

**EXPLORING DEPRESSION AMONG PEOPLE LIVING WITH
HIV/AIDS AND ATTENDING A PRIMARY HEALTH CARE CENTRE
IN KIGALI-RWANDA:
A DESCRIPTIVE, CROSS-SECTIONAL STUDY**

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**COURSE WORK MASTERS DEGREE IN NURSING
(MENTAL HEALTH NURSING)**

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Declaration

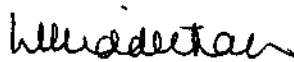
I, UMUBYEYI Benoite, declare that this dissertation titled “Exploring depression among people living with HIV/AIDS and attending a Primary Health Care Centre in Kigali, Rwanda: a descriptive, cross-sectional study” is my original work. It has never been submitted for any other purpose, or at any other University. I also declare that sources of information utilized in this work have been acknowledged in the reference list.



20th / 04 / 2010

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20/04/2010

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Dedication

This work is dedicated to you my late Mother, for all your love and care. This was made possible thanks to your intercession prayers. Rest in Peace.

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Benoite UMUBYEYI

Abstract

HIV is major public problem in the world and in Sub-Saharan Region in particular. The literature has shown that mental disorders and particularly depression are common among people living with HIV/AIDS, but that little is known about the prevalence of depression and factors associated with it, among people living with HIV/AIDS in Rwanda.

A descriptive, cross-sectional study was done to assess the prevalence of depression, the clinical profile and the factors associated with depression among people living with HIV and attending a primary health care centre in Kigali-Rwanda. This study was informed by the stress and vulnerability framework. A questionnaire was used to collect socio-demographic and HIV related medical information, while depression was assessed using the Beck Depression Inventory Scale, with a cut off of less than 10 for no depression and above 10 scoring positive for depression. Respondents were randomly selected from the patient appointment list for patients who were scheduled during the period of data collection and according to the sample selection criteria. The sample consisted of 96 people living with HIV. Permission to conduct the study was requested and obtained from the University of Kwazulu-Natal Ethics Committee, from the CNLS Research and Ethics Committee in Rwanda and from the management of the health care centre to consult patients' files.

Data was analyzed using the Statistical Package for the Social Sciences (SPSS for window, 15). Descriptive data was analyzed by means of frequencies, mean and standard deviation. Cross tabulation using Pearson' chi-square test was performed to test the association between socio-demographic factors and HIV related medical information and depression for categorical variables, while t-test for independent simple test was performed for continuous variable. Multi logistic regression analysis was performed to test further association between the above mentioned factors with depression, while controlling for confounders. The results were presented by means of tables, histograms and graphs.

The findings of the study revealed that depression is very high among HIV-infected patients attending a primary health care centre in Kigali, with a prevalence of 41.7%. The most frequent depressive symptoms presented were pessimism, fatigability, sad mood; lack of satisfaction, somatic preoccupation, loss of libido, crying spells, work inhibition, irritability, social

withdrawal and loss of appetite. The majority of respondents scored mild to moderate depression, whereas few had moderate to severe depression and only very few scored severe depression. Having considered all other socio-demographic and HIV related medical factors that were studied, being a female, having presented many HIV-related symptoms in the month prior to data collection, and having less than 250 CD4 counts were statistically associated with depression. On the other hand, having high social and family support was a protector factor to depression.

Although the results of this study are not generalizable to the Rwandan population living with HIV, they underscore the importance of integrating mental health in HIV/AIDS services for the care of those who present mental problems related to HIV such as depression.

List of abbreviations

AIDS:	Acquired Immunodeficiency Syndrome
APA:	American Psychiatric Association
ART:	Antiretroviral Therapy
BDI:	Beck Depression Inventory Scale
CDC:	Center for Disease and Control
CD4:	Cluster of Differentiation
CESD:	Centre for Epidemiologic Studies Depression Scale
CHASE:	Coping with HIV/AIDS in the Southeast Study
CI:	Confidence Interval
CNLS:	Commission Nationale de Lutte Contre le Sida
DSM-IV:	Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition
HAART:	Highly Active Antiretroviral Therapy
HCUS:	HIV Costs and Service Utilization Study
HIV:	Human Immunodeficiency Virus
MOH:	Ministry of Health
PTSD:	Post Traumatic Stress Disorder
SD:	Standard Deviation
SPSS:	Statistical Package for the Social Sciences
TRAC:	Treatment and Research AIDS Center
UNAIDS:	Joint United Nations Programme on HIV/AIDS
WE-ACTx:	Women Equity in Access to Care and Treatments
WHO:	World Health Organization
χ^2:	Chi-Square

List of Tables

Table 3.1:	Summary of content validity: Objectives and measurements.....	43
Table 4.1:	Socio-demographic characteristics of the sample.....	52
Table 4.2:	HIV medical related information of the sample.....	56
Table 4.3:	Prevalence of depression.....	57
Table 4.4:	Frequency of clinical symptoms.....	62
Table 4.5:	Relationship between age of respondents and depression.....	64
Table 4.6:	Relationship between gender of respondents and depression.....	65
Table 4.7:	Relationship between marital status and depression.....	66
Table 4.8:	Relationship between employment, economic status and living arrangement and depression.....	68
Table 4.9:	Relationship between level of satisfaction with support and depression.....	69
Table 4.10:	Family psychiatric history and depression.....	70
Table 4.11:	Logistic regression of relationship between demographic factors and likelihood to score positive to depression.....	71
Table 4.12:	Relationship between duration of known HIV and depression.....	73
Table 4.13:	Number of visit and admission to hospital and depression.....	74
Table 4.14:	HIV/AIDS related symptoms and depression.....	76
Table 4.15:	CD4 counts and depression.....	77
Table 4.16	Logistic regression of relationship between medical related factors and likelihood to score positive to depression.....	78

List of figures and graphs

Figure 4.1:	Age of respondents.....	49
Figure 4.2:	Support score.....	51
Figure 4.3:	Duration of known HIV status.....	53
Figure 4.4:	CD4 Counts.....	55
Graph 4.1:	Profile of depression.....	59
Graph 4.2:	Clinic profile of depression.....	60

Appendices

Appendix 1: Data collection instruments.....	110
Appendix 1.2: Data collection instrument translated in Kinyarwanda	116
Appendix 2: Letters of permission to conduct research.....	120
Appendix 2.1: Letter of permission to Kimironko health centre.....	120
Appendix 2.2: Letter of request for application for approbation.....	121
Appendix 3: Ethical approvals.....	122
Appendix 3.1: Letter of approval by CNLS.....	122
Appendix 3.2: Letter of approval by the Research Ethics Committee of the University of KwaZulu-Natal	123
Appendix 3.3: Letter of Permission to conduct research at Kimironko health care centre.....	124
Appendix 4: Patients information document and declaration of consent to participate.....	125
Appendix 5: Tables of variables.....	128
Appendix 5.1: Summary of variables, instruments and types of analyses used in HIV/AIDS and psychiatric disorder prevalence studies.....	128
Appendix 5. 2 Summary of this study design, the variables under study, the instruments to measure the variables and type of analysis.....	132.

Table of contents

Declaration.....	i
Dedication.....	ii
Acknowledgment.....	iii
Abstract.....	v
List of abbreviation.....	vii
List of tables.....	viii
List of figures.....	ix
List of annexures.....	x
CHAPTER ONE.....	1
1.1. Background to the study.....	1
1.2. Problem statement.....	6
1.3. Purpose of the study.....	7
1.4. Research objectives.....	7
1.5. Research questions.....	7
1.6. Significance of the study.....	8
1.7. Definition of key concepts.....	8
1.8. Conceptual framework.....	9
1.9. Conclusion	12
CHAPTER TWO.....	13
2.1 Introduction.....	13
2.2 HIV/ AIDS and Mental Illness in Rwanda.....	13
2.3 Psychiatric disorders in people living with HIV/AIDS.....	16
2.4 Risk factors for the development of psychiatric disorders among HIV infected	

patients	24
2.5 Impact of depression in the evolution and the treatment outcome of HIV/AIDS.....	28
2.6 Issues related to the diagnosis of depression among HIV infected patients in a primary health care setting.....	30
2.7 The role of the mental health nurse in the management of mental health problems associated with HI/AIDS.....	32
2.8 Conclusion.....	34
CHAPTER THREE.....	35
3.1 Introduction.....	35
3.2 Research paradigm and approach.....	35
3.3 Research design.....	36
3.4 Research setting.....	36
3.5 Research population.....	37
3.6 Sampling procedures.....	37
3.7 Data collection instruments.....	40
3.8 Validity and reliability of the tool.....	42
3.9 Data collection procedure.....	43
3.10 Data analysis.....	45
3.11 Data management.....	45
3.12 Ethical considerations.....	46
3.13 Conclusion.....	46
CHAPTER FOUR.....	47
4.1 Introduction.....	47
4.2 Description of the socio-demographic characteristics of the sample.....	48

4.3	Description of the medical information of the sample.....	52
4.4	Prevalence of depression among people living with HIV/AIDS and attending the selected primary health care center in Kigali.....	55
4.5	Clinical profile of depression among people living with HIV/AIDS attending the selected primary health care center in Kigali.....	57
4.6	Relationship between socio-demographic factors and depression in people living with HIV/AIDS.....	63
4.7	Relationship between HIV medical related information and depression.....	71
4.8	Conclusion.....	78
CHAPTER FIVE.....		79
5.1	Introduction	79
5.2	Personal and social protective factors in the sample	80
5.3	Depression among people living with HIV/AIDS attending a primary health care center in Kigali.....	81
5.4	Association between social-personal factors and depression in people living with HIV/AIDS.....	85
5.5	Association between biological vulnerability factors and depression in people living with HIV/AIDS.....	88
5.6	Limitations of the study.....	90
5.7	Recommendations.....	92
5.8	Conclusion.....	97
REFERENCES.....		98
APPENDICES.....		110

Chapter One

Introduction to the Study

1.1 Background to the study

HIV/AIDS continues to be a major public health problem worldwide. The Joint United Nations Programme on HIV/AIDS [UNAIDS], 2008) estimated that in 2007, 33 million people were living with HIV/AIDS, 2.7 million people were newly infected with the virus and 2 million people died due to AIDS related illnesses.

Sub-Saharan Africa is one of the world regions most affected by HIV/AIDS. The region comprises nearly fifty sovereign countries grouped into five sub-regions, namely Eastern Africa, Southern Africa, West Africa, Central Africa and the islands of the eastern coast of the continent (Beaglehole et al., 2008). The World Bank defines the majority of the countries within the region as middle-income to low-income countries. The region has a population of approximately 809115,000, 2.7% (22 million) of whom are living with HIV/AIDS (Population Reference Bureau, 2008). According to the UNAIDS report, 67% of all the people living with HIV/AIDS world-wide live in this region. This same report indicates that for 2007, 17 million people were newly infected with HIV and that 75% of all AIDS related deaths world-wide occurred in this region (UNAIDS, 2008).

The HIV/AIDS prevalence for adults in this region varies substantially from sub-region to sub-region and from country to country, ranging from 23-32% in Botswana and Swaziland, 12-28% in South Africa and to between 2% to 5% in many East African countries (UNAIDS, 2008). The HIV/AIDS adult prevalence has decreased in a number of East African countries and most notably in Rwanda from 5.2 % in 2004 to 3% in 2008 (UNAIDS, 2008). The prevalence of HIV/AIDS varies in Rwanda from 7.3% in urban areas to 2.2% in rural areas (UNAIDS, 2008).

Although the HIV/AIDS overall prevalence rate is decreasing in parts of the sub-Saharan region it is the leading cause of death in the region and fourth in the list of the ten leading

diseases for global disease burden (Stuckler, King, Robinson & McKee, 2008). Furthermore, HIV/AIDS is increasingly regarded as a chronic disease which in turn, contributes to the burden of chronic diseases which is increasing in low-income and middle-income countries (Beaglehole et al., 2008).

While HIV/AIDS dominates the overall burden of fatal diseases, neuropsychiatric conditions and particularly depression is responsible for the greatest proportion of the global disease burden for the non-fatal disabling conditions (Lopez, Mathers, Ezzati, Jamison & Murray, 2006). Depression is the seventh leading cause of burden of disease in low-middle income countries and the third leading cause in high income countries. Beaglehole, et al. (2008), estimate that neuropsychiatric disorders, most notably uni-polar depression, account for 14% of the global burden of disease. These authors demonstrate that this figure is increasing, particularly in lower-middle income countries.

The World Health Organization [WHO] Report on HIV/AIDS and mental health outline a number of studies which have demonstrated a high prevalence of psychiatric disorders in people infected by HIV/AIDS (WHO, 2008). According to Faber and McDaniel (2002) the prevalence rates of psychiatric disorders among people living with HIV are high, but vary from country to country and from study to study. Bing, Burnam and Longshore (2001) conducted a study to estimate the prevalence of psychiatric disorders and substance abuse among American adults infected by HIV and found that nearly half of their sample ($n=2864$) reported a psychiatric disorder. Similarly, Israelski et al. (2007) estimated the prevalence of psychiatric co-morbidity among a group of people in Northern California receiving primary care for HIV/AIDS. This study revealed that in a sample of 118 people, 56% screened positive for at least one psychiatric disorder.

A number of studies conducted in different countries in Africa, have documented a high prevalence of psychiatric disorders among people with HIV/AIDS (Adewuya et al., 2007; Myer et al. 2008; Sebit et al., 2003). These rates range from 19% (South Africa), 59% (Nigeria), and 71% (Zimbabwe) to 81% (Uganda). This variation in rate may be related to either clinical aspects such as HIV disease stage, or the methodology used to determine this prevalence. For example Myer et al. (2008) studied the common mental disorders

among individuals living with HIV in South Africa. This study found the overall prevalence of mental illness in HIV-infected individual to be high, with 19% of participants having either depression, post traumatic stress disorder, or alcohol abuse/dependence. In Nigeria, Adewuya et al. (2007) found that 59% of HIV-positive individuals who participated in their study had a co-morbid psychiatric disorder, and this rate was significantly higher than in non infected patients. In Zimbabwe, psychiatric disorders were also found to be high among people living with HIV/AIDS. The findings showed that 71.3% of HIV infected individuals had a co-morbid psychiatric disorder, compared to 44.3% of the HIV negative control group (Sebit et al., 2003). In Uganda, Petrushkin, Boardman and Ovuga (2005) found that the total prevalence of psychiatric disorders was 82.6% of which depressive and anxiety disorders were the most common.

A number of reasons are given for the presence of psychiatric disorders among people living with HIV/AIDS. Freeman, Patel, Collins, and Bertolote (2005) state that pre-morbid mental history, the effects of the HIV virus on the central nervous system, the psychological impact of living with HIV/AIDS, side effects of medication and results of social stigma and discrimination constitute some of the reasons for the high level of mental disorders affecting people living with HIV/AIDS. However, according to Freeman, Nkomo, Kaffaar and Kelly (2007), not everyone living with HIV/AIDS has a mental disorder.

Research suggests there are some socio-demographic factors and HIV medical related factors that increase the risk of having depression among people living with HIV/AIDS. Clinical factors such as number of HIV related symptoms, short time since the HIV status is known, illicit drug use and heavy alcohol use were significantly associated with psychiatric disorders among people living with HIV/AIDS (Bing et al., 2001; Myer et al., 2008). On the other hand, socio-demographic factors such as unemployment, marital status, living alone and poor social support were found to be significantly associated with the high prevalence of psychiatric disorders among people living HIV/AIDS (Adewuya et al., 2007; Bing et al., 2001).

Depression has been found to be the most common psychiatric disorder affecting people with HIV/AIDS. According to Valente (2003), depression constitutes one of the most common reasons for psychological evaluation and treatment for people living with HIV infection. It is estimated that a prevalence of depression among people living with HIV/AIDS in industrialized countries range from 9 to 60% (Kaharuza et al., 2006). Two studies, HIV Costs and Service Utilization Study (HCUS) and the Coping with HIV/AIDS in the Southeast Study (CHASE) (cited in Whetten, Reif, Whetten & Murphy-McMillan, 2008) found that depression was the most prevalent psychiatric disorder among people living with HIV in the United States, with similar level of prevalence rate of 36% and 35% respectively. Basu, Chwastiak, and Bruce (2005) report that the prevalence of psychiatric disorders among HIV infected people in India is approximately 50% with major depressive disorder being the most common co-morbid disorder with a prevalence ranging from 4% to 45%. In Uganda, Kaharuza et al. (2006) found that among 1017 HIV-infected participants assessed for depression, 47% screened positive for depressive symptoms.

Although psychiatric disorders, particularly depression, appear to be high in people living with HIV/AIDS they frequently go undetected and therefore untreated in HIV care settings (Israelski et al., 2007; Petrushkin et al., 2005). For example, Israelski et al. (2007) found that 56% of participants met symptom criteria of depression, post traumatic stress disorders and acute disorders, and of these, 43% reported no current treatment for any mental health condition. Only 24% of participants reported currently receiving psychotherapy services, and only 35% reported current use of psychiatric medications. Similarly, Petrushkin et al. (2005) found that among a small sample of 46 participants attending an urban clinic in Uganda, 38 screened positive for depressive and anxiety disorders, but none were receiving any treatment for their psychiatric disorders. Untreated depression among HIV infected people has been found to be associated with poor outcome of HIV/AIDS treatment and is likely to cause immunosuppression (Olatunji, Mimiaga, O'Cleirigh & Safren, 2006). Berger-Greenstein et al. (2007) found that some of the symptoms of depression such as difficulty concentrating, fatigue and suicidal thoughts interfere with medication adherence among people with HIV.

It is argued that there can be no health without mental health and that systematically addressing neuropsychiatric disorders in primary health care is one of the ways in which the burden of co-morbid diseases, especially mental disorders and HIV/AIDS, can be reduced over time (Prince et al., 2007). Depression has been found to be associated with lower overall health and poorer quality of life among people living with HIV/AIDS than with HIV-negative control groups (Williams et al., 2005). The degree of psychological distress is frequently related to the severity of symptoms of HIV infection, to a shortened life-expectancy, to complicated therapeutic regimens, stigmatization and loss of social support. Studies on the treatment of depression in people living with HIV/AIDS have showed promising results. In a critical review on the treatment of depression in people living with HIV/AIDS, antidepressant medications were shown to be as effective in ameliorating major depression in HIV-positive patients as in physically healthy patients (Ferrando & Freyberg, 2008). On the other hand, psychological interventions combining cognitive-behavioral therapy, individual psychotherapy, counseling, and education on self-management techniques have been shown to effectively treat depression in people living with HIV/AIDS (Valente, 2003).

Rwanda has made a number of efforts to improve the medical care of those affected by HIV/AIDS and it is more than likely that these efforts have contributed to the decreasing adult prevalence rate. For example, services for the prevention of HIV transmission from mothers to children have expanded and are accessible in more than half of the country's health facilities. Furthermore, the rate of male partners participating in mother to child transmission prevention services has increased from 9% in 2003 to 74% in 2006 (UNAIDS, 2008). The sites providing ARVs increased from 76 in 2005 to 165 in 2007, and the ARVs coverage rate from 71% to 84% (UNAIDS, 2008).

The World Health Organization (WHO, 2008) recommends that a successful HIV/AIDS intervention programme should include appropriate strategies for the assessment and management of mental disorders as part of the routine service. Israelski et al. (2007) and Freeman et al. (2005) argue that people receiving primary care for HIV/AIDS should be routinely screened and treated for symptoms of mental disorders as this has been shown to significantly improve the HIV disease outcome. These authors suggest that estimating

the prevalence of depression among HIV/AIDS affected people is important to developing and/or improving services for the treatment of mental illness at HIV treatment sites and thus, to improving HIV disease outcome and quality of life.

1.2 Problem statement

Although the impact of depression on quality of life in HIV/AIDS affected people is reasonably well documented in developed and high income countries, there are limited studies of the prevalence of depression in primary care HIV/AIDS treatment settings in Rwanda. However, statistical data provided by services delivering psychosocial care to people living with HIV/AIDS in Rwanda estimate that psychiatric disorders are common in HIV infected patients. The statistics of Women Equity in Access to Care and Treatment (WE-ACTx) show that of the 2640 HIV/AIDS people enrolled with the programme and attending for psychological follow-up, 49% experienced depression and 41% had a post traumatic stress disorder (Uwineza, Fabri, Zaninyana & Mafurebo, 2008).

The Treatment and Research AIDS Center [TRAC], 2008) recognizes that psychosocial care is an important component of a successful HIV service, and appears in the Rwanda National strategic plan for HIV and AIDS 2009-2012 as care and support outside the medical treatment. One of the strategies to achieve this is to integrate psychosocial support and mental health in the routine follow-up of the HIV patients (Commission Nationale de Lutte Contre le Sida [CNLS], 2009). Prince et al. (2007) argue that HIV services would be more likely to offer routine mental health care if the connection between depression and HIV/AIDS and between physical disorders and mental health in general, were better understood and appreciated.

This study therefore focuses on the prevalence of depression among HIV infected people attending an urban Primary Health Care Centre in Kigali, Rwanda. It will also explore the possible associations between depressive symptoms, socio-demographic factors and selected HIV medical related indicators.

1.3 Purpose of the study

The purpose of this study is to explore the prevalence of depression and to analyze the factors associated with depression among HIV infected patients attending the Kimironko Health Centre.

1.4 Research objectives

- 1.4.1 To explore the prevalence of depression among HIV infected patients attending the Kimironko Health Centre.
- 1.4.2 To describe the clinical profile of depression among HIV infected patients.
- 1.4.3 To explore the relationship between socio-demographic factors (age, gender, marital status, employment, socioeconomic status, social support, and history of a psychiatric disorders) and depression in people living with HIV/ AIDS.
- 1.4.4 To explore the relationship between HIV medical related indicators (CD4 cell counts, HIV related symptoms and time known of HIV status) and depression in people living with HIV/AIDS

1.5 Research questions

- 1.5.1 What is the rate of depression among HIV infected patients attending Kimironko Health centre?
- 1.5.2 What depression symptoms constitute depression among people living with HIV/AIDS?
- 1.5.3 What is the relationship between socio-demographic variables and depression among people living with HIV/AIDS?
- 1.5.4 What is the relationship between HIV related indicators and depression among people living with HIV/AIDS?

1.6 Significance of the study

The World Health Organisation report on HIV/AIDS and mental illness (WHO, 2008) has indicated that while low and middle-income countries carry more than 90% of the burden of HIV/AIDS, there is very little information about the interaction between HIV/AIDS and mental health in these countries.

The findings of this study would add to the limited body of knowledge about the prevalence rate of depression among HIV/AIDS infected patients in Rwanda. This will serve as a clinical reference to HIV care providers who may use the findings of this study to offer comprehensive care to their patients living with HIV/AIDS.

Since little is known about the prevalence of depression and the factors associated with depression in a population of people living with HIV in Rwanda, this study might serve as a foundation for future public health and nursing research in the area, thus deepening understanding of the issue. It is therefore anticipated that the study findings will contribute to the development of local knowledge about mental illness and HIV/AIDS and be used to inform nursing education curricula for both community and mental health nursing. The findings of this study might also help in influencing the development of appropriate policies, plans and intervention programmes for the management and treatment of psychiatric illnesses in HIV/AIDS treatment settings. This in turn, might improve the quality of care for people with HIV/AIDS who are also suffering from depression and thus and in so doing, their quality of life.

1.7 Definition of key concepts

1.7.1 People living with HIV/AIDS

People living with HIV/AIDS are defined in this study as all adults (18 years and older) who have been tested positive for HIV and who are receiving care and treatment at Kimironko Health Centre.

1.7.2 Depression

In this study, depression will be defined from the score obtained in Beck Depression Inventory Scale. All people living with HIV/AIDS who will have a score greater than 10 in the 21 Beck Depression Inventory will be considered as having depression.

1.7.3 Prevalence

In this study, prevalence refers to the extent to which depression is common in a sample of people living with HIV/AIDS and attending a primary health care center.

1.7.4 A primary health care center

A primary health care center is a health care center which offers comprehensive care to patients and which has an HIV/AIDS care and treatment service.

1.8 Conceptual framework

The conceptual framework for this study has been drawn from the literature on HIV/AIDS and psychiatric disorders, as well as from aspects of the stress vulnerability model of illness development (Adewuya et al., 2007; Berger-Greenstein et al., 2007; Bing et al., 2001; Farber & McDaniel, 2002; Komiti et al., 2003; Uys & Middleton, 2004).

According to Farber and McDaniel (2002), HIV/AIDS poses a number of acute and ongoing challenges that may influence emotional distress levels and psychiatric co-morbidity. Aspects of the stress vulnerability model of chronic and mental illness explain the impact of these challenges on this co-morbidity. This model suggests that biological factors predispose individuals to developing emotional problems and or/ specific diagnosable psychiatric symptoms in the presence and action of a number of personal and social factors. The psychiatric rehabilitation literature conceptualizes psychiatric symptoms as impairments. The term psychiatric symptoms will be retained for this study.

These factors may be both source of stress and a source of protection, depending upon their presence and action (Uys & Middleton, 2004).

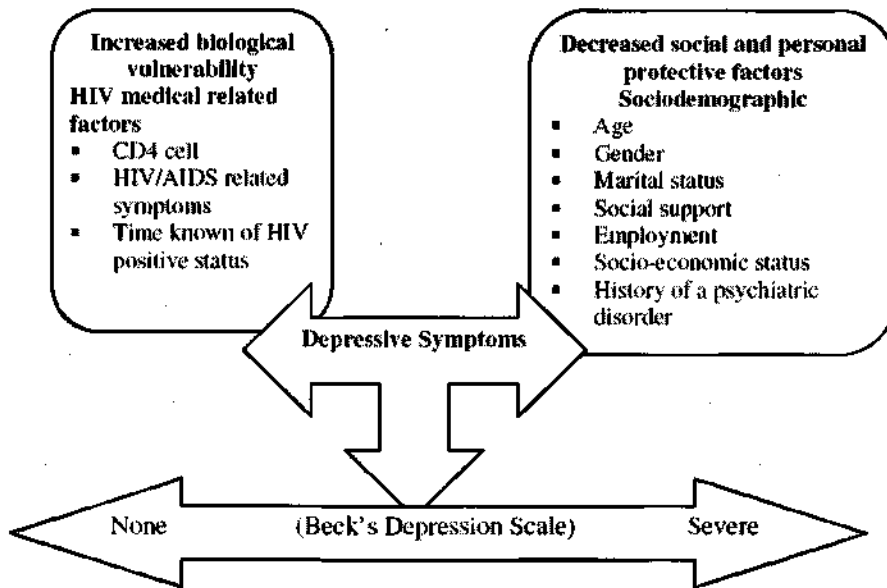
To establish the key variables for this conceptual framework, a variable table was developed from eleven studies related to the prevalence of psychiatric disorders and depression among people living with HIV/AIDS. The variables studied, the tools used to collect data for each variable and the statistical tests applied to determine the relationship between these variables is outlined in Appendix 5. The most common variables associated with each of the factors for this study are schematically presented in diagram 1. In this study, HIV related disease factors constitute biological factors; specific socio-demographic factors such as gender, marital status, social support, employment, social economic status are defined as social and personal factors and depression the outcome of the interaction between these factors. However, as Freeman et al. (2007) state, not everyone living with HIV/AIDS has a mental disorder.

The diagram shows, according to the stress vulnerability framework, how these factors might be related. The more biologically compromised the individual (low CD4 Count, progression towards AIDS, high viral load), and the less the presence and action of protective personal and social factors, the more likely the person is to developing serious depressive symptoms. Likewise, the more biologically compromised the individual (low CD4 Count, progression towards AIDS, high viral load), and the greater the presence and action of protective personal and social factors, the less likely the person is to developing serious depressive symptoms. (Adewuya et al., 2007; Berger-Greenstein et al., 2007; Bing et al., 2001; Farber & McDaniel, 2002; Kaharuza et al., 2006; Komiti et al. 2003; Leserman et al., 2000; Uys & Middleton, 2004).

Socio-demographic factors found to be associated with the presence and severity of depressive symptoms among people living with HIV/AIDS include the marital status, unemployment and lack of social support; past contact with mental health service due to pre-morbid psychiatric illness; gender where women are more likely to suffer depression and anxiety disorders than men; age, where younger age people with HIV/AIDS are more likely to suffer with a psychiatric disorders than those 50 years and older; and poor social

economic status (Bing et al., 2001; Komiti et al., 2003). Compared to non-depressed participants in a study by Komiti et al. (2003), the depressed participants were less likely to secure a paid full time employment and were more likely to be involved in stable intimate relationship or living with one's partner.

Diagram 1: Schematic Representation of the Conceptual Framework
 (Adapted from Adewuya et al. 2007; Farber & McDaniel, 2002; Kaharuzza et al. 2006; Komiti et al. 2003 and Uys and Middleton, 2004.)



HIV medical related factors indicate biological vulnerability. A number of studies have found that specific HIV related factors such as the progression of HIV towards AIDS, low CD4 cell counts or advanced clinical stage of AIDS illness; short time since the HIV status is known; patients who are not on ART; are associated with an increase in the presence and the severity of depressive symptoms (Berger-Greenstein et al., 2007; Bing et al., 2001; Freeman et al. 2007; Judd et al., 2005; Komiti et al., 2003).

1.9 Conclusion

The aim of this chapter was to highlight the background to the problem of mental health problems encountered among people living with HIV/AIDS, drawing both from international and African literature. The aim, objectives, research questions and conceptual framework have been presented and discussed. This next chapter will explore the literature with respect to depression and HIV/ AIDS.

Chapter Two

Literature Review

2.1 Introduction

This chapter reviews some of the current literature with respect to the phenomenon of depression and its prevalence among people living with HIV/AIDS. The following search terms “Psychiatric disorders and HIV/AIDS, mental disorders in HIV/AIDS, depression among people living HIV/AIDS” were used to search for literature in the on-line databases of CINAHL, MEDLINE-EbscoHost, MEDLINE-PubMed, Cochrane library, BioMed Central, Science Direct, and LWW Journals @ OVID full text.

The literature review is presented in three sections. The first section provides an overview of epidemiological trends of HIV/AIDS globally, within the sub-Saharan Africa continent and within Rwanda. It also highlights the available literature on prevalence of depression in the Rwandan population. The second section reviews common psychiatric disorders affecting people living with HIV/AIDS while the third section explores depression among HIV infected patients, and its impact in the evolution and treatment outcomes of HIV/AIDS. Thereafter, the role of the mental health nurse in the management of mental health problems associated with HIV/AIDS is briefly discussed.

2.2 HIV/ AIDS and Mental Illness in Rwanda

2.2.1 HIV/AIDS in Rwanda

Rwanda is a small, landlocked country (approximately 228,200 square kilometers) located in East Africa, bordered by the Democratic Republic of Congo in the East, Burundi in the South, Tanzania in the West and Uganda in the North. It is considered the most densely populated country in Africa, with an estimated population of 9,200,000 and a population density of 351 persons per square Km (CNLS, 2009). Rwanda is designated

a low income category country according to the World Bank classification of countries (<http://web.worldbank.org>).

The first case of HIV/AIDS in Rwanda was discovered in 1983 in the “Centre Hospitalier Universitaire de Kigali”. The first study on HIV prevalence among the general population in Rwanda was carried out in 1986. This study established a prevalence rate of 17.8% in urban settings and 1.3% in rural areas (CNLS, 2007). At the end of 2001, it was estimated that 11.1% of the adult population in Rwanda were living with HIV/AIDS (UNAIDS, 2002).

This rate has steadily declined to 7% in 2004 and to 3% among the general population in 2005 (CNLS, 2007; UNAIDS, 2008). This decline in prevalence is possibly associated with the coordinated efforts of the Ministry of Health, TRAC *Plus* and the District Aids Control Committee which are available in each of the 30 districts of the country (CNLS, 2009). These efforts have focused on increasing the number of sites providing antiretroviral therapies and implementing the five key treatment strategies contained within the Rwandan AIDS National Care and Treatment Plan 2003-2007 (Ministry Of Health [MOH], 2003). These treatment strategies emphasize making medical treatment available, increasing adherence, providing psychosocial care in the form of group counseling and community based support, initiating community and home base care and giving support in terms of assistance required for the success of medical treatment (MOH, 2003). In line with this plan, the number of sites for antiretroviral therapy has increased from 76 in 2005 to 165 in 2007 thus enabling 65% of the population requiring ARVs to access treatment (MOH, 2007). Currently, there are 313 Voluntary Counseling and Testing sites and 285 sites for Protection of Mother –To- Child Transmission (MHO, 2007).

2.2.2 Mental health in Rwanda

Mental health in Rwanda is coordinated by the national mental health programme in the Ministry of Health, and mental health care services have been integrated into primary health care system. With 0.2 total psychiatric beds per 100.000 population, the country is

served by 0.03 psychiatrists, 0.8 psychiatric nurses and 0.3 psychologists per 100.000 populations (WHO Atlas, 2005).

There is very limited research available in the literature on the epidemiology of mental disorders in Rwanda. There are a few studies about the effects of the Rwandan genocide on mental health of children and adolescents (Dyregtov, Gupta, Gjestad & Mukanoheri, 2000; Schaal & Elbert, 2006) and the mental health needs of refugees (De Jong, Scholte, Koeter & Hart, 2000). Dyregtov et al. (2000) assessed the trauma exposure and psychological reactions to genocide among Rwandan children approximately a year after the genocide and concluded that 79% of the interviewed children presented moderate to severe post traumatic stress reactions.

Approximately ten years after the genocide, Schaal and Elbert (2006) conducted a study to assess the post traumatic reactions among orphans in Rwanda. This study found that among 68 orphans interviewed, 44% met the full DSM-IV criteria for PTSD. A study of trauma and post traumatic stress symptoms among adults Rwandan found that of the 2091 participants, 518 (24.8%) met symptoms criteria for PTSD (Pham, Weinstein & Longman, 2004). In a survey conducted by de Jong et al. (2000) to assess the prevalence of mental health problems in Rwandan and Burundese refugee camps, it was estimated that 50% (n=854) of adults who were living in these refugee camps suffered severe mental disorders.

2.2.3 Depression in Rwanda

Although there is not much information available in the literature regarding the prevalence of depression in the general population in Rwanda, a few studies assessing depression showed it to be high both in HIV-infected and among the genocide affected group. Cohen et al. (2009) conducted a study to assess the improvement in the post traumatic stress and depressive symptoms in HIV-infected Rwandan women on antiretroviral therapy, and found that at baseline, 59% of HIV positive women (n=779) had post traumatic stress, while 81% of them had clinical significant depression.

Studies assessing depression following the 1994 genocide have shown it to be high among the affected groups. Bolton, Neugebauer and Ndogoni (2002) conducted a community-based survey in a selected rural area five years after the 1994 genocide and found a prevalence rate of 15.5% for depression among a sample of 368 adult Rwandans living in this area.

Similarly, Hangengimana, Hinton, Bird, Pollack and Pitman (2003) conducted a study to determine the rate of panic attacks, panic disorders, post traumatic disorders and depression levels in a population of Rwandans survivors of 1994 genocide using Beck Depression Inventory Scale and additional scales. The findings of the study reported that in a sample of 100 Rwandans women survivors of the 1994 genocide, 35% presented with symptoms of panic disorders, 18.6% scored positive to depression on BDI and 62.3% presented post traumatic stress disorders symptoms on Harvard Trauma Questionnaire.

A more recent cross-sectional survey conducted by Boris et al. (2008) examined the level of depressive symptoms and their predictors in youth heads of household from one selected region in Rwanda. This study used the Centre for Epidemiologic Studies Depression Scale. The findings revealed that 53% of their sample (n: 539) screened positive for depression. This same study found that predictors such as eating fewer than one meal per day, having three household assets or fewer, youth with fair or poor health, not having a close friend, having a parent who died during the genocide, and high levels of grief were significantly associated with depressive symptoms.

2.3 Psychiatric disorders in people living with HIV/AIDS

Like any other chronic and fatal disease, HIV/AIDS affects every aspect of a person's life, including their mental health. Many research studies suggest that mental illnesses are common in people living with HIV (Bing et al., 2001; Morrison et al., 2002; WHO, 2008). Bing et al. (2001) conducted a study to estimate the prevalence of psychiatric

disorders and substance abuse among American adults infected by HIV and found that nearly half of their sample (n=2864) reported a psychiatric disorders, namely major depression, anxiety disorders such as general anxiety disorder and panic attack, and 40% reported having used an illicit drug. Similarly, Israelski et al. (2007) estimated the prevalence of psychiatric co-morbidity of three stress related disorders, namely depression, post traumatic stress disorders and acute stress disorders among Northern Californians receiving primary care for HIV/AIDS. Their study revealed that in a sample of 118 people, 56% screened positive for at least one psychiatric disorder. Vitiello, Burnam, Bing, Beckman and Shapiro (2006) found that 29.1% of all patients studied in the United States (n=2864) met criteria for at least one of the studied psychiatric disorders namely major depression, dysthymia, generalized anxiety disorder, panic disorders and PTSD.

The prevalence of mental disorders in people living with HIV/AIDS in South Africa ranges from 19% to 43.7%. For example, Freeman et al. (2007) estimated the prevalence of mental disorders in this population using a large sample (n=900). This study found that 43.7% of the total sample screened positive to at least one mental disorder. The most common disorders in this study were depression, alcohol abuse and post traumatic stress disorders. Myer et al. (2008) studied three common mental disorders (depression, post traumatic stress disorder and alcohol dependence/abuse) among individuals living with HIV/AIDS and found that 19% of their sample (n=88) met criteria for at least one psychiatric disorder.

Four of the most commonly occurring psychiatric problems in people living with HIV/AIDS are mood disorders, suicide, anxiety disorders and substance abuse and these are reviewed below.

2.3.1 HIV/AIDS and mood disorders

Mood disorders commonly studied among people living with HIV include major depression, bipolar disorder and dysthymia (Bing et al., 2001; Israelski et al., 2007; Morrisson et al., 2002). Of all the mood disorders, major depression has been found to be

the most common disorder affecting people living with HIV (Berger-Greenstein et al., 2007). These authors found that in a sample of 85 patients, 72.9% screened positive for major depressive disorders, 14.1% of participants screened positive for bipolar disorder, and 4.8% for dysthymia.

A number of studies suggest that the prevalence rates for depression among HIV/AIDS infected people are in general high, both in high income and middle to low income countries (Collins, Holman, Freeman & Patel, 2006). Two studies conducted in the United States, namely the HIV Cost Service Utilization Study (Bing et al., 2001) and the Coping with HIV/AIDS in the Southeast (Pence et al., 2007) found that depression was the most prevalent psychiatric disorder among people living with HIV. Bing et al. (2001) used a nationally representative cohort of the HIV Cost Service Utilization Study (n=2864) and found that more than one third of the population study (36%) met the criteria for major depression, and 26.5% screened positive to dysthymia. Similarly, Pence et al. (2007) studied 611 patients living with HIV in the Southeast America and found that around 35% of the participants scored positive to depression, and 16% met criteria for post traumatic stress disorder. This prevalence rate is similar to that reported by Israelski et al. (2007) who found that among 350 patients, 80 participants (38.1%) screened positive for depression.

The prevalence rates of depression among HIV infected patients in America seem to be greater than the overall prevalence of major depressive disorders in the general American population. This has been estimated to be 9.50 % in a national representative sample (n=8449) (Riolo, Nguyen, Greden & King, 2005). A more recent study involving a sample of 9090 found a 16.2% life-time prevalence of major depression in the general American population and a 6.6% prevalence for 12 months (Kessler et al., 2007).

In Australia, depressive disorders among HIV infected patients have been also found high in a study by Judd et al. (2005) conducted to understand the nature of depression among 129 HIV infected patients attending a primary care setting. The findings report a high rate of depressive disorders, where 27% of the participants met the criteria for a mood disorder. Similarly, Kolaric, Tesic, Ivankovic and Begovac (2006) assessed the

prevalence of depression among Croatians HIV-infected patients and found that 20% of their sample screened positive to moderate and severe depression.

In a systematic review of studies done in different low and middle income countries Collins et al. (2006) found that the average rate of depression among HIV asymptomatic patients in these countries was between 6%, ranging from 0% in Democratic Republic of Congo to 10.9 % in Brazil and as high as 4.4% to 19.6% among symptomatic patients in these same respective countries. Myer et al. (2008) studied three common mental disorders namely depression, post traumatic stress disorders and alcohol abuse among people living with HIV in South Africa and found a prevalence rate of 14%, 5% and 7% respectively. Freeman et al. (2007) studied the prevalence of mental disorders among HIV infected patients and found that the main diagnosis was depression, with an estimate of 11% for major depression and 29.1% for minor depression. Other mental disorders found by these authors were alcohol abuse disorders (12.9%), alcohol dependence (2.9%), post traumatic stress disorders (4.2%) and intermittent explosive disorders (3.9%). Another study conducted in South Africa targeting the most recently diagnosed HIV patients attending an outpatient clinic found that major depression was as high as 35% among this population (Olley, Seedat & Stein, 2006).

However, the prevalence of depression among people living with HIV in South Africa, an upper- middle income country, is higher than the estimated prevalence of depression in the general population. In an epidemiological study of major depression in South Africa, it was found that the prevalence of major depression in general population was 9.7% for lifetime prevalence and 4.9% for the 12 months prior to interview (Tomlinson, Grimsrud, Stein, Williams & Myer, 2009).

In Uganda, Kaharuzza et al. (2006) found that among 1017 HIV infected patients who were assessed for depression using the Center for Epidemiologic Studies Depression Scale, 476 (47%) reported depressive symptoms. A prevalence rate close to this was also found by Ndeti et al. (2009) who conducted a cross-sectional study to determine the prevalence of psychiatric disorders among HIV infected patients in Kenya. This study found that overall, 42.3% of the total sample screened positive depression using BDI,

whereas in Nigeria, major depression was the highest affective disorders (11.4%) among HIV infected patients, followed by dysthymia (9.1%), hypomania (6.8%) and mania (3.4%).

High rates of depression have been also found among people diagnosed with other chronic medical conditions such as chronic hepatitis C, cardiovascular diseases, diabetes (Kagee, 2008; Zhang, Ye, Huang, Li, & Yang, 2008). Zhang et al. (2008) assessed the level of depression among patients with cardiovascular disease, diabetes, and chronic pulmonary heart disease and found high rate of 78.9% of patients with the above mentioned chronic diseases having different levels of depression (n=322). In the same way, Kagee (2008) in South Africa conducted a study to estimate the prevalence of depression and anxiety among south African patients living with a chronic illness and found that 26.1% had mild to moderate depression, 15.3% had moderate depression and 4.5% had severe depression, whereas 38.5 % of the total sample (n=119) scored elevated range of anxiety.

Depression was also high among patients treated for chronic hepatitis C. Before treatment, 11% of patients had mild depression, but when depression was again assessed during treatment, 55% developed depression (Fransen Van de Putte, Fischer, Posthouwer, Van Erpecum & Mauser-Bunschoter, 2009). Similarly, in a study by Arnold et al. (2008) regarding the prevalence of depression and anxiety among patients with primary brain tumor, it was found that 41% had current depression and 48% had current generalized anxiety disorders. Only 5% of this study population had previous diagnosis of a psychiatric illness.

2.3.2 Suicide among people living with HIV/AIDS

Suicide and suicidal attempts have been found to be high in people infected by HIV/AIDS. Komiti et al. (2001) conducted a review of existing literature on suicidal behavior in people living with HIV/AIDS and found an increase in both suicidal ideation, behavior and completed suicide. Roy (2003) researched the prevalence of suicide among people living with HIV and examined the risk characteristics of these patients. In a

sample of 149 HIV infected patients, it was found that 66 patients (44.3%) had attempted suicide. Gender was related to the increase in suicide attempts, with women being at higher risk ($p=0.01$) than men. Other characteristics associated with suicide attempts among people living with HIV in Roy's study was the history of depressive disorders (59 of 66) with patients who were receiving antidepressant medication being more likely to attempt suicide (49 of 66) and a family history of suicide attempt or behavior (17 of 66) (Roy, 2003). In France, suicide attempts have been found high among people living with HIV/AIDS. Preau et al. (2008) conducted a study with 2932 French people living with HIV. The findings indicated that 22% had attempted suicide, a figure which is much higher than the prevalence of suicide attempts in the adult French general population of 8%.

The literature suggests there are at least three periods in the illness cycle during which time people are more at risk for suicide. Meel (2006) argues that the period following the person's awareness of HIV status is one of the most important and immediate risk periods for suicide. The author suggests that this may be exacerbated by an unexpected positive result or a result disclosure for which the person was not adequately prepared beforehand. Stolar et al. (as cited in Citron, Brouillette & Becket, 2005) suggest that people infected by HIV are at higher risk for suicide in the early course of HIV disease when they are adjusting to the diagnosis, and again late in the disease, when the physical burden of AIDS becomes severe.

The prevalence of suicide among people living with HIV was found consistent with findings of suicide rate in other medically ill people (Komiti et al., 2001). Misono, Weiss, Fann, Redman & Yueh, (2008) conducted a study to assess the incidence of suicide among people diagnosed with cancer in the United States. The findings of the study revealed that a total of 5,838 suicides were identified among 3,594,750 people with cancer, giving an age, sex and race adjusted suicide rate of 31.4 per 100,000 persons, which is approximately twice the prevalence rate of suicide in the general American population (16.7 per 100,000 persons per year suicide rate).

Kendal (2007) also conducted a gender comparative study on suicide among people diagnosed with cancer in Ontario, using 1.3 million cancer cases and found that a total of 1572 cases of suicide were enumerated, counting 265 cases of female (0.04%) and 1307 (0.19%) suicide cases for males. Based on types of cancer, head and neck cancer were associated with high rate of suicide in both studies (Kendal, 2007; Misono et al., 2008) plus lung and stomach cancer (Misono et al., 2008).

2.3.3 HIV/ AIDS and anxiety disorders

Anxiety disorders commonly associated with HIV/AIDS found in the literature include generalized anxiety disorder, acute stress disorder, post traumatic stress disorder, panic disorder and specific phobia (Bing et al., 2001; Israelski et al., 2007; Morrison et al., 2002; Olley et al., 2006). Israelski et al. (2007) found that 43.3% of their sample screened positive for acute stress disorders, and 33.8% reported having post stress traumatic disorders. Berger-Greenstein et al. (2007) found that post traumatic stress disorder was as high as 43.5% in a sample of HIV infected patients attending a rural medical service, 15.3% had panic disorder and 3.6% screened positive to generalized anxiety disorder. Similarly, Bing et al. (2001) found that in a sample of 2864 American adult living with HIV, 15.8 % met the criteria of generalized anxiety disorder, and 10.5% screened positive to panic attack.

Morrison et al. (2002) estimated that women infected with HIV/AIDS presented high rate of all types of anxiety disorders, with estimated rate of 5.4% of social phobia, 3.2 % of post traumatic stress disorders, 2.2% of special phobia and generalized anxiety disorders, 1.1 % of obsessive compulsive disorder and agoraphobia. More than half of the sample (n=75) in a study by Safren, Gershuny and Hendriksen (2003) met the criteria for a diagnostic of post traumatic stress disorder related to being diagnosed and living with HIV/AIDS. The Coping with HIV/AIDS in the Southeast study (Pence et al., 2007) also found that 29.5% of HIV infected people living in the Deep South had significant levels of anxiety.

In a South African sample of 85 patients recently diagnosed with HIV, a study by Martin (2007) revealed that 34 participants (40%) screened positive to post traumatic stress disorder related to HIV. Of those who met the criteria for PTSD, 82.4% were clinically distressed, 58.8% experienced high level of anxiety and 76.5% had depression. High rates of anxiety disorders were also reported in Nigeria where Adewuya et al. (2007) found that 12.5% of their sample screened positive to PTSD, 9.1% had social anxiety disorder, 8% screened positive to generalized anxiety disorder, 6.8% panic disorder, 4.5% screened positive to specific phobia and 3.4% to obsessive compulsive disorders.

According to McDaniel and Blalock (cited in Freeman et al., 2007), anxiety disorders among HIV infected patients has been associated with initial diagnosis, first opportunist infection, declining CD4 count, and the onset or progression of AIDS defining illness. PTSD in a study by Olley, Zeier, Seedat, and Stein, (2005) was found secondary to the diagnosis of HIV/AIDS and to a range of other traumas such as previous sexual violation and intimate partner violence. Similarly, Katz and Nevid (2005) found that PTSD in HIV infected patients was associated with past traumatic events, less satisfaction with social support, presence of physical symptoms related to HIV/AIDS, degree of negative life events and perceived stigma. High death anxiety in HIV infected individual has been also found associated with the development of PTSD (Safren et al. 2003). On the other hand, HIV/AIDS is potentially a severe, life threatening illness and a trauma response to this potentially threatening experience does partially explain the increase of PTSD in this population (Whetten et al., 2008).

2.3.4 Substance and alcohol use disorders among people living with HIV/AIDS

Drugs and alcohol abuse have been found to be common among people living with HIV, as isolated disorders or in comorbidity with other mental disorders, (Freeman et al., 2007; Gallego, Gordillo, & Catalan, 2000; Pince et al., 2007). According to Freeman et al. (2007), substance abuse and dependence was high among their sample, with 12.4% reporting using alcohol and 2.9% having alcohol dependence, 1.9% use drug and 0.3% have developed dependence to drug. Pince et al. (2007) found a higher rate of drug use among HIV infected patients, where 70% of the sample reported drinking alcohol to

intoxication more frequently and 22% uses drugs. Similarly, Bing et al. (2001) found high rates of drug use, where 25.6% of the sample reported using drugs, with 12.5% who have developed drug dependence, and 12.3% reported heavily using alcohol.

In studies comparing the rate of substance abuse among HIV infected women and non infected women, it was found that the proportion of women with a history of substance abuse or dependence was higher in the HIV-seropositive group (50.5%) than in the HIV-seronegative women (30.6%), a difference they found to be statistically significant (Morrison et al., 2002). Similar difference was also found in a study by Sebit et al. (2003) who found that the prevalence rate of drug/alcohol use among Zimbabwean HIV positive subjects was high (24.3%) than among HIV negative subjects.

Drug and alcohol use and misuse is known to increase the risk of HIV infection and transmission. Based on the findings from the HIV Costs and Service Utilization Study, individuals who had a history of drug and alcohol abuse were found more likely to engage in unprotected sex (Rand, 2007). Gallego et al. (2000) ; Khouzam, Donnelly and Ibrahim (1998) argue that not only do some drug substance abusers use direct intravenous injection, but also demonstrate risky behaviors such as sexual disinhibition, impaired judgment and impulsivity which increase their risk of infection and interfere with compliance with antiretroviral regimens. The results of HIV Costs and Service Utilization Study (Rand, 2007) also revealed that individuals with substance abuse or addiction, or those who were heavy drinkers were found to be non adherent to HAART than individuals without drug use.

2.4 Risk factors for the development of depression among HIV infected patients

A number of biological and psychosocial factors have been used to explain the link between the HIV/AIDS and psychiatric disorders (Chandra, Desai & Ranjan, 2005; Farber & McDaniel, 2002; Rao, Sagar, Kabra & Lodha, 2007).

2.4.1 Biological factors

From a biological perspective, psychiatric disorders among HIV infected people may be caused by the direct involvement of HIV with the central nervous system, opportunistic infection, changes in metabolism and some treatments used (Cazullo, Bessone, Bertrando, Pedrazzoli & Cusini, 1998; Schwartz & Selwyn, 2001). According to Valente and Saunders, (in Valente, 2003) and Lochet et al., Fumaz et al. (in Rao et al., 2007) the HIV virus directly affects the central nervous system, and may damage neurons and impair cognition, thus causing depression. Faber and McDaniel (2002) state that precipitous changes in physical functioning, onset of opportunistic infections and neurocognitive decline may constitute the acute illness related stressors that may influence psychiatric disorders among HIV infected individuals.

Furthermore, research has found that psychiatric disorders and particularly depression are more likely to occur at late stage of the disease progression, where HIV infected patients have a lot of symptoms associated with their HIV status and when their immune system is compromised (Bing et al., 2001, Kaharuza et al., 2006). Kaharuza et al. (2006) found association between HIV disease severity, as measured by CD4 counts and depression, where the findings of the study revealed that that the presence of depressive symptoms become more important when the CD4 counts become low. Similarly, using the World Health Organization staging criteria, Freeman et al. (2007) found that mental disorders were likely to be high in stage 3 and 4 of the disease, with a rate of 49.7% and 68% respectively.

However, some studies have not found any relationship between the disease progression and depression. In their study, Morrison et al. (2002) did not find any significant correlation between different stages of illness progression and the proportion of depressive disorders. Their study found that depressive disorders were similar across different stages of HIV/AIDS illness according to CDC stage of illness. Griffin et al. (in Faber & McDaniel, 2002) and Rabkin, Ferrando, Lin, Sewell & McElhiney, (2000) suggested that it is the degree of physical limitation and physical symptoms severity,

rather than the disease progression itself that is more important in predicting psychological adjustment.

A number of studies have shown that some antiretroviral agents precipitate psychiatric disorders among patients who had not previous psychiatric history (Halman, 2001; Foster, Olajide & Evarall, 2003). Medication used as antiretroviral therapy, especially efavirenz, has been found to be associated with a range of side effects on the central nervous system, including depression, nervousness, euphoria, hallucination and psychosis (WHO, 2008). Halman (2001) has indicated that some medications such as efavirenz, zidovudine, isoniazid, steroids, vinblastine and the protease inhibitors have been reported to cause depression and depressive symptoms. Morrison et al. (2002) found that although not statistically significant, the proportion of depressive disorders was higher among women who were receiving protease inhibitor therapy (29.0%) than women who were receiving antiretroviral therapy that did not include a protease inhibitor (14.5%).

Foster et al. (2003) report a case of an HIV positive patient who presented with severe persecutory delusions, bizarre behavior and a labile and inappropriate mood which developed a month following the start of combination antiretroviral therapy of abacavir, nevirapine and combivir; her mental state resolved to premorbid stability once her medication was stopped. Similarly, De la Garza, Paoletti-Duarte, Garcia-Martin and Gutierrez-Cesares (2001) report a case of a woman who presented symptoms of confusion, disorientation, and feeling fearful at home, with paranoid delusions and insomnia. These symptoms appeared two days after efavirenz was added to her regime, and once efavirenz was discontinued, the mental state of the patient improved to premorbid stability.

There are additional case study reports of manic symptoms (e.g. pressure of speech, grandiose delusions and agitation) occurring in patients being treated with zidovudine and acyclovir (Maxwell, Scheftner, Kessler, & Busch, 1998) and with zidovudine and aerosolized pentamidine (O'Dowd & Mc Kegney, 1988). Again, these symptoms resolved immediately the medication was stopped. These case studies concluded that the sudden appearance of psychotic symptoms and/or manic symptoms a month after starting

the antiretroviral therapy, together with the rapid resolution of symptoms after stopping treatment provides strong support for antiretroviral agent as possible cause of the psychotic and manic symptoms (De la Garza et al., 2001; Foster et al., 2003).

2.4.2 Psychosocial factors

HIV/AIDS imposes a significant psychological burden. The psychological reactions of adjustment to new illness, existence of premorbid psychiatric disorders and personality characteristics have been found to be associated with the emergence of psychiatric disorders among HIV infected patients (Faber & McDaniel, 2002). According to WHO (2008), in their attempts to adjust to the impact of being infected by that universally fatal illness and to other difficulties associated with it, HIV infected people often suffer mental illness. Issues such as shortened life expectancy, complicated therapeutic regimens, stigmatization, and loss of social support, increase that burden. Similarly, (Rabkin, 1995; Verdhana & Laxminarayana, 2007) state that the emotional shock associated with learning of HIV diagnosis presents a significant stressor that may increase the prevalence of mental disorders and this shock differs from person to person; some people may be overwhelmed with suicidal feelings whereas others will experience minor distress.

Fear of present and anticipated negative life events such as an increased rate of early HIV progress, severely disrupted interpersonal relationships, life threatening illness, on-going exposure to loss and grief and feelings of helplessness, hopelessness, loneliness and utter despair have been found to trigger psychiatric symptoms and disorders in people living with HIV (Gallego et al., 2000; Rao et al., 2007; Valente & Saunders in Valente, 2003).

Psychosocial factors such as lack of support, stigma, living alone, unemployment, have been also found associated to psychiatric disorders (Bing et al., 2002, Morrison et al., 2002). According to Faber, Mirsalimi, Williams and McDaniel (2003), HIV infected individuals who are victims of stigma; discrimination and lack of social support are likely to suffer psychiatric disorders. Adewuya et al. (2007) reported possible correlation between marital status and lack of social support in psychiatric disorders, whereas Leserman et al. (2000) state that the availability of social support, a sense of belonging or

integration within a social network including primary partners, families, and/or friends and peers is associated with greater psychological adjustment in HIV/AIDS. On the other hand, some studies have found that people who are able to find positive meaning in their HIV status report high levels of psychological well being and are less likely to suffer depression (Faber et al., 2003).

Other factors such as past psychiatric history have been found to be a risk factor to the development of psychiatric disorders among people living with HIV/AIDS. Studies have shown that people infected with HIV who had premorbid psychiatric history are likely to suffer psychiatric co-morbidity (Chandra et al., 2005; Verdhana et al., 2007). In their study, Chandra et al. (2005) found that all of the patients infected by HIV who attempted suicide had past history of psychiatric illness. Morrison et al. (2002) found that having a previous history of depressive disorders was a strong predictor of scoring high rate of depressive disorders among people living with HIV/AIDS than it was in non-infected people. Premorbid history of personality disorders has been found to be a strong predictor of psychiatric disorders, Johnson, William, & Goetz (as cited in Gallego et al., 2000).

2.5 Impact of depression in the development and the treatment outcome of HIV/AIDS

Depressive symptoms are associated with a variety of problems for people with HIV/AIDS. According to Adewayu et al. (2008) depression impacts negatively on quality of life of those infected by HIV/AIDS. Several studies (Cook et al., 2004; Leserman et al., 2000; Myer et al., 2008; WHO, 2008) have suggested that depressive disorders may speed the progression of HIV disease, and is associated with increased risk of AIDS-related mortality. Leserman (2008) support that trauma, psychosocial stressors and depression can affect immunological progression of HIV/AIDS in terms of CD4 decline and increase in viral load.

Depression has been found to be associated with lower overall health and poorer quality of life among people living with HIV/AIDS than with HIV-negative control groups

(Williams et al., 2005). In a study by Mayne et al. (cited in Berger-Greenstein et al., (2007) of women with HIV/ AIDS, it was found that there is a significant differences in mortality rates among women with and without depressive symptoms, where over a period of 7-year period of investigation, 8% of women who had few symptoms of depression had died, compared to 16% of women with intermittent depressive symptoms and 23% of women with chronic depressive symptoms.

Meanwhile, depression and other mental illnesses were found to be associated with high risk behavior and substance abuse, which increase the risk for further transmission of HIV (Chander, Himelhoch & Moore, 2006). According to Rabkin (2008), symptoms of depression such as absence of pleasure, isolated life, impairment of social and professional abilities, have been found to negatively impact, not only on quality of life, relationships, but also associated with failure to respect a proper diet and exercise regimen. Starace et al. (2002) support that having a mental health illness may make following a daily routine more difficult and therefore complicate one's ability to adhere to a medicine regime.

Depression is believed to influence adherence to antiretroviral treatment (Starace, cited in Starace et al., 2002). It is argued that symptoms of depression such as pessimistic thoughts, negative expectations, hopelessness, may dissuade patients living with HIV from adhering to antiretroviral or any other prescribed treatment. In the same view, the social withdrawal often found in people with depression limits the patient's abilities to request for help in adhering to medication regime (Starace et al., 2002). It is also believed that the fact of having dual diagnosis of depression and HIV expose people living with HIV to a risk of dual stigmatization, which can in turn affect their treatment adherence (Sirey et al., 2001; Starace et al., 2002).

Depression as factor of poor adherence was also reported in the WHO (2008) report on HIV and mental health, which states that strong evidence from high-income countries suggests that adherence to highly active antiretroviral therapy is lowered by depression, cognitive impairment, alcohol use and substance use disorders. In a study done by Singh et al. (cited in Angelino, 2002), poor compliance to antiretroviral treatment was related

mainly to the low interest in self-care manifested by patients who suffer depression. Berger-Greenstein et al. (2007); Olatunji et al. (2006) found that some of the symptoms of depression such as difficulty concentrating, fatigue and suicidal thoughts interfere with medication adherence among people with HIV.

2.6 Issues related to the diagnosis of depression among HIV infected patients in a primary health care setting

Despite the high rate of psychiatric disorders and depression in particular among HIV infected patients, research have found that these conditions are often undetected and consequently untreated (Israelski et al., 2007; WHO, 2008). In the light of this study, it is important to highlight some of these issues related to poor identification of depression in primary health care settings.

In its practice guidelines, the American Psychiatric Association, [APA], 2000) reports that psychiatric disorders in HIV infected patients sometimes go “undetected, misdiagnosed, undertreated, or treated improperly in primary care settings”. Of 56% participants in a study by Israelski et al. (2007) who met criteria for three assessed psychiatric disorders, 43% reported no current treatment for any of these mental conditions. Similarly, Petrushkin et al. (2005) found that among a small sample of 46 participants attending an urban clinic in Uganda, 38 screened positive for depressive and anxiety disorders, but none were receiving any treatment for their psychiatric disorders. In a study done by Asch et al. (2003) to estimate the extent to which depression was underdiagnosed among patients with HIV/AIDS, it was found that 37% of their sample (n:1140) have depression, yet only 46% of them were recognized as depressed by their health care providers.

Some reasons for this underdetection of depression as pointed out by Rabkin (2008) is that in their routine work with people living with HIV, very few care providers ask them if they are depressed, and very few patients volunteer the information spontaneously.

Other researchers have identified different myths about depression that interfere with its diagnosis in people with HIV/AIDS. It is often believed that depression is an expected and common reaction to HIV/AIDS; that if patient with HIV/AIDS has got depression, he/she will obviously report it to his/her treating doctor and that suicide can be seen as understandable choice for people living with HIV/AIDS (Valente, 2003). However, it has been reported that not all people living with HIV/AIDS will have a mental health illness (Freeman et al., 2007).

On the other hand, there are many resemblances in the clinical profiles of depression and of HIV, which sometimes complicate the diagnosis (Verdhana et al., 2007). The presence of somatic symptoms for depression such as weight loss, poor appetite, loss of energy and insomnia may be taken as part of the medical symptoms of HIV disease itself, therefore making difficult the diagnosis (Khouzam et al., 1998; Rabkin, 1995; Rabkin, 2008). According to Verdhana et al. (2007), the diagnosis may be further complicated by the presence of co-morbid neurological illness, substance abuse and use of multiple drugs, including antiretroviral drugs that are known to cause depressive symptoms as side effects. Valente (2003) recommends the use of screening instruments and reliable diagnostic methods to detect depression among people living with HIV/AIDS.

Different tools have been used in the diagnosis of depression. The Beck Depression Inventory scale and the Center for Epidemiological Studies-Depression Scale are the most frequently used tests. The Beck Depression Inventory Scale contains 21 items describing depressive symptoms and their severity; it has been used by different researchers in detecting depression among people living with HIV/AIDS in public health settings and has high reliability and validity (Berger-Greenstein et al., 2006; Gibbie et al., 2006; Judd et al., 2005; Kagee, 2008). The Center for Epidemiological Studies-Depression Scale is a 20 items questionnaire, widely used to assess depressive symptoms over the previous seven days, and emphasizes on depressed mood, feeling of guilt and worthlessness, psychomotor retardation, loss of appetite and sleep disturbance (Kaharuza et al., 2006; Lyon & Younger, 2001). Researchers suggest that although the above scales may be useful in detecting depressive symptoms, patients who score above the normal

cutoff on these tools should be submitted to a more advanced assessment and a mental status evaluation for appropriate diagnosis and treatment (Valente, 2003).

2.7 The role of the mental health nurse in the management of mental health problems associated with HI/AIDS.

Mental health nurses, especially in low income countries are frequently the first mental health providers the patient encounter (Collins, 2006). This underscores the need to discuss their role in the management of mental health problems associated with HIV/AIDS.

Although there are a limited number of studies about the role of the mental health nurse in the care of HIV/AIDS patients, the study that do exist strongly support the idea that these nurses contribute effectively to the care of people living with HIV either through collaboration with other team members in psychiatric consultation liaison, or individually as advanced psychiatric nurse practitioners (Allen et al., 2009; Weglarz & Boland, 2005). Their role in the management of mental health problems among HIV-infected persons has been found to comprise three main activities: participation in the assessment of mental health problems among HIV- infected patients, offering effective and supportive mental health care and participating in health-promoting activities (Allen et al., 2009; Valente, 2003).

In the assessment of mental health problems among patients affected by HIV/AIDS, Porche and Willis (2006) report that although generally nurses recognize the signs and symptoms of depression in HIV-infected patients, they infrequently use standardized scales and tools in their mental health assessment of these patients. Valente (2003) argues that the use of standardized screening scales helps nurses to recognize depressive symptoms which are often underestimated in their practice. It has been reported that advanced practice nurses can provide individual and group therapy using combined cognitive behavioral therapy and other modalities such as counseling, self-management

technique to effectively treat depression (Valente, 2003). Case management was also found in the studies to be one of the methods of care nurses can use to help HIV-infected patients (Porche & Willis, 2006; Husbands et al., 2007) did a study to assess the effectiveness of case management community care for people living with HIV/AIDS and found that the method was very beneficial to patients with depression. Patients who were very depressed and who received case management had 31% improvement in their mental health index, 45% improvement in social functioning, 16% improvement in physical function and 30% improvement in their mental health summary score. Patients have also reported being satisfied with the care provided by nurses.

The role of the community-based mental health nurse in the care of people living with HIV/AIDS in one Australian city was evaluated by Allen et al. (2009). In this study, patients reported receiving effective empathic support, enhanced emotional support and reassurance from nurses. Patients felt they were being listened to and in this process, experienced relief from feelings of isolation and burden as the nurses assisted them to normalize and to contextualize their situation and experiences. This helped them to develop a more positive view of self and to consider other strategies to manage the difficulties associated with their disease into the future.

Participating in health promoting activities has been identified as an important role of nurses in the management of mental health problems associated with HIV (Porche & Willis, 2006, Allen et al., 2009). According to Valente (2003), education helps the client to understand his/her disorder and to clarify which symptoms are related to depression and which to HIV or to treatment. This differentiation helps clients to understand their experience better and to engage with appropriate coping strategies. It also helps families, other care givers and care providers to increase their awareness and to provide effective support. The findings of the study by Allen et al. (2009) suggest that health promoting education was helpful, reassuring and alleviated participants' anxiety by increasing their awareness of depression and other mental health problems and by assisting them to change their perception of mental illness. This helped them to cope better with their problems.

These core roles can be accomplished within a stress-vulnerability framework which like the mental health nursing process, considers the patient and his/her experience within the context of personal and environmental strengths, issues, symptoms and protective and coping factors (Uys & Middleton, 2004). The main aim of the interventions within each of these roles is to assist the patient to live a meaningful and satisfactory life within the parameters of his/her illness by increasing the presence and action of protective factors, through psychiatric symptoms amelioration, increased adaptive functioning and improved quality of life (McDaniel et al. in Faber & McDaniel, 2002; Uys & Middleton (2004). The presence of professional psychiatric services such as regular and competent psychiatric symptoms assessment, education, psychopharmacological and psychotherapeutic interventions, all constitute protective factors in the patients coping and recovery (McDaniel et al. in Faber & McDaniel, 2002; Uys & Middleton, 2004; Valente, 2003).

2.8 Conclusion

This chapter highlighted the literature on mental disorders among people living with HIV/AIDS, with a focus on depression. It was noted that there is a higher rate of psychiatric disorders among people living with HIV/AIDS than in non- infected people. The common psychiatric disorders were mood disorders, anxiety disorders, and suicide and drug/alcohol abuse. Depression was found to be the most prevalent disorder with a prevalence ranging from 5% up to 48%, depending on the population studied (Hartzell, Janke, & Weintrob, 2008). Factors associated with the risk of depression among people living with HIV/AIDS were reviewed, and can be summarized into two categories; biological factors and psychosocial factors. Finally, some of the issues related to the diagnosis of depression in HIV infected patients leading to poor treatment outcomes were reviewed and the role of the mental health nurse in working with this population was emphasised.

Chapter three describes the methodology that was used in the study.

Chapter Three

Research Methodology

3.1 Introduction

This chapter describes the research approach, setting and design. This includes a discussion of the sampling procedure, tools that were used to collect data, how data was managed and analyzed, the ethical issues that arose during the course of the study and the precautions that were taken to manage these.

3.2 Research paradigm and approach

This research study is based on a positivist and quantitative understanding of how the social (including experience) and physical world can be known and studied (Terre Blanche, Durrheim & Painter, 2006). This paradigm argues that it is possible to understand and to describe the reality of specific phenomena through direct observation and measurement of its discrete aspects (O'Leary, 2004). Data derived from observation and measurement is therefore numerically represented, is shown to be true beyond chance and has applicability beyond the sample to a wider population (Burns & Grove, 2005; O'Leary, 2004; Terre Blanche et al., 2006).

The study aims to explore the prevalence rate of depression among people living with HIV/AIDS and the extent of the association between depression and the specific HIV/AIDS medical factors and socio-demographic factors commonly associated with depression in this population. A quantitative approach is therefore suitable for this study because it represents these observations and the relationship among them in explicit, numerical terms (Babbie, 2007).

3.3 Research design

A descriptive cross-sectional design informs this study. The purpose of a descriptive cross-sectional study in health research is to observe and to describe the status of a phenomenon and the relationships among specific aspects of the phenomenon during one period of data collection (Morrone & Myer cited in Joubert & Ehrlich, 2007; Polit and Beck, 2008). The status of a phenomenon or condition in health research is commonly measured in terms of prevalence (the extent to which a phenomenon is present in a population at risk) and/or incidence (the frequency of new cases) at a single point in time (Polit and Beck, 2008).

A descriptive cross-sectional design was used to study the prevalence of depression and the relationships among depression, sociodemographic and HIV/AIDS related medical indicators in adults living with HIV/Aids and attending the Kimironko Health Centre in Kigali, Rwanda.

3.4 Research setting

This research was undertaken at the Kimironko Health Centre in Rwanda. This centre is situated in the heart of Kigali city, and is thus regarded as an urban public health service. The centre was established in 1998 to provide routine health care for this urban population. It began offering comprehensive HIV care and antiretroviral (ARV) treatment in 2003 and was one of the first health services to offer ARV treatments (Griensven et al., 2008).

Currently, approximately 3700 HIV positive people are enrolled with the centre for care and treatment for HIV related illness (annual report of Kimironko Health Centre, 2008). The service offers ARVs prophylaxis, treatment of opportunistic infections, blood measurement for CD4 cell counts and viral load, and psychosocial care.

3.5 Research population

Polit and Beck (2008) define a population as all the individuals or objects with common, defining characteristics. Establishing prevalence requires that this population be at risk for the condition being studied. In the case of this study, the population at risk for depression is comprised of all HIV infected patients attending the Kimironko Health Centre for HIV/AIDS treatment. According to the annual report of Kimironko Health Centre (2008), the centre lists a population figure of 3700 people living with HIV and who are followed for care and treatment.

3.5.1 Inclusion criteria

The sample included all participants who have tested HIV positive; who are currently receiving care and treatment for their HIV/AIDS status at Kimironko Health Centre; and who are over the age of 18 years and therefore legally able to consent to participate in the study.

3.5.2 Exclusion criteria

Participants who are under the age of 18 years of age were excluded from the study population. Participants were not excluded on the basis of literacy. Although the tool used in this study is self-administered, participants were offered the opportunity to have the researcher work through the questionnaire with them.

3.6 Sampling procedures

3.6.1 Sampling procedure

A sample is defined as a subset of the population that is selected for a particular study while sampling is the process through which a group of people and/or events are selected for study (Burns & Grove, 2005). Probability, simple random sampling technique was

used to select participants for this study. According to Polit and Beck (2008), probability sampling involves the random selection of elements from the population, whereby each element has an equal, independent chance of being selected. The simple random sampling involves the use of a sampling frame.

In this study, a sampling frame was defined based on the list of all patients living with HIV/AIDS attending the Kimironko Health Centre who were scheduled for appointment during the 12 days data collection, between the 20th July and the 3rd August. In total, 349 patients were scheduled for appointment during that period. Permission to use the patients' files to obtain the file codes for all the scheduled patients was sought from and granted by the clinic's manager (see appendix 3.3 for this permission). A list of all patients identified by files codes was made and numbered and a table of random numbers was used to select the desired sample size from the sample frame.

3.6.2 Calculating the sample size

The sample size was calculated based on the following formula provided by Sayed (cited in Joubert & Ehrlich 2007).

$$n = \frac{p(1-p)z^2}{d^2}$$

Where p is the anticipated population proportion, d is the precision required on either side of the proportion, and z refers to the cutoff value of the normal distribution and is based on a 95% confidence limit (=1.96).

No prevalence data for depression among people living with HIV/AIDS is available for Rwanda. Therefore, 50% was used to anticipate the proportion of the population of people living with HIV and who experience depression. This was supported by Katzenellenbogen, Joubert and Abdool Karim (1997) who state that when the proportion or average of the true population presenting with the outcome variable is not known, an estimate of proportion (p) of 0.5 shall be used. A total of 10 percentage points of error was tolerated on each side of the estimated proportion, expressed as $d = 0.1$.

$$\text{Therefore: } n = \frac{0.5(1-0.5) (1.96)^2}{(0.1)^2}$$

The sample size in this study was 96 people living with HIV/AIDS attending Kimironko Health Centre during the data collection phase.

3.6.3 Procedure for selecting the participants

Participants were randomly selected from a list of all patients scheduled for appointment during the period Monday 20th July and Monday 3rd August. In total, 349 patients were scheduled during that period. These were identified through their codes, and a random sampling table was used to select 96 participants for the sample. A list of codes for selected patients and their dates of appointments was given to the consulting nurses to recruit participants. The selected patients were directed by the clinic staff to the office assigned to the researcher as they arrived at the clinic. The researcher introduced herself to each patient, explained the purpose of the study, outlined the inclusion criteria and finally, invited those who met the inclusion criteria to participate. Those who were approached and agreed to participate were included in the sample.

The anticipated sample size of 96 was not achieved during this period. Fifteen of the randomly selected patients did not arrive at the clinic and either sent their relatives to collect their medication or simply did not arrive for their scheduled clinic appointment. Five additional participants were selected and approached to participate but were unable to participate because of personal time constraints. In order to achieve the desired sample size (n=96), it was therefore necessary to add a further two days for data collection (4th and 5th August). The same procedure was used to collect data during this time. All patients scheduled during the two days were added to the list and then fifteen were randomly selected and approached. A total sample of 96 people living with HIV was therefore reached with these additional two days.

3.7 Data collection instruments

Two data collection instruments were used to collect data for this study and are contained in appendix 1. Each of these instruments and their forms of measurement are briefly described.

3.7.1 Socio-demographic and medical information

A structured questionnaire was developed and used to collect socio-demographic characteristics and medical information related to HIV/AIDS. Demographic data includes variables such as age, gender, marital status, socioeconomic status, employment, perceived level of social support and the presence of a pre-morbid psychiatric history. These are the variables most commonly used in studies of HIV status and psychiatric comorbidity (Adewuya et al., 2007; Israelski et al., 2007; Komiti et al., 2003; Morrison et al. 2002). Medical data related to HIV/AIDS includes the CD4 cell count, the length of time participants have known their HIV status and the presence of HIV related medical symptoms. The decision to use these variables is based on previous studies (Berger-Greenstein et al., 2006; Gibbie et al., 2006; Judd et al., 2005; Komiti et al., 2003). See appendix 5 for a summary of these studies.

Demographic data were obtained directly from each participant, either through self-reporting or through a brief interview process in the case of those participants who were unable to read or to write Kinyarwanda or who expressed a preference for the researcher to work through the questionnaires with them.

The medical information was obtained from the participants and the CD4 count information was verified in the files for those participants who were unable to remember their CD4 counts measures. Written permission to access the patients' files was requested from and granted by the center manager (see appendix 3.3).

3.7.2 Depression information

The presence of depression among people living with HIV/AIDS was assessed using Beck Depression Inventory Scale. According to Berger-Greenstein et al. (2006) the BDI is a widely used and accepted brief screening instrument for depression that can easily be adapted to the clinical setting. One of the many advantages of the scale is that it takes a short time to complete and has been used in other previous, similar studies (Berger-Greenstein et al., 2006; Gibbie et al., 2006; Judd et al., 2005; Kagee, 2008).

The scale takes approximately 10 minutes to complete. Twenty-one items describing depressive symptoms and their severity are ranked along an ordinal continuum from absent (0) or mild to severe. Respondents are required to rate each item from 0 – 3 according to how they have felt during the past week (Gibbie et al., 2006). According to Beck, Steel and Garbin, (in Berger-Greenstein et al., 2006) the summed scores range from 0 to 63. A score of 14 or more is widely used as a cut-off score indicating depression when using the 21-item BDI (Gibbie et al., 2006). In this study, the cut-off used in Kagee's (2006) study was considered to score depressive symptoms among people living with HIV/AIDS where a score of 0–9 was considered as normal range; 10–18, mild to moderate depression; 19–29, moderate to severe depression and 30–63, severe depression.

The Beck Depression Inventory Scale was translated in Kinyarwanda to produce local terms equivalent to the scale's items (see appendix 1.2). The translated version was submitted to and reviewed by two local teams: the department of mental health of the Kigali Health Institute and the department of Linguistics of the National University of Rwanda. The linguistic team helped to construct the items of BDI in Kinyarwanda terms, and the team from the mental health department validated the mental health/psychological sense of the terms, such as getting the appropriate meaning of "depression" in Kinyarwanda.

The reviewed scale was administered to five people living with HIV/AIDS in order to ensure that the terms and concepts and instructions were understandable. The respondents

were assisted by the researcher to complete the Beck Depression Inventory Scale. There was ambiguity in the instruction given about circling all the responses that described the way they have been feeling in the last week, including the day of interview. This instruction was changed to read ‘circle the one statement which best describes the way they have been feeling in the last week’.

3.8 Validity and reliability of the tool

Validity refers to the degree to which an instrument measures what it is supposed to measure. There are various approaches to validating an instrument, such as content validity, criterion related validity and construct validity (Polit & Hungler, 1999). In this study, content validity was applied to validate the data collection tool. Table 3.1 below highlights the content validity and shows which items of the measurement correspond with which study objectives.

Table 3.1 Summary of content validity: Objectives and Measurements

Research objectives	Item for measurement
Explore the prevalence rate of depression among HIV infected patients attending the Kimironko Health Center	Beck Depression Inventory Scale (BDI) Item 1-21
To describe the clinical profile of depression among HIV infected patients	Beck Depression Inventory Scale (BDI) Item 1-21
To estimate the extent to which socio-demographic factors are associated with depression in people living with HIV.	Self-administered questionnaire Part 1: Section 1-9, together with the BDI will help to determine the extent of association between these variables
To estimate the extent to which HIV medical related indicators are associated with depression.	Self-administered questionnaire Part 2: Section 10-14, together with the BDI will help to determine the extent of association between these variables
Concepts within the conceptual framework	
Increased biological vulnerability (HIV related medical information).	Self-administered questionnaire Part 2: Section 10-14
Decreased social and personal protective factors (Socio-demographic factors).	Self-administered questionnaire Part 1: section 1-9
Presence or absence of depression.	Beck Depression Inventory Scale (BDI)

Beck Depression Inventory Scale has been used in different depression studies and has been shown to have high validity and reliability in measuring depressive symptoms. In a study by Berger-Greenstein et al. (2006) Beck Depression Inventory was used to assess major depression in patients with HIV/AIDS. The scale was also used in a Rwandan context by Hangengimana et al. (2003) to assess depressive symptoms in a sample of genocide survivors and these authors found it to be reliable although the reliability figures were not presented. The instrument was received from the first author as this project was being written up, but without the reliability figures. The content of the Hangengimana et al. (2003) instrument and the one adapted for this study were compared and found to be very similar, except for few items where the sentences construction differed. This difference did not seem to affect the interpretation of the instructions for either questionnaire.

The Beck Depression Inventory scale has also been used in different South African contexts. Kagee (2008) used it to determine the prevalence rate of depression among patients with chronic illness and the scale's internal reliability as measured by Cronbach's alpha was 0.85. In the current study Cronbach's alpha was 0.83.

3.9 Data collection procedure

The researcher collected the data with the help of a research assistant. The research assistant was a psychiatric nurse with an advanced diploma in psychiatric nursing. She was oriented to the use of the Beck Depression Inventory and the ethical principles of confidentiality and data management prior to her involvement with data collection.

Data collection commenced after all required ethical approvals were obtained including permission to conduct the research at Kimironko Health Care Center and permission to view the patients' files (please see Appendices 3.1, 3.2 and 3.3 for these letters of ethical approval). The researcher then approached the nurses in the HIV service to discuss how participants would be identified and the referral process that would be followed in the case of adverse events occurring during the data collection process. It was agreed that the

researcher will manage the events and if a referral was necessary, the normal referral procedure of the service would be used. No adverse events occurred during data collection although some participants became tearful and some angry about their illness and/or social support. In these instances, the researcher allowed them to talk through their feelings before moving on to complete the questionnaire.

The researcher contacted the mental health service at the district hospital and set up appointments and provided referral letters for those who scored severe depression. One participant was already receiving treatment and participating in follow up care and was therefore not referred. Another participant with a previous history of attempted suicide reported thoughts of self-harm and was referred to the mental health outpatient service for immediate follow-up. The researcher made the appointment for the patient and wrote a letter of referral. Those who reported moderate depressive symptoms were also advised to consult the district hospital while others who reported mild depressive symptoms were scheduled to see the social worker of the health center.

The researcher and her assistant were at the clinic on a daily basis from 8:00 until all the patients scheduled for the day were seen. Each morning, a list of patients scheduled for that day was given to nurses, and the selected participants were referred to the allocated offices where they met with either the researcher or the research assistant. Once the participant agreed to participate she/he was given a letter of information and signed the informed consent. Although the instrument is designed as a self-completion questionnaire, all the participants expressed a preference for the researcher to work through the questionnaire with them. It took approximately 20-30 minutes to complete each questionnaire. Participants who experienced emotions such as crying were given time to debrief and were asked if they were still willing to continue. None of the participants asked to be withdrawn from the study.

3.10 Data analysis

Data was analysed using the Statistical Package for the Social Sciences (SPSS for window) version 15. Appendix 5 summarises the variables and types of measurement and statistical analyses that were performed. To estimate the prevalence of depression, descriptive statistics, using frequencies, mean and standards deviation were performed.

The categorical variables in this study (gender, marital status, level of social support, employment status, socio-economic status, symptoms of illness and history of psychiatric disorder) were correlated with the depression score using Chi-square test. Polit and Hungler (1999) state that the chi-square (χ^2) test is a commonly used method for comparing frequencies or proportions among categorical variables and is used to test the significance of the effect of one variable (e.g. HIV/AIDS) upon an outcome (depression).

To analyze the extent to which numerical variables (age, support score, CD4 cell counts and duration of known HIV status) are associated with depression, the *t*-test for independent sample test was used. According to Jackson (2009), the *t* test for a single sample is a parametric statistical test of the null hypothesis for a single sample. It is used to determine the number of standard deviation units a score is from the mean of a distribution. It is used when the researcher wants to compare the mean scores of two different groups of people or conditions for the purposes of assessing if there is any significant difference in the mean scores. (Terre Blanche et al., 2006).

3.11 Data management

All the data collected will be used for the purpose of this study only. Hard copy completed questionnaires and computer data were kept confidential, under lock and key. Data were stored during the study on a computer which has a code of access known only to the researcher. Paper will be shredded after a period of 5 years and data stored on the computer will be erased from both the programme files and the recycle bin.

3.12 Ethical considerations

This study deals with two very sensitive issues: depression and HIV/AIDS. The researcher strived to protect and to respect the privacy, anonymity and wellbeing of persons with these conditions.

Three types of data were collected for the purpose of this study, neither of which contains identifying information, thus ensuring the anonymity of the participants. A consent to participate form and an outline of the purpose of the study were discussed with each client who agreed to participate (see appendix 4). This form indicated that participation is voluntary, and that clients have the right to withdraw from completing the questionnaire at any time they wish. Participants were assured that if they wished to decline to participate, their care or dignity would not be compromised in any way since there is no relationship between participation and health or treatment outcome. No participant declined to participate in the study. Participants were also informed that there is no expectation of additional treatment or any benefits for them associated with participating in the study but that those who scored high on the depression scale were referred to a specific person at the clinic for assistance.

The study commenced once the research proposal has been approved by the research ethics committee of the University of KwaZulu-Natal, the research committee of the National AIDS Control Commission (CNLS) in Rwanda, and the Kimironko Health Centre management (these documents can be found in Appendices 3.1, 3.2 and 3.3).

3.13 Conclusion

This chapter outlined the research methodology followed in this study. It also highlighted the procedure that was used to collect the data as well as the measures taken to ensure that ethical considerations involved in this study were protected. The following chapter will highlight the presentation and analysis of data.

Chapter Four

Data Analysis

4.1 Introduction

This chapter presents the findings of the study. The main aim of the study was to explore the prevalence of depression among people living with HIV/AIDS and to analyze the association between selected socio-demographic data and medical information with depression. Data collection was done using two types of data collection tools: a socio-demographic questionnaire and Beck Depression Inventory Scale (BDI). A description of the socio-demographic characteristics of the sample is presented, followed by data on depression score of the participants obtained from BDI.

The primary outcome measure for this study was depression as measured by BDI. Depression scores were summed using the cutoff of 0-9 for a normal range, 10-18 for a mild to moderate depression, 19-29 for a moderate to severe depression and 30-63 for a severe depression. All the scores above 10 (beginning of the mild-moderate depression range) were then grouped into “depressed” and the scores below 10 were grouped into “not depressed”.

Analysis was done using the Statistical Package for the Social Sciences (SPSS) for Windows, version 15. Cross tabulations and Pearson’s Chi-square analysis were used to determine the extent of relationship between socio-demographic factors and medical factors with depression. A p value of < 0.05 was considered as statistically significant. Logistic regression was later performed to determine each of these factors and how they are associated with a BDI score greater than 10. Only factors that have been found to be significantly associated with depression score in cross tabulation and in chi square analysis were entered into the logistic model, using a backward stepwise approach. With a confidence interval of 95%, factors that had a p value less than 0.05 were retained in the final model.

4.2 Description of the socio-demographic characteristics of the sample

Ninety-six people living with HIV/AIDS attending a selected primary health care center in Kigali constituted the sample size for this study. This sample was randomly selected from a total sampling frame of 349 patients who were scheduled during the period of data collection. The sample size was 27.5% of the total sampling frame for this study.

4.2.1 Age of respondents

The minimum age of the respondents in the sample was 18 years and the maximum was 62 years with a mean of 39.15 years, a median of 38 years and a standard deviation (SD= 9.121). As it appears in the following histogram, the ages of respondents were normally distributed, since most ages were close to the mean age, and only very few were distributed to one and other side of the mean.

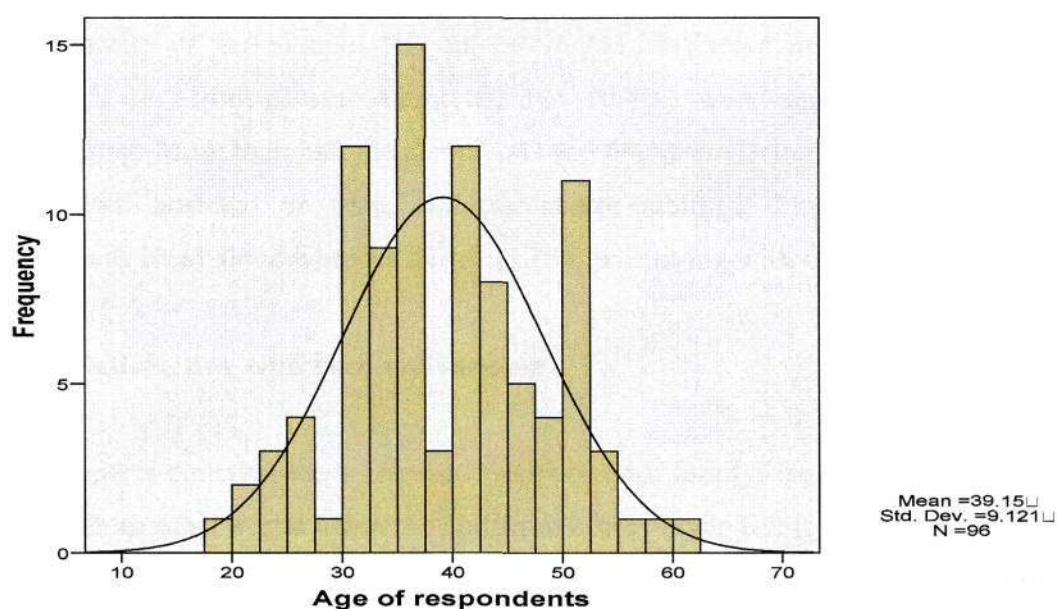


Figure 4.1 age of respondents

4.2.2 Gender of respondents

The largest proportion of the total sample (n=96) were female (67 at 69.8%) and 29 (30.2%) were male.

4.2.3 Employment and amount of money for daily living

Thirty-seven (38.5%) of the respondents were employed, whereas 59 (61.5%) were not employed. About 54 (56.3%) of the participants in the sample were able to afford more than 250 Rwandan Franc for their daily living, and 42 (43.8%) earned less than 250 Rwandan Franc for their daily living. This suggests that under half of the sample in this study lives under poverty line. According to the Second Integrated Household Living Conditions Survey of 2007, a person in Rwanda who consumes less than 250 Rwandan Franc per day is classified as poor (National Institute for Statistic [NIS], 2007).

4.2.4 Relationship status and living arrangement

The majority of the sample, 40 out of 96 (41.7%) were married, 27 (28.1%) were widowed, 14 (14.6%) were divorced, 10 (10.4%) were single and 5 (5.2%) were cohabitating. More than half the sample, 63 (65.6%) were living with their family, that is, living with husband or wife, children and/or siblings. Thirty-two (33.3%) of the respondents lived alone whereas only 1 (1.0%) was living with friends.

4.2.5 Satisfaction with received support

Five supports domains were assessed: support from family, from neighbors and friends, support from other social networks and from other people living with HIV/AIDS, using a scale from 0 meaning extremely dissatisfied to 5 extremely satisfied with support. All these supports scores were added together to make an overall support score out of a maximum of 20.

The minimum support score was 0 and the maximum was 19, with a mean of 11.80 and a standard deviation (SD=3.897). The majority of respondents were overall satisfied with the received support, (Figure 4.2), which is slightly skewed negatively. This means that the majority of the sample scored high above the mean in the level of satisfaction with support.

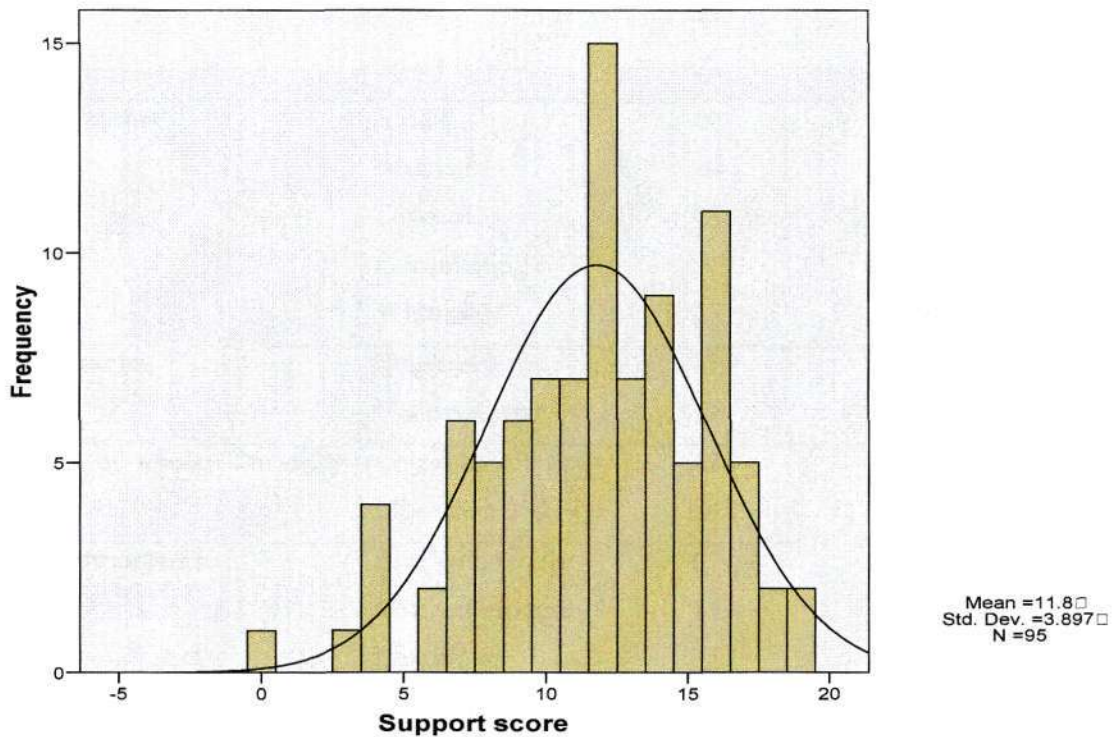


Figure 4.2: Support score

4.2.6 Previous psychiatric history

None of the participants had a past history of psychiatric disorders before learning of their HIV status and 82 (85.4%) of the total sample did not have a history of psychiatric disorder in their family. Only 14 (14.6%) had a past psychiatric history in the family, though none could identify the name of the psychiatric disorder of their family member. These socio-demographic characteristics are shown in table 4.1.

Table 4.1 Socio-demographic characteristics of the sample

Socio-demographic variables	Attributes	Frequency	Percentage
Gender	Male	29	30.2%
	Female	67	69.8%
Age group	18-30	16	16.7%
	31-41	39	40.6%
	42-52	34	35.4%
	53-63	7	7.3%
Marital status	Single	10	10.4%
	Married	40	41.7%
	Divorced	14	14.6%
	Cohabiting	5	5.2%
	Widowed	27	28.1%
Employment	Employed	37	38.5%
	Not employed	59	61.5%
Amount of money for daily living	Less than 250 Frw	42	43.8%
	More than 250 Frw	54	56.3%
Living arrangement	Live with family	63	65.6%
	Live with friends	1	1.0%
	Live alone	32	33.3%
Past personal psychiatric history	Yes	0	0
	No	96	100%
Past psychiatric history in the family	Yes	14	14.6%
	No	82	85.4%

4.3 Description of the medical information of the sample

4.3.1 Duration of known HIV status

The minimum time in years that the respondents in this study (n=93) have known their HIV status was 1 year and the maximum was 15 years, with a mean of 5.20 and a standard deviation (SD=2.869). The figure shows that the distributions of duration of know HIV status is slightly skewed positively bellow the mean. This means that the majority of the samples have known their HIV status in a period less than the mean (5.2). This is illustrated in the following figure.

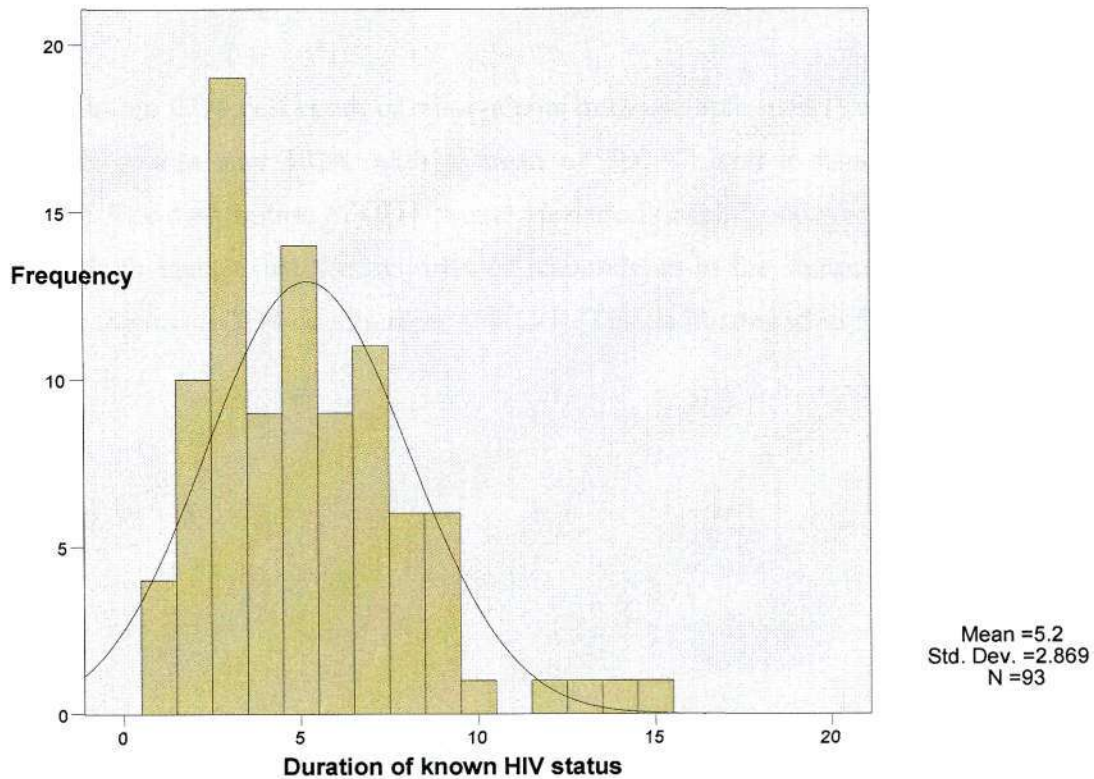


Figure 4.3: Duration of known HIV status

4.3.2 Number of visits to and admissions in the hospital

Seventy-one (74.0%) of the participants had not visited the hospital in the last month for any reason related to their HIV status other than medication supply and laboratory blood values checkup. 14 (14.6 %) visited the hospital once and 10 (10.4%) visited the hospital more than once. Of those who visited the hospital, 4 (4.2%) were admitted into hospital in the last month while 91 (94.8) were never admitted into hospital.

4.3.3 CD4 cell counts

The CD4 cell counts from 91 respondents were considered. Five respondents did not provide their CD4 cell counts and did not provide the code number for their files to allow the researcher to access them. Therefore, these have been considered missing values.

The minimum CD4 cell count of respondents in the sample (n=91) was 50 and maximum CD4 cell counts was 1034, with a mean of 380.97, and a standard deviation (SD= 193.396). The distribution of CD4 counts measure is slightly skewed positively below the mean, which means that the majority of respondents in the sample scored CD4 counts less than the mean CD4 counts score (380.97). This is illustrated in figure 4.4.

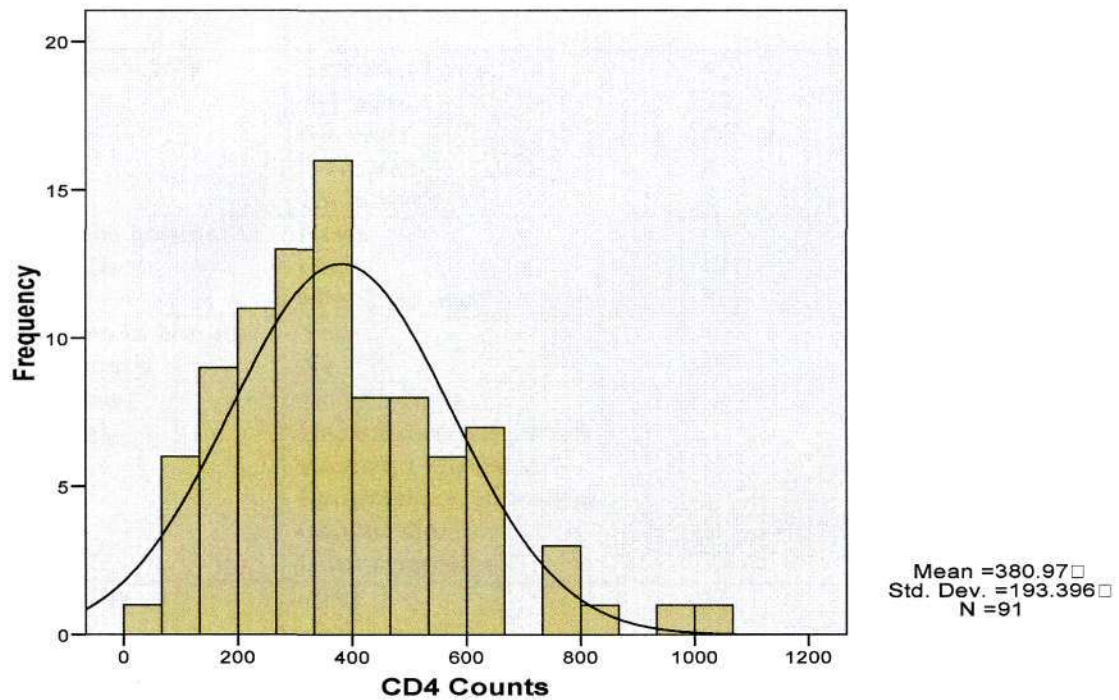


Figure 4.4 CD4 Counts

4.3.4 HIV related symptoms

About 54 (56.3%) of the sample did not present any symptoms related to their HIV status in the month preceding data collection, 17(17.7%) presented unexplained weight loss, 13 (13.5%) presented recurrent respiratory infection, 3 (3.1%) presented recurrent oral ulceration, 2 (2.1%) presented chronic diarrhea and 7 (7.3%) presented other symptoms. Other symptoms comprised of persistent headaches, forgetfulness, urinary infection, tuberculosis, neurological pain and abdominal pain. The medical characteristics of the sample are shown in table 4.2.

Table 4.2 HIV medical related information of the sample

Medical related variables	Attributes	Frequency	Percentages
Time known HIV status	Less than 1 year	4	4.2%
	1-4 years	37	38.5%
	5-8 years	40	41.7%
	9-12 years	8	8.3%
	13-16 years	4	4.2%
Visit to the hospital in last month	Never	71	74.0%
	Once	14	14.6%
	More than once	10	10.4%
Admission in hospital in last month	Yes	4	4.2%
	No	91	94.8%
HIV related symptoms	No symptoms	54	56.3%
	Unexplained weight loss	17	17.7%
	Recurrent respiratory	13	13.5%
	Recurrent oral ulceration	3	3.1%
	Chronic diarrhea	2	2.1%
	Other symptoms	7	7.3%
CD4 counts	<250	21	21.8%
	>=250	70	72.9%

4.4 Prevalence of depression among people living with HIV/AIDS and attending the selected primary health care center in Kigali

The prevalence of depression was assessed using Beck Depression Inventory Scale. The scale constitutes a total score of 63. A score from 0 to 9 was considered normal (not depressed) and all the scores above 9 were considered depression.

As shown in table 4.3, of the total sample (n=96), 56 (58.3%) of respondents scored less than 9 and therefore they were considered not depressed, whereas 40 (41.7%) had a score above 9 and they were considered depressed. With a 95% Confidence Interval, the total prevalence of depressed participants is in the range between 31.83% - 52.18%.

This suggests that the prevalence of depression among people living with HIV/AIDS and attending the selected primary health care center, based on Beck Depression Inventory

Scale, was 41.7%, with 95 % confidence that the prevalence ranges between 31.83% and 52.18 %.

Table 4.3 Prevalence of depression

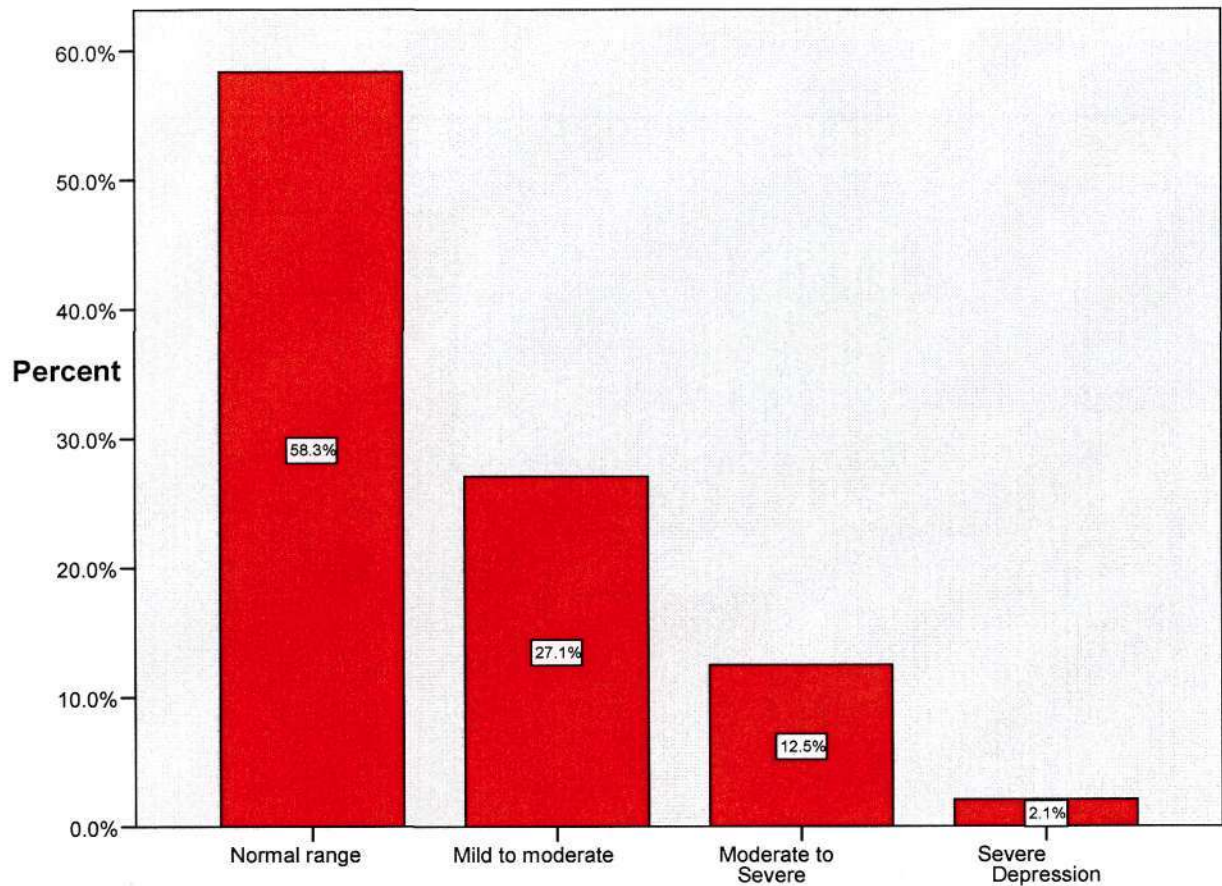
	Frequency	Percentage
Not depressed	56	58.3%
Depressed	40	41.7%
Total	96	100.0%
Proportion Confidence Interval= [95% CI]		: 41.67 [31.83, 52.18]

This finding corresponds to the first objective of this study which was to explore the prevalence of depression among people living with HIV/AIDS attending a primary health care center in Kigali.

4.5 Clinical profile of depression among people living with HIV/AIDS attending the selected primary health care center in Kigali

Respondents who scored from 0 to 9 score in Beck Depression scale were considered not depressed, those with a score between 10-18 were considered as having a mild to moderate depression, those with a score between 19-29 were considered having moderate to severe depression and those with a score above 30 to 63 were considered as having severe depression.

The findings of this study showed that 56 (58.3) of the respondents (n= 96) scored the normal range score, 26 (27.1%) scored mild to moderate depression, 12 (12.5%) scored moderate to severe depression and 2 (2.1%) scored severe depression. This is shown in the following graph 4.1.

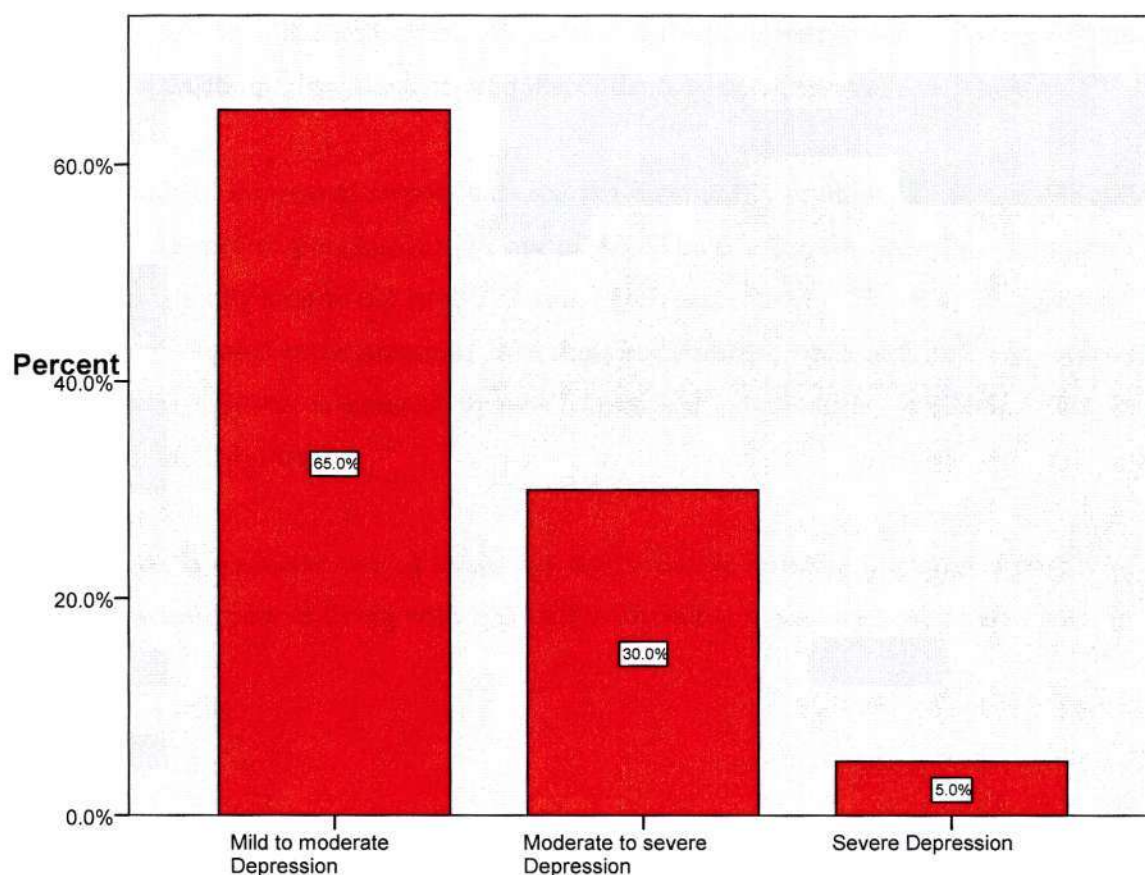


Graph 4.1 Profile of depression

To estimate the profile of depression among people living with HIV/AIDS, respondents who scored within the normal range, in other words those who were not depressed (56 respondents) were not considered. Therefore those who scored depressed, who had a score greater than 9 on Beck Depression Inventory, was considered (n=40).

The following graph 4.2 shows the proportion of depression severity in respondents who scored positive to depression. It shows that out of all the depressed respondents (n=40), 26 respondents (65.0%) scored within the range of 10-18 and are therefore mild to moderately depressed, 12 respondents (30.0%) scored within the range of 19-29 (moderately to severely depressed) and 2 respondents (5.0%) scored within the range of 30-63 and are therefore severely depressed.

This means that 65.0% of all the depressed respondents had mild to moderate depression, 30.0% had moderate to severe depression and 5.0% had severe depression.



Graph 4.2: Depression profile

Graph 4.2 Clinic profile of depression

Particular clinical symptoms for depression commonly presented by respondents in this study were analyzed.

The most common depressive symptoms that were presented by depressed respondents (n=40) were pessimism and fatigability (37), followed by sad mood (36); lack of satisfaction (35), somatic preoccupation (31), loss of libido (30), crying spells (29), work inhibition (28), irritability, social withdrawal and loss of appetite (23). The difference in

all these symptoms was statistically significant when compared the depressed to non depressed respondents (p values ranging from < 0.001 to 0.016).

Although a significant number of depressed respondents (32 out of 40) did not have self-punitive wishes, 6 of them have had thoughts of self-harm before, and 2 expressed that they would like to kill themselves. Again this difference was statistically significant ($p=0.026$) when comparing the depressed respondents to non-depressed respondents.

More than half of depressed respondents did not have guilty feelings (21 out of 40) and did not feel a sense of punishment (24 out of 40). The p value for these two symptoms were not statistically significant ($p=0.223$ and 0.180) respectively. 22 out of 40 depressed respondents presented preoccupations with their body image, but this difference was not statistically significant compared to non depressed respondents ($p=0.08$). This is illustrated in table 4.4 below.

This responds to objective two of this study which was to describe the clinical profile of depression among people living with HIV/AIDS attending a primary health care center in Kigali.

Table 4.4 Frequency of clinical symptoms

		Depression		Total	χ Value	P Value
		Not depressed	Depressed			
Mood	I do not feel sad	25(44.6%)	4(10.0%)	29(30.2%)	26.158	< 0.001
	I feel sad	31(55.4%)	24(60.0%)	55(57.3%)		
	I am sad all the times	0(0.%)	11(27.5%)	11(11.5%)		
	I am so sad and unhappy	0(0.%)	1(2.5%)	1(1.0%)		
Pessimism	I am not discouraged	29(51.8%)	3(7.5%)	32(33.3%)	24.983	< 0.001
	I am discouraged about the future	26(46.4%)	29(72.59%)	55(57.3%)		
	I have nothing to look forward to	1(1.8%)	5(12.5%)	6(6.3%)		
	the future is hopeless	0(0.0%)	3(7.5%)	3(3.1%)		
Sense of failure	I do not feel like a failure	45(80.4%)	22(55.0%)	67(69.8%)	9.863	0.007
	I have failed more than the average	11(19.6%)	14(35.0%)	25(26.0%)		
	All I see is a lot of failure	0(0.0%)	4(10.0%)	4(4.2%)		
Lack of satisfaction	I get satisfaction as I used to	26(46.4%)	5(12.5%)	31(32.3%)	23.547	< 0.001
	I don't enjoy things as I used to	28(50.0%)	20(50.0%)	48(50.0%)		
	I don't get satisfaction anymore	2(3.6%)	14(35.0%)	16(16.7%)		
	I am dissatisfied with everything	0(0.0%)	1(2.5%)	1(1.0%)		
Guilty feelings	I don't feel guilty	38(67.9%)	21(52.5%)	59(61.5%)	4.382	0.223
	I feel guilty a good part of time	18(32.1%)	17(42.5%)	35(36.5%)		
	I feel guilty most of the time	0(0.0%)	1(2.5%)	1(1.0%)		
	I feel guilty all of the time	0(0.0%)	1(2.5%)	1(1.0%)		
Sense of punishment	I don't feel punished	43(76.8%)	24(60.0%)	67(69.8%)	4.894	0.180
	I feel I may be punished	13(23.2%)	14(35.0%)	27(28.1%)		
	I expect to be punished	0(0.0%)	1(2.5%)	1(1.0%)		
	I feel I am being punished	0(0.0%)	1(2.5%)	1(1.0%)		
Self hate	I don't feel disappointed	53(94.6%)	28(70%)	81(84.4%)	11.128	0.011
	I am disappointed	3(5.4%)	10(25.0%)	13(13.5%)		
	I am disgusted	0(0.0%)	1(2.5%)	1(1.0%)		
	I hate myself	0(0.0%)	1(2.5%)	1(1.0%)		
Self accusation	I don't feel worse than other	47(83.9%)	19(47.5%)	66(68.8%)	14.525	0.001
	I am critical of myself	7(12.5%)	15(37.5%)	22(22.9%)		
	I blame myself	2(3.6%)	6(15.0%)	8(8.3%)		
Self punitive wishes	I don't have thoughts of killing myself	55(98.2)	32(80.0)	87(90.6)	9.242	0.026
	I have thoughts of killing myself but I would not	1(1.8)	6(15.0)	7(7.3)		
	I would like to kill myself	0(0.0)	1(2.5)	1(1.0)		
	I would kill myself if I had a chance	0(0.0)	1(2.5)	1(1.0)		
Crying spells	I don't cry than usual	44(78.6%)	12(30.0%)	56(58.3%)	25.790	< 0.001
	I cry now more than I used to	12(21.4%)	21(52.5%)	33(34.4%)		
	I cry all the time now	0(0.0%)	6(15.0%)	6(6.3%)		

Irritability	I used to cry, but now I can't, though I want	0(0.0%)	1(2.5%)	1(1.0%)	21.056	< 0.001
	I am no more irritated	48(85.7%)	17(42.5%)	65(67.7%)		
	I get irritated easily than I used to	7(12.5%)	15(37.5%)	22(22.9%)		
	I get irritated all the time now	1(1.8%)	8(20.0%)	9(9.4%)		
Social withdrawal	I have not lost interest in people	42(75.0%)	17(42.5%)	59(61.5%)	19.626	< 0.001
	I am less interested in other	14(25.0%)	12(30.0%)	26(27.0%)		
	I have lost most of interest in people	0(0.0%)	10(25.0%)	10(10.4%)		
	I have lost all of my interest in people	0(0.0%)	1(2.5%)	1(1.0%)		
Indecisiveness	I make decision as I ever could	51(91.1%)	21(52.5%)	72(75.0%)	19.943	< 0.001
	I put off making decisions	5(8.9%)	13(32.5%)	18(18.8%)		
	I have greater difficult in making decisions	0(0.0%)	6(15.0%)	6(6.3%)		
Body image	I don't feel any worse	43(76.8%)	18(45.0%)	61(63.5%)	11.817	0.08
	I am worried I am looking old	6(10.7%)	6(15.0%)	12(12.5%)		
	I feel permanent changes in my appearance	7(12.5%)	15(37.5%)	22(22.9%)		
	I believe I look ugly	0(0.0%)	1(2.5%)	1(1.0%)		
Work inhibition	I can work out as before	38(67.9%)	10(25.0%)	48(50.0%)	19.685	< 0.001
	It takes extra effort to work	17(30.4%)	23(57.5%)	40(41.7%)		
	I have to push myself very hard	1(1.8%)	6(15.0%)	7(7.3%)		
	I can't do any work at all	0(0.0%)	1(2.5%)	1(1.0%)		
Sleep disturbance	I can sleep as usual	42(75.0%)	19(47.5%)	61(63.5%)	18.177	< 0.001
	I don't sleep as usual	14(25.0%)	10(25.0%)	24(25.0%)		
	I wake up 1-2h before time, hard to sleep	0(0.0%)	3(7.5%)	3(3.1%)		
	I wake up several hours before, hard to sleep	0 (0.0%)	8(20.0%)	8(8.3%)		
Fatigability	I don't get any more tired	18(32.1%)	3(7.5%)	21(21.9%)	12.218	0.007
	I get more tired	36(64.3%)	30(75.0%)	66(68.8%)		
	I get tired from doing anything	2(3.6%)	5(12.5%)	7(7.3%)		
	I am too tired to do anything	0(0.0%)	2(5.0%)	2(2.1%)		
Loss of appetite	My appetite is no worse	48(85.7%)	17(42.5%)	65(67.7%)	23.974	< 0.001
	My appetite is not as good as it used to	8(14.3%)	13(32.5%)	21(21.9%)		
	My appetite is much worse	0(0.0%)	9(22.5%)	9(9.4%)		
	I have no appetite at all	0(0.0%)	1(2.5%)	1(1.0%)		
Weight loss	I haven't lost much weight	45(80.4%)	29(72.5%)	74(77.1%)	0.815	0.367
	I have lost more than 5 pounds	11(19.6%)	11(27.5%)	22(22.9%)		
Somatic preoccupation	I am no more worried about my health	42(75.0%)	9(22.5%)	51(53.1%)	27.792	< 0.001
	I am worried about physical problems	12(21.4%)	20(50.0%)	32(33.3%)		
	I am worried that I can't think of much else	2(3.6%)	10(25.0%)	40(41.7%)		
	I am so worried that I can't think about anything	0(0.0%)	1(2.5%)	1(1.0%)		
Loss of libido	I have not noticed any change in interest in sex	30(53.6%)	10(25.0%)	40(41.7%)	10.283	0.016
	I am less interested in sex than I used to	10(17.9%)	6(15.0%)	16(16.7%)		
	I am much less interested in sex now	8(14.3%)	13(32.5%)	21(21.9%)		
	I have lost interest in sex completely	8(14.3%)	11(27.5%)	19(19.8%)		

4.6 Relationship between socio-demographic factors and depression in people living with HIV/AIDS

The relationship between socio-demographic factors and depression was tested in different steps. First each selected socio-demographic factor (age of respondents, gender, marital status, socioeconomic status, family and social support and past psychiatric history) was tested for its relationship with depression using cross tabulation, and Pearson's chi-square analysis. Secondly, the socio-demographic factors that showed a trend of relationship with depression were assessed using the logistic regression to assess the likelihood of each factor being associated with depression whilst controlling for confounders.

4.6.1 Cross tabulations of relationship between socio-demographic factors and depression

4.6.1.1 Relationship between age of respondents and depression

Increase in age tended to be associated with being depressed. People aged between 20 and 30 were less likely to be depressed (25%) than people aged between 42 and 52 year old (50%). However, this tendency changed in people between the ages of 53 and 63 (28.6%). Despite this trend, the results of the Pearson's chi-square indicated that this association was not statistically significant. The value of the Pearson's chi-square was 3.3532 with a *p* value of (*p*= 0.340) as shown in table 4.5.

Table 4.5 Relationship between age of respondents and depression

		Depression		Total	χ Value	P Value
		Not depressed	Depressed			
Age	18-30	12 (75.0%)	4 (25.0%)	16(100.0%)	3.3532	0.340
	31-41	22 (56.4%)	17 (43.6%)	39 (100.0%)		
	42-52	17 (50.0%)	17 (50.0%)	34 (100.0%)		
	53-63	5 (71.4%)	2 (28.6%)	7 (100.0%)		
Total		56 (58.3%)	40 (41.7%)	96 (100.0%)		

4.6.1.2 Relationship between gender of respondents and depression

Of the total male sample (n=29), 21 (72.4%) were not depressed, and 8 (27.6%) were depressed. On the other hand, of the total number of female in the study (n=67), 35% were not depressed while 32 (47.8%) were depressed.

Cross tabulation was done on the relationship between gender and depression. The results of this showed that out of 40 respondents who scored depressed, women were more likely to be depressed with a proportion of 32 (47.8%) than men 8 (27.6%). This is shown in table 4.6.

A Pearson's chi-square test was performed to test if this relationship was statistically significant. The results indicated that there was a borderline not statistically significant relationship, with females being more likely to be depressed than males (Pearson's chi-square value of 3.389 and a $p = 0.066$).

Table 4.6 Relationship between gender of respondents and depression

		Depression		Total	χ Value	P Value
		Not depressed	Depressed			
Gender	Male	21 (72.4%)	8 (27.6%)	29 (100.0%)	3.389	0.066
	Female	35 (52.2%)	32 (47.8%)	67 (100.0%)		
Total		56 (58.3%)	40 (41.7%)	96 (100.0%)		

4.6.1.3 Relationship between marital status and depression

The majority of the sample size (n=40) were married. Amongst the married respondents, 29 (72.5%) were not depressed and 11 (27.5%) were depressed. The proportion of widowed respondents was 27, and 16 of them (59.3%) scored depressed, against 11 (40.7%) who scored not depressed. Of the 10 respondents who were single, 7 (70.0%) were not depressed and 3 (30.0%) were depressed. 8 divorced respondents (n=14) were

not depressed whereas 6 (42.9%) were depressed. Very few respondents (5) were living in a cohabitating relation, and amongst them, 4 (80%) were depressed, whereas only 1 (20%) was not depressed.

A cross tabulation was done to assess the relationship between the relationship status and depression score. The results indicated that respondents who were living in cohabitation, who were widowed and who were divorced, were more likely to be depressed (80%, 59.3% and 42.9% respectively) than those who were married and who were single (27.5% and 30.0% respectively).

A Pearson's chi-square was performed to test the level of significance of this relationship. The test showed a χ^2 value of 10.332 and a p value of ($p=0.035$) which is statistically significant. Thus, there is a relationship between marital status and depression ($p=0.035$), in which those who are cohabitating, widowed and divorced were more likely to be depressed than those who are married. This is illustrated in table 4.7.

Table 4.7 Relationship between marital status and depression

		Depression		Total	χ Value	P Value
		Not depressed	Depressed			
Relationship status	Single	7 (70.0%)	3 (30.0%)	10 (100.0%)	10.332	0.035
	Married	29 (72.5%)	11 (27.5%)	40 (100.0%)		
	Divorced	8 (57.1%)	6 (42.90%)	14 (100.0%)		
	Cohabiting	1 (20.0%)	4 (80.0%)	5 (100.0%)		
	Widowed	11 (40.7%)	16 (59.3%)	27 (100.0%)		
Total		56 (58.3%)	40 (41.7%)	96 (100.0%)		

4.6.1.4 Relationship between employment, socioeconomic status and living arrangement and depression

Socioeconomic status was assessed in relation to depression. Respondents were asked to rate the amount of money they were able to afford for their daily living, in terms of less than 250 Rwandan Franc (Frw) or more than 250 Frw. Employment status was assessed in terms of respondents being employed or not being employed. Respondents were also asked to state whom they live with, either living with family, with friends or living alone.

The cross tabulation showed a trend on the amount of money earned for daily living with the depression score. Respondents who earned less than 250 Frw. per day were more likely to be depressed (47.6%) compared to those who earned more than 250 Frw. (37.0%). However, the Pearson's chi-square analysis indicated a χ^2 value of 1.088 and a p value of ($p=0.297$) which is not significant, thus indicating that there is no statistically significant relationship between socioeconomic status and depression.

Employment status was related to depression, where respondents who were not employed (27) tended to be more depressed (45.8%) than those who were employed (13, 35.1%). Again, the Pearson's chi-square analysis indicated a χ^2 value of 1.057 and a non-significant p value ($p=0.304$), suggesting that employment was not statistically associated with depression.

Although living alone was more likely to be associated with depression (50.0%) than living with family (36.5%) in cross tabulation analysis, this difference was not statistically significant in Pearson's chi-square analysis, with a χ^2 value of 3.004 and a ($p=0.22$). These values are indicated in table 4.8.

4.6.1.4 Relationship between employment, socioeconomic status and living arrangement and depression

Socioeconomic status was assessed in relation to depression. Respondents were asked to rate the amount of money they were able to afford for their daily living, in terms of less than 250 Rwandan Franc (Frw) or more than 250 Frw. Employment status was assessed in terms of respondents being employed or not being employed. Respondents were also asked to state whom they live with, either living with family, with friends or living alone.

The cross tabulation showed a trend on the amount of money earned for daily living with the depression score. Respondents who earned less than 250 Frw. per day were more likely to be depressed (47.6%) compared to those who earned more than 250 Frw. (37.0%). However, the Pearson's chi-square analysis indicated a χ^2 value of 1.088 and a p value of ($p=0.297$) which is not significant, thus indicating that there is no statistically significant relationship between socioeconomic status and depression.

Employment status was related to depression, where respondents who were not employed (27) tended to be more depressed (45.8%) than those who were employed (13, 35.1%). Again, the Pearson's chi-square analysis indicated a χ^2 value of 1.057 and a non-significant p value ($p=0.304$), suggesting that employment was not statistically associated with depression.

Although living alone was more likely to be associated with depression (50.0%) than living with family (36.5%) in cross tabulation analysis, this difference was not statistically significant in Pearson's chi-square analysis, with a χ^2 value of 3.004 and a ($p=0.22$). These values are indicated in table 4.8.

Table 4.8 Relationship between employment, economic status and living arrangement and depression

		Depression	Total	χ Value	P Value	
		Not depressed	Depressed			
Employment status	Employed	24 (64.9%)	13 (35.1%)	37 (100.0%)	1.057	0.304
	Not employed	32 (54.2%)	27 (45.8%)	59 (100.0%)		
Amount of money for daily living	Less than 250	22 (52.4%)	20 (47.6%)	42 (100.0%)	1.088	0.297
	More than 250	34 (63.0%)	20 (37.0%)	54 (100.0%)		
Living arrangement	Live with family	40 (63.5%)	23 (36.5%)	63 (100.0%)	3.004	0.223
	Live with friends	0 (0.0%)	1 (100.0%)	1 (100.0%)		
	Live alone	16 (50.0%)	16 (50.0%)	32 (100.0%)		

4.6.1.5 Relationship between level of satisfaction with family and social support and depression

The level of satisfaction was assessed in terms of how satisfied respondents were with the support from family, from neighbors and friends, from other social networks and from other people living with HIV/AIDS. All these supports were added together to make an overall support score of 20. The minimum support score was 0 and the maximum was 19, with a mean of 11.80, and a standard deviation (SD=3.897). The mean score among depressed respondents was less (10.70) compared to that of non-depressed respondents (mean score of 12.60), with a mean difference of 1.900. Thus, the less support score, the more likely respondents were to be depressed and the greater support score, the less likely respondents were to be depressed. The t-test for independent sample test was performed to assess the relationship between the levels of support score and depression. The reason that a parametric test was used here is because the dependant variable was not significantly skewed and that the test was robust to departure from normality. The results

confirmed that support was significantly associated with scoring for depression, with a significance p of 0.018, a mean difference of 1.900, a standard difference error of 0.790 a 95% confidence interval of this difference ranging between 0.332 and 3.468. Thus the more support received, the less likely the person is to be depressed. This is illustrated in table 4.9.

Table 4.9 Relationship between level of satisfaction with support and depression

	T-test for Equality of Means				
	Significance	Mean difference	Standard error difference	95% confidence interval of the difference	
				Upper	Lower
Support score	0.018	1.900	0.790	0.332	3.468

4.6.1.6 Relationship between past personal and family psychiatric history with depression

None of the respondents recorded any past psychiatric history before knowing his/her HIV status. Two of the respondents were treated for psychiatric disorders after they discovered their HIV/AIDS status and therefore they were not recorded. For the total sample of respondents, only 14 had a psychiatric history in their family against 82 who had not a family psychiatric history. For those respondents who had past family psychiatric history, 9 (64.3%) did not score depressed and 5(35.7%) scored depression.

Comparing those who have a family psychiatric history with those who did not, only 5 (35.7%) scored depression compared to 35 (42.7%) who did not. On Pearson's chi-square analysis, this also was not statistically significant ($p=0.625$). Therefore, this indicated that there is no relationship between having a past family psychiatric history and scoring for depression. This is illustrated in table 4.10.

Table 4.10 Family psychiatric history and depression

		Depression	Total	χ	P
		Not depressed	Depressed	Value	Value
History of psychiatric disorder in family	Yes	9 (64.3%)	5 (35.7%)	0.239	0.625
	No	47 (57.3%)	35(42.7%)		
Total		56 (58.3%)	40 (41.7%)	96 (100.0%)	

4.6.2 Logistic regression of relationship between socio-demographic factors and depression

Logistic regression was performed to assess the association of different socio-demographic factors for the likelihood that respondents would score positive to depression. Socio-demographic variables which were found to have a relationship with depression score or were statistically significant on Pearson's chi-square analysis were further tested for their relationship with depression. The independent variables entered in the logistic regression model were gender, marital status and the level of support score.

As shown in table 4.11, gender and level of support were the only variables that remained in association with depression in the logistic regression model. Being a female was significantly associated with depression ($p=0.047$), recording an Odd Ratio of 2.712. This indicates that female participants were 2.7 times more likely to be depressed than males, with a Confidence Interval of 95%, ranging from 1.014 to 7.252.

On the other hand, the total score of family, social and friend support was significantly associated with scoring positive to depression ($p=0.018$). The Odd Ratio for this value was however 0.868, ranging from 0.772 to 0.976. This indicates that the more support the participants received from family, social network and friends the less likely they were to

be depressed. Expressed in other words, an increase in social support by one unit decreases the likelihood of depression by 13.2%.

The variable marital status lost its significance in the logistic regression model, possibly due to controlling for the confounding effect of support score. The findings showed a p value of ($p=0.223$) which is not statistically significant. This is illustrated in table 4.11.

Thus, the results of the final logistic regression model showed that gender and level of satisfaction with received support were significantly associated with depression score ($p=0.047$ and $p=0.018$) respectively, taken into account all other socio-demographic factors that were studied.

Table 4.11 Logistic regression of relationship between demographic factors and likelihood to score positive to depression

Variables		B	P Value	Odds Ratio	95% Confidence Interval (CI)	
					Lower	Upper
	Gender female	0.998	0.047	2.712	1.014	7.252
	Family, friends and social support	-0.142	0.018	0.868	0.772	0.976
	Constant	0.627	0.419	1.873		

This answers objective three of this study which was to assess the relationship between socio-demographic variables and depression among people living with HIV/AIDS attending a primary health care center in Kigali.

4.7 Relationship between HIV medical related information and Depression

The relationship between medical related information with depression was also assessed in two different ways. Firstly, the relationship between medical related independent variables and depression were analyzed using cross tabulation, chi-square Pearson analysis. Secondly, variables which were found to be associated with depression were entered in the logistic regression model.

4.7.1 Cross tabulations of relationship between medical information and depression score

4.7.1.1 Relationship between the duration of known HIV/AIDS status and depression

The relationship between the duration of time since respondents have known their HIV status and the likelihood of scoring for depression was assessed using cross tabulation. The results showed a slight difference in mean years (-0.544) between scoring depression and the duration of time since respondents have known their HIV status. Those who have known their HIV status with a mean duration of 4.98 years were less likely to be depressed than those who knew it within a mean of 5.53 years. A T-test for independent sample test was performed to test if this difference was statistically different.

The results of the *t* test confirmed that there is no relationship between duration of time of knowing the HIV status and depression, with a *p* value of 0.371, a mean difference of -0.544, a standard error difference of 0.606 and a CI ranging from -1.748- 0.659, thus excluding any significant statistical relationship.

Table 4.12 Relationship between duration of known HIV and depression

	T-test for Equality of Means				
	Significance	Mean difference	Standard error difference	95% confidence interval of the difference	
				Lower	Upper
Duration of time since known HIV	0.371	-0.544	0.606	-1.748	0.659

4.7.1.2 Relationship between the number of visits and having been admitted to the hospital and depression

The number of visit to the hospital within the last month was assessed using categories such as has never been to the hospital, has been to the hospital once and has been to the hospital more than once. The results from the cross tabulation indicated that the number of visits to the hospital was associated with depression. As indicated in table 4.13, respondents who visited the hospital more than once (n=7) and those who visited the hospital once (n=9) were more likely to score depression (70.0% and 64.3% respectively) than respondents who never visited the hospital (32.4%).

The Pearson's chi-square confirmed this relationship. It was found that the number of visits to the hospital was statistically significantly associated with depression, with a chi-square value of 8.785 and a ($p=0.012$). Thus, the more the respondents visited the hospital, the more likely they are to score depression. This is illustrated in table 4.13 below. However, having been admitted to the hospital in the last month was not statistically associated with depression, with a ($p=0.158$).

Table 4.13 Number of visit and admission to hospital and depression

		Depression		Total	χ^2 Value	P Value
		Not depressed	Depressed			
Number of visit to hospital	Never	48 (67.6%)	23 (32.4%)	71(100.0%)	8.785	0.012
	Once	5 (35.7%)	9 (64.3%)	14 (100.0%)		
	More than once	3 (30.0%)	7 (70.0%)	10 (100.0%)		
Admission in hospital	Yes	1 (25.0%)	3 (75.0%)	4 (100.0%)	1.989	0.158
	No	55 (60.4%)	36 (39.6)	91 (100.0%)		

4.7.1.3 Relationship between the presence of HIV/AIDS related symptoms and depression

HIV/AIDS related symptoms such as unexplained weight loss, recurrent respiratory infection, recurrent oral ulceration and chronic diarrhea were assessed. Respondents were given an option of naming other HIV/AIDS related symptoms they may have presented with. The main other symptoms that were given by respondents were persistent headaches, forgetfulness, urinary infection, tuberculosis, neurological pain and abdominal pain.

The findings of the cross tabulation analysis showed that overall; having HIV-related symptoms was associated with scoring positive to depression. Of the total number (n=15) of respondents who suffered recurrent respiratory infection, 10 (66.7%) scored depression, while 5 (33.3%) were not depressed. Again, of 11 respondents who presented other HIV-related symptoms such as persistent headaches, forgetfulness, urinary infection, tuberculosis, neurological pain and abdominal pain, 10 (90.9%) were depressed, whereas only 1 (9.1%) was not depressed. Of the 20 respondents who presented unexplained weight loss, 10 (50.0%) were depressed, and 10 (50.0%) were not depressed. Of the 4 respondents who presented recurrent oral ulceration, 3 (75.0%) were

depressed and 2 (25.0 %) were not. Also, the all respondents (2) who presented chronic diarrhea were depressed. More than half of respondents (55) did not present any symptoms related to HIV in a month prior to data collection. Of those who did not have symptoms, the majority, 40 (72.7%) were not depressed whereas 15 (27.3%) were depressed.

The Pearson's chi-square test was performed to assess the significance of the relationship between presence of HIV related symptoms and depression. The results showed that having presented recurrent respiratory infection was statistically associated with depression, with a χ^2 value of 4.571 and a p value of ($p=0.033$). Further, having presented other HIV-related symptoms such as persistent headaches, forgetfulness, urinary infection, tuberculosis, neurological and abdominal pain was statistically associated with depression, with a p value of ($p=0.001$) on Fisher's exact test. On the other hand, not having presented any symptoms related to HIV/AIDS was a protective factor to depression, with a statistically significant p value of ($p=0.001$). Thus, having presented HIV related symptoms is strongly associated with depression. This is illustrated in table 4.14.

Table 4.14 HIV/AIDS related symptoms and depression

		Depression		Total	χ Value	P Value
		Not depressed	Depressed			
HIV related symptoms	No symptoms	40 (72.7 %)	15 (27.3%)	55 (100.0%)	10.978	0.001
	unexplained weight loss	10 (50.0 %)	10 (50.0 %)	20 (100.0%)	0.722	0.396
	Recurrent respiratory infection	5 (33.3 %)	10 (66.7 %)	15 (100.0%)	4.571	0.033
	oral ulceration	1 (25.0 %)	3 (75.0 %)	4 (100.0%)	1.908	0.167
	Unexplained chronic diarrhea	0(0.0%)	2(100.0%)	2(100.0%)	2.860	0.091
	other symptoms	1 (9.1 %)	10 (90.9 %)	11 (100.0%)		0.001 (Fisher's exact)

4.7.1.4 Relationship between number of CD4 count and depression

The numbers of CD4 counts were collected, either through self report information for those patients who could easily remember their CD4 measures, or through patients' files for those who were unable to remember. The most recent CD4 measurement was recorded. Five respondents (5.2% of the total sample) did not provide their CD4 and their file codes. The researcher was therefore not able to retrieve their files to check for them. These were considered missing values and the total number of respondents was considered to be 91. The majority of the respondents, 70 (n=91), had CD4 counts greater than or equal to 250, and the remaining 21 had CD4 counts less than 250.

The results of the cross tabulation showed that depression was highest (57.1 %) among respondents who had less than 250 CD4 counts compared to those who were not depressed (42.9 %). More respondents (64.3%) who had CD4 counts greater than 250 were not depressed compared with those who were depressed (35.7%), but this difference was not statistically significant ($p=0.080$). This is illustrated in table 4.15.

Table 4.15 CD4 counts and depression

		Depression		Total	χ	P
		Not depressed	Depressed		Value	Value
CD4 counts	<250	9 (42.9 %)	12 (57.1%)	21 (100%)	3.074	0.080
	\geq 250	45 (64.3 %)	25 (35.7 %)	70 (100.0%)		
Total		54 (59.3%)	37 (40.7%)	91 (100.0%)		

4.7.2 Logistic regression of medical related information associated with depression

Logistic regression was performed to assess the association of different medical related factors with the likelihood of scoring positive to depression, while controlling for confounders. The independent variables entered in the logistic regression model of six steps were number of CD4 counts, presence of HIV related symptoms, number of visits to the hospital, admission in the hospital and time known HIV status. Only the last of six steps of logistic regression model is presented in table 4.16.

As shown in the table 4.16, the presence of HIV related symptoms was statistically associated with scoring positive to depression. Presenting with other HIV/AIDS related symptoms such as persistent headache, urinary infection, neurological and abdominal pain, was significantly associated with depression, with a p value of (0.005) and an Odd Ratio of (OR=22.011), with a Confidence Interval of (2.209-193.130). Thus, respondents who presented other HIV/AIDS related symptoms were 22.01 times more likely to score

depression than respondents who did not have those symptoms. Also, having CD4 counts less than 250 was statistically associated with depression, recording a p value of (p=0.054) and (OR=2.915, CI=0.981-8.657). Thus respondents who had less than 250 CD4 cell counts were 2.915 times more likely to be depressed than those who had more than 250 CD4 counts.

Variable recurrent respiratory infection was significantly associated with depression in chi-square but lost its significance in logistic regression, with a p value (p=0.066) which is borderline not statistically significant. The variable visit to hospital which was significantly associated with depression in Pearson's chi-square also lost its significance in logistic regression.

Thus, the results of the final logistic regression model indicated that having taken into consideration all the medical related factors that were studied; presenting with HIV related symptoms and having CD4 counts of less than 250 were statistically associated with depression.

Table 4.16 Logistic regression of relationship between medical related factors and likelihood to score positive to depression

Variables	B	Significance P	Odds Ratio	95% Confidence Interval (CI)	
				Lower	Upper
Recurrent respiratory infection	1212	0.066	3.362	0.924	12.223
Other HIV related symptoms	3.092	0.005	22.011	2.509	193.130
CD4 <250	1.070	0.054	2.915	0.981	8.657
Constant	-1.189	<0.001	0.305		

This answers objective four of this study which was to assess the relationship between HIV related medical variables and depression among people living with HIV/AIDS attending a primary health care center in Kigali.

4.8 Conclusion

In this chapter, the researcher analyzed data by means of SPSS for window version 15 and by using different statistical tests such as frequencies, standards deviation, cross tabulation analysis and Pearson's chi-square analysis, and *t* test for independent test. Logistic regression was used to test the relationship between independent variables in the study and depression. A *p* value of less than 0.05 was considered as statistically significant.

Overall, the findings suggest that depressive symptoms are very high among HIV-infected patients in this study, with a prevalence of 41.7%. The most frequent depressive symptoms presented in this study were pessimism, fatigability, sad mood; lack of satisfaction, somatic preoccupation, loss of libido, crying spells, work inhibition, irritability, social withdrawal and loss of appetite.

Having taken into consideration all other socio-demographic factors that were studied, being a female ($p=0.047$, $OR=2.712$, $95\% CI =1.014-7.252$) was associated with high risk of depression, and high support from family was a protector factor to scoring for depression ($p=0.018$, $OR=0.868$, $95\% CI=0.772-0.976$).

Considering all the HIV-related medical factors that were studied, presenting with many HIV-related symptoms in the month prior to data collection ($p=0.005$, $OR=22.011$, $95\% CI=2.209-193.130$), and having a CD4 count of less than 250 ($p=0.054$, $OR=2.915$, $95\% CI=0.981-8.657$) were strong predictors of depression.

The next chapter contains a discussion of the findings, limitations of the study and recommendations for mental health care in general and for psychiatric nursing practice at the primary health care centre.

Chapter Five

Discussion of findings, conclusion and recommendations

5.1 Introduction

The purpose of this study was to explore the prevalence of depression and to analyze the factors associated with depression among HIV infected patients attending a Primary Health Care Centre in Kigali (see page 7 section 1.4 for these objectives).

In this chapter, the major findings of the study will be discussed in relation to the conceptual framework. This discussion will be supported by relevant literature. This chapter also discusses the limitations of this study and outlines a number of recommendations for health organizations and for nursing education, practice and research.

HIV medical related factors (CD4 count, number of HIV-related symptoms, the time of known HIV status and previous admission to hospital) were taken to represent increased biological vulnerability and the sociodemographic factors (age, gender, marital status, employment, economic status, social support and past history of psychiatric disorders) were taken to represent personal and social protective and/or vulnerability factors.

According to the stress vulnerability model, the more biologically compromised the individual (low CD4 count, progression towards AIDS, frequent admission to hospital), and the less the presence and action of protective personal and social factors, the more likely the person is to developing serious depressive symptoms. Likewise, the more biologically compromised the individual, and the greater the presence and action of protective personal and social factors, the less likely the person is to developing serious depressive symptoms. (Adewuya et al., 2007; Berger-Greenstein et al., 2007; Bing et al., 2001; Farber & McDaniel, 2002; Kaharuza et al., 2006; Komiti et al. 2003; Leserman et al., 2000; Uys & Middleton, 2004).

5.2 Personal and social protective factors in the sample

Ninety- six people living with HIV/AIDS attending a selected primary health care centre in Kigali constituted the sample size for this study. The mean age was 39.15 years, and a standard deviation (SD= 9.121), the age years ranged from 18 to 62. This suggests that the age of the sample was normally distributed. The sample was predominantly female (69.8%). This is in agreement with other studies to assess mental disorders and depression in people living with HIV in Africa, in (Uganda) and (South Africa) (Kaharuza et al., 2006; Freeman et al., 2008). The predominance of women in this sample can be justified in part by the high rate of women infected with HIV in Rwanda which is estimated to be significantly higher in women (3.6%) than in men (2.3%) (CNLS, 2009).

More than half the sample was not employed (61.5%) and a little over two thirds of the sample were employed (38.5%). Under half of the sample in this study (43.8%) lives under the poverty line and 56.3% live above the poverty line. This is in line with the estimates of CNLS (2009) which states that around 20% of people living with HIV in Rwanda are not employed or working, and that HIV infected women are more likely to live in extreme poverty than men.

The majority of the sample (41.7%) were married, 27 (28.1%) were widowed, 14 (14.6%) were divorced, 10 (10.4%) were single. More than half (65.6%) were living with their family, while 33.3% of the respondents lived alone. The minimum support score was 0 and the maximum was 19, with a mean of 11.80 and a standard deviation (SD=3.897). This suggests that the majority of respondents were overall satisfied with their support from families, neighbours and friends, their other social networks and other people living with HIV/AIDS. This finding is potentially different from that reported by CNLS, (2009). This organization reported that in 2008, over 40% of people living with HIV have been excluded from a social gathering, over 50% have been insulted and over 20% have been physically assaulted. This finding may suggest that stigmatizing attitudes are not as prevalent. However, it is also possible that the exclusionary practices highlighted in the CNS study emanated from the wider social environment and not by people intimately or

even loosely connected with the infected person. Thus, further research is necessary to differentiate between perceived sources of social support (personal and structural) and degree of social stigma.

The majority of the respondents were medically well, based on the CDC classification of system for HIV (www.cdc.gov). Although there was a large variation in CD4 counts, the minimum CD4 count was 50, maximum 1034, with a mean of 380.97, and a standard deviation (SD= 193.396). More than half the sample (56.3%) did not present any symptoms related to their HIV status in the month prior to data collection while 42.7% presented with HIV related symptoms. The sample characteristics in this study are in line with a previous study done by Komiti et al. (2003) in a population of people living with HIV attending a primary care clinic. This study found that both CD4 counts measures and viral load counts indicated that the immune function of most participants in their study was at normal level. The explanation for the absence of HIV related symptoms among respondents in this study may be that the sample was selected from an outpatient health facility, which mainly receives patients who are generally medically well.

5.3 Depression among people living with HIV/AIDS attending a primary health care center in Kigali

From the conceptual framework point of view, the presence of psychiatric problems or symptoms is regarded as the outcome of the interaction between biological, social and personal vulnerability factors (Uys & Middleton, 2004). In this study, the prevalence of depression and the depressive symptom profile of people diagnosed with depression are the phenomena of interest.

5.3.1 Prevalence of depression among people living with HIV/AIDS

The prevalence of depression among people living with HIV/AIDS who participated in this study was 41.7%. The total of depressed participants is in the range between 31.83%

and 52.18% (CI of 95%). This means that almost a half of people living with HIV in the present study scored positive for depression, thus confirming that there is a high prevalence of depression among people living with HIV/AIDS attending a selected primary health care centre in Kigali.

This prevalence of depression among people living with HIV in this study is closer to the prevalence of 53% for depression among youth heads of household in Rwanda (Boris et al., 2008). This rate is higher than the prevalence rate of depression in a group of Rwandans affected by genocide which was estimated to be around 15.5% (Bolton et al., 2002) and higher than that of found among genocide widows (18.6%) (Hangengimana et al., 2003). On the other hand, the rate is significantly lower than the 81% prevalence for clinically significant depression among Rwandan HIV infected women on antiretroviral therapy (Cohen et al., 2008). The reasons for this difference between the prevalence of depression in this study and the prevalence in a study by Cohen et al. (2008) may have been caused by different factors. Firstly, these authors studied a cohort of Rwandan women who are both HIV positive and for the majority, rape survivors of the 1994 genocide. These traumatic experiences (rape and an HIV/AIDS diagnosis) contributed significantly to increasing their risk for depression. In the second place, their study used the Center for Epidemiologic Studies Depression Scale and not the Beck Depression Inventory Scale to assess the prevalence of depression. Kalichman, Rompa and Cage (2000) compared the results of CESD and BDI scales and found that a number of people who scored depressed on the BDI were not depressed on the CESD, and a number of those who were depressed in CESD were not depressed in BDI. There was only a 55% concordance in depression among the two scales, which suggests that both scales can yield different scores. This underscores the need for further research to explore the commonalities and differences in the two scales, and how the results from the scales can be effectively used in clinical screening.

The prevalence of depression in this study is similar to that found in a study done in Kenya to assess the psychiatric disorders among adults patients in general medical facilities. The study found that 42.3% of the total sample screened positive to mild, moderate or severe depression using BDI (Ndeti et al., 2009). A similar rate (47%) was

also found in a study done in Uganda to assess depression among HIV- infected adults undergoing antiretroviral eligibility screening (Kaharuza et al., 2006).

However, the prevalence of depression in this study is higher than the prevalence of depression among people living with HIV in South Africa, which was found to be between 11% and 14% (Freeman et al., 2007; Myer et al., 2008). It is also higher than the prevalence rate of 19.4% - 22% found in American people living with HIV attending outpatient primary care clinics (Komiti et al., 2003; Morrison et al., 2002).

The fact that the prevalence in this study is greater than that found in South African and American HIV-infected populations may suggest that depression among HIV-infected patients is higher in low income countries (such as Rwanda, Uganda, Kenya and Rwanda) (Cohen et al., 2008; Kaharuza et al., 2006; Ndeti et al., 2009.) than in upper-middle income countries (such as South Africa,) Myer et al. (2008) and higher income countries (such as America) Morrison et al. (2002). This underscores the importance of a comparative study of prevalence of depressive disorders among HIV-infected people across countries.

5.3.2 Clinical profile of depression

This study found that for the total sample (n=96), 27.1% respondents were mild to moderately depressed, 12.5% were moderately to severely depressed and 2.1% were severely depressed. This score profile of depression is similar to that found in a study by Kolaric et al. (2006). These authors found that of a sample of 80 HIV-infected Croatian patients, 20% (CI= 11% to 29%) scored moderate to severe depression (BDI >18) and 5% (CI 0.3% to 9.7%) scored severe depression. However, the depression score in this study is marginally less severe than in Weiser et al. (2006) who found that 42% of their sample (n=239) in the United States scored mild to moderate depression and 14% scored severe depression.

The most common depressive symptoms that were presented by depressed respondents in this study were pessimism and fatigability (37/40), followed by sad mood (36/40); lack of

satisfaction (35/40), somatic preoccupation (31/40), loss of libido (30/40), crying spells (29/40), work inhibition (28/40), irritability, social withdrawal and loss of appetite (23/40). In a study by Berger-Greenstein et al. (2006), most participants (74.1%) reported experiencing at least three or four vegetative symptoms such as insomnia, psychomotor retardation/agitation, fatigue/loss of energy and weight loss; 68% reported affective symptoms such as anhedonia and depressed mood; and 60% experienced cognitive symptoms such as thoughts of worthlessness, diminished ability to think or concentrate, and thoughts of death.

Kalichman et al. (2000) have argued that the presence of somatic symptoms may cause the overscoring of depression in people affected by a medical condition. These authors maintain that using the Beck Depression Inventory Scale without removing the overlapping symptoms of HIV disease and somatic symptoms for depression can increase depression scores in symptomatic HIV positive persons. However, Weiser et al. (2006) found that the depression score in their study did not differ when they used the full Beck Depression Inventory Scale and when somatic symptoms were removed from the scale. Similarly, in a study by Kolaric et al. (2006), comparing the distribution of Beck Depression Inventory Scale scores without somatic symptoms yielded a similar result as when the full BDI was used. Kaharuza et al. (2006) also did not find any difference in the depression score among people infected with HIV/AIDS when they used the full Epidemiologic Studies Depression Scale and when they removed the somatic symptoms from the scale.

Previous research assessing psychopathology, particularly affective disorders such as depression in African countries (Patel, Abas, Broadhead, Todd & Reeler, 2001; Tomlinson, Swartz, Kruger & Gureje, 2007), and in Rwanda (Hagengimana et al., 2002), have reported that affective disorders, particularly depression have different presentations across cultures, and that somatic presentations are frequent in these populations. For example, Patel et al. (2001) reported that depression in Zimbabwe presents mainly with multiple somatic complaints such as headaches and fatigue, and other symptoms related to the heart and the head. In the same way, in their study on manifestation of affective disorders in Sub-Saharan Africa, Tomlinson et al. (2007) found that affective disorders

present largely in somatic forms, which if not accounted for, may obscure the detection of depression. It should also be noted that the majority of respondents in this study (55%) were HIV asymptomatic. Thus, the probability is high that the symptoms of fatigue, reduced appetite and loss of energy were not present as an expression of the HIV/AIDS profile and therefore influenced the depression score as depressive symptoms and not than HIV/AIDS symptoms.

5.4 Association between social-personal factors and depression in people living with HIV/AIDS

Socio- personal factors which were studied in this study are age, gender, marital status, employment status, income, living arrangement, previous history of mental disorders and the level of satisfaction with social and family support.

Overall, being a female, divorced, and widowed or cohabitating, with poor social and family support were found to be the social-personal factors that increased the risk of depression among people living with HIV/AIDS.

The findings of this study suggest that both in univariate and multivariate analysis models, age of respondents ($p=0.340$), employment status ($p=0.304$), income ($p=0.297$) and living arrangement ($p=0.223$) were not associated with depression. These findings are in line with those in a study by Morrison et al. (2002) who found that age and income were not significantly correlated with psychiatric disorders. Similarly, Adewuya (2007) found no significant correlation between psychiatric disorders with age, sex, and socio-economic status. However, unemployment and living alone were found to be significantly associated with the high prevalence of psychiatric disorders among people living with HIV/AIDS (Bing et al. 2001). The fact that employment and income were not significantly associated with depression in this study may in part be because participants in this study were selected from an urban primary health care centre situated in Kigali, the capital city of the country. This area is ranked the least affected province by poverty in Rwanda compared to the other remaining four provinces (NIS, 2007).

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5.4 Association between social-personal factors and depression in people living with HIV/AIDS

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Overall, being a female, divorced, and widowed or cohabitating, with poor social and family support were found to be the social-personal factors that increased the risk of depression among people living with HIV/AIDS.

The findings of this study suggest that both in univariate and multivariate analysis models, age of respondents ($p=0.340$), employment status ($p=0.304$), income ($p=0.297$) and living arrangement ($p=0.223$) were not associated with depression. These findings are in line with those in a study by Morrison et al. (2002) who found that age and income were not significantly correlated with psychiatric disorders. Similarly, Adewuya (2007) found no significant correlation between psychiatric disorders with age, sex, and socio-economic status. However, unemployment and living alone were found to be significantly associated with the high prevalence of psychiatric disorders among people living with HIV/AIDS (Bing et al. 2001). The fact that employment and income were not significantly associated with depression in this study may in part be because participants in this study were selected from an urban primary health care centre situated in Kigali, the capital city of the country. This area is ranked the least affected province by poverty in Rwanda compared to the other remaining four provinces (NIS, 2007).

None of the participants in this study reported suffering from a mental disorder before knowing their HIV/AIDS status. Previous research has found that previous history of depressive disorders was a stronger predictor of scoring high rate of depressive disorders among people living with HIV/AIDS than with non-infected people (Komiti et al., 2003; Morrison et al., 2002). Only two respondents reported suffering from a mental health problem which developed after they learned of their HIV/AIDS status. This is in line with the findings of a study by Mello and Malbergier (2005) who found that a large proportion of women in their sample (48%) presented at least one depressive episode after being informed of their HIV diagnosis. The WHO Report (2008) stresses that most people suffer depression or other psychiatric disorders when trying to adjust to the impact of being infected and having to face the difficulties of living with a chronic life-threatening illness. For the few (14, n= 96) respondents who reported a family history of psychiatric disorders, the results of the cross tabulation and chi-square test did not show any significance relationship between family history and depression. This lack of association may be due to the low number of respondents who had family history of psychiatric disorders in this study.

Marital status, particularly living in cohabitation, being a widow and a divorcee, were associated with scoring positive to depression than being married or single in univariate cross tabulation analysis in this study ($p=0.035$). This significance was reduced in multivariate logistic regression. This might have been due to controlling for the confounding effect of support score, thus, it is possible that those who are married get more support than those who are divorced, widowed or are living in cohabitation. In their study, Judd et al. (2003) found that being in an intimate relationship and living with one's partner lowered the risk of depression.

The results of the multi-logistic regression have shown that gender and level of satisfaction with family and social support were significantly associated with depression, having taken into account other factors that were studied. Being a female was over 2 times more likely to score positive to depression than being a male (OR=2.712, 95% CI=1.014-7.252). A possible explanation for the higher rate of depression among females (47.8%) than males (27.6%) might have been due to the overrepresentation of females

(65/91) than males (29/91) in this study. Nevertheless, the female gender has been found to be associated with scoring positive to depression in other previous studies assessing depression in a population of HIV infected people (Israelski et al., 2007; Kaharuza et al., 2006). Research on depression in the general population have also found that gender is significantly associated with depression with females being more likely to have depression than males (Riolo et al., 2005; Stein et al., 2008). Morrison et al. (2002) argue that the significant additional stressors that women living with HIV/AIDS face, in addition to their family and career roles, constitute a principal factor of vulnerability to depression. This is possibly the case in Rwanda, where the female gender is considered a vulnerable group, especially because a large number are rape survivors, are single heads of household in the absence of husbands who may have died or are imprisoned on charge of genocide. These are considered pre-existing traumatic experiences which make women especially vulnerable to depression in the context of HIV (Cohen et al., 2008).

The findings of this study suggest that having more family and social support was a protective factor to scoring positive to depression (OR=0.868, 95% CI=0.772-0.976). This means that an increase in social support by one unit decreases the likelihood of depression by 13.2%. Conversely, a decrease in social support by one unit increases the likelihood of depression by 13.2%. Previous studies assessing factors associated with depression among HIV infected people have found that lack of social support constitutes a strong predictor to depression and to mental disorders among people living with HIV (Bing et al., 2001; Ingram, Jones, Fass, Neidig & Song, 1999; Judd et al., 2005; Leserman et al. 2000). In a study by Ingram et al. (1999), individuals living with HIV who reported receiving more unsupportive social interactions, mainly insensitivity, disconnecting and blaming interactions also reported being more depressed. Similarly, Prachakul, Grant and Keltner (2007) report that people living with HIV with less social support had more depressive symptoms. On the other hand, Leserman et al. (2000) state that the availability of social support, a sense of belonging or integration within a social network including primary partners, families, and/or friends and peers is associated with greater psychological adjustment in HIV/AIDS. A South African study found that people who had been part of a support group and who perceive themselves as having a supportive context were less likely to have a diagnosis of mental disorder than those who

never joined a support group and who felt discriminated or isolated by their family members and community (Freeman et al., 2007). On the same way, Mundell (2006) found that participating in a support group increased HIV infected women's self-esteem and offered them support and positive ways of coping with the infection.

Social support is especially significant in African context, where people depend on their family support and social networks for social as well as economic survival (Mundell, 2006).

5.5 Association between biological vulnerability factors and depression in people living with HIV/AIDS

HIV medical related factors that were studied in this research were time of known HIV status, number of visit and admission to hospital due to HIV, the presence of HIV-related symptoms and the CD4 counts measures.

Overall, having lower CD4 counts, having visited the hospital more than once and having presented many HIV-related symptoms were the biological factors that increased vulnerability to depression among people living with HIV/AIDS. On the other hand, having high CD4 counts, fewer visits to hospital and few HIV-related symptoms were the biological factors that decreased the risk of depression.

The duration of knowing HIV status was not statistically associated with depression ($p=0.618$). This is in line with the findings from other studies that the number of years of knowing HIV status is not associated with depression (Judd et al., 2003; Katz et al., 1996; Komiti et al., 2003). However, Myer et al., (2008) found that depressive episodes were more likely to be associated with short time since the HIV status is known. Having been admitted to hospital in the previous month before data collection was also not statistically associated with depression (p values 0.158). Adewayu et al. (2007) also found that previous hospitalization due to HIV/AIDS did not predict depression or other psychiatric disorders. The lack of significance in this study might be also explained by the fact that

there were very few respondents (4/96) who were admitted into hospital in the month prior to the data collection period to allow accurate cross tabulation with depression.

CD4 cell count was significantly associated with scoring positive to depression, with those having less than 250 CD4 cell counts being almost 3 times at risk of depression than those who had CD4 counts more than 250. This corroborates the findings from previous studies which found that CD4 counts are a strong predictor to mental disorders (Katz et al., 1996; Moosa, Jeenah & Voster, 2005) and to depression in particular (Berger-Greenstein et al., 2007; Kaharuza et al., 2006). However, other studies have not found any statistically significant difference in CD4 counts with depression. Judd et al. (2005) found that HIV indicators such as number of years HIV seropositive, CD4 counts measures and viral load were not significantly correlated with depression. This is in agreement with Komiti et al. (2003) who found that immune function indicators such as number of CD4 counts, HIV RNA count, disease stage and duration of HIV illness did not have any significant association with depressive symptoms. Also, Freeman et al. (2008) have found in their study that CD4 counts were not significantly associated with mental disorders.

Number of visits to hospitals ($p=0.012$) was significantly associated with depression in univariate analysis, with respondents who visited the hospital more than once being at risk of depression than those who did not visit the hospital, but this did not remain significant in multivariate analysis in this study. This might have been due to controlling for HIV-related symptoms, since it is these symptoms that motivated their frequent visits to hospital.

The presence of HIV-related symptoms in previous month was strongly associated with depression in both models. Having presented other HIV/AIDS related symptoms, such as persistent headache, urinary infection, neurological and abdominal pain, was significantly associated with depression ($p= 0.005$; $OR=22.011$, $95\% CI=2.209-193.130$). Thus, respondents who presented other HIV/AIDS related symptoms were over 22 times more likely to score depression than respondents who did not have those symptoms. Not having presented any symptoms related to HIV/AIDS was a protective factor to

depression, with a statistically significant p value of ($p=0.001$). This confirms the findings of Bing et al., (2001), where HIV-related symptoms were associated with screening positive to psychiatric disorder, and the strength of the relationship increased with increasing HIV-related symptoms. This is in line with the findings of this study, since the more symptoms respondents presented with, the more their chances of screening positive to depression increased. Freeman et al. (2008) support that HIV related symptoms explain a deteriorating condition of one's health, which may be highly distressing compared to CD4 counts measures which are not tangible and visible.

Overall, the findings of this study suggest that female gender, social support, HIV-related symptoms and CD4 counts less than 250 are the factors that are statistically significantly associated with depression, and this is in agreement with the findings by Katz et al. (1996). These authors found that overall, HIV related symptoms ($p=0.001$), low CD4 counts ($p=0.003$) and social support ($p=0.001$) remained statistically significant as predictors of depression (Katz et al., 1996).

5.6 Limitations of the study

This study has some limitations, mainly related to the sample and the use of a standardized scale to measure depression.

The sample used in this study is selected from a single health center patient population and therefore the results may not be representative and generalizable to the general population of people living with HIV/AIDS in Rwanda. Although the sample size was calculated according to an acceptable formula, it could have been bigger to allow for the statistical tests to yield the level of significance between some variables and scoring depression. Nevertheless, despite these limitations related to the sample size, the results from this study are informative in a way that they give a prevalence of depression and associated factors among HIV infected people in a context of a selected primary health care centre in Rwanda, which adds to a limited body of knowledge in this area and may serve as foundation for future representative researches of the same issues.

Generally, the use of standardized self-report scales has been criticized for focusing on symptom severity by using cutoff scores rather than relying on clinical interview data (Sheeran & Zimmerman, 2002). The criticism may therefore have more to do with the issue that using a standardized scale does not always allow for an in-depth exploratory conversation as does a clinical interview. According to Sheeran & Zimmerman, (2002), the primary function of a standardized scale is symptoms screening, preparing as a prelude to in-depth interviewing in the clinical situation.

The reliability of BDI has been extensively validated in similar population and in similar context and found to be reliable. Furthermore, the reliability of Beck Depression Inventory was validated in this study and a Cronbach's alpha of 0.83 was found.

Due to time and resource constraints, this research did not screen for other common psychiatric disorders. The choice of depression was motivated by the fact that it is the most common psychiatric disorder affecting people living with HIV in the literature. However, it should be noted that people living with HIV infections may suffer from other range of psychiatric disorders which need to be screened and treated. Research assessing the prevalence of other psychiatric disorders affecting people living with HIV/AIDS is needed.

Some HIV medical indicators such as viral load measures and types of antiretroviral treatment used by patients were not assessed in this study, yet have been found to be predictors of depression in previous studies (Morrison et al., 2002; Myer et al., 2008). Time and resources constraints mitigated against their inclusion and it is recommended that future research consider all these HIV related medical factors and how they increase vulnerability to depression.

5.7 Recommendations

The need for early screening of depression in this population is critical. Therefore, this section begins with a brief description of what such a screening tool might consider and how it might be structured, by drawing on the findings from this study. Thereafter, recommendations for HIV/AIDS policy makers, for nursing practice, nursing education and nursing and public health research have been developed.

5.7.1 Clinical screening tool for depression, based on the major findings of this study

The tool should comprise an assessment of both symptoms of depression commonly presented by patients with HIV/AIDS, and assess the vulnerability factors, as well as protective factors

5.7.1.1 Common symptoms of depression

It has been found in this study that the most common depressive symptoms among respondents were pessimism, fatigability, sad mood, lack of satisfaction, somatic preoccupation, loss of libido, crying spells, work inhibition, irritability, social withdrawal and loss of appetite. Although suicide did not reach a statistical significance, six of the respondents reported having had thoughts of self-harm and two respondents would like to kill themselves if they had a chance.

The screening tool should contain the above mentioned common symptoms, and the presence of them among HIV infected people attending the health centre should require a thorough assessment.

5.7.1.2 Vulnerability factors

It was found in this study that being female, having lack of social support, presenting different HIV-related symptoms and having CD4 counts fewer than 250 constitute factors of vulnerability to depression among people living with HIV/AIDS in this study.

HIV-infected patients who are found to have one of the above vulnerability factors should be considered as at risk of depression and undergo screening assessment.

5.7.1.3 Protective factors

Being married, having enough social support, having greater CD4 counts, few HIV-related symptoms and fewer visits to hospital were found to be protective factors to depression. These factors need to be highlighted in the screening tool to save the clinician to reinforce and to focus on them while designing a plan of care for patients.

5.7.1.4 Risk assessment tool

Factors to consider	Yes	No
1. Depressive symptoms		
Do you feel sad, depressed?		
Do you feel discouraged about the future?		
Do you have thoughts of killing yourself?		
Are you dissatisfied with everything?		
Do you cry more often?		
Do you feel irritated more often?		
Have you lost interest in other people		
Do you push yourself to get something done?		
Do you get tired more easily?		
Did you lose your appetite?		
Did you lose interest in sex?		
Do you feel worried about your health than usual?		
If at least four answers to the above questions are yes, explore risk factors		
2. Risk factors for depression among HIV-infected patients		
Female		
Poor social support		
HIV-related symptoms		
Visits to hospital in previous month		
CD4 counts less than 250		
If risk factors are present, consider the patient as being at risk for depression		

5.7.2 Policy-makers

Mental health and HIV/AIDS services should be integrated and routine screening a matter of policy.

It is recommended that the National Aids Control Commission (CNLS) and the Center for Treatment and Research on AIDS (TRAC) make the integration of mental health services into existing HIV services in the country a priority. WHO (2008) report that this integration constitutes an opportunity to improve the health of people living with HIV/AIDS. The prevalence of depression among people living with HIV/AIDS in this study (almost half the sample; 41.7%) shows that there is a high prevalence of depression (and there may be other mental health problems) among people living with HIV/AIDS. Yet, previous studies have shown that depression and other mental disorder often go undetected and subsequently untreated in HIV care settings (Israelski et al., 2007; Petrushkin et al., 2005). CNLS should therefore include the policy on integration of mental health in HIV/AIDS services in their AIDS strategic plan. The already started initiative of integrating HIV services in one psychiatric hospital should be reinforced and expanded to other mental health services in the country. The results of this and previous studies underscore the need for integrating mental health in HIV/AIDS services and a systematic screening of mental disorders among people living with HIV/AIDS. TRAC should conduct training on recognizing; diagnosing and treating depression and other mental disorders among people living with HIV/AIDS for all health professionals who work in HIV/AIDS services. The World Health Organization (2005) has outlined some modules that can be used to achieve this.

Systematic screening can be achieved through the use of quick and easy to administer screening tools such as the BDI and Epidemiological Depression Scale. All health professionals involved in consultation can be trained on how to use these screening tools, and patients who screen positively can then be referred for further, in-depth assessment (Valente, 2003). HIV services at district level should collaborate with mental health services available in district hospitals of the country through regular supervision, and difficult cases can be referred for mental health follow-up. A risk assessment tool based on the key findings of this study has been provided (section 5.7.14) and can routinely

serve the primary care clinician to assess the risk of depression before administering more structured screening scales.

5.7.3 Nursing practice

It is recommended that the primary health care centre conduct in-service training with their health professionals, particularly nurses since are the group which consults with HIV infected patients about how to manage their health status, treatment regimes and psychosocial issues. Systematic training for this group in mental health screening should be a matter of policy (addressed above) and routine application in each consultation. Nurses should include mental disorders and depression in their education to patients living with HIV and their family, with particular emphasis on how to recognize symptoms of depression, how to report them and practical measures for increasing the protective factors in their lives and for decreasing biological vulnerability. The stress-vulnerability framework would ensure that the approach is holistic and in keeping with the patients needs and the nursing mandate.

Evidence has shown that that support groups have been successful in dealing with psychosocial problems related to HIV in other African countries (Bolton et al., 2003; Freeman et al., 2007). This is therefore an important protective coping strategy which nurses could include in their repertoire of interventions. Group work also has the advantage over individual work in that support is simultaneously provided for and generated through the coming together of a larger number of people. All patients living with HIV/AIDS should at least participate in support groups during their course of treatment and this participation should be prescribed and adhered to as are the biological treatments. Furthermore, stigma-reducing and thus, support enhancing programs could be developed to advocate for the support of people living with HIV/AIDS and their families through concerted primary health care awareness campaign.

5.7.4 Nursing and public health research

This study did not assess the prevalence of all common psychiatric disorders among people living with HIV/AIDS and yet this information is important for health system planning, resource allocation and targeted primary health intervention programmes. Research in this area would be valuable for strengthening health systems capacity to respond to twin health burden of HIV/AIDS and mental illness. A larger sample based on a national survey and taking into account different sites can help to generate generalizable information about the prevalence of mental disorders among HIV infected people in Rwanda.

Furthermore, some important HIV medical related information such as viral load and antiretroviral treatment and how they are associated with depression or other mental disorders were not assessed in this study. Knowledge about these relationships is important for supporting medication and treatment adherence in both HIV/AIDS and mental illness and for understanding both the biological and psychological dimensions of both disorders. This is especially important for psychiatric nursing which defines itself as a holistic, person-oriented caring process. In this respect, psychiatric nursing needs to develop a more robust body of knowledge about how patients experience and manage these disorders and the impact of specific targeted nursing actions in strengthening protective factors and reducing the impact of vulnerability factors in supporting the mental health status of patients living with HIV/AIDS.

5.7.5 Nursing and health professional education

HIV/AIDS has been introduced as a compulsory course in all higher education learning programs in Rwanda. The content of this course focuses on HIV/AIDS in general but it is this researcher's opinion that the mental health aspects of HIV/AIDS should be integrated into the curriculum, especially in those institutions where nurse training is the focus of attention. The curriculum could be expanded to include skills in identifying and managing depression and other mental disorders commonly affecting HIV-infected

patients, running support groups and mobilizing community awareness and participation in the social process of health.

5.8 Conclusion

The aim of this study was to estimate the prevalence of depression among people living with HIV/AIDS attending a primary health care centre in Kigali and to assess the factors that are associated with depression. From the findings of this study, it emerged that depression is high among people living with HIV who participated in the study. The majority of participants who scored positive to depression had mild to moderate depression and very few had severe depression. For all the socio-demographic factors and HIV medical related factors that were studied, it emerged from the findings of the study that being a female and lack of social support were statistically associated with scoring positive to depression. On the other hand, the number of HIV-related symptoms and having CD4 counts below 250 were statistically associated with scoring positive to depression. Although this was not assessed in this study, it was found that for all the respondents who made the sample size, only two were receiving treatment for mental disorders, which confirms the findings of Israelski et al. (2007) ; Petrushkin et al. (2005) that most of the time, depression is undetected and untreated in primary health care setting.

The findings of this study underscore the importance of integrating mental health in HIV/AIDS services for appropriate mental health care of those affected.

References

- Adewuya, A. O., Afolabi, M. O., Ola, B. A., Ogundele, O. A., Ajibare, A.O., Oladipo, B. F. (2007). Psychiatric disorders among the HIV-positive population in Nigeria: A control study. *Journal of Psychosomatic Research*, 63(2), 203-206.
- Adewayu, A.O., Afolabi, M. O., Ola, B.A, Ogundele, O.A., Ajibare, A.O. Oladipo, B.F. et al. (2008). Relationship between depression and quality of life in persons with HIV infection in Nigeria. *The international Journal of Psychiatry in Medicine*, 38(1), 43-51.
- Allen, J., Hamilton, A., Nunn, R., Crock, L., Frecker, J. & Burk, N. (2009). Evaluation of a community-based mental health drug and alcohol nurse in the care of people living with HIV/AIDS. *Journal of Psychiatric and Mental Health Nursing*, 16(2), 129-136.
- American Psychiatric Association (2000). *Practice Guideline for the Treatment of patients with HIV/AIDS*. United States of America. American Psychiatric Publishing.
- Angelino, A. F. (2002). Depression and adjustment disorder in patients with HIV disease. *Topics in HIV Medicine*, 10(5), 31–35.
- Arnold, S.D., Forman, L.M., Brigidi, B.D., Cartel, K.E., Schweitzer, H.A., Quinn, H.E. et al. (2008). Evaluation and characterization of generalized anxiety and depression in patients with primary brain tumors. *Neuro-Oncology*, 10(2), 171-181.
- Asch, S. M., Kilbourne, A. M., Gifford, A. L., Burnam, M. A., Turner, B., Shapiro, M. F. et al. (2003). Underdiagnosis of Depression in HIV: Who are we missing?. *Journal of General Internal Medicine*, 18(6), 450-460.
- Babbie, E. (2007). *The practice of Social Research* (11th ed.). United States of America: Wadsworth Cengage Learning.
- Basu, S., Chwastiak, L. A., & Bruce D. R. (2005). Clinical management of depression and anxiety in HIV-infected adults. *Journal of International AIDS Society*, 19 (18), 2057-2067.
- Beaglehole, R.; Epping-Jordan, J.; Patel, V.; Chopra, M.; Ebrahim, S.; Kidd, et al. (2008). Improving the prevention and management of chronic disease in low-income and

- middle-income countries: A priority for primary health care. *The Lancet*, 372(9642), 940-949.
- Berger-Greenstein, J.A., Carlos, A., Cuevas, C. A., Brady, S, M., Trezza, G., Mark A. et al. (2007). Major Depression in patients with HIV/AIDS and substance abuse. *Journal of AIDS Patients Care and STDs*, 21 (12), 942-955.
- Bing, E.G., Burnam, M.A., & Longshore, D. (2001). Psychiatric disorders and drug use among human immunodeficiency virus-infected adults in the United States. *Archive of General Psychiatry*, 58(8), 721-728.
- Bolton, P., Neugebauer, R. & Ndogoni, L. (2002). Prevalence of depression in rural Rwanda based on symptom and functional criteria. *The Journal of Nervous and Mental Disease*, 190(9), 631-637.
- Boris, N. W., Brown, L.A., Thurman, T.R., Rice, J.C., Snider, L.M., Ntaganira, J. et al. (2008). Depressive symptoms in youth heads of household in Rwanda: Correlates and implications for intervention. *Archives of Pediatrics and Adolescents Medicine*, 162(9), 836-843.
- Burns, N., & Grove, S. K, (2005). *Understanding Nursing Research: Building an Evidence –Based Practice*. (4th ed.). Philadelphia, USA, Elsevier, Saunders.
- Cazullo, C.L., Bessone, E., Bertrando, P., Pedrazzoli, L., & Cusini, M. (1998). Treatment of depression in HIV-infected patients. *Journal of Psychiatry and Neuroscience*, 23(5), 293-297.
- Centre de Treatment et de la Recherche sur le SIDA, Malaria et Tuberculose (TRAC Plus, 2008). *Prise en charge psychosociale des personnes infectées et/ou affectées par le VIH/SIDA: Guide du prestataire*. Kigali, Rwanda Ministry of Health.
- Chander G., Himelhoch S. & Moore R., D. (2006). Substance abuse and psychiatric disorders in HIV-positive patients: epidemiology and impact on antiretroviral therapy. *Drugs*, 66(6), 769–789.
- Chandra, P. S., Desai, G., & Ranjan, S. (2005). HIV and psychiatric disorders. *Indian Journal of Medical Research*, 121(4), 451-467.
- Citron, K., Brouillette, M. J., & Alexandra Beckett, A. (2005). *HIV and Psychiatry: A training and resource manual* (2nd ed.). New York, Cambridge University Press.
- Cohen, M. H., Fabri, M., Cai, X., Shi, Q., Hoover, D.R., Binagwaho, A. et al. (2009).

- Prevalence and predictors of posttraumatic stress disorder and depression in HIV-infected and at-risk Rwandan women. *Journal of Women's Health*, 18 (11), 1783-1791.
- Collins, P.Y. (2006). Challenges to HIV prevention in psychiatric settings: perception of South African mental health care providers. *Social Sciences and Medicine*, 63, 979-990.
- Collins, P.Y., Holman, A.R, Freeman, M.C. & Patel, V. (2006). What is the relevance of mental health to HIV/AIDS care programs in developing countries? A systematic review. *AIDS*, 20 (12), 1571-1582.
- Cook, J.A., Grey, D., Burke, J., Cohen, M.H., Gurtman, A.C., Richardson, J.L. et al. (2004). Depressive symptoms and AIDS-related mortality among a multisite cohort of HIV-positive women. *American Journal of Public Health*, 94(7), 1133-1140.
- De Jong, J. P., Scholte, W. F., Koeter, M. W. J. & Hart, A.A.M. (2000). The prevalence of mental health problems in Rwandan and Burundese refugee camps. *Acta Psychiatrica Scandinavica*, 102(3), 171-177.
- De la Garza, C., L., S., Paoletti-Duarte, S., Garcia-Martin, C. & Gutierrez-Cesares, J., R. (2001). Effavirenz-induced psychosis. *International AIDS Society*, 15(14), 1911-1912.
- Dyregrov, A., Gupta, L., Gjestad, R. & Mukanoheri, E. (2000). Trauma exposure and psychological reactions to genocide among Rwandan children. *Journal of Traumatic Stress*, 13(1), 3-21.
- Faber, E. W., & McDaniel, J. S. (2002). Clinical management of psychiatric disorders in patients with HIV disease. *Psychiatric Quarterly*, 73(1), 5-16.
- Farber, E. W., Mirsalimi, H., Williams, K. A., & McDaniel, S. J. (2003). Meaning of illness and psychological adjustment to HIV/AIDS. *Journal of Psychosomatic Medicine*, 44(6), 485-491.
- Ferrando, S.J., & Freyberg, Z. (2008). Treatment of depression in HIV positive individuals: A critical review. *International Review of Psychiatry*, 20(1), 61-71.
- Foster, R., Olajide, D. & Evarall, I.P. (2003). Antiretroviral therapy-induced psychosis: Case report and brief review of the literature. *HIV Medicine*, 4(2), 139-144.
- Fransen Van de Putte, D.E., Fischer, K., Posthouwer, D., Van Erpecum, K. & Mauser-

- Bunschoten, E.P. (2009). Occurrence, course and risk factors of depression during antiretroviral treatment for chronic hepatitis C in patients with inherited bleeding disorders: A prospective study. *Haemophilia*, 15(2), 544-551.
- Freeman, M., Nkomo, N., Kafaar, Z. and Kelly, K. (2007). Factors associated with prevalence of mental disorders in people living with HIV/AIDS in South Africa. *AIDS Care*. 19 (10), 1201-1209.
- Freeman, M., Nkomo, N., Kafaar, Z. and Kelly, K. (2008). Mental disorders in people living with HIV/AIDS in South Africa. *South African Journal of Psychology*, 38(3), 489-500.
- Freeman, M.C., Patel, V., Collins, P.Y., & Bertolote, J.M. (2005). Integrating mental health in global initiatives for HIV/AIDS. *British Journal of Psychiatry*, 187, 1-3.
- Gallego, L., Gordillo V., & Catalán J. (2000). Psychiatric and psychological disorders associated to HIV infection. *Journal of AIDS Reviews*, 2(1), 48-60.
- Gibbie, T., Mijch, A., Ellen, S., Hoy, J., Hutchison, C., Wright, E. et al. (2006). Depression and neurocognitive performance in individuals with HIV/AIDS: 2 year follow-up. *The British HIV Association*, 7(2), 112-121.
- Griensven, V. J., De Naeyer, L., Uwera, J., Asimwe, A., Gazille, C., & Reid, T. (2008). Success with antiretroviral treatment for children in Kigali, Rwanda: Experience with health center/nurse-based care. *BMC Pediatric*, 8(39), 1-13.
- Halman, M. (2001). Management of depression and related neuropsychiatric symptoms associated with HIV/AIDS and antiretroviral therapy. *Canadian Journal of Infectious disease*, 12, 9-19.
- Hangengimana, A., Hinton, D., Bird, B., Pollack, M., & Pitman, R., K. (2003). Somatic panic-attack equivalents in a community sample of Rwandan widows who survived the 1994 genocide. *Psychiatric Research*, 117(1), 1-9.
- Hartzell, J. D., Janke, I. E., & Weintrob, A. C. (2008). Impact of depression on HIV outcomes in the HAART era. *Journal of Antimicrobial Chemotherapy*, 62(2), 246-255.
- Husbands, W., Browne, G., Caswell, J., Buck, K., Braybrook, D., Roberts, J. et al. (2007). Case management community care for people living with HIV/AIDS (PLHAs). *Journal of AIDS Care*, 19(8), 1065-1072.
- Ingram, K.M., Jones, D.A., Fass, R.J., Neidig, J.L. & Song, Y.S. (1999). Social support

- and unsupportive social interactions: their association with depression among people living with HIV. *Journal of AIDS Care*, 11(3), 313-329.
- Israelski, D.M., Prentiss, D.E., Lubega, S., Balmas, G., Garcia, P., Muhammad, M., Cummings S., et al. (2007). Psychiatric co-morbidity in vulnerable populations receiving primary care for HIV/AIDS. *Journal of AIDS Care*, 19(2), 220-225.
- Joint United Nations Programme on HIV/AIDS [UNAIDS] (2008). *Report on the global AIDS epidemic*. Geneva, UNAIDS.
- Joint United Nations Programme on HIV/AIDS [UNAIDS] (2002). *Report on the global AIDS epidemic*. Geneva, UNAIDS.
- Jackson, S., L. (2009). *Research methods and statistics: a critical thinking approach*. (3rd ed.). United States of America: Wadsworth.
- Joubert, G. & Ehrlich, R. (2007). *Epidemiology: A research manual for South Africa*, (2nd ed.). Cape Town: Oxford University Press.
- Judd, F., Komiti, A., Chua, P., Mijch, A., Hoy, J., Grech, P. et al. (2005). Nature of depression in patients with HIV/AIDS. *Australian and New Zealand Journal of Psychiatry*, 39 (9), 826-832.
- Kaharuza, F., M., Bunnell, R., Moss S., Purcell, W.D., Bikaako-Kajura, W., Wamai, N., et al. (2006). Depression and CD4 cell count among persons with HIV infection in Uganda. *AIDS and Behavior*, 10(1), 105-111.
- Kagee, A. (2008). Symptoms of depression and anxiety among a sample of South African patients living with a chronic illness. *Journal of Health Psychology*, 13(4), 547-555.
- Kalichman, S.C., Rompa, D. & Cage, M. (2000). Distinguishing between overlapping somatic symptoms of depression and HIV disease in people living with HIV/AIDS. *Journal of Nervous and Mental Disease*, 188(10), 662-670.
- Katz, M.H., Douglas J.M., Bolan, G. A., Marx, R., Sweat, M., Park, M.S. et al. (1996). Depression and use of mental health services among HIV-infected men. *Journal of AIDS Care*, 8(4), 433-442.
- Katz, S. & Nevid, J. (2005). Risk factors associated with posttraumatic stress disorder symptomatology in HIV-infected women. *AIDS Patient Care and STDs*, 19(2), 110-120.
- Katzenellenbogen, J.M., Joubert, G. & Abdool Karim, S.S. (1997). *Epidemiology: A*

- manual for South Africa*. Cape Town: Oxford University Press.
- Kendal, W.S. (2007). Suicide and cancer: A gender-comparative study. *Annals of Oncology*, 18(2), 381-387.
- Kessler, R. C., Berglund, P., Demler, O., Jin, R., Koretz, D., Merikangas, K. R. et al. (2007). The epidemiology of major depressive disorder: Results from the national comorbidity survey Replication (NCS-R). *Journal of American Medical Association*, 289(23), 3095-3105.
- Khouzam, H. R., Donnelly, N. J., & Ibrahim, N. F., (1998). Psychiatric morbidity in HIV patients. *Canadian Journal of Psychiatry*, 43(1), 51-56.
- Kimironko Health Centre (2008). Annual report of activities. Kigali, Kimironko Health Centre.
- Komiti, A., Judd, F., Grech, P., Mijch, A., Hoy, J., Llyod, J. H. et al. (2001). Suicidal behaviour in people with HIV/AIDS: A review. *Australian and New Zealand Journal of Psychiatry*, 35(6), 747-757.
- Komiti, A., Judd, F., Grech, P., Mijch, A., Hoy J., Williams, B. et al. (2003). Depression in people living with HIV/AIDS attending primary care and outpatient clinics. *Australian and New Zealand Journal of Psychiatry*, 37(1), 70-77.
- Kolaric, B., Tesic, V., Ivankovic, D. & Begovac, J. (2006). Prevalence of moderate and severe depression among Croatian patients infected with Human Immunodeficiency Virus. *Collegium Anthropologicum*, 30(2), 85-88.
- Leserman, J. (2008). Role of depression, stress and trauma in HIV disease progression. *Psychosomatic Medicine*, 70(5), 539-545.
- Leserman J., Petitto J.M., Golden R.N., Gaynes, N.B., Gu, H., Silva S.G., et al. (2000). Impact of stressful life events, depression, social support, coping, and cortisol on progression to AIDS. *American Journal of Psychiatry*, 157(8), 1221–1228.
- Lopez, A.D., Mathers, C.D., Ezzati, M., Jamison, D., & Murray, C.J.L., (2006). The global and regional burden of disease and risk factors, 2001: Systematic analysis of population health data. *The Lancet*, 367 (9524), 1747-1757.
- Lyon, D.E. & Younger, J.B. (2001). Purpose in life and depressive symptoms in persons living with HIV disease. *Journal of Nursing Scholarship*, 33(2), 129-133.
- Markowitz, J. C., Klerman, G. L., Clougherty, K. F., Spielman, L. A., Jacobsberg, L. B.,

- Fishman, B., et al. (1995). Individual psychotherapies for depressed HIV-positive patients. *American Journal of Psychiatry*, 152(10), 1504-1509
- Martin, L.I. (2008). HIV-related post-traumatic stress disorder: Psychological distress among a sample of individuals recently diagnosed with HIV (Master dissertation, Stellenbosch University, 2008).
- Marzuk, P. M., Tardiff, K., Leon, A.C., Hirsch, C.S., Hartwell, N., Portera, L. et al. (1997). HIV seroprevalence among suicide victims in New York City, 1991-1993. *American Journal of Psychiatry*, 154(12), 1720-1725.
- Maxwell, S., Scheftner, W., Kessler, H., & Busch, K. (1988). Manic syndrome associated with zidovudine treatment. *Journal of the American Medical Association*, 259(23), 3406-3407.
- McCombe, J. A.; Noorbakhsh, F.; Buchholz, C.; Trew, M., & Power, C. (2009). NeuroAids: A watershed for mental health and nervous system disorders. *Journal of Psychiatry Neurosciences*, 34(2), 83-5.
- Meel, B.L. (2006). Epidemiology of suicide by hanging in Transkei, South Africa. *American Journal of Forensic Medicine and Pathology*, 27(1), 75-78.
- Mello, V., A. & Malbergier, A. (2005). Depression in women infected with HIV. *Revista Brasileira de Psiquiatria*, 28(1), 10-17.
- Ministry of Health of Rwanda (2003). *HIV/AIDS treatment and care plan, 2003-2007*. Kigali, William J. Clinton Foundation.
- Ministry of Health of Rwanda (2007). *Annual report, 2007*. Kigali, Rwanda Ministry of Health.
- Misono, S., Weiss, N. S., Fann, J. R., Redman, M. & Yueh, B. (2008). Incidence of suicide in persons with cancer. *Journal of Clinical Oncology*, 26(29), 4731-4738.
- Moosa, M.Y.H., Jeenah, F.Y. & Voster, M. (2005). HIV in South Africa: depression and CD4 count. *South African Journal of Psychiatry*, 11(1), 12-15.
- Morrison, M.F., Pettito, J. M., Have, T. T., Gettes, D. R., Chiappini, M. S., Weber, A.L., et al. (2002). Depression and anxiety disorders in women with HIV infection. *American Journal of Psychiatry*, 159(5), 789-796.
- Mundell, J.P. (2006). The impact of structured support groups for pregnant women living with HIV. (Master dissertation, University of Pretoria, 2006).
- Myer, L., Smit, J., Le Roux, L., Parker, S., Stein, D., & Seedat S. (2008). Common

- mental disorders among HIV-infected individuals in South Africa: Prevalence, predictors, and validation of brief psychiatric rating scales. *Journal of AIDS Patients Care and STDs*, 22(2), 147-158.
- National AIDS Control Commission (CNLS, 2007). The current HIV epidemiology in Rwanda, retrieved March 15th, 2009, on www.cnls.gov.rw
- National AIDS Control Commission (CNLS, 2009). *Rwanda National Strategic Plan on HIV & AIDS 2009-2012*. Kigali, CNLS.
- National Institute of Statistics (2007). *Profile of living conditions in Rwanda, 2005-2006: Based on the second integrated household living conditions survey*. Kigali, National Institute of Statistics.
- Ndeti, D. M., Khasakhala, L. I., Kuria, M.W., Mutiso, V.N., Ongesha-Owuor, F.A., & Kokonya, D. (2009). The prevalence of mental disorders in adults in different level general medical facilities in Kenya: a cross-sectional study. *Annals of General Psychiatry*, 8(1), 1-8.
- O'Dowd M., A. & Mc Kegney, F.P. (1988). Manic syndrome associated with zidovudine. *Journal of the American Medical Association*, 260(4), 3587-3588.
- Olatunji, B.O., Mimiaga, M.J., O'Cleirigh, C., & Safren, S., A. (2006). A review of treatment studies of depression in HIV. *International AIDS Society-USA topics in HIV Medicine*, 14(3), 112-124.
- O'Leary, Z. (2004). *The essential guide for doing research*. London: Sage.
- Olley, B.O., Seedat, S., Nei, D.G & Stein, D.J. (2004). Predictors of major depression in recently diagnosed patients with HIV/AIDS in South Africa. *AIDS Patients Care and STDs*, 18(8), 481-487.
- Olley, B.O., Seedat, S., & Stein, D.J. (2006). Persistence of psychiatric disorders in a cohort of HIV/AIDS patients in South Africa: a 6-month follow-up study. *Journal of Psychosomatic Medicine*, 61(4), 479-484.
- Olley, B. O., Zeier, M. D., Seedat, S. & Stein, D. J. (2005). Post-traumatic stress disorder among recently diagnosed patients with HIV/AIDS in South Africa. *AIDS Care*, 17(5), 550-557.
- Patel, V., Abas, M., Broadhead, J., Todd, C. & Reeler, A. (2001). Depression in developing countries: lesson from Zimbabwe. *British Medical Journal*, 322(7284), 482-484.

- Pence, B.W., Reif, S., Whetten, K., Leserman, J., Stangl, D., Swartz, M., et al. (2007). Minorities, the poor, and survivors of abuse: HIV-infected patients in the US deep South. *Southern Medical Journal*, 100(11), 1114-1122.
- Petrushkin, H., Boardman, J. & Ovuga, E. (2005). Psychiatric disorders in HIV-positive individuals in urban Uganda. *Psychiatric Bulletin*, 29(12), 455-458.
- Pham, P.N., Weinstein, H.M. & Longman, T. (2004). Trauma and PTSD symptoms in Rwanda: Implication for attitudes toward justice and reconciliation. *Journal of American Medical Association*, 292(5), 602-612.
- Polit, D.F. & Hungler, B.P. (1999). *Nursing research: Principles and methods*. Philadelphia: Lippincott.
- Polit, D.F., & Beck, T.C. (2008). *Nursing research: Generating and assessing evidence for nursing practice* (8th ed.). New York: William and Wilkins.
- Population Reference Bureau (2008). 2008 World population data sheet. Retrieved on 20th March 2009 from <http://www.prb.org/Publications/Datasheets/2008/2008wpds.aspx>.
- Porche, D. J. & Willis, D.G. (2006). Depression in HIV-infected men. *Issues in Mental Health Nursing*, 27(4) 391-401.
- Prachakul, W., Grant, J.S. & Keltner, N.L. (2007). Relationship among functional social support, HIV-related stigma, social problems solving and depressive symptoms in people living with HIV: a pilot study. *Journal of the Association of Nurses in AIDS Care*, 18(6), 67-76.
- Préau, M., Bouhnik, A. D., Peretti-Watel, P., Obadia, Y., Spire, B. and the ANRS-EN12-VERPA Group (2008). Suicide attempts among people living with HIV in France. *AIDS Care*, 20(8), 917-924.
- Prince, M., Patel, V., Saxena, S., Maj, M., Maselko, J., Phillips, M. R., et al. (2007). No health without mental health. *The lancet*, 370 (9590), 857-877.
- Rabkin, J., (1995). Depressive disorders among HIV disease: an uncommon association. *Focus*, 10(9), 1-4.
- Rabkin, J.G. (2008). HIV and depression: 2008 review and update. *Current HIV/AIDS Reports*, 5(4), 163-171.
- Rabkin, J.G., Ferrando, S.J., Lin, S.H., Sewell, M. & McElhiney, M. (2000).

- Psychological effects of HAART: A 2-year study. *Psychosomatic Medicine*, 62(3), 413-422.
- Rand Corporation (2007). Mental health and substance abuse issues among people with HIV: Lesson from HCUS. Research highlight, 1-5.
- Rao, R., Sagar, R., Kabra, S.K.; & Lodha, R. (2007). Psychiatric morbidity in HIV-infected children. *Journal of AIDS care*, 19(6), 828-833.
- Riolo, S. A., Nguyen, T.A., Greden, J.F., & King, C.A. (2005). Prevalence of depression by race/ethnicity: Findings from the national health and nutrition examination survey III. *American Journal of Public Health*, 95(6), 998-1000.
- Roy, A. (2003). Characteristics of HIV patients who attempt suicide. *Acta Psychiatrica Scandinavica*, 107(1), 41-44.
- Safren, S.A., Gershuny, B.S., & Hendriksen, E. (2003). Symptoms of posttraumatic stress and death anxiety in persons with HIV and medication adherence difficulties. *AIDS Patient Care and STDs*, 17(12), 657-664.
- Schaal, S. & Elbert, T. (2006). Ten years after the genocide: trauma confrontation and post traumatic stress in Rwandan adolescents. *Journal of Traumatic Stress*, 19(1), 95-105.
- Schwartz, C. E. & Selwyn, P. A. (2001). HIV psychiatry: Epidemiology, depression diagnostic issues and treatment choice, drug interactions. *NeuroAids*, 4(4).
- Sebit, M. B., Tombe, M., Siziya, S., Balus, S., Nkomo, S.D.A., & Maramba, P. (2003) Prevalence of HIV/AIDS and psychiatric disorders and their related risk factors among adults in Epworth, Zimbabwe. *East African Medical Journal*, 80(10), 503-512.
- Sirey, J. A., Bruce, M.L., Alexopoulos, G.S., Perlick, D.A., Raue, P., Friedman, S.J. et al. (2001). Perceived stigma as a predictor of treatment discontinuation in young and older outpatients with depression. *American Journal of Psychiatry*, 158(3), 479-481.
- Sheeran, T. & Zimmerman, M. (2002). Case identification of depression with self-report questionnaires. *Psychiatric Research*, 109 (1), 51-59.
- Starace, F., Ammassari, A., Trotta, M.P., Murri, R., De Longis, P., Izzo, C. et al. (2002). Depression is a risk factor for suboptimal adherence to highly active antiretroviral therapy. *Journal of Acquired Immune Deficiency Syndrome*, 31(3), 136-139.

- Stein, D.J., Seedat, S., Herman, A., Moomal, H., Heeringa, S.G., Kessler, R.C et al. (2008). Lifetime prevalence of psychiatric disorders in South Africa. *British Journal of Psychiatry*, 192(2), 112-117.
- Stuckler, D., King, L., Robinson, H. and McKee, M., (2008). WHO budgetary allocations and burden of disease: a comparative analysis. *The Lancet*. 372(9649), 1563-1569.
- Tomlinson, M., Swartz, L., Kruger, L.M., & Gureje, O. (2007). Manifestations of affective disturbance in Sub-Saharan Africa: key themes. *Journal of Affective Disorders*, 102(1), 191-198.
- Tomlinson, M., Grimsrud, A.T., Stein, D.J, Williams, D.R & Myer, L. (2009). The epidemiology of major depression in South Africa: results from the South African stress and health study. *South African Medical Journal*, 99(2), 367-373.
- Terre Blanche, M., Durrheim, K., Painter, D. (2006). *Research in practice: Applied methods for the social sciences*. Cape Town: University of Cape Town Press.
- Uwineza, J., Fabri, M., Zaninyana, I., Mafurebo, J. (2008). *Proceeding from the fourth annual conference of research on HIV and AIDS*, Kigali, Rwanda
- Uys, L. & Middleton, L. (2004). *Mental Health Nursing: a South African perspective* (4th ed.). Cape Town: Juta.
- Valente, S.M., (2003). Depression and HIV disease. *Journal of the Association of the Nurses in AIDS Care*, 14 (2), 41-51.
- Verdhana, S. M., & Laxminarayana, B. K. (2007). Depression in patients with HIV/AIDS. *Kuwaiti Medical Journal*, 39(3), 227-230.
- Vitiello, B., Burnam, M. A., Bing, E. G., Beckman, R. & Shapiro, M. F. (2006). Use of psychotropic medication among HIV-infected patients in the United States. *American Journal of Psychiatry*, 160(3), 547-554.
- Weglarz, M. & Boland, M. (2005). Family-centered nursing care of the perinatally infected mother and child living with HIV infection. *Journal for Specialists in Pediatric Nursing*, 10(4), 161-169.
- Whetten, K., Reif, S., Whetten, R., & Murphy-McMillan, L.K., (2008). Trauma, mental health, distrust, and stigma among HIV-positive persons: Implication for effective care. *Journal of Psychosomatic Medicine*, 70(5), 531-538.
- Weiser, S., Riley, E.D., Ragland, K., Hammer, G., Clark, R. & Bangsberg, D. (2006).

- Factors associated with depression among homeless and marginally housed HIV-infected men in San Francisco. *Journal of General Internal Medicine*, 21(1), 61-64
- Williams, P., Narciso, L., Browne, G., Roberts, J., Weir, R., & Gafni, A., (2005). The Prevalence, correlates, and costs of depression in people living with HIV/AIDS in Ontario: Implications for service directions. *AIDS Education and Prevention*. 17(2), 119-130.
- World Bank (2009). World Bank list of economies. Retrieved from <http://web.worldbank.org>
- World Health Organization (2004). *WHO HIV/AIDS Treatment and Care Protocols for Commonwealth Independent Countries*. Geneva, Switzerland
- World Health Organization (2005). *Mental health and HIV/AIDS series: Psychiatric care in anti-retroviral therapy: for second level care*. Geneva, World Health Organization.
- World Health Organization (2005). *Mental Health Atlas, 2005*. Accessed from http://www.who.int/mental_health/evidence/mhatlas05/
- World Health Organization (2007). *Chronic HIV Care with ARV therapy and prevention: Interim guidelines for health workers at the health centre or district hospital outpatients clinic*. France, World Health Organization.
- World Health Organization (2008). *HIV/AIDS and Mental Health, report by the Secretariat*. Geneva, World Health Organization.
- Zhang, J., Ye, M., Huang, H., Li, L. & Yang, A. (2008). Depression of chronic medical inpatients in China. *Archives of Psychiatric Nursing*, 22(1), 39-49.

Appendices

Appendix 1: Data collection instruments

Study Title: Exploring Depression among people living with HIV /AIDS

Participant Number:

Date:

Instructions: There are three parts to this questionnaire. Part 1 asks you for some personal information about yourself, part 2 asks for your medical information and part 3 asks you to rate your mood.

Please complete all three parts.

Part 1: Demographic data

Please answer each item.

1. **Please write in your age:** _____

2. **Tick your gender:** Male Female

3. **Please tick your relationship status:**
Single Married Divorced Separated Cohabiting Widow

4. **Please tick your employment status:**
Employed Not employed

5. **Please tick the amount of money you and the people you live with use for your daily living:** Less than 250 Frw/ day More than 250 Frw/day

6. **Please tick who you live with:**
Family Friends Live alone

Please turn over

7. On a scale from 0 to 5, where 0 means extremely dissatisfied and 5 means extremely satisfied, please TICK how satisfied are you with the social support you receive from the following:

	Extremely dissatisfied		Extremely satisfied			
Level of satisfaction with social support	0	1	2	3	4	5
1. How satisfied are you with the social support you receive from your family (husband, wife, children, siblings, relatives)?						
2. How satisfied are you with the social support you receive from your neighbors and friends?						
3. How satisfied are you with the social support you receive from your other social network (for example, your church, your work place)?						
4. How satisfied are you with the social support you receive from other people living with HIV/AIDS individually or in association?						

8. Have you suffered from any psychiatric disorder or consulted a psychiatric service before you learnt of your HIV status?

Yes No

If yes, what is the name of the psychiatric disorder?

9. Do any of your immediate family members suffer or have suffered from a psychiatric disorder or consult a psychiatric service on a regular basis?

Yes No Unsure

If yes, what is the name of the disorder they suffer from?

Thank you for completing Part 1. Please turn over for part 2 about your medical status.

Participant Number:

Date:

Part 2: Medical Information

10. Please write down the duration (months, years) you have known you are HIV positive: _____

11. During the last month, how often have you been at the hospital for symptoms of HIV/AIDS?

Never Once More than once

12. During the last month, have you been admitted in the hospital for HIV symptoms?

Yes No

13. Which of the following symptoms related to HIV/AIDS have you had in the last month (or you still have)?

- 13.1 No symptoms
- 13.2 Unexplained weight loss
- 13.3 Recurrent respiratory infection
- 13.4 Recurrent oral ulceration
- 13.5 Unexplained chronic diarrhea
- 13.6 Others

13.6.1 Please name or describe these other symptoms:

14. The last time your blood was taken for testing, what range were you told your CD4 cells were in? Please write in the range you were given:

Thank you for completing part two. Now please complete part three.

Participant Number:

Date:

PART THREE: INFORMATION ABOUT YOUR MOOD

Directions:

1. On this questionnaire are 21 groups of statements.
2. Please read each group of statements carefully.
3. Then pick the one statement in each group that best describes the way you have been feeling the past week, including today.
4. Circle the number beside the statement you picked.
5. Be sure to read all the statements in each group before making your choice.

-
- | | | |
|--------------------------------|---|--|
| 1. Mood | 0 | I do not feel sad. |
| | 1 | I feel sad. |
| | 2 | I am sad all the time and I can't snap out of it. |
| | 3 | I am so sad or unhappy that I can't stand it. |
| 2. Pessimism | 0 | I am not particularly discouraged about the future. |
| | 1 | I feel discouraged about the future. |
| | 2 | I feel I have nothing to look forward to. |
| | 3 | I feel that the future is hopeless and that things cannot improve. |
| 3. Sense of failure | 0 | I do not feel like a failure. |
| | 1 | I feel I have failed more than the average person. |
| | 2 | As I look back on my life, all I can see is a lot of failures. |
| | 3 | I feel I am a complete failure as a person. |
| 4. Lack of satisfaction | 0 | I get as much satisfaction out of things as I used to. |
| | 1 | I don't enjoy things the way I used to. |
| | 2 | I don't get real satisfaction out of anything anymore. |
| | 3 | I am dissatisfied or bore with everything. |
| 5. Guilty feelings | 0 | I don't feel particularly guilty. |
| | 1 | I feel guilty a good part of the time. |
| | 2 | I feel guilty most of the time. |
| | 3 | I feel guilty all of the time. |

- 6. Sense of punishment** 0 I don't feel I am being punished.
 1 I feel I may be punished.
 2 I expect to be punished.
 3 I feel I am being punished.
- 7. Self-hate** 0 I don't feel disappointed in myself.
 1 I am disappointed in myself.
 2 I am disgusted in myself.
 3 I hate myself.
- 8. Self-accusation** 0 I don't feel I am any worse than anybody else.
 1 I am critical of myself for my weakness or mistakes.
 2 I blame myself for my faults.
 3 I blame myself for everything.
- 9. Self-punishment wishes** 0 I don't have any thoughts of killing myself.
 1 I have thoughts of killing myself but I would not carry them out.
 2 I would like to kill myself.
 3 I would like to kill myself if I had the chance.
- 10. Crying spells** 0 I don't cry anymore than usual.
 1 I cry now more than I used to.
 2 I cry all the time now.
 3 I used to be able to cry, but now I can't cry even though I want to.
- 11. Irritability** 0 I am no more irritated than I ever am.
 1 I get annoyed or irritated more easily than I used to.
 2 I feel irritated all the time now.
 3 I don't get irritated at all by the things that used to irritate me.
- 12. Social withdrawal** 0 I have not lost interest in other people.
 1 I am less interested in other people than I used to be.
 2 I have lost most of interest in other people.
 3 I have lost all of my interest in other people.
- 13. Indecisiveness** 0 I make decisions about as well as I ever could.
 1 I put off making decisions more than I used to.
 2 I have greater difficulty in making decisions than before.
 3 I can't make decisions at all anymore.
- 14. Body image** 0 I don't feel any worse than I used to.
 1 I am worried that I am looking old or unattractive.

- 2 I feel that there are permanent changes in my appearance that make me look unattractive.
3 I believe I look ugly.
- 15. Work inhibition**
- 0 I can work out as well as before.
1 It takes extra effort to get started at doing something.
2 I have to push myself very hard to do anything.
3 I can't do any work at all.
- 16. Sleep disturbance**
- 0 I can sleep as well as usual.
1 I don't sleep as well as I used to.
2 I wake up one or two hours earlier than usual and find it hard to get back to sleep.
3 I wake up several hours earlier than I used to and cannot get back to sleep.
- 17. Fatigability**
- 0 I don't get anymore tired than usual.
1 I get tired more easily than I used to.
2 I get tired from doing almost anything.
3 I am too tired to do anything.
- 18. Loss of appetite**
- 0 My appetite is no worse than usual.
1 My appetite is not as good as it used to be
2 My appetite is much worse now.
3 I have no appetite at all anymore.
- 19. Weight loss**
- 0 I haven't lost much weight, I any, lately.
1 I have lost more than 5 pounds.
2 I have lost more than 10 pounds.
3 I have lost more than 15 pounds.
- 20. Somatic preoccupation**
- 0 I am no more worried about my health than usual.
1 I am worried about physical problems such as aches and pains, or upset stomach, or constipation.
2 I am very worried about physical problems and it is hard to think of much else.
3 I am so worried about my physical problems that I cannot think about anything else.
- 21. Loss of libido**
- 0 I have not noticed any recent change in my interest in sex.
1 I am less interested in sex than I used to be.
2 I am much less interested in sex now.
3 I have lost interest in sex completely.

(For researcher: Total score: _____)

Appendix 1.2 Beck Depression Scale (Kinyarwanda version)

IGIPIMO CY'AGAHINDA CYA BECK

Numero y'usubiza: _____

Itariki: _____

Amabwiriza:

1. Iki kicro cy'ibibazo kigizwe n'ibice 21. Buri gice kigizwe n' interuro 4
2. Soma neza buri gice na buri nteruro.
3. Hitamo interuro muri buri gice isobanura neza uburyo wiyunvaga mu bijyanye n'amarangamutima yawe mu cyumweru gishize, kugeza uyu muni.
4. Zengurutse akaziga ku mubare uri iruhande rw'interuro wahisemo.
5. Witegereze neza ko wasomye neza bihagije buri nteruro muri buri gice mbere yo gubitamo.

1.	0	Numva nta gahinda mfite
	1	Numva mfite agahinda
	2	Numva iteka mfite agahinda, birangora kuba nagasohokamo
	3	Mfite ishavu n'akababaro ntabasha kwihanganira
2.	0	Nunva ntahangayikishijwe by'umwihariko n'ubuzima buri imbere.
	1	Numva ubuzima buri imbere bunca intege.
	2	Nunva ntacyo nfite kimpa ikizere cy'ejo hazaza.
	3	Nunva ubuzima buri imbere nta kizere bumpa kandi nunva nta kintu nakimwe cyabihindura.
3.	0	Sinunva ko ntacyo nagezeho mu buzima bwanjye.
	1	Ntekereza ko ntacyo namaze mu buzima bwanjye mfatiye ku rugero rw'abandi bantu basanzwe.
	2	Iyo nsubije amaso inyuma mu buzima bwanjye bwahise mbona bwaranzwe no kutagira icyo ngeraho.
	3	Nunva ndi umuntu udafite icyo amaze.
4.	0	Nunva nishimira ibintu uko byari bisanzwe na mbere.
	1	Sinkishimira ibintu nk' uko nahoze mbyishimira mbere.

	2	Nta kintu na kimwe kikinshimisha habe na gato.
	3	Nunva ibintu byose bisigaye bitakinshimisha, bindambiye.
5.	0	Sinunva nishinja cyangwa nirega by'umwihariko.
	1	Hari igihe rimwe na rimwe nunva nishinja cyangwa nirega.
	2	Igihe kinini nunva hari ibyo nishinja cyangwa nirega.
	3	Igihe cyose hari ibyo nunva nishinja.
6.	0	Sinunva meze nk'uri mu gihano
	1	Nunva ari nkaho ndi mu gihano.
	2	Nunva meze nkutegereje guhanwa
	3	Nunva ndimo guhanwa.
7.	0	Nunva nfitiye agaciro muri nje.
	1	Nunva nta gaciro nfitiye muri nje.
	2	Nunva nihaze.
	3	Nunva nifitiye urwango.
8.	0	Sinunva ko merewe nabi cyane kuruta abandi bose.
	1	Mpora nigaya kubera intege nke zanjye cyangwa amakosa yanjye.
	2	Ndigaya kubera amakosa yanjye
	3	Nunva nishinja, nigaya kubera ibintu byose bimbaho.
9.	0	Ntabitekerezo nfitiye byo kuba nakwiyahura.
	1	Mfite ibitekerezo byo kwiyahura ariko nunva ntabishyira mu bikorwa
	2	Nunva nifuzaga kwiyahura.
	3	Nunva ndamutse mbonye uburyo nakwiyahura.
10.	0	Ntabwo nkirira cyane birenze uko nari nsanzwe
	1	Ndarira cyane muri iki gihe birengeje uko nari nsanzwe ndira.
	2	Ndarira buri muni muri iki gihe.
	3	Kera najyaga mbasha kurira, ariko ubu simbibasha nubwo mba mbishaka.
11.	0	Sinkigira umunabi nkuko nawugiraga mbere.
	1	Nsigaye ndambirwa nkanagira umunabi kuburyo bworoshye kuruta uko nari meze mbere.
	2	Nsigaye nunva mporana umunabi igihe cyose.
	3	Singiterwa umunabi nibintu byawunteraga mbere.
12.	0	Sinigeze ntakaza gusabana nabandi bantu?
	1	Nunva nta bushake nkigira bwo gusabana nabandi nkuko nabihoranye mbere.

	2	Natakaje ubushake nagiraga mu gusabana nabandi.
	3	Sinkigira na gato ubushake bwo gusabana nabandi.
13.	0	Mbasha gufata ibyemezo neza nkuko nari nsanzwe mbifata na mbere.
	1	Ntibinyorohera gufata ibyemezo nka mbere.
	2	Bisigaye bingora cyane gufata ibyemezo kuruta uko byari bimeze mbere.
	3	Sinkibasha gufata ibyemezo habe na gato.
14.	0	Sinunva mfite isura mbi kurusha mbere.
	1	Mfite ubwoba ko ngaragara nk'ushaje kandi utari mwiza ku mubiri
	2	Nunva hari impinduka zimbaho zituma ngenda nsa nabi ku isura
	3	Nunva nfite isura mbi kandi ngaragara nabi.
15.	0	Mbasha gukora nk'uko bisanzwe.
	1	Binsaba kongera imbaraga nyinshi kugirango mbashe gutangira kugira icyo nkora.
	2	Binsaba guhatiriza cyane kugirango mbashe kugira icyo nkora.
	3	Sinkibasha kugira icyo nkora na gito.
16.	0	Mbasha gusinzira neza nk'ibisanzwe.
	1	Sinsinzira neza nk'uko byari bisanzwe mbere.
	2	Nsigaye nicura isaha 1 cyangwa 2 mbere y'igihe nakangukiraga kandi bikangora kongera gusinzira.
	3	Nsigaye nicura amasaha menshi cyane mbere y'igihe nakangukiraga mbere kandi simbashe kongera gusinzira.
17.	0	Sinkinaniwa nk'uko nari nsanzwe nanirwa.
	1	Nsigaye nanirwa vuba cyane kuruta uko byari bimeze mbere.
	2	Nsigaye nanizwa n'ikintu cyose ngerageje gukora.
	3	Numva naniwe cyane kuburyo ntacyo nabasha gukora.
18	0	Ntabwo nkibura apetit cyane nk'ibisanzwe.
	1	Apeti yanjye si nziza nkuko yahoze.
	2	Apeti yanjye yaragabanutse cyane muri iki gihe.
	3	Sinkigira apetit habe na gato.

19	0	Ntabwo nataye ibilo byinshi mu minsi ishize.
	1	Nataye hejuru y'ibilo 2.5.
	2	Nataye hejuru y'ibilo 4.5.
	3	Nataye hejuru y'ibilo 6.5.
20	0	Singihangayikishwa cyane n'ubuzima bwanjye nka mbere.
	1	Nunva mpangayikishijwe n'ibibazo by'umubiri: nko kuribwa, umutwe, kutamererwa neza mu gifu, cyangwa kunanirwa kwituma.
	2	Mpangayikishijwe cyane n'ibibazo by'umubiri kuburyo bingora kugira ikindi kintu ntekerezaho.
	3	Mpangayikishijwe bikabije cyane n'ibibazo by'umubiri kuburyo ntakindi mbasha gutekereza.
21	0	Nta mpinduka nigeze ngira kubijyanye no kwifuza imibonano mpuzabitsina.
	1	Gushaka gukora imibonano mpuzabitsina byaragabanutse.
	2	Gushaka gukora imibonano mpuzabitsina byaragabanutse cyane.
	3	Singishaka nagato gukora imibonano mpuzabitsina.
		(Bireba umushakashiatsi: Igiteranyo: [REDACTED])

Appendix 2: LETTERS OF PERMISSION TO CONDUCT RESEARCH

Appendix 2.1 Letter of permission to Kimironko Health Centre

The Management
Kimironko Health Center,
Kigali -Rwanda

6th April, 2005

Dear Sir:

Application to conduct a research at Kimironko Health Centre

I hereby request permission to conduct research at Kimironko Health Centre.

I am a student at the University of KwaZulu-Natal in the School of Nursing, undertaking a Master degree in Mental Health Nursing. One of the requirements for the degree is to conduct a research project.

The title of the research is *“Depression among people living with HIV/AIDS attending a Primary Health Care setting in Rwanda, a descriptive study”*.

Kimironko Health Centre was purposively chosen to be the setting for this study. Data will be collected from 96 patients who are 18 years and older and living with HIV/AIDS and who attend the clinic for care. Patients will be required to complete two questionnaires and this will take place during their visit at the clinic. This protocol has been approved by the Research Ethics Committees of the University of KwaZulu-Natal, and of CNLS. These approvals are attached to this. Also attached is the informed consent for participants which shows that participation is voluntary and how the rights and identity of the patients will be protected in the research process.

Your consideration will be greatly appreciated.

Yours faithfully

Benoite UMUBYEYI

Research Supervisor: Dr. Lyn Middleton (University of KwaZulu-Natal)

Appendix 2.2 Letter of request for application for approbation

The Executive Secretary
CNLS Rwanda,
Kigali -Rwanda

6th April, 2005

Dear Madam:

Application for approbation of a research proposal

I hereby request the approbation of my research proposal by CNLS.

I am a student at the University of KwaZulu-Natal in the School of Nursing, undertaking a Master degree in Mental Health Nursing. One of the requirements for the degree is to conduct a research project.

The title of the research is *“Exploring depression among people living with HIV/AIDS attending a Primary Health Care setting in Rwanda, a descriptive, cross-sectional study”*.

Kimironko Health Centre was purposively chosen to be the setting for this study. Data will be collected from patients who are living with HIV/AIDS, aged 18 years and older and who attend the clinic for care. Participants will be required to complete two types of questionnaires and this will take place during their visit at the clinic. This protocol has been submitted to the Research Ethics Committee of the University of KwaZulu-Natal, and is waiting for approval. This letter will be forwarded to you as soon as it is available. The research protocol, the data collection tools and the consent form for participants are enclosed herein. The informed consent for participants shows that participation is voluntary and how the rights and identity of the patients will be protected in the research process.

Your consideration will be greatly appreciated.

Yours faithfully

Benoite UMUBYEYI

Research Supervisor: Dr. Lyn Middleton (University of KwaZulu-Natal)

Appendix 3: Ethical Approval Letters

Appendix 3.1: Letter of approval by CNLS

PRESIDENCE DE LA REPUBLIQUE DU RWANDA
COMMISSION NATIONALE DE LUTTE CONTRE LE SIDA

Kigali, le 29 JUL 2009



B.P 7162 KIGALI

N. Réf : 0136.../CNLS/2009/S.E

V. Réf :

Madame Benoite Umubyeyi

Principal Investigator

KHI

Kigali

Objet : Approbation de votre Projet de recherche

Madame,

Suite à votre demande d'approbation du projet de recherche intitulé «**Exploring depression among people living with HIV/AIDS and attending a Primary Health Care Setting at Kigali, Rwanda: A descriptive study**» adressée à la CNLS, j'ai le plaisir de vous informer qu'après lecture et analyse de votre protocole par le Comité de pilotage des recherches du domaine du VIH/SIDA, votre projet a été approuvé.

A cet effet, la CNLS vous accorde l'approbation de votre projet et vous remercie pour l'intérêt que vous portez à la recherche dans le domaine du VIH/SIDA.

Par ailleurs, il vous est demandé de bien vouloir partager avec le Comité de recherche dans le domaine du VIH/SIDA, les résultats de votre recherche.

Veuillez agréer Madame, l'expression de franche collaboration.

Dr Anita ASHIMWE

Secrétaire Exécutif

CPI :

- Ministre de la Santé
- Président du Comité national d'Éthique.

Appendix 3.2: Letter of approval by the Research Ethics Committee of the University of KwaZulu-Natal



RESEARCH OFFICE (GOVAN MBEKI CENTRE)
WESTVILLE CAMPUS
TELEPHONE NO.: 031 – 2603587
EMAIL: ximbap@ukzn.ac.za

3 JULY 2009

MS. U BENOITE (204501595)
SCHOOL OF NURSING

Dear Ms. Benoite

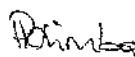
ETHICAL CLEARANCE: "EXPLORING DEPRESSION AMONG PEOPLE LIVING WITH HIV/AIDS AND ATTENDING A PRIMARY HEALTH CARE SETTING IN KIGALI, RWANDA: A DESCRIPTIVE STUDY."

I wish to confirm that ethical clearance has been granted for the above project, subject to necessary gatekeeper permission being obtained:

This approval is granted provisionally and the final clearance for this project will be given once the above conditions have been met. Your Ethical Clearance Number is HSS/0369/09

Kindly forward your response to the undersigned as soon as possible

Yours faithfully


.....
MS. PHUMELELE XIMBA
ADMINISTRATOR
HUMANITIES & SOCIAL SCIENCES ETHICS COMMITTEE

cc. Supervisor (Dr. L Middleton)
cc. Mr. S Reddy

Appendix 3.3: Letter of Permission to conduct research at Kimironko health care centre

REPUBLIQUE DU RWANDA



MINISTERE DE LA SANTE

CENTRE DE SANTE KIMIRONKO

Kigali le 05/07/09

Madame Umubyeyi Benoite

Kigali Health Institute.

Kigali.

Objet : Permission de conduire le projet de recherche.

Madame,

Suite a votre demande de permission de conduire votre projet de recherche intitulé « Exploring depression among people living with HIV/AIDS and attending a Primary Health Care Setting : A descriptive study », au sein du centre de santé KIMIRONKO, j'ai le plaisir de vous informer que la permission vous est accordée.

Nous vous prions de bien vouloir respecter les conditions d'éthique et de ne commencer la collecte des données qu'après approbation de votre projet de recherche par le comité de pilotage des recherches de la CNLS. Vous avez aussi reçue la permission de consulter les dossiers des patients dans le cadre de votre recherche.

Par ailleurs, il vous est demandé de bien vouloir partager avec le centre de santé les résultats de votre recherche.

Nous vous remercions d'avoir choisi le centre de santé Kimironko pour faire le terrain de votre recherche.

Veuillez agréer Madame, l'expression de notre franche collaboration

Muhirwa Jean Pierre
Titulaire de C.S Kimironko

A circular official stamp of the Centre de Santé Kimironko is placed over the name. Below the stamp is a handwritten signature in black ink.

Appendix 4: Patients information document and declaration of consent to participate

Dear Participants,

My name is Benoite UMUBYEYI; I am a student at the University of KwaZulu-Natal, undertaking a Masters degree in Mental Health Nursing. One of the requirements for the degree is to conduct a research project.

This letter serves to ask consent from you to take part in this research. The purpose of the research is to understand the feeling of depression that some people living with HIV gave from time to time. This will help to understand the importance of the problem of depression, which is sometimes under-looked in the care of people living with HIV/AIDS. Depression is a very painful and unpleasant experience but the symptoms can be managed. This study will help us to know how many people do suffer from depression so that the clinic can help them to manage it.

You are thereby requested to answer a questionnaire with three parts. The first part asks you for personal information about yourself, the second for medical information and the third to describe how you have been feeling in the last two weeks. All this information will be kept confidential. No names will be asked for and only the researcher and her lecturer will have access to the questionnaires. The questionnaires will be destroyed after the study is complete.

Your participation in this research is voluntary. If you decide not to participate there will be no negative consequences for you. If you do decide to participate there will be no benefits for you. However, if you report feeling very depressed or have thoughts of harming yourself or others the researcher will, with your permission, be able to refer you immediately to a person at the clinic for assistance.

It will take you approximately 20 minutes of your time to complete the questionnaire.

Contact Details

- 1. Contact details of researcher (for further information / reporting of study related adverse events).**

Benoite UMUBYEYI
University of KwaZulu-Natal
School of Nursing
Tel: 0798305760

- 2. Contact details of the research ethic committee of Kigali Health Institute (for reporting of complaints / problems).**

Dr Kato Ndjunwa
Kigali Health Institute
Faculty of Allied sciences
Office Tel :(+250) 572172

- 3. Contact details of the research supervisor (for further information on the research and reporting of study related adverse events).**

Dr. Lyn Middleton
School of Nursing
5th Floor Desmond Clarence Building
Howard College Campus
Faculty of Health Sciences
University of KwaZulu-Natal
DURBAN
South Africa
Tel: +27 31 260 1655
Fax: +27 31 260 2855

Thank you for your decision to take part in this research.

Yours truly,

Benoite UMUBYEYI

Research Supervisor: **Dr. Lyn Middleton**

DECLARATION OF CONSENT TO PARTICIPATE IN THE RESEARCH

I hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating voluntarily in the research project.

I understand that I am at liberty to withdraw from the project at any time, should I so desire.

SIGNATURE OF PARTICIPANT

DATE

.....

Appendix 5: Tables of variables

Appendix 5. 1. Summary of variables, instruments and analyses used in HIV/AIDS and psychiatric disorder prevalence studies

Title of the study	Author and Date	Variables studied	Measurement instruments used	Type of Analyses performed
1. Psychiatric disorders among HIV-positive population in Nigeria: a control study	Adewuya et al.(2007)	<ol style="list-style-type: none"> 1. Present and past psychiatric disorders 2. Sociodemographic data e.g. age, gender, marital status, educational level, socioeconomic status and level of social support 3. Clinical details (stage of the disease, time of diagnosis, any present medical problems, previous hospital admissions due to HIV, and length of ARVs use) 	<ol style="list-style-type: none"> 1. Mini International Neuropsychiatric Interview 2. Proforma questionnaire about sociodemographic data 3. Licket scale measure for social support 4. Clinical information from clients 	<ol style="list-style-type: none"> 1. Frequencies, mean and standard deviation 2. Chi-square and Student's <i>t</i> test
2. Major depression in patients with HIV/AIDS and Substance Abuse	Berger-Greenstein et al. (2006)	<ol style="list-style-type: none"> 1. Rate, severity and types of depressive symptoms 2. Adherence to HAART, CD4 and viral load 3. Sociodemographic variables e.g. gender, ethnic group, alcohol and substance abuse 	<ol style="list-style-type: none"> 1. Structured clinical interview for DSM IV 2. Beck Depressive Inventory (2nd edition) 3. Medication adherence questionnaire 	<ol style="list-style-type: none"> 1. Frequency statistics 2. Correlation between depressive symptoms & severity and adherence 3. Depressive symptoms correlated with demographic variables 4. ANOVA used to compare gender and ethnic group on depressive severity and subtypes of depression symptoms
3. Symptoms of depression and anxiety among a sample of South African patients living with a chronic illness	Kagee, (2008)	<ol style="list-style-type: none"> 1. Psychological distress 2. Symptoms of depression 3. Symptoms of anxiety 	<ol style="list-style-type: none"> 1. The Hopkins Symptoms Checklist (HSCL-25) to measure psychological distress 2. Beck Depression Inventory Scale 	<ol style="list-style-type: none"> 1. SPSS version 14 2. Descriptive statistic; sample mean and standard deviation 3. T-test used to establish significance difference between variables

4. Depression in people living with HIV/AIDS attending primary care and outpatients clinics	Komiti et al. (2003)	<ol style="list-style-type: none"> 1. Demographic data (employment status; living situation and relationship status) 2. Medical information (CD4 cell counts; Viral load; ART and HIV related medication; stage of illness and duration of known HIV seropositivity) 3. Psychiatric data (current psychiatric diagnosis by the treating practitioner; treatment; treatment provider; past psychiatric diagnosis; alcohol and illicit drug use) 4. Symptoms of depression 	<ol style="list-style-type: none"> 1. Questionnaire to collect medical data and psychiatric data 2. Questionnaire to collect sociodemographic information and drug/alcohol use 3. The Inventory to Diagnose Depression(IDD) 4. Laboratory tests (Quantiplex RNA assay; COBAS Amplicor HIV monitor assay) 	<ol style="list-style-type: none"> 1. Non-parametric methods to compare those who met criteria for depression and those who did not 2. Continuous variables compared using Kruskal-Wallis Test 3. Categorical variables compared using Chi-square test
5. Depressive and anxiety disorders in women with HIV infection	Morrison et al. (2002)	<ol style="list-style-type: none"> 1. Depressive symptoms scores 2. Anxiety symptoms scores 3. Physical, neuro-psychological and immune aspects of HIV infection 4. Sociodemographic data (age; race; marital status; number of children; and monthly income) 5. HIV disease stage and ART 	<ol style="list-style-type: none"> 1. Interviews: physical and neuropsychological examination 2. Questionnaires assessing mood, psychosocial factors, health habits 3. 17- items Hamilton Depression Rating Scale 4. Classification of HIV disease status used Centre for Disease Control and Prevention (CDC) criteria for staging of HIV infection 	<ol style="list-style-type: none"> 1. SAS version 8.01 2. Univariate test and estimation of odds ratios for discrete variables 3. Kruskal-Wallis Test was performed to compare p value for seronegative versus seropositive and constant variance assumptions. 4. ANOVA was used for continuous variables of Hamilton depression and anxiety scale scores

Table 1: Continued

Title of the study	Author and Date	Variables studied	Measurement instruments used	Type of analyses performed
6. Psychiatric co-morbidity in vulnerable population receiving primary care for HIV/AIDS	Israelski et al. 2007	<ol style="list-style-type: none"> 1. Demographic data (gender; age; ethnicity) 2. Medical information (AIDS status; use of ARTs; CD4 counts and viral load) 3. Utilization of psychiatric and social service 4. Symptoms of depression, PTSD and acute stress disorders 	<ol style="list-style-type: none"> 1. Structured questionnaire to collect demographic data 2. Patients record for medical information 3. Beck Depression Inventory 4. Posttraumatic Stress Checklist-Civilian (PCL-C) 5. The Stanford Acute Stress Reaction Questionnaire (SASRQ) 	<ol style="list-style-type: none"> 1. Descriptive statistical methods, frequency description and percentages 2. Central tendencies (mean, median and standard deviation) were used for continuous data (age, viral load, CD4 results). 3. In cross-tabulation analysis, Mantel-Haentzel odds ratios were calculated using SPSS 13.0 4. Multivariate logistic regression were used to estimate the relative association between demographic with symptom criteria
7. Purpose in Life and Depressive symptoms in persons	Lyon & Younger (2001)	<ol style="list-style-type: none"> 1. Demographic data (age; ethnicity; gender) 2. Concurrent medications both ART and 	<ol style="list-style-type: none"> 1. Self-administered questionnaire 2. Sociodemographic tool 3. The Center for Epidemiological 	<ol style="list-style-type: none"> 1. Inferential statistics e.g multiple regression 2. Hierarchical regression analysis was

living with HIV disease		<ul style="list-style-type: none"> 3. antidepressants 4. Frequency of depressive symptoms 5. Purpose in life 6. Severity of HIV disease (CD4+ T lymphocytes) 	<ul style="list-style-type: none"> 7. Studies Depression Scale (CES-D) 8. Purpose in Life Scale 9. Revised HIV Center Medical Staging Scale (r-HCMSS) 10. Clinical support laboratory used to measure CD4+ 11. Reverse Transcription Polymerase Chain Reaction (RT-PCR) 	<ul style="list-style-type: none"> 12. used to test the hypothesis that the purpose in life is a stronger predictor of depressive symptoms. 13. Hierarchical multiple regression model was constructed in which demographic variables and then HIV disease severity indicators were compared to depressive symptoms.
8. Depression and Neurocognitive performance in individuals with HIV/AIDS: 2 years follow-up	Gibbie et al. (2006)	<ul style="list-style-type: none"> 1. Depression 2. HIV illness progression (CD4, viral load) 3. Demographic data (age; education; current living situation; current relationship status; current and past alcohol and illicit drug; and personal psychiatric history) 	<ul style="list-style-type: none"> 1. Beck Depression Inventory Scale 2. Structured Clinical Interview for Depression (SCID-CV) 3. Neuropsychological tests (Cambridge Neuropsychological Test Automated Battery (CANTAB) and the Hopkins HIV dementia Scale (HDS)) 4. Laboratory assays for CD4 counts, viral load 5. HIV symptoms and AIDS defining illness were obtained from patient record 	<ul style="list-style-type: none"> 1. SPSS version 10 2. Univariate analysis using χ^2 for categorical variables 3. Kruskal-Wallis Test for continuous variables 4. Multiple linear regression model used to measure association

Table 1: Continued

Title of the study	Author and Date	Variables studied	Measurement instruments used	Type of analyses performed
9. Symptoms of depression and anxiety among a sample of South African patients living with a chronic illness	Kagee, (2008)	<ul style="list-style-type: none"> 1. Psychological distress 2. Symptoms of depression 3. Symptoms of anxiety 	<ul style="list-style-type: none"> 1. The Hopkins Symptoms Checklist (HSCL-25) to measure psychological distress 2. Beck Depression Inventory Scale 	<ul style="list-style-type: none"> 1. SPSS version 14 2. Descriptive statistic 3. T-test used to establish significance difference between variables
10. Nature of depression in patients with HIV/AIDS	Judd et al. (2005)	<ul style="list-style-type: none"> 1. Sociodemographic data (gender; age; employment; educational level; sickness/disability pension; intimate relationship) 2. Medical characteristics (HIV-RNA loads; CD4 cell counts, duration of knowing HIV diagnosis) 3. Personality traits 4. Illicit substance use 5. Medical adherence 6. Cognitive impairment 	<ul style="list-style-type: none"> 1. Beck Depression Inventory 2. Revised Neo Personality Inventory 3. Structured Clinical Interview for DSM 4. The Hopkins HIV dementia scale 5. The Grooved Peg-board and the Cambridge Automated Neuropsychological Test Battery 	<ul style="list-style-type: none"> 1. Descriptive analysis 2. Correlation 3. Chi-square test

<p>11. Factors associated with depression among homeless and marginally housed-HIV infected men in San Francisco</p>	<p>Weiser et al. (2006)</p>	<ol style="list-style-type: none"> 1. Symptoms of depression 2. Sociodemographic characteristics e.g. age, race, sex, income, education, homelessness and representative payee. 3. Drug and alcohol use 4. CD4 cell counts and viral load 	<ol style="list-style-type: none"> 1. Beck Depression Inventory Scale 2. Structured interviews 3. Blood for CD4 and viral loads 	<ol style="list-style-type: none"> 1. SAS statistical analysis software, version 8 2. Multiple logistic regression used to measure association
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Appendix 5. 2 Summary of this study design, the variables under study, the instruments to measure the variables and type of analysis.

Title of the study	Study design	Variables to be studied	Instruments to be used	Type of Analysis
Depression among people living with HIV/AIDS and attending a primary health care setting in Kigali, Rwanda	Descriptive Cross sectional design	<p>Increased biological vulnerability (HIV related medical information):</p> <ul style="list-style-type: none"> ▪ CD4 cell ▪ HIV/AIDS related symptoms ▪ Time known of HIV positive status <p>Decreased social and personal protective factors (Sociodemographic factors):</p> <ul style="list-style-type: none"> ▪ Age ▪ Gender ▪ Marital status ▪ Social support ▪ Employment ▪ Socio-economic status ▪ History of a psychiatric disorder <p>Depressive symptoms in BDI</p> <ul style="list-style-type: none"> ▪ 0-9 score: Normal range ▪ 10-18 score: Mild- Moderate ▪ 19-29 score: Moderate-severe ▪ 30-63 score: severe 	<p>-Questionnaire for demographic data</p> <p>-Questionnaire for medical related information</p> <p>-Beck Depression Inventory Second Version</p>	<p>-Descriptive statistic analysis: frequencies, mean, standard deviation</p> <p>-The categorical variables in this study were compared for correlation with depressive symptoms using the Chi-square test-</p> <p>-To analyze the extent to which numerical variables are associated with depressive symptoms; the <i>t</i>-test for independent sample test was used.</p>