCD symptoms and all the independent variables used.

Key terms: Obsessive-Compulsive Disorder, Prenatal depression and Anger.

TABLE OF CONTENTS

Content		Pages
	DECLARATION……	ii
	DEDICATION……..	iii
	ACKNOWLEDGEMENTS…….	iv
	ABSTRACT……..	v
	TABLE OF CONTENTS…….	vi
	LIST OF TABLES……...	ix
	ABBREVIATIONS……	xi

CHAPTER ONE: GENERAL ORIENTATION OF THE STUDY

1.1	Introduction…….....	1
1.2	Research problem……	3
1.3	Aim of the study……	4
1.4	Objectives of the study……...	4
1.5	Hypotheses…….....	4
1.6	Significance of the study…….....	5
1.7	Summary.....	5

CHAPTER TWO: THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.1	Operational definition of key concepts …….	6
2.1.1	Obsessive-Compulsive Disorder……..	6
2.1.2	Pregnancy……	8
2.1.3	Prenatal period……	8
2.1.4	Perinatal period……	8
2.2	Theoretical perspective……...	8
2.3	Literature review…….....	9
2.3.1	Introduction …….....	9
2.3.2	Prevalence of OCD during pregnancy…….	10

	Content	Pages
2.3.3	Onset and exacerbation of OCD……	13
2.3.4	Course of OCD…….	15
2.3.5	Factors related to OCD during pregnancy……...	16
2.3.6	The relationship between depression and OCD……	18
2.3.7	Psychosocial impact of OCD during pregnancy…….....	20
2.3.8	Anger and OCD……	20
2.3.9	Summary……..	23

CHAPTER THREE: RESEARCH METHODOLOGY

3.1	Introduction……...	24
3.2	Research design……..	24
3.3	Variables of the study …….	24
3.4	Sampling…….....	24
3.5	Measures……..	25
3.5.1	Demographic information…….……	25
3.5.2	Revised version of the OCI-R……..…..	25
3.5.3	Padua Inventory-Washington State University Revision Scale (PI-WSUR): Contamination Obsessions and Washing Compulsions….....	27
3.5.4	Edinburgh Postnatal Depression Scale (EPDS)…….	27
3.5.5	Clinical Anger Scale (CAS)……	28
3.5.6	Pregnancy Related Anxiety Scale (PRAS)……..	29
3.6	Ethical clearance……..	30
3.7	Data collection procedure……	30
3.8	Summary…….…….	31

CHAPTER FOUR: RESULTS

4.1	Introduction……..	32
4.2	Plan for analysing data……..	32
4.3	Description of the sample…….....	32
4.4	Prevalence of OCD among the pregnant women……..……	36

4.5 Comparisons between OCD and non-OCD classified pregnant women on the EPDS, CAS, PRAS and PI-WSUR (Contamination and Washing Compulsion)..…….. 38
4.6 Associations between the main study variables…… 40
4.7 The prediction of OC variables symptoms from pregnancy-related anxiety, prenatal depression and clinical anger…….. 40
4.8 Summary……... 50

CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction……... 51
5.1.1 The prevalence of OCD during pregnancy…….. 51
5.1.2 The relationship between both depression and anxiety……. 52
5.1.3 Relationship between anger and OCD……. 54
5.1.4 Reproduction related descriptive factors and OCD ……... 55
5.1.5 Regression model of OCD …….. 56
5.2 Conclusion…… 57
5.3 Limitations of the study……..……. 57
5.4 Recommendations…….. 58
5.5 Summary…….. 59
References……... 60
Appendices…… 70

LIST OF TABLES

	Content	Page
Table 1:	Characteristics of the sample (N = 206)…….	34
Table 2:	Median and mean scores of study scales……	37
Table 3a:	Comparison of pregnant women with and without OCD symptoms (OCI-R total score) on EPDS, CAS, PRAS and PI-WSUR: Cut-off score of 21…….……	38
Table 3b:	Comparison of pregnant women with and without OCD symptoms (OCI-R Obsessing) on EPDS, CAS, PRAS and PI-WSUR: Cut-off score of 4……	39
Table 4:	Correlations between variables of the study……...	41
Table 5:	Regression analysis - OCI-R total score…….	46
Table 6:	Regression analysis - OCI-R Washing subscale…….....	46
Table 7:	Regression analysis - OCI-R Obsessing subscale……..…	47
Table 8:	Regression analysis - OCI-R Hoarding subscale……...	47
Table 9:	Regression analysis - OCI-R Ordering subscale……	48
Table 10:	Regression analysis - OCI-R Checking subscale……..	48
Table 11:	Regression analysis - OCI-R Neutralizing subscale……..	49

APPENDICES

Appendix A:	Ethical compliance certificate…….…….……..	69
Appendix B:	Approval letter – Limpopo Department of Health……	70
Appendix C:	Approval letter – Mankweng Hospital……	71

ABBREVIATIONS

CAS	-	Clinical Anger Scale
CBT	-	Cognitive Behavioural Theory
DSM-5	-	Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition
EPDS	-	Edinburg Postnatal Depression Scale
OCD	-	Obsessive-Compulsive Disorder
OCI-R	-	Revised version of the Obsessive Compulsive Inventory
OCRD	-	Obsessive-Compulsive and Related Disorders
PI-WSUR	-	Padua Inventory–Washington State University Revision Scale
PSWQ	-	Penn State Worry Questionnaire
PRAS	-	Pregnancy-Related Anxiety Scale

CHAPTER 1:
GENERAL ORIENTATION OF THE STUDY

1.1 INTRODUCTION

Pregnancy is known to influence the onset and course of psychiatric conditions such as mood, psychotic and anxiety disorders (Kalra, Tandon, Trivedi, & Janca, 2005). Obsessive-Compulsive Disorder (OCD) is one of the Obsessive-Compulsive and Related Disorders (OCRD) that is observed relatively frequently and appears to be among the conditions related to pregnancy (American Psychiatric Association, 2013; Uguz, Kaya, Gezginc, Kayhan, & Cicek, 2011). In the DSM-5 OCD is recognized as a disorder distinct from anxiety and it is characterized by the presence of obsessions and/or compulsions. Obsessions are then defined as recurrent and persistent thoughts, urges, or images that are experienced as intrusive and unwanted, whereas compulsions are repetitive behaviours or mental acts that an individual feels driven to perform in response to an obsession or according to rules that must be applied rigidly (American Psychiatric Association, 2013).

A number of researchers (Abramowitz, Schwartz, Moore, & Luenzmann, 2003; Fairbrother & Abramowitz, 2007; Fenske & Petersen, 2015; Gangdev, Stein, & Ruzibiza, 1996; Guglielmi et al., 2014; Niehaus, 2004; Vousoura, 2012) report that the lifetime prevalence of OCD in the general population is approximately 2–3%, making it one of the most common psychiatric disorders. Interestingly, estimates of the prevalence rates of OCD in pregnant women have been found to be greater than the estimated prevalence in the general population (Uguz & Ayhan, 2011; Uguz, Kaya, Gezginc, Kayhan, & Cicek, 2011). Current empirical evidence suggests that the perinatal period is the time of high risk for the onset of OCD, with studies reporting that up to 40% of women of childbearing age have onset of symptoms during this period (Abramowitz et al., 2003; Fenske & Petersen, 2015; Frías et al., 2015; Kaya, Uguz, Sahingoz, & Gezginc, 2015; Russell, Fawcett & Mazmanian, 2013; Sharma & Sharma, 2015; Uguz & Ayhan, 2011; Vythilingum, 2009). Moreover, studies indicate that up to 50% of women

suffering from OCD recall the onset or worsening of their symptoms during the perinatal period (Lord, Reider, Hall, Soares, & Steiner, 2011).

Amongst the pregnant women with OCD, the most common obsessions are germ contamination, and symmetry or exactness, while the most common compulsions are cleaning and checking (Abramowitz et al., 2003; Chaudron & Nirodi, 2010; Kaya et al., 2015). Perinatal obsessions and compulsions are very specific in content and are frequently directed towards the baby's health and well-being, and the environment. The symptoms thus create immense distress and impair not only the mother's social, occupational and personal life, but may also affect the ability of the mother to care for her baby, leading to negative fetal outcomes, long-term behavioural challenges and disrupts the mother-infant bonding process (Chaudron & Nirodi, 2010; Fairbrother & Abramowitz, 2007; Gezginç et al., 2008; Lord et al., 2011; Vythilingum, 2009). Furthermore, the quality of life in patients with OCD seems to be worse than that in patients with depressive disorders, and similar to those with patients with Schizophrenia (Gezginc et al., 2008).

Researchers have also noted that there is a substantial overlap between general OCD and depressive symptoms, with comorbidity studies indicating that as many as a third of adults with OCD also meet criteria for major depressive disorder (Abramowitz et al., 2003). According to van Heyningen et al. (2016), depression during the perinatal period is of particular concern because of the disabling effect on maternal functioning and the negative consequences for the health and development of infants and children. A study by Chaudron and Nirodi (2010) revealed that 32% of the pregnant women who reported high levels of anxiety also reported experiencing depressive symptoms, suggesting that OCD is related to depression. Moreover, Whitehead and Abromawitz (2005) found that patients with OC symptoms experience more anger, have a tendency to suppress it inwardly and express anger outwardly. Patients also report more difficulty in controlling their anger, with anger correlating with the presence of comorbid depression.

Although the relationship between pregnancy and OCD has been extensively explored amongst Western women, the prevalence and factors related to OCD during pregnancy amongst African women do not seem to be investigated frequently. The incidence of OCD symptoms in blacks is considered to be low (Gangdev et al., 1996). This is surprising since the DSM-5 itself recognizes that OCD is common globally and its prevalence patterns, with respect to onset age, comorbidity and distribution by gender, are the same cross-culturally (American Psychiatric Association, 2013, p. 240). Thus, the proposed study focuses on OCD amongst pregnant African women. This study focuses on the issue of prevalence as a starting point. Thereafter, some related variables are also included. These include prenatal anxiety, depression and anger.

1.2 **RESEARCH PROBLEM**

Recent research suggests that the onset of OCD symptoms amongst pregnant women is a reality and occurs frequently (Uguz et al., 2011). Apparently, many women suffer from either new onset or worsening of existing OCD symptoms during pregnancy (Vythilingum, 2009). The occurrence of OCD symptoms tends to interfere with the women's daily functioning and often disrupts the mother-infant bonding process as OCD symptoms are directed to the foetus's health and well-being. OCD leads to definite anxiety and disturbs social and occupational capacity, wastes time, and also causes severe disturbance in the quality of life of pregnant women (Gezginc et al., 2008; Uguz et al., 2007a).

In a study by Uguz, Gezginc, Kayhan, Sarı, and Büyüköz (2009) OCD and depression were found to be the most common two disorders in most pregnant women with the prevalence rate of OCD being 5.5% and depression being 5.2%. On the other hand, Whitehead and Abramowitz (2004) found that patients with severe OCD symptoms present with increased levels of anger than patients with low OCD symptoms. Moreover, those with severe obsessive-compulsive symptoms also experience depressive symptoms. The literature concerning anxiety disorders such as OCD in pregnancy is limited and there are also contradictory reports as to whether anxiety disorders are more or less common

during pregnancy (Adewuya, Ola, Aloba, & Mapayi, 2006). Although there is evidence that OCD does occur among South Africans, including Blacks (Gangdev et al., 1996), I have not come across a study of OCD directed at pregnant women in Limpopo. Therefore, it is necessary to investigate the prevalence of OCD amongst pregnant women and thereafter investigate the relationship between OCD and anger in pregnant African women.

1.3 Study aim

The aim of the study is to present rates of OCD amongst pregnant African women attending community clinics in the Capricorn district, Limpopo Province and to determine the relationship between OCD and prenatal depression, pregnancy-related anxiety and anger during pregnancy.

1.4 Study objectives

1.4.1 To determine rates of OCD amongst pregnant women attending community pregnancy clinics in the Capricorn district, Limpopo Province.

1.4.2 To establish if OCD is related to prenatal depression, pregnancy-related anxiety and anger during pregnancy.

1.5 Hypotheses

Rates of OCD amongst pregnant women in the community pregnancy clinic:

1.5.1 High rates of OCD will be reported.

Factors related to OCD among pregnant women in the community pregnancy clinic:

1.5.2 Pregnant women who report high levels of prenatal depression, pregnancy-related anxiety and anger will also report experiencing symptoms of OCD.

1.5.3 OCD symptoms will be positively predicted in a model that includes prenatal depression, pregnancy-related anxiety and anger as predictors.

1.6 SIGNIFICANCE OF THE STUDY

The research outcomes of this study will indicate if OCD exists during pregnancy. The study will also help to determine whether OCD exists amongst African women in a South African context, since many of the existing studies were conducted in Western countries. Besides its cross-cultural value, the study also adds to an area that has received little attention by researchers. It is necessary to find out the role of variables such as pregnancy-related anxiety, depression and anger in the study. There is also a health related benefit. The findings will also be useful to health care institutions. They will give guidance regarding the need for intervention. OCD during pregnancy affects the developing mother-infant bonding and a mother's ability to take care of her new-born. Identification of OCD and its rates amongst pregnant women will enable health institutions to design, plan and implement strategies to manage it during pregnancy. For instance, it may actually be necessary to hospitalise those pregnant women to whom OCD has become a serious health risk to them or their unborn children.

1.7 SUMMARY

This chapter focused on introducing the study, providing its aims, objectives and hypotheses. The research problem and its significance were also presented. The next chapter will provide the theoretical framework of the study and the literature review.

CHAPTER 2:
THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.1 OPERATIONAL DEFINITION OF KEY CONCEPTS

2.1.1 Obsessive-Compulsive Disorder (OCD)

The cognitive models of OCD posit that specific kinds of dysfunctional beliefs underlie the development of the disorder (Abramowitz, Khandkera, Nelson, Deacon, & Rygwalla, 2006; Whiteside & Abramowitz, 2005). On the other hand, one perspective from the biological model of OCD argues that the disorder occurs when there is an implicated dysregulation of the serotonin system which generates obsessional thoughts and compulsive behaviours (Abramowitz et al., 2003). Although the underlying biological or genetic factors might predispose individuals towards developing OCD generally, the cognitive formulations of OCD are specific, face valid, and can account for the disorder's highly idiosyncratic nature (Abramowitz et al., 2006). Hence the proposed study uses the cognitive behavioural model as a theoretical framework of the study.

OCD is a discrete diagnostic subcategory in the OCRD chapter of the DSM-5 (American Psychiatric Association, 2013). The DSM-5 defines OCD as a disorder that is characterized by the presence of obsessions and/or compulsions. Obsessions are defined as recurrent and persistent thoughts, urges, or images that are experienced as intrusive and unwanted, whereas *c*ompulsions are repetitive behaviours or mental acts that an individual feels driven to perform in response to an obsession or according to rules that must be applied rigidly (American Psychiatric Association, 2013).

According to the DSM-5 (American Psychiatric Association, 2013, p. 237) OCD is diagnosed as follows:

The presence of both obsessions and compulsions must be evident in an individual. The obsessions are defined by recurrent and persistent thoughts,

urges, or images that are experienced as intrusive and unwanted at some time by the individual. Furthermore, during the disturbance, they cause anxiety or distress in the individual. The individual must also attempt to ignore or supress such thoughts, urges or images or to neutralise them with some actions (performing compulsions). The compulsions include repetitive behaviours such as hand washing, ordering, checking or mental acts such as praying and counting. The individual feels driven to perform in response to an obsession or according to rules that must be applied rigidly. The individual must perform the compulsions or mental acts with the aim of preventing or reducing anxiety. However, these compulsions are not connected in a realistic way. Criterion B emphasizes that obsessions and compulsions must be time-consuming (more than 1 hour per day) or cause clinically significant distress or impairment to warrant a diagnosis of OCD. Furthermore, OCD symptoms must not be attributable to the physiological effects of a substance (e. g., a drug of abuse, medication) or another medical condition. And the disturbance is not better explained by the symptoms of another mental disorder. Furthermore, you must specify if the OCD is with good or fair insight (the individual recognizes that OCD beliefs are definitely or probably not true or that they may or may not be true); Specify if with poor insight (the individual thinks obsessive-compulsive disorder beliefs are probably true); Specify if it is with absent insight or delusional belief (the individual is completely convinced that OCD beliefs are true) and lastly, specify if it is tic-related: The individual has a current or past history of a tic disorder.

Fenske and Petersen (2015) highlight the point that OCD should be seen as a distinct entity from obsessive-compulsive personality disorder, since the latter is characterized by a pervasive pattern of behaviours emphasizing organization, perfectionism, and a sense of control, rather than repetitive behaviours or intrusive thoughts (the common characteristic in OCD).

2.1.2 **Pregnancy**

Pregnancy is defined as a period of reproduction during which a woman carries one or more live foetuses following implantation of a zygote in the uterus throughout gestation (Al-Tawil, 2013).

2.1.3 **Prenatal period**

The prenatal period is defined as the period of gestation, relating to the duration of pregnancy from conception to birth. The gestation period of humans is approximately forty weeks (Claasen, 2006). Although the concept prenatal period may be used interchangeably with perinatal period, there are differences, as the definition of the concept perinatal period below will show.

2.1.4 **The perinatal period**

The perinatal period is defined as a period of twenty-two completed weeks gestation and lasting through seven days after birth (Nguyen & Wilcox, 2005).

2.2. **THEORETICAL PERSPECTIVE**

This study is empirical and not strictly framed according to any particular theory. Concepts that have been found to be associated with OCD are included in the study. The OCD concept of this study emanates from the DSM model of psychopathology. However, it can also be interpreted within the framework of cognitive behavioural theory (CBT). The CBT of OCD explains the relationship between an individual's thoughts, behaviours and the occurrence of OCD symptoms. The model begins with the premise that intrusive thoughts are normally occurring phenomena and that everyone experiences intrusive thoughts, and such intrusions are not harmful, dangerous or uncommon (Simos, 2002). The theory further states that people with obsessional thoughts appraise normal intrusive thoughts, images and impulses as an indication that harm to themselves or others is a particularly serious risk and they may be responsible

for such harm. The difference between individuals with and without OCD symptoms is the negative meaning they assign to such intrusions. Moreover, the theory proposes that compulsive behaviours develop as a means of coping with the stress caused by the intrusive thoughts, and that the use of compulsions increases the probability of subsequent neutralizing (Coles, Pietrefesa, Schofield, & Cook, 2008).

Individuals with OCD appraise intrusive thoughts as threatening and personally relevant to them, while individuals without OCD do not appraise intrusive thoughts as such. The negative appraisals would logically lead to emotional distress, worry and the urge to engage in overt or covert compulsive behaviour that functions to reduce the threat (Simos, 2002). For example, a pregnant woman under stress of caring for an infant may have intrusive thoughts of harming the infant. Individuals without OCD would be able to avoid such thoughts. However, those with OCD might exaggerate the importance of these thoughts and respond as though it represents an actual threat. They may actually think that they are a danger to their children if they have thoughts of harming them. This causes high levels of anxiety and other negative emotions, such as shame, guilt and disgust.

2.3 **LITERATURE REVIEW**

2.3.1 **Introduction**

In the review of the literature, details about the prevalence, onset and exacerbation, impact and course of OCD during pregnancy will be discussed. Thereafter, factors related to OCD during pregnancy, including the relationship between OCD and depression, as well as the risk factors associated with OCD during pregnancy will be explored. Special attention will be given to the expression of anger in OCD.

2.3.2 **Prevalence of OCD during pregnancy**

Psychiatric conditions are common during pregnancy, but OCD ranks among the most common during this time (Paschetta et al., 2014). In the past research focused on mood disorder, but OCD is now receiving attention because of its common occurrence during pregnancy (Frías et al., 2015). Unfortunately, this observation is true of the international literature than it is for South Africa, and Africa in general. There is an interest in studying OCD among South African researchers, but it rarely involves estimation of prevalence rates in the general population (e.g., Lochner & Stein, 2003; Lochner et al., 2002). In fact, a South African study of anxiety disorders, inclusive of OCD, simply refers to international prevalence rates and says nothing about South African ones (Vythilingum, 2009). Seedat, Roos, Pretorius, Karayiorgou, and Nel (2007) studied the comorbidity of OCD in schizophrenic and schizoaffective Afrikaners.

Although data regarding the prevalence of OCD during pregnancy in African populations is limited, some information is available. Gangdev et al. (1996) reviewed the literature on OCD occurrence on the African continent, and found the following: Nigeria had a rate of 0.4%, Sudan had 1.5%, Benin = 1.4%, Uganda = 2.4% and Egypt was the highest with a rate of 2.6%. Lochner et al. (2015a) did not study a representative sample, but conducted a study of symmetry symptoms in OCD among four hundred and fifty-one South African Caucasian males and females. Lochner et al. (2015a) found that patients with OCD who reported experiencing symmetry-related obsessions and compulsions including ordering, counting and arranging comprised 46.6% of the sample. However, when Lochner et al. (2015b) conducted a study on hoarding symptoms in OCD, a lower rate of 18.1% of patients with hoarding symptoms was found.

The prevalence rates of OCD during pregnancy vary, ranging from 0.2% to 5.2% according to the literature (Andersson et al., 2003; Uguz & Ayhan, 2011). Uguz, Kaya, Gezginc, Kayhan, and Cicek (2007b) examined the current prevalence rate, clinical characteristics and related factors of OCD in pregnant women from Turkey in the third trimester of pregnancy, and found a prevalence

rate of 3.5%. Additionally, a 0.5% rate of women with OCD symptoms during the second trimester (16th and 24th gestational weeks) of pregnancy was found. However, OCD symptoms were present even before pregnancy on other women. Moreover, pre-existing OCD symptoms were reported to have worsened during pregnancy by six women 46.1%, whereas OCD symptoms decreased in three women 23.1%.

However, Andersson et al. (2003) found a prevalence rate of 1.3% OCD on pregnant women. The study was conducted during the second trimester of pregnancy on pregnant women from Sweden. The prevalence rate of OCD in pregnant women was much lower than what was found by Uguz et al. (2007b). The different rates could be attributable to the different sample size and methodology used in both studies. Furthermore, the data revealed that fear of approaching childbirth was significantly more common in women with psychiatric diagnoses than those without psychiatric diagnoses. Moreover, Andersson et al. (2003) found that other women had comorbid diagnosis in the study.

On the other hand, Adewuya, Ola, Aloba, and Mapayi (2006) found that the rate of anxiety disorders amongst Nigerian women in late pregnancy was 39%, whereas in the non-pregnant control group it was 16.3%. However, out of the 39% of anxiety disorders found, OCD prevalence rate in pregnant women was found to be 5.2% than in the general non-pregnant women which was 1.7%. Similarly, Uguz, Gezginc, Kayhan, Sarı, and Büyüköz (2010) who investigated the prevalence of mood and anxiety disorders in a sample of three hundred and nine pregnant women and one hundred and seven control non-pregnant women from Turkey also found a prevalence rate of 5.2%. However, Uguz et al.'s (2010) sample consisted of pregnant women in all trimesters. The above reported prevalence rate in pregnant women was three times high than in non-pregnant controls. This proportion was very high as compared to what was found by Uguz et al. (2007b) and Andersson et al. (2003). According to Adewuya et al. (2006) factors that contribute to anxiety disorders during pregnancy are lack of experience in pregnancy and the fear of safe delivery

especially in young inexperienced women. The higher prevalence rate of OCD symptoms reported in the study supports the notion that OCD symptoms are more common during pregnancy.

More recently Kaya et al. (2015) found a prevalence rate of 6.6% of OCD in both pregnant and non-pregnant women from Turkey. Interestingly, their rates of OCD in both pregnant and non-pregnant women were the same whereas lower rates are reported on the general non-pregnant women when compared to pregnant women in other studies. This rate was much higher than what was found in previous studies. According to Abramowitz et al., 2003; Chaudron and Nirodi, 2010; Kaya et al. 2015 the most common obsessions in pregnant women are contamination and symmetry or exactness, whereas the most common compulsions are cleaning, washing and checking. Additionally, hoarding was reported as the most common compulsion by Chaudron and Nirodi (2010).

Furthermore, Faisl-Cury, Menezes, Araya, and Zugaib (2009) found a rate of common mental disorders amongst low-income pregnant women in Brazil to be 20.2%. The common psychiatric symptoms found to be prevalent were worries with a rate of 34.3%, closely followed by irritability (33.3%) and anxiety (33.3%). The least frequent psychiatric symptoms were depressive thoughts (9.6%), phobias (7.8%) and panic (7.8%). The co-occurrence of symptoms of depression and anxiety was high, with 69% of the women presenting with depressive symptoms also showing symptoms of anxiety, and with 51% of the women presenting with symptoms of anxiety also showing symptoms of depression. Similarly, Chaudron and Nirodi (2010) revealed that 32% of pregnant women reported high levels of anxiety and depressive symptoms during the third trimester of pregnancy with the prevalence of OCD being at 29% out of the twenty-four women who completed a structured clinical interview. Furthermore, Mitsuhiro, Chalem, Barros, Guinsburg, and Laranjeira (2009) on their study of the prevalence of psychiatric disorders in a population of pregnant teenage women from Brazil found a prevalence rate of 32.5%. Depression was found to be the most prevalent disorder with a rate of 12. 9%

while OCD had a rate of 0.5%. The rate of OCD was much lower than the rates reported by other researchers. This may be due to the fact that coping with early parenthood, poverty, limited education, poor professional skills, and lack of adequate social support predispose them to stress. Hence the high rate of depression.

2.3.3 **Onset and exacerbation of OCD**

Researchers have reported that there is an association between pregnancy and onset of OCD in some women. The onset of OCD symptoms associated with pregnancy in the literature ranges from 2% to 40% respectively. In addition, the exacerbation of pre-existing OCD has been reported to be 8% to 16% during pregnancy (Uguz & Ayhan, 2011). Uguz et al. (2007b) noted that pregnancy is related to onset of OCD in 13.3 % of female patients with OCD. On the other hand, Forray, Focseneanu, Pittman, and McDougle (2010), who assessed the onset of OCD and symptom exacerbation in relationship to reproductive events, found a rate of 32.1% women who had OCD onset in the perinatal period, 15.4% during pregnancy, 14.1% at postpartum, and 1.3% after having a miscarriage. However, Labad et al. (2010) found a lower prevalence rate of 10% onset OCD during the perinatal period.

Several researchers found pregnancy to be associated with the onset of OCD in a considerable proportion of female patients (5.7% to 39%) who had been pregnant at least once (Forray et al., 2010; Labad et al. 2010; Neziroglu, Anemone, & Yaryura-Tobias, 1992). Guglielmi et al. (2014) on the other hand report OCD to be related to a reproductive event with most women referring to their onset at menarche. Moreover, Forray et al. (2010) found that 34.1% women had an exacerbation of OCD symptoms, 22.0% reported that their OCD symptoms improved, and 43.9% did not change symptom severity in women with pre-existing illness.

On the other hand, Labad et al. (2010) explored the relationship between OCD dimensions and the onset of OCD at first menstrual cycle or during the perinatal

period and found that women who reported onset of OCD during their first menstrual cycle were 21.1%, during the perinatal period were 10% and during any other non-reproductive major events it was 27.8%. Patients with symptoms of symmetry or ordering dimension had an earlier age of onset of OCD symptoms compared to patients without symmetry or ordering symptoms. However, those with hoarding symptoms reported an earlier age onset during their first menstrual cycle than non-hoarders. The prevalence of perinatal OCD was notably high in a quarter of patients with children. Labad et al.'s (2010) findings regarding the perinatal onset of OCD are consistence with Uguz et al.'s (2007a) findings. Both studies described the onset of OCD during pregnancy and postpaturm and found a higher risk of OCD onset during the perinatal period than at postpaturm.

Guglielmi et al. (2014), who examined the onset and exacerbation of OCD in reproductive cycle events, and investigated the likelihood of repeated exacerbation in subsequent pregnancies and postpartum periods in women, revealed that more than 25% of women reported their onset of OCD symptoms to be related to a reproductive event, with most of the women referring to their first menstrual cycle with a rate of 13.0%. However, onset of OCD symptoms related to first menstrual cycle was lower in Guglielmi et al.'s (2014) sample than the 21.1% found by Labad et al. (2010). Lack of consistency could be due to the different samples used in both studies and the difference in sample sizes. Furthermore, out of the eleven women who reported their onset to be related to pregnancy, six reported that it was during the first, four reported it was during the second, and one reported the onset during their third pregnancy. Interestingly, the worsening of pre-existing OCD symptoms was reported by 37.6% of women at premenstrual period, 33.0% during pregnancy, 46.6% during postpartum, and 32.7% during menopause. Although the difference is not high, Uguz et al. (2011) found a lower rate (32.7%) of pre-existing of OCD symptoms during pregnancy.

2.3.4 **Course of OCD**

The severity of pre-existing OCD symptoms lessens or remains unchanged in a considerable proportion of women. The rates of worsening and improvement of OCD symptoms have been reported as 8% to 46% and 10% to 23%, respectively (Uguz & Ayhan, 2011). Uguz et al. (2007a) revealed that there is decrease in the severity of OCD symptoms in a considerable number of women during the early postpartum period than during pregnancy. On the other hand, Uguz and Ayhan (2011) found that anxiety disorders at the onset of pregnancy are associated with worsening of pre-existing symptoms of OCD. A rate of 18.8% of women whom their OCD symptoms occurred during their pregnancy was found. This basically supports the notion that OCD symptoms worsen during pregnancy than at postpartum (Labad et al., 2010; Uguz & Ayhan, 2011; Santvana, Shamsah, Firuza, & Rajesh, 2005).

The data further revealed that obsessional symptoms with high rates were contamination of germs to the baby, symmetry or exactness, aggressive, and religious. Whereas the most frequent compulsions with high rates were cleaning or washing, checking, ordering and arranging during the 38th gestational week. Interestingly, the aggressive and contamination obsessions related to the foetus resolved in their severities after childbirth in some women (Uguz et al., 2007a). Similarly, Labad et al. (2010) did not find aggressive obsessions during postpartum period. These support the notion that OCD symptoms are more prevalent during the prenatal period.

However, Brockington, MacDonald, and Wainscottn (2006), who examined anxiety, obsessions and morbid preoccupations in pregnancy and the puerperium, found that the frequency and severity of anxiety as compared with depression were more clinically significant during pregnancy and equally common after delivery. Inconsistence to the obsessional symptoms reported by Uguz et al. (2007a), Brockington et al. (2006) found that during pregnancy, (11%) women reported that the obsessional symptoms they experienced were only cleaning or housework. Moreover, one woman reported that she had

obsessions about foetal movements and that she would lie awake for up to two hours, counting movements until they reached the number required for comfort and sleep. Furthermore, the focus of pre-partum anxiety found reported in 51 (43%) pregnant women was fear of foetal abnormality, 51 (40%) reported fear of foetal death, 41 (32%) reported fear of inadequacy as a mother, 36 (28%) reported fear of childbirth, 27 (21%) reported fear that there would be too little support after delivery and 45 (35%) reported to experience all other themes such as family dynamics and financial issues.

2.3.5 **Factors related to OCD during pregnancy**

The cause of perinatal OCD has not been clearly established. However, it is believed that OCD may be caused by a variety of processes and their interactions. These include genetic, environmental, immunological, and hormonal factors. Additionally, psychological stress of pregnancy and infant care may also contribute to the development of OCD symptoms (Chaudron & Nirodi, 2010). Vasconcelos et al. (2010) found that one of the risk factors associated with OCD during pregnancy is the prevalence of perinatal complications such as premature rupture of membranes, prolonged labour and nuchal cord entanglement. At post-natal period, individuals with OCD reported that they have suffered birth process related problems, mainly preterm birth and jaundice with greater frequency and more often they were found to have had delayed bladder control. Additionally, a number of prenatal, perinatal, and postnatal factors associated with OCD, which, in interaction with other environmental or genetic factors, were described to play important roles in the clinical expression of OCD.

According to Vasconcelos et al. (2010) protracted labour and edema during pregnancy are said to be the most important risk factors associated with OCD. Such findings indicate that patients with OCD had more complications during gestation and delivery than control subjects did. In a recent study by Martini et al. (2015) it was reported that women with anxiety or depressive disorders prior to their pregnancies are at increased risk to also exhibit anxiety and or

depressive symptoms during the peripartum period. Additionally, a history of a sexual or traumatic experience is associated with anxiety disorders during pregnancy and with postpartum depression.

Furthermore, Uguz et al.'s (2011) study examined clinical factors and socio-demographic factors related to the worsening of OCD in pregnant women. They found that pre-existing OCD symptoms worsened in 17 (32.7%) women, remained unchanged in 28 (53.8%), and decreased in 7 (13.5%) of them during their pregnancy. Interestingly, women whose symptoms worsened during pregnancy had similar socio-demographic characteristics for educational level, employment status, and number of children, gestational week, and a history of abortion to the control in whom the obsessive-compulsive disorder symptoms had not worsened (Uguz et al., 2007b; Uguz et al., 2010). Seemingly, the demographic characteristics were factors related to OCD. However, there were no significant differences between the pregnant women in terms of their obsessive-compulsive symptoms. Additionally, the proportion of primigravida (19.2%) was found to be one of the related factors of OCD. Similarly, Neziroglu et al. (1992) found primigravida to be a related factor to OCD with a rate of 34.8%. According to Uguz et al. (2011), history of abortion, family history of major depression, personal history and the existence of major depression at the onset of pregnancy are factors related to OCD in pregnant women.

On the other hand, Abramowitz et al. (2006) evaluated whether dysfunctional beliefs that underlie OCD act as a specific vulnerability factor in the pathogenesis of obsessive-compulsive symptomatology. Consistent with other previous researches, it was revealed that most new parents report distressing intrusive thoughts regarding their new-borns. The content of their intrusions were similar to those of clinical obsessions in that they focused on misfortune, but were described as senseless and incongruent with the person's belief system. According to Abramowitz et al. (2006) cognition has an impact on OCD and provides evidence that dysfunctional beliefs implicated in cognitive models of OCD serve as risk factors for the development of obsessions and compulsions from normal intrusive thoughts. From the biological perspective,

however, the neurochemical model posits that obsessive-compulsive symptoms are generated due to deficits in the serotonin neurotransmitter system (Vousoura, 2012).

Too much attention has been given to early-onset OCD with little studies focusing on late-onset OCD. However, when Frydman et al. (2014) examined late onset obsessive-compulsive disorder risk factors and correlates they found a rate of 8.6% women that displayed significant OCD symptoms after fourty years old. Frydman et al. (2014) found that late-onset OCD was particularly related to a major traumatic event occurring after age fourty and a history of recent pregnancy in self or in significant others. Furthermore, late-onset OCD was comorbid with PTSD. These suggest that OCD symptoms that develop after traumatic events occur at later ages.

2.3.6 **The relationship between OCD and depression**

The lifetime prevalence of major depressive disorder is estimated to be between 10% and 15% globally, and in South Africa, it is estimated that 9.8% adults will experience a major depressive episode at least once during their lifetime. Current research has demonstrated that perinatal depression has become a burden to most pregnant women (van Heyningen et al., 2016). Chaudron and Nirodi (2010) state that perinatal depression affects 14% of the general population and in low-income and minority groups of women, the rates can be up to 25%. In high-income countries, the burden of perinatal depression is approximately 13-15% which is much lower than in low-income minority groups (van Heyningen et al., 2016). Depression has been considered as one of the most common complications in pregnancy (Lancaster et al., 2010). Vousoura (2010); Bartz and Hollander (2006) demonstrate that, in general, OCD patients manifest a number of additional psychiatric conditions, predominantly major depressive disorder. Moreover, it is said that when women are exposed to infant demands that require maternal adaptability and flexibility, they become increasingly anxious and most of the time they feel depressed.

In a study by van Heyningen et al. (2016) conducted in a low-income setting in Cape Town, South Africa, a 22% prevalence rate of depression was reported amongst pregnant women. The rate is approximately double that of high income settings. This may be due to the fact that researchers use different methods in diagnosing depression and the domicile of participants thereof. van Heyningen et al.'s (2016) study used the Expanded Mini-International Neuropsychiatric Interview (MINI Plus) in diagnosing depression which is a tool that has been validated in South Africa for diagnosing depression. Mitsuhiro et al. (2009) found a rate of 12.9% of perinatal depression although among teenage pregnant mothers in Brazil in low income setting.

Furthermore, Manikkam and Burns (2012) who conducted a study of antenatal depression and its risk factors in Kwazulu-Natal found a prevalence rate of 38.5% women with depression. Their study also found that having had thoughts of deliberate self-harm was the strongest risk factor in depression among pregnant women. Interestingly, Hartley et al. (2011) found a rate of 39% of pregnant women with depression in Khayelitsha and Mfuleni, Cape Town which is almost similar to what was found by Manikkam and Burns (2012). Both studies used the EPDS to diagnose depression, which may partly explain why the two studies have close to similar rates. van Heyningen et al. (2016) also reported that a recent study conducted in the Western Cape reported a 21% prevalence rate of pregnant women diagnosed with depression.

Chaudron and Nirodi (2010) found that during the third trimester of pregnancy, 32% of pregnant women reported high levels of anxiety and depressive symptoms. Furthermore, more than half (57%) of the women with OCD had a co-morbid mood or anxiety disorder. At one month postpartum, 12.5% had new OC symptoms and 25% had new high levels of depressive symptoms indicative that OC symptoms co-occur with depression. The most common obsessions reported were symmetry, fear of contamination, and intrusive thoughts while the most common compulsions were hoarding, checking, and cleaning (Abramowitz et al., 2003; Chaudron & Nirodi, 2010). The intensity of symptoms

was greater at one month postpartum than during pregnancy, though the symptom characteristics did not change (Chaudron & Nirodi, 2010)

2.3.7 **Psychosocial impact of OCD during pregnancy**

According to the literature, OCD has an impact during pregnancy as it disturbs the social and occupational capacity of an individual, wastes time, and also causes severe disturbance in the quality of life of pregnant women (Gezginc et al., 2008). Few studies investigated the impact of OCD during pregnancy. Nevertheless, Gezginc et al. (2008), who investigated the impact of OCD on the quality of life of twenty-five pregnant women diagnosed with OCD and twenty five pregnant women with no mental disorders, found that OCD leads to significant disturbance in the quality of life of pregnant women. Moreover, OCD was found to have an effect on the perception of physical health status of the pregnant women. Additionally, OCD was found to lead to significant anxiety and disturbs the occupational and social life of individuals (Chaudron & Nirodi, 2010; Fairbrother & Abramowitz, 2007; Gezginç et al., 2008; Lord et al., 2011; Vythilingum, 2009). Gezginc et al. (2008) further stated that the presence and the negative perception of quality of life may lead to further mental disorders**.** No statistically significant difference was observed between the patient and control groups regarding age, educational status, pregnancy number and duration and occupation.

2.3.8 **Anger and OCD**

According to Painuly, Grover, Mattoo, and Gupta (2011) research on anger attacks were mostly limited to depression, and only a few studies have focused on anger attacks in OCD. Research evidence suggests that anger and hostility play a significant role in the cause and maintenance of anxiety disorders (Moscovitch, McCabe, Antony, Rocca, & Swinson, 2008). Whiteside and Abramowitz (2005) further argue that anger is not central to OCD. However, even though it may not be central to OCD, elevated levels of anger may co-occur with the disorder or be associated with certain presentations or

dimensions of OCD such as checking (Rubenstein, Altemus, Pigott, Hess, & Murphy, 1995; Radomsky, Ashbaugh, & Gelfand, 2007; Whiteside & Abramowitz, 2005). Whiteside and Abramowitz (2005) in their study of the expression of anger and its relationship to symptoms and cognitions in OCD in a clinical and non-clinical population found that individuals with OCD as well as the non-clinical group were found to have levels of anger that were similar to the mean of the general population. Interestingly, those individuals with OCD presented with increased levels of anger than the control group.

Although individuals with OCD exhibited minimally higher levels of anger than non-clinical patients, the difference was attributable to the general distress such as generalized anxiety, or comorbid depression in individuals with OCD. Contrary to Radomsky et al. (2007), they did not find any general distress that accounted for the relationship between checking symptoms, beliefs, and anger amongst compulsive checkers. In fact, amongst checkers, many of the initial correlations remained significant after controlling for depression. Self-reported ordering and washing symptoms were most strongly correlated with anger whereas ordering symptoms were associated with reduced attempts to control anger. According to Whiteside and Abramowitz (2005) obsessional symptoms and the tendency to believe that bad thoughts have moral significance and increase the risk of harm were associated with the suppression of anger. This is consistent with the cognitive model of OCD which proposes that appraisal of unwanted or upsetting intrusive thoughts result in obsessional fear as well as efforts to suppress or neutralize the thoughts and the tendency to believe that bad thoughts have moral significance increase the risk of harm especially to oneself (Whiteside & Abramowitz, 2005).

Similarly, Whiteside and Abramowitz (2004) examined the association between OCD symptoms and anger. However, their study was conducted with a non-clinical sample of 131 undergraduates. The study sample was divided into two groups based on self-reported OC symptoms and they were compared for their tendency to suppress anger inward, express anger outward, and control their anger. In comparison to subjects with low OC symptoms, subjects with high OC

symptoms experience more anger, have a tendency to suppress it inwardly, and report more difficulty in controlling their anger. According to Whiteside and Abramowitz (2004) the group differences in OC symptoms were explained by the depressive symptoms found amongst those with more severe OC symptoms. The results are similar to those of Whiteside and Abramowitz (2005). Furthermore, anger was found to be more strongly related to checking than to any other type of OC symptoms such as washing (Whiteside & Abramowitz, 2004; Radomsky et al., 2007).

When Painuly et al. (2011) examined anger attacks in OCD they found a rate of 21 (50%) subjects with OCD who have anger attacks, comorbid depression, significantly higher irritability which is both inward and outward. Moreover, the individuals were found to exhibit more aggressive acts towards their spouse, parents, children, and other relatives in the form of yelling and threatening to hurt, trying to hurt, and threatening to leave. Although there were no significant difference between the subjects with anger attacks and without anger attacks on the depression domain of irritability, depression and anxiety, the subjects with anger attacks had higher severity of depression. From the study results, anger attacks are present in half of the patient's with OCD and they correlate with the presence of comorbid depression.

On the other hand, Moscovitch et al. (2008) explored the possible differences in the experience and expression of anger across four anxiety disorder groups and non-clinical control group. Moscovitch et al. (2008) found no differences between the clinical population and controls in anger expression. However, individuals with OCD, social phobia, and panic disorder were found to experience higher levels of anger than the control group whereas patients with specific phobia do not. Interestingly, the heightened anger experience that was found amongst those with OCD, social phobia, and panic disorder was related to symptoms of comorbid depression. This suggests that anger experience in anxiety disorders is related to symptoms of depression which is consistent to what was found by Painuly et al. (2011).

Uguz et al. (2007b) reveals that OCD symptoms are prevalent during pregnancy with Forray et al. (2010) confirming that pre-existing OCD symptoms begins and worsens during pregnancy. It is also reported that OCD leads to significant disturbance in the quality of life of pregnant women and has an effect on the perception of physical health status of pregnant women (Gezginc et al., 2008). However, many studies have been conducted with Western women, and seemingly, data regarding OCD symptoms and related factors such as depression and anger is little. Moreover, many studies have been limited to depression and OCD whereas few studies have focused on anger during pregnancy (Painuly, Grover, Mattoo, & Gupta, 2010). Thus, it is necessary to investigate OCD symptoms and the relationship between OCD and prenatal depression and anger during pregnancy in the African context.

2.4. **Summary**

This chapter elucidated the theoretical framework of the study, and reviewed the literature on the topic of the study. In the review, the rate of OCD amongst pregnant women was reported. In most studies, OCD was found to be high in pregnancy than in the general population. Most studies were conducted amongst pregnant women in western countries. Studies conducted in South Africa focused on OCD in the general population, and, in the absence of South African sources, tended to provide reviews of international prevalence rates. Furthermore, OCD and its related affects (prenatal depression and anger) were found to affect the quality of life of pregnant women with OCD. The following chapter will describe the study methodology.

CHAPTER 3:
METHODOLOGY

3.1 INTRODUCTION

In this chapter the researcher discusses the methodology used in collecting data. The research design, variables of the study, sampling, data collection, and measures used are also presented. The psychometric properties of the measures will also be supplied.

3.2 RESEARCH DESIGN

The study is quantitative in nature and uses a cross-sectional survey design. A cross-sectional design involves the measurement of a subset of a population at a certain point in time, with no intention of conducting a follow-up study at a different time (Mann, 2003).

3.3 VARIABLES OF THE STUDY

The variables of the study are as follows:

Independent variables: Anger
Anxiety
Depression

Dependent variable: OCD

3.4 SAMPLING

Convenience sampling was used to select participants for this study. In convenience sampling, researchers use those participants that are easy to access and participants are selected on the basis of their availability (Gravetter & Forzanno, 2009). This sampling type may be legitimate for a few exploratory

preliminary studies and some qualitative research studies when the purpose is something other than creating a representative sample for purposes of generalizing the findings (Neuman, 2014). In spite of that, it is possible to obtain valuable, usable information using this method of sampling. The final sample of the study consisted of 206 pregnant women presenting for their antenatal check-ups at Mankweng Hospital, and Mankweng, Nobody, and Rethabile Clinics. The number is considered sufficient to conduct any type of statistical analysis desired.

3.5 MEASURES

3.5.1 Demographic Information

Participants completed the demographic questionnaire, which was designed to collect information on their personal details. Demographic information collected included the participant's marital status, age, domicile, socio-economic status, and obstetric history.

3.5.2 Revised version of the OCI-R

The current study used the OCI-R to assess OCD. The OCI-R is an18-item self-report questionnaire in which participant's rate the degree to which they are bothered or distressed by OCD symptoms in the past month (Foa et al., 2002). Its response scale is keyed on a 5-point Likert-type scale ranging from 0 (Not at all) to 4 (Extremely). The OCI-R assesses OCD symptoms across six factors, which are Washing, Checking, Obsessions, Neutralizing, Ordering and Hoarding (Abramowitz & Deacon, 2006; Foa et al., 2002). The factor structure was confirmed and convergent validity was established by Huppert, et al. (2007) in a clinical sample (see also, Abramowitz & Deacon, 2006; Hajcak, Huppert, Simons, & Foa, 2004). The scale includes items such as "I find it difficult to touch an object when I know it has been touched by strangers or certain people" and "I sometimes have to wash or clean myself simply because I feel contaminated". Scores of the OCI-R are generated by adding the item

scores. Foa et al. (2002) report that the OCI-R overall scale and its six subscales have good internal consistency, with four of the six reliability coefficients exceeding α = 0.72. In the same report by Foa et al. (2002) and colleagues the overall test-retest reliabilities for the total scale and subscale scores were excellent, ranging from *r* = 0.74 to 0.91.

In the present study Cronbach's alphas were computed to estimate the internal consistency of the OCI-R. The overall reliability of the 18 items of the scale was α = 0.87. The reliability levels of the subscales were as follows: Washing's α = 0.56, Obsessing's α = 0.52, Hoarding's α = 0.42, Ordering's α = 0.58, Checking's α = 0.59 and Neutralising's α = 0.62. The relatively lower reliabilities in this study seem to confirm Whiteside and Abramowitz's (2005) observation that subscales of the OCI-R tend to have lower reliability levels among non-clinical (meaning, non-diagnosed OC) samples.

The Contamination Obsessions and Washing Compulsions subscale of the Padua Inventory-Washington State University Revision Scale (PI-WSUR; Burns, Keortge, Formea, & Sternberger, 1996) was administered in this study for purposes of establishing convergent validity. This particular scale was chosen for validity purposes because obsessions of contamination are among the frequently reported OCD symptoms during pregnancy (cf. Frías et al., 2015; Johnson, 2013). The OCI-R and its subscales recorded the following coefficients in its correlation with the PI-WSUR Contamination Obsessions and Washing Compulsions: OCI-R full scale – *r* = 0.552, Washing – *r* = 0.548, Obsessing – *r* = 0.380, Hoarding – *r* = 0.371, Ordering – *r* = 0.434, Checking – *r* = 0.401 and Neutralizing – *r* = 0.426 and all the correlations were statistically significant at $p < .001$. The positive and statistically significant associations demonstrate convergent validity between the OCI-R and its components and the Contamination Obsessions and Washing Compulsions subscale of the PI-WSUR. It is for that reason that although the OCI-R is primarily a measure of the severity of OC symptoms, it is used in this study as a proxy for a measure to detect OCD.

3.5.3 Padua Inventory-Washington State University Revision Scale (PI-WSUR): Contamination Obsessions and Washing Compulsions

The PI-WSUR: Contamination Obsessions and Washing Compulsions subscale (Burns, Keortge, Formea & Sternberger, 1996) of an established measure of obsessions and compulsions, was added to this study to provide convergent validity for the OCI-R. Each item of the scale is rated on a 5-point Likert-type scale according to the degree of disturbance caused by the thought or behaviour. The scoring ranges from 0 (Not at all) to 4 (Very much). The scale measures five content areas relevant to OCD, which are obsessional thoughts about harm to self or others, obsessional impulses to harm self or others, Contamination Obsessions and Washing Compulsions, checking compulsions, and dressing or grooming compulsions. In the present study only the 10 items of the Contamination and Washing Compulsion subscale were used. The PI-WSUR Contamination and Washing Compulsion subscale includes items such as “I feel my hands are dirty when I touch money” and “I sometimes have to wash or clean myself simply because I think I may be dirty or contaminated”. When correlated with the Penn State Worry Questionnaire (PSWQ) each PI-WSUR item had a significantly higher correlation with its own subscale than with the PSWQ. In addition, each PI-WSUR item had a significantly higher correlation with the total score on the PI-WSUR than with the PSWQ ($p < .0006$) (Burns et al., 1996), thus demonstrating discriminant validity. In the present study the Cronbach’s alpha was computed to estimate the internal consistency of the PI-WSUR Contamination and Washing Compulsion subscale, and it was estimated at $\alpha = 0.836$.

3.5.4 Edinburgh Postnatal Depression Scale (EPDS)

The EPDS was used to measure depression in this study. The EPDS is a 10 item self-report scale which was developed by Cox, Holden and Sagovsky (1987) as a tool for detecting depression in the pre-and postnatal periods {also see Matthey, Barnett, & White, 2003). The scale includes items such as “I have blamed myself unnecessarily when things went wrong” and “**I** have been so

unhappy that I have had difficulty sleeping". Each item on the scale is given any value from 0 and 3, with higher scores being consistent with greater depressive symptoms. A cut-off point for probable depression has been suggested at 12 or 13, for postpartum depression. The EPDS has also been validated as a screening tool for antepartum depression in pregnant women, with a cut-off point of 14 or 15 for probable depression (Gibson, McKenzie-McHarg, Shakespeare, Price, & Gray, 2009).

Furthermore, the EPDS has been translated into, and validated in, many languages either than English. In a study by Gibson et al. (2009) which systematically compared the EPDS with a structured clinical interview for the detection of antepartum depression and postpartum depression across a variety of settings and in different languages of administration, heterogeneity of results with regard to the sensitivity and specificity of cut off points of the EPDS across studies were reported. The differences in the methodology and language could be attributable to the variations in the study results. The EPDS was also found to be validated during the postpartum period mostly than during antepartum period in most studies. Interestingly, the EPDS is a reliable and valid measure of perinatal depression symptom severity probable postnatal depression in the African context (Tsai et al., 2013). The overall reliability of the EPDS as measured by Cronbach's alpha was $\alpha = 0.79$. In the present study, the overall reliability of the scale was $\alpha = 0.67$. Although the scale can be interpreted for both anxiety and depression (Jomeen & Martin, 2005), its single factor structure for depression is the one that has received wider usage. A statistically significant correlation *(r* = 0.60, *p* < .01) between the EPDS and the Hamilton Depression Rating Scale demonstrate concurrent validity (Kheirabadi, Maracy, Akbaripour & Masaeli, 2012).

3.5.5 **Clinical Anger Scale (CAS)**

The CAS, a 21-item self-report instrument developed by Snell, Scott Gum, Shuck, Mosley and Hite (1995), was used to measure the syndrome of clinical anger. Each of the 21 scale items consists of 4 statements. The respondent is

directed to select a single statement that best describes how he/she feels. An example of a cluster of statements for an item is as follows: A = I do not feel angry, B = I feel angry, C = I am angry most of the time now, and D = I am so angry all the time that I can't stand it. The four statements in each cluster vary in symptom intensity, with more intense clinical anger being associated with statement D. Thus, each cluster of statements is scored on a 4-point Likert scale, with A = 0, B = 1, C = 2, and D = 3. The total score ranges from 0 to 63. According to Snell et al. (1995), the clinical interpretation of the CAS scores is accomplished through the following score ranges: 0-13 = minimal clinical anger, 14-19 = mild clinical anger, 20-28 = moderate clinical anger; and 29-63 = severe clinical anger. The reliability of the CAS was also estimated at α = 0.94 for both males and females, α = 0 .95 for males only, and α = 0.92 for females only. The scale also has good convergent validity (Snell et al., 1995). The overall reliability of the scale in the current study was α = 0.89 for the whole sample.

3.5.6 **Pregnancy-Related Anxiety Scale (PRAS)**

The PRAS was developed by Rini, Dunkel Schetter, Wadhwa, and Sandman (1999). It is a 10-item questionnaire that asks women to report the frequency or extent to which they have worried or felt concerned about their health, their labour and delivery, the baby's health, and caring for the baby. The items are rated on a 4-point Likert scale as follows: 1="Not at all", 2="Somewhat", 3="Moderately" and 4="Very much". The scale includes five items about childbirth with items such as "I am afraid that I will be harmed during delivery"; four items about the baby (e.g., "I am worried that the baby could be abnormal") and one item about taking care of the baby (namely, "I am worried about taking care of new baby") (Guardino & Schetter, 2014). In a study by Rini, Schetter, Hobel, Glynn and Sandman (2006) the scale was found to have good internal consistency across times (time 2 α = 0.81, time 3 α = 0.81 and good predictive validity. In the current study, the overall reliability of the scale was α = 0.69.

3.6 ETHICAL CLEARANCE

Ethical clearance for the study was provided by the University of Limpopo, Turfloop Campus Research and Ethics Committee (TREC; appendix A).

3.7 DATA COLLECTION PROCEDURE

All relevant questionnaires (3.5.1 to 3.5.6 above) were compiled into a composite data collection instrument. All pregnant women present for regular antenatal check-ups at the Mankweng Hospital, and the Mankweng, Nobody and Rethabile Clinics for the period of May to July 2016, were approached for participation in the study. Following the ethical clearance of the study from the TREC, the researcher requested permission from the Limpopo Department of Health and Social Development to access patients in the Capricorn district institutions within their jurisdiction (appendix B). Once the department inspected the study protocol and granted approval to access the patients, the researcher obtained another approval from Mankweng Hospital to access the participants attending antenatal check-ups at Mankweng Hospital and its outside clinics (appendix C). The approval at Mankweng Hospital had conditions that the data collection must be completed within a limited time. To access the district clinics, another approval from the Capricorn District Department of Health was obtained.

All the necessary ethical considerations such as informed consent, confidentiality and voluntary participation pertaining to the research, were taken into account when collecting data. For instance, before commencing with data collection, the researcher provided an information leaflet and explained the nature and purpose of the study to prospective participants. The researcher also outlined to the participants that their participation in the study is voluntary and withdrawal from the study was non-conditional and could be done at any stage of the study. Furthermore, participants were urged to direct their questions to the researcher in the event that they experienced difficulties with any parts of the data collection instrument. To ensure confidentiality,

participants were not expected to write down their names or any personal information that could be traced back to them, anywhere on the questionnaires. Only after being fully informed about the study could participants provide both written and oral consent, and then complete the questionnaires. Copies of the instrument were administered by the researcher by hand, and were completed by the participants in their respective clinics while waiting for their appointments.

3.8 **SUMMARY**

This chapter outlined the study methods. The study design was described. In addition, sampling was described and the details regarding the measures to be used for data collection were presented. The chapter also described how ethical considerations were handled. The following chapter gives a presentation of the study results.

CHAPTER FOUR:
RESULTS

4.1 INTRODUCTION

This chapter includes the plan for analysing data, description of the sample and the results of the study.

4.2 PLAN FOR ANALYSING DATA

The data was analyzed using version 23 of the Statistical Package for the Social Sciences (SPSS 23). Before analysis could proceed, data was checked and cleaned, and the Kolmogorov was used to detect outliers. The data was considered to have been extracted from a normal distribution ($p < .05$), based on the failure of the Shapiro-Wilk test to reach statistical significance. Subsequently, data analysis proceeded parametric statistics. Firstly, a descriptive analysis of the background information was performed. Thereafter, correlation and regression analyses were conducted to determine the association between the main variables of the study and the predictive capacity of independent variables to predict obsessive-compulsive symptoms.

4.3 DESCRIPTION OF THE SAMPLE

The study comprised of pregnant women who attended their antenatal check-ups at the Mankweng Hospital and the Mankweng, Nobody and Rethabile Clinics, which are situated in the Capricorn District, Limpopo Province, South Africa. The study used those participants that were available on the day of data collection. To control for language problems, since the scales were not translated from English to any of the local languages (e.g., Afrikaans, Tshivenda, Xhitsonga, and so on) participants who declared that they were not conversant and could not read in English were excluded from the study.

The final sample was drawn from pregnant women from the selected clinics and hospital, for a sample size of n = 206. Non-Black participants were not represented in the final sample, not by design, but because the facilities where sampling was carried out were frequented largely by Blacks. Table 1 shows the rest of the demographic characteristics of the participants. The average age of the sample was 27.72 (SD = 5.974, range = 14-45). Most of the participants (45.1%) reported that they were single. Nearly 64% of them listed their domicile as a rural area. Most (51.9%) participants came from lower middle class families, with the second largest group (33.5%) coming from a working class family background. With regard to their obstetric history, the average weeks of pregnancy in the sample was 25.39 (SD=8.434). Sixty two (30.1%) women reported that they were going to be first time mothers. Additionally, most participants (56%) reported that they had planned their pregnancies. Most participants reported that they have experienced complications in their previous pregnancies. There were more women reporting a history of miscarriage (24.3%) than was the case with each of the other complications. Moreover, current complications reported were back pains and abdominal pains (4.4%), high blood pressure (3.9%) and hyperemesis gravida (3.9%).

Table 1

Characteristics of the sample (n=206)

Variable	*Level of variable*	*n*	*%*
Marital status	Married	54	26.2
	Live-in-partner	51	24.8
	Widowed	1	.5
	Separated	6	2.9
	Divorced	1	.5
	Single	93	45.1
Age	Adolescents <19 yrs. old	9	4.4
	Young adults 19-24 yrs. old	57	27.7
	Adults >24 yrs. old	118	57.3
	Adults >35 yrs. old	22	10.7
Domicile	Urban/Township	75	36.4
	Rural/Village	131	63.6
Social class	Working class	69	33.5
	Lower middle class	107	51.9
	Upper middle class	26	12.6
	Upper class	4	1.9
Planned pregnancy	Yes	115	55.8
	No	91	44.2
Weeks pregnant	4-12	22	10.7
	13-26	88	42.7
	27-40	96	46.6
First pregnancy	Yes	62	30.1
	No	144	69.9
Live birth	0-2 children	121	82.9
	3-4 children	21	14.4
	5-6 children	4	.2
Miscarriage history	Yes	60	29.1
	No	146	70.9

Variable	*Level of variable*	*n*	*%*
Past complications	Miscarriage	36	24.3
	Abortion	9	6.1
	High blood pressure	7	4.7
	Caesarean birth	11	7.4
	Premature birth	2	1.4
	Back and abdominal pains	4	2.7
	Hypoxia	1	.7
	Foetal distress	1	.7
	Still born	3	2.0
	No complications	74	50.0
Current complications	High blood pressure	8	3.9
	Hyperemesis gravida	6	2.9
	Back and abdominal pains	9	4.4
	Bridge position	1	.5
	No complications	172	83.9
Medical check-up	Very often	55	26.8
	Fairly often	93	45.4
	Now and then	33	16.1
	Rarely or never	24	11.7
No of family members	4 or less members	108	53.2
	5 members	35	17.2
	6 members	29	14.3
	Over 6 members	31	15.3

Note. Column total frequencies of variables do not add up to 206 due to missing values.

4.4 **Prevalence of OCD among the pregnant women**

The present study followed Frias et al.'s (2015) method of determining prevalence by doing a head count of pregnant women who had OCD whether or not they exhibited the disorder before falling pregnant. The presence of OCD was established on the basis of the cut-off score of 21 as recommended by Foa et al. (2002) for differentiating OC from non-OC individuals on the OCI-R. This cut-off seems to be common and working well within many cultures, although different circumstances may lead to different cut-off points (Belloch et al., 2013; cf. Tang, Yu, He, Wang, & Chasson, 2015). Hundred and seventy-eight (80.6%) pregnant women scored at or above the OCI-R score of 21. The median score for the OCI-R total score was 32 and 5 or 6 for each of the subscales.

Table 2:

Median and mean scores of the primary study scales

	Range	*Median*	*Mean*	*S.D*
OCI-R Total score	5—64	32	32.59	12.402
OCI-R Washing	0—12	5	5.76	2.778
OCI-R Obsessing	0—12	6	5.88	2.770
OCI-R Hoarding	0—12	5	5.03	2.448
OCI-R Ordering	0—12	6	6.26	2.544
OCI-R Checking	0—12	5	5.45	2.773
OCI-R Neutralizing	0—12	5	5.30	2.408
EPDS	0—26	14	13.87	4.621
CAS	21—81	37	38.28	11.742
PRAS	12—40	24	24.76	5.688

Note. CAS = Clinical Anger Scale; EPDS = Edinburgh Postnatal Depression Scale; OCI-R = Revised version of the Obsessive–Compulsive Inventory; PRAS = Pregnancy-Related Anxiety Scale.

4.5 Comparisons between OCD and non-OCD classified pregnant women on the EPDS, CAS, PRAS and PI-WSUR (Contamination and Washing Compulsions)

A follow-up analysis was conducted between pregnant women scoring on or above the OCI-R cut-off score of 21 and those scoring below the cut-off score. The cut-off scores of 21 was used because it is one of the thresholds considered to differentiate between OCD and non-OCD patients with greater sensitivity and specificity (Foa et al., 2002; also see Belloch et al., 2013). All comparisons were statistically significant ($p < .001$), and the effect sizes were large (Cohen's $d = 0.55$—1.01) (see table 3a). The same analysis was also done using the cut-off score of 4 on the OCI-R Obsessing subscale. The results (table 3b), for purposes of the present study, are quite comparable.

Table 3a:

Comparison of pregnant women with and without OCD symptoms (OCI-R Total score) on EPDS, CAS, PRAS and PI-WSUR: Cut-off score of 21

Measure	*OCD symptoms present or absent*	*N*	*Mean*	*S.D*	*T*	*p-value*	*Cohen's d*
EPDS	OCD Obsession present	166	14.6928	4.369	5.618	.001	1.01
	OCD Obsession Absent	39	10.3846	4.043			
CAS	OCD Obsession present	163	39.5399	11.520	3.214	.002	0.58
	OCD Obsession Absent	38	32.8947	11.287			
PRAS	OCD Obsession present	164	25.3476	5.625	3.088	.002	0.55
	OCD Obsession Absent	39	22.2821	5.336			
PI-WSUR	OCD Obsession present	164	19.3476	8.128	4.285	.001	0.77
	OCD Obsession Absent	39	13.2821	7.104			

Note. CAS = Clinical Anger Scale, EPDS = Edinburgh Postnatal Depression Scale, OCD = Obsessive-Compulsive Disorder, PI-WSUR = Padua Inventory Washington State University Revision (Contamination Obsessions & Washing Compulsions), PRAS = Pregnancy-Related Anxiety Scale.

Table 3b:

Comparison of pregnant women with and without OCD symptoms (OCI-R Obsessing) on EPDS, CAS, PRAS and PI-WSUR

Measure	*OCD symptoms present or absent*	*N*	*Mean*	*S.D*	*t*	*p-value*	*Cohen's d*
EPDS	OCD Obsession present	168	14.55	4.518	4.720	.001	0.86
	OCD Obsession Absent	37	10.78	3.787			
CAS	OCD Obsession present	165	39.10	11.546	2.121	.035	0.39
	OCD Obsession Absent	36	34.56	12.072			
PRAS	OCD Obsession present	166	25.50	5.758	3.552	.001	0.65
	OCD Obsession Absent	37	21.84	4.343			
PI-WSUR	OCD Obsession present	166	18.75	8.017	2.075	.039	0.38
	OCD Obsession Absent	37	15.65	9.053			

Note. CAS = Clinical Anger Scale, EPDS = Edinburgh Postnatal Depression Scale, OCD = Obsessive-Compulsive Disorder, PI-WSUR = Padua Inventory Washington State University Revision (Contamination Obsessions & Washing Compulsions), PRAS = Pregnancy-Related Anxiety Scale.

4.6 Associations between the main study variables

All the main variables of the study were subjected to a correlation analysis between themselves. The results are shown in Table 4. The patient characteristics of age, having undergone a medical check-up, and having previously delivered a live baby generally did not correlate with any of the main scales measuring obsessive-compulsive disorder, depression, pregnancy-related anxiety and clinical anger ($p > .05$). There was an exception though. The experience of complications in the past pregnancy was associated with almost all the OCI-R sub-scales (obsessions and compulsions) ($r = 0.20—0.25$, $p < .01—.05$), except OCI-R Ordering ($p > .05$). It was also associated with EPDS (depression) ($r = 0.245$, $p < .01$).

The EPDS (depression) was positively associated with all the OCI-R scales (obsessions and compulsions) ($r = 0.18—0.37$, $p = .001—.01$). PRAS (pregnancy-related anxiety) was also positively related to all the OCI-R scales ($r = 0.23—0.34$, $p = .001$), but correlated marginally ($p < .10$) with EPDS and the correlation with CAS (clinical anger) failing to reach statistical significance ($p > .05$). The CAS (clinical anger) was associated with all but two of the OCI-R scales. It correlated with the OCI-R total scale and its subscales of Obsessing, Hoarding, Checking and Neutralizing ($r = .16—.23$, $p < .001—.01$), and did not correlate with the OCI-R Washing and OCI-R Ordering ($p > .05$). CAS also correlated with EPDS ($r = 0.29$, $p < .001$).

Table 4:
Correlations between variables of the study

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Age	1														
2. Live birth	0.573	1													
	.001														
3. Medical check-up	-0.090	-0.072	1												
	.201	.388													
4. Past complications	0.170	0.379	-0.051	1											
	.039	.001	.537												
5. Weeks pregnant	0.016	0.105	-0.016	0.023	1										
	.824	.209	.816	.777											
6. OCI-R total	0.128	0.004	-0.061	-0.257	0.108	1									
	.069	.958	.389	.002	.125										
7. Washing	0.085	-0.088	-0.024	-0.250	0.156	0.803	1								
	.224	.292	.734	.002	.026	.001									
8. Obsessing	0.116	-0.082	-0.083	-0.277	0.065	0.782	0.673	1							
	.099	.324	.240	.001	.355	.001	.001								
9. Hoarding	0.106	0.031	-0.066	-0.228	0.124	0.789	0.524	0.532	1						
	.131	.709	.346	.005	.077	.001	.001	.001							

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
10. Ordering	-0.023	-0.040	-0.086	-0.150	0.067	0.689	0.547	0.440	0.421	1					
	.742	.637	.222	.070	.341	.001	.001	.001	.001						
11. Checking	0.202	0.087	-0.103	-0.111	0.052	0.792	0.487	0.493	0.710	0.469	1				
	.004	.298	.141	.181	.461	.001	.001	.001	.001	.001					
12. Neutralizing	0.021	0.038	-0.034	-0.161	0.088	0.758	0.503	0.414	0.543	0.602	0.573	1			
	.764	.652	.633	.051	.208	.001	.001	.001	.001	.001	.001				
13. EPDS	-0.034	-0.063	0.096	-0.273	-0.136	0.349	0.212	0.373	0.227	0.182	0.201	0.248	1		
	.631	.449	.171	.001	.051	.001	.002	.001	.001	.009	.004	.001			
14. CAS	-0.081	0.077	-0.034	-0.068	0.069	0.232	0.116	0.162	0.170	0.084	0.222	0.233	0.288	1	
	.253	.360	.633	.413	.331	.001	.100	.021	.016	.233	.002	.001	.001		
15. PRAS	-0.122	-0.109	-0.070	-0.046	0.030	0.344	0.291	0.298	0.231	0.274	0.237	0.261	0.120	0.067	1
	.083	.194	.319	.581	.676	.001	.001	.001	.001	.001	.001	.001	.088	.343	

Note. CAS = Clinical Anger Scale; EPDS = Edinburgh Postnatal Depression scale; OCI-R = Revised version of the Obsessive–Compulsive Inventory; PRAS = Pregnancy-Related Anxiety Scale.

4.7 The prediction of OC symptoms from pregnancy-related anxiety, perinatal depression and clinical anger

The main analysis of the study sought to determine if pregnancy-related anxiety (PRAS), perinatal depression (EPDS) and clinical anger (CAS) could, in conjunction with some demographic factors, significantly predict rates of OC symptoms among pregnant women. A series of multiple regression analyses was conducted. The total and scale scores of obsessive-compulsive symptoms were each entered as dependent variables. A number of variables were entered as predictors. Age, gestation weeks and past complications experienced with the pregnancy were entered first. They were followed by pregnancy-related anxiety, perinatal depression and clinical anger. The results of regression analysis where the total OC symptoms (OCI-R) score was the dependent variable indicated that the predictors explained 31% of the variance (adjusted $R^2 = 0.275$, $F(6,143) = 10.034$, $p < .001$). Table 5 shows that almost all the predictor variables significantly predicted the total scale scores of OC symptoms. Higher age ($\beta = .20$, $t = 2.812$, $p < .01$), the number of gestation weeks ($\beta = 0.17$, $t = 2.316$, $p < .05$), having previously experienced pregnancy-related complications ($\beta = .17$, $t = 2.286$, $p < .05$), perinatal depression ($\beta = 0.17$, $t = 3.536$, $p < .001$) and pregnancy-related anxiety ($\beta = .17$, $t = 3.290$, $p < .001$) were positive predictors, whilst the significance level of clinical anger's probability value was marginal ($\beta = .14$, $t = 1.787$, $p < .10$).

The results of regression analysis to predict the OCI-R Washing dimension indicated that the predictor variables explained 19.2% of the variance (adjusted $R^2 = 0.157$, $F(6,143) = 5.440$, $p < .001$). When the OCI-R Washing dimension was the dependent variable, the number of gestation weeks ($\beta = 0.24$, $t = 3.238$, $p < .01$), past pregnancy-related complications ($\beta = .16$, $t = 2.034$, $p < .05$), perinatal depression ($\beta = 0.21$, $t = 2.398$, $p < .05$) and pregnancy-related anxiety ($\beta = 0.18$, $t = 2.344$, $p < .05$) were the significant predictors (Table 6). The direction of their influence was positive, meaning that higher values of the variables predicted higher values of OCI-R Washing, the dependent variable. However, the probability values of age and clinical anger were not statistically

significant (*β* = .18, *t* = 2.344, *p* = *ns*). On the other hand, the predictor variables explained 30.0% of the variance (adjusted R^2 = 0.270, F (6,143) = 9.793, *p* < .001) when the OCI-R Obsessing dimension was the dependent variable (Table 7). Higher age (*β* = .19, t = 2.601, *p* < .01), the number of gestation weeks (*β* = 0.15, *t* = 2.064, *p* < .05), having previously experienced pregnancy-related health complications (*β* = .20, *t* = 2.628, *p* < .01), perinatal depression (β = 0.34, *t* = 4.244, *p* < .001) and pregnancy related anxiety (*β* = .21, *t* = 2.831, *p* < .05) were positive predictors. The probability value of clinical anger failed to reach statistical significance (*β* = .060, *t* = 0.775, *p* = *ns*).

The results of regression analysis to predict the OCI-R Hoarding dimension indicated that the predictor variables explained 15.5% of the variance (adjusted R^2 = 0.118, F (6,143) = 4.181, *p* < .001). Only gestation week (*β* = 0.16, t = 2.028, *p* < .05) and the perinatal depression (β = .34, *t* = 4.244, *p* < .001) were positive predictors (Table 8). Age (*β* = 0.15, *t* = 1.931, *p* < 0.010), past pregnancy-related complications (β = .16, *t* = 1.888, *p* < .010) and pregnancy-related anxiety (*β* = .15, *t* = 1.814, *p* < .010) were only marginally significant, and clinical anger did not reach statistical significance (*β* = 0.34, *t* = 0.877, *p* = *ns*). With regards to the prediction of the OCI-R Ordering dimension, the results of regression analysis showed that the predictor variables explained 11.6% of the variance (adjusted R^2 = 0.077, F (6,143) = 2.990, *p* < .01). Only pregnancy-related anxiety (*β* = .19, *t* = 2.328, *p* < .05) and perinatal depression (*β* = .18, *t* = 2.052, *p* < 0.05) were positive predictors (Table 9). Higher age (*β* = .12, *t* = 1.414, *p* = *ns*), gestation weeks (β = .11, *t* = 1.292, *ns*), having previously experienced pregnancy-related health complications (*β* = .19, *t* = 2.328, *ns*) and clinical anger (*β* = .04, *t* = 0.439, *p* = *ns*) were not predictors of the dependent variable.

The results of regression analysis to predict the OCI-R Checking dimension indicated that the predictor variables explained 17.2% of the variance (adjusted R^2 = 0.138, F (6,143) = 4.754, *p* < 0.001). The OCI-R Checking dimension was predicted by age (*β* = .24, *t* = 3.069, *p* < .01), pregnancy-related anxiety (*β* = .18, *t* = 2.304, *p* < 0.05) and clinical anger (*β* = .22, *t* = 2.624, *p* < .01) (Table

10). On the other hand, gestation period (*β* = .07, *t* = 0.927, *p* = *ns*), past pregnancy-related complications (*β* = .08, t = 1.041, *p* = *ns*), and perinatal depression (*β* = .09, *t* = 0.999, *p* = *ns*) were not statistically significant predictors of the OCI-R Checking variable. Finally, the results of regression analysis to predict the OCI-R Neutralizing dimension showed that the predictor variables explained 16.5% of the variance (adjusted R^2 = 0.128, F(6,143) = 4.499, *p* < .001). The OCI-R Neutralizing dimension was predicted by pregnancy-related anxiety (*β* = .18, t = 2.304, *p* < 0.05), perinatal depression (*β* = .20, *t* = 2.295, *p* < 0.05) and clinical anger (*β* = .17, *t* = 1.974, *p* < 0.05) (Table 11). Age (*β* = 0.11, *t* = 1.322, *p* = *ns*), gestation period (β = .08, *t* = 1.012, *p* = *ns*) and past pregnancy-related complications (*β* = .08, *t* = 0.947, *p* = *ns*) were not statistically significant predictors of the dependent variable.

Table 5:

Regression analysis - OCI-R total score

Model	Predictor variable	*B*	*t*	*p*-value
1	*Age*	.204	2.812	.006
	Weeks pregnant	.169	2.316	.022
	Past pregnancy-related complications	.170	2.286	.024
	Postnatal depression	.280	3.536	.001
	Clinical anger	.137	1.787	.076
	Pregnancy-related anxiety	.239	3.290	.001

Table 6:

Regression analysis - OCI-R Washing subscale

Model	Predictor variable	*B*	*t*	*p*-value
1	*Age*	.127	1.620	.108
	Weeks pregnant	.254	3.238	.002
	Past pregnancy-related complications	.163	2.034	.044
	Postnatal depression	.205	2.398	.018
	Clinical anger	.014	0.172	.863
	Pregnancy-related anxiety	.184	2.344	.020

Table 7:

Regression analysis - OCI-R Obsessing subscale

Model	Predictor variable	*B*	*t*	*p*-value
1	*Age*	.189	2.601	.010
	Weeks pregnant	.151	2.064	.041
	Past pregnancy-related complications	.196	2.628	.010
	Postnatal depression	.337	4.244	.001
	Pregnancy-related anxiety	.207	2.831	.005
	Clinical anger	.060	0.775	.440

Table 8:

Regression analysis - OCI-R Hoarding subscale

Model	Predictor variable	*B*	*t*	*p*-value
1	*Age*	.154	1.931	.056
	Weeks pregnant	.163	2.028	.045
	Past pregnancy-related complications	.155	1.888	.061
	Postnatal depression	.187	2.145	.034
	Pregnancy-related anxiety	.146	1.814	.072
	Clinical anger	.074	0.877	.382

Table 9:

Regression analysis - OCI-R Ordering subscale

Model	Predictor variable	*B*	*t*	*p*-value
1	*Age*	.116	1.414	.160
	Weeks pregnant	.106	1.292	.199
	Past pregnancy-related complications	.075	0.894	.373
	Pregnancy-related anxiety	.191	2.328	.021
	Postnatal depression	.183	2.052	.042
	Clinical anger	.038	0.439	.661

Table 10:

Regression analysis - OCI-R Checking subscale

Model	Predictor variable	*B*	*t*	*p*-value
1	*Age*	.243	3.069	.003
	Weeks pregnant	.074	0.927	.356
	Past pregnancy-related complications	.084	1.041	.300
	Past pregnancy-related anxiety	.183	2.304	.023
	Postnatal depression	.086	0.999	.319
	Clinical anger	.220	2.624	.010

Table 11:

Regression analysis: OCI-R Neutralizing subscale

Model	Predictor variable	*B*	*t*	*p*-value
1	*Age*	.105	1.322	.188
	Weeks pregnant	.081	1.012	.313
	Past Pregnancy-related complications	.077	0.947	.345
	Pregnancy-related anxiety	.181	2.267	.025
	Postnatal depression	.199	2.295	.023
	Clinical anger	.166	1.974	.050

4.8. **Summary**

The results of the study were presented in this chapter. Findings from the study indicated that almost 81% of the pregnant women could be classified as obsessive-compulsive disordered, when using the Foa et al. (2002) cut-off score of 21. Furthermore, findings from the regression analyses indicated that higher age, the number of gestation weeks, having previously experienced pregnancy-related complications, perinatal depression, pregnancy-related anxiety and clinical anger were positive predictors when included in the prediction of different OCI-R measured OCD symptoms. The next chapter discusses the results, concludes on the study as a whole, discusses study limitations and makes recommendations.

CHAPTER 5:
DISCUSSION

5.1 INTRODUCTION

In this chapter, the researcher discusses the results of the study. The purpose of the study was to establish the prevalence rate of OCD during pregnancy among women in Polokwane, a municipality within the Capricorn district of Limpopo, South Africa. Furthermore, the study also aimed to investigate whether prenatal depression, pregnancy-related anxiety and anger, together with selected demographic variables, can predict obsessive-compulsive symptoms. This chapter also includes a discussion of the limitations of the study and the recommendations emanating from the findings.

5.1.1 The prevalence of OCD during pregnancy

To reiterate what we said earlier about the occurrence of OCD, the prevalence rate of OCD in the general population is 1.1% to 1.8% (American Psychiatric Association, 2013). The condition is more prevalent among females, especially those of childbearing age, than it is in the general population (Abramowitz et al., 2003; Fenske & Petersen, 2015; Frías et al., 2015; Kaya et al., 2015; Russell, Fawcett, & Mazmanian, 2013; Sharma & Sharma, 2015; Uguz & Ayhan, 2011; Vythilingum, 2009). Although other psychiatric conditions are common following pregnancy, a number of studies consider OCD to be relatively more predominant (Chaudron & Nirodi, 2010; Fenske & Petersen, 2015; Ross & McLean, 2006). In fact, pregnancy and childbirth are two of the life events considered to trigger OCD (Johnson, 2013).

With the above information in mind, the current study set out to establish the prevalence rate of OCD among clinic attending pregnant women in the Capricorn district, South Africa. The pregnant women who participated in the study obtained a median OCI-R score of 32 and further obtained median scores of 5 and 6 on each of the subscales of the same measure. This meant that

almost 81% of the pregnant women could be classified as OC disordered, when using the Foa et al. (2002) cut-off score of 21.

In the existing literature, mostly conducted from non-African settings, prevalence of OCD during pregnancy varies between studies, with rates ranging from 0.2% to 5.2% (Andersson et al., 2003; Frías et al., 2015; Russell et al., 2013; Uguz & Ayhan, 2011; Uguz et al., 2007b). Neziroglu, Anemone, and Yaryura-Tobias reported as early as 1992 that studies found that OCD symptoms appear in close to 40% of females of child-bearing age. The prevalence rate obtained in the current study is therefore very high.

Nevertheless, there may be various reasons why prevalence rates differ across studies (Abramowitz et al., 2003). Two of them are the scale used and the pregnancy period covered (see Abramowitz et al., 2003; Frías et al., 2015; Uguz, & Ayhan, 2011). Borri (2008) interviewed women between 12–15 weeks gestation using the SCID-I DSM-I and Uguz et al. (2010) used the Turkish adaptation of the Structured Clinical Interview for DSM-IV Clinical Version (SCID-I/CV) among women at different gestational stages. The women in both Chaudron and Nirodi (2010) and Forray et al. (2010) studies completed a combination of the OCI-R, the Yale–Brown Obsessive–Compulsive Scale (Y-BOCS) and the Structured Clinical Interview for DSM-IV (SCID; First, Spitzer, Gibbon & Williams, 1997). Chaudron and Nirodi (2010) studied women in the first trimester of pregnancy, while Anderson et al. (2003) focused on the second trimester. In this study the OCI-R was used to measure OCD, and pregnant women were included without regard to the gestational stage they were in. This may partly explain the reason why the rate of prevalence was so high. Add to that the fact that all participants came from a clinical setting, even if the settings were not specialist with regards to psychiatric services.

5.1.2 **The relationship between OCD and both depression and anxiety**

The most common comorbid disorders to OCD, especially during pregnancy, are depression and anxiety (Fenske & Petersen, 2015; Rintala et al., 2017).

Additionally, depression and anxiety are comorbid during pregnancy (Verreault et al., 2014), and antenatal anxiety has been found to predict the experience of depression during pregnancy (Mohamad Yusuff, Tang, Binns, & Lee, 2015). Regardless, pregnant women tend to score higher on depression and anxiety measures (Sharma & Sharma, 2015). This has also been the case in South Africa (Brittain et al., 2015; van Heyningen et al., 2016; Rochat, et al., 2011). Whiteside and Abramowitz (2004) also found that individuals who report severe OCD symptoms also report severe depression. However, at least in one study, major depression was common in non-gravid women when compared with pregnant women (Kaya et al., 2015).

It is likely that reports of depression during pregnancy in this study are related to some pre-existing depressive condition (Guglielmi et al., 2014). The inverse is also true, that pregnancy, especially in instances of complicated pregnancy, may have led to negative affect, including depression (Biaggi, Conroy, Pawlby, & Pariante, 2016). It is also possible that some depressive condition may have co-occurred with OCD, and pregnancy being the trigger (Sharma & Sharma, 2015).

The present study also sought to investigate whether prenatal depression will predict OCD. Similar to other previous studies, the present study also found a relationship between prenatal depression measured with the EPDS and OCD symptoms measured with the OCI-R. Depression predicted higher values of OCD symptoms on the total OCI-R scale. At a lower (subscale) level, the prenatal depression assessed in this study could positively predict the Washing, Obsessing, Hoarding and Neutralizing dimensions of the OCI-R. But it had no role in predicting the Checking dimension of the OCI-R. Interestingly, depression could also predict the OCI-R Hoarding dimension, the subscale whose reliability estimate in this study was relatively low.

Pregnant women who report high levels of depression report high levels of anxiety as well (Chaudron & Nirodi, 2010). Although anxiety and depression are frequently comorbid with OCD during pregnancy, anxiety disorders were

the most frequent comorbid conditions to OCD than was the case with mood disorders (Faisl-Cury et al., 2009; Kaya et al., 2015). Since anxiety-related disorders and symptoms are generally common during pregnancy (Fairbrother, Janssen, Antony, & Tucker, 2016; Leach, Poyser & Fairweather-Schidt, 2017; Ross & McLean, 2006), it is worthwhile to investigate their association and prediction of OCD.

In this study, pregnancy-related anxiety was positively associated with the OCI-R total scale and all its subscales. This was not unexpected since OCD is primarily an anxiety-based disorder, although it is no longer classified as such in the DSM-5 (American Psychiatric Association, 2013). It also predicted all the OCI-R and all but one of its subscales. Pregnancy related anxiety was only marginal in its prediction of the OCI-R hoarding subscale. Hoarding is considered a distinct psychopathology deserving a separate classification from OCD in the WHO ICD-11 (Fontenelle & Grant, 2014); In fact, it is classified separate from OCD as Hoarding Disorder (HD), a subcategory of OCRD in the DSM-5 (Woerner, Selles, De Nadai, Salloum, & Storch, 2017). In an earlier study, Foa et al.(1995) observed that hoarding affects only a few individuals with OCD, and HD itself affects older persons (55 years of age and above; DSM-5) (American Psychiatric Association, 2013). Importantly, hoarding itself does not provoke anxiety in hoarders; it is the clutter that does (Neziroglu, Weissman, Allen, & McKay, 2012). Aside from the evidence of the distinctiveness of hoarding, the OCI-R Hoarding subscale's reliability level was quite low in this study. Therefore, it is not surprising that in the current study pregnancy-related anxiety was not a strong predictor of the Hoarding subscale of the OCI-R.

5.1.3 **The relationship between anger and OCD**

Anger is a feature of many psychiatric conditions (Cassiello-Robins & Barlow, 2016), including premenstrual dysphoric disorder, separation anxiety disorder, disruptive, impulse-control, conduct disorders, and trauma and stressor-related disorders such as acute stress disorder and posttraumatic stress disorder

(American Psychiatric Association, 2013). The present study investigated the element of anger in OCD among pregnant women. Elevated levels of anger may co-occur with OCD or be associated with certain presentations or dimensions of OCD (Whiteside & Abramowitz, 2004, 2005). This study found the CAS measured anger to be associated with OCD; pregnant women who scored high on the OCI-R reported higher CAS rates when compared to women who scored low on the measure.

Clinical anger also significantly predicted OCD symptoms when included in regression models to predict all aspects of OCD measured by the OCI-R. However, the effect was limited to the Checking and Neutralising dimensions. Clinical anger could not predict the OCI-R dimensions of Washing, Obsessing, Hoarding and Ordering, while its prediction of the total OCI-R score was only marginal. The results of this study are close to those of Whiteside and Abramowitz (2004), who found anger to be more strongly related to the Checking dimension than any other type of OC symptoms. However, the difference between the current study findings and Whiteside and Abramowitz (2004) findings is that the current study also found anger to be strongly related to the Neutralizing dimension which was not found in their study. It is possible that anger is related to the Neutralizing dimension in so far as the pregnant women may seek to deal with ego dystonic feelings of aggression by minimizing (neutralizing) their impact.

5.1.4 **Reproduction-related descriptive factors and OCD**

The role of reproduction-related descriptive factors such as age, gravidity and parity, gestational stage, unplanned pregnancy, existence of pregnancy complications, and many others, has been explored in a few studies (Biaggi et al., 2016; Kaya et al., 2015; Uguz et al., 2011; cf. Uguz & Ayhan, 2011; Vousoura, 2010, p. 40). The findings are mixed. This study focused on the role of three of the factors, namely, age, gestational period and past pregnancy-related complications. Contrary to researchers such as Leach et al. (2017), Kaya et al. (2015) and Uguz et al. (2007b), the present study found that age

predicted the OCI-R total score and the Obsessing and Checking dimensions of the OCI-R. Additionally, the relationship between past pregnancy complications and the OCD symptoms was positive and statistically significant for the Washing and Obsessing dimensions of the OCI-R. Primi and multiparous women were asked to state if they have experienced any complications and what those complications were. The affected women listed the following as their past complications: back and abdominal pain, hypoxia, hyperemisis gravida, foetal distress, caesarean section birth, stillbirth, miscarriage, and so on. Some included abortion. All of the pregnancy-related complications predicted, as a group, the experience of OCD symptoms.

Vasconcelos et al. (2007) found perinatal complications to be one of the risk factors associated with OCD during pregnancy. Similarly, Uguz et al. (2011) found perinatal complications to be associated with OCD symptoms. Interestingly, they found that a history of abortion was more prevalent among pregnant women with OCD than any other factor. In the present study the most reported pregnancy-related complication was a history of miscarriage and abortion. It thus goes without saying that, had each of the complications been analysed separately, it is likely that abortion would be among those that would produce a high predictive value.

The current study further analysed whether gestation stage could predict OCD. Gestation stage, stated in weeks, was found to be a predictor of OCD in the Washing, Obsessing and Hoarding dimensions of the OCI-R. Later weeks of pregnancy predicted increased levels of washing, obsessing and hoarding symptoms. This finding is similar to that of Uguz et al. (2010), who found an increase in the prevalence rate of OCD in pregnant women in the last trimester of pregnancy other than during the first and the second trimesters of pregnancy.

5.1.5 **Regression model of OCD**

The regression model tested in the study, that involving the prediction of an OCD symptom or the total score, with prenatal depression, pregnancy-related

anxiety and clinical anger, suggests that the predictor variables tend to be specific to the dimension of OCD symptom measured. The reproduction-related descriptive factors also had a similar exclusive quality; each one of them tended to predict particular OCD symptoms. Studies such as Radomsky et al. (2007) which target a specific OCD symptom and using more refined predictors (e.g., various types of anger) are likely to yield much clearer and informative results.

5.2 CONCLUSION

The current study indicates that African pregnant women also experience OCD symptoms. Based on the results of the OCI-R, it can also be stated that rates of OCD are much higher than expected. The study further indicates that there is an association between prenatal depression, pregnancy related anxiety, anger and OCD. The predictive part of the study further suggests that the relationships are not straight forward. For instance, it is clear that clinical anger associates with some dimensions of OCD symptoms and not others. The same applies to factors related to reproduction, such as age at pregnancy and complications experienced in past pregnancies. The factors do not apply to all dimensions of OCD symptoms.

5.3 LIMITATIONS OF THE STUDY

There are several limitations in the study. The first limitation of the study is that it used a cross sectional study, which limited the capacity to determine cause and effect between variables. Additionally, the study sample was drawn from three health facilities situated in the rural areas (Mankweng Hospital, Mankweng Clinic and Nobody Clinic) and one from urban areas (Rethabile Clinic). Thus, the sample was dominated by participants from the rural areas, something which might have impacted the types of responses to the measures used. Another limitation is the sampling method used. It is possible that the sample may not be representative of all the pregnant women in the Capricorn district. Therefore, findings cannot be generalised to all pregnant women in the Capricorn District, let alone the Limpopo Province. Finally, the scales used to

collect data were standardized amongst Western cultures. Their use in African cultures could be limited. Unless proper validation is done, there is no way we will know if indeed the scales effectively measure what they purport to measure.

5.4 RECOMMENDATIONS

All the variables of the study were measured at one point only. Therefore, cause and effect was not possible to establish. It is recommended that in future researchers should use longitudinal designs to study the variables. For instance, it will be clear whether the anxiety, depression and anger observed during pregnancy were there before pregnancy or not. Besides, relying on retrospective accounts of symptom occurrence has drawbacks, including inaccurate recall. Longitudinal study designs will also help to establish whether all the conditions, including OCD symptoms, still exist postpartum, and whether there is a change in the contents of obsessions and compulsions. The designs will also help to detect change in the severity of all symptoms during the postpartum period.

The rates of symptoms reported in this study are extremely high. It is not clear whether this is a true reflection of the state of affairs, or whether it is a consequence and/or artefact of measurement. The scales used in this study have high validity and have been used in different cultural contexts. However, it is still necessary to investigate their factor structure in this particular context. In that regard, it is recommended that larger sample sizes be used to allow for validation studies. Findings of the study suggested a discrepancy between history of past complications and whether individuals have had any history of miscarriage as a question. Therefore, it is recommended that future researchers analyse the variables separately or rather researchers ask direct questions to individuals.

The OCI-R was used to identify possible OCD incidents in the sample. It is recommended that future studies incorporate DSM-5 based interviewing tools, a method considered even more valid to diagnose or identify OCD cases. The

advantage of identifying true OCD cases is that they can be compared to control groups of similarly identified clinical groups of other diagnostic categories and non-clinical controls.

5.5. **SUMMARY**

This chapter discussed the findings of the study, and presented a conclusion and the recommendations thereof. The prevalence rate of OCD symptoms in this study was high as compared to the rates found in other studies. In a number of studies, pregnant women are studied with regard to their gestational stage. However, women were included without regard to the gestational stage they were in in this study, which may partly explain the reason why the rate of prevalence was so high. The use of different diagnostic tools may also explain the difference.

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APPENDICES

Appendix A: Ethical compliance certificate

University of Limpopo
Department of Research Administration and Development
Private Bag X1106, Sovenga, 0727, South Africa
Tel: (015) 268 2212, Fax: (015) 268 2306, Email:noko.monene@ul.ac.za

TURFLOOP RESEARCH ETHICS COMMITTEE CLEARANCE CERTIFICATE

MEETING:	**06 May 2015**
PROJECT NUMBER:	**TREC/31/2015: PG**
PROJECT:	
Title:	Prevalance and effective outcomes of prenatal obsessive Compulsive disorder amongst clinic attendees in Mankweng, Limpopo Province
Researcher:	Ms RD Malemela
Supervisor:	Prof S Mashegoane
Co-Supervisor:	N/A
Department:	Psychology
School:	Social Sciences
Degree:	Masters in Clinical Psychology

PROF TAB MASHEGO
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) **Should any departure be contemplated from the research procedure as approved, the researcher(s) must re-submit the protocol to the committee.**
ii) **The budget for the research will be considered separately from the protocol.**
PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES.

Finding solutions for Africa

Appendix B: Approval letter – Limpopo Department of Health

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH

Enquiries: Latif Shamila

Ref:4/2/2

Malemela RD
University of Limpopo
Private Bag X1106
Sovenga
0727

Greetings,

RE: Prevalence and effective outcomes of prenatal obsessive Compulsion Disorder amongst clinic attendees in Mankweng, Limpopo Province

The above matter refers.

1. Permission to conduct the above mentioned study is hereby granted.
2. Kindly be informed that:-
   - Research must be loaded on the NHRD site (http://nhrd.hst.org.za) by the researcher.
   - Further arrangement should be made with the targeted institutions.
   - In the course of your study there should be no action that disrupts the services.
   - After completion of the study, a copy should be submitted to the Department to serve as a resource.
   - The researcher should be prepared to assist in the interpretation and implementation of the study recommendation where possible.
   - The above approval is valid for a 3 year period.
   - If the proposal has been amended, a new approval should be sought from the Department of Health.

Your cooperation will be highly appreciated.

Head of Department

30/07/2015
Date

18 College Street, Polokwane, 0700, Private Bag x9302, POLOKWANE, 0700
Tel: (015) 293 6000, Fax: (015) 293 6211/20 Website: http/www.limpopo.gov.za

Appendix C: Approval letter – Mankweng Hospital

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH

MANKWENG HOSPITAL

Ref: S5/3/1/2

Enq: Makola M.M

From: HR Utilization and Capacity Development

Date: 18 April 2016

Ms Malemela RD
University of Limpopo
Private Bag X 1106
SOVENGA
0727

REQUEST OF PERMISSION TO CONDUCT RESEARCH AT MANKWENG HOSPITAL: MALEMELA RAESETSA DOROTHY

1. The above matter has reference.
2. This is to confirm that Malemela Raesetsa Dorothy has been granted permission to conduct research on "Prevalance and effective outcomes of prenatal obsessive compulsive disorder amongst clinic attendees at Mankweng Hospital ,Limpopo Province".
3. She will be conducting research as from Monday, 25 April 2016 to Friday, 29 July 2016.
4. Attached please find her application letter, a copy of Ethical Clearance from University of Limpopo, Approval from Provincial Office and Research proposal.

Thanking you in advance

Chief Executive Officer

2016/04/18
Date

Department Of Health
Mankweng Hospital
Reciever NKWE
2016 -04- 18
Office No. 106
Tel: 015 286 1016
LIMPOPO PROVINCE