CHAPTER 1   INTRODUCTION

A.   DEPRESSION

Definition

The World Health Organization (WHO) defines depression as a common mental disorder that presents with depressed mood, loss of interest or pleasure, feelings of guilt or low-self worth, disturbed sleep and appetite, low energy and poor concentration (WHO, 2010).

According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) depression is a disorder with both physical and mental characteristics that negatively impacts an individual's ability to function day to day, in both social and work environments. Depression is diagnosed when a condition of this nature lasts for more than two weeks   (American Psychiatric Publishing, June 2000).

The South African version of the Concise Oxford Dictionary, Edition 1999 defines depression as severe despondency and dejection, especially when long-lasting (South Africa Concise Oxford Dictionary, 1999).

Findings from previous studies conducted by the World Health Organization (WHO), University of New Mexico Health Sciences Centre and Moosa and Jeenah (2007), in South Africa, conclude that depression is common in the general population and occurs frequently in patients with HIV/AIDS.

In this study, the researcher would like to find out whether depression occurs in adult patients on antiretroviral treatment for Human Immunodeficiency Virus (HIV) in the Rustenburg primary health care system and how common depression is among these patients.

B. HIV/AIDS.

Definition:

Human Immunodeficiency Virus (HIV) is the virus that causes Acquired Immune Deficiency Syndrome (AIDS) and occurs worldwide.

The United Nations joint programme on HIV/AIDS's (UNAIDS) report on global HIV/AIDS estimates, At the end of 2008 UNAIDS estimated that the number of people living with AIDS (PLWAS) in the world was 33,4 million. Among these people, 22.4 million adults and children living with HIV/AIDS reside in Sub-Saharan Africa. Adult prevalence is 5.2% and deaths of adults and children were estimated to have been 1.4 million people in 2008 (UNAIDS, 2009).

From the South African Department of Health study 2007, the prevalence of HIV/AIDS in the North West province is estimated at 29.0% of the adult population (South Africa HIV/AIDS Statistics, 2010).

The South Africa National Survey 2008 estimated HIV/AIDS's prevalence among adults in South Africa 25 years and older, was 16.9%. Prevalence of HIV/AIDS, in the North West province in 2002-2008 was estimated to be 11.3% (South Africa HIV/AIDS Statistics, 2010).

Origins of the Human Immunodeficiency Virus (HIV):

The Human Immunodeficiency Virus (HIV) is a zoonosis that can cross species in transmission. Two plausible reasons given are; that humans are exposed to infected primate blood during hunting and that social, economic and behavioural changes that occurred in humans predispose them to infection. The first transmissions occurred around 1920-40 in West Central and West Africa (Advanced KITSO, 2008).

C. Background to the Research problem

The researcher is a medical officer who works in Job Shimankana Tabane Hospital (JST Hospital) and also at Boitekong Health Centre, in the Rustenburg sub district.

JST Hospital was one of the four selected sites in the North-West Province that initiated the antiretroviral therapy programme in 2003. There was a rapid increase in the number of patients on treatment, with approximately 8000 patients registered in the programme, of which 5000 were on antiretroviral therapy by 2006.The rapid increase in the number of patients who needed antiretroviral therapy posed a major challenge to the hospital and the health care system. The patient load, space, resources and manpower were seriously strained by the huge number of patients. A down referring system was put in place in 2007, to address this challenge. The new system down referred patients to primary health care facilities. Patients who had been on treatment for six months, who had an undetected viral load and patients without any opportunistic infection, were considered stable and referred to their nearest health centre or clinic. Approximately 820 patients on antiretroviral therapy were referred down in 2008.

As a medical officer at one of the receiving community health centres, the researcher encountered patients on antiretroviral therapy from the hospital, who showed signs of depression, of which they were unaware.. The researcher became concerned about the undiagnosed depression and consequences to the patients. As no similar study had been done in this locality, the researcher decided to conduct a study on the prevalence of depression among adult patients on antiretroviral therapy for HIV, in the Rustenburg primary health care setting.

D. Study setting

1. Profile and geographical background of Rustenburg

"Rustenburg" means "town of rest" and is situated in the North- West Province of South Africa, roughly 100 km or a ninety minute drive from both Johannesburg and Pretoria.

Rustenburg is surrounded by townships, farms and mines of platinum and chrome. Most of the patients from the area work at a mine.. Rustenburg stands in a region that provides more than 75% of the world's supply of platinum. Mining and agriculture are the key economic sectors in Rustenburg.

2. Socio Economic profile

Based on census 2001 and implementing the STATS SA population growth formula to estimate annual growth, Rustenburg had a population of about 433,701 on April 2010. (SA Department of Water Affairs ,2001).

Common challenges in this area include increasing unemployment (more or less 40%), poverty, under- and malnourishment, a high crime rate, substance abuse, poor sanitation, and a high dependency rate on social grants, The poor management of tuberculosis, as presented by the Department of Health of the North West Province in an update of the Bojanala district profile for the website, also adds to problems encountered by people who live in this area.

Social circumstances and behaviors of miners lead to high rates of sexually transmitted Infections (STIs) and tuberculosis.
During April 2010, nine new cases of tuberculosis (TB) were registered in the Boitekong Health Centre. Multidrug resistance (MDR) for tuberculosis,

reported in the same centre, for January, February and March 2010 was one, two and one respectively.

From January to April 2010 the Boitekong Health Centre recorded 14 cases of TB defaulters. In Hartebeesfontein clinic, the number of new cases of TB was three for April 2010, MDR was two and there were three defaulters. In the Tlhabane Health Centre nine new cases of tuberculosis were registered and, three MDR and 13 defaulters were reported in April 2010 (Rustenburg sub district report 2010).

In Terms of sexual transmitted infections (STIs); in May 2010, Boitekong health centre had 125 new cases and Hartebeesfontein 82 cases. Information about TB and STIs from the two Health centers and the clinic was obtained from the Rustenburg sub district office (Rustenburg sub district report 2010).

The Corporate Responsibility Report 2007 estimates the prevalence of HIV/AIDS in Impala (one of the big mines in Rustenburg) to be about 29% among the adult population in the areas of primary operations (Rustenburg sub district report 2010).

Rustenburg has one provincial hospital (Job Shimankana Tabane Hospital), four health centers and sixteen clinics. This research was conducted in two health centerses (Tlhabane and Boitekong) and one clinic (Hartebeesfontein) which were the three sites accredited to receive down referred patients on HIV treatment, in Rustenburg district.

3. Location of health centre and clinic
Boitekong Health Centre is about 10Km to the North West of Rustenburg central town, on the main road (Thabazimbi road) linking Rustenburg to the Limpopo province. Hartebeesfontein clinic is roughly 42 Km to the

North West of Rustenburg central town. To get to the clinic one has to travel along the Thabazimbi road and continue along the Beestekraal road about three to four kilometers after the Boitekong Health Centre. Tlhabane Health Centre is   about nine kilometers north of Rustenburg central town along the Nelson Mandela drive road.

5. Catchment population

Boitekong Health centre serves a population of 36,844, Hartebeesfontein clinic 22,023 and Tlhabane 43,225 (Rustenburg sub district report 2010).

6. HIV prevalence

The Rustenburg sub district office data, from the antenatal clinic (ANC) in Boitekong Health Centre, show the HIV infection prevalence for attending patients for April and May 2010 to have been 33%.ANC data for the Hartebeesfontein clinic for April and May 2010 showed a 29% prevalence of HIV infection among patients (Rustenburg sub district report 2010).

7. Numbers of down referred patients

By midyear 2009, JST hospital down referred 271 adults to Hartebeesfontein, 323 adults to Boitekong Health Centre and 226 adults to Tlhabane Health Centre (Rustenburg sub district report, 2010).

CHAPTER 2.   LITERATURE REVIEW

Internet search engines were utilized in conducting a literature review. Electronic literature through Google, the United States Library of Medicine (Pubmed) and Cochrane were used to search for information.

2.1   Definition of depression

Depression can be described as feeling sad, blue and unhappy, miserable, or down in the dumps. Depression is a mood disorder in which feelings of sadness, loss, anger or frustration interfere with everyday life for an extended period of time (Ballas P. & Jefferson T., 2009).

Most of the authors of literature reviewed by this researcher, define depression using its clinical presentations. These clinical features can also be seen in a normally functional human being from time to time, but do not last for more than two weeks, as described in the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Publishing, 2000) and also by Schimelpfening N (2007).

Other authors are not precise on the duration of the clinical symptoms but mention a few weeks (WHO, 2010; South Africa Concise Oxford Dictionary, 1999).

Depression often goes undiagnosed, perhaps because some of its signs might be seen in the daily life of a normal human being, or the HIV infection may presenta similar clinical picture. For the purpose of this research study, all patients with classical signs of depression (persistently sad, anxious, empty mood, feeling of guilt, worthlessness, helplessness, loss of interest, fatigue, difficulty to concentrate, with insomnia, weight change, thoughts of death, irritability etc…) for more than two weeks and with an HIV test positive, shall be assumed to be depressed.

2.2 Diagnosis of depression

2.2.1 Clinical features

Consultation for a family physician remains the principal way that leads to a good diagnosis. Depression is a problem of mood. A person is depressed when five of the following factors are present: diminished interest in all or most activities, significant weight loss or disturbance in terms of appetite, excessive sleeping or chronic tiredness, insomnia, loss of self-esteem, decreased attention or concentration or ability to think clearly, suicidal ideations (Carver J. M. & Mulhauser G., 2009).

2.2.2 Use of tools

Kerr L.K. and Kerr L.D. (2001) present comprehensive self-reporting tools as one of the ways of diagnosing depression in a primary setting. Although these tools have some limitations, using these tools are considered better than to risk missing a depression case.

2.3 Prevalence of depression

In the United States of America approximately 20.9 million American adults suffer from mood disorders, Around 9.5 % of the U.S. population older than 18 years, are annually diagnosed with a mood disorder. The median age of onset is around 30 (National Institute of Mental Health, 2010).

Olorunfemi et al. (2007) encourage mental health education in the rural areas because it has been found that depression is more common in rural than urban areas, in the Nigerian population.

The prevalence of mental disorders in adult African rural communities in South Africa is 23.9% (95% CI 15.1%-32.7%) with 4.8% of these patients suffering from major depression (Bhagwanjee A., Parekh A., Paruk Z., Petersen I. & Subedar H., 1998).

2.4 Types of depression

The seven most common types of depression, as described by Schimelpfening N. (2007) are:

Major depressive disorder; two weeks of mood disorder characterized by lack of interest in activities that you used to enjoy, changes in sleep and weight, tiredness even for no reason, feeling guilty, lack of concentration and suicidal ideations.

Dysthymic disorder; a mild to moderate, chronic state of depression.

Bipolar disorder; a patient experiences alternating manic episodes (elevated moods) and depression (low moods).The manic period can last from one hour to months before the patient returns to depression.

Postpartum depression; depression that occurs in women after the birth of a baby.

Seasonal affective disorder; Depression is related to a particular season e,g. winter.

Premenstrual dysphoric disorder (PMDD) occurs before the menstruations. The patient will be irritable, tired, anxious, nervous, experience mood swings and depression, have changes in appetite and experience abdominal discomfort and tenderness of the breasts.

Atypical depression doesn't follow the typical set of depression symptoms like lack of appetite and insomnia. The patient who suffers from atypical depression does not experience improvement of mood when good things happen.

In National Institute of Mental Health (1999), other authors classify depression in 3 types:

Major depression as a depressive disorder that involves the body, mood and thought as described in the definition of depression.

Dysthymia as a less severe type of depression, a long-term condition which, from time to time, results in major depression or acute depression.

Bipolar disorder or manic-depressive illness where depression alternates with severe high mood is also called also mania.

2.5   Causes of depression in HIV positive patients.

2.5.1 Multiple factors

In general, depression in an adult does not have certain causes. Causes include many risk factors such as childhood events; current psychosocial adversities such as social context and personality dimensions, and genetic factors (Butler R., Hatcher S., Price J. & Korff M,, 2007).

2.5.2 Adverse effects of drugs (ARV)

In Cape Town, in his assessment and management of depression in HIV patients, Seedat S. (2007)   mentions that depression can also be caused by an antiretroviral drug efavirens, also called stocrine.

2.5.3. Other drugs
The use or the low levels of testosterone, vitamin B6, or Vitamin B12 has been described to be associated with depression in aidsinfonet.org since 1998 (2010).
2.5.4. HIV status
Awareness of having an HIV positive test result can also lead to the onset of depression as it has been described in depression and HIV/AIDS (The Body,2002).
2.5.5 Other co morbidities
Some conditions, such as anaemia or diabetes in an HIV positive patient can cause symptoms that look like depression, as described in aidsinfonet.org since 1998 (2010).

2.5.6 Other risk factors:

Being female , being without enough social support, treatment (ARV) failure and other factors are also described as indicating a high risk for depression in the HIV positive patient, in aidsinfonet.orgsince 1998 (2010).

2.6   HIV/AIDS and depression

Many studies in the world show that there is an association between HIV/AIDS and psychiatric disorders such as depression.

Depression is common in people living with HIV/AIDS. In a study conducted at the University of New Mexico Health Sciences centre, almost 60% of HIV/AIDS patients were found to suffer from depression (2009).

Rabkin J. (1995) came to a similar conclusion while studying psychiatric disorders among patients with HIV infection. The rate of depression for his study among gay men, was between 4 and14%.

Schade A. and Bierman W.F. (2009) in ʺHIV infection and psychiatric symptoms: a common and important combinationʺ, confirm that about 50% of HIV patients have one or more mental disorders such as depression or anxiety disorders.

Other studies enumerated in the introduction of this study elicit that depression has been noticed in HIV/AIDS patients (Moosa and Jeenah, 2007; University of New Mexico Health Sciences Center,2009).

2.2   Diagnosis of depression in HIV/AIDS

Rabkin J, (1995) conclude that depression and HIV/AIDS infection result in similar somatic or physical symptoms, complicating diagnosis. In both HIV/AIDS infection and in depression there is fatigue, low libido, low appetite, lethargy and weight loss. Rabkin states the questions the the

health care worker asks the patient, can help the health care worker to make a good diagnosis; e.g. "If it were not for the lesions in your mouth, or the antibiotic you are taking, would you feel like eating? Or if you had energy, are there things you would like to do today?" Asking relevant questions can be complicated but would certainly help if the patient can still express him/herself.

The signs can be confusing when dealing with an advanced HIV patient. He may present with tiredness, loss of appetite and loss of weight and other signs seen in depression. To avoid confusion, Kerr L.K. and Kerr L.D. (2001) consider screening for depression by using self-reporting tools.

Moosa and Jeenah (2007) support the idea of Judith, Laura and Len, by stating that the diagnosis can be difficult because of the fact that there is similitude of symptoms such as fatigue, lethargy, low libido, diminished appetite and weight loss. Nevertheless, by asking questions around feeling sad, losing interest in formerly enjoyable activities, guilt and irritability, which are aspects of mood affliction, the health care worker may differentiate depression from HIV/AIDS infection.

As described by authors (Moosa, Jeenah and Kerr), to diagnose depression in patients with HIV/AIDS is not easy because of similitude of symptoms. A good consultation, with appropriate questions, and combined with the use of tools or questionnaires, may lead the health care worker to make a good diagnosis and treat the patient accordingly.

2.3   Management strategies of depressions

From New York State Psychiatric Institute, Rabkin R. and Rabkin J. (1995) state that the recognition of signs of depression and improving the quality of a patient's life should be the first idea in the mind of the health care provider. A depressed person who also has, AIDS can be treated either with psychotherapy or with medication.

Olatunji B., Miniaga M.J., Cleirigh C. and Safreen S.A. (2006), summarized some studies conducted on the treatment of depression in HIV positive patients and reported that depression is associated with poor self-care and lead to worse health outcomes in patients with HIV/AIDS.   They emphasized the fact that recognizing and treating depression is very important as it was also stipulated by Rabkin R. and Rabkin J. (1995). Numerous authors found that there is a significant relationships between depressive symptoms and HIV disease progression   (Burack J.H. et al, 1996; Kacanek D. et al, 2007). These authors confirmed that psychosocial interventions procure a significant reduction of depression's symptoms, as shown in depression outcome studies; and pharmacologic agents such as Selective Serotonin Reuptake Inhibitors (SSRIs), TriCyclic Antidepressants (TCAs) and Psychostimulants (e.g. desipramine) appear to be effective in the treatment of depression in HIV-infected individuals. Most of the patients who used SSRIs (e.g. fluoxetine) and TCAs (e.g. imipramine) reported some side-effects such as dryness of the mouth, sleeplessness, nausea and headache. The side effects explained the drop-off reported in some trials.

From literature, most of the authors present two modalities of management of depression: the psychosocial interventions and use of pharmacologic agents.   A better management can be applied once the cause of the depression is known (Kacanek D., Jacobson D.L., Spiegelman D., Wanke C., Issac R. & Wilson I.B., 2010).

Depression in HIV/AIDS should be managed by a mental health professional   e.g, a psychiatrist, psychologist or social worker, in close communication with the physician providing ARV treatment, as described in depression and HIV/AIDS (The Body,2010).

In the Rustenburg primary health care system , depressed HIV positive patients were treated with amitriptylin (Tricyclic) , referred to the psychologist and given a follow up plan. The severely depressed patients were referred to the psychiatrist for management and follow up.

CHAPTER 3   <u>METHODOLOGY</u>

3.1   <u>Title</u>

Screening for depression among adult patients on antiretroviral therapy for human immunodeficiency virus (HIV) attending Primary Health Care facilities in Rustenburg.

3.2   <u>Aim of the study</u>

To determine the prevalence of depression among adult HIV positive patients on antiretroviral therapy, presenting for treatment at three clinics in the Rustenburg district.

3.3   <u>Objectives</u>

- To describe the profile of patients on antiretroviral therapy, attending Primary Health Care facilities in Rustenburg.
- To determine levels and severity of depression amongst adult patients on antiretroviral therapy for human immunodeficiency virus (VIH), attending primary health care facilities in Rustenburg sub district.
- To describe the characteristics of patients with depression amongst patients on antiretroviral therapy, attending Primary Health Care facilities in Rustenburg.

3.4   <u>Study Design</u>

This is a cross-sectional quantitative study using a questionnaire adapted from the World Health Organization's (WHO) Zung self-rating depression scale to screen for depression.

The Zung Self-Rating Depression Scale designed by Duke University psychiatrist,Dr William W. assessed the level of depression among patients who were diagnosed with depressive disorder. The scale quantifies the depressed status of a patient.

There are 20 items on the scale that rate the four common characteristics of depression: the pervasive effect, the physiological equivalents, other disturbances and psychomotor activities. There are twenty questions, each is scored on a scale of 1 through 4 (based on the replies: "a little of time", "some of the time", "good part of the time", "most of the time". By adding the individual item scores the total score is obtained and   ranges from 20 to 80. People with a depression score of 20 to 49 are considered not to have depression. A depression score of 50 to 59 indicates mild depression, a score from 60 to 69 indicates moderate depression and a score of 70 and more indicates severe depression. (WHO,2010; Wikipedia).

3.5   Study Population

The study population consisted of all adult patients on antiretroviral therapy referred down from the hospital to the Primary Health Care facilities in Rustenburg. 820 patients on Anti Retroviral Therapy had been down referred to multiple sites in the district.

3.6   Sample Size

The sample size was 117 patients with a 95 % confidence level,

The Epi info statistical analysis program was used to calculate the sample size needed.

3.8   Inclusion Criteria

-    Adult patient (18 years or older) on antiretroviral therapy, referred down to the clinics from Job Shimankana Tabane (JST) hospital.

-    Patient consents to participate in this study.

-    Patient able to respond to questions either in English or Setswana.

3.9   Exclusion Criteria

-    Patient younger than 18 years.

-    Patient unwilling or unable to consent to participate.

-    Patient too ill to participate in the study.

-    Patient unable to communicate in Setswana or English.

3.10   Setting

The study was carried out in Rustenburg sub-district (Primary Health Care facilities). The study sites were two health centers, Tlhabane and Boitekong and one clinic, Hartebeesfontein, to where patients were down referred.

3.11   Sampling

Adult patients on antiretroviral therapy attending three primary care facilities were sequentially selected. At each study site, on a randomly selected day, the first patient attending the ARV clinic was selected as the first participant. The next patient in line would be included until the desired number, proportional to the patient numbers in the three facilities, was achieved. According to the relative proportions of down referred patients, the desired numbers were 38 for Hartebeesfontein, 46 for Boitekong and 33 for Tlhabane clinics.

Three nurses trained as research assistants explained the study to potential participants. Once the patient agreed to participate in the study, informed consent would be signed. Any patient who declined was not included in the sample. Recruiting continued until 117 questionnaires were completed..

3.12 Method of Data Collection

The Zung depression assessment questionnaire, adapted from the World Health Organisation, was administrered by three trained nurses who were able to communicate in both English and the local language (Setswana).Each centre has one trained nurse. The study participant selected the preferred language (English or Setswana) and the research assistant administered the questionnaire in that language. The trained nurse asked the questions to all the participants and captured the answers in the questionnaire.

In the first part of the questionnaire, demographic details such as age, sex, marital status of the participant and the kind of work the patient does, was asked for. The participants were also asked to give the names of the drugs (Antiretroviral) that they were taking and for how long they had been on this treatment. If the participant could not name the medication, the trained nurse retrieved the names of the medications from the patient's clinical record.

In the second part of the questionnaire, the trained nurse scored the responses to the questions from the participant by ticking the appropriate square on the questionnaire. A numerical value was accorded to each response and added to find a total score for the 20 questions for the Zung depression scoring system

3.13 Data analysis

Information contained in 117 completed questionnaires was captured

on a MS Excel spreadsheet. Each questionnaire was assigned a unique number (UN) starting from 001 to 117. The unique numbers were useful during the data cleaning process whenever a particular questionnaire was needed to correct information. Variable labels were developed to represent personal information and the 20 questions measuring depression. These labels were captured in the first row of the spreadsheet and information for each questionnaire was captured in subsequent rows. The data was cleaned for incorrect entries and converted into a SPSS data file. Values for each variable were described in SPSS. For example, gender, F=female and M=male. Responses to questions 1 to 20 were scored using the "Key to scoring the Zung Self-Rating Scale". Levels of depression were computed as follows: No depression= 0-49; Mild depression =50-59; Moderate depression=60-69; Severe depression=70-79; and Very severe depression=80 and above.

The patient's answers were scored based on the key to scoring Zung Self-rating depression scale. A patient with a total score of less than 50 was not diagnosed with depression. Those with a total score equal to or more than 50 were diagnosed as depressed and were managed according to the clinical protocol of the management of depression in the North West province.

Data analysis was done by the contracted statistician. Descriptive statistics were computed to describe the sample of the participants and levels of depression. The only inferential statistic used in the analysis was the chi-square which indicates if the proportions of participants suffering different levels of depression, were significantly different among various variables. For example chi-square tests were done between levels of depression and sex (female, male), age, types of ARV drug, clinic attended etc. As is the case in other social science analysis, a significance level of $p=0.05$ was used where a chi-square value with p inferior or equal 0.05 was considered

statistically significant. Chi-square with p greater than0.05 was considered "not statistically significant". The results of the analysis are presented in the section on "Results".

3.14 Reliability, Validity, Bias and Error

Reliability

This is the ability of a test to reproduce the same results when repeated.   .

In this study a standardized questionnaire was administered by one trained assistant, in a language chosen by the participant.

This enhanced reliability.

Validity

This is an expression of the degree to which a test is capable of measuring what it is intended to measure (Beaglehole R., Bonita R. and Kjellstrom T., 2000).

In this study, the only instrument or tool used to assess depression amongst adult patients on Antiretroviral Therapy for human immunodeficiency (HIV) in Rustenburg Primary Health Care, is the World Health Organization's questionnaire on depression (Zung self-rating depression scale).

Bias and Error

Bias and error refer to any effect that may cause a systematic deviation of results or interference from the truth (Ogunbanjo G.A., 2000).

Bias of interpretation of data: two languages were used in the administration of questionnaires to the participant. Participants were asked to choose the questionnaire that was in their language of preference. In the case that he or she did not understand something; the trained nurse clarified it in the patient's preferred language (English or Setswana).

3.15 Ethical Considerations

The research protocol was approved by the Medical Research, Ethics and Publications Committee (MREC) of the University of Limpopo/ Medunsa campus. A clearance certificate was issued: MREC/M/29/2009, on 6th May 2009.

Permission to conduct the study at the two health centers and one clinic was obtained from the sub district manager.

Each participant was given a full explanation about the aim and the objectives of this research. The questionnaire was shown to all adult patients who received consultation and those patients who agreed to participate and gave their consent, became part of the sample.

Name, surname, identity number, physical address, work address and contact numbers were not requested on the questionnaire. This was done so that anonymity and confidentiality could be maintained throughout the entire process.

The researcher recruited adult patients only.

Although the judicial maturity differs from country to country, in this particular study, an adult was considered to be someone aged 18 and older.

CHAPTER 4   <u>RESULTS</u>

Results of 117 adult patients selected to participate in this study are presented.

Following data analysis, an overview of the results obtained will be presented under the following major headings:

- Demographic data (age, sex, marital status, occupation)
- Clinic attended
- Type of ARV Regimen used (ARV= antiretroviral drugs)
- Comparison of sex and level of depression
- Comparison of clinic and level of depression
- Percentage and type of depression (mild, moderate, severe)
- Comparison of marital status and level of depression
- Comparison of age and level of depression
- Comparison of type of ARV Regimen and level of depression

4.1   <u>Demographic Data</u>

4.1.1 Age Category

Table no.1: <u>Frequency and percentage of participants and Age category</u>

	Frequency	Valid Percent
18-29 yrs	14	12
30-39 yrs	49	41.9
40-49 yrs	38	32.5
50 yrs & Over	16	13.6
TOTAL	117	100.0

4.1.2 Sex

During this particular month (December 2009), there were more female participating patients (70 %) than males (29 %).

Table no.2: <u>Frequency and percentage of participants and sex category</u>

sex	Frequency	Percent
Female	82	70.1
Male	35	29.9
TOTAL	117	100.0

4.1.3 Marital Status

Seventy percent of participants were unmarried. One (0.9%), was divorced, twenty-seven percent were married and one percent was widowed.

Table no. 3 : <u>Frequency and percentage of participants and Marital Status category.</u>

	Frequency	Percent

Unmarried	82	70.1
Divorced	1	0.9
Married	32	27.4
Widowed	2	1.7
TOTAL	117	100.0

4.1.4 Occupation

Ninety patients (76.9%), were unemployed. Domestic Workers made up three point four percent of the participants with Mine Workers and Pensioners being two point six percent in each group. Vegetable Sellers, Drivers, Cleaners, Taxi Drivers and Shopkeepers equaled one point seven percent of each group. Sales Ladies, Admin Clerks, Artisans, Casual Workers, Dockers, Home Based Care Givers and a Municipal Tree Feller constituted zero point nine percent each.

Table no.4: <u>Frequency and percentage of participant and Occupation category</u>

	Frequency	Percent
Unemployed	90	76.9
Admin Clerk	1	0.9
Artisan	1	0.9
Casual Worker	1	0.9
Cleaner	2	1.7
Docker	1	0.9
Domestic Worker	4	3.4
Driver	2	1.7
Home Based Care Giver	1	0.9

Mine Worker	3	2.6
Municipal Tree Feller	1	0.9
Pensioner	3	2.6
Saleslady	1	0.9
Shopkeeper	2	1.7
Taxi Driver	2	1.7
Vegetable Seller	2	1.7
TOTAL	117	100.0

4.2 <u>Clinic Attended</u>

The majority of patients were from the Boitekong Health Centre (74 %) followed by the Tlhabane Health Centre (17 %) with the Hartebeesfontein Clinic constituting the smallest proportion, 9 %.

In the months of November and December 2009, the attendance of patients to the clinics varied greatly from the calculated numbers to be sampled. There was a large inter-clinic transfer of patients from Tlhabane to Boitekong as the former clinic was undergoing structural revitalization with consequent challenges of clinical space and from Hartebeesfontein that was fully saturated. As such more patients were sampled from Boitekong clinic than previously intended.

Table no.5: Frequency and percentage of participants and Clinic
category

	Frequency	Percent
Boitekong	86	73.5
Hartebeesfontein	11	9.4
Tlhabane	20	17.1
TOTAL	117	100.0

4.3   Antiretroviral Regimen used and the Participants (Type and
    Frequency)

More than half of the participants (58.1 %), were on 3TC (Lamuvidine),
D4T (Stavudine) and EFV (Effavirens or Stocrine). These three drugs
constitute the first line treatment of HIV infection in South Africa.

Twenty point four percent were on 3TC (Lamuvidine), D4T (Stavudine)
andNVP (Niverapine).

Height point five percent were on AZT (Zidovudine),3TC (Lamuvidine) and
EFV (Efavirans). Four point three percent were on on AZT (Zidovudine),
3TC (lamuvidine) and NVP (Niverapine). Two participants or one point
seven percent were on KLT (Kaletra), D4T (stavudine) and 3TC
(Lamuvidine).

Table no.6: <u>Number and percentage of participants and ARV Regimen</u>
<u>   category</u>

ARV Regimen	Number of participants	Percentage
D4T, 3TC+ EFV	68	58.1 %
D4T, 3TC+ NVP	30	27.4 %
3TC, EFV+ AZT	10	8.5 %
3TC, AZT+ NVP	07	4.3 %
3TC, D4T+ KLT	02	1.7 %

4.4 Depression <u>(Level, frequency and Percentage)</u>

Sixty nine percent had mild depression, twenty eight percent had "No Depression" while a small proportion of two percent and one percent had moderate and severe depression respectively.

Table no.7: <u>Frequency and percentage of participants and Level of</u>
<u>depression</u>

	Frequency	Percent
No depression	33	28.2
Mild depression	81	69.2
Moderate depression	2	1.7
Severe depression	1	0.9
TOTAL	117	100.0

4.6.1 Table no.8: <u>Table of comparison of Sex and Level of Depression.</u>

	No Depression	Mild Depression	Moderate Depression	Severe Depression	TOTAL COUNT
Female	24 (29.3%)	58 (70.7%)	0 (0.0%)	0 (0.0%)	82 (100%)
Male	6 (17.1%)	27 (77.1%)	1 (2.9%)	0 (0.0 %)	35 (100%)
TOTAL	30 (25.4%)	85 (72.6%)	1 (0.85%)	1 (0.85%)	117 (100%)

There were no statistically significant differences between the proportions of males and females with various levels of depression (χ^2 = 2.24, df = 3, p $\geq$ 0.05)

4.6.2 Table no.9: <u>Table of comparison of clinic attended and level of depression.</u>

	No Depression	Mild Depression	Moderate Depression	Severe Depression	TOTAL COUNT
Boitekong	9.3 %	87.2 %	2.3 %	1.2 %	11
Hartebees-fontein	100.0 %	0.0 %	0.0 %	0.0 %	86
Tlhabane	70.0 %	30.0 %	0.0 %	0.0 %	20
TOTAL	28.2 %	69.2 %	1.7%	0.9 %	117

There were significant statistical differences between the proportions of patients attending the three clinics and the level of depression (χ^2 = 60.54, df = 6, p $\leq$ 0.05).

While all the patients in the Hartebees-fontein showed "no depression", 87 % and 30 % in the Boitekong and Tlhabane Clinics respectively had "Mild Depression". Only small proportions of patients

with moderate and severe depression were found in the Boitekong and Tlhabone Clinics.

4.6.3 Table no.10: <u>Table of comparison of Marital Status and Level of Depression.</u>

	No Depression	Mild Depression	Moderate Depression	Severe Depression	TOTAL COUNT
Not indicated	24.4 %	74.4 %	1.2 %	0.0 %	82
Divorced	100.0 %	0.0 %	0.0 %	0.0 %	1
Married	37.5 %	59.4 %	3.1 %	0.0 %	32
Widowed	0.0 %	50.0 %	0.0 %	50.0 %	2
Total	28.2 %	69.2 %	1.7 %	0.9 %	117

There were significant statistical differences between the proportions of patients with different marital status and levels of depression (χ^2 = 63.4, df = 9, p ≤ 0.05).

4.6.4 Comparison of Age Category and Level of Depression.

There were no significant differences (Chi-square = 9.27, p ≥ 0.05) between age category and levels of depression. Depression was not associated with the age of the participants.

Table no.11: <u>Table of comparison of Age category and Level of</u>

depression.

			Depression category				
			No Depression	Mild depression	Moderate depression	Severe depression	Total
Age Cat	18-29 yrs	Count	4	10	0	0	14
		% within Age Cat	28.6%	71.4%	.0%	.0%	100.0%
	30-39 yrs	Count	18	31	0	0	49
		% within Age Cat	36.7%	63.3%	.0%	.0%	100.0%
	40-49 yrs	Count	8	27	2	1	38
		% within Age Cat	21.1%	71.1%	5.3%	2.6%	100.0%
	50 & Over yrs	Count	3	13	0	0	16
		% within Age Cat	18.8%	81.3%	.0%	.0%	100.0%
Total		Count	33	81	2	1	117
		% within Age Cat	28.2%	69.2%	1.7%	.9%	100.0%

4.6.4   Table no:12 Table of comparison of Type of ARV Regimen and Level of Depression

ARV Regimen	No depression	Mild depression	Moderate depression	Severe depression	Total	Percentage
D4T,3TC+EFV	19	46	02	01	68	58.1%
D4T,3TC+NVP	06	24	00	00	30	27.4%
3TC,AZT+EF	02	08	00	00	10	8.5%

V						
3TC,AZT+NVP	03	04	00	00	07	4.3%
3TC,D4T+KLT	00	02	00	00	02	1.7%
Total	30	84	02	01	117	100%

D4T means stavudine, 3TC is lamivudine, EFVis efavirens or stocrine, NVP is niverapine and KLT is kaletra.

Sixty eight patients were taking stavudine,lamivudine and efavirens.

Thirty were taking stavudine , lamuvidine and niverapie and ten were taking lamuvidine, zidovudineand efavirens.

CHAPTER 5   DISCUSSION

Different variables such as age, sex, marital status, occupation, clinic and drugs were considered while analyzing the occurrence of depression among patients on antiretroviral for HIV.

In this chapter, each variable will be discussed, to evaluate the impact or association with the occurrence of depression among HIV clients on antiretroviral therapy.

5.1 Association between Age category and Depression amongst patients on ART

The main finding is that patients older than forty nine have the highest percentage (81.3%) of depression.

The relationship between age and depression was analyzed in the Department of Sociology, University of Illinois, United States of America.

For some reasons such as physical dysfunction, it was said that depression reaches its highest level in adults 80 years old or older (Mirowsky J. and Ross C.E., 1992).

In "44 is the age of depression ,say researchers" Richard Alleyne (2008) compares the ages of developing depression for both British men and women and found that both sexes are likely to develop depression at about 44 years of age while 40 and 50 years of age was when American women and men, respectively developed depression.

Harvard Medical School reports that depression can strike anybody at any age. It is common for an individual to face depression at different times in his life, for different reasons (President and fellows, 2007).

Depression had been found among adolescents while analyzing the academic achievement of high school students (Yousefi et al, 2010).

Answering to a question: "In which age group is depression most common?" Winker M. (2008) explained that there is a peak of onset of depression around 30 years of age. Depressed people have their first depressive episode before 40 years of age. Elderly people have a pronounced risk of depression. Winker (2008) concluded that only 10% of all depressed people will have their depressed episode before 60 years of age.

Depression is more persistent in older women than older men as presented in a study by Nauert R. and reviewed by Grohol J.M. (1998).The researchers conducted a study among people aged 70 and older.

Henry K. (2009); Vance D.E., Moneyham L., Fordham P. and Struzick T.C. (2008) and also the Guidelines and use of the National Institute of Mental Health (NIMH) publications 2009, studied the relationship between aging and HIV infection. They concluded that aging people with HIV/AIDS had an

increased risk of numerous common diseases as such heart disease, cancer, osteoporosis, stroke, dementia and depression.

In HIV related memory loss linked to Alzheimer's protein, Clifford D.B., Fagan A.M., Morris J.C., Teshome M., Sarah A.R. and Kauwe J.S.K. (2009) state that, with aging, some HIV patients will develop cognitive deficits related to HIV and other Alzheimer's disease.

Sale S. and Gadanya M. (2008) found a high prevalence of depression among 15 to 20 year old HIV patients in Nigeria.

Abiodun O.A. (2006) requests the use of Edinburgh Postnatal Depression Scale (EPDS) as a tool for diagnosing depression into maternal and child care programs of primary health care in developing countries (Africa) .This will assist in early detection of depression and the application of an appropriate therapeutic intervention.

Agbir T.M. (2010) found, in the study conducted in Nigeria that no significant association was found between depression and the age of participants.

Research on suicide attempts, as one of the risk factors of depression, found that an average age for fatal suicides is about 36 years old in South Africa (Schlebusch L., 2005).

5.2 <u>Association between Gender category and depression amongst patients</u>

   <u>on ART</u>

The main finding for this category in my study was that men and women are equally depressed. There were no statistically significant differences between males and females.

The World Health Organisation (WHO) with Professor Ronald Kesser, as a chief investigator, repeated the research known as the United States National Co-morbidity Survey conducted between 1990 and 1992, between 2001 and 2003Heconcludes that mental illness is equally prevalent among men and women. However, some notable differences were identified e.g. that women are twice as likely to have a single episode of major clinical depression in their life, than men. He concluded that the total number of depressive episodes men and women can have in their life is almost the same (Gonzales L., 2007). This is in keeping with this researcher's findings.

In the United States and internationally, Culberton F.M. (1997) confirmed that women experience depression about twice as frequently as men. Some researchers, such as Klerman and Weissman (1989) and Wetzel (1994) even quote a female- male ratio of 3:1.There is no similarity with this researcher's study.

Mc Grath et al. (1990) found that,regarding gender and depression, women are at higher risk for depression than men because of some socioeconomic, biological and emotional variables.

In terms of gender difference in depression prevalence, Nancy Schimelpfening (2009) supports what was confirmed by Frances M.C. and concludes that women are exposed to factors contributing to depression more often than men.

In contrast with what the international literature presents, in developing countries Kisekka (1990) described higher rates of depression in men than

women, based on the Orley study that compared gender differences in psychiatric institutions of Africa; and Nolen-Hoeksema (1990) reported no gender difference.

Although men and women experience depression in different ways, depression is more common in women than men in developed countries and the ratio is about 2:1, but for developing countries the ratios vary, with most reporting no differences as presented by Frances M. Culbertson in the conclusion of his article reviews (1997).

Although women are reported to have a higher risk of depression than men in most of the studies, in this Rustenburg study, there were no statisticaly significant differences between the number of males and females who could be diagnosed as being depressed

5.3 Association between Marital status and depression amongst patients on ART

The main finding in this research was that there were significant statistical differences between different marital statuses.

One of the predictors of mortality in heart failure is depressive symptoms. Positive spousal support is associated with improved outcomes in case of heart failure. Although married patients experience longer event free periods than people who are not married, the levels of depressive symptoms were similar between married and non married patients (Misook L. et al., 2009).

Erica C. et al. (2009), in their article, conclude that low social support is associated with worse health status and more depression for the first year, after an acute myocardial infarction, for women.

Leserman J. et al. (1999) examined the effects of stress, depressive symptoms and social support, on the progression of HIV infection. They conclude that less social support causes more stress and it can accelerate or worsen the HIV condition.

The National Survey of families and households (Lapierre T.A., 2009) conclude that men and women are better in the first marriages compared to in other marital status categories, with regard to depressive symptoms.

In a survey conducted on marital status, gender and depression: "Analysis of the baseline survey of Korea longitudinal study of ageing (KLoSA).", no significant differences were found between married women versus widowed, divorced or separated, with regard to depressive symptoms (Soong-Na ng Jang et al., 2009)

From "Connect Africa", marriage benefits and its general contribution to the well being for a person, is greater for men than women. The rate of depression is lower for the married men, than for single and divorced men. Lack of intimacy and marital strive are linked to women's depression (Onah T., 2010).

Depression was significantly associated with unmarried, diabetic and HIV patientswho had poor relationships with their partners, according to the study conducted in Nigeria (Agbir T.M., Audu M.D., Adebowale T.O. & Goar S.G., 2010).

In South Africa, male partners of infertile couples experience a high level of psychological distress (Dyer S. et al., 2009).

5.4   Association between occupation category and depression amongst patients on ART

In this study the finding was that depression was more common amongst the unemployed than patient participants who were employed. The sample in this study included 117 participants of whom 90 were unemployed.

Depression resulting from unemployment has increased over the years. When people found their dreams crashing down because of a lack of employment they become overwhelmed with sorrow, grief and hopelessness and depressed (Redmonds S., 2010).

Depression, even a minor level of depression, is associated with a significant decrease in all quality of live domains and got worse with aging (Chachamovich E., Fleck M., Laidlaw K. and Power M., 2007).

The negative impact that depression can create in the community in terms of economic productivity should also be considered (WHO, 2010; Kumar & Encinosa W., 2009; Horberg M.A. et al., 2008).

Zulu H. (2003) describes unemployment as linked to depression and as the worst killer in Africa.

Policies that would reduce unemployment in South Africa are really needed because of high unemployment rates. Unemployment causes the unemployed to suffer mental and physical hardship (Koller M., 2005).

5.5 Association Level between depression and participants' demographic characteristics

The main finding is that most of the respondents had mild depression (69.2%)

Kartha D. (2010) found that mild depression is common among women and men but not many people who are depressed are aware of the fact

that they have depression. The presence of depression should be acknowledged and the patient has to be seen by a health worker to prevent the occurrence of something more serious.

Barnaud K. (2007) discusses aetiologies of mild depression that can be linked to external factors i.e. exogenous depression e,g. major worries or family tragedy but depression also sometimes occur for no apparent reason i.e. endogenous depression.

Patients on antiretroviral therapy for Human Immunodeficiency Virus, who live in rural areas are more vulnerable to depression than those patients who live in urban areas (Sheth S.H., Jensen P.T.& Lahey T., 2009).

In practical ideas and suggestions for coping with mild depression, Lovegrove B. (2010) describes mild depression as a mental disorder that can be controlled and perhaps cured, by using physical, mental and emotional exercises and techniques. When severe, depression needs the involvement of trained and expert health workers.

5.6. Association ARV Regimen and Depression amongst patients on ARV

Knowing that patients on ARV are always on three drugs, in this study the main finding is that the percentage of depression was higher in participants using the regimen of stavudine, lamuvidine and stocrine (58%) followed by those who were taking   stavudine, lamuvidine and niverapine (27.3%).

 AIDS Infonet (2009), state that depression can be caused by drugs-especially stocrine or efavirens.There is a similitude with the study since the higher level of depression is noted among patients taking the regimen that includes stocrine.

In the South Africa Medical Formulary (SAMF) sixth edition, it is brought to the attention that stocrine or efavirens causes severe depression and psychotic-like symptoms.

In Cape Town, Seedat S. (2007) found, what will be confirmed two years later by AIDS Infonet i.e.that Efavirens or Stocrin can also cause mental disorders.

Butler R., Hatcher S., Price J. and Von Korff M. (2007), support the idea that many risk factors can be the cause of depression in the adult HIV/AIDS patient, as was also stated by AIDS infonet.

5.7 Methodology

A descriptive cross-sectional study, using an adapted questionnaire from the World Health Organization (Zung Self-rating depression scale) was used to screen for depression among adult patients on antiretroviral therapy for human immunodeficiency virus, attending primary health care facilities in Rustenburg district.

5.7.1 Descriptive study

This study gives the picture of what is happening in a specific population (adult patients on ART in Rustenburg primary health care).

5.7.1 Advantages of the study design

Levin K. A. (2006) defined a cross-sectional study as a study carried out at one time point or over a short period. It estimates the prevalence of the outcome of interest for a given population.

This current study was conducted during December 2009.It describes the situation at that time, of the population of patients on ART in Rustenburg district and their characteristics. This studyalso describes the level and severity of depression among the same population.

5.7.2 Disadvantages of the study design

Neyman bias: since HIV/AIDS is a longer-lasting disease, any risk factor that may kill the patient will be under-estimated among those risk factors which are well established (e.g. depression) with the disease. Recall is real in a study involving behaviour modification, such as depression.

5.7.3   Sample selection

The changes in the sample size for the three facilities was a possible source of bias. Information bias hence arose from the changes employed in the proportions of patients sampled. A disproportionately large sample from Boitekong clinic could have had different characteristics to those from the two other clinics at which they were previously allocated. This is however mitigated by the fact that the three facilities serve patients which similar characteristics as they reside in the same geographical area.

The human factor predisposes bias in a study such as this. To limit bias some precautions were taken, such as making sure that participants understood questions, by providing the questionnaire in the participant's preferred language (English or Setswana) to prevent misinterpretation.

CHAPTER 6   CONCLUSION AND RECOMMENDATIONS

6.1   CONCLUSION

Based on the results obtained from this study during December 2009, depression is common among the adult patients who attended primary health care facilities in the Rustenburg district and who were on antiretroviral therapy for human immunodeficiency virus. Depression was diagnosed in 71.8% of participants in this study 81 (69.2%) had mild depression, 2 (1.7%) had moderate depression and 1(0.9) had severe depression.

6.2   RECOMMENDATIONS

By 2020 depression will be the second killer disease after heart disease; and since it is common in chronic diseases, all health workers dealing with patients who have a chronic disease, specifically HIV/AIDS, should be skilled in recognizing signs of depression.

In HIV/AIDS management, screening for depression should be considered an integral part of comprehensive care as missing it has catastrophic effects including poor compliance with treatment.

A guideline or protocol on management of depression in HIV/AIDS will help Health workers to provide good care to patients affected by the two conditions.

Organizing workshops in the management of depression in HIV/AIDS infection is recommended. The workshops could train people on the use of tools for screening for depression.

Health care workers should be educated on recognizing signs of depression especially in HIV/AIDS patients and be encouraged to use available tools in a primary health care setting.

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