

https://dspace.org/

Factors associated with depression among adults patients attending Daveyton main clinic, Ekurhuleni health district, Gauteng, South Africa

Mpangula, Ndaye Michel

2016-10-25
http://hdl.handle.net/10539/21269

Downloaded from a DSpace repository. https://dspace.org/



FACTORS ASSOCIATED WITH DEPRESSION AMONG ADULT PATIENTS ATTENDING DAVEYTON MAIN CLINIC, EKURHULENI HEALTH DISTRICT, GAUTENG, SOUTH AFRICA

NDAYE MICHEL MPANGULA

511037

A research report submitted to the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg in partial fulfilment of the requirements for the degree of Master of Medicine in Family Medicine (M. Med in Fam. Med)

Declaration

I, Ndaye Michel Mpangula, declare that this research report is my own work. It is being submitted for the degree of Master of Medicine of family Medicine at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any other degree or examination at this or any other university.

Signature: NM Mpangula……..……...

Signed on: 07/11/2015…….……

Dedication

I would like to dedicate this work to my family and friends who have been there from the beginning supporting me throughout difficult times.

To all Daveyton staff and patients who sacrificed their time and energy to enable me to complete this research.

To my lovely wife and children, for their support and understanding during my studies and completion of this work.

I would also like to thank my senior colleagues and supervisors who gave me moral support to strengthen my confidence and finish this work.

ABSTRACT

Introduction:

Major depression disorder (MDD) is a disabling disease, if diagnosed and treated in time its course can be changed and the patient's quality of life can be restored. To our knowledge, no research has been conducted in primary care in Daveyton, South Africa to assess the profile of patients living with this disease. Against this background, this study aimed to assess factors associated with MDD among adult patients attending the Daveyton Main Clinic in Ekurhuleni in South Africa.

Methodology:

A cross-sectional study was conducted among 278 participants aged 18 and above. A patient health questionnaire (PHQ-9) including socio-demographic questions was used to gather participants' information. The variables measured were: MDD prevalence, socio-demographics (age, gender, level of education, marital status, and employment status) of respondents who met diagnostic criteria for MDD, and participants' co-morbid medical chronic conditions.

Data capture was done using Excel, and analysis was done using the Statistical Packages for Social Sciences (SPSS) version 13. Demographic factors of participants are described in pie chart format, except for age, which is described in a table format with mean and standard deviation. Secondly, co-morbid medical conditions are described in table format. The association of MDD and the participants' measured variable was examined using cross-tabulation, and it was tested using the chi-square test of independency.

Results:

The prevalence of MDD was 23%. The socio-demographic assessment revealed that: 22% of male were depressed versus 23.4% of female (p-value=0.8); 24.5% of single participants versus 18.9% of married participants (p-value=0.07); 10.5% of respondents without formal schooling, 29.4% of primary school educated respondents, 20.9% of high school educated respondents, and 34.2% of college graduates were depressed (p-value=0.1); 15.5% of employed participants versus 27.4% of unemployed participants were depressed (p-value= 0.02); and 14.7% of participants living with chronic co-morbid medical conditions were depressed (p-value=0.00).

Conclusion:

MDD was common in Daveyton Main Clinic. Patients living with chronic co-morbid diseases and those who were unemployed were more likely to have MDD. Health care workers must routinely carry out active screening for MDD in primary care patients.

Acknowledgements

I would like to thank Jesus Christ, the almighty God for giving me necessary energy and ability to complete this research.

I would like to thank my supervisor, Dr John Musonda for his unconditional support, detailed guidance, and full understanding. Without his leadership, this research would not have been successfully completed.

Table of contents

Declaration ……ii

Dedication ……...iii

Abstract…..……iv

Acknowledgements……v

Chapter one: Introduction……..1

1.1. Background……1
1.2. Rationale……1

Chapter two: Literature review……3

2.1. Definition…..……..3

2.2. Major Depression Disorder Diagnosis and treatment……3

2.3. Burden of Major Depression Disorder……6

2.4. Co-morbidities and Major Depression disorder……....8

2.5. Challenges in diagnosing MDD……9

2.6. Major Depression Disorder and Socio-demographic Factors……10

2.7. Summary of the literature review……10

Chapter Three: Research Methodology……12

3.1. Aim and objectives……12

3.2. Study design……..12

3.3. Site of study……..12

3.4. Study population……13

3.5. Sampling……13

3.6. Inclusion criteria……13

3.7. Exclusion criteria……13

3.8. Data collection tools……13

3.9. Data collection……14

3.10. Data analysis……..14

3.11. Source of Bias……15

3.12. Ethical considerations..……15

Chapter Four: Study Results……17

4.1. Description of demographic factors of study participants……...17

4.2. Description of participants' co-morbid conditions……20

4.3. Prevalence of MDD……..21

4.4. Specific data for partici[pants diagnosed with MDD……22

Chapter Five: Discussion……30

5.1. Introduction……30

5.2. Prevalence of MDD among participants…..……..…..…..30

5.3. The Socio-Demographic Factors of participants diagnosed with MDD……31

5.4. The association between MDD and socio-demographic factors……...33

5.5. The association between MDD and chronic co-morbid illnesses……..36

5.6. Study Limitations……38

Chapter Six: Conclusion and recommendations……39

6.1. Conclusion……39

6.2. Recommendations……39

References……..41

Appendices……45

LIST OF TABLES

Table 1: Distribution of co-morbid chronic conditions of participants……..21

Table 2: Distribution of MDD and suicidal tendencies among participants……21

Table 3: Distribution of MDD according to participants' gender……22

Table 4: Distribution of MDD according to participants' level of education……22

Table 5: Distribution of MDD according to participants' employment status……...23

Table 6: Distribution of MDD according to participant's marital status……23

Table 7: Logistic regression of age and employment status on depression……...24

Table 8: Association between MDD and participants' employment status……..24

Table 9: Association between MDD and participants' gender……..25

Table 10: Association between MDD and participants' level of education……..25

Table 11: Association between MDD and participants' marital status……....26

Table 12: Association between depression and co-morbid conditions of participants……..26

Table 13: Association between depression and pregnancy……..27

Table 14: Association between depression and co-morbid epilepsy condition……..27

Table 15: Association between depression and co-morbid diabetes mellitus condition……...28

Table 16: Association between depression and co-morbid hypertension condition……..28

Table 17: Association between depression and co-morbid HIV/AIDS condition……29

LIST OF FIGURES

Figure 1: Distribution of participants' gender……17

Figure 2: Distribution of the level of education of participants……...18

Figure 3: Distribution of marital status of study participants…….....19

Figure 4: Distribution of employment status of participants……..20

CHAPTER ONE: INTRODUCTION

1.1. Background

This research was conducted in Daveyton Main Clinic, in the eastern sub-district of the Ekurhuleni Health District in Gauteng province. Daveyton Main Clinic is one of the biggest clinics in the district in terms of the number of patients attended to every day, with an average of 60 to 70 patients. The total number of patients that are attended to monthly in the clinic varies from 1 000 to 1 200 patients. This includes first time patients and follow-up patients. The clinic provides a comprehensive service package including: curative service; chronic care unit; family planning service; mental health unit; sexually transmitted diseases unit; tuberculosis unit; dental care clinic; well-baby clinic; HIV clinic; antenatal clinic; youth centre unit; and allied services (physiotherapy, audiology, and podiatry). The Daveyton Main Clinic is located in Daveyton township, which has a population of 127 967 (8854.78 per km^2) according to the 2011 census.

The Daveyton Township is located in the Ekurhuleni Metropolitan Municipality of Gauteng province in South Africa. This township was established in 1952 and achieved municipal status in 1983.

1.2. Rationale

The 1996 World Health Organization (WHO) report states that depression is the leading cause of disability worldwide among people aged five and above.[1, 2] Mental health is a big component of medicine in general, and family medicine in particular. From personal experience, the researcher has observed that depression in most patients at primary care level is overlooked; yet symptoms related to depression are common. In addition, it has been found that depression is common among patients with chronic illnesses.[3]

By observing the huge number of patients attending Daveyton Main Clinic, it can be expected that some of them suffer from depression, yet the screening for depression is not a routine practice. Based on the above observation, this research aimed at identifying the factors associated with major depression among adult patients attending the Daveyton Main Clinic.

This research will assist health care providers to understand factors associated with major depression among their patients. The results will be presented to the clinic and the health district management to enable them to mobilise health care providers to increase their index of suspicion for MDD, and to improve the screening for major depression across all health district facilities, and to involve other local stakeholders depending on final findings. The results would

be published in a peer reviewed journal to share findings with fellow family physicians and primary health care practitioners.

CHAPTER TWO: LITERATURE REVIEW

This chapter covered a review of the available literature about Major Depression Disorder among adult patients. The review covered some aspects of MDD among adult patients, mainly: definition, diagnosis, management, prevalence, associated co-morbid, and associated socio-demographic factors. Even though many types of depression disorders exist, the review was limited only to MDD.

The literature was collected from textbooks, medical articles from the internet and the university of Witwatersrand library. From the internet, the researcher subsequently searched four databases: Medscape, Trip, Pubmed, SUMsearch and Cochrane Library for observational studies and research reports. Further, the researcher looked at Google scholar for other articles, which could not be included on the medical databases.

The researcher used different search strategies depending on the database used. For Medline, Trip, SUMsearch and Cochrane library, he used key words: depression, adult, prevalence, comorbidity, main complaint, primary health care, factors. While using google scholar, the researcher used the study title and selected relevant literature.

2.1. Definition

The term 'depression' is not a specific term for a single diagnostic condition. Depressive disorders consist of seven disorders: MDDs; disruptive mood dysregulation disorder; persistent depressive disorder (dysthemia); premenstrual dysphoric disorder; substance induced depressive disorder; depressive disorder due to other medical conditions; and unspecified depressive disorder.[4, 5] MDD is the most serious diagnosis. A variety of terms are used for people with depressive symptoms but whose depression does not meet the criteria for MDD, among these conditions we have sub-threshold depression and sub-syndromal depression.[2]

2.2. Major Depression Disorder Diagnosis and Treatment

2.2.1. <u>Diagnostic criteria for MDD</u>

MDD is diagnosed when a patient exhibits five or more of the following symptoms during the previous two weeks; at least one of the symptoms must be either a depressed mood or anhedonia (the absence of pleasure or the ability to experience it).[5, 6] In addition, sleep and appetite disturbances, feelings of worthlessness or guilt, fatigue, hopelessness, and suicidal

ideation may form part of the clinical presentation.[2, 5, 6] These symptoms must have a negative impact on the patients social and occupational functioning.[4, 5] Also these symptoms or mood changes should not be a consequence of drug use effects or general medical conditions, nor bereavement.[4]

2.2.2. Screening tools for MDD

Many MDD screening and diagnostic tools have been used internationally depending on the characteristics of population screened.[7, 8, 9, 10] Commonly used tools include Patient Health Questionnaire 9 (PHQ-9), the Beck Depression Inventory (BDI), the Center for Epidemiologic Studies' Depression Scale(CESD), and the Zung Self-Rating Depression Scale (ZSDS).[9, 10, 11, 12]

2.2.2.1. PHQ-9 questionnaire

The PHQ-9 was chosen because it was commonly used across the world, including some African countries, and it is validated for use in the South African population. It takes much less time to be completed. It has shown high sensitivity in the diagnosis of depression in patients in primary care settings.[7, 8] This questionnaire is also validated for use in primary health care among patients receiving treatment for chronic diseases.[9]

2.2.2.2. Beck Depression Inventory

The BDI screening tool could be also used when screening for depression among patients. It was found that it could be used as alternative to the PHQ-9 tool. [13] However, it has many items to complete and takes more time to be completed compared to the PHQ-9.[14]

2.2.2.3. The Center for Epidemiology Studies' Depression Scale

The CESD screening tool was one of the tools used when screening for depression among patients living with type two diabetes.[15] A comparison study between the CESD and PHQ-9, demonstrated that CESD was a good tool, however PHQ-9 was considered to be the best because it has less items to complete, therefore it takes less time.[15]

2.2.2.4. The Zung Self-Rating Depression Scale

The ZSDS also was previously used to screen for depression.[10, 11, 12] However, it is long and includes affective, psychological and somatic symptoms associated with depression.[16] The

researcher decided not to use this tool because it was long, more 11 additional items compared to the PHQ-9.

2.2.3. Management of MDD

Once the diagnosis of MDD has been established, a comprehensive plan should be implemented in collaboration with the patient according to their individual needs.[6] The treatment of MDD comprises a combination of an antidepressant and psychotherapy (either cognitive behavior therapy or interpersonal therapy).[17]

Many groups of antidepressants exist because many neurotransmitters are involved in the etiology of depression.[4] These neurotransmitters are mainly serotonin, dopamine, and norepinephrine.[4] Most antidepressants used include selective serotonin reuptake inhibitors (SSRIs), serotonin-norepinephrine reuptake inhibitors (SNRIs); norepinephrine-dopamine reuptake inhibitors (NDRIs), monoamine oxidase inhibitors (MAOIs) and tricyclic antidepressants (TCAs).[4, 6, 17, 18]

Some groups of anti-depressants are safer and have superior tolerability compare to others. Based on this, SSRIs, SNRIs, and NDRIs are considered safer than TCAs and MAOIs.[17] Therefore, the decision to use a particular drug should consider its safety and tolerability, patient's preference, and drug's cost and availability.

In addition, it has been established that lifestyle-based strategies including exercise therapy, dietary modification, or other psychosocial interventions play a major role in the management of depression.[19]

2.2.4. MDD in Primary Health Care

The emphasis on recognition and treatment of MDD in a primary care setting dates to the late 1980s with studies documenting a high prevalence of depression at the primary care level.[20] Depression can cause great distress and have a significant effect on a patient's life, on their family, on medical services, and also on the economy.[3] The fact that it can be treated and that its course can be reversed, makes early diagnosis and adequate treatment essential.[3]

A recent Nigerian study confirmed that depressed patients have a high utilisation rate of health care resources compared to non-depressed patients.[21] The study was conducted among primary health care patients, which makes it very applicable to our context, even though their

sample size was relatively small. The majority of these patients are exposed to the health system at primary care level where they should be diagnosed, treated, and/or referred accordingly.[20] There is limited data on the epidemiology of MDD in the primary health care setting in South Africa, there was no clear information regarding this condition in our setting.[22]

2.3. Burden of Major Depression Disorder

2.3.1. Burden of MDD in South Africa

According to the survey conducted between 2002 and 2004, South Africans had a 9.7% lifetime prevalence of MDD, and this prevalence was less than the rate found in the United States, but above other African countries such as Nigeria.[22] This survey was a national household survey conducted in the community, not a survey conducted in a primary care setting. Therefore, these findings should be considered with caution.

The prevalence of MDD is probably much higher in the clinical population.[21] Regardless of some limitations acknowledged by authors, such as the lack of clinical validation of the data collection tool used and the heterogeneity of South African population, this study provided an estimation of how common depression could be in the community. A similar result was found in another survey conducted between 2003 and 2004, where it was found that 30% of participants met the criteria for common mental disorders in general, and 9.8% of participants had MDD.[23] This was a good survey, having included a large number of the South African population over a significant period of time, unfortunately the findings are still limited because it was not conducted in a clinical setting.

Since the researcher could not find published data about the burden of MDD among Ekurhuleni Health District patients in general, and Daveyton Main clinic patients in particular, the researcher requested information from the District Health Information System (DHIS). The information from the Gauteng Department of Health Information Directorate revealed that 1 372 mental health clients aged from 18 years and above, were seen in Daveyton Main Clinic from April to June 2014. The challenge with this data was that there was no clarification regarding the specific condition suffered by these mental health users, and above all, there was no specification if these patients were new patients or follow-up patients.

2.3.2. Burden of MDD on the African continent

In a cross-sectional study conducted in Tanzania to determine and compare the prevalence of common mental disorders among patients attending primary health care clinics and traditional healer centres in Dar es Salaam, it was found that 25% of patients attending primary health care clinic were depressed compared to 49% attending traditional healer centres.[24]

During the interview of patients with depression who consulted the traditional healer, it was found that their main reason for consulting traditional healers was the perceived medical doctors' incompetence to diagnose and treat mental conditions, mainly depression at primary care level. Similar results were found in Malawi, where it was found that 30% of primary care patients were depressed.[25]

2.3.3. Burden of MDD Worldwide

The WHO predicted that by the year 2020, depression would be the second most important cause of disability worldwide, after ischemic heart disease,[12] accounting for 5.7% of the total disability adjusted life years compared to 2.65% for HIV/AIDS. Furthermore, depression is expected to become the number one cause of medical burden among females in developing countries.[18]

Studies conducted some European countries on the prevalence of depression showed that depression was common in primary care settings.[26, 27] A descriptive study was conducted in Sweden to assess how common depression symptoms were in primary care settings. It was found that 15% of patients in primary care settings were depressed.[26] Similar results were found in Spain, where it was found that 16.8% of patients were depressed.[27] This was a significant study because it was undertaken in 10 different primary care centres and had a large sample size, and the results from the participants were compared to those of non-participants.

Other studies conducted in the United States of America (USA) confirmed a similar prevalence of depression, around 17%.[2, 7, 28] However, in one American study in which primary care patients were interviewed about major depression, 29% met the criteria for depressive episodes.[29] The researcher believes that the selection of participants could explain the high prevalence, because only English speakers and highly educated people participated in the study.[29]

While depression was found to have a high prevalence in the USA and Europe in general, a different rate of prevalence was found in Germany. A multi-centred and multi-stage study conducted in Germany found that the prevalence of depression in primary care settings was 10.9%.[30] Because of the paucity of African literature regarding depression in primary care settings, the literature from Asia and the Middle East was reviewed to compare the prevalence of the disease there, and to ascertain whether or not prevalence was similar to accidental findings. A cross-sectional study done in Qatar, found that 27.8% of primary care setting patients were depressed.[18] These findings were consistent with the prevalence of depression in Saudi Arabia (28.5%) and Kuwait (37%).[18]

An Israeli systematic review found that 14-24% of primary care patients had depressive symptoms, while only 1.6-5.9% had major depression.[31] The low prevalence could be due to the socio-cultural influence of the Israeli participants. Their religious beliefs could have played a role in reducing the prevalence of depression in comparison to other countries where communities are more heterogeneous.

In conclusion, the South African prevalence of MDD was found to be below the prevalence from the rest of the world. The African prevalence was similar to the rate found in the Middle East, and slightly above the rest of the world. While similar prevalence was found among European countries.

2.4. Co-morbidity and Major Depression Disorder

MDD is commonly associated with a variety of medical chronic illnesses. A large number of medical conditions may be associated with depression: the mechanism of association may be due to the condition itself; a reaction to having a medical condition; a result of the medical treatment of the condition; or a combination of these factors.[21] Among medical conditions commonly associated with depression are: neurological disorders (epilepsy and others); endocrine disorders (thyroid disorders, etc.); infectious and inflammatory disorders (HIV/AIDS, Systemic Lupus Erythematous); and miscellaneous disorders (malignancies).[21]

A systematic review of literature conducted in Croatia by Suzana Uzun and colleagues about depression and co-morbidity in 2009 revealed that comorbidity between depressive disorders and various somatic disorders appears regularly.[31] It was found that depressive disorders were

present in over 25% of the patients with cardiovascular disorders and 15-33% of patients with myocardial infarction. Depression appears to simultaneously cause and exacerbate cardiovascular disease.[6, 31] It was found to be common among diabetic patients and impaired diabetic management. Among diabetic patients, the prevalence of depression varied from 8.5% to 27.3%, and the severity of depression correlated with many symptoms of diabetes mellitus.[31] The same study revealed that other conditions were also common in patients with depression; 24% of asthmatic patients and 21.9% of epileptic patients were depressed.[31]
A significant number of patients with the above named co-morbidities attend our facility on a daily basis. Therefore, the researcher believed that local research was needed to ascertain whether or not many of these patients had MDD.

2.5. Challenges in diagnosing MDD

A study from Pakistan highlighted the difficulty faced by physicians in their daily practice to diagnose depression due to its association with many somatic diseases; some common co-morbidities were mentioned.[32] In addition to common conditions, they also emphasised the role played by HIV/AIDS without specifying the prevalence of the association between the two diseases.[32] A cross-sectional study conducted by the WHO in different five centres (Brazil, Germany, Kenya, Thailand, and the Democratic Republic of Congo) found that 26% of HIV/AIDS patients were depressed.[33] This prevalence was confirmed by a systematic review conducted in 2 000, where it was found that the prevalence of depressed patients among HIV/AIDS patients ranged between 22% and 45%.[34]

While the prevalence of depression differed according to the region of the world considered, its association with somatic illnesses was found to be almost the same globally. Studies conducted in the USA revealed that the association between depression and chronic physical conditions was higher than that of the general population.[30] A significant association was found between depression and somatic illnesses, with diabetes and hypertension having the highest prevalence among other illnesses.[18] An Israeli systematic review study found a 44% increase in the frequency of co-morbid chronic medical illnesses among individuals with major depression, compared to the general population.[31] Therefore, the researcher believed that the effort to improve the diagnosis of depression in primary care settings needs to address all situations where depression may be under diagnosed.

2.6. Major Depression Disorder and Socio-demographic Factors

Although widespread, depression affects some groups of people more than others.[6, 23] Among these groups, depression may affect people differently depending on their gender, age, marital status, employment status, education level, and religion.[23] Major depression is more common in women than it is in men, it is also common among single and divorced or widowed patients.[2, 23, 27, 29]

A study conducted among Alaskan natives found a 20% prevalence of depression in women as opposed to 13% in men. There was a significant association between depression and chronic unemployment, where individuals had less than a high school education and low income, and marital status was borderline significant.[7] This contradicted previous studies where statistical significance was found between marital status and depression.[23] The difference between the two studies could be explained by the way in which depression symptoms were ascertained, because researchers acknowledged that since they relied on self-reporting, it was possible that married participants could have under-reported their symptoms.

A study conducted in Qatar found similar results to European studies, but surprisingly a significant association was found between married participants and depression.[13] The findings were contrasted with many American studies,[4, 11] where depression was associated with single and widowed women. The reason for that association could be due to the influence of Middle-Eastern culture whereby very often men have significantly more power than women and often have many wives.

2.7. Summary of the literature review

In conclusion, the review of the literature has revealed that MDD was common in primary care settings. The African continent and the Middle East had the highest prevalence rate, while the prevalence from the rest of the world was slightly lower. South African clinical rate was not available when the search was conducted.

The association between MDD and medical co-morbid conditions was common, even though the association was high in some co-morbidity conditions compared to others. Patients living with diabetes mellitus, epilepsy, asthma, and HIV/AIDS had the highest association with MDD.

MDD also was associated with unemployment status, poor income and low education level. Female patients were found to be more depressed than their male counterparts were.

The difference in the prevalence of MDD in the different parts of the world, the paucity of local literature, and the possible association with chronic diseases, and it different impact on patients based on their socio-demographic factors, has motivated the researcher to fill this gap.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1. Aim and Objectives

3.1.1 Aim of the Study:

To explore factors associated with MDD among adult patients attending the Daveyton Main Clinic.

3.1.2. Study Objectives

3.1.2.1. To determine the prevalence of MDD among adult patients attending the Daveyton Main Clinic, using PHQ-9 tool for MDD;

3.1.2.2. to describe depressed participants' socio-demographic characteristics;

3.1.2.3. to ascertain the association between MDD and socio-demographic factors; and

3.1.2.4. to demonstrate the association between MDD and co-morbid chronic illnesses among depressed participants.

3.2. Study Design:

A descriptive and cross-sectional study.

3.3. Site of Study:

The study was conducted at the Daveyton Main Clinic, in the eastern sub-district of Ekurhuleni Health District in Gauteng province. Daveyton Main Clinic is one of the biggest clinics in the district in terms of the volume of patients seen daily. It provides a comprehensive service package, including: curative service; chronic care unit; family planning service; mental health unit; sexually transmitted diseases unit; tuberculosis unit dental care clinic; well-baby clinic HIV clinic; antenatal clinic; youth centre unit; and allied services (physiotherapy, audiology and podiatry).

Data was collected mainly from the curative unit, chronic unit, HIV clinic, tuberculosis treatment unit, mental health unit, youth centre unit, and the antenatal clinic. The family planning unit and forensic units were excluded due to the fact that, these units provide service to relatively well clients.

3.4. Study Population:

All adult patients aged 18 years and above seeking medical help from curative, chronic, HIV/AIDS, tuberculosis, mental health, youth centre and antenatal clinic units from February to March 2015.

3.5. Sampling

3.5.2. Sample size:

The sample size was calculated using the Raosoft software. The total number of adult patients seen at the clinic per month is between 900 to 1 000 patients. The total population over the study period was approximately 1 000. The calculated sample size was 278 patients with 5% margin of error, 95% confidence level, and 50% response distribution.

3.5.3. Selection of Participants:

Convenient sampling was used. Every patient in the queue was invited to participate in the study until the number for the day was reached. The researcher and two trained primary care nurses conducted interviews. However, participants willing to complete the questionnaire on their own were allowed to do so. A minimum of 18 participants were interviewed per day because the plan was to collect data from Monday to Thursday and to minimise patients' waiting time. Eighteen participants were interviewed per day, and that allowed the research team to interview 72 participants per week and 278 participants during the entire data collection period.

3.6. Inclusion Criteria:

Adult patients (18 years old and above) who were capable of giving consent and attending the Daveyton Main Clinic during the period of data collection.

3.7. Exclusion Criteria:

Sick patients needing emergency assistance were excluded.

3.8. Data Collection Tool:

A PHQ-9 was used to screen and diagnose major depression among participants. It had nine questions that participants were asked to answer. The researcher and an interviewer administered the questionnaire, except in cases where the participants wished to complete it on their own. Trained interpreters where used for non-English speakers. The questionnaire was

validated and appropriate for use among the South African population.[9, 35] If the patient answered at least five sections with two or three points, with one of which corresponded to question 1 or 2, that participant was considered having a MDD.

In addition to the PHQ-9 questionnaire, participants were assisted in the completion of a second short questionnaire comprising of two sections, the first section collected socio-demographic information, and the second section collected information about possible co-morbidities. The questionnaire successfully helped to collect all the variables measured. These are variables that were measured: participants' gender; age; race; employment status; level of education; marital status; MDD prevalence; suicidality proportion; and chronic co-morbid diseases.

The questionnaire was not translated into other languages, due to the diversity of languages spoken in Daveyton township. However, nurses were trained to interpret questions in South African local languages to assist illiterate and non-English speakers to complete questionnaires.

3.9. Data Collection:

When patients arrived at the clinic, they collected their files from the receptionist and then waited in the queue to be attended to. During this time, the assistant nurse gave collective information to every one regarding the study. Their informed consent for participation in the study was obtained during their consultation time, and the questionnaire was completed prior to their departure. Given the need for only 18 participants per day to minimize patients' waiting time, six participants were interviewed in each room per day and three consulting rooms were used. All completed questionnaires were stored in a safe place (locked office) for data capturing and analysis.

3.10. Data Analysis

Data from questionnaires was captured using a Microsoft Excel spreadsheet. The analysis included a descriptive analysis of the study population.

Firstly, demographic aspects of patients in the study were described in pie chart format, except age, which was described in table format with mean and standard deviation, as it is not a categorical variable. Secondly, health conditions were described in table format. The association of depression with demographic aspects and chronic illness was examined using cross-tabulation, and this association was tested using the chi- square test of independence. The chi-square test of independence was used due to categorical variables.

All the statistical tests were carried out with 5% significance level. Therefore, the researcher rejected the hypothesis if p-value (the probability of getting the observed result by chance alone) was less than 0.05 in favor of the alternative hypothesis.

One of the conditions of the chi-square test the researcher utilised was that the expected frequency count (row-total multiplied by column-total divided by the grand-total) for each cell, in the contingency table, needed to be at least five. Thus, some of the p-values for the association would not be reported if the condition above was violated.

All analyses were carried out using the Statistical Packages for Social Sciences (SPSS) version 13.

3.11. Source of Bias:

The diagnosis of MDD is based exclusively on the patient's self-report of symptoms. Therefore, some participants could have over or under-reported symptoms, which might have affected the over-all results. However, counselling participants was emphasised to ensure that all of them were truthful during the interview.

The data collection procedure was not the same for all participants since the researcher interviewed some participants while some of them completed the questionnaires on their own. However, those assisted in the completion of the questionnaires were only assisted with the interpretation of questions and the decisions were theirs to make from different options presented. In that way, the chance of getting a significant discrepancy of answers was minimised. Lastly, Daveyton Main Clinic was conveniently selected from other clinics, because it is the busiest clinic by patient headcount in the eastern region of the Ekurhuleni Health District where the researcher worked.

3.12. Ethical Considerations

3.12.1. Approvals

Initial permission to conduct the study in the Daveyton Main Clinic was sought and approval was duly received from the clinic manager. Ethical approval was also sought and received from the Human Research Ethics Committee (HREC) of the University of the Witwatersrand; the ethical clearance number is M141107.

3.12.2. Informed consent

Every participant signed an informed consent form prior to the interview; only patients willing to participate were admitted to participate in the study. Patients were informed of the right to refuse to participate in the study, and they were advised that their participation was not at any time and in any way going to interfere negatively with their care.

3.12.3. Confidentiality

Patients' interview forms were retained without their details and all information was stored in a safe place to respect the patients' confidentiality. There was no possible harm to the participants. Every patient who scored high on the PHQ-9 form were referred to the psychologist for further assessment and management. The researcher and the psychologist who worked at the clinic-based mental health unit coordinated the overall management. Participants needing psychiatric intervention were booked for psychiatric assessment and management.

Patients diagnosed with MDD and who were assessed to be suicidal were all transferred by ambulance to the Far East Rand Hospital for further management.

CHAPTER FOUR: STUDY RESULTS

This section deals with the statistical analyses of the data collected. The aim of this study was to explore factors associated with MDD among adult patients attending Daveyton Main Clinic.

4.1. Description of Demographic Factors of Study Participants

A total of 278 patients participated in the cross-sectional study. The following are the demographic factors of the study participants.

4.1.1. Race

All the participants in the study were black, except one Hispanic.

4.1.2. Age

The minimum age of respondents was 18 years old with a maximum of 84 years old. The mean age was 38 years old with a standard deviation of 13.9 years.

4.1.3. Gender

The figure below represents the gender distribution of the participants.

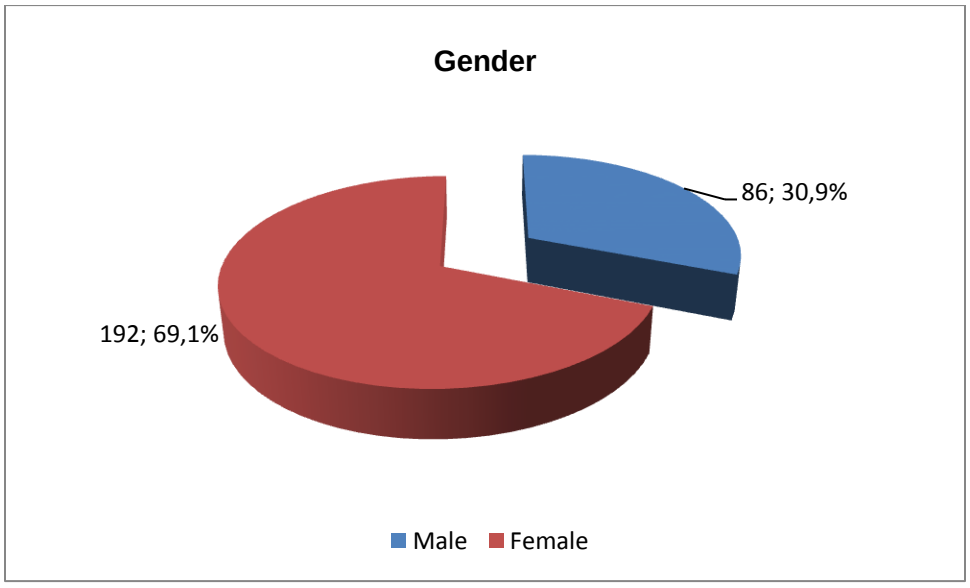

Figure I: Distribution of participants' gender

The majority of participants were females at 69.1%

4.1.4. Level of education of participants

The distribution of level of education of participants appears in the figure below

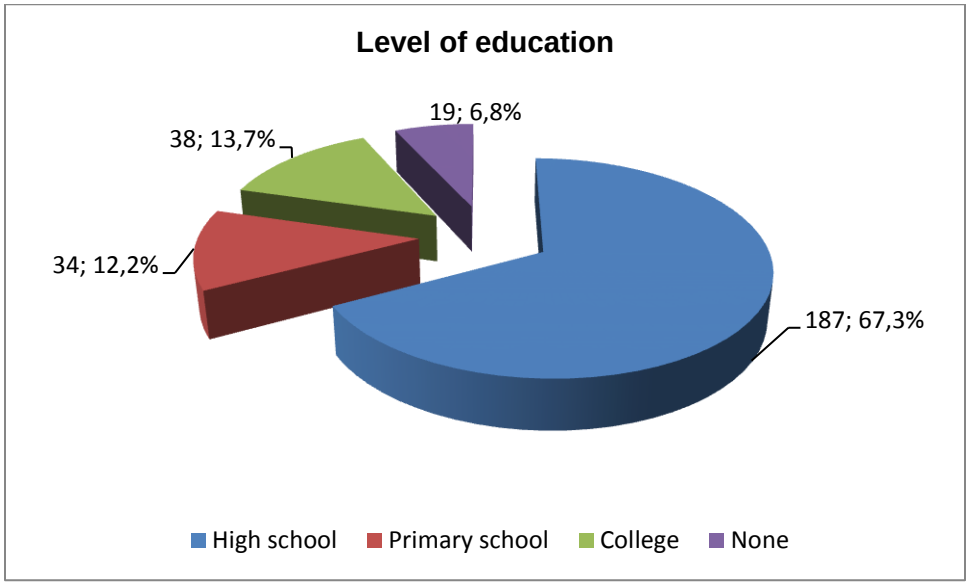

Figure II: Distribution of the level of education of participants

The majority of participants (67.3%) studied until high school, followed by those who attended college (13.7%) and primary school (12.2%). Participants without formal schooling level were 6.8%.

4.1.5. Distribution of marital status of study participants

Marital status of participants is represented in the figure below

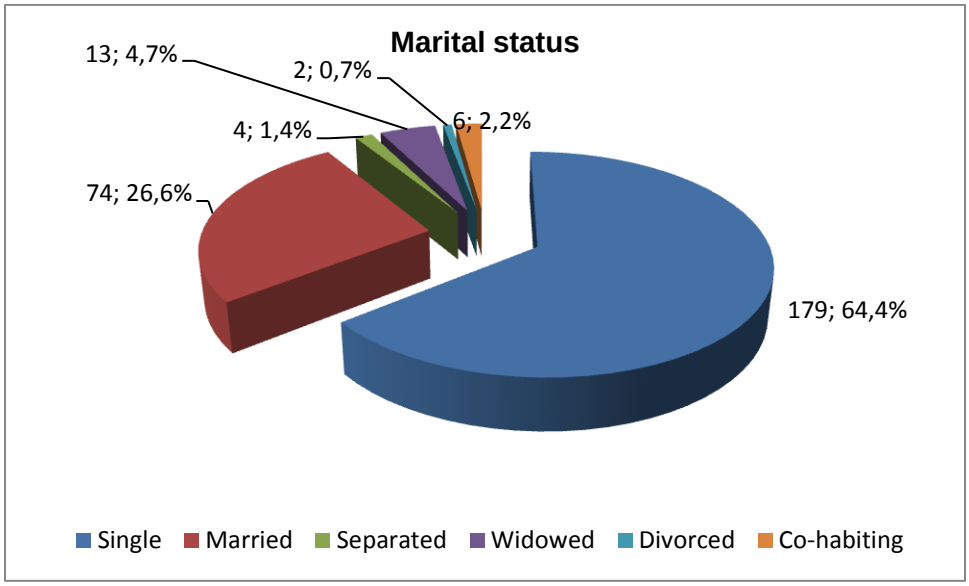

Figure III: Distribution of marital status of study participants

Most of the respondents were single (64.4%). Those who were married represented 26.6% of the participants. The rest of participants were widowed (4.7%), co-habiting (2.2%), separated (1.4%), or divorced (0.7%).

4.1.6. Employment status of participants

Employment status of participants appears in the following figure

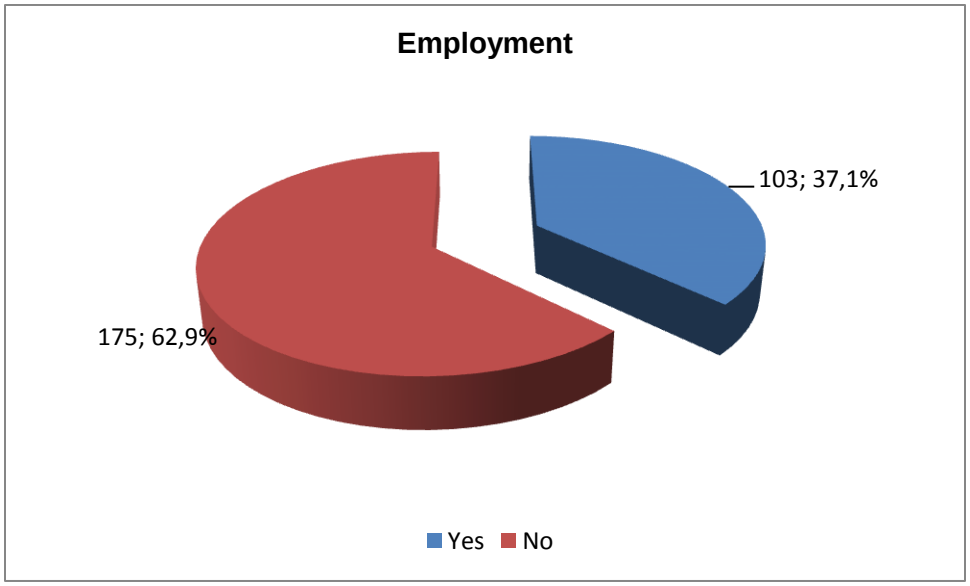

Figure IV: Distribution of employment status of participants

A large portion of participants was unemployed (62.9%). Only 37.1% of participants were employed.

4.2. Description of Participants' Co-morbid Conditions

Co-morbid conditions were divided in two categories. The first category comprised chronic co-morbid conditions: diabetes mellitus; hypertension; asthma; HIV/AIDS; epilepsy; and others. The second category comprised pregnant women.

4.2.1. Distribution of co-morbid chronic conditions of participants

Comorbid chronic conditions in participants appears in the table below.

Comorbid chronic conditions	Numbers	Percentage
Diabetes mellitus	9	3.2
Hypertension	49	17.6
Asthma	4	1.4
HIV/AIDS	92	33.1
Epilepsy	10	3.6
None	114	41.0
Other	0	0
Total	278	100

Table 1: Distribution of co-morbid chronic conditions of participants

HIV/AIDS was the predominant comorbid chronic condition among all the study participants (33.1%), followed by hypertension (17.6%). Participants treated for epilepsy were 3.6% (n=10), diabetic mellitus participants were 3.2%, and asthmatic participants were 1.4%. A large number of participants did not have a chronic co-morbid condition (41%).

4.2.2. Pregnancy among participants

Among participants who had no chronic conditions, 14.4% were pregnant.

4.3. Prevalence of Major Depression Disorder

4.3.1. MDD and suicidal tendency among participants

Prevalence of MDD and suicidal tendencies appear in the table 2.

Variable	Category	Frequency	Percentage
Depression	Yes	64	23.0
	No	214	77.0
Suicide	Yes	18	6.5
	No	260	93.5

Table 2**:** Prevalence of MDD and suicidal tendencies among participants

The prevalence of MDD was 23%. Among the 64 (23%) participants who met the DSM-5 criteria for MDD, 18 (28.1%) of them had suicidal ideation. Considering the total population of respondents (n=278), 6.5% of them had suicidal ideation.

4.4. Specific data for participants diagnosed with MDD

4.4.1. Socio-demographic Factors of Participants Diagnosed with Major Depression Disorder

4.4.1.1. Distribution of MDD according to participants' gender

Gender of participants with MDD is shown in table 3.

Characteristic		Depression				Total	
		Yes		No			
		N	%	N	%	n	%
Gender	Male	19	22.1	67	77.3	86	
	Female	45	23.4	147	76.6	192	
Total		64		214		278	100

Table 3: Distribution of MDD according to participants' gender

The result showed that 23.4% (n=45) of females were depressed compared to 22.1% (n=19) of male participants.

4.4.1.2. Distribution of MDD according to participants' level of education

Table below represents the distribution of MDD according to participants' level of education.

Characteristic		Depression				Total	
		Yes		No			
		N	%	N	%	N	%
Level of education	None	2	10.5	17	89.5	19	
	Primary school	10	29.4	24	70.6	34	
	High school	39	20.9	148	79.1	187	
	College	13	34.2	25	65.8	38	
Total		64		214		278	100

Table 4: Distribution of MDD according to participants' level of education

Thirty four percent (n=13) of 38 respondents college graduates met diagnostic criteria for MDD, followed by primary school graduates at 29.4% (n=10), and high school graduates of 20.9% (n=39). Participants without formal schooling were 10.5% (n=2).

4.4.1.3. Distribution of MDD according to participants' employment status

Employment status of MDD participants appears in the table below.

Characteristic		Depression				Total	
		Yes		No			
		N	%	N	%	N	%
Employment	Yes	16	15.5	87	84.5	103	
	No	48	27.4	127	72.6	175	
Total		64		214		278	100

Table 5: Distribution of MDD according to participants' employment status

The result showed that out of 278 respondents, 64 (23%) had MDD. Out of 64 respondents who met the diagnostic criteria for MDD, 48 (75%) of them were unemployed.

4.4.1.4. Distribution of MDD according to participant's marital status

Marital status of MDD participants appears in the table below.

Characteristic		Depression				Total	
		Yes		No			
		N	%	N	%	N	%
Marital status	Single	40	22.3	139	77.7	179	
	Married	14	18.9	60	81.1	74	
	Separated	3	75.0	1	25.0	4	
	Widowed	3	23.1	10	76.9	13	
	Divorced	1	50.0	1	50.0	2	
	Co-habiting	3	50.0	3	50.0	6	
Total		64		214		278	100

Table 6: Distribution of MDD according to participant's marital status

The above result shows that 75% (n=3) of separated respondents were depressed, followed by divorced and co-habiting respondents with 50% of MDD respectively. The widowed participants contributed to 23.1% (n=3) of the MDD population, while single participants contributed 22.3% (n=40) to the MDD population. However, only 18.9% (n=14) of depressed respondents were married.

4.4.2. Association between Major Depression Disorder and Socio-demographic Factors

This section tests the association between MDD and socio-demographic factors of 64 (n=278) depressed respondents.

4.4.2.1. Logistic regression of age and employment status on depression

Logistic regression of age and employment status on MDD appear on the table below

	B (coefficiency)	S.E (Standard deviation)	Wald test	Degree of freedom	P-value	Odds ratio	95% C.I for Odds ratio	
							Lower	Upper
Age	0.000	0.010	0.001	1	0.977	1.000	0.980	1.021
Responded yes to employed	0.722	0.326	4.897	1	0.027	2.059	1.086	3.902
Constant	0.961	0.446	4.644	1	0.031	2.615		

Table 7: Logistic regression of age and employment status on depression

The results of logistic regression of age and employment status on depression are shown in Table 7 above. It can be noticed that age did not influence depression (p-value = 0.98). However, the unemployed patients were twice as likely to be depressed than the employed ones, as the odds ratio equals 2.059.

4.4.2.2. Association between MDD and participants' employment status

Association between MDD and employment status of participants appears in the table below.

Characteristic		Depression				Total	
		Yes		No			
		N	%	N	%	N	%
Employment	Yes	16	15.5	87	84.5	103	
	No	48	27.4	127	72.6	175	
Total		64		214		278	100
Chi-square = 5.176; P-value = 0.023							

Table 8: Association between MDD and participants' employment status

Depression was significantly associated with the employment status of respondents (p-value = 0.023).

4.4.2.3. Association between MDD and participants' gender

Association between MDD and participants' gender appears in the table below.

Characteristic		Depression				Total	
		Yes		No			
		N	%	N	%	N	%
Gender	Male	19	22.1	67	77.3	86	
	Female	45	23.4	147	76.6	192	
Total		64		214		278	100
Chi-square = 0.061; P-value = 0.806							

Table 9: Association between MDD and participants' gender

The result showed that there was no significant association between MDD and the respondents' gender (p-value = 0.81).

4.4.2.4. Association between MDD and participants' level of education

Association between MDD and participants' level of education appears in the table below.

Characteristic		Depression				Total	
		Yes		No			
		N	%	N	%	N	%
Level of education	None	2	10.5	17	89.5	19	
	Primary school	10	29.4	24	70.6	34	
	High school	39	20.9	148	79.1	187	
	College	13	34.2	25	65.8	38	
Total		64		214		278	100
Chi-square = 5.637; P-value = 0.131							

Table 10: Association between MDD and participants' level of education

The test between MDD and respondents level of education showed that there was no significant association between them (p-value = 0.13).

4.4.2.5. Association between MDD and participants' marital status

Association between MDD and participants' marital status appears in the table below.

Characteristics		Depression				Total	
		Yes		No			
		N	%	N	%	N	%
Marital status	Single	40	22.3	139	77.7	179	
	Married	14	18.9	60	81.1	74	
	Separated	3	75.0	1	25.0	4	
	Widowed	3	23.1	10	76.9	13	
	Divorced	1	50.0	1	50.0	2	
	Co-habiting	3	50.0	3	50.0	6	
Total		64		214		278	100
Chi-square = 10.133; P-value = 0.072							

Table 11: Association between MDD and participants' marital status

There was no significant association between depression and marital status (p-value = 0.33).

4.4.3. Association between MDD and Co-morbid Conditions of Participants

4.4.3.1. Association between MDD and co-morbid conditions of participants

Association between MDD and participants' co-morbid conditions appears in the table below.

Characteristics	Depression				Total	
	Yes		No			
	N	%	N	%	N	%
Diabetes mellitus	3	33.3	6	66.7	9	
Hypertension	13	26.5	36	73.5	49	
Asthma	1	25.0	3	75.0	4	
HIV/AIDS	16	17.4	76	82.6	92	
Epilepsy	8	80.0	2	20.0	10	
None	23	20.2	91	79.8	114	
Total	64		214		278	100
Chi-square = 21.376; P-value = 0.001						

Table 12: Association between MDD and co-morbid conditions of participants

The result showed that there is a significant association between MDD and co-morbid chronic conditions (diabetes, hypertension, asthma, HIV/AIDS, and epilepsy) (p-value = 0.001).

4.4.3.2. Association between MDD and pregnancy

Association between MDD and pregnancy appears in the table below.

Characteristic		Depression				Total	
		Yes		No			
		n	%	n	%	n	%
Pregnancy	Yes	5	12.5	35	87.5	40	
	No	59	24.8	179	75.2	238	
Total		64		214		278	100
Chi-square = 2.919; P-value = 0.088							

Table 13: Association between MDD and pregnancy

No significant association was found between pregnancy and MDD (p-value = 0.08)

4.4.3.3. Association between MDD and co-morbid epilepsy condition

Association between MDD and co-morbid epilepsy condition appears in the table below.

Characteristic		Depression				Total	
		Yes		No			
		N	%	N	%	N	%
Presence of epilepsy co-morbidity	Yes	8	80.0	2	20.0	10	100
	No	56	20.9	212	79.1	268	100
Total		64		214		278	100
Chi-square = 19.003; P-value = 0.000							

Table 14: Association between MDD and co-morbid epilepsy condition

The result showed a significant association between MDD and epilepsy considered alone as co-morbid chronic condition (p-value = 0.00).

4.4.3.4. Association between MDD and co-morbid diabetes mellitus condition

Association between MDD and co-morbid diabetes mellitus appears in the table below.

Characteristic		Depression				Total	
		Yes		No			
		N	%	N	%	N	%
Presence of diabetes mellitus co-morbidity	Yes	3	33.3	6	66.7	9	100
	No	61	22.7	208	77.3	269	100
Total		64		214		278	100
Chi-square = 0.558; P-value = 0.455							

Table 15: Association between MDD and co-morbid diabetes mellitus condition

The result showed no significant association between MDD and diabetes mellitus condition (p-value = 0.45).

4.4.3.5. Association between MDD and co-morbid hypertension condition

Association between MDD and co-morbid hypertension condition appears in the table below.

Characteristic		Depression				Total	
		Yes		No			
		N	%	N	%	N	%
Presence of hypertension co-morbidity	Yes	13	26.5	36	73.5	49	100
	No	51	22.3	178	77.7	229	100
Total		64		214		278	100
Chi-square = 0.413; P-value = 0.520							

Table 16: Association between depression and co-morbid hypertension condition

No significant association was found between MDD and hypertension.

4.4.3.6. Association between MDD and co-morbid HIV/AIDS condition

Association between MDD and co-morbid HIV/IDS condition appears in the table below.

Characteristic		Depression				Total	
		Yes		No			
		N	%	N	%	N	%
Presence of HIV/AIDS co-morbidity	Yes	16	17.4	76	82.6	92	100
	No	48	25.8	138	74.2	186	100
Total		64		214		278	100
Chi-square = 2.460; P-value = 0.117							

Table 17: Association between MDD and co-morbid HIV/AIDS condition

The result revealed no association between HIV/AIDS and major depression disorder (p-value = 0.12).

CHAPTER FIVE: DISCUSSION

5.1. Introduction

The aim of this study was to explore factors associated with MDD among adult patients attending the Daveyton Main Clinic. To achieve this aim, MDD prevalence was calculated and its association with specific factors was assessed. These were selected to assist profiling depressed patients attending the Daveyton Main Clinic. The factors were grouped in two categories: socio-demographic factors (race, age, gender, marital status, level of education, and employment status) and associated medical conditions (diabetes, hypertension, asthma, HIV/AIDS, epilepsy, pregnancy, and others). The discussion that follows examines the results reported in the preceding chapter.

5.2. The Prevalence of Major Depression Disorder among participants

The study revealed that 64 (23%) of the 278 participants met the DSM-V diagnostic criteria for MDD. The reason for this high prevalence could be a result of difficult socio-economic circumstances that the majority of the patients were living in. The majority of the patients were unemployed and lacking adequate social support. The researcher suspected that some of them could have been involved in drug abuse even though all of them denied the use of illicit substances. Even the circumstances in the clinic, such as long queues and lengthy waiting periods prior to their consultation could have affected the patients' mood.

The findings concurred with the prevalence of MDD in studies conducted in Nigeria, Malawi, and Tanzania.[20, 24, 25,] In those studies, it was established that the prevalence of MDD was between 25% and 30%. This could be explained by the similarities between the population where the study was conducted and patients from those countries, which are all developing countries with many socio-economic challenges. Furthermore, the result more closely resembled the overseas results. It was found that the prevalence of MDD was 17% in the USA, 15% in Sweden, and 15% in Spain.[2, 7, 26, 27, 28]

However, this study's result contradicted previous South African surveys' findings where prevalence of MDD was reported to be between 9.7 and 9.8%.[22, 23] From the beginning of this study the researcher presumed that the MDD prevalence could be higher in the clinical population than in the general population where the two South African surveys took place.[22]

Furthermore, this study contradicts findings of a study that was conducted in Sri Lanka, where they found that the prevalence of MDD was 4.5%.[36] This revealed how depression prevalence varies depending on the participants' lifestyle and cultures. A large number of study's participants were unemployed.

Even though this was not part of the study's objectives, but because of its severity, the researcher decided to present the following finding. It should be noted that more than a quarter of participants who met DSM-V criteria for MDD had suicidal tendency. This result emphasises the need for early diagnosis and treatment of MDD. The suicidality was assessed based on participants' suicidal ideation only, its severity was not analysed, nevertheless, all participants diagnosed with MDD were referred to the family physician and psychologist for management and those with suicidal ideation were referred to hospital for inward management.

5.3. The Social Demographic Factors of Participants Diagnosed with Major Depression Disorder

5.3.1. Race

The majority of participants were black African patients with only one Hispanic patient. This finding is acceptable because Daveyton Main Clinic is situated in a Township occupied mainly by the black population.

5.3.2. Gender

There were more female participants than males. This was consistent with the clinic's gender ratio profile. The majority of patients were female; this could be because female patients by nature tend to seek medical help more readily than their male counterparts do. In addition, 14% of participants were sourced from the antenatal unit, which is a section dealing with pregnant women only. This finding concurred with previous studies on depression conducted on the African continent and in Asia, where the majority of participants were found to be female.[36, 37]

5.3.3. MDD and gender

Diagnosis for MDD among female participants was only marginally higher than in males, 23% compared to 22% respectively (Table 3). This could be due to the fact that a significant number of female participants were employed compared to males, and the unemployment situation was more likely to influence the prevalence of MDD. Therefore, the difference based on gender

could not be clearly expressed. This finding was in contradiction with previous studies where it was found that depression was more common among females than males.[23]
The researcher thought that the difference of findings could also be explained by the fact that, other factors such as education level and employment status could have played a role in minimising the gender effect on the MDD prevalence.

5.3.4. Age distribution and MDD

The minimum age of participants was 18 years old with a maximum of 84 years old. The mean age was 38 years old with a standard deviation of 13.87 years. This finding revealed that participants were included from all different age groups but with a predominance of middle age participants. This is consistent with the age profile of Daveyton Main Clinic attendees because the clinic had a comprehensive primary care service administering care to patients of all ages, and participants were interviewed from all service units. Therefore, it was expected that there would be a significant difference in terms of participants' ages. A Nigerian study conducted to assess the association of depression and social demographic factors also found that participants' age group fell within 20 to above 61 years old.[37]

5.3.5. Level of education attained

A large number of participants had attended high school, followed by college graduates, and primary school. A minority of participants had not attended formal school. The results revealed that the majority of participants had a formal education. This finding reflected the educational situation in the township, where many no fee-paying public schools are available. The result showed that many people had attended high school, which explained the fact that free education ends at high school level and thereafter some people were unable to afford a tertiary education. Additionally, a significant number of participants were young and some of them could have still been at high school.

This was in line with a study conducted among Sesotho speaking participants in Mangaung in South Africa, where it was found that the majority of participants had attended a formal school.[38] Participants who attended college had the highest prevalence of MDD compared to other participants, however the statistic test failed to demonstrate an association between MDD and specific levels of education.

5.3.6. Marital status

The largest number of depressed participants was single. In this category, the research included divorced, single, co-habiting, widowed, and separated participants. The lowest rate of MDD was among married participants, where only 18% of participants were depressed. The reason MDD was found high among single participants could be that because depression disorder is a mood disease, and people with good social and emotional support have less risk of developing the disease compared to those living alone. The researcher believed that for the majority of African people, a life partner was a source of emotional, social, and financial support. Loneliness could have been a challenge, and that could have been a trigger for many depressed participants. These results correlate with a study conducted in a family practice population in Nigeria.[39]

Depressed patients have low self-esteem and guilty feelings.[4, 5] These characteristics could be triggered by criticism and gossip directed towards people living alone in African communities. They are very often presented as being the cause of their singleton condition; and for people without alternative means of support, the situation can be a turning point to develop MDD. A large number of participants emanated from the type of community were criticism and gossip directed towards single people are common tendencies. The Daveyton township criticism trend could have influenced the prevalence of depression among the study's participants.

5.3.7. Employment and MDD

A significant number of unemployed participants were depressed; 27% of unemployed participants were depressed compared to 15% of employed participants. This may be because of low self-esteem due to lack of financial power among a large number of participants.[6, 23]

5.4. The Association between Major Depression Disorder and Socio-Demographic Factors

5.4.1. Significant association

The study revealed that there was a significant association between the unemployment status of the respondents and MDD. This was consistent with other studies that found similar results.[37] Because unemployment is associated with poor financial income and an inability to respond to someone's financial needs, it can be surmised that these conditions can induce low self-esteem and lead to a poor quality of life and depression.

Even though this study demonstrated a significant association between MDD and the unemployment status of participants, this was in contradiction with a study conducted in Sri Lanka. Although the Sri Lankan study found that unemployment was associated with high risk for MDD, no significance association was established.[36, 40] The researcher would like to highlight that the Sri Lankan study was conducted in a post-conflict zone. The Sri Lankan participants could have been more preoccupied with safety issues than employment.

No significant association was found between MDD and the participants' gender, age, level of education, or marital status.

5.4.2. Gender

In terms of the participants' gender, the researcher believed that the absence of significance could have been due to other factors not part of the present study. Many policies have been developed to empower women, ignoring the needs of men.[41] In addition to that, more women were employed compared to men, and as in many societies, women may have benefited from some financial support even if they were employed. A large number of young female participants received child support grants that men do not receive.

This finding correlates with Nigerian study where it was found that the association between gender and depression was not significant.[40] Furthermore, a systematic review of cross-sectional study found that MDD was not associated with the participants' gender.[2] It should be highlighted that the study was criticised for not having enough power to detect the association even though it was a systematic review.

On the other hand, many studies found that there was an association between major depression and gender.[36, 38, 39] This contradiction confirms the variability of findings among different cultures and populations, and highlights the changing trend of MDD distribution between females and males.

5.4.3. Marital status

The researcher found that MDD was not significantly associated with the marital status of participants. A survey conducted by the South African Stress and Health study found that marital status had a borderline association with MDD.[7] The researcher was of the view that the absence of association could be due to the insufficient number of participants for each category. The test chi-square used requires that each category have at least five participants, while some

of this study's categories had less than that. It could be argued that because some categories had less than five participants, this could have impact on the test result.

Nevertheless, a significant number of participants were categorized as being single but they were in fact co-habiting. Even though their legal status could say "single", many participants could still have stable partners.

This finding contradicts previous results, which found an over whelming association between major depression and marital status.[37, 39, 40] The researcher believes that future studies should be done to assess whether or not there is a likelihood of participants who are legally married to develop MDD in comparison to those living in a stable relationship.

5.4.4. Age

The result of logistic regression of age revealed that age did not influence the prevalence of MDD. This correlated with Swedish findings, but contradicted African studies.[12, 37, 39, 40] Among these contracting studies, one was conducted in Nigerian and another one in China in which both found that MDD was significantly associated with older age.[37, 39]

The reason the researcher found a different result could be due to the way the sample was collected. Previous studies collected participants' ages in groups, which allowed them to compare the association between different age groups. While in this research study, the participants' ages were collected individually. This helped to calculate the mean age, standard deviation, and the minimum and maximum age of participants. Nevertheless, a logistic regression of participants' age was calculated, which failed to demonstrate any association between MDD and age in general.

5.4.5. Education

Lastly, no significant association was demonstrated between MDD and the participants' level of education. It was found that MDD was more common among college graduates. However, even participants with a low level of education also had a significant prevalence of MDD. The researcher wishes to highlight that the study had a small sample size of participants with no formal school status; this could have affected the test result.

The above should be highlighted as a limitation of this study. During the sample collection, the socio-demographic factors of participants in relation to an equal number of participants for each category were not balanced. It was only during data analysis that single participants were found

to be the biggest group compared to other categories. This was in contradiction to previous studies where MDD was found to be more common among participants with low education levels.[37, 39] The researcher wishes to recommend that future studies should focus on the number of participants by category, so that the association would be equally assessed.

5.5. The Association between Major Depression Disorder and Chronic Co-morbid Illnesses

5.5.1. MDD and chronic co-morbidities

The majority of participants living with chronic disease were patients living the with HIV/AIDS condition, followed by hypertensive patients, diabetics, and epileptics respectively. This represented the profile of Daveyton Main Clinic's chronic unit, where a large number of patients lived with the HIV/AIDS condition. More than half of respondents who met DSM-5 criteria for MDD were taking medication for a chronic disease.

The assessment for association between MDD and chronic co-morbid diseases revealed that MDD was significantly associated with all chronic diseases when combined. This implied that patients living with chronic conditions were more likely to develop MDD compared to patients without chronic illnesses. The chronic diseases identified were mainly diabetes mellitus, hypertension, asthma, HIV/AIDS, and epilepsy.

MDD was significantly associated with chronic co-morbid conditions because many patients living with chronic diseases were unemployed and most of them were poor. They depended on the free medical services provided by the government. The researcher suspected that some of them could be subjects of stigma and rejection. The clinic in which the study was conducted sees a large number of patients daily, a common scenario in many public health institutions across South Africa. In such an overcrowded environment, it is difficult to keep someone's mood high

This confirmed previous studies where it was found that MDD was significantly associated with epilepsy, diabetes, HIV/AIDS, asthma, and epilepsy.[18, 31, 32, 33]

5.5.2. MDD and co-morbid epilepsy

Taken individually, epilepsy was found to have a significant association with MDD compared to all other chronic diseases. The results concurred with previous studies where they found that MDD was associated with epilepsy.[21]

5.5.3. MDD and diabetes mellitus

The study revealed that MDD was not significantly associated with diabetes mellitus. The absence could be explained by the quality of care received by participants and by the length of time between the diagnoses of these chronic conditions and the time of this research study. The length of time between the diagnosis of chronic conditions and the development of MDD was not assessed during data collection. Future studies, should include the length between chronic illness diagnosis and the occurrence of MDD.

The absence of association between MDD and other chronic illness taken separately contrasted with previous studies where it was confirmed that MDD is significantly associated with diabetes mellitus and asthma.[32]

The reason for this difference could be due to the fact that all participants with chronic conditions in the study were clinically controlled and stable. They had been on medication for a reasonable period of time and their conditions alone might not have played a major role in the risk of developing MDD.

5.5.4. MDD and HIV/AIDS

The study failed to demonstrate an association between MDD and HIV/AIDS. Previous studies found a significant association between the two conditions.[21, 33] The difference with previous studies could be related to the general conditions of participants. In this study, all HIV participants interviewed had been attending the clinic for reasonable long time, and were clinically stable. All unstable patients were excluded from participating in the study. That could be the reason why HIV as a condition had played less influence.

5.5.5. MDD and hypertension

A significant number of participants living with hypertension met the criteria for MDD. However, the assessment of association between the two conditions failed to demonstrate any significance. The study result therefore, demonstrated a contradiction with previous studies were it was found that MDD was significantly associated with co-morbid hypertension.[18]

Nevertheless, it should be mentioned that this study sample was small for each category of chronic disease, which carried the risk of arriving at a biased conclusion. Therefore, the researcher recommends that studies with a large sample size for each chronic disease should be conducted to confirm the relationship between MDD and chronic diseases.

5.5.6. Pregnancy and MDD

Even though pregnancy is not a disease, pregnant respondents were included in the study to assess pregnancy's association with MDD. It was found that pregnancy was not significantly associated with MDD. A small number of participants were pregnant and few met MDD diagnostic criteria. Pregnancy as a condition did not show an additional risk for patients to develop MDD. This was consistent with a prospective cohort study conducted in Oslo among pregnant women; it was found that the prevalence of depression was 13% among all women from different ethnic backgrounds.[42]

The results revealed that women were not more exposed to developing MDD during pregnancy, regardless of the hormonal changes they go through. Pregnancy itself might not have influenced the risk for MDD, but the researcher acknowledged that many factors may influence the life of a pregnant woman depending on circumstances in which the pregnancy happened and the social support available to these pregnant women. Therefore, a larger study is needed to take consideration of other factors involved in a pregnant woman's life to assess their influence, other than just pregnancy. The researcher believes that this study was a ground breaking research in his work environment, and hopefully future studies shall build on current findings.

5.6. Study Limitations

The convenience sample used in this study must have provided an opportunity for selection bias. The oral translation of the PHQ-9 form to other African languages could have changed the participants' responses due to the level of the translators' competency. The translation of the questionnaire in local languages could help to include everyone, but because Daveyton township is very diverse culturally, patients speak different languages; therefore, it was challenging to translate the questionnaire into many languages to accommodate everyone. Regardless of these challenges this study provides very useful information in profiling a patient suffering from MDD attending a primary care clinic in South Africa.

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1. Conclusion

MDD prevalence was found to be high among adult patients attending Daveyton Main Clinic. Among those diagnosed with MDD, a significant number of them were suicidal. Unemployed participants were found to have more MDD. Male and female patients shared almost equally the

burden of the disease. Participants' age showed no increased risk of developing MDD by a specific age. The majority of MDD patients were college graduates, but this was not an added risk to developing the disease. The marital condition of participants did not have a direct negative impact exposing them or be vulnerable to develop MDD, even though a large number of participants diagnosed with MDD were single.

Patients living with chronic co-morbid diseases were at higher risk of developing MDD. Epileptic participants were the most affected among all chronic diseases. While HIV/AIDS, diabetic, asthmatic, and hypertensive participants were less affected.

The profile of patients diagnosed with MDD described by this research's findings, should help all practitioners working in Daveyton Main Clinic to have a high index of suspicion to diagnose patients suffering from MDD.

6.2. Recommendations

Taking in consideration the findings of this study, namely the high rate of MDD, the high association between MDD and unemployment, the association between MDD and chronic diseases in general, the researcher would like to make the following recommendations:

6.2.1. The first recommendation will be to ensure that all health care providers working in non-psychiatric units at primary care level are aware that MDD is common and that routine screening to detect it be conducted for patients visiting the clinic.

6.2.2. Regular in-service training for health professionals on MDD. The responsible personnel should be the nursing managers and doctors allocated at the clinic, who should plan and organise these in-service training programs.

6.2.3. Because of the seriousness of MDD diagnosis, health care workers need to be supported and trained as soon as the clinic's management receive the study's report.

6.2.4. The screening tool, the PHQ-9 questionnaire forms for the diagnosis of MDD should be included in patients' files and displayed on the notice board to remind practitioners to screen for MDD. The nursing manager and his/her deputy need to coordinate and supervise nurses to order adequate stationaries to be used for each patient.

6.2.5. The last recommendation is for the Government agencies and business community to address the unemployment and keep it at its lowest level to give a large number of the community members an opportunity to be financially stable and to avoid the negative impact of the lack of employment on the patients' mood. This can be achieved by

supporting learners during their career orientation and subject selection, and it should be introduced early in their curriculum to allow all learners to have an idea of what can be achieved in the current labour market, and support the micro-economy sectors that may assist in employing a large number of people.

6.2.6. Additional research is needed to establish the full profile of a patient living with MDD attending primary care clinics, including all the most common symptoms and extensive chronic conditions.

6.2.7. In addition to this, the management outcome of all these patients should be studied to determine their prognosis.

REFERENCES

1. Murray C, Lopez A. The global burden of disease. Boston, Mass, World Health Organization and Havard University Press; 1996. Available from: http://www.hup.havard.edu/catalog.php. (Accessed on 28/01/2016).
2. Gilchrist G, Gunn J. Observational study of depression in primary care: what do we know? BMC Fam Pract 2007 May; 8:28. Available from: URL: http://www.biomedcentral.com/1471-2296/8/28. (Accessed on 25/05/2014).
3. Joska J. The unhappy or depressed patient. In: Primary health care psychiatry, ed by SE Baumann. Cape Town: Juta, 2008, pp. 423-45.
4. Sadock BJ, Sadock VA. Kaplan & Sadock's Pocket handbook of clinical psychiatry. 5th ed. Philadelphia (PA): Lippincott Williams & Wilkins; 2010.
5. American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders. Arlington: American Psychiatric Association, 2013.
6. Freeman CP, Joska JA. Dealing with major depression. S Afr Pharm J 2013; 80(6): 16-21.
7. Dillard DA, Smith JJ, Ferucci ED, Lanier AP. Depression prevalence and associated factors among Alaska native people: The Alaska education and research toward health (EARTH) study. J Affect Disord 2012; 136: 1088-97.
8. Zainab AM, Pereira XV. Depression in primary care part 1: screening and diagnosis. Malays Fam physician 2007; 2(3): 95-101.
9. Bhana A, Rathod SD, Selohilwe O, Kathree T, Petersen I. The validity of the patient health questionnaire for screening depression in chronic care patients in primary health care in South Africa. BMC Psychiatry 2015; 15: 118-27.
10. McQuaid JR, Stein MB, Laffaye C, McCahill EM. Depression in a Primary care clinic: the prevalence and impact of an unrecognized disorder. J Affect Disord 1999; 55:1-10.
11. Nimalasuriya K, Compton MT, Guillory VJ. Screening adults for depression in primary care: A positive statement of the American College of preventive Medicine. J Fam Pract 2009; 58(10): 535-8.
12. Stromberg R, Wernering E, Aberg-Wistedt A, et al. Screening and diagnosing depression in women visiting GP's drop in clinic in primary health care. BMC Fam Pract 2008; 9:34. Available from URL: http://www.biomedcentral.com/1471-2296/9/34. (Accessed on 25/05/2014)
13. Schutt PE, Kung S, Clark MM, Koball AM, Grothe KB. Comparing the Beck Depression Inventory-II and Patient Health Questionnaire Depression measures in

an outpatient bariatric clinic. Springer, 2015 September. Available from URL: http://www.ncbi.nlm.nih.gov/pubmed/26341087 (Accessed on 26/01/2016).

14. Kung S, Alarcon RD, Williams MD, et al. Comparing the Beck depression inventory-II and patient health questionnaire depression measures in an integrated mood disorders practice. J Affect Disord 2013; 145: 341-3.
15. Khamseh ME, Baradaran HR, Javanbakht A, et al. Comparison of the CES-D and PHQ-(depression scales in people with type 2 diabetes in Tehran, Iran. BMC Psychiatry 2011; 11:61. Available URL: http://www.biomedcentral.com/1471-244X/11/61. (Accessed 25/01/2016)
16. Zung WW. A self- rating depression scale. Arch Gen Psychiatry 1965; 12(1): 63-70.
17. Grobler G. Major depressive disorder. S Afr J Psy August 2013; 19(3): 157-63.
18. Flamerzi S, Al-Emadi N, Al-Kuwari MG, Ghanim IM, Ahmad A. Prevalence and determinants of depression among primary health care attendees in Qatar 2008. Middle East J Fam Med 2010 March; 8(2). Available from: URL: http://www.mejfm.com/March2010/depression.htm (Accessed on 24/05/2014)
19. Derman EW, Whitesman S, Dreyer M, Patel DN, Nossel C, Schwellnus MP. Healthy lifestyle interventions in general practice: part 12: lifestyle and depression. S Afr Pract 2010; 52(4): 271-5.
20. Goar SC, Obembe A, Audu MD, Agbir MT. Utilization of health care services by depressed patients attending the general out-patients department of the Jos university teaching hospital, Jos, Nigeria. Niger J Clin Pract 2012 March; 15(1): 59-62.
21. Manning JS. Difficult-to-treat depressions: A primary care perspective. J Clin Psychiatry 2003; 64(1): 24-31.
22. Tomlinson M, Grimsrud AT, Stein DJ, Williams DR, Myer L. The epidemiology of major depression in South Africa: Results from the South African stress and health study. S Afr Med J 2009 May; 99: 367-73.
23. Herman AA, Stein DJ, Seedat S, Heeringa SG, Moomal H, Williams DR. The South African stress and health (SASH) study: 12-month and lifetime prevalence of common mental disorders. S Afr Med J May 2009; 99(5): 339-44.
24. Ngoma MC, Prince M, Mann A. Common mental disorders among those attending primary health clinics and traditional healers in urban Tanzania. Br J Psychiatry 2003; 183: 349-55.

25. Udedi M. The prevalence of depression among patients and its detection by primary health care workers at Matawale health centre (Zomba). Malawi Med J 2014; 26(2): 34-7.
26. Magnil M, Gunnarsson R, Bjorkstedt K, Bjorkelund C. Prevalence of depression symptoms and associated factors in elderly primary care patients: A descriptive study. J Clin Psychiatry 2008; 10(6): 462-8.
27. Aragones E, Labad A, Pinol JL, Lucena C, Alonso Y. Somatized depression in primary care attenders. J Psychosom Res 2005; 58: 145-51.
28. Barry KL, Fleming MF, Manwell LB, Copeland LA, Appel S. Prevalence of and factors associated with current and lifetime depression in older adult primary care patients. Fam Med 1998; 30(5): 366-71.
29. Wittchen H, Pittrow D. Prevalence, recognition and management of depression in primary care in Germany: the depression 2000 study. Hum Psychopharmacol Clin Exp 2002; 17: S1-S11.
30. Geulayov G, Lipsitz J, Sabar R, Gross R. Depression in primary care in Israel. Isr Med Assoc J 2007; 9: 571-8.
31. Uzun S, Kozumplik O, Topic R, Jakovljevic M. Depression disorders and comorbidity: somatic illness VS side effect. Psychiatr Danubina 2009; 21(3): 391-8.
32. Naqvi H, Khan MM. Depression in primary care: difficulties and paradoxes. J Pak Med Assoc 2005; 55(9): 393-8.
33. Penzak SR, Reddy YS, Grimsley SR. Depression in patients with HIV infection. Am J Health Syst Pharm 2000 Feb; 57: 376-89.
34. Boden JM, Fergusson DM, Horwood LJ. Cigarette smoking and depression: Tests of causal linkages using a longitudinal birth cohort. Br J Psychiatry 2010; 196: 440-46.
35. M. Botha. Validation of Patient Health Questionnaire-9 in an African context. 2011. Available from URL: http://www.dspace.nwu.ac.za/bitstream/handle/10394/4647/Botha_MN. (accessed on 29/12/2013).
36. Senarath U, Wckramage K, Peiris SL. Prevalence of depression and its associated factors among patients attending primary care setting in the post-conflict Northern Province in Sri Lanka: a cross-sectional study. BMC Psychiatry 2014; 14: 85-95.
37. Shittu RO, Odeigah LO, Issa BA, Olanrewaju GT, Mahmoud AO, Sanni MA. Association between depression and social demographic factors in a Nigerian family practice setting. 2014; 3(1): 18-23. Available from URL: http://www.scirp.org/journal/ojd. (Accessed on 23/01/2016)

38. Mosotho NL, Louw DA, Calitz FJW, Esterhuyse KGF. Depression among Sesotho speakers in Mangaung, South Africa. Afr J Psychiatry 2008; 11: 35-43.
39. Qin X, Wang W, Jin Q, Ai L, Li Y, Dong G, et all. Prevalence and rates of recognition of depressive disorders in internal medicine outpatient departments of 23 general hospitals in Shenyang, China. J Affect Disord 2008 Sep; 110(1-2): 46-54.
40. Afolabi MO, Abioye-Kuteyi EA, Fatoye FO, Adewuya AO. Pattern of depression among patients in a Nigerian family practice population. SA Fam Pract 2008; 50(2): 63a-63e.
41. South Africa. 2013. Women Empowerment and Gender Equality Bill, No. 37005. Published 6 November 2013. Available URL: https://www.jutalaw.co.za/media/filestore/2013/11/B50_2013.pdf (Accessed on 21/01/2016).
42. Shakeel N, Eberhard-Gran M, Sletner L, et al. A prospective cohort study of depression in pregnancy, prevalence and risk factors in a multi-ethnic population. BMC pregnancy and childbirth 2015; 15: 5-16.

APPENDICES:

Appendix 1: PHQ-9 QUESTIONNAIRE

Over the past two weeks, how often have you been bothered by any of the following problems?

	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself, or that you are a failure, or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed, or the opposite – being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead, or of hurting yourself How difficult have these problems made it for you to do your work, take care of things at home, and get along with other people?	0 Not difficult	1 Somewhat difficult	2 Very difficult	3 Extremely difficult

Appendix 2:

DEMOGRAPHIC AND CHRONIC ILLNESSES QUESTIONNAIRE

1. Are you male or female: (Tick) Male Female
2. If you are female, are you pregnant: Yes No
3. What is your age (in years): ……
4. What is your population group: Black Coloured Indian White
   Other, specify
5. What is your Highest Education: None Primary school High school College/University
6. What is your marital status? Single Married Separated Widowed
   Divorced Co-habiting
7. Are you employed: Yes No
8. Do you suffer from any chronic condition like: Diabetes mellitus
   Hypertension
   Asthma
   HIV
   Epilepsy
   Hyper/hypothyroidism
   Other,

Appendix 3:

INFORMATION SHEET

Good day,

I am Dr NM Mpangula a registrar from the department of Family Medicine at the University of the Witwatersrand Medical School. I am doing a research on depression among adult patients in Daveyton Main Clinic. Depression is the leading cause of disability worldwide among people aged five and above, yet its diagnosis is still uncommon in Daveyton Main Clinic.

Why am I doing this study?

Studies in other countries have shown that depression disorder is very common and is the second common cause of disability among adult patients. Its early detection and treatment can help to improve the quality of life of patients who suffer from it significantly. We want to find out how common this condition is among our patients, and determine which other factors are associated with it. Therefore, I will be very grateful if you would participate in a study to examine this.

What do I expect from you as a participant in this study?

I would like a few minutes of your time to answer a few questions in the study questionnaire. I do not need your name, date of birth, or ID number. However, I will ask general questions about your age, sex, population group, educational background, and medical history.

Are there benefits to the participants?

If you have never been screened for depression, you will be screened and given the necessary information about the condition, if it is established that you exhibit depression symptoms, you will be treated at Daveyton Main Clinic. Contact numbers of the clinic: telephone 011 424 3206 (reception), 011 424 8741 (nurses office).

May I refuse or withdraw from the study?

Certainly, you may do this at any time without giving a reason. Remember that the study is completely voluntary and not taking part in it, or withdrawing from it, carries no penalties of any sort and your attendance at this clinic will not be influenced.

What about confidentiality?

Confidentiality will be maintained by anonymity. I do not need your ID number or name. I will need only your age, gender, education level, marital status, population group, and medical history. Additionally, the form that you complete will be kept locked in an office.

If you have any queries, more information may be obtained by calling Dr Mpangula on telephone number 079 108 4323, 011 717 1237 (during office hours) or you may also contact Prof Cleaton-Jones, chairperson of the Human Research Ethics Committee (medical) using the contact information: telephone number 011 717 2301, email- peter.cleaton-jones1@wits.ac.za. Secretariat: Ms Zanele Ndlovu and Mr Langutani Masingi, zanele.ndlovu@wits.ac.za, langutani.masingi@wits.ac.za, telephone 011 717 1052/2700/1234/2656.

If you are happy to participate in the study, please read and sign the attached consent form. In case you are unable to read, we will assist you.

Thank You.

Dr NM MPANGULA

Appendix 4:

CONSENT DECLARATION:

I agree to participate in the study about depression among adult patients at Daveyton Main Clinic and fully understand what is contained in the accompanying information sheet that I have read/ that was read to me by the research team.

Name:…….....

Signature:……

Date:……

Witness:……..……

Appendix 5:

Ethics clearance certificate, title approval and Daveyton Main Clinic manager's letter

R14/49 Dr Ndaye Michel Mpangula

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M141107

NAME: (Principal Investigator)	Dr Ndaye Michel Mpangula
DEPARTMENT:	Family Medicine Daveyton Main Clinic Ekurhuleni Health District
PROJECT TITLE:	Depression among Adult Patients attending Daveyton Main Clinic, Ekurhuleni Health District, Gauteng, South Africa
DATE CONSIDERED:	28/11/2014
DECISION:	Approved unconditionally
CONDITIONS:	
SUPERVISOR:	John MM Musonda
APPROVED BY:	Professor P Cleaton-Jones, Chairperson, HREC (Medical)
DATE OF APPROVAL:	07/01/2015

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Secretary in Room 10004, 10th floor, Senate House, University.

I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated, from the research protocol as approved, I/we undertake to resubmit the application to the Committee. **I agree to submit a yearly progress report**.

Principal Investigator Signature _____ Date _____

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

GAUTENG PROVINCIAL GOVERNMENT

Department of Health
Lefapha la Maphelo
Departement van Gesondheid
Umnyango wezeMpilo

Enquiries : Sr Nyakatya
Tel : (011) 424 8741
Fax : (011) 734-4306

To: Dr NM Mpangula
Daveyton Main Clinic

From: Sr. M Nyakatya
Clinic manager
Tel no 0114248741

Re: depression among adult patients attending Daveyton main clinic, Ekurhuleni, Gauteng, south Africa.

I would like to thank you for choosing our facility to conduct the above project for the benefit of our clients. Your request has been approved with no objection.
We wish you all the best in the whole process of this project.
Thank you.

Sr. M Nyakatya M.N.Nyakatya
Clinic manager
Date: 17/10/2014

EKURHULENI METROPOLITAN MUNICIPALITY
2014 -10- 17
DAVEYTON MAIN CLINIC
HEALTH & SOCIAL DEVELOPMENT
BENONI S.D.C

Faculty of Health Sciences
Private Bag 3 Wits, 2050
Fax: 027117172119
Tel: 02711 7172076

Reference: Ms Thokozile Nhlapo
E-mail: thokozile.nhlapo@wits.ac.za

20 October 2014
Person No: 511037
PAG

Dr NM Mpangula
12 Lodestar Street
Rhosesfield
Kempton Park
1619
South Africa

Dear Dr Mpangula

Master of Medicine: Approval of Title

We have pleasure in advising that your proposal entitled *Depression among adult patients attenting Daveyton Main Clinic, Ekurhuleni Health District, Gauteng, South Africa* has been approved. Please note that any amendments to this title have to be endorsed by the Faculty's higher degrees committee and formally approved.

Yours sincerely

Mrs Sandra Benn
Faculty Registrar
Faculty of Health Sciences

